

# Babies' language learning starts from the womb

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Credit: Photo by Chris Meyer, Indiana University

(PhysOrg.com) -- From their very first days, newborns' cries already bear the mark of the language their parents speak, reveals a new study published online on November 5th in *Current Biology*, a Cell Press publication. The findings suggest that infants begin picking up elements of what will be their first language in the womb, and certainly long before their first babble or coo.

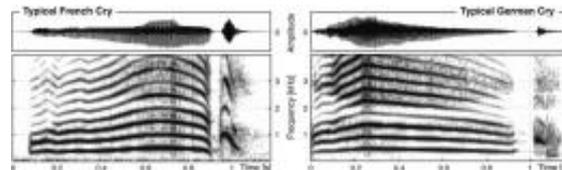
"The dramatic finding of this study is that not only are human neonates capable of producing different cry melodies, but they prefer to produce those melody patterns that are typical for the ambient [language](#) they have heard during their fetal life, within the last trimester of gestation," said Kathleen Wermke of the University of Würzburg in Germany. "Contrary to orthodox interpretations, these data support the importance of human infants' crying for seeding language development."

Human fetuses are able to memorize sounds from the external world by the last trimester of [pregnancy](#), with a particular sensitivity to melody contour in both music and language, earlier studies showed. Newborns prefer their mother's voice over other voices and perceive the [emotional content](#) of

messages conveyed via intonation contours in maternal speech (a.k.a. "motherese"). Their perceptual preference for the surrounding language and their ability to distinguish between different languages and pitch changes are based primarily on melody.

Although prenatal exposure to native language was known to influence newborns' perception, scientists had thought that the surrounding language affected sound production much later, the researchers said. It now appears that isn't so.

Wermke's team recorded and analyzed the cries of 60 healthy newborns, 30 born into French-speaking families and 30 born into German-speaking families, when they were three to five days old. That analysis revealed clear differences in the shape of the newborns' cry melodies, based on their mother tongue.



The cry melody of french (left) and german (right) babies differs considerably with respect to the accentuation. Image: MPI für Kognitions- und Neurowissenschaften

Specifically, French newborns tend to cry with a rising melody contour, whereas German newborns seem to prefer a falling melody contour in their crying. Those patterns are consistent with characteristic differences between the two languages, Wermke said.

The new data show an extremely early impact of [native language](#), the researchers say. Earlier studies of vocal imitation had shown that infants

can match vowel sounds presented to them by adult speakers, but only from 12 weeks on. That skill depends on vocal control that just isn't physically possible much earlier, the researchers explain.

"Imitation of melody contour, in contrast, is merely predicated upon well-coordinated respiratory-laryngeal mechanisms and is not constrained by articulatory immaturity," they write. "Newborns are probably highly motivated to imitate their mother's behavior in order to attract her and hence to foster bonding. Because melody contour may be the only aspect of their mother's speech that [newborns](#) are able to imitate, this might explain why we found melody contour imitation at that early age."

Source: Cell Press ([news](#) : [web](#))

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