

## HUMAN FACTORS – MEMORY IN ACCIDENT RECONSTRUCTION

or WWSINWYG (What Was Seen Isn't Necessarily What You Get.)

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by Joseph E. Badger, Bloomington, Indiana

Hoo boy! We all flunked!

You've heard that anyone who goes to see a psychiatrist ought to have his head examined. Well, how about if you visit a psychologist, have him give you a test, and he lets you grade it yourself... and you still flunk!?

Picture this: A roomful of trained observers. PAID trained observers. The instructor tells you ahead of time that he is going to show you a series of slides and that those slides will depict events leading up to and including a traffic accident. He encourages you to study each slide--although you won't have a long time to look at each one--and remember as much as you can about each scene.

The first slide shows a couple pedestrians on a sidewalk, next to some building, maybe a library. In the distance a red car comes around a curve. In the next slide the two people are further along the sidewalk, and the car passes. Subsequent slides depict the car at an intersection and eventually one of those pedestrians steps off the curb, gets hit and ends up lying in the street. A police car stops. An officer tends to the "victim." A passenger is seen running away. Or is it the passenger?

After a dozen slides or so, our instructor hands out a test. Twenty questions about what

you just saw. This is reminiscent of us being witnesses to a traffic accident and now we're answering probing questions to see just how much we can recall. Keep in mind that we did not have any distractions; we're in comfortable surroundings, and among friends. We know in advance that an accident is going to happen and that we're to remember as many facts as we can. Simple, right?

Yes, we all flunked! At least those of us who admitted we failed flunked. The others? Well, they can live with their consciences. Long before this exercise I became skeptical of what eyewitnesses say. (See LAW and ORDER, December 1994, "The Credibility of Eyewitnesses - Do they really remember what they saw?") Back to the exam.

We could answer the test questions yes or no.

Here are some of the questions:

1. Did the policeman who came to the scene of the accident carry a police radio? Heck, I wasn't even paying attention to the cop; I was looking at the guy running away.

2. Was there a mailbox across the street from the accident scene?

Mailbox? Duh, I wasn't lookin' fer no mailbox. (Turns out it wasn't a mailbox after all; it was a trash container.) Let's skip to question No. 4.

4. Was the pedestrian who was hit by the car wearing a plaid jacket?

Almost all of us remembered the guy in the plaid jacket. But was it he or the other person who got hit? Wasn't the guy in the plaid jacket the one who ran away? Or was that a bystander? Hmm.

6. Was the bus that appeared just before the accident occurred coming from the right?

The trained paid observer sitting next to me muttered aloud, "What bus?"

I like question 14: "As the two pedestrians walked along the sidewalk, were they

talking?"

Well, they might be talking but keep in mind we were looking at a slide. And I didn't hear either of the couple utter a word.

15. Did the accident victim step off the curb inside the crosswalk?

Bingo! I'll bet most of us got that one right.

19. Did the car that drove past the accident have a ski rack on top?

Most of us had to guess. I didn't even answer the question. I not only didn't notice a ski rack, I also couldn't remember a passing vehicle.

Question 10 was one of those questions investigators should never ask. "Did another car pass the red Datsun when it was at the intersection by the stop sign?" Such an inquiry implants in the witness' mind the fact that one car was red and that there was a stop sign and that another car might have passed by.

If you answer the question "Yes" you are admitting also that the Datsun stopped for the stop sign. If you answer "No" you're still agreeing about the stop sign.

Before the instructor showed the original set of slides again, he put up three or four random slides and asked us if we had seen them before. One slide was an obvious fraud, two were iffy, but then there was the slide that showed the red Datsun next to the stop sign at the intersection. Well, sure, we ALL saw that one before.

Wrong.

When the instructor ran through the original slides again we could see where we went astray. Hey, there was that bus alright - coming from our left. And - uh oh - that wasn't a stop sign at all. The original slide showed the Datsun at the intersection next to a YIELD sign.

I was so flustered by the time the series ended that I still can't tell you if a passing car had a ski rack or not.

Our instructor was psychologist Dr. Patrick J. Robins of Etobicoke, Ontario, and Ryerson Polytechnic University. His presentation, "Human Observation on Trial: The Roles of Physical Evidence and Personal Testimony in Motor Vehicle Collision Investigation and Reconstruction," was an eye-opener and a must-see for anyone who interviews witnesses. Both lawyers AND JUDGES should take his class. Robins urges accident reconstructionists to expand their knowledge concerning human perception and memory. Further, he cautions members of the legal community about the "susceptibility of human observation to error." He encourages lawyers and judges to "place greater reliance on expert opinion regarding the application of natural physical laws to motor vehicle collisions." Dr. Robins exclaimed, with certainty, "that most people involved in vehicle collisions, either as occupants or observers, appear to be more confident in their knowledge of the collision events than they are accurate."

