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Curing What Ails You

Laughter may not be the best medicine, but a growing body of work suggests it could be as important as diet and exercise

By Alice Park

BE HAPPY. THINK POSITIVE. SMILE MORE. WORRY less. There's no shortage of platitudes about the wonders happiness and a sunny demeanor can do for you, both physically and mentally. And what better way to bring more happy into your life than by laughing? The joyous ha-ha-ha that comes from deep in the belly, the mouth stretched open in delightful abandon, the tiny crinkles around the eyes all broadcast "This is a happy person."

For many of us, laughing also implies a healthy person. Laughing, for the most part, is a feel-good act, a vocal exclamation point on a positive mood, a gateway certainly to psychic wellness and, as studies are starting to suggest, to physical well-being too. Neuroscience researchers have documented deep connections between laughter and social relationships, as well as indications that laughter may be linked to various physiological benefits. For example, laughing changes the body's chemistry, both raising hormones responsible for happy feelings and lowering stress-related hormones. Because laughing causes a shift in the way people breathe, it may



also help the heart. There is even some suggestive evidence that laughter affects the immune system, by leading to a slight and temporary boost in certain immune cells.

To be sure, much of this research has been conducted in artificial lab settings, where it's hard to replicate real-world situations that prompt laughter and where it's impossible to track laughter's longer-term effects. But there is a growing body of work suggesting that even if laughter is not the best medicine, it is quite good for you. Some researchers think it may be as important as diet and exercise in keeping you disease free.

"Laughter appears to cause all the reciprocal, or opposite, effects of stress," says Lee Berk, an associate professor at Loma Linda University in California who studies laughter's impact on the brain and body. Berk points out that laughter has been associated with health benefits, including less inflammation and improved blood flow, and that it may improve certain neural activity, leading to improved memory. "Many of these same things also happen when you sleep right, eat right and exercise," he says.

THE MOST ROBUST scientific work on laughter so far involves looking at its impact on relationships and social interactions. Why do people laugh in the first place? Robert R. Provine, a neuroscientist and professor of psychology at the University of Maryland, Baltimore County, studied chimpanzees, man's close evolutionary cousin, to find out. When he tickled chimps, they laughed. But not in the same way people do. For chimps, laughing is more like panting, with short bursts of exhaled air. When Provine

played recordings of chimps laughing for people, they described the sound as anything from dogs panting to people having sex. But none thought it sounded like laughter.

Chimps also make this laughing sound when they are playing and roughhousing with each other. It's their way, says Provine, of declaring that they are not threatening their fellow chimps but are there to have some fun. "I think that's where laughter starts. It's a form of communication that I think is involuntary," he says. "One chimpanzee says to another, 'This is play, and I am not attacking you.' Heavy breathing is chimpanzee laughter. That *pant, pant* became the human *ha, ha*."

