

From World Cup to job interviews, why we choke when it matters most

There's a science to performing under pressure — and ways to improve

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Italy's Roberto Baggio lives with the epic moment when he missed the vital penalty kick in the shootout during the 1994 FIFA World Cup final that led to Brazil's winning. Studies show there are ways to improve performance under pressure by understanding the mental processes in high-stress situations. (Ben Radford/All Sport UK/Getty Images)

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At some point during the World Cup in Qatar, soccer fans around the globe will be glued to one of the most unbearably tense moments in all of sport: A player will put the ball down on a white dot painted onto the turf, and attempt a penalty kick with a crucial game on the line — perhaps even the final itself.

He'll stand 12 yards from the goal, aiming at a net that's eight yards wide, with very little to stop him, aside from a goalkeeper's guess and his own nerves.

And yet, even top professional players sometimes choke under the weight of that moment. Just ask England fans about the World Cup semi-final in 1990. Or Italians about the final in 1994. Both watched in shocked misery as their players sailed penalties high and wide of the goal.

- [Tenacious Canada blanked by Belgium in return to men's World Cup](#)
- [ANALYSIS Alphonso Davies, coming off injury, will start for Canada in World Cup opener vs. Belgium](#)

Sian Beilock, a cognitive scientist and author of *Choke: What the Secrets of the Brain Reveal About Getting it Right When You Have To*, says those players likely fell into a common trap.

"In these high-stress situations, we worry. We worry about the situations, its consequences, what others will think of us," said Beilock, who is also president of Barnard College at Columbia University. "And one of the ways that we try and control this is by trying to then control what we're doing."

When we master skills like kicking a penalty or putting in golf, we tend not to think about every step, Beilock told CBC Radio's *IDEAS*. But when we consciously try to control an action we've learned to do without thinking, things can break down.

"It's kind of odd to think that paying attention to something could hurt it. But we've all had this experience. Imagine if I asked you to shuffle down the stairs and think about your knee. While you're doing that, you'd fall on your face."



Patrons at an Italian restaurant in New York City react as Italy's Roberto Baggio misses the final penalty and loses the 1994 World Cup to Brazil. (Getty Images)

'Paralysis by analysis'

Beilock calls this phenomenon "paralysis by analysis" — and it's one that can also afflict musicians, like Carolyn Christie.

"I never had to think about how a finger would move, or my air pressure or any of that, because I had practiced it, and I knew it inside out. And by thinking I have to move my little finger to the right and then down, I already missed the note [by] overthinking," said Christie, a former flautist with the Montreal Symphony Orchestra.

For much of Christie's early career with the symphony, musicians weren't given many tools to deal with anxiety or stage fright, Christie said.

But she said her eyes were opened when she invited her niece, who was studying sports psychology, to address faculty and students at McGill University, where Christie is also an associate professor. The topic? Performance under pressure.

"That is the first time I thought it wasn't just me who was worried about stage fright."

Christie went on to take a degree in sports psychology herself, and now trains musicians in the mental skills of performance.

How to combat the choke

There are several common techniques to combat the choke, experts have found, including breathing, meditation and visualization.

Beyond these, when the nerves flare up, we can choose to interpret our pounding heart and sweaty palms in a way that enhances our performance. [Studies](#) have shown that when people tell themselves they're excited rather than nervous, they perform better.

And choking doesn't just affect athletes and musicians, but can also rear its head in other high-pressure situations, such as job interviews or math tests. In those cases, worry takes up space in our working memory, hindering performance.

"It's very hard to count and do multiplication when I'm worrying in my head because it's using the same language and memory systems," Beilock said.

