

The Relation between Consistency and Accuracy of Eyewitness Testimony: Legal versus Cognitive Explanations

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Ten minutes after witnessing a bank robbery, Ms. Barnes is interviewed by the first police officer on the scene. Ms. Barnes describes the robber as a white male, clean-shaven, medium height, husky, wearing sunglasses and a baseball hat. Three months later, Ms. Barnes is deposed by the defense attorney, and she is asked again to describe the robber. This time Ms. Barnes reports some of the facts she had told the original police officer (white male, medium height, husky, wearing sunglasses), but she omits an earlier mentioned detail (baseball hat). More important, she now reports some new details that she had not described earlier (robber wore a red shirt) and she contradicts a statement she had made initially (robber has a beard). Months later, the case goes to court, and Ms. Barnes takes the witness stand. Here, on cross-examination, the defense attorney focuses on the apparent inconsistencies in Ms. Barnes' two earlier descriptions. Specifically, the attorney draws attention to two critical facts: first, Ms. Barnes contradicted herself across the two interviews ("clean-shaven" on initial police interview, and "bearded" in the deposition) and second, she remembered a detail at the deposition (red shirt), three months after the crime, that she did not recall ten minutes after the crime. "So, Ms. Barnes," presses the defense attorney, "Were you wrong when you spoke to the police officer and said the robber was clean-shaven, or were you wrong in your deposition when you said the robber had a beard? Or, maybe you were wrong both times?" Seeing that he has gained the upper hand, the attorney presses on: "Was your memory better ten minutes after the crime, when you did not recall the robber's shirt, or was it better three months after the crime, when you reported that the robber had a red shirt?" Following Witness Barnes' admission that her memory was better immediately after the crime, the defense attorney tries to account for Ms. Barnes' newly found recollection, which seemingly violates everyone's intuitive beliefs that memory weakens with the passage of time. The defense attorney might even plant a seed of doubt about the quality of the police investigation by asking, "Were you told by the police that the robber had a red shirt?" Finally, in the concluding argument, the defense attorney dutifully notes to the

jury that Ms. Barnes' inconsistent recollections cast serious doubt about the accuracy of her memory, and that the jury should question the credibility of Ms. Barnes' entire testimony.

Although the details of this account are fictitious, the series of events is commonplace in a criminal investigation. Witnesses are likely to testify repeatedly during a criminal case. During these interviews, witnesses may contradict themselves on specific statements or remember some details on later interviews (police interviews, depositions, or in-court testimony) that they did not recall earlier. When this happens, their entire testimony is likely to be questioned. We examine here these two critical issues: (a) contradictions within witnesses' testimonies, and (b) witnesses' later recollection of previously unreported facts (reminiscence). How predictive are contradictions and reminiscences of the overall accuracy of a witness' testimony? How does the legal system account for these two phenomena, and how valid are their conclusions? We compare the legal analyses of these phenomena with analyses found within cognitive theory. Finally, we describe several empirical studies that examine the relation between inconsistency and accuracy of eyewitness recollection under controlled laboratory conditions, and in light of these findings we offer some recommendations for the legal system.

The Legal Approach.

Judges, litigators, and legal scholars deem witness consistency to be one of the most important measures of witness credibility. Pattern jury instructions regularly used in federal and state courts in the United States direct jurors to consider witness self-contradictions when deciding how much weight to give to a witness' trial testimony. A standard federal instruction on witness credibility directs jurors to attend to whether "the witness testified inconsistently while on the witness stand, or if the witness said or did something, or failed to say or do something, at any other time that is inconsistent with what the witness said while testifying" (Sixth Circuit Criminal Pattern Jury Instructions, No. 107, 2005). A standard state court instruction likewise informs jurors that "[y]ou may consider whether a witness made statements at this trial that are inconsistent with each other. You may also consider whether a witness made previous statements that are inconsistent with his or her testimony at trial" (New York Criminal Jury Instructions 2d, Credibility of Witnesses-Inconsistent Statements, 2007).

