

Can you see the emotions I hear? Study says yes

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By observing the pattern of activity in the brain, scientists have discovered they can "read" whether a person just heard words spoken in anger, joy, relief, or sadness. The discovery, reported online on May 14th in *Current Biology*, a Cell Press publication, is the first to show that emotional information is represented by distinct spatial signatures in the brain that can be generalized across speakers.

"Correct interpretation of emotion in the voice is highly important - especially in a modern environment where visual emotional signals are often not available," for instance, when people talk on the phone, said Thomas Ethofer of the University of Geneva, Switzerland. "We demonstrated that the spatial pattern of activity within the [brain](#) area that processes human voices contains information about the expressed emotion."

Previous neuroimaging studies showed that voice-sensitive auditory areas activate to a broad spectrum of vocally expressed emotions more than to neutral speech melody, the researchers explained. However, this enhanced response occurs irrespective of the specific category of emotion, making it impossible to distinguish different vocal emotions with conventional analyses.

In the new study, the researchers presented people with pseudowords spoken in five ways - with anger, sadness, relief, joy, or no emotion - while their brains were scanned with [functional magnetic resonance imaging](#) (fMRI). They then analyzed the overall spatial pattern of

activity in the auditory cortex by using a method called multivariate pattern analysis.

"While conventional methods analyze each point in the brain separately, we looked at the overall pattern," Ethofer explained. "Consider the following analogy: If you have a puzzle consisting of black and white pieces, it is hard to say whether they belong to a picture of a zebra or a checkerboard if you look at each piece in isolation, but it becomes relatively easy if you put the pieces together."

Indeed, their analysis showed that they could classify each emotion against all other alternatives.

The findings have not only yielded new insight into this most critical of social skills, but they might also help researchers unravel where it goes wrong in those with various psychiatric disorders, Ethofer said.

"Comprehension of emotional prosody is crucial for social functioning and compromised in various psychiatric disorders, including deficits for anger and sadness in schizophrenia, fear and surprise in bipolar affective disorder, and surprise in depression," the researchers wrote. "Future research might apply a similar approach as ours to clarify whether these deficits are paralleled by activity changes blurring emotions at the level of auditory cortex, or are due to disrupted patterns within frontal regions reflecting biased interpretation of emotional signals."

Source: Cell Press ([news](#) : [web](#))

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