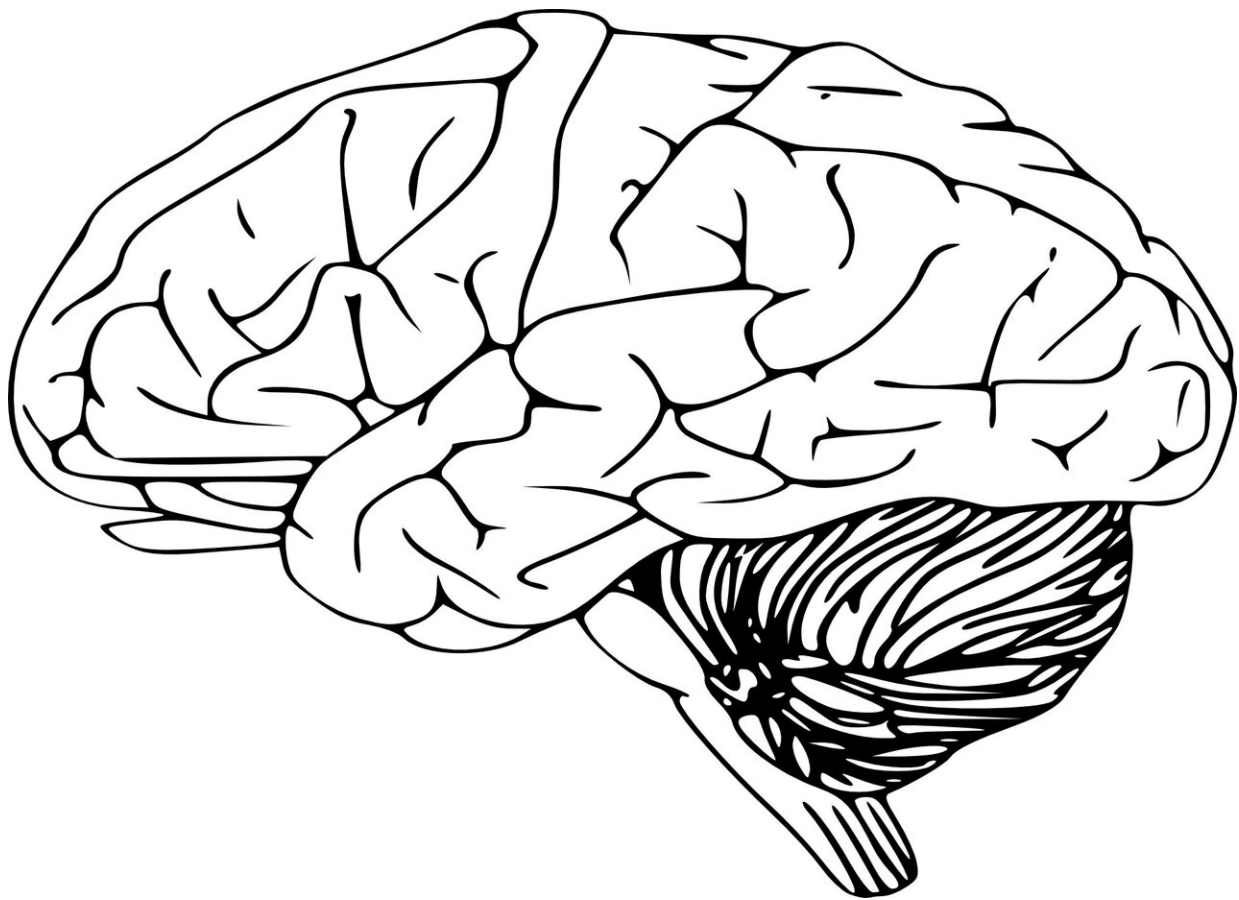


# Research shows unique connectivity lets highly creative people's brains take 'road less traveled' to their destination

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A new study led by UCLA Health scientists shows highly creative people's brains appear to work differently from others', with an atypical approach that makes distant connections more quickly by bypassing the "hubs" seen in non-creative brains.

Exceptionally creative visual artists and scientists—called "Big C" creative types—volunteered to undergo functional MRI brain imaging, giving researchers in psychiatry, [behavioral sciences](#) and psychology a look at how regions of the brain connected and interacted when called upon to perform tasks that put creative thinking to the test.

"Our results showed that highly creative people had unique brain connectivity that tended to stay off the beaten path," said Ariana Anderson, a professor and statistician at the Semel Institute for Neuroscience and Human Behavior at UCLA, the lead author of a new article in the journal *Psychology of Aesthetics, Creativity, and the Arts*. While non-creatives tended to follow the same routes across the brain, the highly creative people made their own roads.

Although the concept of creativity has been studied for decades, little is known about its biological bases, and even less is understood about the brain mechanisms of exceptionally creative people, said senior author Robert Bilder, director of the Tennenbaum Center for the Biology of Creativity at the Semel Institute. This uniquely designed study included highly [creative people](#) representing two different domains of creativity—[visual arts](#) and the sciences—and used an IQ-matched comparison group to identify markers of creativity, not just intelligence. The researchers analyzed how connections were made between brain regions globally and locally.

"Exceptional [creativity](#) was associated with more random connectivity at the global scale—a pattern that is less 'efficient' but would appear helpful in linking distant brain nodes to each other," Bilder said. "The

patterns in more local brain regions varied, depending on whether people were performing tasks. Surprisingly, Big C creatives had more efficient local processing at rest, but less efficient local connectivity when performing a task demanding 'thinking outside the box.'"

Using airline route maps for comparison, the researchers said the Big C creatives' brain activity is akin to skipping flights to connecting hubs to get to a small city.

"In terms of brain connectivity, while everyone else is stuck in a three-hour layover at a major airport, the highly creatives take private planes directly to a distant destination," Anderson said. "This more random connectivity may be less efficient much of the time, but the architecture enables brain activity to 'take a road less traveled' and make novel connections."

Bilder, who has more than 30 years' experience researching brain-behavior relations, said, "The fact that Big C people had more efficient local [brain](#) connectivity, but only under certain conditions, may relate to their expertise. Consistent with some of our prior findings, they may not need to work as hard as other smart people to perform certain creative tasks."

The artists and scientists in the study were nominated by panels of experts before being validated as exceptional based on objective metrics. The "smart" comparison group was recruited from participants in a previous UCLA study who had agreed to be contacted for possible participation in future studies, and from advertisements in the community for individuals with graduate degrees. The researchers made efforts to ensure that age, sex, race and ethnicity were comparable to those of participants in the Big C groups.

**More information:** Ariana Anderson et al, Big-C creativity in artists

and scientists is associated with more random global but less random local fMRI functional connectivity., *Psychology of Aesthetics, Creativity, and the Arts* (2022). [DOI: 10.1037/aca0000463](https://doi.org/10.1037/aca0000463)

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