

# Can science help reinvent the thinking cap?

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Benjamin Franklin was an innovation machine, cranking out game-changers like the odometer, bifocals and the lightning rod. Franklin also played a lot of checkers, which he praised as “not merely an idle amusement.”

Two unrelated facts? According to new advances in how we understand the neuroscience of creativity, maybe not.

When it comes to the mechanics of creative thought, the brain is still very much a black box: Mundane stuff goes in, and sometimes brilliant stuff comes out

(and more often it doesn't). But, as author Jonah Lehrer recounts in his new book *Imagine: How Creativity Works*, brain imaging studies conducted by researchers at Northwestern and Drexel Universities have cracked open the box a little. Functional magnetic resonance imaging (fMRI) tracks changes in blood flow to give a very high-resolution picture of what's happening in the brain during mental activity. On the down side, it's slower than the speed of thoughts: Electroencephalography (EEG) captures brain activity in real-time, but at a fuzzier resolution. But by combining fMRI and EEG, the researchers have started to track the creative-problem-solving process as it happens.

Presented with a problem, our left hemispheres seem to take immediate charge. For problems requiring brute analytical force, this works just fine. But for those requiring creative solutions, the left-brain gets stumped. That's when the right hemisphere kicks in, unleashing a steady stream of novel dot-connections between all sorts of random data in its storehouse. For some reason, an abundance of alpha brain waves – a certain frequency of neural oscillation that, frankly, we don't know much about – seems to help us dip into that connection stream. A lot of these free associations are dead ends, but the ones that aren't? Eureka.

What does all this mean for enhancing creative practice? More importantly: How will playing checkers help you come up with the next Instagram? The key seems to be increasing those alpha waves – they're so closely related to insights that their presence on an EEG allows scientists to predict a test subject's creative breakthrough before it happens. And alpha waves are heavily implicated in relaxing activities. So, as backwards as it sounds, intense focus isn't the way to come up with a creative solution to a problem. Relaxation is.

3M, the Minnesota company behind innovative products such as masking tape and Post-It Notes, is famous for a work environment that encourages employees to regularly break their focus – and thereby crank those alpha waves. Go for a walk. Play a few rounds of pinball. Or even put your work to the side and get busy with a personal passion project. 3M even has a rule that staff spend 15 per cent of their day working on something that's not, well, work.

The 3M approach isn't without its critics. Innovation consultant Chris Trimble, blogging for the Harvard Business Review, noted that coming up with new ideas is only half of the innovation battle: You need to implement those ideas, too. Mr. Trimble warned of the dangers of "generating a mountain of great ideas on paper that never become anything more than a mountain of great ideas on paper." Then again, 3M currently has a mountain of more than 55,000 distinct products on the market, ranging from office supplies to bioanalytic materials. As Jonah Lehrer points out, that's almost one product for every 3M employee. They must be doing something right, and other workplaces are taking notice.

"You can't tell people, 'Just go innovate,'" says Debra Pickfield, owner of ThinkSpot, a meeting space-for-hire in Burlington, Ont., designed to foster innovative thinking. "You have to cultivate the conditions for them to innovate and be successful."

Three years ago, while completing her MBA, the human resources veteran was frustrated at not being able to get her ideas heard during alpha-abundant group work. "And I'm not a wallflower," she notes.

She created ThinkSpot in a handsome brick house a few blocks from Lake Ontario, a deliberately non-corporate setting for clients to engage in non-corporate thinking. Her clients come for anywhere from three hours to three days. They tackle problems 3M-style: around a ping-pong "boardroom" table, playing with Lego, wearing wigs and costumes, or strolling outside – all in an attempt to get those right hemispheres in gear.

"It's very exciting to see science beginning to apply a quantitative study to what has been qualitatively studied for 20 years," says Ms. Pickfield, who is a keen follower of the latest neuroscience news, which, she says, has so far only supported practices she's already seen to be effective.

"The brain is conditioned to know what to expect. To be creative, we need to let our brains be open to something different, and to know that it's okay to laugh, it's okay to play."

Other businesses are adopting those practices in-house. Toronto's Xtreme Labs designs and develops Web and mobile apps; its work for clients as diverse as Al-Jazeera and Groupon has landed the four-year-old company a spot on Profit magazine's list of 50 Hottest Emerging Companies in Canada. While working for several Silicon Valley tech firms, Xtreme co-founder Amar Varma saw non-traditional offices yield huge creative dividends – which is why a considerable part of his company's 25,000-square-foot downtown offices are devoted to lounges littered with video game consoles, musical instruments and foosball tables. The employees – mostly electrical engineers, like Mr. Varma – are free to spend as much time as they want to playing Xbox or shredding on an electric guitar. The only catch: They have to write down any new flashes of inspiration on one of the white boards that are always close at hand.

"You can't put a clock on being creative," says Mr. Varma. "People use those spaces when they need to, for whatever they have the urge to do." He says play-lounge activity can result in "scribbles on white boards that don't make any sense" but also, more importantly, it's sparked several products currently being developed (and still under wraps).

Not all of Xtreme Lab's employee perks are as unusual as unlimited RockBand, though: There's also coffee. When told that recent studies suggest caffeine may impede that cherished right-brain activity, Mr. Varma admits he isn't sure if he could get away with banning the bean.

"Hard to say," he says. "But I know if I tried to get rid of our Friday afternoon beer and cake parties, there'd be mutiny for sure."

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