

Parents' social problems affect their children -- even in birds

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A recent study performed by Floriane Guibert and Cecilia Houdelier at the CNRS-University of Rennes in France, together with researchers at the INRA in Nouzilly, France and with Austrian scientists including Erich Mostl of the University of Veterinary Medicine, Vienna, has revealed that the social environment of mother quails has a direct influence on the growth and the behavior of their young. Their results were published in November by *PloS ONE*.

It may come as a surprise to many that quails are able to distinguish one another, let alone that they form close relationships with other quails. Nevertheless, it has long been known that disruption of the birds' social environment causes them stress. A group within the UMR 6552 at the CNRS-Universite de Rennes in France has been studying the influence of adults on the behavioural development of their offspring. Together with scientists in Austria, they have now shown that changing the composition of groups of quails housed together causes the [birds](#) to behave more aggressively towards one another. In parallel, the level of steroid hormones (corticosterone) in their blood increases when their group composition is disrupted.

Intriguingly, the [eggs](#) they lay were found to have significantly higher levels of testosterone when the mothers were subjected to [social stress](#) of this kind. The results are consistent with previous findings from other groups, which showed that House [sparrows](#), American coots and Common starlings lay eggs with more testosterone when they breed in dense colonies than when they nest in isolation. But the new work from

the French-Austrian collaboration goes considerably further, showing that the eggs of females under social stress hatch later and the chicks grow more slowly after hatching, at least for the first three weeks. There are also indications that the chicks' behave differently: they are more cautious and seem more susceptible to disturbance. Furthermore, they tend to move about more, which can be interpreted as increased attempts to escape from threats or to seek more social contact.

The results show how much the growth and behaviour of chicks is influenced by the concentrations of [steroid hormones](#) in the eggs from which they hatched. As Möstl says, "We know that stress on female mammals influences the development of their young, which takes place in the womb, but it was a big surprise that social stress causes such changes in the level of hormones in the yolks of birds' eggs." The social environment of mother quails thus has a direct effect on the growth and the behaviour of their offspring. It seems, then, that pre-natal nurture is extremely important in birds as well as in mammals and this finding is sure to add fresh fuel to the century-old nature versus nurture debate.

Provided by University of Veterinary Medicine -- Vienna

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