

Our changeable memories: legal and practical implications

Elizabeth Loftus

The malleability of memory is becoming increasingly clear. Many influences can cause memories to change or even be created anew, including our imaginations and the leading questions or different recollections of others. The knowledge that we cannot rely on our memories, however compelling they might be, leads to questions about the validity of criminal convictions that are based largely on the testimony of victims or witnesses. Our scientific understanding of memory should be used to help the legal system to navigate this minefield.

Memories are precious. They give us identity. They create a shared past that bonds us with family and friends. They seem fixed, like concrete, so that if you ‘stepped’ on them they would still be there as they always were.

But memories are not fixed. Everyday experience tells us that they can be lost, but they can also be drastically changed or even created. Inaccurate memories can sometimes be as compelling and ‘real’ as an accurate memory. In this article, I discuss the ways in which memories can be reshaped and their implications for the legal system. If we cannot believe our own memories, how can we know whether the memories of a victim or a witness are accurate?

Remaking memories

We are all familiar with temporary memory problems. “I can’t remember the right word,” says a colleague at a cocktail party. “Is it senility?” I reply: “Can you remember the word later?” And the usual answer will be yes,

proving that the information was not lost, but only temporarily unavailable. Retrieval problems are common.

However, there are also problems with storing something new. This usually occurs simply because the person concerned is not paying attention. But some people are unable to store new information even if they are paying attention and have the opportunity to repeat the new information over and over again — several hours later, it is gone. Such people, including patients with Alzheimer’s disease, might not even complain about ‘losing their memory’ because they do not realize that anything is missing¹.

More insidiously, memories can become scrambled, sometimes in the process of attempting to retrieve something. You might relate a story to a friend but unwittingly include some mistaken details. Later, as you attempt to recall the episode, you might come across your memory of the scrambled recall attempt instead of your original memory. Memory is malleable. It is not, as is commonly thought, like a museum piece sitting in a display case. “Memory is,” as the Uruguayan novelist Eduardo Galeano once said, “born every day, springing from the past, and set against it.”²

Usually the scrambled memory does not matter very much. But if you are an eyewitness to a crime, your scrambled recall could send someone to prison. And, rather than feeling hesitant, you might feel perfectly sure of the truth of your memory. The history of the United States justice system, like those of other countries, is littered with wrongful

convictions made on the basis of mistaken memories³. Huff recently estimated⁴ that about 7,500 people arrested for serious crimes were wrongly convicted in the United States in 1999. He further noted that the rate is thought to be much lower in Great Britain, Canada, Australia, New Zealand and many other nations, especially those that have established procedures for reviewing cases involving the potential of wrongful conviction.

Ronald Cotton, a North Carolina prisoner who was convicted in 1986 of raping a 22-year-old college student, Jennifer Thompson, puts a human face on these cases. Thompson stood up on the stand, put her hand on the Bible and swore to tell the truth. On the basis of her testimony, Cotton was sentenced to prison for life. Eventually, DNA testing — which began 11 years after Thompson had first identified Cotton — proved his innocence. Another man, Bobby Poole, pleaded guilty to the crime³.

Faulty memory is not just about picking the wrong person. Memory problems were also evident during the sniper attacks that killed ten people in the Washington DC area in 2002 (see for example, REF. 5). Witnesses reported seeing a white truck or van fleeing several of the crime scenes. It seems that a white vehicle might have been near one of the first shootings and media repetition of this information contaminated the memories of witnesses to later attacks, making them more likely to remember white trucks. When caught, the sniper suspects were driving a blue car. Were we observing unwitting memory contamination on a nationwide scale?

Witnesses can be wrong for several reasons. A key reason is that they pick up information from other sources; they combine bits of memory from different experiences. A growing body of research shows that memory more closely resembles a synthesis of experiences than a replay of a videotape⁶. Three decades ago, a method of studying memory distortions was introduced. People watched a simulated crime or accident. Later they were given erroneous information about the details

of the event, such as the false detail that a man had curly rather than straight hair. Many of these people later claimed that they had seen a curly-haired person⁷. Studies such as this showed how leading questions or other forms of misinformation could contaminate the memories of witnesses about events that they had recently experienced⁸.

In the past decade, the challenges have become greater. Newer studies showed that you could do more than change a detail here and there in someone's memory. You could actually make people believe that a childhood experience had occurred when in fact it never happened. Examples include being lost in a shopping mall for an extended period of time, being rescued by a lifeguard, or surviving a vicious animal attack^{9–12}. How is this possible? In our studies, we enlist family members to help us to persuade their relatives that the events occurred. This method has led about a quarter of our subjects to believe that they were lost in a shopping mall for an extended period of time, and were ultimately rescued by an elderly person and reunited with their families. In other studies, we engaged people in guided imagination exercises. We asked people to imagine for a minute that as a child they had tripped and broken a window with their hand. Later, many of them became confident that the event had occurred. In other studies, we encouraged people to read stories and testimonials about witnessing demonic possession, and even these raised confidence that this rather implausible event had happened.

