Imperceptible movements guide juvenile zebra finch song development

January 31 2019

A pair of Zebra finches at Bird Kingdom, Niagara Falls, Ontario, Canada. Credit: Wikipedia

New research from Cornell University shows zebra finches engage in socially-guided vocal learning, where they learn their songs by watching their mothers' reactions to their immature songs.

Researchers found that adult females guide juveniles' song development

through specific interactions, similar to how human babies learn to talk.

Using slowed-down video, researchers were able to identify tiny movements, imperceptible to the human eye, made by the female zebra finches to encourage the baby songbirds. The movements included wing gestures and "fluff ups," an arousal behavior in which the bird fluffs up its feathers.

"Over time, the female guides the baby's song toward her favorite version," co-author Samantha Carouso-Peck said. "There's nothing imitative about it."

The study included nine pairs of zebra finches, genetic brothers raised for the first 35 days by their respective parents. When they reached the age at which they begin to produce song, the siblings were split up, moved into individual soundproof containers and monitored on how the two groups learned the same song—with and without timely feedback from their mothers.

"Historically, we've been studying these birds in isolation," said co-author Michael Goldstein. "That means we've been missing out on the entire social aspect of song learning."

Similarly, most labs study human babies more or less in isolation.

"But what babies—zebra finch or human—are good at is exploiting social information in their environment," he said. "These immature behaviors are not mindless practice and noise. Their function is to motivate the adults in the room to provide information."

The study, "Female Social Feedback Reveals Non-Imitative Mechanisms of Vocal Learning in Zebra Finches," published in *Current Biology*, brings the number of species known to engage in socially guided vocal

learning to four: zebra finches, humans, marmosets and cowbirds. The research was supported by the National Science Foundation and Cornell's Institute for Social Sciences.

Provided by Cornell University