

Females live longer when they have help raising offspring

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Seychelles warbler wearing colored rings for identification Credit: Martijn Hammers

Female birds age more slowly and live longer when they have help raising their offspring, according to new research from the University of Sheffield.

Researchers studied the relationship between ageing and [offspring](#) rearing patterns in the Seychelles warbler, and found that females who had assistance from other female helpers benefitted from a longer, healthier lifespan.

The findings help explain why social species, such as humans, which live in groups and cooperate to raise offspring, often have longer lifespans.

The study was led by researchers at the University of East Anglia (UEA) and the University of Groningen in the Netherlands, in collaboration with the universities of Sheffield, Leeds and Wageningen, and with Nature Seychelles.

Professor Terry Burke, from the University of Sheffield's Department of Animal and Plant Sciences, said: "It is well understood that one of

the benefits of having relatives' help to raise offspring is that this improves the survival of the young. We have now shown that as parents age they decline in their ability to care for their offspring, but having helpers compensates for this effect, allowing the parents to continue to reproduce successfully into old age. This result helps to answer the question of why some animals assist others to reproduce, instead of raising their own offspring."

Professor David S Richardson, from UEA's School of Biological Sciences, said: "There is huge variation in lifespan between [different species](#), and also between individuals within a species. But we know very little about what causes one individual to live a long healthy life, and another to die young. Or indeed, why individuals in one species live much longer than individuals in another similar species.

"Finding out more about what causes biological ageing is really important. And, until now, there has been very little known about the relationship between sociality and ageing within species."

Many [species](#) have cooperative breeding systems—in which offspring are cared for not only by their parents, but also by other adult members of the group called 'helpers'. These helpers are often—but not always—grown-up offspring from previous years.

The research team used more than 15 years of data on the breeding patterns of Seychelles warblers living on the small island of Cousin, in the Seychelles, to study associations between cooperative care giving and ageing.

As well as studying how quickly individuals' chances of dying increased as they grow older, the team also used the length of the birds' telomeres as a measure of their condition. Telomeres are found at the end of chromosomes and act as protective caps to stop genes close to the end of the

chromosome being damaged—like the hard plastic ends of a bootlace.

Professor Richardson said: "Our previous work has shown that telomere length can be a good indicator of an individual's biological condition relative to its actual age—a measure of an individual's biological age so to speak. So we can use it to measure how quickly different birds are ageing.

"In the Seychelles warbler the majority of helpers are female—and they assist with incubating the eggs and providing food for the chicks. This means that the parents don't need to do as much work when they have help.

"We found that older dominant females really benefit from having female helpers—they lose less of their telomeres and are less likely to die in the near future. This shows they are ageing slower than females without helpers. Interestingly, these older female mothers were also more likely to have female helpers.

"Meanwhile the survival of elderly birds who were not assisted by helpers declined rapidly with age.

"The birds only need one female helper to show the effect of delayed ageing, and indeed most only have either one or no helpers. Very few may have two or three helpers, but there were not enough of those to determine whether there would be a greater benefit in having more helpers."

Dr. Martijn Hammers, from the University of Groningen, said: "Our results suggest that for the older mothers, there are real benefits to cooperative breeding. Biologically speaking they stay 'younger' for longer, and they are more likely to live longer.

"These findings may help to explain why [social species](#) often have longer lifespans.

"What we don't know yet is why some older individuals have helpers, which enable them to live longer, and some don't despite the obvious benefits. Further research is needed to confirm the causality of the associations we have found."

'Breeders that receive help age more slowly in a cooperatively breeding bird' is published in the journal *Nature Communications* on March 21, 2019.

More information: Breeders that receive help age more slowly in a cooperatively breeding bird, *Nature Communications* (2019). [DOI: 10.1038/s41467-019-09229-3](https://doi.org/10.1038/s41467-019-09229-3)

Provided by University of Sheffield

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