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How Many of Your Memories Are Fake?

When people with Highly Superior Autobiographical Memory—those who can remember what they ate for breakfast on a specific day 10 years ago—are tested for accuracy, researchers find what goes into false memories.

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One afternoon in February 2011, seven researchers at the University of California, Irvine sat around a long table facing Frank Healy, a bright-eyed 50-year-old visitor from South Jersey, taking turns quizzing him on his extraordinary memory.

Observing from outside of the circle, I tape-recorded the conversation as one researcher tossed out a date at random: December 17, 1999.

“Okay,” Healy replied, “Well, December 17, 1999, the jazz great, Grover Washington Jr., died while playing in a concert.”

“What did you eat that morning for breakfast?”

“Special K for breakfast. Liverwurst and cheese for lunch. And I remember the song ‘You’ve Got Personality’ was playing as on the radio as I pulled up for work,” said Healy, one of 50 confirmed people in the United States with [Highly Superior Autobiographical Memory](#), an uncanny ability to remember dates and events. “I remember walking in to work, and one of the clients was singing a parody to Jingle Bells, ‘Oh, what fun it is to ride in a beat up Chevrolet.’”

"Memory distortions are basic and widespread in humans, and it may be unlikely that anyone is immune."

These are the kinds of specific details that writers of memoir, history, and journalism yearn for when combing through memories to tell true stories. But such work has always come with the caveat that human memory is fallible. Now, scientists have an idea of just how unreliable it actually can be. New research released this week has found that even people with phenomenal memory are susceptible to having “[false memories](#),” suggesting that “memory distortions are basic and widespread in humans, and it may be unlikely that anyone is immune,” according to the authors of the study published in [Proceedings of the National Academy of Sciences](#) (PNAS).

UC Irvine’s [Center for the Neurobiology of Learning](#), where professor James McGaugh [discovered](#) the first person proved to have Highly Superior Autobiographical Memory, is just a short walk from the building where I teach as part of the [Literary Journalism Program](#), where students read some of the most notable nonfiction works of our time, including

Hiroshima, *In Cold Blood*, and *Seabiscuit*, all of which rely on exhaustive documentation and probing of memories.

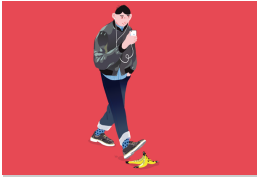
In another office nearby on campus, you can find Professor Elizabeth Loftus, who has spent decades researching how memories can become contaminated with people remembering—sometimes quite vividly and confidently—events that **never happened**. Loftus has found that memories can be planted in someone's mind if they are exposed to misinformation after an event, or if they are asked suggestive questions about the past. One famous case was that of Gary Ramona, who **sued** his daughter's therapist for allegedly planting false memories in her mind that Gary had raped her.

Loftus's research has already rattled our justice system, which relies so heavily on **eyewitness testimonies**. Now, the findings showing that even seemingly impeccable memories are also susceptible to manipulation could have “important implications in the legal and clinical psychology fields where contamination of memory has had particularly important consequences,” the PNAS study authors wrote.

We who write and read nonfiction might find all of this unnerving as well. As our memories become more penetrable how much can we trust the stories that we have come to believe, however certainly, about our lives? The nonfiction list of *New York Times* bestsellers is heavy with reported narratives like Lauren Hillenbrand's *Unbroken*, and memoirs like Solomon Northup's *Twelve Years a Slave*, Elizabeth Smart's *My Story*, and Piper Kerman's *Orange is the New Black*. What becomes of the truth behind accounts of childhood hardships that propelled some to persevere? The merit behind meaningful moments that caused life pivots? The emotional experiences that shaped personalities and belief systems?

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All memory, as McGaugh explained, is colored with bits of life experiences. When people recall, “they are reconstructing,” he said. “It doesn't mean it's totally false. It means that they're telling a story about themselves and they're integrating things they really do remember in detail, with things that are generally true.”

The PNAS study, led by Lawrence Patihis, is the first in which people with Highly Superior Autobiographical Memory have been tested for false memories. Such individuals can remember details of what happened from every day of their life since childhood, and when those details are verified with journals, video, or other documentation, they are correct 97 percent of the time.

Twenty people with such memory were shown slideshows featuring a man stealing a wallet from a woman while pretending to help her, and then a man breaking into a car with a credit card and stealing \$1 bills and necklaces. Later, they read two narratives about those slideshows containing misinformation. When later asked about the events, the superior memory subjects indicated the erroneous facts as truth at about the same rate as people with normal memory.

In another test, subjects were told there was news footage of the plane crash of United 93 in Pennsylvania on September 11, 2001, even though no actual footage exists. When asked whether they remembered having seen the footage before, 20 percent of subjects with Highly Superior Autobiographical Memory indicated they had, compared to 29 percent of people with regular memory.

“Even though this study is about people with superior memory, this study should really make people stop and think about their own memory,”

Patihis said. “Gone are the days when people thought that [only] maybe 20, 30 or 40 percent of people are vulnerable to memory distortions.”

