

# **EYEWITNESSES, EXPERTS, AND JURORS: IMPROVING THE QUALITY OF JURY DECISIONMAKING IN EYEWITNESS CASES**

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In recent years it has been increasingly common for criminal defense attorneys to challenge the reliability of eyewitness identifications through the introduction of expert psychological testimony concerning problems of eyewitness identification. The acceptance of expert psychological testimony on issues associated with eyewitness memory is source of heated debate (McCloskey & Egeth, 1986). Much of the debate centers around three issues raised by lawyers and psychologists who oppose the introduction of expert eyewitness testimony: (1) is there a adequate scientific base of knowledge upon which to base expert testimony; (2) is psychological knowledge about eyewitness memory beyond the ken of the jury; and (3) what are the effects of expert psychological testimony on jury decisionmaking? In this essay we report the results of several studies we and our colleagues have conducted in an effort to answer these questions.

## The Quality of the Research on which

### Expert Testimony is Based

Some psychologists doubt that the existing body of research and theory on human memory is sufficient to draw valid conclusions about eyewitness memory (Konecni & Ebbesen, 1986; McCloskey, Egeth, & McKenna, 1986). The primary issues raised by these psychologists are that the body of scientific research examining eyewitness reliability is not sufficiently large to provide a basis for scientific conclusions, that there is disagreement among psychologists about memory processes and about the consistency of the research findings, and that the research techniques and subject populations used (i.e., college undergraduates) do not justify generalization of the findings to actual crime settings.

Of course the consistency of research findings and the extent to which memory and eyewitness testimony research generalizes to actual criminal cases are ultimately empirical questions. One way to examine the consistency and coherence of the research findings is to use existing research as a data base for further, secondary study. Shapiro and Penrod (1986), for example, conducted a quantitative "meta-analysis" of 128 eyewitness identification and facial recognition studies, involving 960 experimental conditions and 16,950 subjects. Two analytic techniques were employed. The first was an "effect size" analysis, which combined the effect sizes of eyewitness factors across studies which manipulated a particular factor. An effect size (indexed by  $d$ ) reflects the magnitude of differences between two means (e.g., the mean correct identification rate for male witnesses versus the mean rate for female witnesses) in terms of the number of standard deviations separating their means. A  $d$  of zero would indicate that two means are identical, while a  $d$  of .3 (or -.3) would

indicate a difference in means that, in the context of this study, is worthy of note.

The variables examined included such eyewitness factors as context reinstatement (efforts to mentally reinstate the conditions under which observations were originally made), transformations in the appearance of faces (such as disguises and changes in pose), depth of processing strategies (the memorial strategies employed by witnesses during the original viewing), target distinctiveness, exposure time, cross-racial identification, the length of the retention interval, and a number of others. Shapiro and Penrod found that many variables operating at the encoding and retrieval stages did, in fact, produce significant and sometimes substantial effects on performance (see Table 1 which summarizes the impact of factors on correct identification rates). These variables had typically been examined in a half-dozen or more separate studies and in one instance, twenty-nine studies involving nearly 1,800 subjects

Shapiro and Penrod's second analytic method was a "study characteristics" analysis, which integrated the results from all studies to examine the influence of study characteristics (the techniques, settings, and experimental conditions under which the studies were conducted) on performance. For these analyses the identification conditions of more than 950 experimental cells (involving more than 16,000 subjects) were coded for analysis. In brief, Shapiro and Penrod found that almost all study characteristics accounted for a statistically significant portions of variance in eyewitness performance. In all, eleven sets of variables accounted for a highly significant (and, one could easily argue, a forensically significant) 47% of the variance in hit rates.

It was especially noteworthy that after controlling for the effects of study characteristics a variable that reflected whether a study was a laboratory versus field study accounted for only 3% of the variance in performance. In contrast, when considered separately, study type had accounted for 35% of the variance. This result underscores that the laboratory/field distinction is almost entirely confounded with variables that systematically predict identification performance--indeed, nearly 75% of the variance in laboratory versus field study outcomes could be accounted for by variables measuring attention, knowledge about the identification task, mode of presentation targets, exposure time, number of targets studies, and target race. Stated another way, the argument that laboratory results may not generalize to performance under naturalistic conditions is substantially weakened by these results. Furthermore, the variables that account for laboratory versus field differences also mirror natural variations in witnessing and identification conditions that exist in

real-world eyewitness situations. Laboratory, field, and real eyewitness situations all vary along dimensions such as focus of witness attention, load at study and recognition, opportunity to view, same versus cross-race identifications and so on. Knowledge about the effects of these variations on eyewitness performance should, in principle, be of value to anyone (police, district attorneys, judges, jurors, and psychologists) trying to evaluate the reliability of an identification made under a particular set of circumstances.

