Brain responds more quickly to angry voices, says study

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Sight and hearing are the two senses that allow human beings to detect threatening...
Geneva: We notice aggressive or threatening voices much faster than those that sound normal or happy, scientists say.

According to the study published in the journal Social, Cognitive and Affective Neuroscience, our attention is more focused on threatening voices to enable us to clearly recognise the location of the potential threat.

Researchers from the University of Geneva (UNIGE) in Switzerland showed how our brain leverages resources when we sense danger to allow for adequate survival behaviour.

Sight and hearing are the two senses that allow human beings to detect threatening situations.

Although sight is critical, it does not allow for a 360-degree coverage of the surrounding space -- unlike hearing.

"That's why we are interested in how fast our attention responds to the different intonations of the voices around us and how our brain deals with potentially threatening situations," said Nicolas Burra, a researcher at UNIGE.

To examine the brain's response to threats in the auditory environment, the researchers presented 22 short human voice sounds (600 milliseconds) that were neutral utterances or expressed either anger or joy.

Using two loudspeakers, these sounds were presented to 35 participants while an electroencephalogram (EEG) measured electrical activity in the brain down to the millisecond. More specifically, the researchers focused on the electrophysiological components related to auditory attentional processing.
"Each participant heard two sounds simultaneously: two neutral voices, one neutral and one angry voice, or one neutral and one happy voice. When they perceived anger or joy, they had to respond by pressing a key on a keyboard as accurately and quickly as possible," said Leonardo Ceravolo, researcher at UNIGE.

"We then measured the intensity of brain activity when attention is focused on the different sounds, as well as the duration of this focus before a return to the basic state," he said.

Using data from the EEG, researchers examined the appearance of a cerebral marker of auditory attention called N2ac.

"When the brain perceives an emotional target sound, N2ac activity is triggered after 200 milliseconds. However, when it perceives anger, the N2ac is amplified and lasts longer," Burra said.

Subsequently, after 400 milliseconds, our attention must disengage from the emotional vocal stimulus.

At this moment, a cerebral marker of auditory attention, called LPCpc, intervenes. "Anger can signal a potential threat, which is why the brain analyses these kinds of stimuli for a longer time," said Ceravolo.

The study demonstrated for the first time that in a few hundred milliseconds, our brain is sensitive to the presence of angry voices, researchers said.

This rapid detection of the source of a potential threat in a complex environment is essential, as it is "critical in crisis situations and a great advantage for our survival," said Ceravolo.

Tags: brain, angry voice, attention, potential threat, mental health
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Subsequently, after 400 milliseconds, our attention must disengage from the threat and allocate resources to continue our activity. “When the brain perceives an emotional target sound, N2ac activity is amplified and lasts longer,” Burra said.

The participants were instructed to press a key as accurately and quickly as possible when they heard an angry voice. When they perceived anger or joy, they had to respond to the corresponding target. They had to respond to a happy voice when they perceived anger or joy. Each participant heard two sounds simultaneously: two neutral sounds (600 milliseconds) that were neutral utterances or expressed emotions. One of the neutral sounds was replaced by an angry or a happy voice. The study was sponsored by Leonardo Ceravolo, researcher at UNIGE.

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We notice aggressive or threatening voices much faster. A recent study at the University of Geneva (UNIGE) found that our brain can detect angry voices within milliseconds, which is a great advantage for our survival, according to researchers.

The research, led by Leonardo Ceravolo, involved 35 participants. Each participant heard two sounds simultaneously: two neutral sounds or a neutral sound and an angry sound. The brain's reaction was measured by an electrical signal called the N2pc component, which responds to threatening stimuli.

Researchers also found that when people heard angry voices, they showed a faster return to a basic state, indicating that their attention was focused on the threat. Ceravolo said, "This rapid detection of the source of a potential threat in a complex environment can help our survival."

The study contributes to our understanding of how our brain processes different types of sounds and how it responds to potential threats. The findings could have implications for improving warning systems and communication strategies in dangerous situations.