These instructions reflect a long-standing belief among courts and commentators that "a prior self-contradiction shows 'a defect either in the memory or in the honesty' of the witness" (Wigmore, 1970, p. 993). The important empirical assumption is that specific contradictions indicate a general unreliability: "upon perceiving that the witness has made an erroneous statement on one point, we are ready to infer that he is capable of making an error upon other points" (Wigmore, 1970, p. 933). Wigmore collected numerous American cases from the 1800s and 1900s in which courts endorsed this view, and belief in the correctness of this view remains strong. For instance, Uviller's (1993) survey of federal judges found that these judges believed internal inconsistency and

external contradiction were the best measures of witness credibility. McCormick's (as revised by Strong, 1999) influential treatise on evidence states that "the most widely used impeachment technique is proof that the witness made a pretrial statement inconsistent with her trial testimony" (Strong, 1999, p. 50-51). Others (e.g., Park Leonard & Goldberg, 2004) agree with McCormick on the continuing popularity of this technique.

While courts and commentators advance the theory that inconsistency equals lack of credibility, litigators put the theory into practice with a vengeance. Attorneys and their assistants are trained to pore through witness statements to recognize inconsistencies (Pozner & Dodd, 1993). Not only do attorneys search through witnesses' previous statements to find inconsistencies, but they also intentionally question witnesses on the stand in order to create such inconsistencies (e.g., Iannuzzi, 1999). Glissan (1991, p.108) recommends: "A true inconsistency can effectively destroy a witness, and sometimes a whole case...If you find a true inconsistency, or if you can manufacture one, then use the deposition of previous evidence to sheet it home." Similarly, Bailey and Rothblatt (1971, p. 177) suggest, "Capitalize on these conflicts. This is the most effective way of discrediting [the witness'] entire testimony." These strategies are directed primarily toward contradictions, but similar recommendations exist to attack reminiscent statements. For instance, in *Fundamentals of Trial Techniques*, Mauet (1980) notes that a witness may be impeached if that witness recalls details that were omitted from earlier recall attempts. Others express the same concern: "A witness' credibility can be attacked by showing that facts testified to [by the witness] were omitted from a [previous] document that they prepared, even though the document was prepared closer in time to the events in question." (Alavi & Ahmad, 2002, p. 18).

Instructing jurors to attend to inconsistencies should make the inconsistencies more salient. Is there any evidence, however, that jurors' decisions are actually influenced by inconsistencies? Two sources of evidence suggest that jurors, and many other participants in the legal system, are influenced by inconsistent testimony. Brewer and colleagues surveyed a variety of people, including college students, police, prosecutors and defense attorneys about their beliefs of the diagnostic value of inconsistency on the credibility of a witness (Brewer, Potter, Fisher, Bond, & Luszcz, 1999; Potter & Brewer, 1999). They found that inconsistencies within a witness' testimony were considered (by all of these groups) to be strongly indicative of inaccurate testimony. Additionally, experimental studies have examined the role of witness inconsistency on simulated juries (Berman & Cutler, 1996; Berman, Narby, & Cutler, 1995; Brewer & Burke, 2002; Brewer & Hupfeld, 2004; Lindsay, Lim, Marando, & Cully, 1986). In these studies, simulated juries (composed of college students and, sometimes, members of the general community) watched or heard an abbreviated version of a trial that contained inconsistencies in a prosecution witness' account. After the trial, mock-jurors made judgments on measures such as witness credibility or effectiveness, probability that the defendant committed the crime, and verdict. The majority – though not all of these studies (e.g., Brewer & Burke, 2002; Lindsay et al., 1986) – have shown that testimonial inconsistencies harm witness credibility and, in turn, affect judgments

about probability of guilt. In summary, much of the mock-juror research suggests that jurors' decisions are in line with attorneys' courtroom arguments and judges' instructions, viz., that inconsistencies cast doubt on the accuracy of witnesses' testimony.

Rationale of Courtroom Arguments and Instructions. What is the underlying rationale guiding these courtroom arguments and jury instructions? We assume that jurors must rely on witness statements to determine what happened in the critical event, because they have no other relevant information about the event. Jurors most likely sense that witnesses' memories may be incomplete or inaccurate, and so jurors look for clues to assess whether witnesses' recollections of the critical event are accurate and complete. What clues do jurors use to determine the quality of witnesses' testimony? One source of information is relevant world knowledge. Jurors may know, for instance, the amount of time required to travel from place X to place Y, and so they may be able to determine whether a witness' testimony is feasible. More likely, jurors will depend on behavioral cues related to the witness' description of the critical event. Does the witness seem to be confident about her story or is she unsure, as perhaps indicated by hesitations in her speech (Erickson, Lind, Johnson, & O'Barr, 1978)? Does the witness describe the critical event in great detail or does she provide only few details (Wells & Leippe, 1981)? Does the witness provide the same details if she is asked repeatedly to describe the event, or does she change her story (Leippe, Manion, & Romanczyk, 1992)?

