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Breathing In vs. Spacing Out

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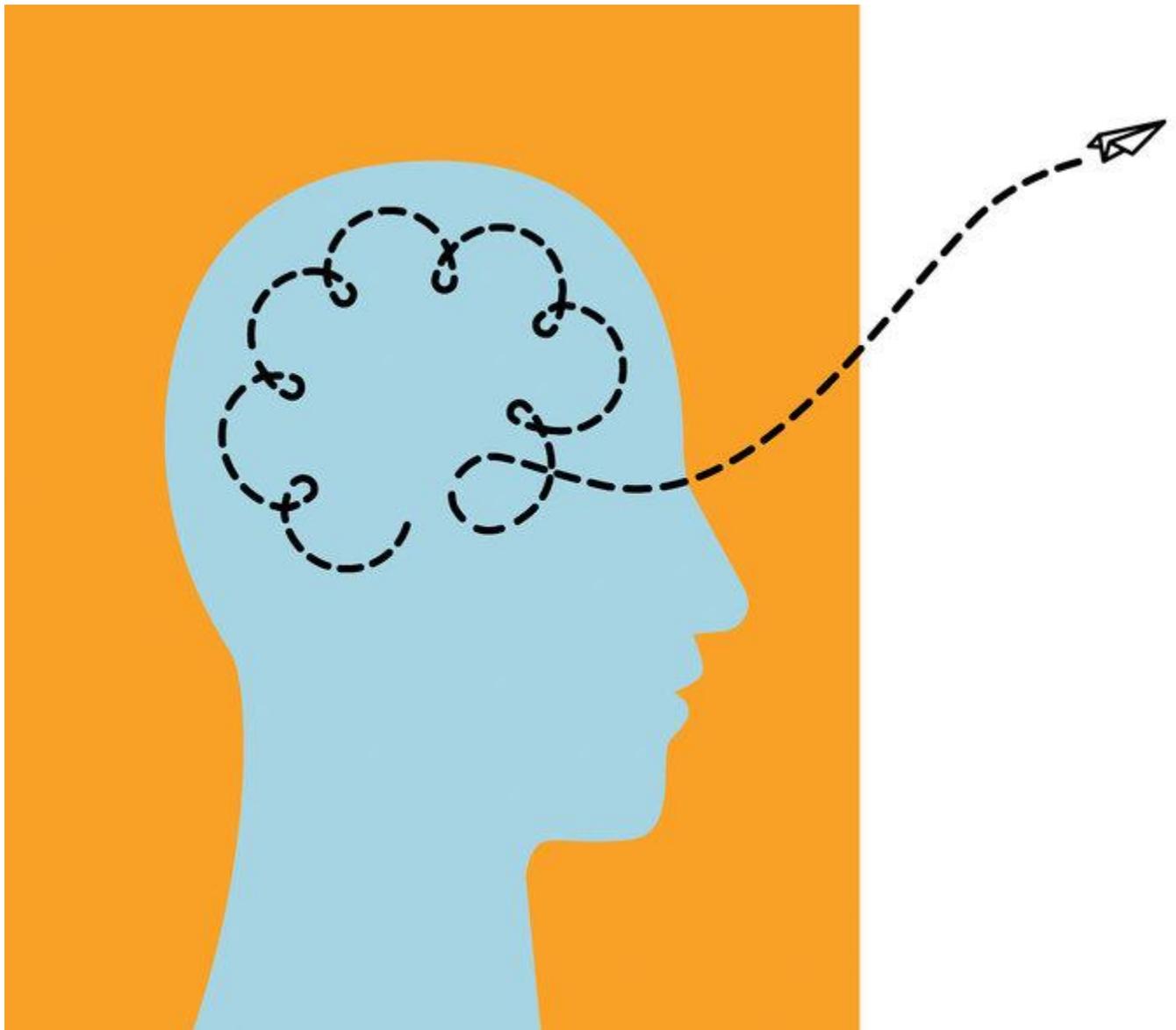


Illustration by Christopher Brand

Eureka

By DAN HURLEY

Two and a half millenniums ago, a prince named Siddhartha Gautama traveled to Bodh Gaya, India, and began to meditate beneath a tree. Forty-nine days of continuous meditation later, tradition tells us, he became the Buddha — the enlightened one.

More recently, a psychologist named Amishi Jha traveled to Hawaii to train United States Marines to use the same technique for shorter sessions to achieve a much different purpose: mental resilience in a war zone.

“We found that getting as little as 12 minutes of meditation practice a day helped the Marines to keep their attention and working memory — that is, the added ability to pay attention over time — stable,” said Jha, director of the University of Miami’s Contemplative Neuroscience, Mindfulness Research and Practice Initiative. “If they practiced less than 12 minutes or not at all, they degraded in their functioning.”

