

# **Adult Eyewitness Testimony**

**Current trends and developments**

*Edited by*

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# 1 Reports of suggested memories: Do people truly believe them?

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*Kenneth R. Weingardt, H. Kelly Toland, and  
Elizabeth F. Loftus*

A true case, described using pseudonyms in *Witness for the Defense* (Loftus and Ketcham, 1991), provides a powerful anecdote showing just how strongly witnesses can believe in their memories – even when their memories are false. The case arose out of an incident that happened early one morning in the spring of 1979 when Sally Blackwell awoke to find an intruder at the foot of her bed. As she raised her head to speak to the man, he put a gun to her head and told her that if she made any noise, he would kill her children. What followed was a two hour ordeal in which both Ms. Blackwell and her teenage daughter Janet were bound, blindfolded, and systematically raped and sodomized by their assailant.

The following morning Sally called Lois Williams, a co-worker, to explain that she would not be coming to work that day. Several hours later, Sally's irate boyfriend began urging her to come up with a name for the man who had assaulted her. He thought the rapist must have been someone she knew, or why else would the man have been so careful to conceal his identity? As Ms. Blackwell testified, he kept saying "It's got to be somebody you know. You've seen him in the neighborhood, you've seen him somewhere before. Just think where you've seen him. You saw him at the grocery store or at church; you've seen him somewhere. You've seen him at a party somewhere." As he said "party," according to Ms. Blackwell, a name flashed with the face.

The name she connected with the face of her rapist was Clarence Von Williams. Williams was the forty-two-year-old husband of Lois Williams, the co-worker Sally had called earlier that morning. Sally and her boyfriend had attended a party with the Von Williamses several weeks earlier, and the two couples had spent several hours together.

With this connection made, Sally found someone to blame for the nightmare that she and her family had been forced to endure. Criminal charges were filed against Von Williams. As the date of the trial grew near, Ms. Blackwell's repeated assertions that "I know what I saw in my mind" made her increas-

Significant portions of the research described in this chapter were supported by a grant from the National Institute of Mental Health to E. F. Loftus. We wish to thank D. S. Lindsay for his helpful comments on portions of this chapter.

ingly confident that Von Williams was the man who had raped her and her daughter.

Ms. Blackwell's positive identification of her attacker during the trial was obviously quite convincing. Despite Von Williams' emotional denials of the accusations, and the lack of any corroborating physical evidence, he was convicted of aggravated rape and sentenced to fifty years in prison.

Two months after his conviction, there was a new development in the Von Williams case: A thirty-two-year-old man named Jon Simonis was picked up by the Louisiana State Police. He confessed to over seventy crimes in seven different states, including the rapes for which Clarence Von Williams had been convicted. Simonis' entire confession was videotaped. When the prosecutors responsible for Von Williams' conviction had the opportunity to watch the tape, they immediately dismissed all charges against him.

The fact that charges against Von Williams were dropped suggests something about the compelling quality of Simonis' confession. Yet the reaction of Sally Blackwell to this videotape was one of stunned shock and disbelief. When she first saw the confession, she was only able to stare at the man on the tape, shake her head back and forth, and with her voice rising over the sound of the videotape, repeated "No, no, no, no, *no no*."

Sally Blackwell believed so fully in the validity of her memory for her assailant, that even when presented with concrete evidence contradicting that recollection, she refused to budge. Loftus and Ketcham (1991) explained: "The victim made her choice – Clarence Von Williams – and later, even with the real criminal staring her in the face, confessing to the rape, and bringing up details that only he could have known, she couldn't accept it. . . . Once Von Williams's face merged with her memory of the rapist's face, and once she committed herself to that memory by stating in court that Von Williams was her rapist, it became impossible to separate the two memories. They were, in a very real sense, permanently fused together" (p. 208).

As this story exemplifies, discussion after witnessing an event can influence people's recollections of that event. If this discussion is misleading (as were the suggestions of Ms. Blackwell's boyfriend), it can cause errors in a person's eyewitness account. And, as Clarence Von Williams would undoubtedly agree, these errors can have enormous consequences.

