

Eyewitness testimony, which relies on the accuracy of human memory, has an enormous impact on the outcome of a trial. Aside from smoking pistol, nothing carries as much weight with a jury as the testimony of an actual witness. The memory of witnesses is crucial not only in criminal cases but in civil cases as well--in automobile accident cases, for example, eyewitness testimony carries great weight in determining who is at fault.

Implicit in the acceptance of this testimony as solid evidence is the assumption that the human mind is a precise recorder and storer of events. Human beings hold fiercely to the belief that our memories are preserved intact, our thoughts are essentially imperishable, and our impressions are never really forgotten. Sigmund Freud believed that long-term memories lie deep in the unconscious mind, too deep to be disturbed by ongoing events and experiences; most people today continue to accept Freud's view of memory.

In a published survey that I conducted with Geoffrey Loftus, my husband and fellow psychology professor, 169 individuals from various parts of the United States were asked to give their views about how memory works. Of these, 75 had formal graduate training in psychology, while the remaining 94 did not. The non-psychologists had varied occupations. Lawyers, secretaries, taxicab drivers, physicians, philosophers, fire investigators, and even an eleven-year-old child participated. They were given this question:

Which of these statements best reflects your view on how human memory works?

- 1 Everything we learn is permanently stored in the mind, although sometimes particular details are not accessible. With hypnosis, or other special techniques, these inaccessible details could eventually be recovered.
- 2 Some details that we learn may be permanently lost from memory. Such details would never be able to be recovered by hypnosis, or any other special technique, because these details are simply no longer there.

Eighty-four percent of the psychologists and 69 percent of the non-psychologists chose the first response, indicating a belief that all information in long-term memory is there, even though much of it cannot be retrieved. The most common reason for choosing that response was based on personal experience and involved the recovery of an idea that the person had not thought about for quite some time; a second reason, commonly given by psychologists, was knowledge of the work of Wilder Penfield, whose studies of brain stimulation in epileptic patients have been used as evidence to support the theory that memories are stable and permanent. Some respondents mentioned hypnosis, psychoanalysis, Pentothal, or even reincarnation to support their belief in the permanence of memory.

But, in fact, human memory is far from perfect or permanent, and forgetfulness is a fact of life. One of the most obvious reasons for forgetting is that the information was never stored in memory in the first place; even the most common, everyday items frequently fail to find a niche in our memory. Take a U.S. penny, for example. Most people would insist that they know what a penny looks like and would have no trouble recognizing one when they saw it. But in a study conducted in 1979, fewer than half of the subjects were able to pick the exact copy of a real penny from fifteen possible designs. See the illustrations on the next page--can you?

Another common object that we look at every day is a telephone. Can you remember the letters that accompany the numbers of your telephone?

Even if we are careful observers and take in a reasonably accurate picture of some object or experience, it does not stay intact in memory. Other forces begin to corrode the original memory. With the passage of time, with proper motivation, or with the introduction of interfering or contradictory facts, the memory traces change or become transformed, often without our conscious awareness. We can actually come to believe in memories of events that never happened.

Child psychologist Jean Piaget, in his *Plays, Dreams, and Imitation in Childhood*, related a personal story about the malleability of memory: ...one of my first memories would date, if it were true, from my second year. I can still see, most clearly, the following scene, in which I believed until I was about fifteen. I was sitting in my pram, which my nurse was pushing in the Champs Elysees, when a man tried to kidnap me. I was held in by the strap fastened around me while my nurse bravely tried to stand between me and the thief. She received various scratches, and I can still see vaguely those on her face. Then a crowd gathered, a policeman with a short cloak and a white baton came up, and the man took to his heels. I can still see the whole scene, and can even place it near the tube station. When I was about fifteen, my parents received a letter from my former nurse saying that she had been converted to the Salvation Army. She wanted to confess her past faults, and in particular to return the watch she had been given as a reward on occasion. She had made up the whole story, faking the scratches. I, therefore, must have heard, as a child, the account of this story, which my parents believed, and projected into the past in the form of a visual memory.

