

Family composition determines success of great tit parents

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Great tits who have as many sons as daughters acquire more grandchildren than great tits with an uneven family composition. That is because their children are reproductively more successful concludes NWO researcher Reinder Radersma. He expects that his results are broadly applicable in the animal kingdom. Radersma gained his doctorate on 2 December from the University of Groningen.

Due to the effect of hormones, birds can influence the sex of their offspring. Biologist Reinder Radersma has now demonstrated the major consequences this has for the success of the parents. A fifty-fifty [sex ratio](#) in great tit families is not just the most prevalent ratio but also the best option.

Radersma took 2-day old nestlings from various nests of a wild population of greats tit in a wood. He determined the sex and redistributed the [nestlings](#) into different ratios of males and females across the nests. He subsequently observed the [reproductive success](#) of the young [great tits](#). 'An equal number of males and females proved to be the ideal situation,' says Radersma. Young birds from such a balanced nest had more offspring. So with a balanced family, the great tit parents ensure that their genes are passed on well. In the wild, families with an equal number of sons and daughters are the most prevalent among birds. Radersma's research reveals why this is the case.

The influence of parents on the composition of the family (gender allocation) is a well-described phenomenon for insects that can be

predicted. For example, there are insects in which fertilised eggs become females and unfertilised eggs males. However, for birds and mammals the gender allocation depends on the combination of [sex hormones](#) and is more complex. The [theoretical models](#) for gender allocation in insects are not adequate enough in this case.

According to Radersma, a possible explanation for the advantage of a family with an equal number of sons and daughters is the harmony in the nest. 'Sons argue more with each other than with their sisters and likewise the sisters argue more with each other than with their brothers. So with an uneven number of [males and females](#) in the nest a lot of energy is wasted on arguing and competing for food,' thinks the researcher. That has a negative effect on the growth and development of the offspring. 'I expect that this principle applies to birds and mammals in general.' The researcher even thinks that the same rule could apply to people in situations where there is a limited food supply. 'In a family with too many sons or daughters, a destabilising situation could develop.'

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