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Capturing Creativity



Creativity requires a challenge to start a flow of new ideas, then a way to capture them.

By Robert Epstein, Ph.D.

When it comes to creativity, there's good news and very good news. The good news is that the mysteries of the creative process are finally giving way to a rigorous scientific analysis. The very good news is that, with the right skills, you can boost your own creative output by a factor of 10 or more. Significant creativity is within everyone's reach—no exceptions. What's more, greater creativity breeds greater happiness. The creative process is itself a source of joy for most people. And with new creative powers we're also better able to solve the little problems that beset us daily.

I make these claims based on nearly 20 years of laboratory research on the creative process, conducted with animals, with impaired and normal children, and with normal adults (well, college students). In recent years I've also successfully

applied some of the lessons of the laboratory in real-life settings with children, teachers, and parents, as well as with executives at some of the nation's largest corporations.

An explosion of creative forces is at hand, and it could make the accomplishments of the Renaissance look like a ride on a stationary bicycle.

Myths and Mysticism

If creativity is so accessible, what's holding back the flood? When I say to a group of a hundred people, "Please raise your hand if you consider yourself to be creative," why do only 10 hands go up? Why are corporate leaders, government officials, politicians, crime fighters, teachers, and parents all starving for new ideas? Why are art, music, and literature in the hands of a tiny fraction of the population—while the rest of us are mere spectators?

Two answers suggest themselves, and each is disturbing. First, our creative potential is virtually shut down by early schooling. Teachers are the first to admit this. A kindergarten teacher told me recently, "I can't believe I get paid to have so much fun every day—before the kids get ruined." Ruined? "Well," he said, "in the first grade the kids have to work all the time. There's no more time for fun, because there's so much they've got to learn. They're not even allowed to daydream any more. It's a wonder that any of them ever grow up to be artists or inventors. In kindergarten, on the other hand, all the kids are artists and inventors."

There's another reason why creativity seems to be in short supply: Myths about creativity are deeply entrenched in our

culture. Myths have enormous power to shape everyday behavior, often to people's detriment. When people believe the world is flat, for example, they're unlikely to venture out to sea very far, and "lands away" remain undiscovered.

When it comes to creativity, myths keep most people firmly shorebound. *Only artists have creativity and creativity is rare*, we're told. *Creativity is mysterious and magical and divine*, people say. *It's in your right brain*, the headlines swear.

None of these beliefs is true, not even slightly. The brain hemisphere distinction is based largely on clinical studies of about 40 "split-brain" patients—people whose brains were severed surgically in order to treat seizures or other neurological problems. The initial studies of such patients, conducted in the 1960s, seemed to show significant functional differences between the left and right cerebral hemispheres. In the 1980s, however, scientists began to reinterpret the data. The problem is split-brain patients all have abnormal brains to begin with.

As a practical matter, the right-hemisphere myth is nonsense because virtually no one has a split brain. The two halves of our brain are connected by an immense structure called the corpus callosum, and the hemispheres also communicate through the sense organs. Creativity has no precise location in the human brain, and people who promise to reactivate your "neural creativity zones" are just yanking your chain.

Enough about myths. What about science? In the 1970s, in animal studies I began at Harvard with behaviorist B. F. Skinner, I became intrigued—obsessed is more accurate—with the fact that much of the interesting behavior



that Japanese patents now dominate many categories of invention worldwide. But after a few minutes of capturing daydreams, Japanese audiences report daydreams every bit as bizarre and rich as Salvador Dalí's: "I saw you, the teacher, small, in my hand, and you turned gray and you shrank and disappeared." (What would Freud say about that? Who cares?) "I flew to the top of the building next door, and I saw this building crumble to the ground while I ate a sandwich." (IBM was located next door. Was this fellow hoping for a better job?)

Fun and Games

Over the years, for various audiences and university classes, I've developed many exercises and games that both spur creativity and illustrate how generative processes work. Here are a few of my favorites:

CAPTURING A DAYDREAM. You can perform this exercise in a group or on your own—right now, if you like. Just close your eyes and let your mind wander freely for a few minutes. You might drift off to the stars; you might see things you've never seen before. Just let your thoughts wander without deliberately guiding them. Okay, relax and get started....

