The Science of Humor Is No Laughing Matter

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In 1957, the BBC aired a short documentary about a mild winter leading to a bumper Swiss spaghetti crop in the town of Ticino. In a dry, distinguished tone, BBC broadcaster Richard Dimbleby narrates how even in the last few weeks of March, the spaghetti farmers worry about a late frost, which might not destroy the pasta crop but could damage the flavor and hurt prices. The narration accompanies film footage of a rural family harvesting long spaghetti noodles from trees and laying them out to dry “in the warm Alpine sun.”

Naturally, the hundreds of people who called the BBC asking where they could get their own spaghetti bushes hadn’t noticed the air date of the news clip: April 1st. The prank was so successful that even some BBC staff were taken in, leading to some criticism about using a serious news show for an April Fool’s Day joke.

Why April 1st became a holiday devoted to pranks and laughter remains a mystery, although some historians trace it back to the Roman holiday of Hilaria. Humans start developing a sense of humor as early as 6 weeks old, when babies begin to laugh and smile in response to stimuli. Laughter is universal across human cultures and even exists in some form in rats, chimps, and bonobos. Like other human emotions and expressions, laughter and humor provide psychological scientists with rich resources for studying human psychology, ranging from the developmental underpinnings of language to the neuroscience of social perception.

The Hidden Language of Laughter

Theories focusing on the evolution of laughter point to it as an important adaptation for social communication. Studies have shown that people are more likely to laugh in response to a video clip with canned laughter than to one without a laugh track, and that people are 30 times more likely to laugh in the presence of others than alone.

“The necessary stimulus for laughter is not a joke, but another person,” writes laughter expert and APS

Fellow Robert R. Provine, professor emeritus at University of Maryland, Baltimore County, in an article in *Current Directions in Psychological Science*.

Just look at the canned laughter in TV sitcoms as an example: The laugh track has been a standard part of comedy almost from the birth of television. CBS sound engineer Charley Douglass hated dealing with the inappropriate laughter of live audiences, so in 1950 he started recording his own "laugh tracks." These early laugh tracks were intended to help people sitting at home feel like they were in a more social situation, such as sitting at a crowded theater. Douglass even recorded varying types of laughter, including big laughs and small chuckles, as well as different mixtures of laughter from men, women, and children.

In doing so, Douglass picked up on one of the qualities of laughter that is now interesting researchers: A simple "ha ha ha" communicates an incredible amount of socially relevant information.

For example, a massive international study conducted in 2016 found that across the globe, people are able to pick up on the same subtle social cues from laughter. Samples of laughter were collected from pairs of English-speaking college students — some friends and some strangers — recorded in a lab at the University of California, Santa Cruz. An integrative team made up of more than 30 psychological scientists, anthropologists, and biologists then played audio snippets of this laughter to 966 listeners from 24 diverse societies spanning six continents, from indigenous tribes in New Guinea to urban working-class people in large cities in India and Europe. Participants then were asked whether they thought the two people laughing were friends or strangers.

On average, the results were remarkably consistent across all 24 cultures: People's guesses about the relationship between the laughers were correct approximately 60% of the time.

Researchers also have found that different types of laughter can serve as codes to complex human social hierarchies. Across the course of two experiments, a team of psychological scientists led by Christopher Oveis of University of California, San Diego, found that high-status individuals had different laughs than low-status individuals, and that strangers' judgments of an individual's social status were influenced by the dominant or submissive quality of the person's laughter.

"Laughing in the presence of others indicates the interaction is safe," the researchers explain. "While the norms of most social groups prevent direct, unambiguous acts of aggression and dominance, the use of laughter may free individuals to display dominance because laughter renders the act less serious."

In the first study, the researchers wanted to know whether high- and low-status individuals actually do laugh differently.

To test this, 48 male college students were randomly assigned to groups of four, with each group composed of two low-status members ("pledges" who had just joined a fraternity a month earlier) and two high-status members (older students who had been active in the fraternity for at least 2 years).

Laughter was recorded on video as the group members engaged in a teasing task. Each member of the group took a turn in the hot seat, receiving light teasing from his peers. The teasers came up with a nickname based on randomly generated sets of initials (e.g., L. I. became "Loser Idiot") and then told

joking stories about why they chose the nickname.

