

Tone-deaf people may also have limited ability to detect emotional cues in speech, study finds

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A new study has revealed that those with congenital amusia (commonly referred to as tone-deafness) have trouble decoding emotions in speech and find it hard to pick up on emotional cues in conversation.

"In all speech there is a musical quality that is created by differences in the timing, pitch and loudness of the speaker. Tone of voice can be used to differentiate a statement from a question, or a sad expression from fearful. Amusic individuals have trouble hearing these subtle differences and so often find it hard understanding the emotional tenor of a conversation," says lead researcher Dr Bill Thompson, Macquarie University.

The findings, published in the [Proceedings of the National Academy of Sciences](#), tested how well tone-deaf people were able to detect emotions such as sadness, happiness, tenderness, irritation and fear. Compared with those who were not tone-deaf, the accuracy rate for detecting certain emotions was up to 20% lower.

The reason for this impairment is a reduced sensitivity to the subtle changes in pitch that speakers often use to convey emotion in their voices. When emotions were conveyed by other cues such as loudness or duration, the tone-deaf individuals were much better.

"Participants were most likely to confuse emotional categories that differed from each other mainly in pitch [intonation](#), and were similar to each other in loudness and duration. For example, tender and sad speech were often confused with each other, as was irritated and fearful speech," say Thompson.

Tone-deaf participants reported greater difficulty understanding how people felt merely by listening to them speak (for example, on the telephone), and said they relied more heavily on [facial expressions](#) and [gestures](#) when interpreting the moods and feelings of people during

conversations. The group also reported fewer changes in their emotional state when listening to music and were less likely to incorporate music into their daily activities.

"That the tone-deaf participants were more likely to report difficulties interpreting subtle aspects of speech – such as sarcasm – indicates that there is definitely some self-awareness of their deficit and how it affects their social interactions," says Thompson.

Thompson and his colleagues believe many tone-deaf individuals develop strategies to compensate for their impairment and are highly attuned to other auditory and visual signals of emotion, such as the facial expressions of a speaker. "Just as a blind individual may develop extra-sensory perception of auditory signals in the environment, tone-deaf individuals may develop a heightened sensitivity to non-pitch signals of emotion, and may even give them an advantage at performing certain tasks," he says.

Though up to 17% of individuals suspect they are tone-deaf, the prevalence of true congenital amusia is estimated to be lower, and while it does not cause a major impediment the discovery that congenital amusia are not restricted to music does have wider social implication.

"This new research supports the claim that music and speech share a common acoustic code for emotional communication. It also lends support to early speculations by Charles Darwin and several contemporary theorists that emotional communication is a fundamental link between music and [speech](#) and reflects their common evolutionary origin," says Thompson.

Provided by Macquarie University

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