

Seals have a sense of rhythm

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The capacity to perceive rhythm and to produce novel vocalizations are crucial for human speech and music. Do other mammals possess these capacities? Researchers tested rhythm processing in seals; like humans, seals learn vocalizations. It was found that, spontaneously and without training, young seals perceive the rhythmicity of other seals' vocalizations and discriminate between more vs. less rhythmic sound sequences. These results show that another mammal, apart from us, shows rhythm processing and vocalization learning and suggest that these two skills coevolved in both humans and seals. Credit: Laura Verga

Rhythm is important for human music and speech. But are we the only mammal with a sense of rhythm? In an experimental study published in *Biology Letters*, a team of researchers led by the Max Planck Institute for Psycholinguistics in Nijmegen and Sealcentre Pieterburen show that seals can discriminate rhythm without prior training. Seals' rhythmic ability may be linked to their ability to learn vocalizations, skills that may have co-evolved in both humans and seals.

Why are we such chatty, musical animals? Evolutionary biologists think that our capacities for speech and music may be linked: Only animals that can learn new vocalizations—such as humans and songbirds—seem to have a sense of [rhythm](#). "We know that our closest relatives, [non-human primates](#), need to be trained to respond to rhythm," explains first author Laura Verga. "And even when trained, primates show very different rhythmic capacities to ours." But what about other mammals?


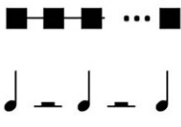


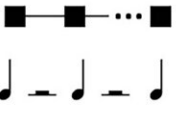
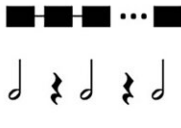
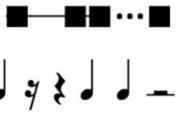

Seal rhythm

The researchers decided to test the rhythmic abilities of harbor [seals](#), animals known to be capable of vocal learning. The team first created sequences of seal vocalizations. The sequences differed in three rhythmic properties: tempo (fast or slow, like beats per minute in music), length (short or long, like duration of musical notes) and regularity (regular or irregular, like a metronome vs. the rhythm of free jazz). Would infant seals react to these rhythmic patterns?

The team tested twenty young seals being held at a rehabilitation center (the Dutch Sealcentre Pieterburen) before being released into the wild. Using a method from human infant studies, the team recorded how many times the seals turned their head to look at the [sound](#) source (behind their backs). Such looking behavior indicates whether animals (or infants) find a stimulus interesting. If seals can discriminate between different rhythmic properties, they might look longer or more often

when they hear a sequence they prefer.

The seals looked more often when vocalizations were longer, faster, or rhythmically regular. This means that the 1-year-old seals—without training or rewards—spontaneously discriminated between regular (metronomic) and irregular (arrhythmic) sequences, sequences with short vs. long notes, and sequences with fast vs. slow-paced tempo.

tempo (IOI)		length		regularity		sex	
fast		short		isochronous		female	
							

Seals listened to vocalizations combined based on the rhythmic principles of tempo (fast or slow), length (short or long calls), and regularity (metronomic or random rhythm). The sex of the seal producing the vocalisations was added as a non-rhythmic manipulation. Yet, the seal's behaviour was only influenced by the rhythm of the vocalizations. Credit: Laura Verga

Evolutionary origins

"Another [mammal](#), apart from us, shows rhythm processing and vocalization learning", says Verga. "This is a significant advance in the debate over the evolutionary origins of human speech and musicality,

which are still rather mysterious. Similarly to human babies, the rhythm perception we find in seals arises early in life, is robust, and requires neither training nor reinforcement."

Next, Verga and her team want to find out whether seals perceive rhythm in [vocalizations](#) of other animals, or even abstract sounds; and whether other mammals show the same skills: "Are seals special, or are other mammals also capable of spontaneously perceiving rhythm?"

More information: Laura Verga et al, Spontaneous rhythm discrimination in a mammalian vocal learner, *Biology Letters* (2022). [DOI: 10.1098/rsbl.2022.0316](https://doi.org/10.1098/rsbl.2022.0316). royalsocietypublishing.org/doi/10.1098/rsbl.2022.0316

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