One team of coders (naïve to the study hypotheses) identified all of the instances of laughter in the video, and a second team of coders (also blind to the study hypotheses) watched the video and rated how submissive or dominant each laugh sounded using a scale of ?3 (definitely submissive) to 3 (definitely dominant). Laughs receiving average ratings of 2 or higher were classified as dominant, whereas laughs receiving average ratings of ?2 or lower were classified as submissive.

A third team of coders, also blind to the hypotheses, coded the audio of each laugh on specific sound characteristics — loudness, pitch, pitch range, pitch modulation, airiness, and burst speed — that are associated with disinhibited behavior.

“If dominant laughs are more disinhibited than submissive laughs, as we hypothesize, they should exhibit greater vocal intensity, more pitch range and modulation, and greater burst speed,” Oveis and colleagues explain.

The analysis revealed that, as predicted, high-status fraternity brothers produced more dominant laughs and fewer submissive laughs relative to the low-status pledges. Dominant laughter was higher in pitch, louder, and more variable in tone than submissive laughter. In this regard, dominant laughter appears to share some of the features researchers have identified in genuine (compared with fake) laughter: greater irregularities in pitch and loudness and faster bursts of sound.

Previous research published in *Psychological Science* demonstrated that holding a position of power can influence the acoustic cues of our speech. The voices of individuals primed with high-power roles tended to increase in pitch and were, at the same time, more monotone. Listeners who had no knowledge of the experiment were able to pick up on vocal cues signaling status: They correctly rated individuals in the high-power group as being more powerful with a surprising degree of accuracy — about 72% of the time.

Findings from the fraternity-brother experiment also showed that low-status individuals were more likely to change their laughter based on their position of power; that is, the pledges produced more dominant laughs when they were in the “powerful” role of teasers. High-status individuals, on the other hand, maintained a consistent pattern of dominant laughter throughout the teasing game regardless of whether they were doing the teasing or being teased themselves.

In another study, the research team tested out whether naïve observers could detect an individual’s social status based just on their laughter, and whether the type of laugh (dominant or submissive) could influence judgements of social status.

A group of 51 college students was randomly assigned to listen to a set of 20 of the laughs recorded from the fraternity brothers. Each participant listened to an equal number of dominant and submissive laughs from both high- and low-status individuals. Participants then estimated the social status of the laugher using a series of 9-point ratings scales. And indeed, laughers producing dominant laughs were perceived to be significantly higher in status than laughers producing submissive laughs.

“This was particularly true for low-status individuals, who were rated as significantly higher in status

when displaying a dominant versus submissive laugh," Oveis and colleagues note. "Thus, by strategically displaying more dominant laughter when the context allows, low-status individuals may achieve higher status in the eyes of others."

However, regardless of whether raters heard a dominant or a submissive laugh from a high-status individual, they rated that person as being relatively high in status.

It's unclear whether this was because high-status laughs include characteristics that were not measured in the current study or whether high-status fraternity brothers just didn't have very convincing low-status laughs while being teased.

Too Soon?

When it comes to comedy, it's often a thin line between love and hate. What qualities make something funny (or not) is a question that philosophers have been attempting to answer for thousands of years. But a pair of psychological scientists have come up with a theory that explains why we might laugh at a dark joke about murder as well as a silly pun or play on words.

Psychological scientists Peter McGraw (University of Colorado, Boulder) and Caleb Warren (University of Arizona) propose that negativity is an intrinsic part of humor — without violating a norm or rule of some kind, a joke just isn't funny. But violations can't stray too far; otherwise, they become unappealing or even disgusting and upsetting. According to the researchers' Benign Violation Theory, a violation is humorous when it breaks a rule or norm but is benign.

McGraw and Warren's Humor Research Lab (HuRL) has conducted several studies examining the exact criteria that cause us to perceive a comedic situation as benign or not. Along with the severity of the norm violation, a sense of psychological distance from the violation — by space, time, relationships, or imagination — is a key ingredient for turning an unpleasant situation into a humorous one, they posit.

For example, in a study published in *Psychological Science*, the researchers looked at the effect of psychological distance in terms of time. Inspired by the classic Mark Twain quote, "Humor is tragedy plus time," the research team investigated how the passage of time can influence one's perception of an event as funny or painful.

"If distance increases the humor in severe violations (i.e., tragedies), but decreases the humor in mild violations (i.e., mishaps), then autobiographical events that get funnier over time should feature more severe violations than those that get less funny over time," the researchers write.