We've all had occurrences where, at an accident scene, we find witnesses with phenomenal memories. Other witnesses admit, "I don't remember, it all happened too fast." Who do we believe?

Ever have a witness who confesses they heard the crash then looked up? And they go on to explain how the accident happened? Yeah, right. How long does a crash take? Two colliding cars at an intersection can strike each other, reach maximum engagement, and separate in 0.1 second. Okay, maybe 0.3 to 0.4 seconds. How fast can a "witness" react to the sound and look up? If they're good, perhaps half a second. Then they didn't see the accident at all; they merely saw the aftermath, perhaps they saw the cars arriving at final rest. But they sure didn't see "how the accident happened!" Robins points out that it should be obvious from such an example that most people could really observe only the post-impact events of a collision. Yet, he acknowledges, "these same individuals later report in considerable detail, events to which they could not possibly have attended."

According to Dr. Robins, "transmission of information in computers is electrical in nature, and consequently very fast (about 300,000,000 m/sec), in the nervous system the medium for transport is primarily chemical in nature, and by comparison to a computer, information moves through the human brain and nervous system at a snail's pace (about

20-120 m/sec)."

He adds that "This slowness in the nervous system accounts for the relatively slow reaction time of most people, about .5 to .75 seconds, to simple stimuli in which the response requirement is well learned, reacting to a red traffic signal for example. It also explains why people often emerge from collisions claiming initially that the events happened so quickly that their recollections were no more than a blur."

But after they read a newspaper account of their accident, talk to fellow workers and a couple pool-house lawyers, watch their memory improve. You cannot remember what you did not perceive in the first place. And you can send only so much information to the nervous system at a time. You want proof?

Dr. Robins gave us another test. This one was fun. He told us to write down the word *antidisestablishmentarianism*, or something like that. But before we got as far as *a-n-t-i-d-i* he interrupted and told us to write the word while singing "Happy Birthday." You think it's tough walking and chewing gum simultaneously? Try singing a familiar tune and writing a word you'll never use but maybe once in your lifetime. The point being is that your mind can't cope with too many events at a time, especially an episode as traumatic and full of action as a traffic accident.

Would a bystander see an air bag deploy in a crashing car? Could a bystander see an air bag deploy in a crashing car? An air bag deploys in 1/30th of a second. If you video tape the situation, it will show up on only one frame! One eye-blink and it's all over.

How about these witnesses--to whom the event initially "happened so fast"--who testify about the event with clarity two years later? Dr. Robins teaches that "recollection of original events decays, not improves, with time." He adds, "memory is a reconstructive process in which we assemble events as we believe they probably took place."

Accentuated in his lecture: "Memory degrades in as little as one to three seconds. While recall might become clearer over time, it does not get better. Memory does not improve with age, either. People are much more confident than they are accurate in their recollection of events." And on another note, Dr. Robins stated that "You cannot improve memory with hypnosis; you can improve it by repetition." Well, I had to run that by a

friend and former colleague.

Sgt. Joseph R. Rhodes, public affairs officer, portrait artist, and hypnotist with the Indiana State Police, doesn't buy into all of Robins' theories on hypnosis. Rhodes occasionally gets requests from prosecutors trying to obtain evidence in criminal cases. Most of the requests are for Rhodes to prepare a composite sketch of a suspect, based on a victim's or witness' description. Sgt. Rhodes acknowledges that hypnosis should be used only as a last resort and he notes that it's not generally used as evidence in court. Rather, it's used as an investigative tool from which detectives can pursue other avenues, other leads.

I asked Joe if he had ever been able to elicit a suspect's license plate number from someone who saw a car driving away. He said that personally he hasn't been successful in such instances but knew of cases where witnesses recalled at least a portion of the license plate number, and in a celebrated case all but one digit. Joe agreed that there are unscrupulous hypnotists, just as there are unethical psychologists--and lawyers--but in the hands of honest, well-trained individuals, hypnotism is a valuable and viable aid. When I told him about flunking the slide-show exam, he ventured that under hypnosis I probably could recall many details from every slide I saw. He said that since I knew I was in a test situation I wasn't relaxed and that by being relaxed--through hypnosis--my ability to recall would indeed be better.

Rhodes reminds us that it's how the hypnotist--or investigator or psychologist--frames the questions that result in unbiased, unprejudiced replies. But he believes in the process and observes that "otherwise impossible cases can be solved through the use of hypnosis, and that society is not well served if this investigative tool is denied to law enforcement."

Noted psychologist Elizabeth Loftus found that when exposed to misleading post-event information, subjects recalled the color of a car that was green as being blue; a yield sign as a stop sign; tape recorders that never existed; and even recalled a barn when no barn was ever seen. This shows that "people will pick up information whether it's true or false and integrate it into their memory."