#### Legal Issues Concerning Expert Testimony

That mistaken identifications occur, when considered alone, is not necessarily troublesome (insofar as the identification procedures were fair). Mistakes are worrisome, however, when juries convict defendants on the basis of erroneous identifications. The criminal justice system is designed, in theory, to provide safeguards against mistaken identifications--safeguards such as exclusion of eyewitness identification evidence in some instances in which counsel is absent from the identification proceeding; rigorous cross-examination of identifying witnesses, and the use of instructions to the jury on factors they should consider when evaluating eyewitness identification. However, from a psychological perspective, serious questions can be raised about the effectiveness of traditional safeguards.

As noted earlier, defense attorneys now seek to supplement these traditional safeguards with expert psychological testimony. A central proposition used to support the admissibility of expert psychological testimony is that jurors are not fully sensitive to the factors that influence eyewitness memory. Lack of sensitivity, in this context, refers to: (1) poor knowledge about factors that influences memory and (2) the inability to integrate or use that knowledge when making an inference or judgment about eyewitness accuracy. If jurors are not adequately sensitive to factors that influence the accuracy of eyewitness identifications, they cannot effectively evaluate eyewitness evidence. Opponents of expert testimony doubt that jurors need or will benefit from expert testimony.

#### Juror Sensitivity to Eyewitness Evidence

Do lay-persons effectively use identification evidence such as witnessing factors and identification procedures to draw appropriate inferences about the accuracy of identifications? A few studies have addressed this question. These studies generally use one of three methodologies: a questionnaire method in which lay-persons are queried about factors that influence eyewitness memory with multiple-choice items (e.g. Deffenbacher & Loftus, 1982); a prediction method in which the witnessing conditions of an eyewitness experiment are described to the subject and the subject predicts the identification accuracy-rates (e.g. Brigham & Bothwell, 1983); and a mock-jury method in which mock-juries (or jurors) try a case involving eyewitness evidence (e.g. Lindsay, Wells, and Rumpel, 1981). While each methodology has its advantages and disadvantages, the studies have converged on the conclusion that empirical findings are often inconsistent with lay-knowledge of and assumptions about factors that influence eyewitness identification accuracy--particularly with respect to eyewitness confidence. These findings have led Wells (1984) to recommend that ". . . the lay person, as trier of fact, be counseled on these matters."

Even though previous research yields consistent findings, most studies can be criticized on the grounds that subjects have not actually been called upon to evaluate eyewitness testimony. The extent of the impact of eyewitnessing factors on jurors' inferences can be better estimated by simultaneously examining the effects of multiple witnessing factors, and by closely approximating actual criminal cases--that is, by

increasing the external validity of the experiment. In a series of studies (Cutler, Penrod, & Dexter, 1989; Cutler, Penrod, & Dexter, 1990; Cutler, Penrod, & Stuve, 1988) we have investigated juror's use of eyewitness evidence. The primary concern of these experiments was to examine the lay-person's knowledge about and critical consideration of the variables that influence eyewitness memory, and the lay-person's belief in or skepticism about eyewitness memory per se.

Methods. Undergraduate and experienced jurors served as subjects in Cutler, Penrod, & Dexter (1990) and Cutler, Penrod, & Stuve, (1988). These mock jurors viewed a videotaped trial of a defendant accused of the armed robbery of a liquor store. The videotaped trial lasted approximately 45 minutes and followed the format of an actual trial. To maximize the realism of the videotaped trial, practicing trial attorneys assumed the roles of attorneys.

The primary source of evidence in the trial was the positive identification of the defendant by the victim of the robbery. The victim was the first trial witness. She testified about the witnessing conditions and the conditions under which she identified the defendant as the robber. The second witness was the police officer who testified about the conditions under which the identification was made. The third witness was a character witness for the defendant. The fourth witness was the defendant who denied all allegations.

