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HEALTH & WELLNESS

Why Does Zoom Exhaust You? Science Has an Answer

On video calls, looming heads, staring eyes, a silent audience, and that millisecond delay disrupt normal human communication



What's behind 'Zoom fatigue'? The answer lies in the interplay of technology, social science and biology.

PHOTO: GETTY IMAGES

By [Betsy Morris](#)

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Tammy Sun, the quintessential Silicon Valley tech entrepreneur, fired off an uncharacteristically low-tech Tweet recently. "Zoom fatigue has me wanting a landline and a

rotary phone,” wrote the founder and CEO of Carrot, a startup that provides fertility benefit plans for companies.

Ms. Sun likes Zoom a lot. In fact, she says she’s a “power user,” spending nine out of 10 conversations on it, six days a week. The hours aren’t the problem, she says, it’s the real-time image of herself on the Zoom grid, reflecting her every move as if she were in front of a mirror. “I’m flat-out not used to that,” she says.

The affliction that’s come to be known as “Zoom fatigue” is way more than a byproduct of too many meetings. Social scientists say it’s the result of the sudden mass adoption of technology that’s disrupting the normal, instinctual and finely-tuned way of communicating that developed to help humans survive.



Tech entrepreneur Tammy Sun says she is a Zoom ‘power user.’ She finds it exhausting but says the video conferences are critical to her business.

PHOTO: TAMMY SUN

“We’ve evolved to get meaning out of a flick of the eye. Our species has survived because we can produce those signals in a way that’s meaningful,” says Jeremy Bailenson, professor and director of Stanford University’s Virtual Human Interaction Lab. “Zoom smothers you with cues, and they aren’t synchronous. It takes a physiological toll.”

Before the pandemic, Zoom was barely known to the public. The 9-year-old company served mainly businesses, hosting lots of webinars and training. In recent months, it has become a staple in many households, growing from 10 million people attending meetings at the end of last year to 300 million in April.

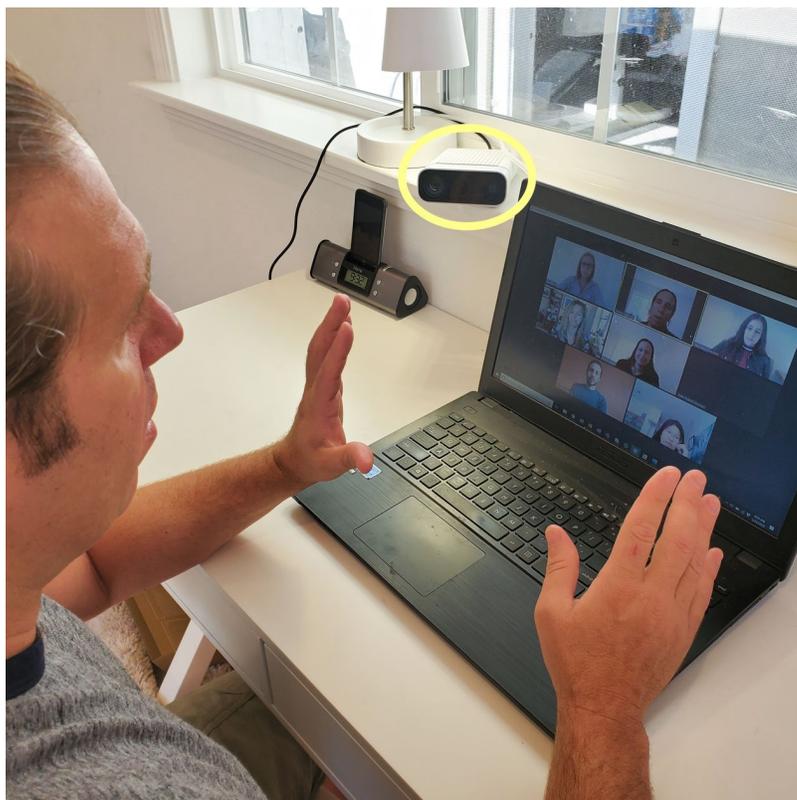
It has connected friends and families, and kept businesses going. It’s unclear how much it’s been hurt by its recent trouble protecting data privacy or preventing trolls and hackers—problems it has said it would fix. It has taken off, overshadowing competitors like Cisco Webex, Microsoft’s Skype, Apple’s FaceTime and Google Meet, because it was built explicitly to make video conferencing easier and more intuitive. Because Zoom had a basic service that was free

and could handle meetings of 100 people, it became a gathering place for those that coronavirus prevented from meeting in person.

So what explains the widespread love-hate with Zoom? The frustration isn't unique to it. Many of the annoyances about video conferencing stem from the fact that it's not as perfect as person-to-person.

Video conferencing has become an essential communication tool for businesses, education and personal connections during the pandemic, a spokeswoman for Zoom said in a statement. "While for some the transition has been seamless, for others it's become challenging," she said, noting that people who were used to going to meetings or classes in various locations are now tethered to their homes. "We're all learning this new way of communicating and adjusting to the blurred lines between work and personal interactions," she said. "It's clear that people miss human interaction that has been limited due to the shelter in place."

