



**The New York Times** | <http://nyti.ms/1yDYKUZ>

---

The Opinion Pages | OP-ED CONTRIBUTORS

# Why Our Memory Fails Us

By **CHRISTOPHER F. CHABRIS** and **DANIEL J. SIMONS** DEC. 1, 2014

NEIL DEGRASSE TYSON, the astrophysicist and host of the TV series “Cosmos,” regularly speaks to audiences on topics ranging from cosmology to climate change to the appalling state of science literacy in America. One of his staple stories hinges on a line from President George W. Bush’s speech to Congress after the 9/11 terrorist attacks. In a 2008 talk, for example, Dr. Tyson said that in order “to distinguish we from they” — meaning to divide Judeo-Christian Americans from fundamentalist Muslims — Mr. Bush uttered the words “Our God is the God who named the stars.”

Dr. Tyson implied that President Bush was prejudiced against Islam in order to make a broader point about scientific awareness: Two-thirds of the named stars actually have Arabic names, given to them at a time when Muslims led the world in astronomy — and Mr. Bush might not have said what he did if he had known this fact.

This is a powerful example of how our biases can blind us. But not in the way Dr. Tyson thought. Mr. Bush wasn’t blinded by religious bigotry. Instead, Dr. Tyson was fooled by his faith in the accuracy of his own memory.

In his post-9/11 speech, Mr. Bush actually said, “The enemy of America is not our many Muslim friends,” and he said nothing about the stars. Mr. Bush had indeed once said something like what Dr. Tyson remembered; in

2003 Mr. Bush said, in tribute to the astronauts lost in the Columbia space shuttle explosion, that “the same creator who names the stars also knows the names of the seven souls we mourn today.” Critics pointed these facts out; some accused Dr. Tyson of lying and argued that the episode should call into question his reliability as a scientist and a public advocate.

When he was first asked for the source of Mr. Bush’s quotation, Dr. Tyson insisted, “I have explicit memory of those words being spoken by the president. I reacted on the spot, making note for possible later reference in my public discourse. Odd that nobody seems to be able to find the quote anywhere.” He then added, “One of our mantras in science is that the absence of evidence is not the same as evidence of absence.”

That is how we all usually respond when our memory is challenged. We have an abstract understanding that people can remember the same event differently. The film “Rashomon” made this point more than 60 years ago, the Showtime series “The Affair” presents each episode from two conflicting viewpoints, and contradictory witness testimony is a crime drama trope. But when our own memories are challenged, we may neglect all this and instead respond emotionally, acting as though we must be right and everyone else must be wrong.

Overconfidence in memory could emerge from our daily experience: We recall events easily and often, at least if they are important to us, but only rarely do we find our memories contradicted by evidence, much less take the initiative to check if they are right. We then rely on confidence as a signal of accuracy — in ourselves and in others. It’s no accident that Oprah Winfrey’s latest best seller is called “What I Know For Sure,” rather than “Some Things That Might Be True.”

Our lack of appreciation for the fallibility of our own memories can lead to much bigger problems than a misattributed quote. Memory failures that resemble Dr. Tyson’s mash-up of distinct experiences have led to false convictions, and even death sentences. Whose memories we believe and whose we disbelieve influence how we interpret controversial public events,

as demonstrated most recently by the events in Ferguson, Mo.

Erroneous witness recollections have become so concerning that the National Academy of Sciences convened an expert panel to review the state of research on the topic. This fall the panel (which one of us, Daniel Simons, served on) released a comprehensive report that recommended procedures to minimize the chances of false memory and mistaken identification, including videotaping police lineups and improving jury instructions.

A critical concern about eyewitness memory is the sometimes tenuous relationship between the accuracy of a witness's memory and his confidence in it. In general, if you have seen something before, your confidence that you have seen it and your accuracy in recalling it are linked: The more confident you are in your memory, the more likely you are to be right. But new research reveals important nuances about this link.

In a paper published earlier this year, the cognitive psychologists Henry L. Roediger III and K. Andrew DeSoto tested how well people could recall words from lists they had studied, and how measured they were in their recollections. For words that were actually on the lists, when people were highly confident in their memory, they were also accurate; greater confidence was associated with greater accuracy. But when people mistakenly recalled words that were similar to those on the lists but not actually on the lists — a false memory — they also expressed high confidence. That is, for false memories, higher confidence was associated with lower accuracy.