Approximately twenty witness and identification factors were discussed in the trial, all of which surface in the examination and cross-examination of the first two witnesses. Ten of these variables were systematically manipulated in a complex factorial design. The ten manipulated factors were all presented in high versus low forms and included: perpetrator disguise (i.e. the perpetrator was either disguised or not disguised); a weapon used or not; the robbery was violent or not; there was a long or short retention interval between the crime and the identification; mugshots were searched by the victim or not; biased versus unbiased lineup instructions were given to the witness; large or small lineups were used; voice samples were given to victim or not; the witness was 80% versus 100% confident about her identification. The manipulated variables were chosen because of their forensic relevance and because they have been shown to have varying effects on identification accuracy. Testimony was also offered about additional factors, but these were held constant across experimental conditions. For example, the witness testified that she was able to view the robber for approximately 90 seconds (the duration of the robbery).

Results. The major dependent measures included verdicts, estimates of the probability the eyewitness identification was correct, and the strength of the prosecution and defense cases. In addition subjects rated the probability that the average person could make a correct identification given the circumstances described. A set of free recall questions tested subjects' memories for the testimony and eyewitnessing conditions.

Results indicated first that jurors remembered the evidence quite well--in particular, recall of the witnessing conditions was generally over 90% accurate. However, despite the excellent recall, none of the variations in eyewitnessing conditions had a significant effect on student juror's verdicts or assessments or the accuracy of the eyewitness identification. Overall, only witness confidence influenced verdicts--54% of jurors convicted if the eyewitness was 100% confident compared to 39% convictions if the witness was 80% confident. Estimates of the probability the identification were correct were 69% and 60% respectively.

Experienced jurors and undergraduates differed only minimally in their assessment of trial evidence. Among experienced jurors, weapon

presence did have an appreciable effect on probability ratings and on verdicts with the former being statistically significant. This effect, though, was not in the expected direction. These jurors were more likely to find the identification correct (66%) and to convict (46%) in the weapon present than the weapon hidden conditions (54% and 30% respectively). Also, experienced jurors in the mugshot search condition gave significantly lower probability ratings ( $d = .39$ ) and (nonsignificantly) fewer guilty verdicts ( $d = .25$ ) than jurors in the no mugshot search condition.

Although these experiments represent a substantial step toward greater external validity, they still support the conclusion of previous, less externally valid research. Of the ten factors that were manipulated, only one, witness confidence, had a consistent, statistically significant, and substantial effect on subjects' perceived probability that the identification was correct and on verdict. The finding that witness confidence predicted verdict and probability ratings was expected, given previous similar findings (Bothwell, Deffenbacher, & Brigham, 1987). Factors that have been shown to affect identification accuracy--such as disguise--had trivial effects on probability ratings and on verdicts.

It is crucial to note that in our manipulation checks subjects demonstrated superior memory for the manipulated variables. There is little doubt that subjects attended to and understood this evidence during the trial, but they basically did not use the information when making judgments about the accuracy of the identification, culpability of the defendant, strength of the prosecution's and defense's case, or credibility of the witness. We also found no evidence to support the proposition that jurors take witnessing factors into consideration if the witness is less confident, but not if the witness is highly confident.

Most importantly, the findings lend support to the argument that jurors may benefit from expert psychological testimony about factors that influence eyewitness performance.

#### The Effects of Expert's Testimony on the Jury

Commentators have offered a variety of hypotheses about the effects that expert testimony on eyewitness issues may have on jurors. Proponents of eyewitness testimony argue that expert testimony will serve precisely the function envisioned in Federal Rule of Evidence 702 in that it "will assist the trier of fact to understand the evidence (and) or to determine a fact in issue..." In light of the earlier discussion of research showing that jurors appear to be insensitive to probative evidence concerning the impact of eyewitnessing factors on eyewitness performance, this hypothesis suggests that expert testimony will sensitize jurors to the effects of various factors on eyewitness performance and enable them to more effectively evaluate evidence. Clearly this would be a desirable effect. Sensitivity refers both to the knowledge of how a given factor influences eyewitness memory and the ability to render decisions in accordance with that knowledge. For example, a juror might know or believe that disguise makes it more difficult for a witness to identify a perpetrator but may fail to make use of the knowledge/belief when actually assessing the accuracy of an identification. This juror might be described as knowledgeable but possessing poor integration skills.