Jha, whose program has received a \$1.7 million, four-year grant from the Department of Defense, described her results at a bastion of scientific conservatism, the New York Academy of Sciences, during a meeting on “The Science of Mindfulness.” Yet mindfulness hasn’t long been part of serious scientific discourse. She first heard another scientist mention the word “meditation” during a lecture in 2005. “I thought, I can’t believe he just used that word in this audience, because it wasn’t something I had ever heard someone utter in a scientific context,” Jha said.

Although pioneers like Jon Kabat-Zinn, now emeritus professor at the University of Massachusetts Medical Center, began teaching mindfulness meditation as a means of reducing stress as far back as the 1970s, all but a dozen or so of the nearly 100 randomized clinical trials have been published since 2005. And the most recent studies of mindfulness — the simple, nonjudgmental observation of a person’s breath, body or just about anything else — are taking the practice in directions that might have shocked the Buddha. In addition to military fitness, scientists are now testing brief stints of mindfulness training as a means to improve scores on standardized tests and lay down new connections between brain cells.

Michael Posner, of the University of Oregon, and Yi-Yuan Tang, of Texas Tech University, used functional M.R.I.’s before and after participants spent a combined 11 hours over two weeks practicing a

form of mindfulness meditation developed by Tang. They found that it enhanced the integrity and efficiency of the brain's white matter, the tissue that connects and protects neurons emanating from the anterior cingulate cortex, a region of particular importance for rational decision-making and effortful problem-solving.

Perhaps that is why mindfulness has proved beneficial to prospective graduate students. In May, the journal *Psychological Science* published the results of a randomized trial showing that undergraduates instructed to spend a mere 10 minutes a day for two weeks practicing mindfulness made significant improvement on the verbal portion of the Graduate Record Exam — a gain of 16 percentile points. They also significantly increased their working memory capacity, the ability to maintain and manipulate multiple items of attention.

That a practice once synonymous with Eastern mysticism could be put to the service of Western rationalism may sound surprising, but consider: By emphasizing a focus on the here and now, it trains the mind to stay on task and avoid distraction.

“Your ability to recognize what your mind is engaging with, and control that, is really a core strength,” said Peter Malinowski, a psychologist and neuroscientist at Liverpool John Moores University in England. “For some people who begin mindfulness training, it's the first time in their life where they realize that a thought or emotion is not their only reality, that they have the ability to stay focused on something else, for instance their breathing, and let that emotion or thought just pass by.”

But one of the most surprising findings of recent mindfulness studies is that it could have unwanted side effects. Raising roadblocks to the mind's peregrinations could, after all, prevent the very sort of mental vacations that lead to epiphanies. In 2012, Jonathan Schooler, who runs a lab investigating mindfulness and creativity at the University of California, Santa Barbara, published a study titled “Inspired by Distraction: Mind Wandering Facilitates Creative Incubation.” In it, he found that having participants spend a brief period of time on an undemanding task that maximizes mind wandering improved their subsequent performance on a test of creativity. In a follow-up study, he reported that physicists and writers alike came up with their most insightful ideas while spacing out.

“A third of the creative ideas they had during a two-week period came when their minds were wandering,” Schooler said. “And those ideas were more likely to be characterized as ‘aha’ insights that overcame an impasse.”

The trick is knowing when mindfulness is called for and when it's not. "When you're staring out the window, you may well be coming up with your next great idea," he said. "But you're not paying attention to the teacher. So the challenge is finding the balance between mindfulness and mind wandering. If you're driving in a difficult situation, if you're operating machinery, if you're having a conversation, it's useful to hold that focus. But that could be taken to an extreme, where one always holds their attention in the present and never lets it wander."

Another potential drawback to mindfulness has been identified by researchers at Georgetown University. In a study presented at the Society for Neuroscience annual meeting in November, they found that the higher adults scored on a measurement of mindfulness, the worse they performed on tests of implicit learning — the kind that underlies all sorts of acquired skills and habits but that occurs without conscious awareness. In the study, participants were shown a long sequence of items and repeatedly challenged to guess which one would come next. Although supposedly random, it contained a hidden pattern that made some items more likely to appear than others. The more mindful participants were worse at intuiting the correct answers.

"There's so much our brain is doing when we're not aware of it," said the study's leader, Chelsea Stillman, a doctoral candidate. "We know that being mindful is really good for a lot of explicit cognitive functions. But it might not be so useful when you want to form new habits." Learning to ride a bicycle, speak grammatically or interpret the meaning of people's facial expressions are three examples of knowledge we acquire through implicit learning — as if by osmosis, without our being able to describe how we did it. (Few of us can recite the rules of grammar, though most of us follow them when we speak.)

After meditating upon such sacrilegious findings, no doubt the Buddha, who taught a middle way between worldly and spiritual concerns, would have agreed that there is a time for using mindfulness to discover inner truths, a time for using it to survive a battle or an exam and a time to let go of mindfulness so that the mind may wander the universe.

Dan Hurley is the author of "Smarter: The New Science of Building Brain Power."