

Brain uses internal 'average voice' prototype to identify who is talking

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(Medical Xpress)—The human brain is able to identify individuals' voices by comparing them against an internal 'average voice' prototype, according to neuroscientists.

A study carried out by researchers at the University of Glasgow and reported in the journal *Current Biology* demonstrates that voice identity is coded in the brain by reference to two internal voice prototypes – one male, one female.

[Voices](#) that have the greatest difference from the prototype are perceived as more distinctive and produce greater [neural activity](#) than voices deemed very similar.

The researchers in the Institute of Neuroscience & Psychology conducted the study by generating a voice prototype through morphing 32 same-gender voices together resulting in a smooth, idealised voice with few irregularities.

They then generated different voices by altering the 'distance-to-mean' of the prototype voice – for example, changing the tone and pitch or morphing two or more voices together.

Using functional Magnetic Resonance Imaging (fMRI), the researchers were able to see increased neural activity the further from the prototype the voices were.

Professor Pascal Belin said: "Like faces, voices can be used to identify a person, yet the neural basis of this ability remains poorly understood. Here we provide the first evidence of a norm-based coding mechanism the brain uses to identify a speaker.

"The research indicates this is a similar process for the identification of faces, where the brain also uses an average face to compare against other faces it encounters in order to establish identity.

"So, rather than having to remember each single voice it hears every day for a lifetime, the [brain](#) facilitates the task of identification by remembering only the differences from the prototype it stores.

"It leads to a range of interesting and important questions, such as whether the prototypes are innate, stored templates or whether they are subject to environmental and cultural influences. Could the prototype consist of an average of all voices experiences during one's life?"

The study 'Norm-based Coding of Voice Identity in Human Auditory Cortex' was supported by the Biotechnology and Biological Sciences Research Council (BBSRC).

More information: Latinus et al., 'Norm-based Coding of Voice Identity in Human Auditory Cortex', *Current Biology* (2013)
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