

Songbird parents evict young for their own benefit

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Credit: University of Illinois at Urbana-Champaign

Parents, you might know the feeling. When kids get pushy and demanding, it's a tempting fantasy to shove them out of the house and let them survive on their own. Of course, we'd never put our babies in

harm's way, but according to new research from the University of Illinois, many songbird parents give nestlings the boot well before they're ready.

The study, published in the *Proceedings of the National Academy of Sciences*, shows the behavior is common in songbirds, appearing in 12 of 18 species studied in various habitats throughout the United States. Across species, nestlings were about 14% less likely to survive when they left the nest too early. If chicks suffer when they leave the nest too early, why do [parents](#) kick them out?

"Individual chicks may be less likely to survive, but by manipulating them out of the nest early, parents benefit through a 14% increase in their likelihood of raising at least one offspring to independence," says Todd Jones, doctoral student in the Department of Natural Resources and Environmental Sciences (NRES) at Illinois and lead author on the article.

In other words, parents avoid leaving all their eggs in one basket.

"The parents are distributing the risk," says Mike Ward, associate professor in NRES and senior author on the study. "The longer chicks stay in the nest, the greater the chance the whole brood will be lost to predators like snakes or raccoons. But we see parents physically separating chicks in space outside the nest, and that way, the probability of them all dying is almost zero."

The study adds to scientists' understanding of parent-offspring conflict, a concept in evolution describing the tradeoffs inherent to [parental care](#). Putting a lot of resources into kids favors their survival, but can leave parents depleted, at risk of predation or disease, and potentially less able to produce additional offspring. Too little care, and offspring may not survive to carry parents' genes into the next generation. And from an

[evolutionary perspective](#), successfully passing genes along is the number one goal.

"For all organisms with parental care, there will always come a point where they're in conflict. In this case, it was a little surprising parents were putting chicks out in a dangerous situation that's good for the parent, but not good for the offspring," Ward says. "But it makes sense from an evolutionary perspective, for the parents."

Jones says surviving offspring eventually benefit, too, because the behavior is baked into their DNA.

"While the offspring are suffering a cost in the immediate term, down the road when they're breeding and they do the same thing to their kids, it's also benefiting them. This behavior is being passed down from generation to generation," he says.

The discovery explains an overlooked period in songbird life histories, the juvenile transition. Most previous research focused on what happens in the [nest](#) or immediately after fledging. This is the first study comparing [survival rates](#) before and after fledging across species and locations, demonstrating an almost universal post-fledging survival decline in these songbirds. It also establishes a baseline for what to expect, survival-wise, against a backdrop of environmental change.

"This has been really understudied, so any information we get on their survival or life histories during this period is really important, especially given anthropogenic landscape changes, [global climate change](#), or what have you. Having that baseline information will allow us to detect shifts or changes in the future," Jones says.

Ward adds, "Some of these species are declining pretty dramatically throughout the Midwest. They're probably right on the razor's edge. So if

predation goes up for some reason, it could really have big implications for that cohort throughout the years."

The article, "Parental benefits and offspring costs reflect parent-[offspring](#) conflict over the age of fledging among songbirds," is published in the *Proceedings of the National Academy of Sciences*.

More information: "Parental benefits and offspring costs reflect parent-offspring conflict over the age of fledging among songbirds," *PNAS* (2020). www.pnas.org/cgi/doi/10.1073/pnas.2008955117

Provided by University of Illinois at Urbana-Champaign

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