

# Pigeon flock members can 'overrule' incompetent leaders, research shows

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Feral pigeon (*Columba livia*) in flight. Credit: Alan D. Wilson/Wikipedia/CC BY-SA 2.5

Flock leaders who attempt to give their fellow pigeons incorrect information about their direction of travel can be overruled by the collective wisdom of the group, according to new research from the University of Oxford.

Recent modelling work has predicted that the mistakes of a misinformed leader will propagate down a hierarchical decision-making system such as a pigeon [flock](#). However, using a method known as 'clock-shifting' that interferes with pigeons' sense of direction, researchers have shown that bad leadership can be overcome, setting the flock back on the correct course.

Research from the same group at Oxford has previously found that the fastest pigeons tend to become flock leaders, rather than the most competent.

The new study is published in the Royal Society journal *Biology Letters*.

Lead author Isobel Watts, a doctoral candidate in the Oxford Navigation Group in the University's Department of Zoology, said: 'Previous research in homing [pigeons](#) has identified a navigational leadership hierarchy where an individual's position in the hierarchy reflects its weight of contribution in the decision-making process. In this study, we were interested in how much control the "top" bird actually has over the flock's decisions during homing. Do the top leader's decisions simply cascade down the hierarchy, or are lower-ranked birds also able to influence the direction in which the flock flies? By manipulating the quality of the leader's information, we hoped to discover whether a poorly informed leader was still allowed to lead or whether the flock would "overrule" inaccurate leadership.'

The study, carried out in Oxfordshire, involved eight GPS-tracked flocks of five birds each and made use of the clock-shifting technique to 'jetlag' certain birds. In some experiments, only the leader was clock-shifted, while in others either the whole flock or no birds at all underwent the process.

Isobel Watts said: 'What we found was that when the whole flock was

clock-shifted, the flock tended to deviate from its normal homeward flight path, whereas when solely the leader was clock-shifted, the flock was generally able to stay on course. Interestingly, we saw from GPS data on flock positions that misinformed leaders tended to lose their place at the top of the hierarchy, spending less time at the head of the flock and less time being followed in their movements by others.'

She added: 'The exact mechanism by which a flock is able to correct for misinformation coming from its leader is still unclear. However, we can speculate that it may be due to either misinformed flock leaders doubting their own abilities and paying more attention to what their flockmates appear to be doing, or the flock members recognising weakness in the leader and taking more control themselves.'

Co-author Dr Dora Biro, also of the Oxford Navigation Group in the Department of Zoology, said: 'Although homing pigeon flocks have fairly stable hierarchical decision-making structures, our results show that they also demonstrate flexibility, and, crucially, they do so in a situation where the performance of the whole flock would suffer if they were inflexible. Following a "bad" leader could lead the whole flock astray, and the capacity to reorganise the leadership hierarchy in this case allows them to stay on course. This could be particularly important in migratory bird species, where getting lost during a trip could be a matter of life and death.'

**More information:** Misinformed leaders lose influence over pigeon flocks, *Biology Letters*, [rsbl.royalsocietypublishing.org ... .1098/rsbl.2016.0544](https://rsbl.royalsocietypublishing.org/doi/10.1098/rsbl.2016.0544)

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