Dear Alice,

I was wondering what exactly makes us laugh? And why is it so hard to stop ourselves from laughing?

Answer

Dear Reader,

Believe it or not, laughter likely evolved a few million years ago even before the development of language! What causes the laughter factor? It’s one of the body’s emotional and physical responses to certain stimulation. Most often, it reflects positive emotional states such as joy or happiness, but it can also result from emotional states such as embarrassment or confusion. It’s also considered an evolutionary mechanism and mode of communication that helps build social bonds and regulate relationships between humans. Neurologically speaking, laughter is produced via a circuit that runs through and activates many regions of the brain, leading to the body’s physical response (most noticeably facial muscle contractions). It’s also generally an involuntary reaction, compared to responses such as talking, which is what can make it hard to stop yourself from laughing in a given situation. More on all things giggles, chuckles, and snickers to come!

Interestingly, less than 20 percent of incidents of laughter are in response to something considered comedic, with laughter most often occurring in natural breaks in conversation. These three theories offer a better sense of just why human beings laugh:

- **The arousal theory** focuses on the cognitive aspects of laughter. While stress increases arousal, laughter helps to reduce this arousal and any tension associated with stress. As a result, the situation doesn’t seem as negative. All in all, this theory proposes that laughter can help reduce negative emotions and unpleasant feelings.
- **The discrepancy theory** suggests that people laugh when there’s inconsistency between a situation and the person’s knowledge or expectation of that particular situation. This theory applies when logic is turned on its head, such as when a joke or story takes an unexpected turn.
- **The superiority theory** states that laughter can occur when a person feels superior to
others as a mechanism to raise confidence. It may occur as a result of someone else’s mistake or misfortune, such as when a cartoon character slips on a banana peel or has an anvil drop on them out of the sky.

Regardless of what stimuli makes people laugh, the brain and body are going through processes to get guffaws going. Laughter starts with activation of the ventromedial prefrontal cortex, which produces endorphins that are intended to alleviate pain. One study showed that within four-tenths of a second of exposure to something potentially funny, an electrical wave moved through the cerebral cortex, the largest part of the brain. From there, the left side of the cortex analyzed the joke, the frontal lobe (associated with social emotional responses) became increasingly active, and the right hemisphere dealt with the intellectual analysis needed to "get" the joke. The limbic system, which lies just beneath the cerebral cortex, controls many functions associated with mood, friendships, and love, and also seems to be central to the production of laughter. Once a joke is understood as funny, the motor aspects of laughter initiate. This may include the contraction of facial muscles, and in extreme circumstances, the activation of tear ducts. Additionally, the epiglottis half-closes the larynx, so that air intake occurs irregularly, which explains why people may gasp while laughing. If, however, someone seems to be laughing uncontrollably or at inappropriate times or in a way that is disruptive to their life, they may have a condition called pseudobulbar affect. This condition is usually the result of a neurological condition or injury. If this is a concern, it’s best to talk with a health care provider.

Though the brain and body produce laughter, it does quite a bit in return! Laughter has been shown to decrease the amount of stress hormones in the body (such as epinephrine and cortisol). These are responsible for increased blood pressure and increased blood platelets, which can cause obstructions in arteries. It also increases the quantity of natural killer cells and T-cells, which are integral components of the immune system, along with B-cells, which make antibodies to fight disease. Laughter also provides an enjoyable workout for the muscles of the diaphragm, abdomen, respiratory tract, and back. Researchers estimate that laughing 100 times is equal to ten minutes on the rowing machine or 15 minutes on an exercise bike. Not a bad way to fit in a workout! While it’s happening, laughter increases blood pressure and heart rate, and reduces stress hormones such as serum cortisol, growth hormone, and catecholamines. After laughing, overall blood pressure is lowered, and there’s an increase in vascular blood flow and in oxygenation of the blood. Muscles are more relaxed, and there’s an inhibition of the biological fight-or-flight response.

Since laughing can be beneficial for your body, emotional health, and social connections, in the midst of a laugh-attack, you can celebrate the fact that something contagious is actually good for you. Here’s to being certain you haven’t yet had the last laugh!

Alice!

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Emotional Health [2]
Communication Concerns [3]
Miscellaneous [4]

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