

Does practice always make perfect?

The surprising answer

By PATRICK J. KIGER

A new study finds that recurring brainstorming sessions produce ideas that are, well . . . kind of meh, actually.

For a marketing professional who’s striving to be more creative, for example, this might translate into sitting down with a notepad and pen every morning and spending a few minutes jotting down as many ideas for new product names as you can. You might come up with a few Edsels at first, but once you get the hang of it, pretty soon you’ll be wowing your colleagues with the next iMac, Frappuccino, or Uber, right? Well, sorry to burst your thought bubble here, but no. According to recent research by Stanford Graduate School of Business alumna Melanie S. Brucks and associate professor of marketing Szuchi Huang, regular brainstorming sessions are not likely to lead to an increase in unique ideas. In fact, the average novelty of your output—that is, the degree to which your inspirations depart from convention—actually might decrease over time.

“It was surprising,” says Brucks, who earned her PhD in marketing at Stanford in 2019 and now is an assistant professor of marketing at Columbia University. “People got worse at one type of idea generation, even as they thought they were getting better at it.”

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Huang, who studies motivation, also admits she was taken aback by the results, which are detailed in an article, “Does Practice Make Perfect? The Contrasting Effects of Repeated Practice on Creativity,” recently published in the Journal of the Association for Consumer Research. “In my

field, practice is always good. It’s always about practice—do it every day and you will learn and improve your skills, or at least build good habits. But it turns out that to get better at creativity, you need to do some creative thinking about creative thinking.” Lead author Brucks says she initially was drawn to the subject as a graduate student, because she wanted to come up with better ideas herself. “There’s a ton of research out there that shows how practice seems to help with everything if you want to improve performance,” she explains. “I thought, ‘Well, OK, I can just practice creativity, and I’ll get good at it.’”

RESEARCH GAP

As Brucks delved into the scientific literature on creativity, however, she discovered an intriguing gap in the research. While there was plenty of work on one-shot interventions—such as using visualization techniques during idea-generating sessions, for example—there was almost no research into the question of whether repetition over time would lead to increased output of conceptual breakthroughs. To complicate things more, creative cognition actually has two components. Divergent thinking, the sort that is utilized in idea-generating sessions, involves branching off from what a person knows and coming up with new ideas. In contrast, convergent thinking requires finding linkage between different existing concepts or ideas and connecting them to context. Often, to come up with a viable concept, “you need them both,” Brucks explains. “They’re both really important, but also very different.” Becoming better at divergent thinking is a particular challenge, because of the way the brain works. With most skills, practice tends to produce improvement by reinforcing certain cognitive pathways in the brain, making them more accessible, Brucks explains. At the same time, it de-emphasizes other pathways, cutting them off in order to allocate an optimal amount of cognitive resources to the prioritized task. But by training the brain to become more efficient and focused, that repetition also “gives you a less flexible brain,” Brucks notes. But inflexibility goes against the nature of creativity, which continually requires the intellect to bend and stretch into new positions. To test how practice would affect idea generation over

time, and what factors might affect productivity, Brucks and Huang constructed a two-part investigation.

HOW THE EXPERIMENTS WORKED

In the first study, a group of 413 subjects were recruited from an online pool and then randomly assigned to practice either divergent or convergent creativity tasks for 12 consecutive days. Those who practiced divergent thinking had to spend a few minutes each day thinking of new product names. The subjects assigned to convergent practice were asked to perform a Remote Associates Test, in which they had to identify a common link between three different words. (For example, “cold” could forge a connection among the words “shoulder,” “sweat,” and “sore.”) All of the participants had to complete their tasks between 6 a.m. and 12 p.m. After the study, they took a survey in which they reported their perception of how well they had performed. Over the 12 days, the subjects working on divergent thinking generated about 15,000 ideas total, of which about two thirds were unique—an average of 5.71 unique ideas per person, per session. The convergent thinkers solved roughly the same amount (5.69) of RAT word problems. But there was a difference. Over the course of the study, the divergent thinkers barely increased the number of unique ideas that they produced, while the convergent thinkers had a markedly higher boost in productivity as they got better at the task. Besides just counting the quantity of unique ideas, Brucks and Huang also gave the ideas to a panel of judges to evaluate their novelty—basically, ideas that were clever and memorable. “For example, if I’m trying to come up with names for a podcast app, I can come up with hundreds of ideas that are unique, but not very novel,” Brucks explains. “I might call it Podcast Organizer, or some variation of that. All those ideas could be unique, but they’re derivative.” In contrast, playful names such as Earworm or Peas in a Pod would be more novel. Novel ideas “come from a different perspective and depart from the most obvious,” she says. “Usually it comes from having random ideas and then incorporating them. You’re hungry, for example, so you think ‘peas in a pod.’” When it came to novelty, the subjects practicing divergent thinking actually got worse rather than better. On average, they actually dreamed



10 Things Healthcare Professionals Need to Know about U.S. COVID-19 Vaccination Plans

In the United States, there is not yet an authorized or approved vaccine to prevent coronavirus disease 2019 (COVID-19). The federal government, through Operation Warp Speedexternal icon, has been working since the pandemic started to make one or more COVID-19 vaccines available as soon as possible. Although CDC does not have a role in developing COVID-19 vaccines, CDC has been working closely with

With the possibility of one or more COVID-19 vaccines becoming available before the end of the year, here are 10 things healthcare professionals need to know about where those plans currently stand.

