

Grasping Metaphors: UCSD Research Ties Brain Area To Figures Of Speech

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What does it take to fathom a proverb - catch the figurative meaning of "an apple doesn't fall far from the tree"?

According to research led by V. S. Ramachandran, director of the Center for Brain and Cognition at the University of California, San Diego, a region of the brain known as the angular gyrus is probably at least partly responsible for the human ability to understand metaphor.

Ramachandran and colleagues tested four right-handed patients with damage to the left angular gyrus. Fluent in English and otherwise intelligent and mentally lucid, the patients showed gross deficits in comprehending such common proverbs as "the grass is always greener on the other side" and "an empty vessel makes more noise." Asked to explain the sayings, the patients tended to give responses that were literal. The metaphorical meaning escaped them almost entirely.

When pressed to provide deeper or more general accounts, Ramachandran said, "the patients often came up with elaborate, even ingenious interpretations - that were completely off the mark."

Patient SJ, for example, a former physician who could maintain the flow of normal conversation and even retained the ability to correctly diagnose descriptions of symptoms, got all 20 of the 20 proverbs he was tested on wrong. Prodded on "all that glitters is not gold," he finally said that it meant you had to be very careful when buying jewelry because you might get robbed.

The patients were equally bad at matching a bulbous, amoeboid shape to the sound "booba" and a jagged shape to "kiki." (See figure.) Whereas more than 90 percent of ordinary respondents succeed at this task - of translating one sort of sensory information into another - patients with damage to the angular gyrus performed at the level of chance.

Three age-matched control subjects, on the other hand, with lesions in other areas of the brain, performed normally both with proverbs and the booba/kiki test.

Disproportionately larger in hominids than other primates, the angular gyrus, given its strategic location at the crossroads of areas specialized for processing touch, hearing and vision, Ramachandran conjectures, is critical both to conceptual metaphors and to cross-modal abstractions more generally.

"While it would be premature to conclude that the angular gyrus is the 'metaphor center' of the human brain, we suggest that the evolution of the dominant angular gyrus contributed enormously to the evolution of many quintessentially human abilities, including metaphorical - and other abstract - thinking," Ramachandran said.

"Any monkey can reach for a peanut," he said, "but only a human can reach for the stars or even understand what that means."

Ramachandran's lab is continuing work on linking other brain areas, the supramarginal gyrus and human homologues of mirror neurons, for example, to other types of metaphoric abilities.

Intriguingly, in the current study, patient KK, who had damage not only to the angular gyrus but also to the supramarginal gyrus, was abysmal at understanding action metaphors such as "grasping an idea" or "putting your finger on the main argument."

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