Critics of eyewitness expert testimony sometimes argue that expert testimony will either have no effect on jurors and will therefore be a waste of time, or if there is an effect, the testimony will simply confuse jurors and make it difficult for them to sort out and evaluate the evidence: ". . . there is always the possibility that the testimony will affect the jury in some unanticipated and undesirable way. Jurors may misinterpret, overgeneralize, or misapply the information presented by the

psychologist, and so may come to unwarranted conclusions." (McCloskey, Egeth, & McKenna, 1986, at p. 6).

Clearly it is possible that expert testimony will have no effect on the judgments of jurors. Though pessimistic, this hypothesis is reasonable in light of research indicating that jurors have difficulty in understanding and evaluating mathematical and statistical evidence (Thompson and Schuman, 1987). Similarly, jurors are known to draw inappropriate inferences in trials in which multiple, loosely-related, charges against a defendant are joined (Tanford & Penrod, 1984).

Critics of eyewitness expert testimony also argue that expert testimony may be prejudicial because it will simply induce skepticism about eyewitness testimony generally. They contend the testimony will induce jurors to give insufficient and therefore inappropriate weight to such testimony. Woocher (1986) observed that: "[The] experimental psychologist's impressive credentials might lead the jury to rely too heavily on her opinion and therefore undervalue the weight of the eyewitness evidence." Though it is agreed that improved juror sensitivity is a desirable effect of expert testimony, there is considerable disagreement as to whether jurors should be made more skeptical of the accuracy of eyewitness identifications. Some argue that jurors place too much weight on identification evidence (Loftus, 1986), while others point out there is little evidence in support of that claim (McCloskey & Egeth, 1983).

#### Research on Expert Psychological Testimony

It is possible to independently examine skepticism and sensitization effects, and it is possible to detect juror confusion, as well. Unfortunately, the procedures designed to test the effects of expert testimony in previous jury simulation research have confounded skepticism and sensitization effects and thus made it quite difficult to determine exactly how jurors are affected by expert testimony.

For example, in their study of expert testimony effects, Wells, Lindsay, and Tausignant (1980) found a main effect for expert testimony such that jurors who heard expert testimony were less likely to believe the eyewitnesses than jurors who heard no expert testimony. There was also a main effect for witness condition indicating that jurors were somewhat sensitive to the witnessing conditions. Though there was a trend toward improved sensitivity with expert testimony, the interaction term was not statistically significant. Thus, the study yielded a skepticism effect and a non-significant sensitizing effect.

In Loftus's (1980) mock-jury study expert testimony significantly reduced the number of convictions and that, in direct contradiction to the eyewitness research findings, violence of the crime increased the number of convictions. The trend toward increased convictions associated with the violent crime was weakened by the expert testimony, though the interaction term was not tested for statistical significance. These findings suggest that the expert testimony produced some sensitization.

Hosch, Beck, and McIntyre (1980) exposed subjects to a videotaped trial and manipulated the presence of expert testimony. Juries who heard the expert testimony rated the identification as significantly less important to reaching a verdict than did juries who did not hear expert testimony. Maass, Brigham, and West (1985) examined the impact of several forms of expert testimony on jurors' perceptions of the defendant's guilt. Expert testimony led to more lenient pre- and post-deliberation judgments.

Fox and Walters (1986) exposed undergraduates to videotaped segments of eyewitness testimony and expert testimony. The witness expressed either high or low confidence. Three conditions of expert testimony were tested. In all expert testimony conditions the expert

psychologist discussed the weak relationship between confidence and accuracy. Results showed that jurors who heard expert testimony were significantly less likely to believe the witness than did jurors who did not hear expert testimony. A main effect was also found for witness confidence. There was no trend toward improved sensitivity to the weak confidence-accuracy relationship associated with expert testimony.

These studies indicate reduced belief of eyewitnesses and fewer convictions are obtained if expert testimony is presented. However, it is not clear whether this reduced belief is due to skepticism (which it may appear to be on first examination) or to improved sensitivity to factors that might have impaired the witness's ability to make a correct identification or to both. Fox and Walters; Hosch, Beck, & McIntyre, Maass; Brigham, & West; and Katzev and Wishart did not independently vary the presence of expert testimony and witnessing and identification factors that would influence eyewitness performance. Therefore, skepticism and sensitivity are perfectly confounded. Fox and Walters did vary the presence of expert testimony and eyewitness confidence simultaneously, but there was no substantial improvement in juror sensitivity to the weak relationship between confidence and identification accuracy.

