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Too many video conferences can lead to what is now nicknamed "Zoom fatigue."

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SCIENCE CORONAVIRUS COVERAGE

# 'Zoom fatigue' may be with us for years. Here's how we'll cope.

New research shows how employers and tech companies can maintain the positive aspects of remote work while reducing the psychological drain, particularly for women.

BY THERESA MACHEMER



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Video conferencing tools have become the default platforms for socially distanced human interaction, especially for many people who once worked in offices. Some companies are now making commitments to offer remote work as an option even after the pandemic ends. But after more than a year of living and working online, society is grappling with the unique exhaustion, nicknamed "Zoom fatigue," that follows a long day of video conferencing.

New research published today offers some of the first data-backed conclusions about Zoom fatigue and provides a broad look at the causes. It also shows that the weight of Zoom fatigue is not equally distributed. In a survey of more than 10,000 people, described online today on the research-sharing platform known as SSRN, women reported experiencing about 13.8 percent more Zoom fatigue than men, on average.

First author Géraldine Fauville, an expert in virtual reality and communication at the University of Gothenburg in Sweden, says that one role of science is to help identify these kinds of inequities, "and then, based on the science, society and companies can use that knowledge to address these issues."

For instance, her team's work shows that long days full of calls with few breaks can cause Zoom fatigue. The self-view video, the crowd of faces on the screen, the expectation to stay in view of the camera, and the lack of nonverbal cues all tax the brain, as well. Now, by knowing what's triggering the problem, there are steps both managers and technology creators can take to ease the burden.

## **A year of adaptation**

There's no doubt that remote working has its perks: no commutes, flexibility to handle household tasks, and easy access to conferences for all workers, including those with disabilities. Teleworking has also made critical pandemic-related work possible. In San Francisco, Andrea Nickerson trains COVID-19 case investigators—the people who conduct contact tracing—through weekly classes on Zoom.

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On a busy day, she might spend five or six hours in video conferences. It's rare for her to have none at all. "At the end of the day, the thing that I want to do most is just close my computer and tuck it into a place where I don't even have to look at my computer," says Nickerson.

When people began having widespread conversations about Zoom fatigue, the scientists who specialize in the interactions between humans with technology began to study the phenomenon in earnest.

First, they created a tool to measure fatigue, which they named the Zoom Exhaustion and Fatigue Scale, or ZEF. Then they created a public survey and gathered over 10,000 responses that measured peoples' fatigue on the ZEF scale, alongside statistics about how long each person spends on Zoom and demographic information.

The data confirmed what many may have already suspected: Spending more time on video calls, with less transition time between each call, will cause more Zoom fatigue. The results also identified four factors that teleworkers have to contend with when using video conferencing.

First, the lack of nonverbal cues is stressful because people cannot naturally convey or interpret gestures and body language when just their colleagues' shoulders and heads are visible. People might overcompensate by exaggerating their own gestures, like raising a dramatic thumbs-up, while they simultaneously struggle to understand their colleagues' moods.

During video calls, people report feeling trapped in one spot so they can stay within view of the webcam, increasing stress levels.

Many video conferencing tools default to showing users their own video window, and the researchers found that this constant, real-time reflection can cause what's known as mirror anxiety. This condition is a stressful self-consciousness that causes distractions and that has been linked to increased anxiety and depression.

Finally, the paper describes "hypergaze," an intense feeling that the other people on the call are staring at you, because the video conferencing display shows everyone looking toward their cameras no matter who their focus is actually on. It's even worse in one-on-one meetings, when your colleague's face appears so large on the screen, it's as if they are standing less than two feet away.

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"This kind of physical proximity that is mimicked by video conference is perceived by the brain as a situation that would lead either to mating or to conflict," says Fauville. "This is very intense for the brain."

## **Differences and discrepancies**

According to the survey, women spent more time per day in meetings, with shorter breaks between them, than men. They also reported greater levels of mirror anxiety and felt more trapped by their video calls—the two strongest predictors of high Zoom fatigue.