A visual memory, indeed--many years later Piaget could picture in his mind not only the scratches on his nurse's face but also the nonexistent crowd, the policeman with his cloak and baton, and the thief taking "to his heels"!

How does memory work, and why does it fail? Scientists generally agree that memories are formed when neurons link together to form new connections, or circuits, actually changing the contact between the cells; in the process, memories are stored. Long-term memories, which include experiences that happened just a few minutes ago to information several decades old, are stored in mental "drawers" somewhere in our brains. No one knows exactly where, although it has been estimated that in a lifetime, long-term memory can hold as many as 1 quadrillion (1 million billion) separate bits of information.

The "drawers" holding our memories are obviously extremely crowded and densely packed. They also constantly being emptied out, scattered about, and then stuffed back into place. Like curious, playful children searching through drawers for a blouse or pair of pants, our brains seem to enjoy ransacking the memory drawers, tossing the facts about, and then stuffing everything back in, oblivious to order or importance. As new bits and pieces of information are added into long-term memory, the old memories are removed, replaced, crumpled up, or shoved into corners. Little details are added, confusing or extraneous elements are deleted, and a coherent construction of the facts is gradually created that may bear little resemblance to the original event.

Memories don't just fade, as the old saying would have us believe; they also grow. What fades is the initial perception, the actual experience of the events. But every time we recall an event, we must reconstruct the memory, and with each recollection the memory may be changed--colored by succeeding events, other people's recollections or suggestions, increased understanding, or a new context.

Truth and reality, when seen through the filter of our memories, are not objective facts but subjective, interpretive realities. We interpret the past, correcting ourselves, adding bits and pieces, deleting uncomplimentary or disturbing recollections, sweeping, dusting, tidying things up. Thus our representation of the past takes on a living, shifting reality; it is not fixed and immutable, not a place way back there that is preserved

in stone, but a living thing that changes shape, expands, shrinks, and expands again, an amoebalike creature with powers to make us laugh, and cry, and clench our fists. Enormous powers--powers even to make us believe in something that never happened.

Are we aware of our mind's distortions of our past experiences? In most cases, the answer is no. As time goes by and the memories gradually change, we become convinced that we saw or said or did what we remember. We perceive the blending of fact and fiction that constitutes a memory as completely and utterly truthful. We are innocent victims of our mind's manipulations.

A pointing finger of blame has a powerful hold on even the most informed and intelligent of juries. Several years ago I conducted an experiment in which subjects acted as jurors in a criminal case. First they heard a description of a robbery-murder, then a prosecution argument, then an argument for the defense. In one version of the experiment, the prosecutor presented only circumstantial evidence; faced with this evidence, only 18 percent of the "jurors" found the "defendant" guilty. In a second version, the prosecutor pled the exact case with one difference: There was testimony from a single eyewitness--a clerk who identified the defendant as the robber. Now 72 percent of the jurors found the defendant guilty.

The danger of eyewitness testimony is clear: Anyone in the world can be convicted of a crime he or she did not commit, or deprived of an award that is due, based solely on the evidence of a witness who convinces a jury that his memory about what he saw is correct. Why is the eyewitness testimony so powerful and convincing? Because people in general and jurors in particular believe that our memories stamp the facts of experiences on a permanent, non erasable tape, like a computer disk or videotape that is write-protected. For the most part, of course, our memories serve us reasonably well. But how often is precise memory demanded of us? When a friend describes a vacation, we don't ask, "Are you sure your hotel room had two chairs, not three?" After we watch a movie, our companion wouldn't normally grill us with questions like "Was Gene Hackman's hair wavy, or was it curly?" or "Did the woman in the bar wear red or pink lipstick?" If we make a mistake, it usually goes unnoticed and uncorrected--does it really matter if there were two chairs or three, or if the actor's hair was wavy or curly? Belief in an accurate memory is confirmed by default.