We focus here on the clue of inconsistency, and specifically on (i) contradictions and (ii) reminiscence. Different arguments underlie the assessment of contradictions and reminiscence, so we shall examine the two separately. When witnesses contradict themselves (e.g., saying on one occasion that the robber was clean-shaven, and on another occasion that he had a beard), it is obvious that at least one of these reports must be incorrect, as the robber cannot be both clean-shaven and bearded. When such inconsistencies occur, it is fair for the cross-examining attorney to ask if the witness was wrong earlier (when she said that the robber was clean-shaven) or if she is wrong now (when she says that the robber had a beard). Similarly, it is appropriate for judges to warn jurors about witnesses who make such contradictory statements, as at least a portion of their testimony must be incorrect. Having established that the witness' memory must be wrong about one aspect of the critical event (robber's face), it seems reasonable to assume that the witness' memory about the entire event is not credible.

Reminiscence, recalling some details at a later time (e.g., at a deposition) that witnesses did not recall at a previous attempt (e.g., to the initial police investigator), seems to violate one of the intuitively obvious principles of memory, namely, that memory declines with the passage of time. Attorneys therefore argue that these counterintuitive events should occur rarely and, when they do occur, they should arouse suspicion. How else can we account for the witness' memory seemingly improving over time? At first glance, it is not unreasonable for attorneys to question the source of these new recollections. Perhaps the witness learned the additional facts from another witness, from the media, or even from the police investigators. If the witness really did learn about these newly found facts from a non-crime source, then the witness' reminiscent

recollections do not necessarily reflect his memory of the crime itself, but what he was told about the crime from another source. Not surprisingly, the law looks askance at such extra-event witness knowledge and will often use the hearsay rule and personal knowledge rules to limit the ability of the witness to testify about facts learned after the event.

The preceding arguments are commonplace in the courtroom and seem reasonable. Are they correct, however, in their assumptions of how memory works? We examine these assumptions by seeing whether they predict the outcomes of controlled, laboratory experiments (see Fisher & Reardon, in press, for the advantages of using controlled, laboratory tests). Technically, we did not ask attorneys and judges to predict the outcomes of laboratory experiments. Instead, we examined their courtroom behaviors (attorneys' arguments and judges' instructions) and converted the apparent logic underlying these behaviors into specific predictions. That is, people who engage in the described courtroom behaviors should make the following predictions about the outcomes of controlled, laboratory experiments. We refer to the implicit theory that underlies these courtroom arguments and jury instructions as the "Courtroom Theory" of memory. What, specifically, are the predictions of the Courtroom Theory?

1. Consistency of recollection is a direct indicator of the quality of a witness' memory. Therefore, factors that influence consistency of recollection should have the same effect on accuracy of recollection. Experimental factors that increase (decrease) consistency should increase (decrease) accuracy, and vice versa. No experimental factors should dissociate (have different effects on) consistency and accuracy.
2. Contradictory statements should be inaccurate—at least as compared to consistent statements.
3. Witnesses who make many contradictory statements should be considerably less accurate overall (across their entire testimony) than witnesses who make few or no contradictory statements. Statistically, there should be a strong, negative correlation between amount of inconsistency in a witness' testimony and the overall accuracy of the witness' testimony.
4. Reminiscence should occur infrequently. Moreover, explaining reminiscence requires an extra-ordinary (non-cognitive) mechanism, such as police informing witnesses about crime details.
5. Reminiscent statements should be inaccurate—at least as compared to consistent statements.
6. Witnesses who make many reminiscent statements should be considerably less accurate overall (across their entire testimony) than witnesses who make few or no reminiscent statements. Statistically, there should be a strong, negative correlation between amount of reminiscence in a witness' testimony and the overall accuracy of the witness' testimony.

As opposed to the "Courtroom Theory" of memory, how would cognitive

psychology account for these witness behaviors?

Cognitive Theory. Two principles of cognitive theory are responsible for the major distinctions between the predictions of the “Courtroom Theory” and “Cognitive Theory”: (a) the importance of retrieval processes, and (b) the independence of components. We describe these principles briefly.

