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Study Reveals How The Creative Brain Is Wired

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The brains of creative people are wired differently than most, finds a new study published in the *Proceedings of the National Academy of Sciences*. Not only does the study reveal unique features of the creative brain, but it also helps dispel a common brain myth (which we'll get to in just a moment).

If you put a group of people in a room, give them a set of objects and ask them to come up with as many creative uses for those objects as possible, most people will produce a fairly limited number of ideas. But a minority of people, perhaps just one or two in the room, will come up with a range of creative ideas that will leave the others wondering how they thought of them.

That scenario is roughly how a research team tested a group of just over 160 volunteers, whose brains they scanned with functional magnetic resonance imaging (fMRI) while the volunteers tried thinking of creative uses for a set of common objects, including a brick, a knife and some rope.

The researchers wanted to know whether the brains of people who are consistently more creative would show different activation patterns than other brains, and which brain areas would be involved. The results of the imaging revealed that the brains of the most creative volunteers showed a distinct pattern of activity across three brain networks: the default mode network, the salience network and the executive control network. Each is a seat of activity for different capabilities (the default mode network, for instance, kicks in when we're daydreaming and plays a major role in imaginative thought), and typically there's not much activity cutting across their boundaries. But in the highly creative brain, they collectively host a symphony of interactions that produce striking ideas.

"What this shows is that the creative brain is wired differently," said Roger Beaty, a Post-Doctoral Fellow in Psychology and the first author of the study. "People who are more creative can simultaneously engage brain networks that don't typically work together."

And it's not just that those brain areas work well together in the creative brain, but they also evidence a "flexibility of thought" that stands in contrast to the rigidity common to most brains when faced with creative challenges.

"It's the synchrony between these systems that seems to be important for creativity," Beaty said in a press statement. "People who think more flexibly and come up with more creative ideas are better able to engage these networks that don't typically work together and bring these systems online."

The value of any research finding like this depends on whether it can accurately predict similar results. In this case, the researchers went back and looked at findings from comparable studies, and found that they could predict levels of creativity in the study participants by measuring the strength of the connections between the three brain networks.

"We used predictive modeling to show we could predict, with some degree of accuracy, how creative people's ideas were (based on brain scans) that had already been published," said Beaty.

A nice side benefit of the research is that it undercuts the common myth that creativity is influenced by being either "left brained" or "right brained." Instead, it seems clear (from this and previous research) that creativity involves multiple brain areas across both hemispheres.

"One thing I hope this study does is dispel the myth of left versus right brain in creative thinking," Beaty said. "This is a whole-brain endeavor."

The researchers were careful to note that the results don't tell us whether creativity is "just something you're born with" or if it can be enhanced via training and practice.

"It's not something where you have it or you don't," added Beaty. "Creativity is complex, and we're only scratching the surface here, so there's much more work that's needed."

The study was published in the *Proceedings of the National Academy of Sciences*.

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