

Older male blue tits out-compete young males when it comes to extra-marital breeding

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A female blue tit on her nest. Many females copulate not only with their own social partner, but also with one or more extra-pair sires. Under natural circumstances, these extra-pair males are typically older, experienced males and rarely one-year-old males. Credit: Kaspar Delhey, MPIBI (CC-BY 4.0, creativecommons.org/licenses/by/4.0/)

Young male blue tits are less successful in fathering offspring outside their breeding pair, not because of a lack of experience, but because they are outcompeted by older males, Bart Kempenaers and colleagues from the Max Planck Institute for Biological Intelligence in Germany report in a study published in the open-access journal *PLOS Biology*.

Many birds form breeding pairs but will also mate and produce offspring outside of that pairing—known as "extra-pair" paternity. Inexperienced males in their first year of breeding are less likely to father extra-pair offspring than adult males, but it is unclear whether their poor performance is because of competition with older males, or because of a lack of skills or experience.

Between 2007 and 2021, researchers studied the breeding behavior of a wild population of [blue tits](#) (*Cyanistes caeruleus*) living in nest boxes in a German forest, using radio-frequency identification technology, behavioral observations, and DNA testing. Then, in 2022, the team relocated almost all the adult males from the population. They compared the extra-pair breeding success of [young males](#) in this altered population with data from the previous 15 years.

In the absence of competition from adult males, 33% of young males fathered at least one extra-pair offspring, compared to just 13% on average in years when adult males were present. Their extra-pair breeding success matched that of adult males in normal conditions.



A complete clutch of a blue tit. In some nests, some of the eggs are not sired by the female's mate, but by an extra-pair male (typically a male breeding in the close neighbourhood). Credit: Lotte Schlicht, MPIBI (CC-BY 4.0, creativecommons.org/licenses/by/4.0/)

These results suggest that young males' failure to father extra-pair [offspring](#) is due to competition with adult males, rather than a lack of experience or maturity. Adult males may outcompete young males for a variety of reasons. They might fare better in fights over females, they might invest more energy in extra-pair mating, females may find them more attractive, or a combination of these factors might be at play, the authors say.

The authors add, "Our study indicates that the generally observed low

extra-pair siring success of first-year males is due to [competition](#) with older males. This age effect is thus mediated by the [social environment](#), at least in the blue tit."

More information: Schlicht E, Gilsenan C, Santema P, Türk A, Wittenzellner A, Kempenaers B (2024) Removal of older males increases extra-pair siring success of yearling males, *PLoS Biology* (2024). [DOI: 10.1371/journal.pbio.3002584](https://doi.org/10.1371/journal.pbio.3002584)

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