Retrieval processes. Recollection reflects not only the contents of the memory store but also the process of retrieval (Tulving, 1983). If the retrieval processes applied on two occasions differ, the recollections will differ, even if the contents of memory do not change. The retrieval process is partially determined by the specific question that is asked. Thus, if the question that is posed to a witness changes from one interview to another, the witness’ recollections may change. In general, the more different are the retrieval cues (questions) across interviews, the more dissimilar will be the recollections on the two interviews. Reminiscence may occur, therefore, if a retrieval cue is present on the second interview, but not on the first interview. The amount of reminiscence should reflect the amount of dissimilarity between the retrieval cues (questions) on two interviews.

Independence of Components. Complex events are made up of many components, each of which is processed somewhat independently of one another (Fisher, Phillips, & Krioukova, 2000; Mitchell, Haw, & Fisher, & 2003). Therefore, if a witness fails to recall one component of a crime, or even if she misperceives or mistakenly recalls one component of the crime, she may still perceive or correctly recall other components of the crime.

Based on these two principles, cognitive psychology predicts the following behaviors by witnesses who are interviewed repeatedly.

1. Some mental processes underpin measures of both consistency and accuracy. For instance, the quality of the memory trace should influence both consistency and accuracy. Better encoded events should be recalled more consistently and also more accurately than poorly encoded events. By comparison, other mental processes do not underpin both consistency and accuracy. Either they have opposite effects on consistency and accuracy, or they influence one measure but not the other. For instance, the similarity of the retrieval cues used across two interviews should influence consistency of recollection, but not accuracy of recollection. We should therefore expect that some experimental manipulations will have similar effects on consistency and accuracy, whereas other manipulations will have different effects on consistency and accuracy (experimental dissociation).
2. As just noted, better encoded events should be recalled more consistently and more accurately than poorly encoded events. We should also expect that encouraging witnesses to guess will lead to less consistent and less accurate responses than instructing witnesses to be certain before volunteering a response. Both of these propositions predict that consistent recollections will be more accurate than

inconsistent recollections.

3. Each component of a complex event is processed independently of the other components. Therefore, accuracy of recalling some components of a complex event may not necessarily predict how accurately witnesses recall the other components. Witnesses who make many contradictory statements may be inaccurate on those specific statements; however, they may be accurate on the remainder of their testimony. That is, the correlation between amount of inconsistency and overall accuracy of a witness' testimony may be relatively weak.
4. Reminiscence should be a common experience. Furthermore, the amount of reminiscence should be explained easily by conventional cognitive theory, which relates reminiscence to changes in retrieval cues from one interview to another.
5. Reminiscent statements may or may not be accurate. Whether reminiscent responses are accurate or not depends on a variety of factors, such as the nature of the question that is asked: Open-ended questions or probes (e.g., Describe his face) should yield more accurate responses than closed questions (e.g., What color were his eyes?).
6. For the same reason as indicated above (#3), the independence of components, witnesses who make many reminiscent statements should not necessarily be inaccurate on the remaining (non-reminiscent) statements of their testimony. The correlation between amount of reminiscence and overall accuracy may be relatively weak.

Experimental Testing

We report an overview of the results from 19 experiments to assess the predictions of the "Courtroom" and "Cognitive" theories. Each of the experiments conformed to the following general procedure. Witnesses (typically college students, but the same patterns of results also obtained for others) either watched a videotape of a simulated crime (robbery or homicide) or observed a live, innocuous event or a staged confrontation between two people. The witnesses were then tested formally (paper and pencil test) or, as in most experiments, participated in face-to-face interviews to assess their memories of the observed event. Most of the witnesses were tested twice. The tests or interviews occurred either shortly after observing the event (within 30 minutes) or after a delay of up to two weeks. The interview questions or probes were either open-ended (e.g., Describe the robber) or were closed. There were three kinds of closed questions: cued recall (e.g., What color were the robber's eyes?), multiple choice (What color was the robber's eyes: green, blue, black, or brown?) and True/False (The robber's eyes were green: True or False?). The witnesses were sometimes encouraged to be very certain before volunteering an answer, sometimes encouraged to guess, and sometimes not provided any explicit instructions about certainty.