To complicate matters further, the content of our memories can easily change over time. Nearly a century ago, the psychologist Sir Frederic Charles Bartlett conducted a series of experiments that mimicked the “telephone” game, in which you whisper a message to the person next to you, who then passes it along to the person next to them, and so on. Over repeated tellings, the story becomes distorted, with some elements remaining, others vanishing, and entirely new details appearing.

When we recall our own memories, we are not extracting a perfect record of our experiences and playing it back verbatim. Most people believe that memory works this way, but it doesn't. Instead, we are effectively whispering a message from our past to our present, reconstructing it on the fly each time. We get a lot of details right, but when our memories change, we only "hear" the most recent version of the message, and we may assume that what we believe now is what we always believed. Studies find that even our "flashbulb memories" of emotionally charged events can be distorted and inaccurate, but we cling to them with the greatest of confidence.

With each retrieval our memories can morph, and so can our confidence in them. This is why the National Academy of Sciences report strongly advised courts to rely on initial statements rather than courtroom proclamations: A witness who only tentatively identifies a suspect in a police station lineup can later claim — sincerely — to be absolutely certain that the defendant in the courtroom committed the crime. In fact, the mere act of describing a person's appearance can change how likely you are to pick him out of a lineup later. This finding, known as "verbal overshadowing," had been controversial, but was recently verified in a collective effort by more than 30 separate research labs.

The science of memory distortion has become rigorous and reliable enough to help guide public policy. It should also guide our personal attitudes and actions. In Dr. Tyson's case, once the evidence of his error was undeniable, he didn't dig his hole deeper or wish the controversy away. He realized that his memory had conflated his experiences of two memorable and personally significant events that both involved speeches by Mr. Bush. He probably still remembers it the way he described it in his talks — but to his credit, he recognizes that the evidence outweighs his experience, and he has publicly apologized.

Dr. Tyson's decision is especially apt, coming from a scientist. Good scientists remain open to the possibility that they are wrong, and should question their own beliefs until the evidence is overwhelming. We would all be wise to do the same.

There's a further twist to Dr. Tyson's tale. Years before he misremembered what Mr. Bush said about 9/11, Mr. Bush himself misremembered what he had seen on 9/11. As the memory researcher Daniel Greenberg documented, on more than one occasion Mr. Bush recollected having seen the first plane hit the north tower of the World Trade Center before he entered a classroom in Florida.

In reality, he had been told that a plane had hit the building, but had not seen it — there was no live footage of the plane hitting the tower. Mr. Bush must have combined information he acquired later with the traces left by his actual experience to produce a new version of events, just as Dr. Tyson did. And just as Dr. Tyson's detractors assumed that he had deliberately lied, some Bush critics concluded that he was inadvertently leaking the truth, and must have known about the attacks in advance.

Politicians are often caught misremembering their past, in part because their lives are so well documented. Hillary Rodham Clinton's 2008 presidential campaign was momentarily sidetracked by her own false memory of a time when, on a trip to Bosnia as first lady, she had to skip a greeting ceremony and run from her plane under sniper fire. As often happens, her memory was an embellishment of a real event, a hooked fish that got bigger in the retelling — there was fighting in the region, but not close enough to be a threat. Our memories tend to morph to match our beliefs about ourselves and our world. Mrs. Clinton did go to dangerous places, but on the tarmac in Bosnia she was met by children, not bullets.

Do our heroes have memories of clay? Dr. Tyson, Mr. Bush and Mrs. Clinton are all intelligent, educated people. Ordinary memory failures say nothing about a person's honesty or competence. But how we respond to these events can be telling.

Politicians should respond as Dr. Tyson eventually did: Stop stonewalling, admit error, note that such things happen, apologize and move on. But the rest of us aren't off the hook. It is just as misguided to conclude that someone who misremembers must be lying as it is to defend

a false memory in the face of contradictory evidence. We should be more understanding of mistakes by others, and credit them when they admit they were wrong. We are all fabulists, and we must all get used to it.

**Christopher F. Chabris**, a psychology professor at Union College, and **Daniel J. Simons**, a psychology professor at the University of Illinois, are the authors of “The Invisible Gorilla: How Our Intuitions Deceive Us.”

A version of this op-ed appears in print on December 2, 2014, on page A27 of the New York edition with the headline: Why Our Memory Fails Us.

---

© 2015 The New York Times Company