

Birds co-operate within a communal nest to achieve a common good

July 7 2014

A new insight into one of the biggest questions in science – why some animals, including humans, work together to maintain a common good – has been achieved by scientists at the University of Sheffield.

Sociable weavers, a highly social and co-operative breeding bird from the savannahs of southern Africa, build the largest nests of any bird, housing colonies of up to several hundred birds that can often weigh tonnes and last for decades. The massive nests consist of individual nest chambers which are used throughout the year for breeding and roosting and are embedded within a communal thatch.

The thatch covering the nest doesn't originate from individual chamber building but requires separate investment from colony members to build and maintain it. As such it provides a [public good](#) from which all colony members benefit in terms of buffering extremes of temperature, supporting individual nest chambers and protecting from predators.

The question that researchers from the University of Sheffield's Department of Animal and Plant Sciences addressed is how sociable weavers work together to successfully build and maintain this public good, while keeping freeloaders at bay. This is a general problem in such situations because some individuals may cheat the system by benefitting from the public good, without contributing to it. There are several potential solutions to this problem, one of which is that co-operative behaviour is directed towards relatives.

Dr Rene van Dijk, from the Sheffield research team led by Professor Ben Hatchwell, said: "Our study shows that relatedness between colony members is low, on average, but co-operation over thatch-building is kin-directed due to the positioning of relatives within nests. Sociable weavers do not contribute to thatch building equally, but those that do contribute to it are more closely related to their neighbours within the colony than are non-builders.

"Crucially, related birds are positioned close to one another within nests, so that thatch building investment also benefits their relatives. Additionally, relatives visit each other's nest chambers suggesting again that the communal benefits are shared among kin.

The study not only demonstrates that the influence of kin selection may stretch beyond that of nuclear and extended family groups thus promoting co-operation in large social groups, but it is also the first study to show that kin selection may promote the communal construction and maintenance of an animal-built physical structure. Such structures include nests, mounds and burrows.

"This co-operation is similar to how human families may decide to accept a lodger into their home. If the lodger isn't related to the family, he or she may pay rent but otherwise they will not care too much about the upkeep of the house. However, if the lodger is a known family member, then you would expect them to maintain the house which he or she may stay in for a longer period and possibly inherit. It may seem like a small difference, but it tips the balance towards a more co-operative society."

Understanding how individuals resolve conflicts over contributions to, or exploitation of, common resources remains a major challenge in ecological research as well as in social sciences. The dilemma of payoffs from social benefits being generally higher when individuals co-operate,

while selfish individuals do better than co-operators within groups, presents a temptation to defect and hence an evolutionary paradox.

"On a broader scale, our research reveals one mechanism through which co-operation between individuals for communal tasks is achieved, but there may be other solutions to the same problem that we see in other animals, including humans, Dr van Dijk added.

"For example, cooperative behaviour may be enforced by social conventions or laws and failure to comply with these may result in collapse of the public good. In terms of humans, global fish stocks are an example of a communal resource and if fishermen and their governments don't work together to agree on policies that are enforced, then global fish stocks will be exhausted and the industry will collapse resulting in the loss of a common good."

The mechanism for the maintenance of cooperative behaviour in sociable weavers revealed by this study is unlikely to operate at such a global scale, but within smaller communities the idea of kin-directed [cooperative behaviour](#) is likely to be widespread and relevant across many other species.

The research is published in the journal *Ecology Letters*.

Provided by University of Sheffield

Citation: Birds co-operate within a communal nest to achieve a common good (2014, July 7) retrieved 19 April 2024 from <https://phys.org/news/2014-07-birds-co-operate-common-good.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.