But precise memory suddenly becomes crucial in the event of a crime or an accident. Small details assume enormous importance. Did the assailant have a mustache, or was he clean-shaven? Was he five eight or five eleven? Was the traffic light red, or was it green? How fast was the Cadillac going when it went through the red light--or was it yellow?--and smashed into the Volkswagen? Did the car cross the center line, or did it stay on its own side? Civil and criminal cases often rest on such subtle, seemingly trivial details, and these details are often hard to obtain.

In July 1977 Flying magazine reported the fatal crash of a small plane that killed all eight people aboard and one person who was on the ground. Sixty eyewitnesses were interviewed, and two eyewitnesses who had actually seen the airplane just before the impact testified at a hearing to investigate the accident. The plane, one of the eyewitnesses explained, "was heading right toward the ground--straight down." This witness apparently did not know that several photographs clearly showed that the airplane hit flat and at a low-enough angle to skid for almost one thousand feet.

To be mistaken about details is not the result of a bad memory but of the normal functioning of human memory. When we want to remember something, we don't simply pluck a whole memory intact from a "memory store." The memory is actually constructed from stored and available bits of information; we unconsciously fill in any gaps in the information with inferences. When all the fragments are integrated into a whole that makes sense, they form what we call a memory.

Still other factors affect the accurate perception, and therefore recollection, of an event. Was there violence? How much? Was it light or dark? Did the eyewitness have any prior expectations or interests? A tragic real-life case illustrates the potential problems surrounding an initial perception of an event.

Two men in their mid-twenties were hunting for bears in a rural area of Montana. They had been out all day and were exhausted, hungry, and ready to go home. Walking along a dirt trail in the middle of the woods, with the night falling fast, they were talking about bears and thinking about bears. They rounded a bend in the trail and approximately twenty-five yards ahead of them, just off the trail in the woods, was a large object that was moving and making noise. Both men thought it was a bear, and they lifted their rifles and fired. But the "bear" turned out to be a yellow tent, with a man and a woman . . . inside. One of the bullets hit the woman and killed her. When the case was tried before a jury, the jurors had difficulty understanding the perceptual problems inherent in the event; they simply couldn't imagine how someone would look at a yellow tent and see a growling bear. The young man whose bullet killed the woman was convicted of negligent homicide. Two years later he committed suicide.

This dramatic case demonstrates what psychologists call "event factors"--those factors inherent within a specific event that can alter perception and distort memory. It was a dark night, and in darkness different colors can't be distinguished and details can't be resolved. The two hunters had strong expectations and motivations--they anticipated that they might see a bear, they wanted to see a bear, they were nervous, excited, and exhausted from a long day in the woods. When they saw something large, moving, and making noise, they automatically assumed that it was a bear, raised their rifles, and shot to kill.

Event factors have to do with the acquisition stage of memory, when we perceive an event and our brains make the instantaneous decision to either discard the information or insert it into memory. If the memory is stored, however, it does not just lie passively in our brains, waiting to be pulled out and recalled. Many things can happen during the retention and acquisition stages of memory--time passes, the memory fades, and more crucially, we are exposed to new information that adds to or alters the original memory.

Suppose that a crime occurs, the police are notified, they arrive at the scene and begin to ask questions. "What happened?" the witness is asked. "What did the assailant look like?" After the witness tells the police what he can remember, he may be asked to come to the police station to look through a set of photographs. The witness is now performing a recognition test, in which either a single item (a photograph) or a set of items (a group of people in a lineup) is shown, and the witness is asked to indicate whether he has seen any of them before.

Keep in mind that most witnesses are obliging--they want to help, and in the case of a violent crime or assault, they have an added incentive to help the police capture a violent criminal. In addition, research tells us that witnesses believe the police would not conduct a lineup unless they had a good suspect. Although witnesses try hard to identify the true criminal, when they are uncertain--or when no one person in the lineup exactly matches their memory--they will often identify the person who best matches their recollection of the criminal. And often their choice is wrong.