- [Monkeys respond to high pressure situations by choking, just like humans do](#)
- [Canadian soccer superstar Christine Sinclair says she's watching World Cup with mixed emotions](#)

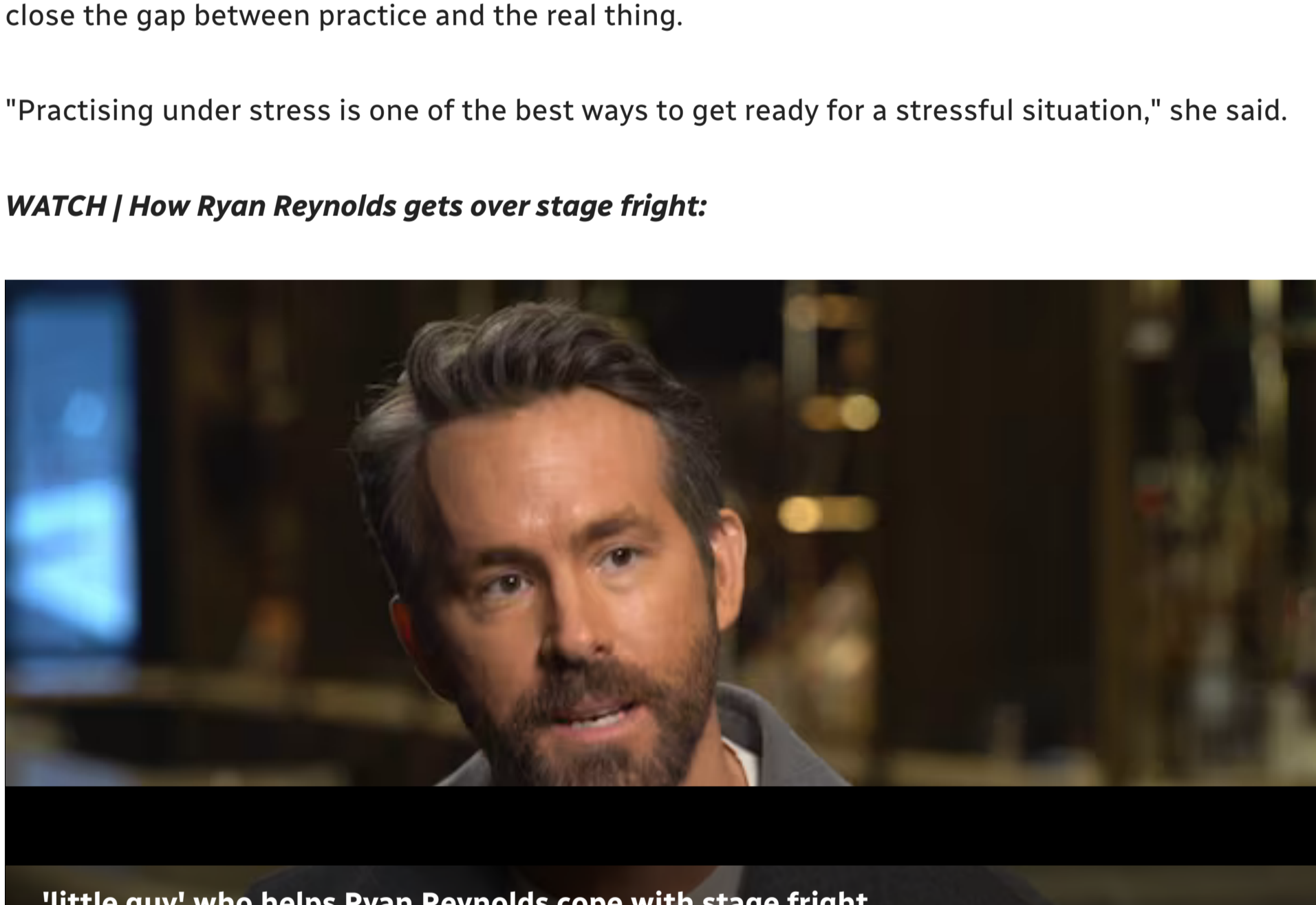
"The one thing that's important not to be thinking about, of course, is whether we're doing well or not," said Noa Kageyama, a performance psychologist at the Juilliard School in New York, who also runs the blog and podcast [Bulletproof Musician](#).

