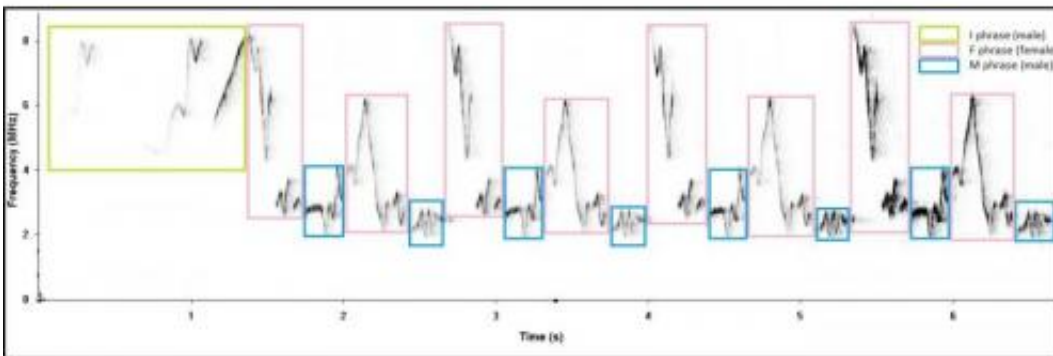


# Research of plain wren duets could help further understand fundamentals of conversation

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The spectrogram corresponds to plain wrens duet, with the contribution of the female and the male highlighted in different colors. Credit: Karla D. Rivera-Càceres, University of Miami College of Arts & Sciences Department of Biology

Known for their beautiful singing duets, plain wrens of Costa Rica perform precise phrase-by-phrase modifications to the duration between two consecutive phrases, achieving careful coordination as their songs unfold, according to a new study published in the *Journal of Avian Biology*.

Duetting is a highly complex collaboration, yet little is known about the mechanisms underlying this behavior. The plain wren males and females

alternate sounds so quickly that sometimes it seems as if a single bird is singing.

"Hearing a plain wren pair singing a spotless duet is overwhelming," said Karla D. Rivera-Càceres, Ph.D. student in the Department of Biology at the University of Miami (UM) College of Arts and Sciences and principal investigator of the study. "This intricate coordination between mating partners is achieved by a complex and dynamic process, where individuals use rules to determine how, or if the vocal interaction is to continue."

The new study shows that these songbirds achieve precise coordination by adjusting the period between two consecutive phrases (inter-phrase intervals), depending on whether their song is answered, the phrase type used in the duet and the position of the inter-phrase interval within the duet.

It has been said that it is the space between the notes or phrases that gives meaning to music; plain wrens demonstrate this well. Rivera-Càceres studied these songbirds in Costa Rica, at La Suerte Field Station and its surrounding areas, where plain wrens are common. She recorded duets of males and females and measured the inter-phrase intervals in their songs.

She found that females perform longer inter-phrase intervals when their mates don't answer a phrase, and males produce shorter inter-phrase intervals when their female partners don't answer.

Females also change the inter-phrase intervals based only on the phrase type their mates sing. While, males modify their inter-phrase intervals based on both the phrase they sing and the phrase the females use to answer. And although both males and females create longer interphase intervals for longer phrase types sung by their partners, males are more

precise than the females.

It's possible that this highly coordinated behavior could signal pair bond strength—the level of commitment a mated male and female have of cooperating with one another.

"Plain wren couples collaborate with each other in two important activities, parental care and territory defense, both of which have big effects on their joint reproductive success," Rivera-Càceres said. "In plain wrens, it seems that individuals invest in performing duets with high coordination, which could help communicate how committed they are to their mates."

This meticulous study of duet coordination has not only revealed how coordination is achieved in plain wrens, but also has implications for how duets develop and how they function, explained William Searcy, professor and Maytag Chair in Ornithology in the College of Arts and Sciences at UM and director of the lab where Rivera-Càceres conducts her research. "I expect her approach to be a model for conducting parallel studies in other species."

The findings may have even broader implications. One of the most studied vocal interactions is human conversation; however, because of its complexity, it's very difficult to understand the rules that govern it.

These vocal interactions among plain wrens could help us understand some fundamental aspects of human conversation, such as turn taking. The study is titled "Plain wrens *Cantorchilus modestus zeledoni* adjust their singing tempo based on self and partner's cues to perform precisely coordinated duets."

Provided by University of Miami

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