This phenomenon, by which new information leads to errors in eyewitness reports, has been well documented empirically, and is often referred to as the "misinformation effect" (Loftus and Hoffman, 1989). Most of the research on the impact of misinformation (for example, Lindsay, 1990; Loftus, Donders, Hoffman, and Schooler, 1989; Loftus, Miller, and Burns, 1978; McCloskey and Zaragoza, 1985; Tversky and Tuchin, 1989) has employed a three-stage procedure in which subjects first witness an event by means of a slide sequence or videotape. Then subjects receive new information about the event, often in the form of a written narrative or embedded in questions.

Finally, subjects take a test of their memory for the event. Typically, people in such studies report that they have seen objects or actions as part of an event, when in fact those objects or actions came from other sources.

### **The issue of “true belief”**

Although the misinformation effect has been well established as a psychological phenomenon, and many of the factors associated with it have been identified, there has been little consensus regarding its interpretation. An issue that has inspired considerable debate concerns whether subjects who have received misleading suggestions about an item (item being loosely defined here as a person, object, or action) come to genuinely believe, as did Sally Blackwell, that they had actually seen the item which had only been suggested to them.

Many researchers have demonstrated that subjects exposed to misleading postevent information are likely confidently to report such misinformation on subsequent memory tests. For example, Loftus, Donders, Hoffman, and Schooler (1989) tested subjects for their memories of what they saw in a series of slides depicting a burglary, and measured their reaction times and confidence levels. When subjects were administered a recognition memory test that required them to choose between the event item and the misinformation item (often referred to as the “standard test”), misled subjects responded as quickly and confidently when choosing the incorrect misinformation response as they did when they chose correctly.

Although this result indicates that misled subjects are confident about their incorrect responses, and that they do not spend much time deliberating about them, it does not conclusively establish that subjects who base their test responses on memories of suggested items actually truly believe that they saw the suggested items as part of the event. In fact, other researchers (for example, McCloskey and Zaragoza, 1985; Zaragoza and Koshmider, 1989) contend that misinformation-based responses are in no way indicative of “true belief.” For example, Zaragoza and Koshmider (1989) argued that because “subjects in the typical misinformation experiment are not encouraged to distinguish between what they believe happened in the original event and what they specifically remember seeing in the original event” (p. 246), the results of experiments that use the standard test are uninterpretable with respect to the issue of true belief.

How can one empirically address the issue of “true belief”? One obvious approach is to come right out and ask subjects to report the source of their memory for each test item. This is exactly what Zaragoza and Koshmider did by administering a memory test that forced their subjects to indicate the source of their memory for each test item. Specifically, subjects were shown slides depicting the critical items, either in the event form or in the postevent form,

and subjects were required to indicate the source of their memory by choosing among the following four response options: the SAW option if subjects were absolutely sure they had seen the test item in the slides; READ if they did not remember seeing the item but did remember reading about it in the narrative; the CONSISTENT option if the item in the slides were consistent with what they remembered about the event, but did not know where it came from; INCONSISTENT if the item in the test slide contradicted what they remembered about the event.

The proportion of SAW responses to the misleading test slide in the misled condition was not statistically greater than the proportion of SAW responses in the control condition. The misleading test slide contained misleading or false information that was provided in the postevent narrative that was given to subjects in the misled condition. Control subjects were not exposed to this misleading information in the narrative they were given. Consequently, the authors argued that exposure to misleading information did not lead subjects to falsely remember seeing the misinformation items, that is, they did not come to genuinely believe that they had seen the misinformation items.

Zaragoza and Koshmider were neither the first nor the last investigators to utilize such a "source monitoring test" in an attempt to address the issue of true belief. Lindsay and Johnson have conducted numerous studies in which subjects were required to identify the source of their memories for each test item (Johnson and Lindsay, 1986; Lindsay and Johnson, 1987, 1989a). Although Lindsay and Johnson's earlier experiments obtained results that were essentially the same as those obtained by Zaragoza and Koshmider, their interpretation of them was considerably different. Zaragoza and Koshmider interpreted the pattern of results mentioned above as evidence that subjects were aware that their memories of the suggested details were derived from the narrative. That is, subjects are typically presented the original event using slides and the narrative is given after the event in the form of a document that subjects read. Lindsay and Johnson argued that subjects taking an old/new recognition test may well have experienced source monitoring confusions (that is, said "yes" to suggested items because they thought they had seen those items in the slide) because they were using lax source monitoring criteria.