"Instead of self-monitoring and evaluating what's actually coming out of our instrument, it's more useful to focus on the sound that we want coming out of our instrument."

Another key is bringing some pressure into your practise sessions, according to Beilock — to close the gap between practice and the real thing.

"Practising under stress is one of the best ways to get ready for a stressful situation," she said.

WATCH | How Ryan Reynolds gets over stage fright:



Actor Ryan Reynolds talks to CBC The National's host Ian Hanomansing about how he overcomes his stage fright with the help of his inner alter-ego.

Performance practice makes perfect

When students walk into a small room at the Royal College of Music in London, England, they're hit by spotlights and the sight of the audience right in front of them — projected on the screen.

Thanks to a performance simulator set up by Aaron Williamon and his colleagues at the Centre for Performance Science in London, the virtual audience is interactive, life sized, and sometimes distracting.

"They do things like cough, they sneeze, sometimes their phones will go off. And we can control all of those reactions from backstage while the student is on stage," Williamon said, adding that they can also control how enthusiastically the audience claps at the end.

"The point is to develop those skills of preparation, delivery and review that can be systematically studied and examined and improved," he said.

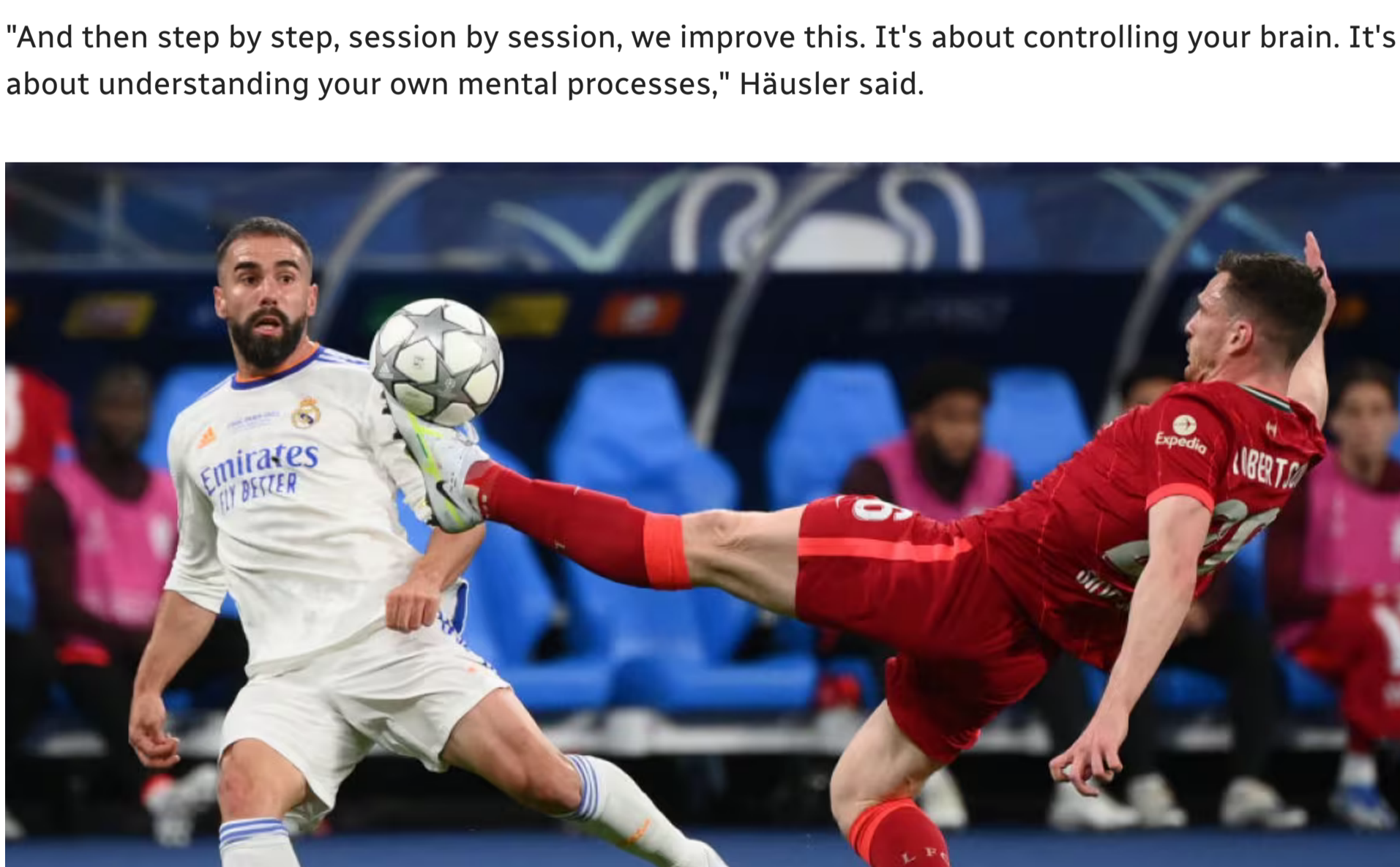
“It's about controlling your brain. It's about understanding your own mental processes.”

