

IN FOCUS

Featured Articles in This Month's *Animal Behaviour*

Communicating Fear is Sexy in Chickens

Alarm calls, vocalizations uttered when individuals encounter predators, have always been of interest to behavioural and evolutionary ecologists because alarm calling may increase the caller's vulnerability to predation. Previous studies have explained the adaptive value of calling by focusing on the direct or indirect fitness gained by warning relatives and the personal fitness gained by either creating pandemonium and therefore guaranteeing escape or discouraging pursuit by a predator. Sexually selected functions of calling have not been explored. In this issue, David Wilson and his colleagues at Macquarie University in Sydney, Australia, present evidence that in ornamented fowl, *Gallus gallus* (Fig. 1), males that alarm call at higher rates are preferred sexual partners for females. Females, seemingly, are attracted to honestly scared males.

Chickens are an ideal system to study this question for a variety of reasons. First, there is some evidence that morphological traits may be important in mate choice decisions. Second, chickens live in stable groups where behaviour and social relationships may indeed provide information about an individual's quality. Third, they have individually distinctive alarm calls so females could potentially keep track of callers. And fourth, a considerable amount is known about the conditions under which calls are produced and the meaning of calls.



Figure 1. Alarm-calling males mate most. Photo: Chris Evans.

Cockerels utter predator-specific, functionally referential alarm calls to aerial and terrestrial predators. Calls to higher-risk aerial predators are uttered only when there is a suitable audience: a conspecific. Raptors are a real threat and solitary individuals make themselves inconspicuous. Terrestrial predators, however, may be discouraged upon hearing a cockerel's terrestrial alarm call. Thus, calling rate may be a revealing handicap whereby only some males can afford to accept the risks of calling. In natural groups, many hens are within earshot of a caller and therefore could evaluate the reliability of males exposing themselves to a real risk of predation.

Wilson et al. studied mate choice decisions and reproductive success in seminatural conditions. They found that dominance rank and the aerial alarm-calling rate were the most important predictors of male mating success, while terrestrial alarm-calling rate and ornament area were the most important predictors of male reproductive success. These results could emerge either from female choice for risk-taking males or because males invest more (by alarm calling) in mates.

More generally, this study highlights the importance of properly quantifying behaviour when studying sexual selection. Many previous studies in this and other systems have ignored behaviour and focused solely on the importance of morphological trait variation in sexual selection. This study shows that when animals live in stable groups and have well-developed social relationships, behaviour matters. While it is relatively easy to catch and measure static traits, females may pay more attention to dynamic behavioural traits. In sum, how one behaves, not simply how one looks, may be very important in mate choice decisions and hens are particularly attracted to honestly scared males.

Daniel T. Blumstein
Editor

They've got Great (Tit) Personalities

As we're all told from the moment we begin dating, it's not looks, it's personality that really counts. While we might like to believe this to be true, especially if we're not blessed with great beauty, a brief glance around the rest of the Animal Kingdom would suggest that appearance matters more. In this month's issue of *Animal Behaviour*,

however, Kees van Oers, Pieter Drent, Niels Dingemans and Bart Kempenaers show that the partner preferences of great tits are also based on the consistent behavioural traits, or personality, of individuals.

While the issue of animal personality has been the subject of a great deal of interest in recent years, the current study is important because it is one of the first to consider how sexual selection acts on personality and it does so in a wild population. Specifically, van Oers and colleagues set out to investigate the relationship between variation in personality and the level of promiscuity seen in their study population. To do so, they monitored the breeding performance of pairs, established the level of extrapair paternity and gave each individual bird a 'personality test'. Birds were captured and then exposed to a novel environment (Fig. 2). The amount of movement between and within trees within the first 2 min of release was used as the measure of exploratory behaviour, with birds that were faster to explore given higher scores than slow birds.

Levels of extrapair paternity were found to be highest in pairs that consisted of two birds that had similar and matching extreme personalities (e.g. a fast female paired with a fast male or a slow female paired with a slow male). Interestingly, the fathers of extrapair offspring did not differ from the social male of a pair in terms of factors such as exploratory score, weight, size and survival probability, which tends to rule out explanations based on the idea that females are seeking better quality males or males with a different personality to increase variability in their offspring.

Although these findings clearly show that personality has an influence on mating behaviour, reflecting an interaction between the traits of females, males and extrapair males, the reason why pairs of fast individuals and slow individuals have greater mixed paternity is not yet clear. Moreover, as van Oers et al. point out, there is no reason why the same explanation should apply to both kinds of pairs: the reason why fast pairs have more extrapair paternity could be completely different to the reason



Figure 2. Personality testing for great tits. Exploratory behaviour in a novel environment is a behavioural trait linked to extrapair mating. Photo: Kees van Oers.

underlying the same pattern in slow pairs. For example, in the case of fast–fast pairs, behavioural incompatibility could be a factor: fast males are more aggressive than slow ones and are expected to spend more time in encounters with other males, whereas fast females are more explorative and so, when mated to a fast male, they may initiate more visits to other territories. In combination, these factors could lead to a greater likelihood of extrapair offspring in a brood. As van Oers et al. suggest, experiments in wild populations are needed to investigate these kinds of scenarios. Whatever the reason for these patterns, this study shows convincingly that the evolution of personality is indeed influenced by sexual selection, helping to make the mating game that much more complex and, of course, more interesting.

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