Penguin calls found to conform to human linguistic laws

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A team of researchers from France and Italy has found that African

penguin calls conform to linguistic laws used by humans. In their paper published in the journal *Biology Letters,* the group describes their study of penguin vocal recordings and what they learned from them.

Back in 1945, linguist George Kingsley Zipf developed what is known as Zipf's law of brevity, which states that the more often a word is used, the shorter the word tends to be, regardless of the language. Subsequent work by other linguists in the ensuing years not only confirmed the finding, but showed that his law was true for all human languages. Several years later, Paul Menzerath and Gabriel Altmann developed what is known as the Menzerath–Altmann law, which states that increases in the size of linguistic constructs result in decreases in the size of their constituents—very long words tend to have short syllables. The law states the opposite to be true, as well. Prior research has shown that other animal communications besides that of humans (primarily by primates) conform to both laws, as well. In this new effort, the researchers found that African penguin calls also conform to them.

The endangered African penguin is known for its distinctive calls—some have described them as similar to a braying ass, which has led to the nickname "jackass penguins." The researchers were interested in learning more about the calls the birds make, so they collected and analyzed 590 of vocalizations from 28 adult males living in Italian zoos. Prior research had shown that the vocalizations of African penguins are constructed using sequences of three clear types of sounds that are similar to syllables in human languages. The analysis revealed that the calls by the birds conformed to both of the linguistic laws developed to explain how human languages work.

The researchers suggest that the linguistic laws are a sign of energy conservation—people and other animals that communicate in the most concise way are more likely to be successful in such endeavors as mating—a skill that is passed down to offspring.

More information: Livio Favaro et al. Do penguins' vocal sequences conform to linguistic laws?, *Biology Letters* (2020). DOI: 10.1098/rsbl.2019.0589