The only experiments that simultaneously and independently varied witnessing factors that influence identification accuracy and the presence of expert testimony were those by Loftus and Wells, Lindsay, and Tousignant and both show trends (albeit weak) toward improved sensitivity. Unfortunately, both studies are weak in realism and external validity. Another problem with this general body of research is that the choice of dependent measures is unsystematic. None of the experiments attempted to determine whether jurors remembered the eyewitness testimony and the expert testimony. Furthermore, in experiments in which sensitivity and skepticism effects were not confounded expert testimony had weak effects on juror sensitivity. Expert testimony may have improved juror knowledge about memorial processes and the factors that influence memory, but the effect might have been attenuated due to poor integration skills. These experiments did not attempt to assess knowledge and integration separately.

#### Assessing the Effects of Expert Psychological Testimony

In light of existing research, the concerns over the effects of expert testimony are valid but speculative. The next in our series of studies explores in detail the influence of expert testimony on the cognitive process of jurors in an effort to disentangle the effects of expert testimony.

Method. The study by Cutler, Penrod, and Dexter (1989) improved on earlier experiments in a variety of ways. First, witnessing and identification conditions, witness confidence, and the presence of expert testimony were varied orthogonally, which allowed for independent tests of sensitivity and skepticism. Second, the study examines the influence of expert testimony on variables in addition to final (or pre-deliberation) verdict with a particular focus on the process by which jurors reach a verdict. To determine the stage(s) at which expert testimony has effects on juror sensitivity, Cutler et al. explored juror memory, knowledge, inference, and decisionmaking.

This study used 538 undergraduate subjects who saw the same trial materials as the earlier studies except expert psychological testimony was introduced. The expert testimony proceeded as follows. First the witness's expertise was established and the judge explained to the jury that the expert was qualified at a previous hearing. Next the expert describes to the jury the case-relevant documents that he studied before the trial. Then, in full accord with FRE 702 the expert testified about the

reconstructive nature of memory and the factors that affect memory at the perception, encoding, storage, and retrieval stages. In response to the defense attorney's question, the expert discussed how the factors of the crime and of the identification procedure might have influenced the witness's memory for the perpetrator. In all trials the expert discussed the effects of stress and violence, the presence of a weapon, the passage of time, suggestive lineup procedures, and the relationship between confidence and identification accuracy. The expert discussed the effects of disguises only in trials in which the witness testified that the robber was disguised during the robbery. Immediately following the defense's examination of the expert, the prosecution mounted a rigorous cross-examination. Both direct and cross-examination were based on actual trial testimony.

Four factors, each having two levels, were manipulated: witnessing and identification conditions (WIC), witness confidence, the form of testimony, and whether or not the expert gave an opinion about the likelihood that the witness's identification of the perpetrator was correct (do to space constraints, the latter two factors are not discussed here). In view of the established findings that jurors are insensitive to the factors that influence eyewitness identification accuracy, several factors were combined to form a powerful manipulation of witnessing and identification conditions (WIC). In the "poor WIC" the witness and police officer offered the testimony associated with the disguise, weapon present, 14-day retention interval, and suggestive lineup instructions. In the "good WIC" the witness and police offered testimony associated with the no disguise, weapon hidden, two-day retention interval, and neutral lineup instruction conditions.

As in the earlier studies, the witness's confidence in the accuracy of her identification was varied. In half of the trials the witness testified that she was 80% confident, in the other half she testified that she was 100% confident.

The orthogonal manipulation of expert testimony, confidence and WIC, allowed independent tests of sensitization effects and skepticism effects. A skepticism effect would appear as a main effect for expert testimony, such that jurors would be less likely to believe the identification if there is expert testimony than if there is no expert testimony. A sensitization effect would emerge as a statistical interaction between WIC and expert testimony or between witness confidence and expert testimony. This interaction would show that WIC are more predictive of jurors' judgments if there was expert testimony than if there was no expert testimony. Witness confidence, on the other hand, would show a stronger relationship with jurors' judgments if there was no expert testimony than if there was expert testimony.

