



The biological sonar system called echolocation is a remarkable skill that lets bats navigate and hunt at high speeds in total darkness by emitting high-frequency sounds and analyzing the echoes that come bouncing back. Now, scientists conclude that bats can actually identify other individuals based on a single echolocation call, the BBC reports.

A new study by Yossi Yovel from the Weizmann Institute of Science in Israel and colleagues in Germany found that bats “are able to differentiate the ultrasonic echolocation calls that other bats make as they navigate,” says BBC science reporter Victoria Gill. Results of the research were published in the journal *PLoS Computational Biology*.

He told the BBC that this ability might explain how bats remain in large groups while flying at high speeds at night and how they avoid interfering with other bats’ echolocation calls.

Yovel’s team recorded echolocation calls of five different greater mouse-eared bats (*Myotis myotis*), then tested the bats’ ability to identify the others by playing the recorded sounds to them.

“Each bat was assigned two others it had to distinguish between,” Yovel told the BBC. “So we trained bat A on a platform, playing a sound from bat B on one side and from bat C on the other. He had to crawl to where the ‘correct’ sound was coming from.” Gill said that if the bat made the correct choice – by, for example, crawling towards the sound from bat B – it was rewarded with a tasty mealworm.

After receiving rewards for right answers in the first stage of the test, Yovel said, in the next stage, bats got a mealworm regardless of whether they chose correctly or not. And, Yovel told BBC, “they still chose correctly more than 80 percent of the time. So we knew the bats were able to distinguish individuals.”

Just how they were doing that remained unclear, however. “If you think of this in comparison with humans, it’s like being able to recognize a person just by listening to the same one-syllable yell in different voices,” Yovel said. “The bats learned the voice by listening to hundreds of very short ‘yells,’ but they then were able to recognize an individual based on one single yell.”

Next, the BBC says, Yovel’s team developed a computer model to analyze the training results and try to mimic the way bats compared sounds. He said the analysis suggests each bat emits calls within a limited range of frequencies, possibly because of different distributions in the frequencies it emits, probably a result of the differences in vocal chords.

He told the BBC that bats may have an internal prototype call: a sort of reference sound against which they can compare these subtle differences.

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