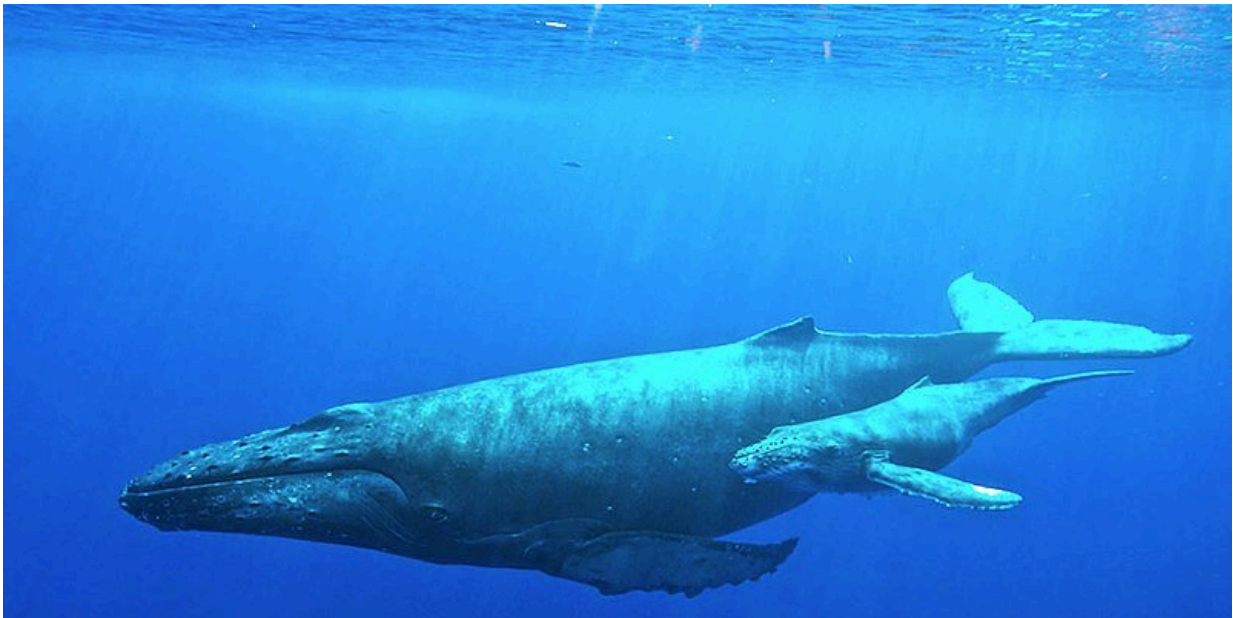


Study: Humpback whale song is about finding, not attracting, whales

November 30 2021, by Bert Gambini



A female Humpback whale with her calf. Credit: [National Marine Sanctuaries/Wikimedia Commons CC BY 2.0](#)

Think of common courtship displays in the animal kingdom, like the flashy display of a peacock's tail or the treetop melody of a songbird's tune. Each is relatively constant. The brilliant colors in a male peacock's plumage do not change during its attempts to attract a female. And songbirds rely on repetition, like top-40 radio stations, singing the same songs in the same kinds of ways during their mating rituals.

Humpback [whales](#), however, constantly vary the acoustic qualities of their songs, dynamic changes that are counterproductive to courtship. Yet [whale song](#) is still largely considered to be a display of reproductive fitness, like the peacock's tail and the serenades of songbirds.

It's a belief that flies (or swims, if you prefer) in the face of conclusions reached by Eduardo Mercado III, a professor of psychology in the University at Buffalo College of Arts and Sciences, who has published several papers over the last few years with results that support a paradigm-shifting perspective on [humpback](#) whale [song](#).

Mercado's latest paper, published in the journal *Learning & Behavior*, is another feather in the cap for advocates of the sonar hypothesis, a proposal stating that singing humpbacks use their songs not to attract females but to actively explore their environments.

"A feather in the sonar hypothesis cap? It's more like an arrow through the chest of the reproductive display hypothesis," says Mercado.

His latest research suggests that the inherent variation of humpback whale song is a form of echolocation. Analysis of those variations produced by whales and recorded off the coast of Hawaii uncovered mechanisms within songs that may be comparable to those at work in the eyes of land animals as they examine their environment.

Reproduction plays a potential role, but the purpose of humpback whale song isn't to attract, but rather to find, other whales, according to Mercado, whose new paper was intended as a descriptive analysis, based on information from Google's publicly accessible Pattern Radio database, before it veered into another curious and more illuminating direction.

"My original intent to describe how individual whales vary their songs

was motivated in part because the reproductive hypothesis suggests singers should be as elaborate as possible since doing anything less wouldn't be attractive to potential mates," says Mercado. "But I was struck by the variety within songs looking at the statistics. Things weren't uniform.

"Looking at what other behaviors showed similar profiles, I found fixation duration [the length of time eyes rest on objects] was similar to what whales were doing."

Courtship displays and mating rituals run in the wild like repetitive commercials appear on television. The repetition is a sales pitch, a merry-go-round that returns to where it started. But humpbacks are oceanic jazz musicians who always perform their songs differently.

Humpbacks produce narrowband and broadband sequences, because each of the distinct set of signals affords specific echolocation advantages. To sing a vowel would be singing a narrowband. Clicking the tongue against the roof of the mouth would be broadband, Mercado explains.

"Neither of these distinctions is important in terms of the reproductive display hypothesis, because it makes no predictions about why a whale should use either one," he says. "But for the sonar hypothesis, it is significant since the acoustic information returned to the sender from clicks is very different from the information obtained through vowels.

"Which is why dolphins use only clicks to echolocate and most bats use only vowel-like sounds."

And like bats and dolphins, whales could be changing their songs based on their current situation.

"The fact that they're changing their songs so much, even within individual sessions, suggests they have more control than previously assumed," says Mercado. "It's why we have to start hearing these songs from new perspectives if they're to reveal features we otherwise never would have considered."

More information: Eduardo Mercado, Intra-individual variation in the songs of humpback whales suggests they are sonically searching for conspecifics, *Learning & Behavior* (2021). [DOI: 10.3758/s13420-021-00495-0](https://doi.org/10.3758/s13420-021-00495-0)

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