Did you leave the room? Did you leave the earth? Did you see or hear or experience anything that's impossible to experience in reality? Given enough time and an absence of distraction, everyone answers yes to each of these questions. Behavior is generative—even the covert perceptual behavior that we call "thought." This simple exercise is especially powerful because it can quickly convince anyone that everyone has enormous creative potential and that capturing skills are essential to unlocking that potential.

I've conducted this exercise all over the world, but I've been most deeply moved by its effect on audiences in Japan. Even bright, professional Japanese people believe that the Japanese are not a creative lot—this, in spite of the fact

we observed in our subjects had never been trained. We would provide certain training, and then new, often very complex, behavior would emerge. Perhaps more important, I eventually realized that the new behavior wasn't random but that it was related in orderly ways to the behavior that had been trained.

Over the years, my students, colleagues, and I became increasingly adept at providing certain minimal training that would inexorably lead to the generation of a specific, complex, new performance—one that could be called "creative." What we ultimately concluded was that *previously established behavior manifests itself in new situations in new yet orderly ways*. Novel behavior is truly new, but the particular novel behavior that emerges in a new situation depends on the particular behaviors that were established previously—that is, on prior knowledge. Creativity, in short, is not something mystical; it's an extension of what you already know. To be more specific, new behaviors (or "ideas") emerge as old behaviors interact, and the process by which behaviors interact is orderly.

GENERATIVITY & CREATIVITY

Behavior is generative; like the surface of a fast-flowing river, it's inherently and continuously novel. We never repeat



BUILDING A BETTER CAPTURING MACHINE.

Ask a group of people to invent machines that will help them become better inventors. Specifically, give them five minutes in which to invent a device that will allow them to capture good ideas on the fly. They can use any materials at hand, including odd items you may supply, except traditional writing implements (pens, crayons, paper, computers, etc.).

At a club one evening, I was faced with one of those challenges that every single person dreads. An appealing woman offered me her telephone number, but I couldn't locate anything with which to write! I grabbed a napkin, tore off one corner to indicate my starting point, and then made a pattern of small tears around the edge to capture the number. First seven tears and a space, then two tears and a space, and then—the rest is none of your business.

the same action or have the same thought twice, at least not if you look closely enough. We brush our teeth a slightly different way each morning; we dream new dreams each night. If you say "dog" twice, a spectrograph will easily distinguish two patterns. Behavior flows, and it never stops changing.

The language of creativity is imprecise. "Creative" is an everyday term, not a scientific one. Novel behavior is generated continuously, but it is labeled creative only when it has some special value to the community. Alas, communities are extremely inconsistent in their use of the language of creativity. Jackson Pollock would not have been dubbed "creative" in fourteenth-century Europe; he would have been burned at the stake.

From a scientific perspective, it's not the label "creativity" itself that's of interest—it's the flow of novel behavior that sometimes inspires the label. How can we account for and understand that flow? Where does novel behavior come from? How does the "creative process" work?

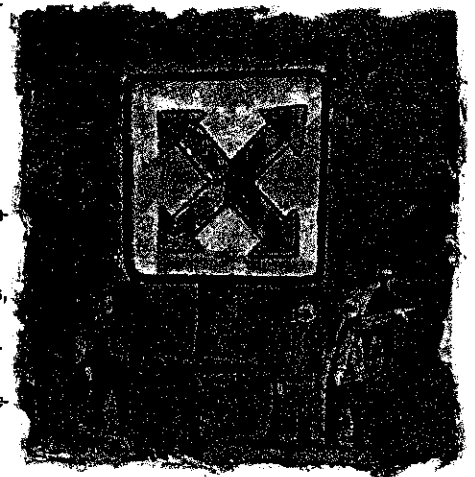
My research suggests that many forces act simultaneously on the neural determinants of many different behaviors and that novel behavior is the result of this complex and dynamic process. Generativity is the basic process that drives all of the behavior we come to label "creative."

In recent years, I've had subjects solving problems directly on a computer touch screen, which allows us to simulate the performances in real time. Using this technology, we're getting better at predicting unique, novel performances in individual subjects moment to moment in time, further suggesting that the creative process is orderly—not mysterious at all. *(continued on page 75)*

THE SHIFTING GAME. Generativity Theory suggests that some of the common methods now used to promote creativity have limited value, at best. Brainstorming, for example, works to some extent because it exposes team participants to multiple social stimuli (a "surrounding" technique). But it also inhibits creativity by exposing individuals to disapproval. Participants may try to withhold signs of disapproval, but eyebrows are still raised, and most people hold back a wealth of good ideas.

