

Human brain becomes tuned to voices and emotional tone of voice during infancy

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New research finds that the brains of infants as young as 7 months old demonstrate a sensitivity to the human voice and to emotions communicated through the voice that is remarkably similar to what is observed in the brains of adults. The study, published by Cell Press in the March 25 issue of the journal *Neuron*, probes the origins of voice processing in the human brain and may provide important insight into neurodevelopmental disorders such as autism.

Dr. Tobias Grossmann from the Centre for Brain and Cognitive Development at the University of London led the study which was performed in Dr. Angela D. Friederici's laboratory at the Max Planck Institute for Human Cognitive and Brain Sciences in Germany. The researchers used near-infrared spectroscopy to investigate when during development regions in temporal cortex become specifically sensitive to the human voice. These specific cortical regions have been shown to play a key role in processing spoken language in adults. Grossmann and colleagues observed that 7-month-olds but not 4-month-olds showed adult-like increased responses in the temporal cortex in response to the [human voice](#) when compared to nonvocal sounds, suggesting that voice sensitivity emerges between 4 and 7 months of age.

Another important question addressed in this study was whether activity in infants' voice-sensitive [brain regions](#) is modulated by emotional prosody. Prosody, essentially the "music" of speech, can reflect the feelings of the speaker, thereby helping to convey the context of language. In humans, sensitivity to emotional prosody is crucial for

social communication. The researchers observed that a voice-sensitive region in the right temporal cortex showed increased activity when 7-month-old infants listened to words spoken with emotional (angry or happy) prosody. Such a modulation of [brain activity](#) by emotional signals is thought to be a fundamental [brain mechanism](#) to prioritize the processing of significant stimuli in the environment.

"Our findings demonstrate that voice-sensitive [brain](#) regions are already specialized and modulated by emotional information by the age of 7 months and raise the possibility that the critical neurodevelopmental processes underlying impaired voice-processing reported in disorders like autism might occur before 7 months," explains Dr. Grossmann. "Therefore, in future work the current approach could be used to assess individual differences in infants' responses to voices and emotional prosody and might thus serve as one of potentially multiple markers that can help with an early identification of infants at risk for a neurodevelopmental disorder."

More information: Friederici et al.: "Report: The Developmental Origins of Voice Processing in the Human Brain." Publishing in *Neuron* 65, 852-858, March 25, 2010. [DOI:10.1016/j.neuron.2010.03.001](https://doi.org/10.1016/j.neuron.2010.03.001)

Provided by Cell Press

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