The dependent measures addressed four domains of interest. Memory for the witnessing conditions, and for the expert testimony (for those who viewed expert testimony) was assessed. Jurors were asked to recall the four stages of memory. Knowledge about the effects of witnessing factors was assessed. For factors manipulated and held constant jurors rated the extent to which the factor is likely to contribute to a correct identification in both the specific case they were deciding and in eyewitness cases in general. To obtain measures of the jurors' inferences drawn from the eyewitness evidence, subjects rated the credibility of the eyewitness and the strength of the prosecution's and defense cases. Decisions about verdict and ratings of the probability the defendant committed the crime, the probability that the witness correctly identified the robber, and the probability that under the circumstances the average person could make a correct identification, were also assessed.

Assessments of juror memory, knowledge, inference and decisionmaking, were designed to ascertain the point in the inferential chain where jurors go awry in evaluating eyewitness evidence. Is it that jurors do not remember the evidence, that jurors do not think the evidence is important, or that jurors fail to integrate effectively the information in their inferences or judgments? The answer to this question might vary as a function of the factors being examined. It was clear from the previous experiments that jurors for the most part recall the evidence and that the evidence does not influence their judgments. It might be that some factors are believed to be unimportant. Other factors might be viewed as important but are not given sufficient weight to be reflected in the jurors' judgments.

**Results.** As in the earlier studies, jurors demonstrated superior memory for the evidence surrounding the crime and the identification. This finding indicates that memory cannot be blamed for any lack of effects for WIC on jurors' judgments. In light of the high recall rates it is also probably the case that expert testimony does little to improve memory, as there is little room for improvement. Overall memory for the expert testimony was also very good, although over half the subjects incorrectly reported that the expert discussed mugshot searches, and the effects of the size of the lineup. This latter finding suggests there was an appreciable response bias toward reporting that the expert discussed a given factor, although accuracy-rates were much higher for factors actually discussed by the expert.

WIC, witness confidence, and the various forms of expert testimony were examined for their influences on juror knowledge, inference, and decisions. Analyses explored how expert testimony (collapsed across form of expert testimony and expert opinion) influenced juror knowledge, inference, and decisionmaking, as compared to the control group.

In discussing the results of this study we again make extensive use of  $d$ , a standardized measure of effect sizes. A  $d$  of zero would indicate that two means are identical, while a  $d$  of .3 (or -.3) would indicate a difference in means that, in the context of this study, is worthy of note.

**Juror Knowledge.** Juror knowledge refers to the juror's view of how an eyewitness factor influences identification accuracy. Consider, for instance, the ratings for the role of disguise. If jurors in both the good and poor WIC conditions rated the impact of disguise as 5 on a 9-point scale anchored at one end by "produces false identifications" and at the other end by "produces correct identifications" this would indicate that jurors failed to recognize a differential impact of disguise on identification accuracy. If juror knowledge was improved by expert testimony we would expect to see ratings of impact to spread apart in the good and poor WIC conditions. Similar spreading might also be observed in the ratings of the effects of weapon visibility, retention interval, or lineup fairness and a narrowing of differences in the ratings of the impact of witness confidence.

In fact, the WIC manipulation had a large effect on ratings of the role of disguise ( $d = 2.30$ ), indicating that jurors were well aware that disguises affect identification accuracy. It is therefore not surprising that expert testimony did not improve juror knowledge for the effects of disguise (i.e., all interaction terms were statistically nonsignificant).

WIC had a trivial and nonsignificant main effect on weapon visibility ratings ( $d = .13$ ), indicating that jurors were unaware of the effects of weapon focus on identification accuracy. But, WIC had a larger effect on weapon visibility ratings among jurors who heard expert testimony ( $d = .41$ ) than among jurors who heard no expert testimony ( $d = -.03$ ). This finding indicates that expert testimony improved juror

knowledge for the effects of weapon focus.

WIC had a large effect on the knowledge ratings for retention interval ( $d = .78$ ), indicating that subjects were aware that person recognition accuracy declines over time. WIC also produced a large main effect on ratings of importance of lineup instructions ( $d = 1.70$ ), indicating that jurors considered lineup instructions to be important in assessing identification accuracy. Even though jurors were aware of the effects of lineup instructions, one form of expert testimony improved juror knowledge in comparison to the other ( $d = 2.22$  and  $1.39$ , respectively).

