ANIMAL BEHAVIOUR, 2008, 75, 1601–1602
doi:10.1016/j.anbehav.2008.03.002



# IN FOCUS

## Featured Articles in This Month's *Animal Behaviour*

### Female Fighters

Sexual selection, the evolution of adornments for attracting mates and weapons for competing with members of the same gender, continues to pose intriguing behavioural questions. In this issue, Rosvall (pp. 1603–1610) asks whether aggression among female tree swallows occurs as a by-product of sexual selection for aggression among males, or whether there is direct selective value for females who are aggressive.

This question arises because selection on one gender often carries over to affect the other gender. Male mammals have functionless nipples because they share most of their genome with females; nipples occur in both males and females as a result of shared genetic architecture, even though they are functional only in females. In cattle, horns probably function primarily in intermale combat, but are carried by both males and females. In horned breeds, such as Texas Longhorns, both bulls and cows carry large horns, and in breeds selected for minimal horns, such as Polled Herefords, both genders lack horns.

In some cases, male and female characteristics are unlinked, genetically. In peafowl, the male, or peacock, carries an elaborate train of feathers, whereas the female, or peahen, is drab. Siamese fighting fish, *Betta splendens*, provide an example that combines linkage and independence: males bear much larger tails than females, but male and female coloration are at least partially linked, so selection for brightly coloured *Betta* males results in bright female coloration.

These observations lead to two important and interesting questions. First, what level of linkage exists between male and female traits, and second, to what extent does selection pressure on one gender lead to the presence of traits that may be disadvantageous in the other? Strong selection for traits such as horns, coloration or aggressiveness in one gender may actually lead to disadvantageous features for the other.

Tree swallows are monogamous and each pair requires a hole in a tree to nest successfully. The availability of holes in any given area is limited, and a significant proportion, about a quarter, of tree swallows fail to nest because they cannot find appropriate holes in trees. Under these circumstances, the obvious prediction is that aggressive competition for holes is critical to these birds. Less obvious is which gender might engage in this competition.

By manipulating the number of nest holes in the birds' habitat, Rosvall was able to measure the intensity of aggression of males and females, the effect of that aggression on each pair's possession of a nest hole, and differences between the outcomes of male and female behaviour (Fig. 1).

A key initial finding was that individual birds consistently expressed aggressive behaviour. This suggests, but does not prove, that genetic differences underlie the behavioural differences between birds. Pairs with more aggressive females were more likely to possess a hole, whereas the aggressiveness of the male was not correlated with hole ownership. Interestingly, the aggressiveness of males and females in pairs was not correlated, suggesting that aggressive birds do not preferentially choose aggressive mates.

Rosvall concludes that similar processes may affect sexually selected traits in females and males. Clearly, female tree swallows gain a direct advantage from being aggressive and are not just aggressive because selection favours aggression in males. Results like this challenge the stereotype of aggressiveness as a typically male trait.

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**Figure 1.** A subadult female tree swallow on an experimental nestbox. Photo: Kimberly Rosvall.



0003–3472/08/$34.00/0

## Public Information for Private Gain

Imitation is, as they say, the sincerest form of flattery, and copying the decisions of others is often beneficial, as it reduces the time and energy costs associated with obtaining information for one's self. In this month's issue of *Animal Behaviour* (pp. 1611–1617), Gustau Calabuig, Joaquin Ortego, José Aparicio and Pedro Cordero investigate the use of public information in nesting colony selection by lesser kestrels, and reveal the ways in which conservation efforts may be enhanced by exploiting the way that kestrels make their nesting decisions.

Birds could use public information for nest site selection in two ways. First, they could select the colony that contains the most breeding pairs (the 'social attraction' hypothesis): a kind of 'when in Rome, do as the Romans do' rule. Alternatively, birds could assess the actual breeding performance of the pairs in the colony (the 'performance-based attraction' hypothesis), thereby gaining some more detailed information on whether the site is, in fact, a good one. Use of the latter information can be applied only in the subsequent breeding season, however, whereas the former can be used in the current breeding season.

The lesser kestrel is an ideal species in which to test these ideas as it is both migratory and colonial, and individuals are known to prospect other colonies that can be several kilometres from their own. In their study of 17 colonies in La Mancha, Central Spain, Calabuig and colleagues monitored the rate at which the colonies were settled in order to test between these two hypotheses. They found that higher rates of early occupancy in the current year were associated with higher productivity in the colony in the previous year, but not with the number of individuals already breeding in the colony. This supports the performance-based attraction hypothesis, because more productive colonies attracted birds at a higher rate in the following season, independently of the number of birds that were already present and breeding there. They also found that the growth of a colony from one year to the next was associated with the previous year's productivity, but not with the number of currently breeding pairs, which again supports the performance-based hypothesis. In addition, there was no relation between the rate of occupancy early in the breeding season and that occurring at a later stage, suggesting that the settlement decisions of late-arriving individuals were not based on attraction to the number of birds currently present in a colony.

As well as their academic interest, these findings have implications for conservation efforts designed to protect and enhance the breeding performance of the lesser kestrel, which is currently listed as a vulnerable species in the IUCN red data book. In central Spain, lesser kestrels nest exclusively in farmhouses and other buildings, many of which are abandoned and derelict. The deterioration of these buildings over time constitutes a form of habitat loss for the kestrels, and new initiatives are in place to refurbish old farmhouses and erect artificial building structures for use as breeding colonies. As Calabuig and colleagues suggest, the success of these measures may be enhanced, and colony growth increased more swiftly, by artificially increasing nest productivity in these new colonies during the first few years of occupation, and exploiting the birds' tendency to use public information on reproductive performance as the basis for their settlement decisions.

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