

CAREERS

PERSONAL STUDIES A scientist diagnosed with Asperger's researches autism **p.554**

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MENTAL HEALTH

The mindful way

The art of mindfulness offers benefits not only for scientists' mental health, but also for their work performance.

BY SABINE LOUËT

When Lokesh Joshi was studying glycobiology as a postdoc at Cornell University in Ithaca, New York, he had mentors who helped to guide his research — and others who trained him in the practice of mindfulness. For up to 45 minutes each morning, in accordance with his teachers' counsel, he would sit on the carpet in a corner of his apartment, close his eyes and focus on his breathing or on the functioning of his internal organs, second by second. "This helped me find my own point of stillness — what I call grounding," he explains.

After regularly practising this morning routine, Joshi found that he could think more clearly, and that he felt better. He no longer had sweaty palms when he was about to give a talk at a conference, for example, nor did he feel anxious or defensive when a manuscript got rejected or needed major revisions. "It helped me take a step back and not react too quickly to my emotions," he says. And on days that he did not engage in mindfulness practice, he could tell the difference — his stress levels would ratchet up and his ability to concentrate would decrease.

Now vice-president for research at the National University of Ireland (NUI) Galway, Joshi continues to practise mindfulness on a

daily basis, during his 1.5-kilometre walk to and from his office. He thinks that it is a crucial soft skill for researchers, and he values it so strongly that he organized and spoke at a university conference on the subject in October. The university has also launched a lecture series and free drop-in classes on the art.

Mindfulness has long been in use in the corporate, entrepreneurial and other sectors. It is more than a new-age buzzword, said speakers at the conference. "In academic circles, there is fear about mindfulness because people believe it could stop you from thinking," says Gelong Thubten, a Tibetan Buddhist monk at the Kagyu Samye Ling Monastery near Langholm, UK, who conducted mindfulness sessions during the conference. "But we are not trying to get rid of thoughts — it is the mind that you are training. We are looking at the container, not the content."

PRESENT THOUGHTS

What is mindfulness, exactly? It is training the mind to focus on the moment, and to acknowledge thoughts and feelings without judging them. It is often likened to fitness training for the mind, and there are innumerable ways to practise it. One simple way is to pay attention to breathing with one's eyes either open or closed. The idea, Thubten says, is to train the mind to centre exclusively on the breath, and to bring it back when it wanders. Another approach is to zero in on sensory input. For example, when a person is washing his or her hands, he or she can focus on the feeling of wet, slippery skin and on the sound of running water.

Mindfulness is useful for researchers, because they can practise it when they are upset or stressed. It does not require special equipment or clothing or leaving the lab, as does going for a run or stepping out to get coffee, for example.

Practising mindfulness helped Joshi when a fellowship fell through and he faced the possibility of losing his US visa. His mastery of the skill helped him to remain calm, he says, and to realize that he could reach out to his supervisor, who was able to secure bridge funding until Joshi could get another fellowship.

Research has suggested that mindfulness helps to improve personal well-being as well as the capacity to relate to others. A meta-analysis this year of 29 studies on mindfulness found that practising it regularly can help to decrease stress and alleviate anxiety and depression (B. Khoury *et al.* *J. Psychosom. Res.* **78**, 519–528; 2015). Some governments have also acknowledged its validity. ▶

► The industry and art sectors are embracing the practice. It helps entrepreneurs to build resilience, says angel investor Peter Read, a former general partner at Google Ventures in London, which offers guided sessions to its employees on how to develop and use the skill. Mary Hawkes Greene, president of the Burren College of Art near Ballyvaughan, Ireland, says that engagement in mindfulness helps artists to hone their creativity, which, she notes, also plays a significant part in scientific research.

Other academic institutions have long acknowledged the value of mindfulness practice. In 2002, for example, Monash University in Melbourne, Australia, introduced a course for all medical students to help them to cope with the pressures of their studies and of working with patients. It has since been made available to other Monash students and to the general public as one of the university's massive open online courses, known as MOOCs.

PhD student Ping Wong, who is studying cognitive impairment at Monash, used to lie awake at night stressing about whether she could recruit enough volunteers for a clinical trial or would have enough time to prepare abstracts for a medical conference. Once she learned how to practise mindfulness, she felt much calmer. "I used my breath as an anchor and fell into deeper sleep more easily," she says. She has noticed that her memory has also improved, particularly when it comes to details such as remembering the names of her patients.