We compared the witness statements across the two interviews, and categorized them as one of four types: Consistent (same answer at Time 1 and Time 2, e.g., *robber was a white male* at Time 1, and *robber was a white male* at Time 2), contradiction

(contradictory answers at Time 1 (*clean-shaven*) and Time 2 (*bearded*)), reminiscent (no answer at Time 1, but witness provides an answer at Time 2 (*red shirt*)), and forgotten (witness provides an answer at Time 1 (*baseball hat*) but does not answer at Time 2). We then calculated the accuracy of each of the four response categories (consistent, contradiction, reminiscent, and forgotten) in addition to the accuracy of the entire testimony. Accuracy was calculated by dividing the number of correct statements by the total number of statements. For instance, if a witness made eight correct statements (out of ten total statements), then her accuracy rate was .8 (8/10).

The results of these experiments are organized around the predictions of the “Courtroom” and “Cognitive” Theories

1. Experimental dissociations: Common versus unique mental processes. Some experimental manipulations had the same effects on consistency and accuracy of testimony, whereas other manipulations had different effects on the two measurements. When witnesses were instructed to be certain before volunteering answers, they were both more consistent and more accurate than when instructed to guess if unsure (Phillips, Fisher, & Krioukova, 1999). Varying the format of the question (open-ended versus closed) also had parallel effects on consistency and accuracy: Open-ended questions yielded more consistent responses and also more accurate answers than closed questions (Fisher & Patterson, 2004). Other manipulations, however, had different, and sometimes opposite, effects on consistency and accuracy of recollection. Specifically, witnesses were less consistent but more accurate when tested shortly after the critical event (within 30 minutes) than when tested after a longer interval (two weeks; Fisher, Schreiber, Burguera, & Alvarez, 2003). That is, delaying the tests increased consistency but decreased accuracy. This experimental dissociation suggests that consistency and accuracy may reflect different underlying mechanisms (Tulving, 1985), in opposition to the “Courtroom” theory.
2. Accuracy of Contradictions. In all of our experiments, the accuracy rate of contradictory answers was low (Brock, Fisher, & Cutler, 1999; Fisher, Patterson & Hazel, in preparation; Fisher & Patterson, 2004; Gilbert & Fisher, 2006). For instance, in Gilbert and Fisher, the accuracy rate of contradictory statements was only .49; by comparison, the accuracy rate of consistent answers was almost perfect (.95). Both the “Courtroom” and “Cognitive” theories correctly predicted the low accuracy of contradictory statements.
3. Contradiction as a predictor of overall accuracy. Although contradictory statements were considerably less accurate than consistent statements, witnesses who made many contradictory statements were *not* much less accurate on the whole (all of the statements in their entire testimony) than were witnesses who made only a few contradictory statements. Witnesses were scored in terms of the accuracy of their overall testimony and the proportion of all statements that were contradictory (typically, this proportion is relatively small, as witnesses who take their task seriously rarely make more than a few contradictions). Across the various conditions of the

experiments, the correlations between the proportion of contradictory statements and the accuracy of the entire testimony was relatively low (the Pearson correlation coefficient was generally between .00 and .35) (Brewer, et al., 1999; Fisher & Cutler, 1995; Fisher & Patterson, 2004; Gilbert & Fisher, 2006). The finding that contradictions are poor predictors of witnesses' overall testimonial accuracy is in direct violation of the "Courtroom" theory.

4. Reminiscence: frequency and extra-ordinary explanations. In our studies, and also those of other researchers (e.g., Scrivner & Safer, 1988), reminiscence was a common phenomenon (see Payne, 1987, for a review). In Gilbert and Fisher (2006), 98% of witnesses who were tested twice (189 of 192) made at least two reminiscent recollections, hardly a rare phenomenon, as suggested by the "Courtroom" theory. Furthermore, the number of reminiscent statements a witness made was highly related to the dis-similarity of the questions (retrieval cues) that were asked on the two tests. When the retrieval cues changed from Test 1 to Test 2, witnesses made almost twice as many reminiscent statements (10.1) as when the same cues were given on the two tests (6.1). As this finding is compatible with the "Cognitive" theory, one need not postulate extra-ordinary mechanisms to account for reminiscence, as the "Courtroom Theory" suggests.

5. Accuracy of Reminiscence. Reminiscent statements varied in accuracy across studies, from a low of .66 (Brock et al., 1999) to a high of .87 (Gilbert & Fisher, 2006). That reminiscent statements can be very accurate violates the dire predictions of the "Courtroom" theory, which assumes reflexively that reminiscence is problematic (see also LaRooy, Pipe, & Murray, 2005).

