Twitter principles of social networking increase family success in nesting birds

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New research carried out by scientists at Universities in Exeter, France and Switzerland reveals for the first time the importance of social networking in producing a successful family.

The study found that, regardless of how big and healthy individual chicks are, what really matters to their chances of surviving and breeding is how siblings in the nest interact with each other, with cooperative families faring best.

Differences in patterns of feeding between mothers and fathers were a key factor in determining the behaviour of their offspring, according to the study published online today in the journal Proceedings of the Royal Society B. Mothers selected weaker, hungrier nestlings while fathers did the opposite, choosing those who were the most competitive.

Dr Nick Royle, from the University of Exeter, was involved in the study, alongside scientists from Universities in Toulouse, Bern and Basel. He said: "Whilst it is well-established that large, strong offspring are generally expected to be more successful than small, less well-nourished offspring, it has not been previously shown that the success of both individuals and families as a whole depends on the structure of social interactions among offspring."

"As any parent knows, parental care can be hard work and there is often a squeeze on the availability of resources in families. This sets the scene for conflicts of interest among family members over how these

resources are allocated. Our study shows that the most successful families are those that are best at resolving these conflicts; parents and offspring that are most effective at responding to each other are the most successful."

Scientists from the University of Exeter's Centre for Ecology & Conservation worked with colleagues from the Universities of Basel and Bern in Switzerland and the French Université Paul Sabatier alongside French scientific research organisation CNRS. It was funded by the Natural Environment Research Council and the Swiss National Science Foundation.

63 broods of begging great tits breeding in nest boxes in woods around Bern in Switzerland were filmed when the nestlings were 10 days old, when both parents feed the young using different methods of selecting which nestlings receive food. The researchers examined the network of social interaction between the siblings, and then monitored the parents and their offspring to see whether they survived and went on to breed the following year.

Great tit mothers prefer to feed hungrier, smaller nestlings whereas fathers choose stronger, larger nestlings to feed. So in families where mothers provide most of the food, the young are more 'gregarious'. They moved around more and interacted more strongly with one another as the hungrier nestlings tried to move closer to their mothers to be fed. In broods where fathers fed more than mothers, nestlings moved around much less because the more competitive offspring took up the best positions near him.

Small and medium-sized broods fared better when the mother was the main feeder, whilst larger broods were more successful when the father provided most of the feeds. This could be because of constraints on space in larger families, making it harder for chicks to move around and

jostle for position and easier to respond to fathers, with their simpler feeding rules, not mothers.

Dr Nick Royle concluded: "Users of Twitter will know that the more interactions they have, the more successful their profile is likely to be, and it's similar for nesting great tits; at least at nests where mothers provide most of the feeds. When fathers do most of the work offspring are much less gregarious. For young great tits social networking is related to the amount of physical contact each nestling has with their siblings, not the amount of tweeting they do. But using our social networks measure enabled us to demonstrate a novel link between how family members interact with one another and the success of those families."

"Our approach is not just applicable to social interactions in birds, however, or just for families. It could also be applied to understanding what patterns of social organisation best determine success between competing groups of humans, such as in business or team sports."

Provided by University of Exeter