One recurring issue for memory distortion research is the question of whether the events being reported after such a manipulation might have actually happened. Perhaps the subject did break a window but had forgotten about it — the imagination exercise might have triggered a true memory rather than planting a false one. To prove that false memories can be insinuated into memory by these suggestive techniques, researchers have tried to plant memories that would be highly implausible or impossible. For example, one set of studies asked people to evaluate advertising copy. They were shown a fake print advertisement that described a visit to Disneyland and how they met and shook hands with Bugs Bunny. Later, 16% of these subjects said that they remembered meeting and shaking hands with Bugs Bunny¹³. In follow-up research carried out by Grinley in my laboratory, several presentations of fake advertisements involving Bugs Bunny at Disneyland resulted in 25–35% of subjects claiming to have met Bugs Bunny¹⁴. Moreover, when these subjects were subsequently asked to report precisely what they

remembered about their encounter with Bugs Bunny, 62% remembered shaking his hand and 46% remembered hugging him. A few people remembered touching his ears or tail. One person remembered that he was holding a carrot. The scenes described in the advertisement never occurred, because Bugs Bunny is a Warner Bros. cartoon character and would not be featured at a Disney property.

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Other ‘impossible’ memories have been recently planted in British students¹⁵. The false event was “having a nurse remove a skin sample from my little finger.” This medical procedure was not one that was carried out in the United Kingdom, according to extensive investigation of health policy records. After guided imagination, many subjects came to remember the non-existent procedure occurring in their childhood. Some embellished their reported memory with significant detail such as, “There was a nurse and the place smelled horrible.”

One of the cleverest and most powerful techniques for planting highly implausible false memories involves the use of fake photographs¹⁶. Subjects were shown a falsified photograph that was made up of a real photograph of the subject and a relative pasted into a prototype photograph of a hot-air balloon (FIG. 1). Family members confirmed that the event had never occurred. Subjects were shown the fake photograph and asked to tell “everything you can remember without leaving anything out, no matter how trivial it may seem.” There were two further interviews, and by the end of the series 50% of the subjects had recalled, partially or clearly, the fictitious hot-air balloon ride. Some embellished their reports with sensory details of a hot-air balloon ride during childhood that had never occurred. For example, one subject said “I’m still pretty certain it occurred when I was in sixth grade at, um, the local school there ... I’m pretty certain that mum is down on the ground taking a photo.”¹⁶

These studies, and many more like them, show that people can develop beliefs and memories for events that definitely did not happen to them. They can do this when fed strong suggestions — such as “your family told us about this event” or “look at this photograph of you from childhood”. They can

even do this when induced to imagine the experiences. Large changes in autobiography can be achieved quickly. Attempts to distinguish the false memories from true ones have occasionally shown statistical differences, such as differences in confidence, vividness or amount of detail¹⁷, or differences in lateralized brain potentials^{18,19}. For example, in the hot-air balloon study¹⁶ the real memories were expressed with much more confidence than the fake ones. In most studies, any differences between true and false memories are observed only when comparing large groups of true and false memories, and these differences are typically too small to be useful for classifying a single autobiographical memory report as true or false. Psychological science has not yet developed a reliable way to classify memories as true or false. Moreover, it should be kept in mind that many false memories have been expressed with great confidence.

Implications for society

While researchers continue to investigate false memories, it is evident that there are already lessons to be learned. The fact that the memories of victims and witnesses can be false or inaccurate even though they believe them to be true has important implications for the legal system and for those who counsel or treat victims of crimes.

Some psychotherapists use techniques that are suggestive (along the lines of, “you don’t remember sexual abuse, but you have the symptoms, so let’s just imagine who might have done it”). These can lead patients to false beliefs and memories, causing great damage to the patients themselves and to those who are accused. In one Illinois case, psychiatrist Bennett Braun was accused by his patient, Patricia Burgus, of using drugs and hypnosis to convince her that she possessed 300 personalities, ate meat loaf made of human flesh and was a high priestess in a satanic cult²⁰. By some estimates, thousands of people have been harmed in similar ways by well-meaning providers who apply a ‘cure’ that ends up being worse than the disease²¹. Law enforcement interrogations that are suggestive can lead witnesses to mistaken memories, even ones that are detailed and expressed with confidence. Hundreds of people have been harmed by witnesses who made a mistake that could have been avoided^{22,23}. Of course, even before the police arrive on the scene, witnesses talk to one another and cross contamination can occur. I personally witnessed this when I entered a shop in Cambridge, Massachusetts, moments after a robbery had occurred and before the police arrived. In the immediate aftermath, customers and employees shared



Figure 1 | **An example of a composite photograph of a hot-air balloon flight.** The photograph on the left was used to create a misleading image (right) that could lead the subject to 'remember' a hot-air balloon flight as a child even when the experience had never occurred. Reproduced, with permission, from REF. 16 © (2002) Psychonomic Society.

their recollections, providing fuel for influencing the thoughts of one another. This is why, during the Washington DC area sniper attacks in 2002, law enforcement officials advised members of the public who might witness the 'next attack' to write down what they saw immediately, even using their hand if they did not have paper. Good advice, but I would suggest having paper handy because the best course of action is to write down everything that can be remembered before witnesses are interrogated or talk to one another. This activity strengthens the memory and protects it to some extent from later contamination²⁴.

