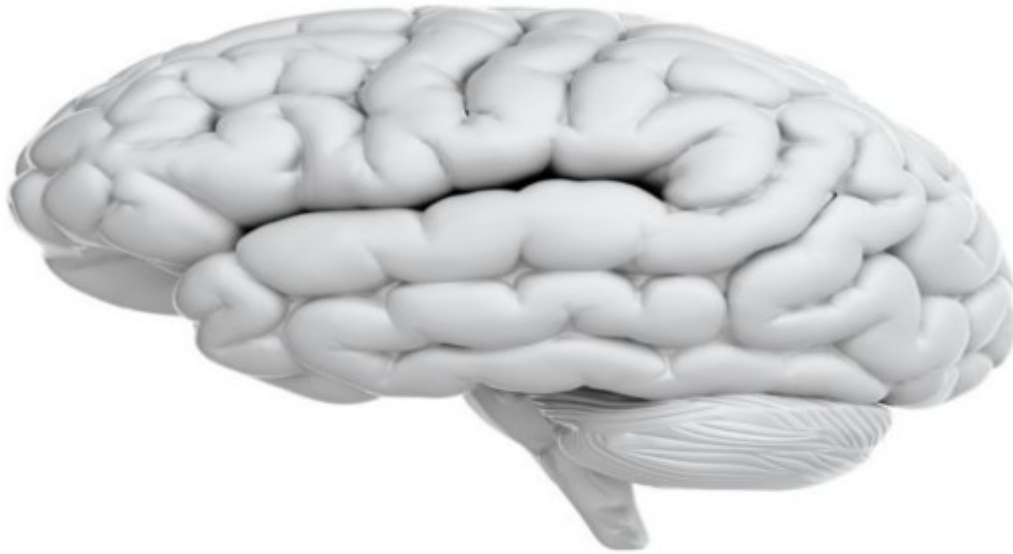


# 10 Brain Myths You've Been Believing That Are Flat Out Wrong



By Megan Scudellari | [Popular Science](#)

In the Hollywood action-film *Lucy*, actor Morgan Freeman—playing a world-renowned neurologist—speaks to a packed auditorium. “It’s estimated most human beings only use 10 percent of their brains’ capacity,” he says. “Imagine if we could access 100 percent.” You may have heard that claim before. Unfortunately, it’s just not true. And after watching *Lucy*, Ramina Adam and Jason Chan, two neuroscience graduate students at Western University in Ontario, decided to set the record straight. “We realized we had to do something about all this misinformation,” Adam says. They set out to collect common misperceptions about how the brain works, and we lent a hand in debunking them.

**Here is some information to help find out the truth about 10**

common neuroscience myths.

## **1. We use only a fraction of our brains.**

In 1907, famed psychologist William James claimed, “We are making use of only a small part of our possible mental and physical resources.” A journalist later misquoted him as saying the average person develops only 10 percent of his mental capacity. Scans, however, show that we use every part of our brain, though not all regions are active at once. (Sorry, Morgan.) That’s why damage to any area of the brain—such as the aftermath of a [stroke](#)—usually results in mental and behavioral effects.

## **2. Playing classical music to infants makes them smarter.**

The state of Georgia began distributing classical-music CDs to the families of newborns in 1998. Each CD included a message from the governor: “I hope both you and your baby enjoy it—and that your little one will get off to a smart start.” While the sentiment is appealing, the so-called [Mozart Effect](#) is dubious. The idea sprang from [a 1993 study](#) at the University of California at Irvine, which showed that 36 college students performed better on an [IQ test](#) after listening to Mozart than after relaxation exercises or silence. No one has been able to replicate those results. In fact, a 1999 Harvard University review of 16 similar studies concluded the Mozart Effect isn’t real.

## **3. Adults can’t grow new brain cells.**

Adult rats, rabbits, and even birds can grow new neurons, but for 130 years, scientists failed to identify new brain-cell growth in adult humans. That all changed in 1998, when a

Swedish team showed that new brain cells form in the [hippocampus](#), a structure involved in storing memories. Then, in 2014, a team at the Karolinska Institute in Sweden measured traces of [carbon-14](#) in DNA as a way to date the age of cells, and confirmed that the striatum, a region involved in motor control and cognition, also produces new neurons throughout life. While our brains aren't exactly an orgy of wildly replicating cells, they do constantly regenerate.

#### **4. Male brains are biologically better suited for math and science, female brains for empathy.**

There are small [anatomical differences](#) between male and female brains, this much is certain. The hippocampus, involved in memory, is usually larger in women, while the [amygdala](#), involved in emotion, is larger in men. (The opposite of what you'd expect from this myth.) But evidence suggests gender disparities are due to cultural expectations, [not biology](#). For example, in 1999, social psychologists at the University of Waterloo in Ontario gave women and men a difficult math test. Women—even those with strong math backgrounds—scored lower than men, unless told the test had revealed no gender differences in the past. Then the women performed equally well as the men.

#### **5. Being in a coma is like being asleep: You wake up intact and well rested.**

In the movies, comas look harmless: A well-groomed patient lays in bed for a few months and wakes fully articulate, seemingly unscathed by his or her ordeal. In real life, those emerging from comas often suffer disabilities and need rehabilitation. Brain scans point to why. Scientists at the French National Center for Scientific Research, in 2012, found

that high-traffic brain regions—normally bright hubs of [activity](#), even during sleep—are eerily dark in coma patients (while other areas inexplicably light up). Most comas also don't last more than two to four weeks. So don't believe everything (or anything) you see on [Grey's Anatomy](#).

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