OP-ED CONTRIBUTOR

Your Brain Lies to You

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FALSE beliefs are everywhere. Eighteen percent of Americans think the sun revolves around the earth, one poll has fo . Thus it seems slightly less egregious that, according to another pou, 10 percent of us think that Senator Barack Obama, a Christian, is instead a Muslim. The Obama campaign has created a Web site to dispel misinformation. But this effort may be more difficult than it seems, thanks to the quirky way in which our brains store memories — and mislead us along the way.

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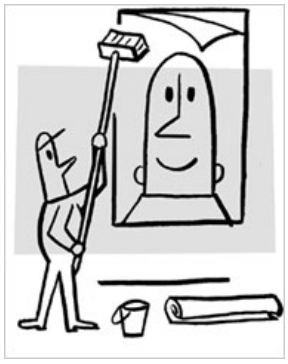

Phil Marden

The brain does not simply gather and stockpile information as a computer's hard drive does. Facts are stored first in the hippocampus, a structure deep in the brain about the size and shape of a fat man's curled pinkie finger. But the information does not rest there. Every time we recall it, our brain writes it down again, and during this re-storage, it is also reprocessed. In time, the fact is gradually transferred to the cerebral cortex and is separated from the context in which it was originally learned. For example, you know that the capital of California is Sacramento, but you probably don't remember how you learned it.

This phenomenon, known as source amnesia, can also lead people to forget whether a statement is true. Even when a lie is presented with a disclaimer, people often later remember it as true.

With time, this misremembering only gets worse. A false statement from a noncredible source that is at first not believed can gain credibility during the months it takes to reprocess memories from short-term hippocampal storage to longer-term cortical storage. As the source is forgotten, the message and its implications gain strength. This could explain why, during the 2004 presidential campaign, it took some weeks for the Swift Boat Veterans for Truth campaign against Senator John Kerry to have an effect on his standing in the polls.

Even if they do not understand the neuroscience behind source amnesia, campaign strategists can exploit it to spread misinformation. They know that if their message is initially memorable, its impression will persist long after it is debunked. In repeating a falsehood, someone may back it up with an opening line like "I think I read somewhere" or even with a reference to a specific source.

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claim taken from a Web site that Coca-Cola is an effective paint thinner. Students who read the statement five times were nearly one-third more likely than those who read it only twice to attribute it to Consumer Reports (rather than The National Enquirer, their other choice), giving it a gloss of credibility.

Adding to this innate tendency to mold information we recall is the way our brains fit facts into established mental frameworks. We tend to remember news that accords with our worldview, and discount statements that contradict it.

In another Stanford study, 48 students, half of whom said they favored capital punishment and half of whom said they opposed it, were presented with two pieces of evidence, one supporting and one contradicting the claim that capital punishment deters crime. Both groups were more convinced by the evidence that supported their initial position.

Psychologists have suggested that legends propagate by striking an emotional chord. In the same way, ideas can spread by emotional selection, rather than by their factual merits, encouraging the persistence of falsehoods about Coke — or about a presidential candidate.

Journalists and campaign workers may think they are acting to counter misinformation by pointing out that it is not true. But by repeating a false rumor, they may inadvertently make it stronger. In its concerted effort to “stop the smears,” the Obama campaign may want to keep this in mind. Rather than emphasize that Mr. Obama is not a Muslim, for instance, it may be more effective to stress that he embraced Christianity as a young man.

Consumers of news, for their part, are prone to selectively accept and remember statements that reinforce beliefs they already hold. In a replication of the study of students’ impressions of evidence about the death penalty, researchers found that even when subjects were given a specific instruction to be objective, they were still inclined to reject evidence that disagreed with their beliefs.

In the same study, however, when subjects were asked to imagine their reaction if the evidence had pointed to the opposite conclusion, they were more open-minded to information that contradicted their beliefs. Apparently, it pays for consumers of controversial news to take a moment and consider that the opposite interpretation may be true.

In 1919, Justice Oliver Wendell Holmes of the Supreme Court wrote that “the best test of truth is the power of the thought to get itself accepted in the competition of the market.” Holmes erroneously assumed that ideas are more likely to spread if they are honest. Our brains do not naturally obey this admirable dictum, but by better understanding the mechanisms of memory perhaps we can move closer to Holmes’s ideal.

Sam Wang, an associate professor of molecular biology and neuroscience at Princeton, and Sandra Aamodt, a former editor in chief of Nature Neuroscience, are the authors of “Welcome to Your Brain: Why You Lose Your Car Keys but Never Forget How to Drive and Other Puzzles of Everyday Life.”

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