Yet scepticism about the skill's efficacy remains, owing mainly to a paucity of empirical data. "The instruments to measure mindfulness are highly controversial," says Jutta Tobias, a social psychologist at the Cranfield University School of Management, UK. Some researchers argue that assessments of its usefulness so far have been ineffective, in part because of their self-reporting nature and because they assess the skill by measuring attention span, which is not relevant to the practice and so, they say, not a valid method. Instead of attempting to measure mindfulness itself, Tobias's research now studies the outcomes of receiving training in the art.

Both Joshi and Jim Browne, president of NUI Galway, hope that the university's lecture series will help researchers to recognize the value of such a skill. "Let's throw a pebble in the pond," says Joshi, "and watch the ripples spread." ■

Sabine Louët is a freelance journalist in Dublin.

TURNING POINT

Jason Lunden

Jason Lunden was diagnosed with Asperger's syndrome while doing a PhD in neuroscience. Now a postdoc at the Rutgers Robert Wood Johnson Medical School in New Brunswick, New Jersey, he conducts research on stress in mice that exhibit autism-like behaviours.

What was it like to go through primary school without a clinical diagnosis?

I was late to talk, and I could be scatterbrained. I was placed in special-education classes to help me with reading, and I was bullied. Everything changed in high school, when a teacher showed me how to solve an algebra equation. I went from working on long division to doing advanced calculus in less than three years, and I got top scores in honours courses. The Asperger's diagnosis did not exist until 1994, but I didn't seek out a diagnosis until after that.

Where did you go to college?

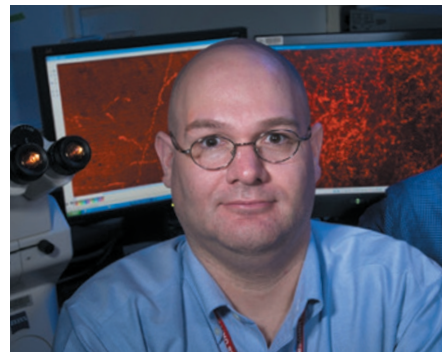
I began my undergraduate degree in 1995 at Cornell University in Ithaca, New York, as a pre-medical major. But I was overwhelmed by the cut-throat competition. I had trouble completing courses and struggled with the focus on research rather than on teaching. In 2000, I transferred to New York's Rochester Institute of Technology. It had a smaller biology department, centred solely on teaching undergraduates. I was much happier. I took a neuroscience course and wrote a paper on the biology of depression, and I got very excited by the idea that you could connect chemistry with psychology. In my mind, that was the most exciting science happening at the moment.

Was it difficult to get into a PhD programme?

Yes. I didn't have any research experience. First, I got into a master's programme at California State University, Los Angeles. I worked with a research group that found that exercise in rats increases production of messenger RNA for a protein involved in neuronal development, to levels similar to antidepressant treatment. Ultimately, I got into a PhD programme at Temple University Medical School in Philadelphia, Pennsylvania, where I worked on drug addiction. We showed that a decrease in serotonin levels could theoretically regress people who had made it through drug withdrawal back into a withdrawal-like state (D. R. Staub *et al. Psychoneuroendocrinology* 37, 859–870; 2012).

How did you start doing work on autism?

When I was finishing my PhD, I looked for people doing autism research and found Emanuel DiCicco-Bloom. I sent him an



NICK ROMANENKO/RUTGERS UNIV.

e-mail expressing interest in his work. We met at a Society for Neuroscience meeting and kept in contact online for a couple of years. His autism mouse model showed signs not only of decreased sociability but also of physiological symptoms of depression, which is estimated to affect 30–37% of adolescents with autism. I wanted to use his model to study other parts of the brain circuit.

How did your experience influence your research?

I suffered from depression, like many on the spectrum. Research has shown that if kids with autism are at a playground with kids without it, their cortisol levels shoot up. I wanted to understand the neural circuitry related to sadness.

What are your career goals?

I hope to go into teaching and possibly do some research with students. I received a US National Institutes of Health Institutional Research and Academic Career Development Award, and I have a mentor from a teaching college. I spend 70% of my time doing research and 30% learning to teach. I don't see myself going through the complexities of fighting for grants at a research university.

What made you want to be a teacher?

There is a personal motivation. If I hadn't had that one-on-one experience with the teacher who taught me how to do algebra, I might not have a PhD now. I hate to lock into the stereotype, but when Hans Asperger first described this disorder, he called sufferers 'little professors who wouldn't stop talking about their special interests'. If I am on a train with a random stranger, I will tell them all about my research. What better job for me to have than to do that in a more formal way? ■

INTERVIEW BY VIRGINIA GEWIN

This interview has been edited for length and clarity.