Obviously, the composition of the lineup--how many people are included, what they look like, what they are wearing--is crucial. A lineup must be as free as possible from suggestive influences, or it could taint the witness's identification and lose its value.

As our rather fanciful illustration of a biased lineup shows, if the suspect is a large, bearded man, the lineup should not include children, women in wheelchairs, or blind men with canes. Unless people resembling the suspect are included in the lineup, the suspect may be picked out by default, not by true recognition.

But many lineups used in actual criminal cases are grossly suggestive, and the identifications they produce should be considered worthless. In a lineup conducted in Minnesota, a black suspect stood next to five white men; in another case, a six-foot-three-inch suspect was placed in a lineup with non suspects who were all under five feet ten inches tall; in a case where the offender was known to be in his teens, an eighteen-year-old suspect was placed in a lineup with five non suspects, all over the age of forty. In a case I worked on from 1986 to 1988, a man was accused of murdering eight people on a fishing boat in Alaska. Eyewitnesses had provided police with a general physical description of the man they saw at the murder scene, including one very specific detail--the man they saw wore a baseball cap. In the photo lineup, the suspect was the only person wearing a baseball cap.

But suppose a witness is presented with a fair lineup, in which everyone is at least approximately the same height and weight and fits a general description. The witness is looking at the lineup, concentrating hard, and the police officer suddenly says, "Take another look at number four." Perhaps the police officer stares conspicuously at number four while the witness is trying to identify the culprit. Or perhaps the witness hesitates while looking at number four and the interviewer leans forward and says, "What do you think about that one?"

The witness takes in these little bits of information and may use them--unconsciously--to "fill in" a vague and fuzzy memory with the image of the person in the photograph. The image shifts, the lines waver, and suddenly the face in number four fuses with the fading memory of the criminal. "Number four looks familiar," the witness might say. And later: "Yes, I'm sure it's number four."

A one-person lineup or viewing in which just one person is pointed out to the witness is particularly dangerous. In the fall of 1970, twenty-one-year-old Bobby Joe Leaster was chatting amiably with friends on a Boston street corner when two policeman jumped out of their patrol car, guns drawn, and accused him of murdering a store owner. They handcuffed Bobby Joe, and drove him to Boston City Hospital where the murdered man's wife was brought to the patrol car and asked to peer in the window at the suspect. "What do you think?" the officer asked her. The woman began to shake and cry. "Yes," she said, sobbing, "this looks like the man who shot and killed my husband." That was the only evidence against him, but Leaster was charged with murder, and on June 22, 1971, he was convicted and sentenced to life without parole.

Six years later father-son lawyer team, Robert and Christopher Muse, were appointed by the U.S. District Court in Boston to represent Bobby Joe Leaster in his appeal. After one interview with Bobby Joe, the Muses had a hunch that this convicted criminal might be different from the rest who claim that they are innocent--this one actually might be innocent. For more than nine years the Muses worked on Leaster's behalf, refusing to charge him a penny for their services. A friend once asked Robert Muse how much of his estate he would be willing to bet on Leaster's innocence. "All of it," he immediately answered.

In November 1986 the bullet taken from the murder victim was matched up with a gun linked to two men who had been arrested in October 1970, two weeks after the murder, for a liquor store holdup. In December 1986 Bobby Joe Leaster was given his freedom. He had spent almost sixteen years of his life behind bars.

Mistaken identifications do happen in real life, and they are sometimes brought about by common police procedures. When the police have a suspect, they often show the witness a photo array and produce the actual lineup only if an identification is made. Almost invariably, only the person identified from the photo lineup also identifies the person he saw in the photos. This is called "photo-biased lineup," and the chances of a mistaken identification rise dramatically in such a situation.