There's little research—experiments are in the dozens, not hundreds—on groups of people doing live videoconferences, Dr. Bailenson says. His department has launched a large-scale study of how they affect users. Past research on media and human behavior sheds light on what underlies the so-called Zoom fatigue.



Jeremy Bailenson meets by Zoom with colleagues at Stanford University's Virtual Human Interaction Lab. Highlighted in yellow is a 3D camera that can measure nonverbal behavior.

PHOTO: PHOTO ILLUSTRATION BY STANFORD VIRTUAL HUMAN INTERACTION LAB



The camera creates a 'depth map' of a person participating in a Zoom meeting. From the data, researchers can learn more about how people communicate during a video conference.

PHOTO: STANFORD VIRTUAL HUMAN INTERACTION LAB

Communication is an exquisite interplay of talk, gestures, movement and timing between people that scientists call synchrony. This complex interaction is so basic that researchers who discovered it between adults later found it happens in newborns—an infant's movements synchronize with the speech of its caretaker as early as the first day of life.

The synchrony found in face-to-face communication is possible over video in ideal circumstances, according to a yet-unpublished dissertation by Jingjing Han, who recently received a doctorate in media arts and sciences from Indiana University. But she too finds Zoom to be exhausting. She suspects that's because humans are driven to achieve synchrony and work hard cognitively to achieve it. On Zoom, "we are working very hard to synchronize with each other," she says. That will be the next phase of her research.

Zoom and other video-conference services present many communication pitfalls—an inability to read body language, faces that move into different spots on the screen, a chat feature to accommodate side comments and transmission delays that hinder turn-taking. "You are always making a judgment about how much to speak and when it's appropriate," says Steve Harrison, associate professor at Virginia Tech and director of its Human-Centered Design Program.

With so little non-verbal and real-time feedback, it's difficult to tell if people on the other end of the video line are with you. "Ask a question and there's silence. You feel like you're talking to

empty air,” says Keeley Sorokti, director of knowledge sharing at the Chicago-based nonprofit Ounce of Prevention Fund.

Another source of stress, researchers have found, is that a mirror or video camera trained on study subjects causes them to see themselves the way they think others do. “When you look in a mirror, what you tend to see is your objective self,” says Amy Gonzales, assistant professor at UC Santa Barbara who studies media and identity. “I guess my nose is kind of big. Maybe I do need some wrinkle cream.” Zoom says it offers a control to block the mirror image.

Images of framed heads of varying sizes are disconcerting, as are the giant faces of speakers. Audiences are particularly sensitive to images of people, especially when they are too big and too close. In an early study of physiological responses to media, researchers at Stanford found that larger screens—56 inches compared to 13 inches—activate the sympathetic nervous system associated with the fight-or-flight response—likely in part because they made images look closer and more threatening.

On Zoom and other services a speaker can seem uncomfortably close and gazing, users say. A body of research on eye contact, a potent social cue, indicates that can be disturbing. In an early study, participants were monitored by EEG as they were stared at from distances of two to 32 feet. Electrical brain activity reflects biochemical changes that can stimulate a range of physiological states including high alert and fight-or-flight. In this study, the brain activity of the participants peaked when the researcher stared directly into their eyes from a distance of two feet.

On video, the biochemistry of communication likely changes in other ways. Studies indicate that face-to-face conversation results in the release of neurotransmitters like dopamine, linked to feelings of pleasure, and the hormone oxytocin, according to Susan Pinker, a psychologist who writes a column for The Wall Street Journal. Oxytocin, a byproduct of synchrony, facilitates communication. Studies of biochemical reactions that occur while communicating by text, social media and telephone suggest “we get more biochemical bang for our buck during face-to-face contact because it offers a richer stream of social signals,” she says.

Zoom has replaced the conference table, which has scrambled the office pecking order. That too is disorienting. “On Zoom, you might have the power seat at the conference table but you really

don't know," says Steve Harrison, associate professor at Virginia Tech and director of its Human-Centered Design Program. "There's no way to control your location."

What lands somebody in the top left of the grid? Dr. Bailenson thought it was the person who called the meeting until two of his students kept beating him to the top spot. They told him that power position went to the first to arrive. Dr. Harrison believes it's the algorithm that decides.

Zoom says the order of the grid is first-come first-served depending on when people join with video turned on. If a user turns off the video, he or she goes to the end of the line. If a group is too big to fit on a page, Zoom tries to move the most recent speaker onto the first page to replace a less active speaker.

Dr. Harrison believes this could change a lot about office politics, especially if video conferencing becomes the de facto office meeting as more companies say they plan to have workers work from home. "How do you become a valued team member on Zoom?" Dr. Harrison asks. "Will the notion of leadership be distorted by the people who are able to manipulate the medium?"

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SHARE YOUR THOUGHTS

Have you experienced 'Zoom fatigue' with the increase in video-conferencing? Join the conversation below.

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