One study found that the events from people's lives that became funnier over time were more severe events (like a car accident), while events that lost their comedic effect over time were seen as minor violations (like stubbing a toe).

Another study examined distance by manipulating whether an image was seen as hypothetical or real. A group of 67 students was asked to rate the humor of images from a website. Those in the *close* condition were told they would be looking at real photos that "have not been altered using image design software"; participants in the *distant* condition were told they would be viewing "fake pictures" that

“have been altered using image design software.”

One picture portrayed a severe abnormality: a Cronenbergian image of a man sticking a finger up through his nose out of his eye socket. The other portrayed a mild abnormality — a man with large icicles hanging from his frozen beard. Using a 6-point scale, participants rated how funny they thought the photos were.

The students rated the more disturbing image of the empty eye socket as more humorous when they were told it was fake, and they reported the less disturbing frozen-beard image as more humorous when they thought it was real.

“These findings suggest that there’s a real sweet spot in comedy — you have to get the right mix between how bad something is and how distant it is in order for it to be seen as a benign violation,” McGraw said.

The Energizing Effect of Humor

Having trouble finishing a project on deadline? Well, put down that Red Bull and head over to YouTube. No joke — watching funny cat videos at work may not be such a bad thing after all. A study conducted by Australian National University management professors David Cheng and Lu Wang suggests that exposure to humorous stimuli may actually help people persevere in completing tedious tasks.

Across two studies, Cheng and Wang found that people who watched a funny video clip before a task spent approximately twice as long on a tiresome task compared with people who watched neutral or positive (but not funny) videos.

Prior research has found that humor can help facilitate recovery from stressful situations, even prolonging people’s tolerance for physical pain. In the business world, many successful organizations such as Zappos, Virgin, and Google deliberately build play areas into their workspaces and organize fun events to ameliorate the stressful nature of work, boost morale, and increase productivity.

Indeed, in a 2007 article published in *Current Directions in Psychological Science*, APS William James Fellow Roy F. Baumeister (Florida State University), APS Fellow Kathleen D. Vohs (University of Minnesota), and APS Fellow Dianne M. Tice (Florida State University) point to humor as a factor that can moderate or counteract the effects of mental depletion.

In line with this idea, Cheng and Wang hypothesized that humor may provide a respite from tedious situations in the workplace. This “mental break” might not only prevent work-related depletion, but also might facilitate the replenishment of mental resources, ultimately allowing people to persist longer on difficult tasks.

To test this theory, for their first study the researchers recruited 74 students studying in a business class to come into the lab, ostensibly for an experiment on perception. First, the students performed a mentally depleting task in which they had to cross out every instance of the letter “e” contained in two pages of text. The students then were randomly assigned to watch a video clip eliciting either humor,

contentment, or neutral emotions.

For the humorous video, students watched a clip of the BBC comedy “Mr. Bean.” In the contentment condition, participants watched a scene with dolphins swimming in the ocean. The students in the neutral condition were treated to an 8-minute video about the management profession designed for students studying business. Immediately after watching the videos, participants reported their responses to a list of 16 discrete emotions (e.g., amusement, anger, disgust) using a 7-point scale.

Then the students completed a persistence task in which they played what amounted to an unwinnable game. The students were asked to guess the potential performance of employees based on provided profiles and were told that making 10 correct assessments in a row would lead to a win. However, the computer software was programmed such that it was nearly impossible to achieve 10 consecutive correct answers. Participants were allowed to quit the task at any time.

Students who watched the humorous “Mr. Bean” video clip ended up spending significantly more time working on the task, making twice as many predictions as the other two groups.

Cheng and Wang then replicated these results in a second study, during which they had participants complete long multiplication questions by hand. Again, participants who watched the humorous video spent significantly more time working on the task and completed more questions correctly than did those who did not watch the funny video.

“Although humor has been found to help relieve stress and facilitate social relationships, the traditional view of task performance implies that individuals must concentrate all their effort on their endeavors and should avoid things such as humor that may distract them from the accomplishment of task goals,” Cheng and Wang conclude. “We suggest that humor is not only enjoyable but more importantly, energizing.”

Kathleen D. Vohs will speak at the 2017 APS Annual Convention, May 25–28, in Boston, Massachusetts.

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