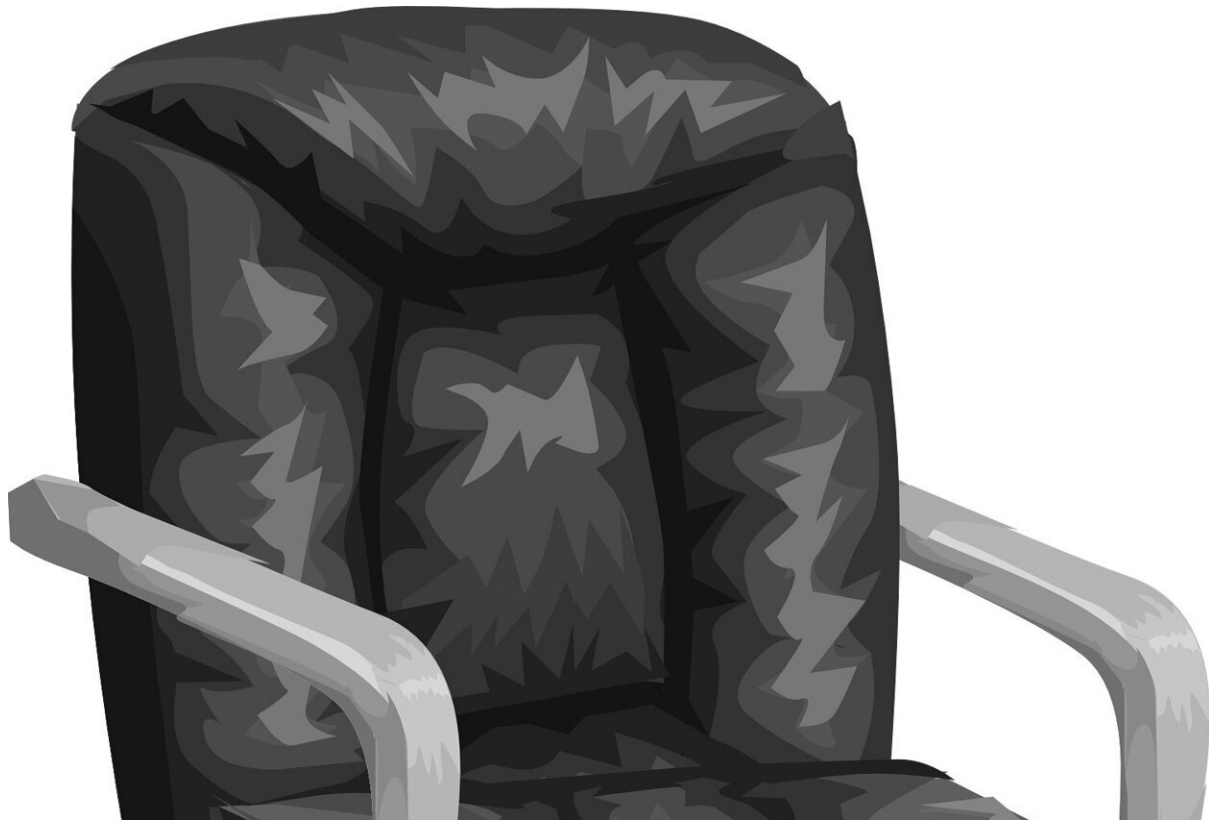


Blinking on a quiz show offers clues to human response under stress

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Quiz shows, where contestants answer rapid-fire questions in a high-stress, high-stakes environment, are an integral part of TV programming—and now they are demonstrating that they have research

value.

By analyzing contestants' behavior and patterns of blinking on the British TV show "Mastermind," [cognitive scientists](#) at the University of Arizona have studied [human physiology](#) under conditions of stress that would be impossible to reproduce in the lab.

The results were [published](#) in the journal *Psychophysiology*.

"This is a dream I've had for a long time—to try to get physiological information out of video signals," said Robert Wilson, senior author on the paper, who is an associate professor in cognition and neural systems at the UArizona Department of Psychology, in the College of Science.

On "Mastermind," contestants sit in a big leather chair, Wilson said, answering rapid-fire questions under the glare of spotlights as a camera slowly zooms in on their face. The [bright lights](#) and slow camera work make it easy to identify blinks, and the stress of being interrogated on national TV cannot be re-created under lab conditions, he said.

"This is a feasible method for doing video-based neuroscience in outside-the-lab conditions so that we can get into situations that are closer to real-world scenarios," said Skyler Wyly, the lead author of the study, who began this work as an undergraduate at UArizona and is now a doctoral student at Duke University.

How blinking is related to cognitive effort still needs to be explored, especially in real world tasks, Wilson said. However, he mentioned that there is a hypothesis that the more stressed humans are, the more they blink.

"We are yet to know about all the [cognitive processes](#) that modulate blinking," Wilson said.

The researchers analyzed 25 episodes from two seasons of the game show to collect data from 100 contestants. A team of nearly 60 research assistants marked the onset and offset of every question and every response made by the contestants, as well as the time of every blink, all of which contributed to nearly 100,000 [data points](#).

The researchers then analyzed the data to determine how blinking varied across individuals at different points in the game and compared their findings to those from less-stressful experiments performed in previous lab-based studies.

One key finding from the lab is that blinking acts like a "punctuation of thought," Wilson said, and this result held true on TV. Contestants blinked at the "punctuation marks" of the game—at the start of each question and at the start of their response. They also reduced their blinking while they were thinking about how to answer, which is also in line with results from the lab, Wilson said. The stress of "Mastermind" was also apparent in contestants' blinking, with their blink rate nearly twice the number of the usual 20 blinks per minute of a person who is at rest.

However, some findings differed from lab tests. For example, in the TV show, [older adults](#) blinked more than younger adults, and women blinked more than men. In the lab, there are no differences between these groups, Wilson said.

There were also some behavioral differences. In lab tests, people tend to slow down and respond more carefully and accurately after they make an error. In "Mastermind," this was not the case.

It's not clear what is driving these differences between the lab and TV, but according to Wilson, the differences are the most exciting part of the research. One of the biggest questions in psychology right now, Wilson

said, is how much of what is observed in the lab relates to what is going on in the real world.

"This question is critical, not only for our basic understanding of the mind, but also more practically if we want to find lab tests that can diagnose mental illness," Wilson said.

For the researchers at UArizona, blinks are just the beginning, and there is so much information in video signals, Wilson said. The way people look, breathe and fidget in their seat can be pulled out by modern computer vision techniques. This can help researchers get a multidimensional measure of physiology.

"This is exactly what we need to study—the psychophysiology of real human behavior and real human thinking," Wilson said.

More information: Skyler Wyly et al, The psychophysiology of Mastermind: Characterizing response times and blinking in a high-stakes television game show, *Psychophysiology* (2023). [DOI: 10.1111/psyp.14485](https://doi.org/10.1111/psyp.14485)

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