This interpretive debate was superseded by findings in both laboratories of suggestibility effects among subjects tested with source monitoring tests. For example, Lindsay and Johnson's most recent (1989a) source monitoring data showed that although misled subjects were capable of identifying the source of their memories of misleading suggestions, they nonetheless sometimes misidentified them as memories derived from the original event. Similarly, Zaragoza's most recent experimentation (Zaragoza and Muench, 1989) also indicates that misled subjects really do experience recollections of suggestions as recollections of details seen in the event.



Though the evidence from some source monitoring studies indicates that misled subjects “truly believe” that they have seen suggested items in the event, the results of such studies are subject to alternative explanations. For example, misled subjects may perform more poorly than their control counterparts because they base their test responses on information they know was obtained from the narrative.

McCloskey and Zaragoza (1985) convincingly argued that subjects are led to believe that the narrative is accurate (in some experiments, subjects are informed that the narrative was written by a professor who had watched the slides very closely). Consequently, subjects may base their responses on information they know was obtained from the narrative because they wish to show that they are attentive and remember details from both the event and the narrative. This explanation is often referred to as a “demand characteristic” interpretation.

As in studies employing standard recognition tests, subjects in misinformation studies that use source monitoring tests are led to believe that the narrative is accurate, and may wish to show their attentiveness by reporting details that they actually only remember from the narrative but that they assume or infer were also present in the visual event (Lindsay, 1990). Because of the demand characteristics inherent in source monitoring tests, experiments that contain such tests are unable to establish conclusively whether subjects truly believe that they saw the suggested details. For these reasons, Lindsay (1990) looked for an entirely new procedure to preclude the demand characteristic interpretation: He adapted Jacoby, Woloshyn, and Kelley’s (1989) “logic of opposition” paradigm.

### **The logic of opposition**

The demand characteristic interpretation of the results of typical misinformation studies suggests that subjects who base their test responses on memories of suggested items do not really remember seeing such items in the event. Rather, it is argued that subjects choose the misinformation response (suggested details) because they believe in the accuracy of the narrative and wish to appear observant. By instructing his subjects that any information contained in the narrative was wrong and should not be reported on the test, Lindsay set the tendency to report suggested details in opposition to the ability to remember the source of the details. Under such opposition instructions, demand characteristics work against the hypothesis of genuine memory effects. If subjects continue to base their test responses on suggested items, despite explicit instructions against doing so, one can more confidently infer that such subjects genuinely believe that they saw the suggested items in the slides.

A more concrete example of the logic of opposition may help the reader

attain a fuller understanding of this concept. Suppose that Gene Siskell and Roger Ebert, the independent minded film critics who appear weekly on the syndicated television show "At the Movies," are about to review a movie that you are considering seeing. From the promotional materials, it is clear that *Halloween Part VI* is a somewhat stereotypical horror picture. Further suppose that it is widely known that Ebert is a big fan of films of this genre, while Siskell detests them. The logic of opposition dictates that if you want to determine whether the movie is actually worth today's exorbitant price of admission, you should attend to Siskell's opinion. If Siskell, who has been known to deride virtually all films of this genre, gives *Halloween Part VI* a "thumbs-up," you know that it must be an excellent film indeed.

Analogously, when Lindsay's subjects based their test responses on information contained in the narrative, despite being informed that any such information was incorrect, he could confidently conclude that misled subjects truly believed they saw the suggested details in the slide sequence. In addition to establishing that some misled subjects come to truly believe that they saw suggested items, Lindsay's logic of opposition study provided evidence that misinformation impairs subject's ability to remember event details. Before explaining how he came about this last piece of evidence, it is necessary to become familiar with several aspects of the design he used.