"Previous researchers have shown that [mirror anxiety] seems to apply more to women than men. So that's also one of the reasons why we decided to look at gender," says Fauville. But as for why women feel more trapped in place during calls, she says, "we don't know. And it's kind of the next step, understanding the roots of these mechanisms."

The survey also showed that people of color tended to report higher Zoom fatigue than white people, although the effect is much smaller than the difference accounted for by gender.

The paper has not yet been peer-reviewed, but it is “excellent methodologically ... It's based on very sound theory,” says [Rabindra Ratan](#), an expert in human-technology interaction at Michigan State University who was not involved with the study.

Many questions remain about the psychological impacts of teleworking and connecting with others through video conferences. So far, there is little data-backed research about how people with disabilities have been impacted by the broad uptake of teleworking, for example. But because the ZEF scale is freely available for other scientists to use, and work is underway to translate it into more languages, Fauville hopes that researchers will be able to apply it to their own future research.

## **Flexibility and connection**

Anecdotally, at least, there do seem to be benefits from using this kind of technology to work from home.

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Ratan moved to California during the pandemic because he could conduct research and classes virtually. Both he and Fauville have also found that during the pandemic, it has been easier to collaborate with international colleagues, because people no longer feel awkward starting long-distance conversations.

For many, the benefits of remote work go beyond newfound convenience. The destigmatization of remote work meant that Zahra Khan, a systems engineer in Southern California, could find a remote job that allows her to manage the symptoms of her disability, which affects her hearing and energy levels. Khan uses video calls for about three or four hours a day on Google Hangouts, which offers auto-captioning. She also has the flexibility to take medication or rest as necessary.

“It has been much better in terms of managing my energy levels and managing my health symptoms, and even keeping hydrated,” says Khan. “And it's something that I wanted at my last job, but it wasn't available.”

The speed with which employers figured out how to host remote workspaces last spring prompted the creation of the [“DisabledAndSaltyAF”](#) hashtag on Twitter. People with disabilities used the hashtag to share stories of times that employers pushed them out of workplaces by refusing to provide remote work as an accessible accommodation. The shift to remote work during the pandemic seems like proof that those accommodations could have been provided all along.

Now, people are worried about what might happen when restrictions lift and people without disabilities feel comfortable going out in person again.

“As soon as things start to go ‘back to normal’ a lot of this might go away,” says Khan. “And that is very scary.”

## **Solutions for the future**

Moving forward, employers may take a hybrid approach when it is safe to return to in-person work. Office culture could become more accommodating, allowing some people to physically attend meetings while others join by video or phone. And the new findings point toward solutions that both workers and managers can use to prevent Zoom fatigue.

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Fauville has purchased a standing desk to reduce the feeling of being trapped by allowing more natural movement while attending video calls. To reduce eye strain, which is one measurable effect of Zoom fatigue on the ZEF scale, Nickerson uses an orange filter on her screen.

But Fauville emphasizes that “the responsibility of addressing Zoom fatigue should not be placed on individuals, since that could just intensify inequity.”


Instead, the researchers hope that employers will use the results to create standard policies that protect everyone from Zoom fatigue. They could require one day per week to be video call-free, require 10-minute buffers between meetings, or carefully consider what tool to use for a meeting. Sometimes, video conferencing is the best tool because it offers auto-captioning, screen sharing, or a social presence. But often, a phone call, text, or email will suffice.

Video conferencing companies can also change their tools to reduce Zoom fatigue.

“The easiest fix is to make it so the self-mode is not so prominent,” says Jeremy Bailenson, a lead author on the SSRN study and the founding director of Stanford University's Virtual Human Interaction Lab. He suggests that, by default, the self-view should disappear after a few seconds to reduce mirror anxiety.

Bailenson adds that video conferencing companies could also address hypergaze by calculating the perceived distance between the user and their video-calling partner, then limit the maximum display size of heads on the screen.

Zoom fatigue could continue to plague remote workers, especially women and people of color, depending on the choices that companies make to prevent it, says Ratan. But he adds that people seem more accepting of telework than ever before.

“We've been pushed forward 10 years, maybe, in terms of progress toward using some of these remote work and education and healthcare technologies in general. So I think society is ready for this.” 

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