A 1977 study conducted at the University of Nebraska shows the effect of photo bias on the memory of witnesses. Student "witnesses" watched some "criminals" committing a crime. An hour later they looked through mug shots that included some of the criminals they had seen. A week later lineups were staged, and the subject witnesses were asked to indicate those who had taken part in the original crime. Eight percent of the people in the lineups were identified as criminals, yet they had neither taken part in the "crime" nor were their pictures included in the mug shots. Twenty percent of the innocent people whose photographs were included among the mug shots were also falsely identified. None of these people had committed a crime, not had they ever before been seen in person--and yet they were recognized from photographs and identified as criminals.

How often are mistaken identifications made? How many Father Paganos and Lenell Geters have been falsely arrested, wrongly convicted, and spent time in prison for crimes they never committed? In a classic text on the subject, *Convicting the Innocent*, legal scholar Edwin M. Borchard presents sixty-five cases of "erroneous criminal convictions of innocent people." In twenty-nine of these cases, or approximately 45 percent, mistaken eyewitness identification was responsible for the conviction. Borchard concludes: "These cases illustrate the fact that the emotional balance of the victim or eyewitness is so disturbed by his extraordinary experience that his powers of perception become distorted and his identification is frequently most untrustworthy" (p. 367).

Misidentifications are often blamed on the fact that the real criminal bears a close resemblance to the wrongly identified person. But in the twenty-nine cases in which mistaken eyewitness identification was responsible for the wrongful conviction, Borchard reports these facts: "...in eight of these cases the wrongfully accused person and the really guilty criminal bore not the slightest resemblance to each other, whereas in twelve other cases, the resemblance, while fair, was still not at all close. In only two cases can the resemblance be called striking." (p. 367).

In 1983 Arye Rattner, a graduate student at Ohio State University, completed his doctoral dissertation titled *Convicting the Innocent: Where Justice Goes Wrong*. Rattner estimated that 0.5 percent (one-half of 1 percent) of people arrested and charged for what the FBI calls "indexed crimes"--murder, robbery, forcible rape, forgery, larceny, assault, and arson--are wrongfully convicted. Although statistically this number seems small, it is one of the largest estimates I've seen, and it translates into an estimated 8,500 wrongful convictions in the United States in one single year.

Let's assume that Rattner's statistics are abnormally high--perhaps the percentage is twice what it should be, which would translate to 4,250 wrongful convictions in this country every year. Perhaps it's only half of that, in which case we would have 2,125 wrongful convictions. We could keep whittling the numbers down, but at some point the statistics have to hit us in the gut--these are real people, people like you and me, who are picked off the street, tried, convicted, and imprisoned--and yet they are innocent. If it were just ten people in one year, it would be too many.

How many people in Rattner's study were convicted on the basis of mistaken eyewitness identification? Rattner carefully examined over two hundred cases and found that 52.3 percent resulted from eyewitness misidentification. "Our data," Rattner concludes, "indicate that eyewitness misidentification is the factor most often associated with the wrongful conviction" (p. 292).

What are the solutions to this grievous problem? Despite the obvious risks inherent in eyewitness identification, it would be a tragic mistake to exclude all eyewitness testimony, because very often, as in cases of rape, it is the only evidence available. And often eyewitness's testimony is correct. But what about that small percentage of times when it is incorrect--how can we safeguard the rights of the innocent person who might be falsely accused? What can we do to give jurors a better understanding of the uses and pitfalls of such testimony?

Defense attorneys often ask judges to read a list of instructions to the jury on the dangers of eyewitness identification. But the instructions tend to be convoluted and hard for many people to follow. Moreover, numerous psychological studies have shown that jurors have difficulty

understanding the instructions. Another possible solution in eyewitness cases is expert testimony--a psychologist can explain to the jury how human memory works and apply the experimental findings to the case in question.

This is what I do. I testify in court about the nature of human memory and the psychological factors that affect eyewitness testimony. I testify in cases where eyewitness identification is the sole or primary evidence against the defendant, including death penalty cases, where the consequences of a mistaken identification are potentially irreversible.