*Lindsay's use of Jacoby's Logic of Opposition: "If you read it, don't report it"*

Lindsay employed the standard three-stage misinformation paradigm. First, subjects saw a sequence of color slides depicting an incident in which a maintenance man steals some money and a calculator from an office. Following the slide presentation, subjects read a detailed description of the events depicted in the slides. This narrative included misleading suggestions about some critical details in the slide sequence and neutral terms for three other details. For example, subjects in the misled condition saw a screwdriver, and then read about a wrench, whereas subjects in the control condition also saw a screwdriver, but read about a tool. Finally, subjects took a test of their memory for the event depicted in the slides.

The innovative character of the test he used, and the manner in which it was administered, allowed Lindsay to observe situations in which subjects' memories for the original event were impaired by exposure to misinformation. Lindsay's unique design also allowed him to observe situations in which subjects appeared to truly believe that they saw items which were only suggested to them.

The test of memory that Lindsay used consisted of one cued recall question about each critical detail. Questions were of the following form: "The man had a pack of CIGARETTES. What BRAND OF CIGARETTES was shown

in the slides?” (p. 1080). As was mentioned earlier, this test was accompanied by “logic of opposition” instructions, as follows:

For some of the questions, the detail in question was not mentioned in the story at all (that is, you saw the correct answer in the slide show, but the detail in question was not mentioned in the story). For other questions, the detail was mentioned, but it was described inaccurately (that is, you saw the correct answer in the slide show, but an incorrect answer was mentioned in the story). **There is no question on this test for which the correct answer was mentioned in the story.**

Subjects were always tested in a second session, forty-eight hours after viewing the slides. In the low-discriminability condition, subjects viewed a slide sequence and studied a postevent narrative in session one, and completed a test of memory when they returned to the laboratory two days later. In the high-discriminability condition, subjects only viewed the slide sequence in the first session, and read the postevent narrative and took the memory test in the second session.

In addition to presenting the event and suggested details in the different experimental sessions, other factors were manipulated in an effort to increase the differences between memories of the slides and memories of the postevent narrative in the high-discriminability condition.

The presentation of the postevent narrative differed in several ways from the low discriminability condition: Subjects listened to the postevent narrative while standing in the fully lit classroom, they were instructed to mentally repeat each word of the narrative as they heard it . . . and the tape recording (which accompanied the narrative) was of a male voice (distinctly different from the female voice which accompanied the presentation of the slide sequence). (p. 1080)

The overall design can thus be viewed as a  $2 \times 2$  mixed factorial, with acquisition condition (high versus low discriminability) as the between-subjects factor and item type (misled versus control) as the within-subjects factor.

The first finding of interest addresses the issue of true belief. Did subjects genuinely believe that they saw the suggested details in the event? Lindsay's results indicate that, for some subjects, the answer is yes. In his low-discriminability condition, subjects who received misinformation more often claimed that they had seen suggested items than subjects who were not misinformed. Whereas misled subjects based their responses on suggested items 27 percent of the time, control subjects based their responses on suggested items only 9 percent of the time.

Another of Lindsay's findings suggests that exposure to misleading suggestions impairs subjects' memories for the original event. In the low-discriminability condition, Lindsay found that the proportion of correct responses for subjects who had received misinformation (.45) was significantly less than the proportion of correct responses for subjects who received no misinformation (.51). More interesting, even in the high-discriminability con-

dition, misinformation seemed to impair the subject's ability to correctly recall event items. In Lindsay's words, "Although subjects in the high-discriminability condition were able to identify the source of their memories of suggested details (and so did not report seeing them more often on misled than control items), the misleading suggestions nonetheless hampered their ability to report the event details" (p. 1081). This impairment is evident when one compares proportion of correct responses for misled and control subjects in the high-discriminability condition (.39 and .48 respectively).