Loftus, who has been able to successfully convince ordinary people that they were **lost in a mall** in their childhood, pointed out that false memory recollections also occur among high profile people. **Hillary Clinton** once famously claimed that she had come under sniper fire during a trip to Bosnia in 1996. “So I made a mistake,” Clinton said later about the false memory. “That happens. It proves I'm human, which, you know, for some people, is a revelation.”

“It’s so powerful when somebody tells you something and they have a lot of detail,” Loftus said. “Especially when they express emotion. To just say, ‘Oh my god it must be true.’ But all those characteristics are also true of false memories, particularly the heavily rehearsed ones that you ruminate over. They can be very detailed. You can be confident. You can be emotional. So you need independent corroboration.”

* * *

When I interviewed Frank Healy this month about what he remembered about his visit two years and nine months earlier to UC Irvine, he got a lot right, but not everything.

He remembered that Wednesday, February 9, 2011, was a meaningful day for him. He felt excited about being a subject in the superior memory study on the UC Irvine campus. Since childhood, he had been fascinated with television schedules, train and bus schedules, the weather, and news events. He made mental notes, which he would remember decades later like, “Today is March 16th, it’s sunny and unusually warm for March, and dad’s playing a Clancy Brothers album because tomorrow is St. Patrick’s Day.” But he didn't always know how to use his memory for something worthwhile.

Sometimes his memory was more of nuisance than a gift. His mind would

be filled with so many details at once that he'd miss lessons in class, or his parents would get mad that he wasn't listening to them. Healy didn't reveal his unique skill to his peers until 8th grade, when he decided to showcase his memory for a talent show. On June 6, 1974, a Thursday, as Healy remembered, kids spent the entire day coming up and asking him about birthdays and other dates. The social studies teacher even left the classroom to tell the principal about Healy's astounding recall.

Memories that stick with us are tinged with emotion.

As Healy got older, he realized that painful events that happened 20 or 30 years ago would come back to him with the same emotional intensity, as if he were reliving those moments again, like when he pledged a fraternity in college but did not get in because he was heavysset and shy. Or when he was let go from his first job out of college after just two months. But he learned to live with the negative memories and put a positive spin on them. He went on to work as a counselor helping others do the same, even writing [books](#) on his experiences of living with phenomenal memory.

When he saw a *20/20* episode on May 9, 2008, about McGaugh's research. Healy sent UC Irvine researchers his memoir, and began answering quiz questions conducted by graduate students over the phone, leading up to the eventual UC Irvine visit. Remembering that day, Healy told me he could again picture McGaugh, whose left eyeglass was cloudy. He described the long table, the nondescript room, and he saw me sitting to his left.

“The first thing they asked me to do, was to write down a series of letters and numbers,” Healy said. He remembered entering the room and immediately being asked to approach the board, which he saw so clearly that he described it to me as green, not black. He said he wrote with chalk.

He was then told to turn around with his back against the board and recall what he had written.

“I didn't do so well with letters,” Healy said. But he still remembered the numbers, like 1, 9, 6, and 4. After the board demonstration, he remembered answering a long series of additional questions.

Part of what he wrote on the board that day was indeed 1, 9, 6, and 4, in that order, according to my tape recorder and notes. But the green board was actually a whiteboard. And he used colored markers, not chalk.

Also, Healy was asked to write on the board 46 minutes after answering a series of memory questions—not first thing. And I sat on his right, on the outside of circle, not on his left at the table. My reporting counted seven people, plus myself in the room, while Healy put the number at “15 or so.”

It seems “puzzling why (Highly Superior Autobiographical Memory) individuals remember some trivial details, such as what they had for lunch 10 years ago, but not others, such as words on a word list or photographs in a slideshow,” Patihis and colleagues noted in the PNAS study. “The answer to this may be that they may extract some personally relevant meaning from only some trivial details and weave them into the narrative for a given day.”

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For all of us, the stronger the emotion attached to a moment, the more likely those parts of our brains involved in memory will become activated. As McGaugh told me, you wouldn't remember every commute you took to work each day. But if along one you witnessed a deadly crash, you would likely remember that one. Memories that stick with us are tinged with emotion.

“Why did evolution do that?” McGaugh said. “Because it was essential for our survival. An animal goes to the creek and gets bitten by a tiger but survives, the animal knows it’s a good idea not to go to that creek again.”

We now know animals are likely susceptible to memory distortions too, as MIT researchers recently were able to [successfully plant false memories in mice](#).

The PNAS study did not contradict that people with superior memory have “abundant and accurate recall,” the authors made sure to note. Indeed, Healy remembered a lot of other discussions that day, which I never would have without a recorder. He remembered being asked about March 26, 1990, and how he replied that he remembered it was the night of the Academy Awards, and he was working at a mental health clinic when a patient told him that he behaved badly because the only attention he got growing up was negative.

