Miscoding Is Seen as the Root of False Memories

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ABSTRACT (ABSTRACT)

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That can change under conditions that foster an openness to suggestion. "Some therapists unabashedly recommend 'suggestion' as a means of pursuing memories," said Dr. [Elizabeth Loftus]. "Yet decades of memory research has shown these are sure-fire ways to implant false memories." Mixing Imagination With Memory

FULL TEXT

IN a scientific nod to the frailty of memory, neurologists and cognitive scientists are coming to a consensus on the mental mechanisms that can foster false memories.

The leading candidate is "source amnesia," the inability to recall the origin of the memory of a given event. Once the source of a memory is forgotten, scientists say, people can confuse an event that was only imagined or suggested with a true one. The result is a memory that though false, carries the feeling of authenticity.

This has been an epic month for false memory. Three new books have been published that investigate the phenomenon and its mirror opposite, repressed memory. In mid-May, a California court awarded $500,000 to the father of a woman who had accused him of sexual abuse after supposedly recovering memories of childhood incidents during therapy. The plaintiff, Gary Ramona, had asked for $8 million in damages against his daughter's therapists and the medical center where they worked.

Earlier in the month new scientific agreement on the most likely neurological and cognitive bases of false memory emerged during a conference on the issue at Harvard Medical School.

Part of the fragility of memory is due to the way the mind encodes a memory, distributing aspects of the experience over far-flung parts of the brain, various researchers said at the meeting. The brain stores the memory of each sense in different parts of the neocortex -- sound in the auditory cortex, sight in the visual cortex, and so on, reports at the meeting pointed out. Another part of the brain, the limbic system, has the job of binding these

dispersed parts of the memory together as a single experience.

One of the more frail parts of a memory is its source -- the time, place, or way the memory originated. Based on careful observations of neurological patients to see which mental operations are harmed by damage to different parts of the brain, the frontal lobes seem to be the main site for source memory, according to a report at the Harvard meeting by Dr. Morris Moscovitch, a neuropsychologist at the University of Toronto.

Patients with damage to specific zones of the frontal lobes are prone to confabulate, concocting stories to make sense of the shards of memory they retrieve, and are unable to evaluate the reasonableness of their fabrications. "The confabulator picks out a bit or piece of an actual memory, but confuses its true context, and draws on other bits of experience to construct a story that makes sense of it," said Dr. Daniel Schacter, a Harvard psychologist and another organizer of the meeting.

Such a plausible scientific explanation has been missing until now in the debates about false memory. The conclusions of scientists at the meeting call into question the methods not only of many therapists who specialize in helping patients retrieve memories of childhood sexual abuse but also those commonly used by officials investigating such charges. Scientists say these methods can inadvertently plant a false memory, and are based on naive or distorted assumptions about how memory works.

"The lay expectation is that whatever we remember should be true, but memory does not work like a video camera," said Dr. Marsel Mesulam, head of the neurology department at Beth Israel Hospital at Harvard Medical School, and one of those who convened the meeting. "From the point of view of neuroscience, every memory is a fragile reconstruction of what the nervous system actually witnessed."

For example, one of Dr. Moscovitch's patients with frontal lobe damage said he had been married for just four months, although he had actually been married nearly four decades. When confronted with the discrepancy, he explained it away by saying he had been married twice -- a confabulation that arose to make sense of the initial mistaken memory.

"Source memory defects -- retrieving the content without knowing its origin -- are a major cause of distorted memory," said Dr. Schacter, "with people confusing whether they heard about, imagined or had something happen to them."
Source amnesia is common, and usually benign, as when one recognizes a face but has no idea where one has seen the person before -- the memory for the face is retained, but not the memory for the time and place the face was first seen. Context Quickest to Fade

This kind of forgetfulness is a natural result of the constant reshuffling and gradual decay of memories in the brain. "What we witness is encoded over neurons that were involved in remembering things we witnessed earlier, and later ones will be encoded over the new one," said Dr. Mesulam. "There are no fresh neurons, like a clean diskette. There's a constant remolding of memory in the brain as older memories are redistributed by newer ones."

Gradually, aspects of a memory are degraded by the normal wear and tear of brain function. "As time goes on, pieces of the memory may not bind together so well, though most of the individual pieces themselves are alive and well in memory," Dr. Mesulam said.

This means the source of a memory may fade even as the rest of the memory can be retrieved, said Dr. Stephen Ceci, a psychologist at Cornell University. In his presentation at the Harvard meeting, Dr. Ceci cited the

experimental work of Dr. Charles Brainerd at the University of Arizona, which shows that "the context -- the time and place -- in which you acquire a memory is the quickest part of the memory to decay and the easiest to interfere with."

Another reason for confusion in memory, said Dr. Schacter, is that all memories are subject to contamination by leakage from related bits of information. In recalling a memory, for example, people typically make inferences about what may have happened to fill in gaps, and can then confuse the sources, melding what they inferred with the actual memory. In addition, Dr. Schacter warned, "just because a memory is vivid does not mean it is more accurate."

