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## PRESS RELEASE

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# Our brains recognise the voices of our primate cousins

A UNIGE team shows that certain vocal processing skills are shared between humans and great apes.

**The brain doesn't just recognise the human voice. A study by the University of Geneva (UNIGE) shows that certain areas of our auditory cortex respond specifically to the vocalisations of chimpanzees, our closest cousins both phylogenetically and acoustically. This finding, published in the journal *eLife*, suggests the existence of subregions in the human brain that are particularly sensitive to the vocalisations of certain primates. It opens a new window on the origin of voice recognition, which could have implications for language development.**

Our voice is a fundamental signal of social communication. In humans, a large part of the auditory cortex is dedicated to its analysis. But do these skills have older roots? To find out, scientists from UNIGE's Faculty of Psychology and Educational Sciences adopted an approach based on the evolution of species. By comparing the neural processing of vocalisations emitted by species close to humans, such as chimpanzees, bonobos and macaques, it is possible to observe what our brain shares, or does not share, with that of other primates and thus to investigate the emergence of the neural bases of vocal communication, long before the appearance of language.

### Visualising vocalisations

In this study, researchers at UNIGE presented 23 participants with vocalisations from four species: humans, as a control; chimpanzees, which are close to us both genetically and acoustically; bonobos, also genetically close but whose vocalisations are more reminiscent of birdsong; and finally macaques, more distant from humans in both respects. Using functional magnetic resonance imaging (fMRI), they analysed the activity of the auditory cortex. "Our intention was to verify whether a subregion sensitive specifically to primate vocalisations existed," explains Leonardo Ceravolo, research associate at UNIGE's Faculty of Psychology and Educational Sciences and first author of the study.

That is precisely what the research team observed. A region of the auditory cortex known as the superior temporal gyrus, which is involved in processing sounds, including language, music and emotions, is activated in response to the vocalisations of certain primates. "When participants heard chimpanzee vocalisations, this response was clearly distinct from that triggered by bonobos or macaques."

High resolution pictures

This specificity is all the more remarkable given that bonobos, although genetically as close to us as chimpanzees, produce vocalisations that are very different acoustically. It is therefore the dual proximity, both evolutionary and sonic, that seems to determine the human brain's response.

### **Implications for understanding the evolution of language?**

This discovery opens up interesting avenues for studying the evolution of the neural basis of communication. It suggests that certain regions of the human brain may have retained, over the course of evolution, a sensitivity to the vocalisations of close cousins. "We already knew that certain areas of the animal brain reacted specifically to the voices of their fellow creatures. But here, we show that a region of the adult human brain, the anterior superior temporal gyrus, is also sensitive to non-human vocalisations," points out Leonardo Ceravolo.

These findings reinforce the hypothesis that certain vocal processing skills are shared between humans and great apes, and therefore predate the emergence of articulate language. They could also contribute to a better understanding of the development of voice recognition, and even language in children, for example by helping to explain how babies manage to recognise the voices of their loved ones while still in utero.

## contact

### **Leonardo Ceravolo**

Senior Lecturer / Research Associate  
Swiss Center For Affective Science  
Faculty of Psychology and Educational Sciences  
UNIGE  
+41 22 379 09 20  
Leonardo.Ceravolo@unige.ch

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### **UNIVERSITÉ DE GENÈVE** **Communication Department**

24 rue du Général-Dufour  
CH-1211 Geneva 4

Tel. +41 22 379 77 17  
[media@unige.ch](mailto:media@unige.ch)  
[www.unige.ch](http://www.unige.ch)