*Logic of opposition revisited: "If you saw it, don't report it"*

In an effort to provide convergent evidence on the issue of true belief, we recently conducted in collaboration with Stephen Lindsay a series of experiments at the University of Washington that utilized the logic of opposition paradigm (Weingardt, Loftus, & Lindsay, forthcoming). These studies, two of which are briefly described here, extend and generalize Lindsay's findings. In these new studies, the means by which the logic of opposition paradigm was operationalized was considerably different than Lindsay's original method. Recall that Lindsay administered a cued-recall test and informed subjects that "There is no question on the test for which the correct answer was mentioned in the story." We, on the other hand, asked subjects to generate category exemplars, and informed them that if they remembered a particular item from the slide sequence, they should not include it on their list. In essence, whereas Lindsay told his subjects; "If you read it, don't report it," we instructed our subjects, "If you saw it, don't report it."

Aside from the novel memory test described above, this experiment followed the typical misinformation paradigm. Specifically, subjects saw a slide sequence depicting a complex event. Following the slides they read a narrative containing some items of misinformation. Finally subjects were asked to list a number of items belonging in each specified category with the prohibition that they exclude items seen in the slides.

Our prediction for the results of this study was twofold. First, we predicted that subjects who read about a suggested item (misled subjects) would include that suggested item on their category lists *less* often than control subjects. Why? If some misled subjects think they actually saw the suggested item as the literature suggests, they would heed the opposition instruction forbidding them to list what they saw, and would thus exclude the suggested item from their list. Thus, the proportion of suggested items that were listed by misled subjects would be lower than the proportion of these same items listed by control subjects. Our second prediction was that misled subjects would include the event item on their category lists *more* often than controls. Why? If some misled subjects are induced to think that they actually saw the suggested item, then they would consequently believe they did not see the event item. If they

then heeded the logic of opposition instruction that forbids them to list what they saw, they would not hesitate to list the event item. Thus the proportion of event items listed by misled subjects would be greater than the proportion of event items listed by control subjects.

*Method.* At the outset of the experimental session, subjects were told that the experiment involved assessment of the relative effectiveness of visual versus verbal modes of presentation. Subjects were therefore instructed to pay close attention to both the slide sequence and subsequent written narrative because they would be asked to evaluate them later.

The two hundred undergraduate subjects watched a sequence of sixty-eight color slides. The sequence depicts a male college student visiting a university bookstore. While shopping, he examines various items, slips several of them into his pack, and watches a handyman in the store doing some maintenance work. There were two versions each of the critical slides, for soft drink (7-Up or Coke), magazine (*Esquire* or *GQ*), and tool (screwdriver or wrench). Half of the subjects in each condition saw each version of the slide sequence. A tape-recorded narrative accompanied the slide sequence. This narrative commented only on the most salient aspects of each slide, and each critical item was mentioned at a generic level (for example, "The handyman picked up a *tool* and began fixing a damaged display case").

After a four-minute filler activity, subjects read a narrative describing the events depicted in the slides. The postevent narrative was a detailed verbal description of the event. For each subject, the narrative inaccurately described three of the six critical items, while describing the remaining three critical items in neutral terms. The items described inaccurately in the narrative served as "misled" items, whereas those items described neutrally served as "control" items. All items were counterbalanced across subject groups: For each item, half the subjects received misinformation about that item in the narrative and the other half received neutral information.

Finally, the subjects entered the test phase of the experiment. On the test of memory, subjects were asked to list five different exemplars of each specified category, but were given explicit instructions against listing items that they had seen in the slides. For example, subjects were asked to generate five different types of magazines, but were prohibited from including on their list any magazines they had seen in the slides. The most important part of these instructions was as follows:

For each question, you will be asked to list five different items that belong within a given category. For example, you may be asked to "Please list five different types of fruit." When making these lists, please refrain from including any items that you remember seeing in the slides. In other words, if you saw a certain item in the slide sequence, do not include it in your list.

These instructions were repeated and rephrased several times, and an example was provided to ensure that subjects understood them.

*Results.* For each critical item, each subject was asked to list five different exemplars that could be included within the specified categories. For each category list, we recorded whether or not the subject included the item in the slides (the event item) and whether or not the subject included the item suggested in the narrative (the suggested item) on the list. We could then compare lists that were produced when subjects had received misinformation, to lists that were produced when subjects had not.