When I began my research on human memory twenty years ago, it had nothing to do with courts of law or expert testimony. When lawyers asked me if I would testify in cases where eyewitness identification played a major role, I was willing to speak out in hopes that the relevant psychological research might help to make our criminal justice system work more fairly.

When I testify in a criminal trial, my testimony does not guarantee that innocent people will go free--but it undoubtedly increases their chances. We cannot, we dare not, assume that our criminal justice system works perfectly and that all innocent men and women are sufficiently protected. "Trials are human affairs and therefore necessarily imperfect," wrote Judge Jerome Frank in his book *Not Guilty*. Mistakes will be made, innocent lives will continue to be pulled into the vast, complicated machinery of our justice system, and some will never make it back out again.

More than seven thousand people have been executed in the twentieth century in this country; a recent study indicates that at least twenty-five of these were innocent. Twenty-five lives taken by mistake. Nearly sixteen hundred people are now on death row--how many of them are innocent?

Hidden within statistics and complicated discussions about guilt and innocence is an unanswerable question, an unsolvable dilemma. In some cases--in Father Pagano's and Lenell Geter's case--the innocent person is proven innocent. But in many cases, innocence cannot be proven beyond a shadow of a doubt. Of the cases I describe in detail in this book, only two have outcomes that are neatly and cleanly tied up, with the real put safely behind bars and the innocent man completely and publicly exonerated. Hollywood can offer us pat, happy endings, but real life often does not give us the facts lined up in neat little rows, carefully sorted and assembled, every snag and tangle smoothed out. But in the absence of such absolute proof, is the person less innocent?

Consider the case of Jimmy Landano. Landano is a former heroin addict and ex-con who did time in Attica. He's now doing life plus fifteen years in Rahway State Prison in New Jersey for killing a policeman in 1976. He was also convicted of robbery, gun possession, breaking in, car theft, and conspiracy.

Four eyewitnesses and an accomplice who admitted his own role in the murder testified in court that Landano was the man who fired the fatal shot. Hairs found in the killer's hat were similar to Landano's; his name was in the address book of another accomplice to the murder; and he had no airtight alibi.

The case against the ex-con and ex-junkie was overwhelmingly persuasive. And when he threatened to "come after" the prosecutor when he got out of prison, the judge and jury were even more convinced that they had convicted a dangerous criminal who should spend his life behind bars.

But Landano claims that he was set up by members of a motorcycle gang known as The Breed in order to protect the real killer. They planted a hat similar to his own on the seat of the getaway car, Landano says. His history as a heroin addict and his incarceration in Attica for grand larceny made him a perfect "throwaway."

Four eyewitnesses pointed to a photograph of Landano as the cop killer; but not all of their facts fit. One eyewitness claimed the killer had a thick mustache while another described the man as having no mustache at all; Landano has a bushy mustache. One forensics expert testified that hairs found in the killer's hat might be Landano's; another expert said they probably weren't. The killer's ski jacket looked comical on Landano, the sleeves reaching only two-thirds of the way down his long arms, exposing two tattoos. Tight at the shoulders and around the chest, it restricted his movements; he couldn't even make the zippers meet. His mother and girlfriend testified that he had been with them during the morning of the killing; but even if the jury believed them, there was theoretically enough time for Landano to commit the crime.

Jim Landano spends his free time in prison reading court transcripts and police reports, pleading his case to anyone who will listen, writing letters to lawyers and reporters, and helping other inmates with similar cases. He is forty-four years old, and it will be twenty more long years before he is eligible for parole. The waiting makes him edgy; he is terrified of growing old in prison and missing out on the chance to straighten out his troubled life. Prisons breed hatred and desperation, he says. "When you treat people like animals," he repeats, over and over, "I've been framed," Landano says with fierce conviction. "I'm innocent."

It's one man's passionate declaration of innocence against the sworn word of four eyewitnesses, three accomplices, and a jury of twelve people who carefully weighed the evidence and found Jimmy Landano guilty.

Who is right and who is wrong?

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