1. Many COVID-19 vaccine candidates are in development, and clinical trials are being conducted simultaneously with large-scale manufacturing. It is not known which vaccines will be authorized or approved—CDC is planning for many possibilities.

CDC is working with partners at all levels, including healthcare associations, on flexible COVID-19 vaccination programs that can accommodate different vaccines and multiple scenarios. CDC is in contact with your state public health department



and immunization program manager, and we will continue to stay in contact throughout this entire process.

2. The safety of COVID-19 vaccines is a top priority.

The current vaccine safety system is strong and robust, with the capacity to effectively monitor COVID-19 vaccine safety. Existing data systems have validated analytic methods that can rapidly detect statistical signals for possible vaccine safety problems. These systems are being scaled up to fully meet the needs of the nation. Additional systems and data sources are also being developed to further enhance safety monitoring capabilities. CDC is committed to ensuring that COVID-19 vaccines are safe. Learn more about how CDC works to ensure the safety of vaccines in the United States.

3. As a patient’s most trusted source of information about vaccines, you will play a critical role in helping build confidence in COVID-19 vaccination.

As you talk with patients, acknowledge the disruption COVID-19 has had on all our lives. This allows you to establish common concerns that can be addressed by vaccination. It's understandable that patients will have questions and CDC is developing resources to help you address these concerns.

4. At least at first, COVID-19 vaccines may be used under an Emergency Use Authorization (EUA) from the U.S. Food and Drug Administration (FDA).

Learn more about FDA's Emergency Use Authorization authorityexternal icon and watch a video on what an EUA is.



5. Once FDA authorizes or approves use of COVID-19 vaccine(s), limited quantities will become available very quickly because of advance planning by the U.S. government and other entities.

Typically, it can take months for a vaccine to become available after it receives FDA authorization or approval, but in the case of a COVID-19 vaccine, it could be a matter of days. CDC is already planning, in collaboration with many partners, for delivering vaccines. With funding from the federal government, manufacturing capacity for selected vaccine candidates is being advanced while they are still in development rather than waiting to scale up after approval or authorization.

6. Limited COVID-19 vaccine doses may be available this year, but supply will increase substantially in 2021.

The goal is for everyone to be able to easily get a COVID-19 vaccine as soon as large quantities areavailable. The federal government began investing in select vaccine manufacturersexternal icon to help them increase their ability to quickly make and distribute a large amount of COVID-19 vaccine.

7. If there is limited supply, some groups may be recommended to get a COVID-19 vaccine first.

Experts are working on figuring out how to give these limited vaccines in a fair, ethical, and transparent way. The National Academies of Sciences, Engineering, and Medicine (NASEM) gave inputexternal icon to the Advisory Committee on Immunization Practices (ACIP). ACIP will issue recommendations to CDC once a vaccine is authorized or approved for use.

8. All interested vaccination providers may not receive vaccines immediately.

If there is a limited supply of COVID-19 vaccines, doses will likely be distributed to providers that serve groups identified to get vaccinated first. There will be an application and onboarding process for those interested in providing COVID-19 vaccines. There are specific logistical requirements, including requirements for vaccine storage and handling, product tracking, administration, and reporting. It will be important to work with your state and local health department to get the latest information on vaccine distribution and availability in your community.

9. At first, COVID-19 vaccines may not be authorized, approved, or recommended for children.

Only non-pregnant adults participated in early clinical trialsexternal icon for various COVID-19 vaccines. However, clinical trials continue to expand who is recruited to participate. The groups recommended to receive the vaccines could change in the future.

10. COVID-19 vaccine planning is being updated as new information becomes available.

CDC will continue to update this website as plans develop.

The House in the Hollow

The house in the hollow was “a mile from anywhere”—so Maywood people said. It was situated in a grassy little dale, looking as if it had never been built like other houses but had grown up there like a big, brown mushroom. It was reached by a long, green lane and almost hidden from view by an encircling growth of young birches. No other house could be seen from it although the village was just over the hill. Ellen Greene said it was the lonest place in the world and vowed that she wouldn't stay there a day if it wasn't that she pitied the child.

Emily didn't know she was being pitied and didn't know what lonesomeness meant. She had plenty of company. There was Father—and Mike—and Saucy Sal. The Wind Woman was always around; and there were the trees—Adam-and-Eve, and the Rooster Pine, and all the friendly lady-birches.

And there was “the flash,” too. She never knew when it might come, and the possibility of it kept her a-thrill and expectant.

Emily had slipped away in the chilly twilight for a walk. She remembered that walk very vividly all her life—perhaps because of a certain eerie beauty that was in it—perhaps because “the flash” came for the first time in weeks—more likely because of what happened after she came back from it.