**Witness confidence** had an appreciable main effect on knowledge ratings for witness confidence ( $d = .72$ ), indicating that jurors believed confidence is a good predictor of identification accuracy. Confidence was viewed as less relevant among jurors who heard expert testimony ( $d = .52$ ) than among jurors who heard no expert testimony ( $d = .84$ ).

These analyses show that jurors believed that disguise, retention interval, and lineup instructions all have appreciable effects on identification accuracy, but jurors were unaware of the effects associated with weapon visibility. As in previous experiments, jurors felt that witness confidence was an important determinant of identification accuracy. The presence of expert testimony improved juror knowledge of the effects of weapon visibility, lineup fairness, and witness confidence. Of course, knowledge of these factors is no guarantee that the knowledge will be successfully employed when making inferences and judgments.

**Juror Inferences.** Inferences refer to the juror's perceptions of the credibility of the eyewitness and the strengths of the prosecution's and defense's cases. Ratings of credibility varied directly with the witness's confidence level ( $d = .37$ ), but confidence was given less weight in determining witness credibility if the expert testified ( $d = .11$ ) than if no expert testified ( $d = .52$ ). WIC also affected eyewitness credibility ratings to a greater extent if the expert testified ( $d = .34$ ) than if no expert testified ( $d = -.01$ ), indicating that expert testimony improved juror sensitivity to WIC effects.

The prosecution's case was perceived as stronger in the good WIC ( $d = .30$ ), but WIC had more of an effect on the perceived strength of the prosecution's case if the expert testified ( $d = .54$ ) than if no expert testified ( $d = .15$ ). The prosecution's case was perceived as stronger if the witness was 100% confident ( $d = .20$ ). The defense case was perceived as stronger in the poor WIC ( $d = -.30$ ) and if the expert testified ( $d = .23$ ). WIC had a stronger influence on defense case strength ratings if the expert testified ( $d = -.53$ ) than if no expert testified ( $d = -.13$ ).

In sum, although jurors indicated that they believed several of the factors included in the WIC manipulation would influence eyewitness performance, without expert testimony, WIC had negligible effects on juror inferences. However, when the expert testified jurors demonstrated significant sensitivity to WIC when drawing inferences about the credibility of the eyewitness and about the strength of the prosecution's and defense's cases. The presence of expert testimony also reduced juror's heavy reliance on witness confidence. The presence of expert testimony also increased the apparent strength of the defense's case but did not increase juror skepticism about the eyewitness's credibility.

**Juror Decision Making.** WIC had an appreciable effect on jurors' judgments about the accuracy of the identification ( $d = .30$ ). Jurors were more likely to judge the identification accurate in the good WIC rather than in the poor WIC. However, WIC had a large influence on jurors' judgments if the expert testified ( $d = .53$ ) but a negligible effect if no

expert testified ( $d = .12$ ). Expert testimony produced trivial main effects on probability ratings. Thus, there was no evidence for a skepticism effect.

WIC had a main effect on verdict such that more convictions were obtained with good WIC ( $d = .29$ ). Once again, WIC had a stronger influence on verdicts if the expert gave testimony ( $d = .37$ ) than if no expert testified ( $d = .20$ ). Expert testimony and form of expert testimony produced trivial main effects on verdicts, again indicating no skepticism effect.

#### The Problem of Knowledge versus Integration

It is clear from the above analyses that jurors do indeed possess some knowledge of the effects of disguise, retention interval, and suggestive lineup instructions. However, jurors are unaware of the influence of weapon visibility and are unaware that confidence is not a powerful predictor of identification accuracy. Thus, poor knowledge is partly responsible for the lack of juror sensitivity. Evidence for problems of integration skills emerges from the findings that WIC, without expert testimony, had a trivial influence on inferences and decisions (all  $d$ 's were no greater than .20). Thus, it is both lack of appropriate knowledge and poor integration skills that jointly contribute to produce poor juror sensitivity to eyewitness evidence.

This experiment indicates that expert testimony improved juror knowledge. Expert testimony increased the juror reliance on witnessing and identification conditions and reduced juror reliance on witness confidence when drawing inferences about the credibility of the eyewitness and the strength of the prosecution's case. There was no evidence to suggest that expert testimony promotes skepticism toward the eyewitness's credibility, the accuracy of the identification, or the defendant's culpability (all  $d$ 's were less than .10).

