

Maybe birds can have it all: Dazzling colors and pretty songs

June 18 2014



Naturalists have long noticed that bright, showy birds like the Northern Cardinal often sing simple songs, while plainer birds like the House Wren often sing complex songs. The new study put this idea to the test. Credits: Photos by Judy Howle/Cornell Lab (cardinal) and Gary Mueller/Cornell Lab (wren). Sounds by Gerrit Vyn (cardinal) and Geoffrey Keller/Thomas Sander (wren) via Macaulay Library at the Cornell Lab of Ornithology.

A study of one of the world's largest and most colorful bird families has dispelled a long-held notion, first proposed by Charles Darwin, that animals are limited in their options to evolve showiness. The study – the largest of its kind – was published today in the *Proceedings of the Royal Society B*.

The natural world is full of showstoppers – birds with brilliant colors, exaggerated crests and tails, intricate dance routines, or virtuosic singing. But it's long been thought that these abilities are the result of trade-offs. For a [species](#) to excel in one area, it must give up its edge in another. For example, male Northern Cardinals are a dazzling scarlet but sing a fairly simple whistle, whereas the dull brown House Wren sings one of the most complicated songs in nature.

"Animals have limited resources, and they have to spend those in order to develop showy plumage or precision singing that help them attract mates and defend territories," said Nick Mason, the paper's lead author. "So it seems to make sense that you can't have both. But our study took a more detailed look and suggests that actually, some species can." Mason did the research as a master's student at San Diego State University. He is now a Ph.D. student at the Cornell Lab of Ornithology.

Mason and his colleagues tested the idea of trade-offs by looking at a very large family of songbirds from Central and South America, the tanagers. This group consists of 371 species – nearly 10 percent of all songbirds. It includes some of the most spectacularly colorful birds in the world such as the Paradise Tanager as well as more drab birds such the Black-bellied Seedeater. The group also includes both accomplished and weak songsters alike.

"If there were going to be any group of birds at all that would show this trade-off, the tanagers would be a very good candidate, because there's all this variation in song and plumage complexity," Mason said, noting that the group's large size lends confidence to the statistical analysis.

"But when we dive into it and do some rigorous statistics, it turns out that there is no overall trend. Tanagers can be drab and plain-sounding, or colorful and musical, or anything in between."



The study compared plumage and song complexity in the tanager family, which includes showy species like the Paradise Tanager and more drab birds like the Black-bellied Seedeater. Credits: Photos by Joao Quental. Sounds by Theodore Parker III via Macaulay Library at the Cornell Lab of Ornithology.

As a byproduct of the analyses, Mason was able to put together top-10 lists of tanagers with the most colorful plumage and the most complex songs. The lists – which are available [here](#) – help illustrate the overall lack of a trade-off between singing and plumage. For example, a single genus of mountain-tanagers had members on both lists. The Lacrimose Mountain-Tanager ranked eighth among the most complex songs, while the Blue-winged Mountain-Tanager had the fourth most complex plumage of all 303 species examined.

The study puts a significant dent in the idea of evolutionary trade-offs between plumage and song. It's still possible that trade-offs take place at the level of genus, Mason said, or that they influence species relatively fleetingly as evolutionary pressures appear and disappear. But as a broad effect on an entire family of [birds](#), a voice–plumage tradeoff doesn't seem to exist. One possibility is that the resources needed to develop fancy plumage are different from the ones required for complex songs,

freeing tanagers to invest in both forms of showiness simultaneously.

More information: Elaborate visual and acoustic signals evolve independently in a large, phenotypically diverse radiation of songbirds, [rspb.royalsocietypublishing.org1098/rspb.2014.0967](https://rspb.royalsocietypublishing.org/doi/10.1098/rspb.2014.0967)

Provided by Cornell University

Citation: Maybe birds can have it all: Dazzling colors and pretty songs (2014, June 18) retrieved 26 April 2024 from <https://phys.org/news/2014-06-birds-dazzling-pretty-songs.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.