It had been a dull, cold day in early May, threatening to rain but never

L.M. MONTGOMERY

raining. Father had lain on the sitting-room lounge all day. He had coughed a good deal and he had not talked much to Emily, which was a very unusual thing for him. Most of the time he lay with his hands clasped under his head and his large, sunken, dark-blue eyes fixed dreamily and unseeingly on the cloudy sky that was visible between the boughs of the two big spruces in the front yard—Adam-and-Eve, they always called those spruces, because of a whimsical resemblance Emily had traced between their position, with reference to a small apple-tree between them, and that of Adam and Eve and the Tree of Knowledge in an old-fashioned picture in one of Ellen Greene’s books. The Tree of Knowledge looked exactly like the squat little apple-tree, and Adam and Eve stood up on either side as stiffly and rigidly as did the spruces.

Emily wondered what Father was thinking of, but she never bothered him with questions when his cough was bad. She only wished she had somebody to talk to. Ellen Greene wouldn’t talk that day either. She did nothing but grunt, and grunts meant that Ellen was disturbed about something. She had grunted last night after the doctor had whispered to her in the kitchen, and she had grunted when she gave Emily a bedtime snack of bread and molasses. Emily did not like bread and molasses, but she ate it because she did not want to hurt Ellen’s feelings. It was not often that Ellen allowed her anything to eat before going to bed, and when she did it meant that for some reason or other she wanted to confer a special favour.

Emily expected the grunting attack would wear off over night, as it generally did; but it had not, so no company was to be found in Ellen. Not that there was a great deal to be found at any time. Douglas Starr had once, in a fit of exasperation, told Emily that “Ellen Greene was a fat, lazy old thing of no importance,” and Emily, whenever she looked at Ellen after that, thought the description fitted her to a hair. So Emily had curled herself up in the ragged, comfortable old wing-chair and read The Pilgrim’s Progress all the afternoon. Emily loved The Pilgrim’s Progress. Many a time had she walked the straight and narrow path with Christian and Christiana—although she never liked Christiana’s adventures half as well as Christian’s. For one thing, there was always such a crowd with Christiana. She had not half the fascination of that solitary, intrepid figure who faced all alone the shadows of the Dark Valley and the encounter with Apollyon. Darkness and hobgoblins were nothing

EMILY OF NEW MOON

when you had plenty of company. But to be alone—ah, Emily shivered with the delicious horror of it!

When Ellen announced that supper was ready Douglas Starr told Emily to go out to it.

“I don’t want anything to-night. I’ll just lie here and rest. And when you come in again we’ll have a real talk, Elfkin.”

He smiled up at her his old, beautiful smile, with the love behind it, that Emily always found so sweet. She ate her supper quite happily—though it wasn’t a good supper. The bread was soggy and her egg was underdone, but for a wonder she was allowed to have both Saucy Sal and Mike sitting, one on each side of her, and Ellen only grunted when Emily fed them wee bits of bread and butter.

Mike had such a cute way of sitting up on his haunches and catching the bits in his paws, and Saucy Sal had her trick of touching Emily’s ankle with an almost human touch when her turn was too long in coming. Emily loved them both, but Mike was her favourite. He was a handsome, dark-grey cat with huge owl-like eyes, and he was so soft and fat and fluffy. Sal was always thin; no amount of feeding put any flesh on her bones. Emily liked her, but never cared to cuddle or stroke her because of her thinness. Yet there was a sort of weird beauty about her that appealed to Emily. She was grey-and-white—very white and very sleek, with a long, pointed face, very long ears and very green eyes. She was a redoubtable fighter, and strange cats were vanquished in one round. The fearless little spitfire would even attack dogs and rout them utterly.

Emily loved her pussies. She had brought them up herself, as she proudly said. They had been given to her when they were kittens by her Sunday-school teacher.

“A living present is so nice,” she told Ellen, “because it keeps on getting nicer all the time.”

But she worried considerably because Saucy Sal didn’t have kittens. “I don’t know why she doesn’t,” she complained to Ellen Greene. “Most cats seem to have more kittens than they know what to do with.”

After supper Emily went in and found that her father had fallen asleep. She was very glad of this; she knew he had not slept much for two nights; but she was a little disappointed that they were not going to have that “real talk.”



Ingredients

- 1 ½ cups self rising flour
- 1 stick butter
- ½ cup water
- 2 cups sugar, divided
- 4 cups peaches, peeled and sliced
- 1 cup milk
- ground cinnamon, optional

Directions

- Preheat oven to 350 °F.
- Combine the peaches, 1 cup sugar, and water in a saucepan and mix well. Bring to a boil and simmer for 10 minutes. Remove from the heat.
- Put the butter in a 3-quart baking dish and place in oven to melt.
- Mix remaining 1 cup sugar, flour, and milk slowly to prevent clumping. Pour mixture over melted butter. Do not stir.
- Spoon fruit on top, gently pouring in syrup. Sprinkle top with ground cinnamon, if using. Batter will rise to top during baking. Bake for 30 to 45 minutes.
- To serve, scoop onto a plate and serve with your choice of whipped cream or vanilla ice cream.

Paula Deen's

Peach Cobbler