

The key to long female lives may be heterogeneity

April 27 2017, by Birgitte Svennevig



Male sparrowhawk. Credit: Pierre Dalous

Females often live longer than men—this is true for humans and for many other animal species.

The phenomenon exists even when you adjust for male risky behavior which leads to more early male deaths than female (car accidents, wars, homicides, etc).

Scientists don't know why. Females are not better at withstanding certain viruses or bacteria for instance—there seems to be no obvious physiological reasons.

More robust females

A new study in *Journal of Ecology* has looked at [sex differences](#) and mortality in the Eurasian sparrowhawk. It turns out that heterogeneity is what drives longer lives in female sparrowhawks.

Heterogeneity in this context means that female sparrowhawk physiology is more diverse and less average than the males. There are more frail females than frail males, but there are also more robust females than robust males.

- The females have a wider range and when it comes to ageing it gives them an advantage, says study author, Associate Professor Fernando Colchero from Department of Mathematics and Computer Science, University of Southern Denmark. Other authors are biologists Owen Jones og Dalia Conde from Department of Biology.

Surprised researchers

With more frail females, there will of course be more early female deaths than male. But this is more than weighed up by the larger number of robust females than males.

According to the study, the life expectancy for the most robust adult females reach up to 4.23 years, while for the most robust adult males it was 2.68 years.

The results are a surprise to the researchers.

Possible in other species.

- This shows us that sexual differences in mortality are not only due to factors like physical size or how much time an individual invests in reproducing. It is also unusual to see shorter life spans in the smaller sex, as we do here; Male sparrowhawks are smaller than the females. Our results contribute a novel perspective to the ongoing debate about the mechanisms that drive sex differences in vital rates in vertebrates, said Fernando Colchero.

It is possible that this phenomenon can be found in other animal species, but it is still uncertain. I suggest that when studying sex differences in mortality, researchers should consider accounting for heterogeneity.

The study also concludes

- Individuals who spend more energy on reproducing and raising chicks live longer.
- Bigger females are better at reproduction than smaller [females](#).
- Smaller males have better chances for surviving than bigger males.

More information: Fernando Colchero et al, Individual heterogeneity determines sex differences in mortality in a monogamous bird with reversed sexual dimorphism, *Journal of Animal Ecology* (2017). [DOI: 10.1111/1365-2656.12677](https://doi.org/10.1111/1365-2656.12677)

Provided by University of Southern Denmark

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