The Shifting Game uses a team optimally to increase creative output. Two teams are selected from the larger audience. One is instructed to stay together for a 20-minute brainstorming session. The second team is instructed to "shift" twice from five-minute private work sessions to five-minute team meetings. Each team must generate names for a new soft drink, and each has a total of 20 minutes in which to accomplish the task.

The "shifting" group typically generates twice as many ideas as the brainstorming group. Why? Because creativity is always an individual process, and social disapproval is the major deterrent to creativity our entire lives. Groups are far better at selecting good ideas than at generating them.



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FOUR TECHNIQUES TO BOOST CREATIVITY

Generativity research suggests four distinct strategies for increasing creative output. Each can be implemented in different situations in different ways, sometimes in multiple ways.

CAPTURING

New ideas are like rabbits streaking through consciousness; they're fleeting. If you don't grab them quickly, they're usually gone forever. Just a few minutes ago, while taking care of nature's business (more about that later), a catchy title for an article about our need for mild stressors—something like "What Would My Dog Do Without Her Fleas?"—popped into my head. Alas, by the time I got back to my desk, the title was gone, and I'm unable to get it back.

The main thing that distinguishes "creative" people from the rest of us is that the creative ones have learned ways to *pay attention to* and then to *preserve* some of the new ideas that occur to them. They have *capturing* skills.

The scientist Otto Loewi had struggled for years with a problem in cell biology. One night, a new approach to the problem occurred to him in his sleep. In the dark, he grabbed a pen and pad, recorded his new ideas, and went back to sleep. Come morning, he couldn't read his writing! Had he imagined this great solution, or was it real? The next night he was blessed by the same flash of insight. This time, he took no chances; he pulled on his clothes and went straight to his lab. He won the Nobel Prize for the work he began that night.

People who are serious about exploring their creative side develop and practice various methods of capturing new ideas. Artists carry sketchpads. Writers and advertisers carry notepads or pocket computers. Inventors make notes on napkins and candy-bar wrappers—especially inventors of new foods!

Salvador Dalí, the great surrealist,

used to grab ideas for paintings from the very fertile semi-sleep state we call the hypnagogic state. He'd lie on a sofa and hold a spoon in one hand, balancing it on the edge of a glass placed on the floor. Just as he'd drift off to sleep, he'd release the spoon, and the sound of the spoon hitting the glass would awaken him. Immediately, he'd sketch the bizarre hypnagogic images he was seeing.

Anyone can do this. We all have bizarre perceptual experiences in those moments before we fall fully asleep. Dalí simply developed a way to seize some of them.

Capturing skills can be taught to young children, to high school kids, to adults, to top executives. Teachers, parents, and managers can boost the creative output of a group manyfold simply by providing some simple training and the right materials.

Capturing is easier in certain settings and at certain times, so we improve our catch by identifying the settings and times that work best for us. For some people, the Three Bs of Creativity—the Bed, the Bath, and the Bus—are particularly fertile, especially if you keep writing materials handy in those locations (obviously, today I failed to do so). Others need to sit by a pool or on a cruise ship or in a lonely cabin in the woods. Years ago I gave a talk on creativity at the Rowland Institute, a private research center built by Edwin Land, the millionaire inventor of the Polaroid "Land" camera. Land designed the entire institute to be a giant idea-capturing machine. Inside, a serene Japanese garden runs the length of the building, with skylights overhead. He wanted himself and fellow researchers to be able to "hear themselves think" as they walked, slowly and peacefully, through the magnificent indoor garden—literally, a garden of new ideas.

CHALLENGING

One way to accelerate the flow of new ideas is by challenging yourself—that is, by putting yourself in difficult situations in which you're likely to fail to some extent. A challenging situation is

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like an "extinction" procedure in the behavioral laboratory. We extinguish behavior when we withdraw the reinforcers that usually maintain that behavior. In challenging situations, a great deal of behavior goes unreinforced; it just doesn't work.

When a behavior is unsuccessful, typically it gets weaker. We feel frustrated and upset, and, most important for creativity, there is a "resurgence" of behaviors that used to be effective. We begin trying out every other behavior that ever worked for us in the past under similar conditions. That gets many behaviors competing vigorously, which greatly enhances the generative process. (Our feelings of frustration and confusion are largely byproducts of this stiff competition.)