Although reminiscent statements were often accurate, they were not as accurate as either consistent or forgotten statements. In Gilbert & Fisher (2006), for example, the accuracy rates for consistent, forgotten, and reminiscent, statements were, respectively, .95, .93, and .87, (see also Brock et al. 1999; Fisher & Patterson, 2004, for similar patterns.) Reminiscent statements, however, were much more accurate than contradictions (.49). At the very least, then, we should distinguish between different kinds of inconsistency, and pay most attention to direct contradictions.

6. Reminiscence as a predictor of overall accuracy. The prevalence of reminiscent statements was not predictive of overall accuracy. Witnesses who made more reminiscent statements were only minimally, and non-significantly, less accurate than witnesses who made fewer reminiscent statements. In Gilbert and Fisher (2006) the Pearson correlation coefficient between proportion of reminiscent statements and overall accuracy was -.05. This correlation was uniformly low across the two tests: Proportion of reminiscent statements was non-significantly correlated with overall accuracy at Test 1 (.03) and also at Test 2 (-.14). Similar patterns of non-significant correlations were also found in Fisher and Patterson (2006) and Gordon and Follmer (1994).

Relative to consistent recollections, which are by far the most common category

of response, reminiscent responses are relatively infrequent (approximately 22 % of all responses in Gilbert & Fisher, 2006) and contradictions are very rare (less than 1 %). To increase the reliability of these infrequent events, we therefore combined contradictory and reminiscent statements into one score to determine if these “troublesome” inconsistencies, when aggregated, were more predictive of overall accuracy. Specifically, we examined whether the amount of inconsistency was related to the accuracy of consistent items. The number of inconsistencies (contradictions + reminiscences) was not at all predictive of the accuracy of consistent items (correlation coefficient = $-.06$). Even when we compared the most discrepant witnesses (those who made 12-18 inconsistencies) to the most consistent witnesses (0-6 inconsistencies), the accuracy rates of consistent items did not differ, .94 versus .96, respectively. No matter how we scored the data, there was no evidence to support the “Courtroom” theory that reminiscence is predictive of inaccuracy of the overall testimony.

Resolving a Puzzle. There is an apparent conundrum here: Inconsistent statements (and especially contradictions) are less accurate than consistent statements; yet witnesses who make more inconsistent statements (whether contradictions, reminiscences, or the combination of the two) are not much less accurate than witnesses who are consistent. We believe that this conundrum can be explained by the idea that the various components of a complex event (e.g., crime) are processed independently of one another. That is, accuracy of memory for one component of a complex event tells us very little about accuracy of memory for other components of the event. Thus, if a specific statement (e.g., facial hair) is believed to be inaccurate, because the witness contradicted himself, this tells us very little or nothing about the accuracy of the remainder of the testimony. To test this idea, we conducted several experiments in which witnesses attempted to describe the various components of complex events. We then measured the relationships between accuracy levels for each of these various components or dimensions. For example, Brewer et al. (1999) classified the testimony of witnesses to a bank robbery into five different dimensions – offender description, offender actions, bystander description, bystander actions, and objects – but failed to detect any meaningful relationships between accuracy on one dimension and that on any other. Other studies have replicated this finding (e.g., Mitchell et al., 2003; Fisher et al., 2000). It is not surprising, therefore, that inaccurate recollection for a few, isolated parts of a crime (as inferred by contradictory statements) cannot predict the accuracy of the witness’ overall testimony. That is, inconsistent recollection, and especially a contradiction, informs us about the *specific statement* that is reported inconsistently, but it tells us little or nothing about the accuracy of the *rest of the testimony*.

An Alternative Predictor of Overall Witness Accuracy. We were reluctant to dismiss a traditional cue used by the legal system (inconsistency) without suggesting an alternative to assess accuracy of witness testimony. Therefore we re-examined the data from our experiments to see if another cue was more predictive of testimonial accuracy. One cue that was highly predictive of recall accuracy was the format of the question (open-ended