In her recent book *The Myth of Repressed Memory* [St. Martin's Press, New York, 1994], Dr.

Loftus, along with co-author Katherine Ketcham, recounts psychologist Ulric Neisser's experiment the day after the shuttle Challenger explosion in which he asked students to describe how they heard the news of the January 1986 disaster.

Then, in September 1988 those students described their two-and-a-half-year-old memories differently. "Not one of the memories was entirely accurate." Compare that to witnesses' versions immediately following an accident and those same witnesses' accounts two years later at a deposition or trial.

Loftus writes about psychotherapist James Hillman, who, in his *We've Had a Hundred Years of Psychotherapy and the World's Getting Worse*, quotes Freud who said: "It's how you remember, not what actually happened."

After witnesses, or others involved in accidents, read about a case or discuss it with co-workers, and listen to rumors, inevitably they start believing what they heard was what they actually saw. Moreover, they sound convincing when they relay the story to others.

Loftus and Ketcham ask you to "imagine the brain as filled with hundreds of thousands of tiny overlapping 'nets' of information connecting separate and distinct neural locations. Tug on one thread of a particular memory, and the whole net will shift position; surrounding and overlapping sheets of memory will also be disturbed."

The authors relate an account regarding memories of an event that occurred on August 18, 1967 in Boston's Fenway Park. Jimmy Hamilton, pitching for the California Angels, threw a fast ball, struck and severely injured Red Sox outfielder Tony Conigliaro. Years later, Hamilton recounted that day. "It was like the sixth inning when it happened. I think the score was 2-1, and he [Conigliaro] was the eighth hitter in their batting order. With the pitcher up next, I had no reason to throw to him." It was a day game, Hamilton recalled, because he remembered visiting Conigliaro in the hospital later that afternoon. Hamilton debated whether to return to Fenway later that year; however, he eventually decided to make the trip, so he said.

But, according to Loftus, Hamilton's memory wasn't even close to the truth. "The accident didn't happen in the sixth inning, but the fourth; the score wasn't 2-1, but 0-0;

Conigliaro wasn't the eighth hitter in the order, but the sixth; it wasn't a day game, but a night game; and Hamilton didn't make another trip that year because the tragedy occurred during the Angels' final road trip to Boston."

So what of eyewitnesses who recall, in vivid detail, various minutiae surrounding a tragic event of their own? Attorneys ask deponents to estimate how many seconds elapsed between related circumstances. "I'm not sure," they may answer, "maybe five or six seconds." The lawyer prompts, "Could it have been as many as seven or eight?" Often, the deponent, anxious to help (and to get the deposition over with), hazards a guess and adds, "Yeah, maybe seven or eight."

I once had occasion to read a deposition where a truck driver distinctly remembered that two tires "blowed" on his truck. He even remembered hearing "two bangs." But he never saw the tires after the accident. He later acknowledged that someone told him both tires blew out. So his "memory" was possibly more of what someone said rather than what he truly "remembered."

Back in April 1994, during the Mother of All Trials, a newspaper article bore this headline: "Lawyers attack witnesses over failure to remember." That Associated Press account quoted psychiatry professor Louis J. West of UCLA: "If a witness had some trouble recalling, it seems to me that -- more or less -- it's an authentic effort at recall rather than a phony one. We are not supposed to remember everything."

Once insurance investigators or attorneys or--as columnist Carp Combs likes to call them, the Guys down at the Baitshop--get hold of a witness, look out. Their questions and perhaps self-serving comments can implant memories of things that never were, never happened. "Did the red Datsun stop at the stop sign?" Horrible question. The notion that the vehicle was a Datsun, and red, has now been implanted in the "witness's" memory -- plus the thought that the car could have stopped.

Some questioners ask, "How fast was the kid going?" (and they ease in a little emphasis on "fast"). Or, "Was the teenager speeding?" But the way they ask the question, with that little twist, suggests that, why certainly, all teenagers speed. So this one must have been speeding too. Ask instead, "Describe the car and what it was doing; which direction was it going?" Don't ask how far was the pedestrian thrown when the Chrysler smashed into



her? You've implanted the idea of speed with the words "thrown" and "smashed."

Be wary of the witness who describes an accident in vivid detail. Be even more skeptical the more positive the person sounds. When someone tells you, "I don't remember; it all happened so fast," you may have a more believable story. Granted, you'll occasionally encounter convenient losses of memory from errant motorists playing dumb because they're afraid of admitting wrongdoing.

Keep in mind that accidents do "happen so fast." And with all the noise, debris crashing around, people yelling, other drivers slamming on their brakes... all these new sounds begin the mesh with the initial ones... and you can't remember everything.