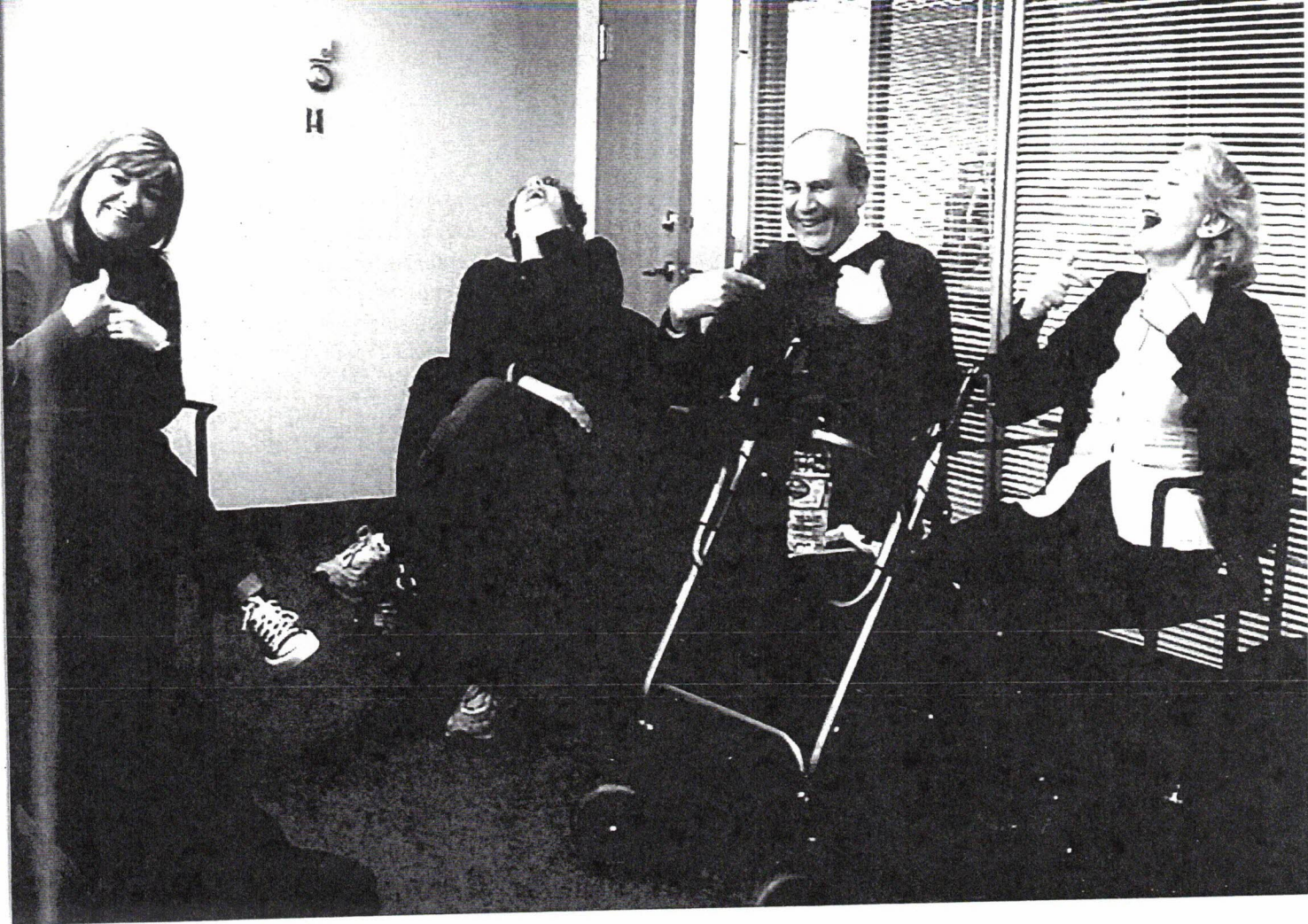
Remarkably, despite the thousands of languages and many thousands more dialects that the human species speak, the sound of laughter is practically universal. Play a track of French people laughing to Mandarin speakers in China, and they will have no problem recognizing it as laughter.

Provine proved this point by making recordings, often surreptitiously, of people laughing in public places. After analyzing all the laughs, he determined that human laughter has at its core a short burst of sound that lasts about 15 milliseconds and recurs every 200 milliseconds. "If everyone laughed in a different way, we wouldn't know what it was," he says of this commonality.

That stereotyping makes a strong case for laughter as essentially a way for animals—and people—to communicate to one another. "We think laughing can draw us closer together to other people and grease the wheels for better social interaction," says Sara Algoe, an associate professor of social psychology at the University of North Carolina at Chapel Hill.

And that's where laughter can affect health. In Algoe's work, she looked at laughter both among people involved in romantic relationships and among strangers. In one study, she and her team video recorded romantic couples who described how they first met. Researchers analyzed the time each person spent laughing and found that couples who laughed more also reported having higher-quality relationships and a better connection with each other. "We were able to show that laughing at the same time as a romantic partner was a really good signal of how the relationship was going," says Algoe. "These people said they felt more as one with their partner and felt more safe and secure."

"Laughter appears to cause all the reciprocal, or opposite, effects of stress," says Lee Berk, who studies laughter's impact on the brain. Among them: improved blood flow and memory.



