

Mind Games

This debut column explodes common myth-conceptions about how the brain works.

BY SARAH KLEIN // ILLUSTRATIONS BY NOMA BAR

Thinking about the brain is a lot like contemplating the limits of outer space: So much lies outside our grasp that it can be dizzying—especially when some of our fondest-held beliefs are challenged and proved wrong. Even then, some myths live on, defying logic and proof, so persistent that they’ve earned their own name: neuromyth.

Neuromyths flourish because they seem to explain, albeit with dubious logic, otherwise bewildering phenomena. Even our educators may be misguided. In one study, teachers believed nearly 50% of common neuromyths, such as right brain/left brain pseudoscience. Here are some talking points to use when you’re confronted with a myth-conception.

MYTH: Men’s and women’s brains function differently.

• **REALITY CHECK:** “Americans tend to think of women as being more verbally than mathematically adept,” says clinical psychologist Cynthia Green, author of the *Prevention* book *Brainpower Game Plan* (Rodale, 2009). But when researchers compare academic performance



between the sexes in some Asian and European countries where stereotypical attitudes aren't as prevalent, women's math skills are easily on par with men's. While there are structural differences between men's and women's brains, they don't directly affect behavior, personality, or learning. A 2015 Tel Aviv University study published in the *Proceedings of the National Academy of Sciences* found that those differences don't even allow researchers to identify any given brain as male or female. "Humans and human brains are composed of unique mosaics of features," the researchers wrote.

• **WHERE THE MYTH ORIGINATED:**

Structural differences—for example, a band of nerve fibers called the corpus callosum that connects the two sides of the brain is thicker in women; men's brains tend to be larger overall—have less significance than was assumed until recently.

• **WHY IT PERSISTS:** If men are from Mars and women are from Venus, their brains *must* be different! Gender bias is getting the best of anyone who buys this one.

MYTH: You use only about 10% of your brain.

• **REALITY CHECK:** You may not use your entire brain when you're resting, for



example, but you don't have an untapped expanse of gray matter, either. "All of us use the entirety of our brains but not every part constantly or equally," says Stephen M. Kosslyn, a cognitive neuroscientist and author of *Top Brain, Bottom Brain: Surprising Insights into How You Think*. Some areas function automatically, such as the brain stem, which controls unconscious activities like breathing. Others control higher-level thinking and may be activated only when we're reasoning, planning, or solving problems. These are the regions famously thought to be "exercised" by crossword puzzles,

brain games, or brain-training software. Although research has found that cognitive claims for brain games are unsubstantiated, they persist as well, partly due to ingenious marketing efforts by the companies that make these products. In reality, there's no silver bullet to ward off dementia, and we need to approach cognitive wellness from all angles, Green says, including intellectual stimulation, regular physical activity, and a Mediterranean-style diet, which has been shown to be beneficial for brain health.

• **WHERE THE MYTH**

ORIGINATED: "The 10% idea may be based on a misreading of some data that was collected in the 1920s and '30s that showed rats could relearn how to run through mazes even after having large amounts of their brains removed," Kosslyn says. Other researchers trace it to American philosopher and psychologist William James, who wrote in 1908, "We are making use of only a small part of our possible mental and physical resources."

• **WHY IT PERSISTS:** Who wouldn't like to imagine a brain of nearly infinite capacity for brilliant ideas just waiting to be tapped?

MYTH: The right and left hemispheres of the brain operate independently and determine the "type" of thinker you are.

• **REALITY CHECK:** As neat and tidy as it is to claim sides—with creative people right-brained and logical folks left—both hemispheres work together. "When you scan people's brains as they do tasks, you don't see just one half light up with activity," Kosslyn says.

• **WHERE THE MYTH ORIGINATED:** Back in the 1960s, researchers surgically separated the two sides of the brain and identified areas that governed functions like math and language skills. Differences were found between the two hemispheres, but the right brain/left brain paradigm oversimplifies the science. Today, experts believe the communication between the two sides likely facilitates our most

creative and logical thoughts.

• **WHY IT PERSISTS:** It makes pegging people easy. For instance, educators have relied on such faulty thinking to create learning strategies targeted at right- and left-brainers. Up to 91% of teachers believe differences in how individuals learn are due to the dominant side of their brains. As for the rest of us, personality quizzes would fall out of favor if we lost interest in knowing whether we are right- or left-brained and what our "types" are. No one's brain, though, is exactly like *your* brain—which can be as heady a concept as contemplating the cosmos. ■

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