People tend to repress memories of tragic and traumatic events. Often, those involved blank out not only the cataclysmic event itself but also what happened five minutes on either side of it.

How about hypnosis? Dr. Robins says it doesn't improve memory. But will it help people get better access to their memories? Edmund Blair Bolles says no. In his book *Remembering and Forgetting: An Inquiry into the Nature of Memory* [Walker and Company, New York, 1988], Bolles writes that if he were a judge, he "would never allow [a hypnotized] witness in my courtroom." Why? Because the hypnotist has had access to the subject's inner thoughts. "The witness's testimony has become tampered evidence and must be considered as suspect as a reconstructed fingerprint. Experiments also show that we can tell a hypnotized person that something imaginary happened in the past, and then, after the hypnotic state, the person will claim to remember such an experience."

According to Bolles, "when we remember something, our minds do not consult some file cabinet to check a dossier containing a fixed truth. We imagine what happened in the past and then we believe our own construction. As a consequence, we remember things that never happened; we combine memories so that the details of separate incidents become hopelessly intertwined; we remember words, but change their tone; we consistently forget the way we saw things in the past, remembering ourselves as being much the way we are now."

Witnesses to traffic accidents often sound so positive (that is, if you find someone who is willing "to get involved"). But Bolles notes that being sure does not mean a person is

right.

He attests that such people are not [necessarily] liars, nor do they deliberately use narrative technique to embellish their tales. Bolles makes the point that "It is simply that memory is not a tape recorder. People recall experiences in the way they themselves interpret them and are at least as likely to recall their prejudices as their real experiences."

Harry Lorayne is one of those people with a fantastic memory. But he's practiced at it. He gives lectures on improving one's memory; he gives tips on how to memorize dates, names, numbers, lines in scripts, and so on. Lorayne can meet a roomful of people, one at a time, talk with them individually and hear each pronounce their own name. An hour later he can confront any of them and recite their name and perhaps something else he picked up on the way. As the author of

Memory Makes Money [Little, Brown and Company, Boston, 1988], Lorayne reminds us that "we live in a number-oriented society . . . ." Think of miles per hour; how many car lengths one vehicle was from another; how many seconds elapsed between events; was this the 9th or 10th wedding anniversary? Lorayne writes that ". . . where memory is concerned, numbers are like quicksilver - the more you try to grasp them, the farther away they spurt!"

You have undoubtedly heard drivers say, "It all happened so fast, like a split second." So you ask, "What did you do?" The answer may have gone this way: "Well, I said to my wife 'Oh, no, he's pulling out!' So I honked my horn; then I checked my outside mirror and saw that I couldn't change lanes because there was traffic out there, so I turned the wheel to the right and got on the brakes." What fantastic powers of recall! The driver seemingly managed to accomplish myriad tasks in an unbelievably short period.

Or, were all those reactions merely things he thought later he should have done? Or could have done, had he had the time?

Philologist Thomas Butler, Ph.D. writes in Memory [Basil Blackwood Ltd., 1989]: "One can analyse [sic] personal Memory in terms of at least four stages: perception, processing, storage, and retrieval. It's obvious that few human beings have the ability to capture a

complex sensory event in such a way that they can later reproduce it in all its complexity - the sights, sounds, smells, etc."

In his *Remembering and Forgetting*, Edmund Bolles notes that ". . . experiments have shown that we do not simply forget. We distort, combine, and reorganize our memories."

So just how competent are eyewitnesses? What do drivers and passengers actually remember? Do people involved in accidents really remember much of anything when "it all happened so fast"? Dr. Pat Robins wants us to rely more on physical evidence than personal testimony. He teaches that witnessing an event can be broken down into two parts:

1. Perception and processing

2. Memory and recall

We've shown that both phases are subject to all manner of outside forces, thoughts, and so forth; consequently, they're not too dependable. Physical evidence, Robins contends, is the most reliable. He adds that when it comes to the courtroom it appears that Newton's Laws are on trial. There's a mistaken belief that somehow motor vehicles behave differently from the objects described by Sir Isaac. As an accident investigator or reconstructionist, it behooves you to convince the legal community that the proper interpretation of physical evidence is usually superior to post-event recollections of what happened.

According to Dr. Robins, the legal community needs to grant more leeway in hearing physical evidence testimony from non-scientists who are trained in the application of basic physical laws to the reconstruction of motor vehicle collisions. With enthusiasm, we need to challenge the notion that personal testimony is inherently more valuable than physical evidence testimony given by a non-scientist.

And, being a psychologist, Robins argues that attorneys and courts need to make more widespread use of psychologists--and others--with expertise in the area of human factors when evaluating the worth of personal testimony.

Sure, you can misinterpret physical evidence, but that's another story.