Part of the new scientific evidence for the vulnerability of memory to suggestion comes from studies in which false memories are implanted through experimental manipulations. Children Particularly Susceptible

Many of these studies have involved young children, who are particularly susceptible to false memories. At the Harvard meeting, Dr. Ceci reported a series of recent experiments, none of which have yet been published, showing the surprising ease with which children can become convinced that something they only imagined or was suggested to them really happened.

In an earlier study involving 96 preschool children reported last year, Dr. Ceci showed that with repeated questioning about events that had never occurred, many children gradually came to believe that the events had happened. The false memories were so elaborate and detailed that psychologists who specialize in interviewing children about abuse were unable to determine which memories were true, Dr. Ceci said.
At the Harvard meeting, Dr. Ceci reported on five more studies with a total of 574 preschool children, all of which confirm his earlier results. After 10 weeks, 58 percent of the children in those studies had made up a false account for at least one fictitious event repeatedly suggested to them, and a quarter of them had concocted false stories for most of the phony events. Three of the studies are scheduled for publication next year, one in The Journal of Child Development.

"Each time you encourage a person to create a mental image, it becomes more familiar," said Dr. Ceci."Finally they see the imagined image as an actual memory, with the same feel of authenticity. In our studies there are about a quarter of the children we can't talk out of the fact the memory we implanted was real, even though we explain their parents helped us concoct the false memory." Frontal Lobe Factor

Commenting on Dr. Ceci's findings, Dr. Moscovitch said, "Young children may be led into concocting memories so easily because their frontal lobes are immature. Until age 7 or 8, children respond to neurological tests like adults with frontal lobe damage."

Source amnesia is also frequent in the elderly whose frontal lobes have deteriorated. "There is some anatomical evidence that in aging the frontal lobes deteriorate faster than other brain regions," said Dr. Schacter. In an article published earlier this year in The Journal of Psychology and Aging, Dr. Schacter reported that failures of source memory in the elderly seem to be associated with decline in their frontal lobe function.

But adults whose brains presumably are intact can also be led to believe in memories of fictitious events. Dr. Elizabeth Loftus, a psycholgist at the University of Washington, reported at the Harvard meeting on the final results of a study in which false memories about childhood events were created in 24 men and women ages 18 to 63.

Dr. Loftus reported that the parents of volunteers in the experiment cooperated to produce a list of events that had

supposedly taken place in the volunteer's early life; three were true and one, a description of the person becoming lost on a shopping trip, was fictitious.

"I vaguely remember walking around K-Mart crying," one volunteer said when asked about the fictitious event. "I thought I was lost forever. I went to the shoe department, because we always spent a lot of time there. I went to the handkerchief place because we were there last. I circled all over the store it seemed 10 times. I just remember walking around crying."

Such false memories incorporate "elements of the truth," said Dr. Loftus, "but there is a confusion about the source in their minds."

To be sure, most adults do not so readily concoct false memories in response to suggestion. "About 10 percent of adults will come up with a specific elaborated memory from childhood, and another 15 percent or so will say they feel a vague sense of certainty that it occurred if you keep asking them about it," said Dr. Loftus. But she also found that about 75 percent of those studied did not manufacture false memories in this experimental situation, despite the implicit pressure to produce one.

But that can change under conditions that foster an openness to suggestion. "Some therapists unabashedly recommend 'suggestion' as a means of pursuing memories," said Dr. Loftus. "Yet decades of memory research has shown these are sure-fire ways to implant false memories." Mixing Imagination With Memory

Dr. Ceci said: "Our study asking children each week about a supposed memory is an analog of the therapist who asks you to think back to a time when you felt uncomfortable in your childhood, and says 'focus on some image that floats to mind,' and not to worry if you're mixing imagination with different episodes of memory. They say you can sort all that out later, but that's a naive view of memory. Once they're mingled, it's very hard to separate their source."

Psychotherapy patients who undergo methods like hypnosis, which heighten suggestibility, can easily become "honest liars," convincing themselves of the truth of a false memory, said Dr. David Spiegel, a psychiatrist at Stanford University, in a report at the Harvard meeting. In a 1983 study, for example, 27 people were told while hypnotized that as they slept the night before they had been awakened by the sound of a car backfiring; when questioned a week after the hypnotic session, 13 reported having heard the backfiring on that night. Six of those in the study were so convinced they had heard the fictitious backfiring that they persisted in the false belief even after experimenters explained to them how the memory had originated.

"Under hypnosis people can experience themselves as retrieving a memory when in fact they are creating it, and also develop an inflated conviction that the fabricated recollection is accurate," Dr. Spiegel said.

This conviction of truth becomes stronger the more intensely people work at retrieving details of the event. "It's a real concern about using hypnosis to retrieve memories," said Dr. Spiegel. "It inflates your confidence in your accuracy more than it improves your accuracy. You don't need hypnosis to get the same effect -- a therapist pressing a highly suggestible patient to try to remember could do the same."

Given the scientific evidence for the frailty of memory, "the miracle is that anything we remember is true," said Dr. Mesulam, "not that there is distortion."

Photograph

Dr. Elizabeth Loftus, a psychologist at the University of Washington, has completed a study in which false childhood memories were created in 24 adults. (University of Washington) (pg. C1) Diagram (pg. C8)

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