- Niklas Häusler, neuroscientist

About 350 kilometres north of London, Liverpool Football Club, one of England's top soccer teams, is harnessing the power of neuroscience for its performance practice. The club bought in a German company called Neuro 11 to offer cutting-edge training in penalty kicks and other stressful situations.

Niklas Häusler, the company's founder and CEO, attends Liverpool's training sessions. He and his colleagues attach electrodes to the players' heads, and have them take penalty kicks. Häusler then shows the players their brain scans, and helps them determine what's a distraction, and which mental routines help.

"And then step by step, session by session, we improve this. It's about controlling your brain. It's about understanding your own mental processes," Häusler said.



Real Madrid's Dani Carvajal, left, looks on as Liverpool's Andrew Robertson, right, reaches for the ball during the UEFA Champions League, May 28, 2022. Robertson says after learning from brain scans how to avoid distraction during a game, he was able to perform better on the field. (Franck Fife/AFP via Getty Images)

Each player develops his own routine for taking penalties — some stare at the grass, some look at the target, Häusler explained.

Liverpool player Andy Robertson said he believes the brain scans have helped him. Last season, Liverpool won two major tournaments on penalty shoot-outs.

"Before they came in, it was more just kind of: throw the ball down and, you know, however many steps to take, or whatever I've done before that," Robertson said. "Now I just follow my routine."

- [For soccer players, the less brain they use, the better for penalty kicks](#)
- [Canadians with ties to other nations face tough choice on who to cheer for at World Cup](#)

So, when a World Cup player inevitably steps up to take the crucial penalty kick that will decide the sporting fate of his nation, the outcome could depend on what's going on in that player's mind as much as it does their athletic skill.

It will be a public and high-stakes example of a feature of human behaviour scientists and researchers are still learning to understand.

But that won't make it easier to watch.

Guests in this episode:

Sian Beilock is a cognitive scientist and author of *Choke: What the Secrets of the Brain Reveal About Getting it Right When You Have to* and *How the Body Knows its Mind*. She's recently been named President-elect of Dartmouth College.

Sandra Bezic is a former Olympian and Canadian champion in figure skating (with her brother Val), and is now a producer, director and choreographer.

Carolyn Christie is a retired member of the flute section of the Montreal Symphony Orchestra. She now teaches classical flute at McGill and is also a Certified Mental Skills Consultant.

Niklas Häusler is a neuroscientist and co-founder and CEO of the German startup company [Neuro 11](#).

Noa Kageyama is a performance psychologist. He maintains a blog and podcast, [Bulletproof Musician](#).

Elizabeth Manley was world and Olympic silver medalist in figure skating in 1988, and is now an executive life coach.

Jennifer Montone is principal horn of the Philadelphia Orchestra.

Aaron Williamon is head of the Center for Performance Science, a partnership between the Royal College of Music and Imperial College, London.

Written and produced by IDEAS contributor Peter Brown.