The Science of Laughter

What happens in your brain when you get the giggles?

Erman Misirlisoy, PhD Follow
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People laugh about five times in every 10 minutes of conversation. They are also 30 times more likely to laugh when they are with other people compared to when they are alone. It's common to think of laughter as a loud reaction to a funny joke, but most of the time it's simply a recurring feature of normal social interaction.

Sophie Scott is a scientist and professor at University College London who leads much of the current research about laughter. Interestingly enough, she says, “most of the laughter you produce is not helpless” but rather the result of a voluntary act.

Laughter comes in two shades: voluntary and spontaneous. Voluntary laughter is the social lubricant that helps a conversation run smoothly, while spontaneous laughter erupts following a particularly humorous remark. Each form uses a different network in the brain. Voluntary laughter typically features more activity in frontal and motor areas of the brain associated with action planning and language. Spontaneous laughter includes greater activity in deeper structures such as the hypothalamus, which regulates basic physiological processes like hormonal balance.

Humans aren’t the only species to express these two types of laughter. Chimpanzees demonstrate a similar pattern, using more controlled laughter to join in with the giggles of other chimpanzees, and distinct spontaneous laughter in response to amusing events during play. The more chimpanzees laugh together, the longer they play together, especially when that laughter is social rather than spontaneous.

People are fairly good at distinguishing spontaneous from voluntary laughter. In one experiment from 2019, researchers tested whether hearing laughs after a joke would make it funnier. In essence, they were testing the psychological effects of the laugh tracks found in such American comedies as *Seinfeld* and *Friends*. People in the study rated jokes that were followed by laughter as funnier than those followed by silence, supporting the idea that laughter is driven by social situations rather than a joke’s content. It’s important to note that spontaneous laughter amplified humor ratings more than voluntary laughter did.

Thanks to its deeply social nature, laughter can be incredibly infectious. People who find it most infectious are better able to distinguish between spontaneous and voluntary laughs. When researchers recently compared this laughter sensitivity in 21 societies across six continents, they found judgments to be surprisingly universal. Every society could meaningfully distinguish a spontaneous laugh from a voluntary one.

Indeed, sensitivity to laughter and its cues is a sign of healthy social function. In a sample of boys between 11 and 16, those who were at risk of developing psychopathy expressed a weaker desire to join in with the laughter of other people. An area of their brain known

as the insula — which is associated with awareness of bodily experiences — was less active while they listened to laughter, which partly explained the subdued reaction to social joy.

In the same study, boys who were at risk of general antisocial behavior also showed reduced activity in the supplementary motor area of the brain, which is involved in voluntary and social actions. A study in 1998 targeted this area in the brain of a 16-year-old girl who was undergoing surgery for severe seizures. In contrast to most areas of her brain, when researchers stimulated her supplementary motor area, the girl would consistently laugh. A weak electrical current made her smile, while stronger currents made her laugh longer and harder. Despite the clear connection between the stimulation and the girl's laughter, she would offer a random reason for laughing each time, such as "You guys are just so funny… standing around," or "The horse is funny," when a picture of a horse was used in the experiment.

Electrical stimulation studies are important because they provide a glimpse into what specific brain areas can do when they are activated. This same method has recently implicated other brain areas in laughter, too, including the pregenual anterior cingulate cortex for more emotional laughter, and the frontal operculum for more voluntary laughter. The common thread across many laughter-related brain areas is that they generally play a critical role in social actions and emotional awareness.

But what about those giggle fits? Most laughter is social and relatively voluntary, but occasionally people will experience an outburst that they can't control. Some researchers say that they are, in effect, experiencing the infectiousness of their own laughter. "The worst thing to think," says Sophie Scott, "is 'I must stop laughing,' because then all you can think about is laughing." Laughter's infectious social quality means that even the thought of laughter can set people off, especially if they've already primed themselves with previous laughs. This is exactly why comedians on stage often want an audience "warmed up" before their performance. If they're already laughing, they're more likely to continue.

The science of laughter is far from complete. For one thing, it's still not clear why particular words or scenes trigger laughter. Many theories exist, including the idea that material is funny when it violates our expectations, but no single theory of humor seems entirely satisfying. "Nothing is funny at every time at every place," Scott points out.

“Context is much more important for humor and laughter than the specific content of a joke.”

Context really does seem to be everything. People laugh for all kinds of unfunny reasons, and nervous laughter is just one example. Scott explains, “people often laugh to deal with stress and cover up pain or embarrassment.” When they’re angry, it’s not socially acceptable for them to fly into a rage. When they’re embarrassed, they rarely want to show it. But a pleasant social expression like laughter, says Scott, is “a very acceptable social mask.”

All the evidence points toward a simple conclusion: Laughter is communication. This is naturally true for voluntary laughter, which is used as a pleasant tool to complement speech in everyday conversations. But even when people laugh uncontrollably, it is almost always in a social setting. Whether it’s a news anchor nervously stumbling over their words in front of a live camera, or simply a friend bursting into a fit of laughter upon hearing an unexpected joke, the laughter is automatic, contagious, and sometimes difficult to stop. Whatever the context, laughter sends a message of joy and friendly engagement, making it an indispensable tool for a healthy social life.

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