#### Summary and Conclusions

Proponents and opponents of expert testimony disagree over (1) whether there exists an adequate scientific foundation for the presentation of such testimony, (2) whether the evidence provided by the expert is beyond the ken of the jury, and (3) whether expert testimony is likely to improve jury decisionmaking. We have reported a series of studies designed to examine these three issues empirically.

The first study was a quantitative "meta-analysis" of a large body of experiments conducted by researchers interested in facial recognition performance. This study indicated that factors investigated by researchers have substantial and reliable effects on eyewitness performance and that experimental laboratory findings do not differ significantly from findings produced in field settings.

In a second set of studies mock jurors were shown realistic videotaped criminal trials in which the primary evidence was the identification of the defendant by an eyewitness. The evidence surrounding the crime (e.g., the disguise of the perpetrator, the extent to which the witness was threatened) and the identification procedures (e.g., the time delay between the crime and the identification, the procedures used to construct and conduct the lineup parade) were manipulated via the testimony of the eyewitness and the police officer in charge of the investigation. These studies examined the extent to which juror decisions were influenced by the variations in the crime and the identification. The studies indicate that jurors were uninfluenced by the factors that normally influence identification accuracy--with the exception that judgments were influenced by the confidence of the eyewitness. Unfortunately, a number of studies indicate that confidence is only weakly related to the accuracy of the identifications.

In the third set of studies the videotaped trials included expert

psychological testimony. In the first study of this set expert testimony improved the sensitivity of jurors to eyewitness evidence. If expert testimony was presented jurors took the witnessing and identification factors into consideration to a greater extent, and the confidence of the witness to a lesser extent, than if no expert testimony was presented. The study also showed that expert psychological testimony did not increase juror skepticism about eyewitness evidence.

Overall, these studies indicate that expert psychological testimony can improve jury decisionmaking by assisting jurors in the task of appropriately evaluating eyewitness evidence, and that the improvements in juror sensitivity can be secured without increasing juror skepticism.

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TABLE 1. Manipulated Variables

VARIABLE	HITS						
	Studies	S's	d	SD	D	Z	p
CONTEXT REINSTATEMENT (YES VS NO)	23	1684	1.91	1.87	1.39	17.54	***
SUBJECT AGE (YOUNG VS OLD)	9	603	1.10	.68	.78	13.34	***
TRANSFORMATION (NONE VS. DISGUISE)	19	2682	1.05	.83	.67	13.46	***
FACE WAS ASSOCIATED WITH RICH VS POOR ELABORATION AT EXPOSURE	10	362	1.00	.67	.98	8.15	***
ENCODING INSTRUCTIONS (HIGH VS LOW)	29	1868	.97	1.32	.63	9.87	***
TARGET DISTINCTIVENESS (HI VS LOW)	22	2174	.76	.79	.67	12.53	***
EXPOSURE TIME AT STUDY TIME (LONG VS SHORT)	8	990	.61	.74	.38	4.48	***
SAME VS CROSS RACE IDENTIFICATION	17	1571	.53	.56	.40	6.99	***
POSE AT STUDY (3/4 VS FRONT OR PROFILE)	10	1266	.53	.87	.30	5.37	***
MODE OF PRESENTATION AT STUDY TIME (LIVE OR VIDEOTAPE VS STILL)	5	896	.50	.80	.18	3.92	**
RETENTION INTERVAL (SHORT VS LONG)	18	1980	.43	.61	.27	8.03	***
RACE OF TARGET (WHITE VS MINORITY- BLACK OR ORIENTAL)	18	1894	.24	.55	.10	2.05	*
TRAINING IN FACIAL RECOGNITIONS (YES VS NO)	8	534	.18	.58	.08	.54	n.s
SAME VS CROSS SEX IDENTIFICATION	13	1197	.14	.19	.23	3.18	***
KNOWLEDGE OF RECOGNITION TASK	5	703	.10	.12	.05	.42	n.s
MODE OF PRESENTATION AT RECOGNITION PHASE (LIVE OR VIDEO VS STILL)	13	1807	.07	.28	.14	3.13	*
SEX OF TARGET (MALE VS FEMALE)	19	2052	.02	.38	-.08	1.88	n.s
GRAND MEANS FOR ENTIRE DATA SET	443	44301	.47	.85	.32	25.57	

\* < .05    \*\* < .001    \*\*\* < .0001