People with ALS, also known as Lou Gehrig's disease, lose the ability to speak but can often continue to laugh, as demonstrated by these patients at an ALS clinic in Montreal.

To test whether laughter was strong enough to bring strangers together, she had volunteers come into the lab and watch humorous GIFs. The participants were then paired with someone they didn't know, who they were told had watched the same video. In reality, the strangers' laughter had been recorded earlier, and the researchers played the recordings for the study volunteers during either the funny GIFs or the less funny ones. Sure enough, in the same way that the romantic partners felt more in common with each other the more they laughed together, people who thought another person was laughing in sync with them felt they might have more in common with each other. These folks were more interested in spending time with the stranger than with people who weren't laughing at the same time. "That suggests that sharing a laugh can translate to how people might feel connected with each other," says Algoe.

Establishing connection is important for mental health, since study after study shows that people who are lonely or socially isolated tend to experi-

ence more health problems as well as depression and mental health issues. If someone has the capacity to connect to another human through laughter, even if it is just a texting conversation or a one-sided interaction such as watching television, he or she is less likely to feel so solitary.

And because laughter is a form of communication, it's also famously contagious. Algoe found that some partners in the romantic couples laughed just because their partner was laughing, even if they didn't know why. The laughter, she says, may be a way of communicating that you see the world in the same way and want to share the same experiences. Scientists speculate that something called the mirror neuron system may be involved in contagious laughter—it's an unconscious response for the body to mimic what the brain sees. Not surprisingly, this happens more often among people who know each other well, since they are more likely to think and respond in the same way to a shared experience. "It really doesn't matter what [the laughter] is about," says Algoe. "It's

about feeling more similar to someone than if you don't laugh with them."

The same goes for smiling. If a stranger smiles at you, try not to smile back. It's not easy; your brain reads the stranger's smile and wants to mimic it. It's possible that you're trying to pick up on that person's reason for smiling; as a fellow human being, you want to show that you can potentially share in whatever emotions the other person is feeling and empathize. Smiling back at someone you don't know could therefore be a dress rehearsal for times when someone you do know is extremely happy and wants to share his or her joy with you. Being able to read people's facial expressions is a critical part of communicating and connecting with others.

On the more physical side, researchers have documented that laughing changes the body's very chemistry, raising hormones responsible for happy feelings and lowering stress-related hormones. In one recent trial involving 20 healthy older adults, half watched humorous videos, while the other half sat silently for 20 minutes. All the participants then took a short memory test and had their saliva tested for stress hormones. The people who had watched the funny videos scored nearly twice as high on the recall test as those who had sat quietly, and they also showed lower levels of cortisol, the hormone responsible for triggering the body's stress response.

Lower levels of stress hormones can have wide-ranging benefits for the body. Stress is linked to higher blood pressure and a greater risk of heart disease, as well as increased levels of inflammation. Inflammation, or an overstimulation of the body's immune response, is associated with everything from arthritis to degenerative brain conditions like Alzheimer's.

Laughing may also do particularly good things for the heart. Because laughing causes a change in the way you breathe, it forces the heart to pump a little faster and a little harder, which can dilate the blood vessels and increase blood flow to the brain and body. Such changes, according to researchers at the University of Maryland Medical Center, are similar to the improved flow that exercise causes.

What's more, laughing may be a good way to lower pain. Watching comedy videos, for example, has been shown to decrease hospital patients' need for opioid painkillers. One Oxford University study, executed in laboratories and at the Edinburgh Fringe Festival, subjected participants to types of pain—a tightening blood-pressure cuff, a frozen wine-chilling sleeve

placed around the arm—both before and after watching funny videos. (Among them, episodes of *South Park*, *The Simpsons* and *Friends* and clips of Eddie Izzard and other stand-up comics.) The Oxford team concluded that there was a dose-related response to laughter: people who laughed more at the comedies felt less pain later.

