

Outlook Perspective

Five myths about consciousness

By Christof Koch

“Consciousness” refers to any subjective experience — the delectable taste of Nutella, the sharp sting of an infected tooth, the slow passage of time when bored, the sense of vitality and anxiety just before a competitive event. In the words of the philosopher Thomas Nagel, consciousness exists in a human or other subject whenever “there is something it is like to *be* that organism.” The concept has inspired countless philosophical theories since antiquity and much laboratory work over the past century, but it has also given rise to many misunderstandings.

MYTH NO. 1

Humans have a unique brain.

There’s a long history of scientists thinking they have identified a particular feature to explain our advanced consciousness (and planetary dominance). In [a popular TED talk](#), the neuroscientist Suzana Herculano-Houzel argues that the human brain’s distinctiveness lies in the huge number of neurons that make up the outermost layer of the organ, the cerebral cortex (or neocortex): 16 billion, out of some 86 billion total neurons. “That’s the simplest explanation for our remarkable cognitive abilities,” she says. Other suppositions have included [special brain regions](#) or nerve cells found only (or primarily) in humans — [spindle or von Economo neurons](#), for example. Or perhaps the human brain [consumes more calories](#) than the brains of other species?

After close to two centuries of brain research, however, no single feature of the human brain truly stands out. We certainly do not possess the largest brain — [elephants and whales trounce us](#). [Recent research](#) has revealed that pilot whales, a type of dolphin, have 37 billion cortical neurons, undermining Herculano-Houzel’s hypothesis. And researchers have found that [whales](#), elephants and other large-brained animals (not just great apes and humans) also have von Economo neurons. New research shows that humans and mice have about the same number of categories of brain cells. The fact is, there is no simple brain-centric explanation for why humans sit atop the cognitive hill.

MYTH NO. 2

Science will never understand consciousness.

This is a particularly pernicious myth, because it inhibits research. “I have a much easier time imagining how we understand the big bang than I have imagining how we can understand consciousness,” the eminent string theorist Ed Witten [has said](#); it’s likely to “remain a mystery,” he insists. “The Hard Problem of Consciousness” — some say insurmountable — is the phrase the philosopher David Chalmers [coined](#) to describe the immense leap required to move from understanding which brain events are linked to

But the argument that difficult science problems are unsolvable has a very poor track record. And scientists and clinicians have learned more about consciousness over the past century-plus than in all of preceding history. An entire profession, anesthesiology, is devoted to safely turning consciousness off and on again. We are getting better at [detecting its presence or absence](#) in neurologically impaired patients unable to speak or otherwise interact with their environment — by stimulating their brains using a magnetic pulse and then monitoring the echoes of the evoked electrical activity crisscrossing the neocortex. Researchers study the [neuronal footprint of consciousness](#) by presenting images or other stimuli to people in magnetic scanners and identifying which brain regions respond. These advances have not solved the hard problem, to be sure, but there is little reason for pessimism that they won't, eventually.

MYTH NO. 3

Dreams contain hidden clues about our secret desires.

Sigmund Freud called dreams “[the royal road to the unconscious](#).” Much 20th-century thinking about dreams has been influenced by his theory that at the heart of any dream is the fulfillment of desires and wishes that are suppressed by the mind. “In psychoanalytic theory, dreams represent wish fulfillment, unconscious desires, and conflicts,” as the website [GoodTherapy puts it](#), and are often rife with “repressed, symbolic meaning.” They have to be deciphered using [free association](#) or other methods.

But modern research exploring the content of dreams of healthy subjects, as well as dreams of patients suffering from trauma, does not support this theory. William Domhoff, a research psychologist, maintains an [online dream bank](#) with more than 20,000 curated dream reports. It and other resources make clear that most of our dreams contain residue from our daily concerns and events — interrupted by seemingly random episodes either imagined or recalled and woven into the narrative tapestry. There is usually clear continuity between dream content and waking conceptions: People who are anxious have anxiety dreams; victims of trauma have flashbacks or recurrences of their traumatic experiences. Sometimes we express sexual longing for somebody — but that hardly requires decoding. By and large, dreams do not disguise our desires but rather express our concerns in a readily understandable and coherent manner.

MYTH NO. 4

We are susceptible to subliminal messages.

Subliminal advertising — which includes words or images that can't be consciously perceived — became famous in 1957, after a marketing researcher claimed to have [radically boosted sales](#) of popcorn and Coca-Cola in a movie theater by flashing the phrases “eat popcorn” and “drink Coca-Cola” on-screen for a single

frame. He later admitted he'd made up the data. But interest in the concept persisted: In the book "[Subliminal Seduction](#)" (1974), author Wilson Key [claimed](#) that 99 percent of alcohol ads include subliminal messages. In 2000, Republicans were accused of trying to [unconsciously manipulate voters](#) with a TV ad that attacked the role of "bureaucrats" in an Al Gore health-care plan — and lingered ever so briefly on the letters R-A-T-S.

To be sure, over the years, some studies [have found](#) evidence that unconsciously presented words and images can influence ideas and behavior, but many of those studies could not be replicated. (One influential [1970 study](#) found that exposure to the word "Coke" increased thirst, but it fell apart when [conducted again in 1989](#).) Although research continues, the best evidence suggests that if subliminal messages have any effects at all, they are [inconsistent](#), small and short-lived: One 2015 study found that unconscious exposure to a brand name raised interest in that brand a bit — but also that the effect [evaporated after 15 minutes](#). You need not worry about subliminal propaganda. As the present political moment makes clear, it is overt, conscious messages — hateful insults directed by influential people at members of minority groups, for example — that hold the real power.

MYTH NO. 5

Near-death 'visions' are evidence of life after death.

Patients revived after heart failure or other close-to-fatal episodes sometimes report having felt detached from their body, seeing a bright light or sensing that they are in the presence of the numinous. Many consider these experiences to be proof of a divine realm. Eben Alexander, in the bestseller "[Proof of heaven: A Neurosurgeon's Journey Into the Afterlife](#)," reported, while deep in a coma, entering "[the strangest, most beautiful world I'd ever seen](#)." Pondering the implications, he [wrote](#): "So I was communicating directly with God? Absolutely."

Once dismissed by scientists as idiosyncratic hallucinations or derided as occult experiences, these episodes are now drawing close attention. Epidemiological surveys [find](#) that significant near-death visions are not that rare, occurring in roughly a 10th of patients who have undergone cardiac arrest. It appears that they are related to neurological events that occur when particular cortical regions are starved of oxygen critical to their function, though the precise cause is unknown. Similar intensely felt experiences [occur](#) during temporal-lobe epileptic seizures or during direct stimulation of certain regions of the exposed cortex during neurosurgery, further evidence of their biological, not spiritual, origins.

Visions that people experience when near death — often devoid of religious content — appear to be attempts by the brain to continue to do its job of comprehending the world even when its own function is hampered, and when some of its perceptual and memory circuits are offline or generating spurious activity. Though we don't need to turn to supernatural explanations, it is important to study why these events leave many patients with a long-lasting [sense of calm](#), serenity and acceptance of their eventual demise. Understanding that could lead to therapeutic breakthroughs.

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