



## Universal syllables



### Some innate preferences shape the sound of words from birth

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Languages are learned, it's true, but are there also innate bases in the structure of language that precede experience? Linguists have noticed that, despite the huge variability of human languages, there are some preferences in the sound of words that can be found across languages. So they wonder whether this reflects the existence of a universal, innate biological basis of language. A SISSA study provides evidence to support to this hypothesis, demonstrating that certain preferences in the sound of words are already active in newborn infants.

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Take the sound "bl": how many words starting with that sound can you think of? *Blouse, blue, bland...* Now try with "lb": how many can you find? None in English and Italian, and even in other languages such words either don't exist or are extremely rare. Human languages offer several examples of this kind, and this indicates that in forming words we tend to prefer certain sound combinations to others, irrespective of which language we speak. The fact that this occurs across languages has prompted linguists to hypothesize the existence of biological bases of language (inborn and universal) which precede language learning in humans. Finding evidence to support

this hypothesis is, however, far from easy and the debate between the proponents of this view and those who believe that language is merely the result of learning is still open. But proof supporting the “universalist” hypothesis has now been provided by a new study conducted by a research team of the International School for Advanced Studies (SISSA) in Trieste and just published in the journal PNAS.

David Gomez, a SISSA research scientist working under the supervision of Jacques Mehler and first author of the paper, and his co-workers decided to observe the brain activity of newborns. “In fact, if it is possible to demonstrate that these preferences are already present within days from birth, when the newborn baby is still unable to speak and presumably has very limited language knowledge, then we can infer that there is an inborn bias that prefers certain words to others”, comments Gomez.

“To monitor the newborns’ brain activity we used a non-invasive technique, i.e., functional near-infrared spectroscopy”, explains Marina Nespors, a SISSA neuroscientist who participated in the study. During the experiments the newborns would listen to words starting with normally “preferred” sounds (like “bl”) and others with uncommon sounds (“lb”). “What we found was that the newborns’ brains reacted in a significantly different manner to the two types of sound” continues Nespors.

“The brain regions that are activated while the newborns are listening react differently in the two cases”, comments Gomez, “and reflect the preferences observed across languages, as well as the behavioural responses recorded in similar experiments carried out in adults”.

“It’s difficult to imagine what languages would sound like if humans didn’t share a common knowledge base”, concludes Gomez. “We are lucky that this common base exists. This way, our children are born with an ability to distinguish words from “non-words” ever since birth, regardless of which language they will then go on to learn”.

In addition to Gomez, Mehler and Nespors, the SISSA team that took part in this study also includes Silvia Benavides-Varela. The study was carried out in co-operation with the Northeastern University of Boston and the Santa Maria della Misericordia Hospital of Udine.

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#### Useful Links:

- **Original paper on PNAS:** <http://goo.gl/hkqRhU>

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#### IMAGE:

- **Credits:** Sergiu Bacioiu (<http://bit.ly/OEwYV2>)



**Contact:**

Communication office:

[pressroom@sissa.it](mailto:pressroom@sissa.it)

Tel: (+39) 040 3787557 | (+39) 340-5473118, (+39) 333-5275592

via Bonomea, 265

34136 Trieste

More information about SISSA: [www.sissa.it](http://www.sissa.it)