

# Bats found to have innate sense of speed of sound

4 May 2021, by Bob Yirka



An adult bat (*Pipistrellus kuhlii*) flying from its perch to the target. Credit: Eran Amichai

A pair of researchers with Tel Aviv University's School of Zoology has found that bats have an innate sense of the speed of sound. In their paper published in *Proceedings of the National Academy of Sciences*, Eran Amichai and Yossi Yovel describe experiments they conducted with both wild and lab raised bats and what they learned from them.

Scientists have known for some time that many species of [bats](#) use echolocation to determine how far away an object is from them. They send out a signal and then measure its distance by the amount of time that it takes for the signal to bounce back to them. What is not known is whether this ability is something they are born with or if it is learned. To answer that question, the researchers conducted two kinds of experiments—one with bats reared in the lab, the

other with captured wild bats.

The first experiment involved raising bats from when they were pups until they were old enough to find food on their own. Each was trained to eat from a certain target placed 130 cm away from a starting perch. Some of the bats were raised in an environment with added helium in the air—helium is thinner than air, thus sound travels faster when passing through it. Each of the bats were then tested under two scenarios. In the first, the bats were tested on their ability to reach the target under normal conditions—they were also timed. In the second scenario, the bats were tested in the same ways as they flew in helium-enriched air.

The researchers found that those flying in helium-enhanced air tended to underestimate the distance to the target—and it did not matter if they were raised in a helium-rich environment or not.

In the second experiment, the researchers caught and trained several wild bats and taught them to eat from the same target as the bats in the first experiment. They then ran the same tests as they did in the first experiment and obtained the same results. The bats flying in [helium](#)-enriched air tended to underestimate the distance to the target. The researchers therefore suggest that bats have an innate sense of the speed of [sound](#).

**More information:** Eran Amichai et al. Echolocating bats rely on an innate speed-of-sound reference, *Proceedings of the National Academy of Sciences* (2021). [DOI: 10.1073/pnas.2024352118](https://doi.org/10.1073/pnas.2024352118)

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APA citation: Bats found to have innate sense of speed of sound (2021, May 4) retrieved 17 May 2021 from <https://phys.org/news/2021-05-innate.html>

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