Research out of Western Kentucky University has tied laughing to greater numbers and activity of "killer cells," which the immune system deploys to attack disease. In their conclusion, the study's authors suggested that using humor to stimulate laughter could be an effective complementary therapy to decrease stress and improve killer-cell activity in people with viral illnesses or cancer.

But it's important to remember that it's hard to separate out laughter and its effects on the body from other things that may be going on. For example, laughter's benefit to the immune system might be due to its ability to reduce stress. Stress can lead to a drop in certain antibodies and immune cells, so if laughter can lower stress hormones, it might indirectly contribute to a healthy immune system.

And laughing may have an analgesic effect simply by being a distraction; people watching a funny video or listening to a joke are less likely to be thinking about their pain—in the same way that someone having a conversation or singing or doing something else might feel less pain. Provine also points out that since people often laugh in the company of others, it's hard to attribute the health effects—on stress hormones, the immune system and the like—solely to the act of laughing. It's possible, for example, that those benefits are also related to the fact that social interaction and social connection can contribute to healthier minds and bodies.

However it works, scientists stress that, like other human behaviors, laughter and the positive feelings it represents are not the be-all and end-all for health and well-being. "Some of the frenzy over positive psychology can give the impression that we can just be happy all the time," says Robert Waldinger, a Harvard psychiatrist who studies happiness. "But having a positive outlook is a transient thing, just like laughter."

Even if there isn't the hard scientific proof for a prescription for laughter as medicine, researchers do agree that laughter is a rich experience that they are only just beginning to mine on the biological level. And in the meantime, it can make you feel better, so why not laugh a little more? □

13 Things You Probably Don't Know About Laughing

By Sally Wadyka



1. Contrary to popular belief, the No. 1 catalyst for laughter isn't a joke: it's interacting with another person.
2. Just listening to recorded laughter can evoke fits of giggles in subjects, according to research. In fact, a person is 30 times as likely to laugh when someone else is around as when he or she is alone.
3. The ideal number of words in a joke? 103.
4. Often what makes us laugh is when our brain is expecting one thing and then, in the space of a few words, that expectation is turned on its head, says Scott Weems, a research scientist at the University of Maryland, College Park, and the author of *Ha!: The Science of When We Laugh and Why*.
5. Ten to 15 minutes of daily laughing burns 10 to 40 calories.
6. Our appreciation for the unexpected starts as early as infancy, although on a very basic level. "Parents will notice that they can elicit a giggle from their baby by making a funny face, talking in a funny voice or playing peekaboo," says Merideth Gattis, a psychologist at Cardiff University in Wales.

7. Geography often plays a role too, says British psychologist Richard Wiseman. Americans, for example, tend to like jokes that include a sense of superiority. (Texan: "Where are you from?" Harvard grad: "I come from a place where we do not end our sentences with prepositions." Texan: "OK, where are you from, jackass?") Europeans tend to laugh at topics that are anxiety producing. (A patient to his doctor: "Last night I made a Freudian slip. I was having dinner with my mother-in-law and wanted to say, 'Could you please pass the butter?' But instead I said, 'You silly cow. You have completely ruined my life.'") In Japan, laughter is tied to the humorless samurai, the ruling warrior class that ruled the country for centuries. They took timing quite seriously and had little time for shameful comedy. "You are laughing at me, so I kill you," according to *The Humor Code*, a study of humor around the world.
8. An adult laughs an estimated 15 to 20 times a day.
9. "The same pleasure sensors in the brain that are activated when we eat chocolate become active when we find something funny," says Weems. "It's a natural high." In fact, a 2003 brain-scan study

published in the journal *Neuron* found that the dopamine reward centers and pathways in the brains of subjects lit up when they were treated to a funny cartoon but not when they were shown an unfunny version.