It is often argued that a few false accusations are just the cost of doing business. But this cost includes the potential for the actual perpetrator to commit more crimes, and for the taxpayer to have to pay sizable sums of money in compensation when wrongful convictions are exposed (which probably happens in only a fraction of cases). Although the defendants in most wrongful prosecution cases are government officials or organizations, in one recent case the witness with mistaken memory was successfully sued²⁵. Donna Parmeter, a former prison guard, was charged with kidnapping, robbery and torture. She had been identified by the victim, Peter Kretzu, who was tied up, blindfolded and tortured by two masked robbers. Although the attackers wore ski masks, Kretzu claimed that he recognized Donna (from her voice and eyes) and her husband Joseph (from his breathing, laugh, body shape and 'chicken soup' body odour). Kretzu was 100% certain. Donna was eventually exonerated when investigators substantiated her alibi. But she had spent a month in jail, and she later

sued, eventually winning a US\$100,000 civil judgement against Kretzu. In the past, mistaken witnesses simply went their own ways, although there are a few known instances in which they have made profound apologies to those whom they had falsely accused. Will we now see more cases in which mistaken witnesses end up paying financially for their mistakes?

Although much of the research has focused on wrongful convictions, there is another side to the criminal justice coin. Memory distortions can also contribute to failures to convict a guilty person, not because an innocent person is convicted in their place, but because accurate witness testimony can be undermined. If witnesses misremember some detail, or they are told that their stories conflict with other evidence, they might discount their testimony and be less persuasive than perhaps they should be, or the jury might consider their entire testimony to be unreliable.

Scientific research into memory has the potential to minimize these kinds of problem. Information from psychological scientists (and perhaps neuroscientists) could help to keep the people in power from making decisions on the basis of myths or misconceptions about memory. Scientific knowledge could be shared with relevant individuals in many ways: through workshops for mental health professionals, training for police, seminars for lawyers and judges, judicial instructions or expert testimony for jurors. In one example, Jacob Beard of West Virginia was wrongly convicted of murdering two women and spent many years in prison. He managed to win a second trial. Expert testimony on suggestion and false memory was presented in that

second trial, and helped to secure his acquittal. Beard later filed a civil lawsuit, and eventually received a settlement of nearly US\$2 million in his case against state and county police²⁶.

This list of potential venues for education about the nature of memory represents just one proposal for a possible programme for action. Some legislative remedies might also be called for, especially in the most serious cases that can result in a sentence of death. Recently, the Innocence Protection Act was introduced in the United States Congress. It has two useful elements: access to DNA testing for convicted people and improvement in the quality of lawyers who try death penalty cases. Better lawyers might be better acquainted with the problems of memory and how to educate judges and jurors about these problems. Congress will be considering this legislation again in 2003 (REF. 27).

The American Judicature Society proposed the creation of an 'innocence commission' that would study why the legal system has failed in known cases of wrongful conviction. After all, look what the National Transportation Safety Board does when a plane crashes. Few expenses are spared as every aspect of the crash is examined. Not long ago, I proposed an analogous 'National Memory Safety Board' that might concentrate specifically on memory problems that have led to injustice²⁸. If the travesties of the past few decades were thoroughly examined side-by-side with scientific knowledge on memory, we would all benefit. It would be too late for the family of Steve Titus, who died of a heart attack at the age of 35 after being falsely convicted of rape. It would be too late for the many death row prisoners who have recently been exonerated by DNA evidence. It would be too late for the scores of innocent defendants who have had to face civil litigation over false claims of satanic ritual abuse and other dubious charges. But it might be in time to keep us from searching for that next white van that does not exist because someone inadvertently planted a false memory.

To reiterate the main points: memory is more prone to error than many people realize. Our memory system can be infused with compelling illusory memories of important events. These grand memory errors have contributed to injustices that could have been avoided or minimized. As a start, I suggest that we all remember an important truth about the mind — paraphrasing Galeano: memory is born anew every day.

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Online links

FURTHER INFORMATION

Elizabeth Loftus's homepage:

<http://www.seweb.uci.edu/faculty/loftus/>

Encyclopedia of Life Sciences: <http://www.els.net/>

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