He also remembered being asked about October 8, 2007, which he replied was a 90-degree day, and he remembered going for swim in the ocean in the morning and he chatted with a man who said, “It's like July out here.”

At the end of the memory test, McGaugh asked Healy, “What would you like to ask us?”

Healy wanted to know how the research would be used.

“There are very few people in the world that have this ability,” McGaugh told him. “We want to know what goes on in your brain that allows you to do this.”

“I’m actually excited about the idea of this being used maybe to further education and psychology,” Healy told the group. “It’s kind of nagged me in the back of my head for years you have this special ability, but have never really been able to incorporate it much into a career.”

Healy said several times to me and to others that he hoped it would be used to benefit the world. Last year, researchers released a [report](#) based on the interviews with Healy and others with superior memory showing all had more robust white matter linking the middle and front parts of their brains, compared to people with ordinary memory.

When I recently talked to Healy, and told him about the flawed memories proven in people with superior memories, a study that he did not participate in, he sounded disappointed to find out that his memory might actually be as malleable as an ordinary person's.

He remembered how he had felt after the memory tests were completed: "A mixture of satisfaction that I was able to further research and use my God-given gift ... to do good."

Out of all of his memories, Healy had carved out a personal narrative about that day, one that fit into the complication of his life story, and ended on a redemptive note.

"We all have narratives," McGaugh said, explaining that people form beliefs and values, and then develop explanations within their memories for these beliefs and values. "We're all creating stories. Our lives are stories in that sense."

All of these discussions got me wondering about the journalism that I practice and teach. Reporters' stories have often been considered the first drafts of history. As Carolyn Kitch, of Temple University, [wrote](#) in the academic journal *Memory Studies*, perhaps "journalism does not sit at the top of a hierarchical truth pile, as many journalism scholars assume. Journalism is inside memory; it is at its heart."

Over the years, I have interviewed witnesses of the 9/11 terrorist attacks, and rushed to the scene to obtain anecdotes from witnesses from a catastrophic train crash, or the Virginia Tech shooting massacre. It makes sense that the people I spoke to would have intimately remembered such

shocking, emotionally charged events. Some call this “[flashbulb memory](#).”

Even those can be unreliable. In 1977, 60 eyewitnesses to a plane crash that killed nine people were interviewed by *Flying* magazine. But they had differing recollections. One of the witnesses explained that the plane “was heading right toward the ground—straight down.” Yet photographs showed that the airplane hit flat and at a low-enough angle to skid for almost one thousand feet.

A true story is always filtered through the teller’s take on it.

For journalists, “faulty memory is definitely a problem. So how do you guard against it?” said Richard E. Meyer, a two-time Pulitzer Prize finalist in feature writing. For one of those pieces, about a [woman trapped inside of her body after a stroke](#), Meyer interviewed her using a letter board, because she could not speak. Much of her narrative was from the life of her mind, when no one else knew she was alive inside. Many parts could not be otherwise verified, like when she tried to drown herself by angling shower spray into the tracheostomy hole in her neck. “I had to depend her memory,” he said. “I knew this going in.” But to test his own confidence in her memories after the stroke, he first talked to her husband, sister, daughter, and nurses and checked memories of her life pre-stroke with theirs. They checked out.

The director of UC Irvine’s Literary Journalism Program had an eye-opening experience when reporting *A Death in White Bear Lake*. To reconstruct a scene, he interviewed people who had attended a funeral. In one of those interviews, a person remembered something peculiar: The little boy who was the focus of the story, was wearing red plastic sunglasses. “In the context of story, I knew the meaning,” Barry Siegel

said. “He had a black eye.” When Siegel went over the scene with 10 other funeral attendees, he tried not to lead them with questions. No one else mentioned the sunglasses. Then, he interviewed a 12th. Lo and behold, Siegel said, that person also remembered the boy in the red plastic sunglasses.

There is no absolute guarantee that everything in a nonfiction narrative is the absolute truth, “but you as the writer have the obligation to get as close to the truth as you possibly can,” Meyer said, “and the only way to do that is to report the living hell out of it.”

He challenged anyone who wanted to write his or her own memoir to actually report it out and see how often they are wrong about what they remember. Some journalists have done just that, including [David Carr](#) of *The New York Times*, and [Walt Harrington](#), a former reporter for *The Washington Post Magazine*.

Harrington, now a professor of literary journalism at the University of Illinois, once said, “Truth is a documentary, physical reality, as well as the meaning we make of that reality, the perceptions we have of it.”

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The mind and its memory do not just record and retrieve information and experiences, but also infer, fill in gaps, and construct, wrote Bryan Boyd in *On the Origin of Stories*. “Episodic memory’s failure to provide exact replicas of experiences appears to not be a limitation of memory but an adaptive design.”

Narrative, as Siegel explains, shapes meaning and order out of an existence that is otherwise just angst and chaos. This is one takeaway that nonfiction enthusiasts might consider when thinking about the intersections between stories and memory. There is harmony in both.

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