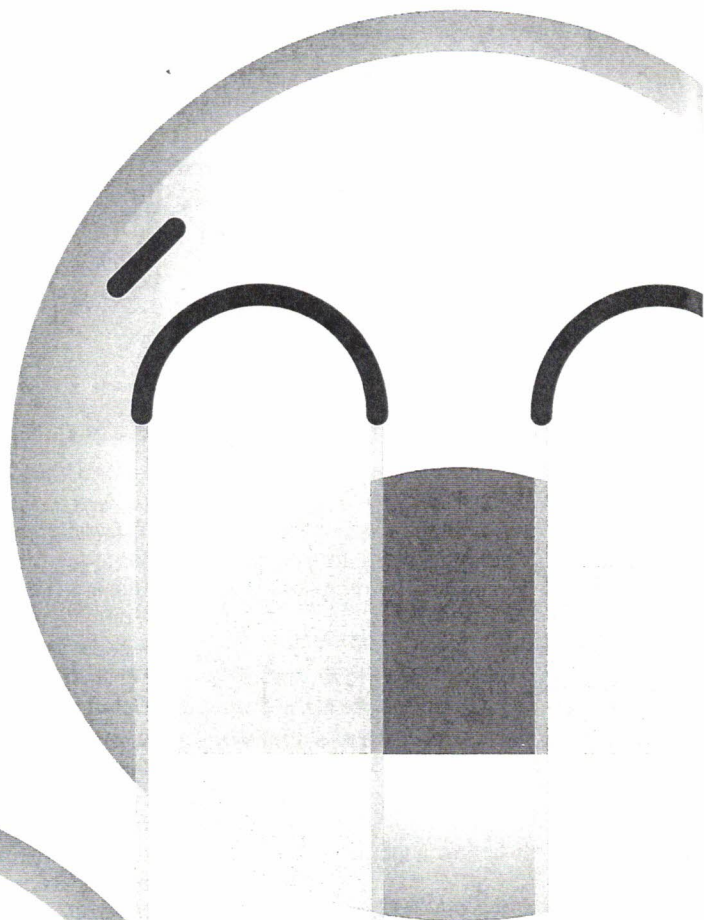
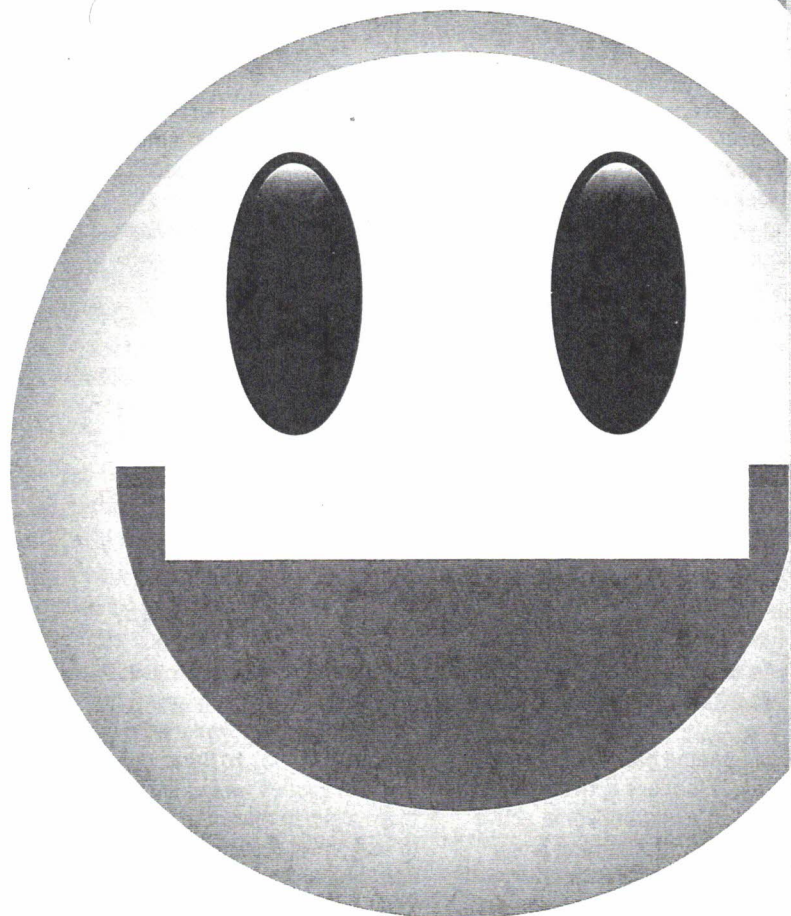
10. After a good, hearty laugh, your muscles will stay relaxed for up to 45 minutes.
11. A typical 10-minute conversation has an average of 5.8 bouts of laughter.
12. No sense of humor? Fake it. The human brain is unable to distinguish spontaneous laughter from self-induced, so pretending to laugh can produce the same health-related benefits as the real thing, according to a 2010 report in *Alternative Therapies in Health and Medicine* by Ramon Mora-Ripoll.
13. While humor is quite subjective, some things can make almost everyone laugh. Professor Sophie Scott, a British cognitive neuroscientist and stand-up comic, found that one of the best ways for getting people in her lab to break out in fits of giggles was to show them a clip of others trying not to laugh in a situation where it would be highly inappropriate to do so. □

