

The Physical Act of Creativity

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When Hollywood producer Steven Spielberg was working on his 1977 hit movie *Close Encounters of the Third Kind*, he spent long hours puzzling over the artistic texture of the film, trying to get just the right feel. Late one night, he decided to put his work aside and take a drive to clear his head. He headed up Hollywood Hill to one of the vistas overlooking Los Angeles and—impulsively, for no reason at all—he did a hand-stand on the roof of his car. With his perspective on the illuminated LA cityscape turned topsy-turvy, he “saw” what would become the alien visitors’ spacecraft.

This Hollywood legend may be apocryphal, but creativity gurus love it anyway. Creative thinking is the lifeblood of every intellectual enterprise, from the arts to commerce, yet it remains elusive. There is no on-off switch, no simple formula—in short, no reliable path to novel and useful ideas. This leaves a lot of room for charlatans and gimmicks, and hand-stands are far from the strangest.

Indeed, Spielberg may have been on to something. New research is pointing to a possible link between bodily movement and creative thinking. Psychological scientist Angela Leung of Singapore Management University (working with colleagues at the Ross School of Business at the University of Michigan and Cornell, and others) got interested in this possibility because of the many common metaphors linking creativity and physical experience—“thinking outside the box,” for example. A rich body of recent work has suggested that such metaphors may derive from an actual and intimate link between abstract concepts and concrete experience, and that priming physical sensations can activate abstract ideas. Leung and colleagues wondered: What if it goes even further than that? What if physical experiences not only activate existing knowledge, but also trigger cognitive processes that enlarge knowledge in creative new ways?

The scientists ran several experiments to test this idea in various ways. In one, for example, they decided to explore the metaphor “on the one hand . . . on the other hand”—a common figure of speech for problem solving. The scientists took it literally, and asked volunteers to actually use two hands while pondering a problem. Specifically, the volunteers tried to generate novel ideas for using university property, while (under the ruse of another study) simultaneously holding out a hand as if they were making a speech. Some of the volunteers held out just their right hand, while others switched hands during the course of the experiment—so they were generating ideas “on the one hand, and on the other.” The volunteers’ ideas were rated by independent judges for originality, flexibility and fluency. Fluency is the sheer number of ideas generated, and flexibility is the extent to which these ideas differ from one another, spanning categories. These are considered the three components of a kind of creativity called

“divergent thinking.”

When the scientists crunched the data, the two-handed thinkers were clearly the more creative. As described in a forthcoming issue of the journal *Psychological Science*, they generated more ideas, and more ideas of different types, and their ideas were judged as more novel. The scientists interpret these results as evidence that accessing both sides of a problem—literally—helps overcome cognitive rigidity that stifles creative thinking.

The researchers then tested the platitude “thinking outside the box.” This phrase originated in an old parlor game—appropriated by creativity consultants in the 1970s—which challenges the solver to connect nine dots arranged in a three-by-three grid. The trick is to connect the dots using only four lines, and without once lifting the pencil. To solve the puzzle, one must think creatively, literally outside the box. To test the potency of this metaphor, Leung and her co-workers actually made a box, a five-foot cube, out of pipe and cardboard. They asked some volunteers to sit inside this box while they solved word problems, while others solved the same problems sitting just outside the box. This particular kind of word problem tests another form of creativity called “convergent thinking”—the ability to analyze relationships among remote ideas and come up with the one correct solution. Doing well requires insight and cognitive flexibility.

Again, the results clearly favored those who were acting out the metaphor. Compared to those inside the makeshift box, those on the outside generated more correct answers, suggesting that the physical experience fostered creative thinking. To double-check this, the scientists ran another version in which some volunteers walked in a rectangular square, while others just walked freely. They all contemplated riddle pictures while walking and, again, those outside the box came up with more creative solutions than those walking in an inflexible pattern. They also ran a version in which they became avatars the popular 3D virtual world, *Second Life*. The avatars either walked freely or in a box, with the same results for creative thinking. This suggests that using mental imagery to think about one’s body can also trigger creative processes.

These results, taken together, suggest that common metaphors for creativity tap into a kind of deep wisdom about physical experience. Actual physical acts appear to activate the abstract processes that overcome mental rigidity and make new connections—the nuts and bolts of creativity. Something as simple as gesturing with alternate hands, or literally getting out of the box, may eliminate unconscious barriers that restrict thinking. It’s a strange and unfamiliar idea—or put another way, it’s far from familiar, stale or clichéd.

Wray Herbert’s book, [*On Second Thought*](#), is out in paperback. Excerpts from his two blogs—“We’re Only Human” and “Full Frontal Psychology”—appear regularly in *Scientific American Mind* and in *The Huffington Post*.