Say you start to turn a door knob that has always turned easily. It won't budge. At first, you start to turn the knob harder; then perhaps you pull up on the knob or push it down. Then maybe you wiggle it. Eventually, you shove the door with your shoulder or kick it with your foot. What you do will *depend on your history* with doors. Eventually, you'll shout for help—maybe even call out for "mommy," even if your mother is no longer among the living.

It's possible to take advantage of this robust process to spur creativity. For example, from time to time we can give students and employees open-ended problems to solve—problems that have an infinite number of solutions. Rather than saying, "Please give me three names for our company's new widget," try saying, "Please give me as many names as possible for the widget." You'll get two or three times as many proposals from which to make a final selection.

"Ultimate problems"—challenging problems that have *no* solution—can also be used to accelerate creative output. With children or friends or colleagues, try spending 15 minutes a week solving one of these:

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- You have 24 hours in which to bring about world peace. How do you do it?
- You have one year in which to clean up all of the pollution on earth and make sure that people never pollute the planet again. What's your plan?
- Aging is a real drag. Eliminate it.

You shouldn't expect to find a real solution, but you'll certainly stimulate a lot of interesting new ideas. This is an example of using a "controlled failure system"—a structured challenge that makes people feel reasonably safe—to stimulate new ideas without causing those annoying myocardial infarctions.

Do we really want to place ourselves in situations in which we know we're going to feel frustrated and confused? Emphatically, yes! If you're feeling frustrated, you're in the company of the greatest poets, composers, and inventors of all time, and, more likely than not, you're on the verge of a new idea. Failure is not something to fear; properly managed, it's a great well-spring of creativity.

BROADENING

Here's a deceptively simple fact: for repertoires of behavior to contribute to the generative process, they must first exist. In other words, the more training you have and the more diverse that training is, the greater the potential for creative output. Letting kids float around a classroom from one "activity center" to another is not the way to go; when we're on our own, we gravitate toward a very narrow range of learning opportunities. The creative process is spurred on by multiple well-established repertoires of behavior. Traditional, structured, aggressive methods of teaching and training have special value in laying a foundation for creativity.

A contradiction? Didn't I say that first-grade teachers were monsters who stifled creativity by doing too much teaching? The problem with traditional education is not that it teaches diverse

subjects or subjects that lack apparent utility; the problem is that it doesn't allocate any time and training for creativity as such. Kids need to learn things that they don't want to learn—not just to become good citizens, but also to become more creative people.

If you want to enhance your own creativity, take courses in subjects you know nothing about. Once a year, at least, take a course at a local college in the last thing you'd ever want to know about. Land's own breakthrough invention came about because of training he had in crystallography, chemistry, and other fields. The invention of Velcro, the modern theory of electron spin, and countless other advances were made possible because their creators had training in diverse fields.

SURROUNDING

Finally, you can enhance your creativity by surrounding yourself with diverse stimuli—and, even more important, by changing those stimuli regularly. Diverse and changing stimuli promote creativity because, like resurgence, they get multiple behaviors competing with each other. If you put a Mickey Mouse hat and pliers on your desk in the morning, your thinking will move in odd directions during the day. Call these items distractions, if you like; they are great reservoirs of creativity.

Here's the great news: Generativity research shows that *everyone* has creative abilities. The generative mechanisms that underlie the creative process operate all the time in each of us. Every one of us has the creative potential of Mozart or Picasso or Edison or Einstein. To boost your creative output, capture your new ideas as they occur, challenge yourself in order to get ideas competing, broaden your training so that many new repertoires of behavior will be available to compete, and surround yourself as much as possible with diverse and ever-changing stimuli.

Anyone can master these creative strategies. They're all that stand between you and the most creative people in history. ☐

CONTRIBUTORS

Robert Epstein, author of "Capturing Creativity," is a contributing editor at *Psychology Today*. Epstein, who earned his Ph.D. in psychology at Harvard University in 1981, is founder and director emeritus of the Cambridge Center for Behavioral Studies in Massachusetts and a researcher at San Diego State University. His latest books include *Pure Fitness: Body Meets Mind* (with Lori Petrick) and *Creativity Games for Trainers*.