Laughing and Crying: The Same Release?

**Some physiological
differences between the two**

By Courtney Mifsud

IN HER 1974 SONG "PEOPLE'S PARTIES," JONI Mitchell sang that laughing and crying are the same release. The assumption is not an uncommon one, but physiology paints a different picture. When you laugh, your body is both shutting down the release of stress hormones and releasing feel-good endorphins. When you cry so-called psychic tears, on the other hand, your body is reacting to intense emotions and the fight-or-flight response kicks in.



Laughing

Teasing the Brain

Laughter starts with a punch line or surprising ending to a thought, which forces the brain to interpret the surprise and problem-solve. Once the punch line is accepted and the brain registers humor, "the body sends a signal to the brain that says, 'Hey, that's clever, that's worth it,' and we laugh," says social neuroscientist Carl D. Marci.

Amazing Limbic Moves

The limbic system, in the center of the brain, is the same real estate that processes feelings like hunger and fear. You hear a joke or see something amusing and the limbic system is triggered. The motor region of the brain is stimulated.

The One-Two Punch

The muscles of the face begin to contract. Fifteen of them jump into action, including the zygomatic major, which lifts your upper lip. At the same time, your epiglottis, a flap at the entrance of the larynx, closes the passage to your lungs, which disrupts air intake and makes you gasp.

"Killer" Cells

When a good belly laugh disrupts the respiratory system, you begin to breathe diaphragmatically to help the release of air. As the diaphragm pumps lymphatic fluid through your system, lymph nodes filter out waste and trigger the production of white blood cells, which kill infected cells. This in turn strengthens the immune system.

Feeling Good

Laughter both helps shut down the release of cortisol, a harmful stress hormone, and releases endorphins, the brain chemicals known for their feel-good effect. It's not the joke that sets the reaction in motion but the physical act of emitting a hearty "ha, ha"—just as with exercise.

Crying

Typecasting

There are three kinds of tears: basal, which keep your eyes moist and nourished; reflex, which wash out irritations like onion fumes; and psychic or emotional tears, the ones that you shed when you're stressed, angry, happy or in pain. Psychic tears contain a natural painkiller, called leucine enkephalin, and can help boost your mood and relieve physical and psychic aches.

Danger Ahead

Your body processes intense emotions as a sign of danger. The amygdala, an emotion-processing component of the brain, sends a sign, and the fight-or-flight response kicks in. This is the body's way of keeping you out of harm's way, and salty tears are central to the body's strategy: they mean blurred vision, not ideal for battle. But if you do risk it, the viscous drops coat the eye, acting like shields.

The Messenger

The hypothalamus is the part of the brain responsible for motivational behavior—it lets us know if we are hungry or thirsty, for example. When you experience an emotional moment, the hypothalamus produces a chemical that signals the lacrimal glands in the eyes, just beneath the rims. These glands produce tears.

Go with the Flow

It may be hard, but resist the temptation to hold back the tears. When you cry, your brain releases endorphins, which act like pain relievers to boost your mood.

Contradiction?

The hypothalamus can't tell the difference between which kind of emotions are "good" and which are "bad," which is why many may cry at a happy moment, like a wedding or when receiving some good news. □