

# Researchers show environmental changes may affect vital cooperative bird behaviors

January 11 2011

---

While scientists believe that climate change and related extreme weather events such as drought and flooding will likely affect the earth's flora and fauna, just how much is not known. A new study by researchers Walter Jetz from Yale University and Dustin Rubenstein from Columbia University however shows an important link between the natural variation in climate conditions and complex behaviors among birds.

The study, which appears in print in [Current Biology](#) on Jan. 11, 2011, has implications for understanding how organisms may respond behaviorally to increased climate variability resulting from [climate change](#). They argue that species that live in families may be better guarded against the effects of unpredictable climatic conditions.

Family-living, or cooperative breeding, is common among birds. Cooperative breeding societies, such as humans, are typically characterized by groups of relatives that work together to raise young. Usually, some birds forgo their own reproduction to help raise others' [offspring](#). However, some cooperative breeding societies consist of groups of non-relatives that also work together in raising young. From Australia to the Amazon, cooperatively breeding birds account for approximately 831 species—or nearly 10 percent—of the nearly 10,000 avian species worldwide.

Using a behavioral data set of more than 95 percent of the world's birds, and a global 40-year climate dataset, the researchers examined how environmental factors—like mean and variation in temperature and

rainfall—and biotic factors—like body mass, diet breadth and type—influence the incidence and global distribution of family-living in birds.

"Scientists have long known that family-living birds are more common in some parts of the world than others," said Rubenstein, assistant professor of ecology, evolution & environmental biology. "But this is the first time that we have been able to study the geographic distribution of complex avian [social behavior](#) on a global scale, while simultaneously examining how the environment influences these geographic patterns."

By combining behavioral and climate data in a statistical modeling framework the researchers found dramatic spatial and environmental variation in social behavior globally. "We discovered 'hot-spots' in places like Australia and Africa where family-living species are overrepresented, as well as 'cold-spots' in places like South and Central America where there are fewer family-living species than we would have expected," said Jetz. This geographic unevenness coincided with the occurrence of specific bird lineages, but also carried a strong signal of environmental and biotic factors. In particular, among year variation, or climatic uncertainty, in rainfall emerged as a key predictor of family-living in birds.

The study demonstrates that even on a global scale, the incidence of complex avian social behavior may be greatly influenced by the consequences of living in unpredictable environments. Variable environments encompass a broad range of [climate conditions](#) that pose a greater range of challenges to survival and reproduction than predictable ones. Family-living among [birds](#) may therefore be a conservative "'best of a bad job" strategy to maximize fitness when breeding conditions vary unpredictably from year to year.

"Families act as insurance against environmental uncertainty," said

Rubenstein. "Just as predicting a drop in the stock market is difficult, so too is determining when food is going to be scarce." When times are bad and food is difficult to find, joining up to raise young may pay off for both parents and helpers.

This thinking may have implications for an entirely different group of animals: humans. "Think twice," cautions Rubenstein, "before you kick your grown kids out of the house, as you never know when you might need them."

Provided by Columbia University

Citation: Researchers show environmental changes may affect vital cooperate bird behaviors (2011, January 11) retrieved 26 April 2024 from <https://phys.org/news/2011-01-environmental-affect-vital-cooperate-bird.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.