

Monkeys can also thank their body for vocal development, not only their brain

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Common marmoset. (*Callithrix jacchus*) Credit: Carmem A. Busko/Wikipedia/CC BY 2.5

Normally we think about the brain as an all-controlling organ that guides

the development of all bodily organs and functions. But according to the authors of a new paper in *Nature Communications*, this is not solely the case.

"There is a growing realization amongst neuroscientists that you cannot ignore the body. The body is capable of locally solving problems without the use of brain power," says biologist Coen Elemans, associate professor, University of Southern Denmark.

Together with Professor of Neuroscience Asif A. Ghazanfar and his team at Princeton University, he studied vocal communication in marmoset monkeys. Their study can be found [here](#)

Infant marmosets and humans

Like human infants, marmoset infants spontaneously call in sequences that include both immature and mature vocalizations. However, over the course of a few months during their maturation, infant vocalizations change from mostly immature-sounding low pitched contact calls to high-pitched and loud mature contact calls.

"Previously we thought the brain was responsible for this developmental shift. In this study we show that this is not the case," Elemans says.

The team studied sound production in the larynx of infant and adult marmosets using [high-speed cameras](#).

From chest to falsetto register in humans

"We show that the infant marmoset larynx undergoes changes in the biomechanical properties that causes changes in how the [vocal folds](#) in the larynx vibrate. At [low frequencies](#) the vocal folds vibrate, but at [high](#)

[frequencies](#) instead thin membranes on top start to vibrate."

This shift is comparable to the change observed from chest to falsetto register in human singers. In [marmoset monkeys](#) the shift from low to high pitch, loud calls also guides the changes in marmoset vocal behavior changes.

"What we see here, is the body making a local solution," says Elemans.

Takes a load off the brain

According to the researchers, local body solutions make sense, because they save energy: >It takes a load off the brain and significantly simplifies [motor control](#). It reduces the computational load, and thus energy consumption, of the developing brain.

More information: Yisi S. Zhang et al, Vocal state change through laryngeal development, *Nature Communications* (2019). [DOI: 10.1038/s41467-019-12588-6](#)

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