Recall that our first prediction for this experiment was that the proportion of suggested items listed by misled subjects would be lower than the proportion of suggested items listed by control subjects. In accordance with this expectation, misled subjects included the suggested items on the category list significantly less often than subjects in the control condition (28 percent versus 43 percent,  $t(199) = 5.49$ ,  $p < .001$ ).

Also recall our second prediction, that misled subjects would include the event item on their category lists more often than controls. The data analysis also confirmed this prediction. Whereas control subjects included the event item on their lists 26 percent of the time, misled subjects listed the event item 33 percent of the time, significantly more often than control subjects ( $t(199) = 2.38$ ,  $p = .02$ ).

*Discussion.* The primary results from this study can be easily summarized. When subjects were given a logic of opposition instruction to list category members but exclude any items that they saw in the slides, they responded differently in the face of misinformation. When given misinformation, they were less likely than controls to put suggested items on their list, and more likely to include the event items.

Why are misled subjects refraining from putting the suggested items on their list? One possibility is that subjects genuinely believe they saw the suggested item, and, given the logic instructions, they do not list it. However, another possibility is that subjects adopt a strategy for responding to the request to produce category members that involve avoiding any exemplar presented in the experiment. For example, say a subject correctly remembers seeing a hammer in the slides, and reading about a screwdriver in the narrative. However, when asked to "Please list five different types of tools," the subject, eager to obey instructions against listing items seen in the slides, fills up each of the available slots with tools that did not appear anywhere in the experiment (for example, shovel, drill, rake, etc.). This strategy could account for the lowered frequency of suggested items in the category lists produced by misled subjects.

We think that this explanation is unlikely. One reason is that misled subjects

did not also avoid the event item. Put another way, they were more likely than controls to list the event item in the category list. This brings us to the second major finding of this experiment, that misinformation increased the frequency of listing event items, even though subjects were explicitly instructed not to list what they remembered seeing.

Why were misled subjects more likely to list the event item than controls? One possibility is that misinformation impaired their memory for the event item, making subjects fail to remember seeing it, and thus leaving them free to list it. There are several other plausible explanations for this finding, however, all of which have nothing to do with memory impairment.

One possibility is that the result is due to limitations placed on subjects as to the number of category exemplars that were required. Recall that subjects in this experiment were asked to produce five different exemplars of each specified category, with the prohibition that they not list items that they remembered seeing in the slides. The requirement to produce five, and only five, members of each category limits the conclusions that can be drawn from the results. Perhaps, when asked to list five different types of soft drink, for example, misinformed subjects first thought of 7-Up (that is, the suggested item). They would then include 7-Up on their list of soft drinks, because they correctly remembered that they read about 7-Up, and did not see it. In thinking about 7-Up, subjects might then be induced to think of other light-colored soft drinks (Sprite, ginger ale, seltzer, etc.). Because subjects start thinking about light-colored soft drinks, it is possible they fill in the remaining four slots on their lists with members of this subcategory of drinks thereby leaving no slots for an event item that is not a member of the subcategory (Coca-Cola). Thus, subjects who did not remember seeing the event item may nonetheless have excluded it from the list, for reasons having nothing to do with impairment of event memory.

Another possible reason for the finding that misled subjects were more likely than controls to list the event item (Coca-Cola) is based on sheer probability. We have already seen that misinformation reduces reports of the suggested item. This alone could cause reports of the event item (Coca-Cola) to rise. Misled subjects who refrained from listing 7-Up would have five slots to fill with other items, whereas control subjects who did not refrain from listing 7-Up would have only four slots.

These concerns motivated a second logic of opposition study. In this second study, we made sure that subjects had more slots for listing category members than there were category members to list. This was accomplished in the following way. Subjects again saw slides, received misinformation on some critical items, and then were tested. The test again asked subjects to generate exemplars for each of the specified categories. However, rather than ask subjects to think up five exemplars for each category, as they did in the first experiment, we gave all subjects in the second experiment a list of two hundred