or closed). Invariably, responses to open-ended questions were considerably more accurate than were responses to closed questions. For instance, in Fisher and Patterson (2004), responses to Free Recall probes (Describe the robber) were almost perfectly accurate, whether witnesses were tested after a few minutes (proportion correct = .97) or after two weeks (.94). By comparison, responses to cued recall tests (e.g., What color was the robber's jacket?) were considerably less accurate both when tested after a few minutes (.70) and after two weeks (.54). Likewise, responses to multiple-choice recognition tests (e.g., What color was the robber's jacket: Blue, White, Green, Red?) were also poor when tested after a few minutes (.74) or when tested after two weeks (.64). Furthermore, this marked superiority for responses to open-ended questions held for the most consistent witnesses as well as the least consistent witnesses. If this marked superiority of open-ended questions obtains reliably in future testing, the courts may wish to pay more attention to question format, which appears to be highly diagnostic of response accuracy, and less attention to consistency of responding, which appears to be less diagnostic of response accuracy.

Conclusion

Focusing the courtroom drama on inconsistencies within a witness' testimony, rather than on more diagnostic cues of testimonial accuracy, encourages litigators to exploit witness uncertainties and encourages jurors to discount evidence for the wrong reasons. If the cross-examination strategy is effective and witnesses are impeached because of their inconsistent recollections, jurors will discount some witness testimony and base their decisions on less information. Reducing the amount of accurate information that jurors consider should give rise to less accurate decisions. In short, contrary to two centuries of accepted legal folklore, an inconsistent witness may not be an inaccurate witness. Furthermore, in cases where one side puts up most of the witnesses, impeaching witnesses will influence the two sides disproportionately, thereby imbalancing the evidence. Both of these ills, reducing the amount of valuable witness evidence and imbalancing the evidence provided to jurors, are likely to pervert justice.

Recommendations. Based on our findings, we make the following recommendations.

1. If jurors are encouraged to use consistency of testimony as a guideline to assigning credibility to evidence, they should be strongly encouraged to think in terms of the credibility of *individual statements* and not in terms of the credibility of the witness as a whole. Inconsistency is diagnostic of error, but only at the level of the individual statement: Inconsistent statements are unlikely to be correct. Jurors should not, however, extrapolate to the level of the witness, as witnesses who make inconsistent statements, on the whole, are not less accurate than witnesses who make only consistent statements. Judges should instruct jurors to think in terms of individual facts of the case, not in terms of witnesses. At the very least, jurors should not discredit witnesses reflexively simply

because they have made inconsistent statements. Over-reliance on (in)consistency as a means to the truth falls prey to Ralph Waldo Emerson's insight: "Foolish consistency is the hobgoblin of small minds."

2. Not all inconsistencies are equally diagnostic of error. Direct contradiction should certainly be used to discredit a particular statement. By contrast, reminiscent statements are considerably more accurate than contradictions, and in some conditions, are almost as accurate as consistent statements. Reminiscent answers should therefore be considered only "mildly" inconsistent. At the very least, one should consider other factors before rejecting reminiscent answers, e.g., Were the questions on the two interviews similar to each other? Were the questions open-ended or closed? Were the witnesses encouraged to volunteer uncertain answers?

Limitations.

The conclusions we have put forward here are tentative at best, as the data base to support the conclusions is not robust. For starters, there is a paucity of studies, and most of the research has been conducted in only two laboratories. We encourage other researchers to conduct empirical studies to expand the data base. Second, all of the research was conducted in controlled laboratory conditions with volunteer witnesses. The logistic and ethical limitations of conducting such research prevent us from examining memory under highly arousing conditions and with long intervals between either (a) the critical event and the interviews, or (b) one interview and another. Expanding the research to include more arousing events and testing over longer intervals will certainly strengthen the data base. Thus far, our studies have examined only college-aged students as the witnesses—although note similar findings with children (Gordon & Follmer, 1994; LaRooy et al., 2005). Once again, including a wider sample of witnesses should improve our ability to generalize the results. All of the participants in our studies were motivated to be truthful. As such, our conclusions are restricted to cooperative witnesses who are attempting to volunteer truthful information. We make no claims here about the testimony of deceptive witnesses (see Granhag, Stromwall, & Jonsson 2003, for some recent, interesting findings on the consistency of liars and truth-tellers). Finally, we did not cross-examine witnesses in any of our studies. Perhaps a strong cross-examination will reveal more differences between accurate and inaccurate witness recollections. We strongly encourage future researchers to shore up some of the limitations of our studies. We hope that we have at least stimulated the appetites of researchers and those within the legal community to examine more carefully the matter of inconsistency within witness testimony.

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