

Bird embryos respond to adult warning calls inside their shells

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Yellow-legged gull eggs. Inside, gull embryos hear, and respond to, warning calls from adult gulls. CC0 Public Domain.



A pair of researchers with Universidad de Vigo has found that yellowlegged gull embryos respond to parental warning calls by vibrating inside their shells. In their paper published in the journal *Nature Ecology and Evolution*, Jose Noguera and Alberto Velando describe their study of the gulls in their lab and what they learned.

Prior research has shown that embryonic birds, amphibians, reptiles, and even insects receive <u>sensory information</u> that helps them prepare for the harsh reality of the real world. In this new effort, Noguera and Velando have found evidence that yellow-legged gull embryos hear the warning cries of their parents and respond to them. They also found that hearing adult warning cries resulted in chicks with physical and behavioral changes, as well.

The experiments by the researchers involved collecting 90 gull <u>eggs</u> from nests along the shores of Sálvora Island and bringing them back to their lab for testing. They separated the eggs into individual three-egg clutches and incubated them. The researchers then pulled two of the three eggs from each incubator and exposed them four times a day to either recorded adult warning sounds or silence.

The researchers report that the embryos exposed to the shrill warning calls would vibrate when the recordings were played—and they continued vibrating for some time even after they were returned to their incubator. They suspected that the vibrations could be felt by the nest mate that had not heard the recordings. To find out, they monitored the embryos after they hatched as chicks. They report that the birds exposed to the warning sounds took longer to hatch, and when they finally did so, they were quieter than the chicks that had been exposed to silence. The hatchlings also crouched lower when exposed to perceived threats. And they were smaller overall, and had shorter legs.

Interestingly, the clutch mates of the chicks exposed to the recordings



had all the same differences, though they were not exposed to the warning calls. The researchers suggest this indicates that they felt the vibrations of nearby <u>embryos</u> and responded as if they had heard the warning calls themselves.

More information: Jose C. Noguera et al. Bird embryos perceive vibratory cues of predation risk from clutch mates, *Nature Ecology & Evolution* (2019). DOI: 10.1038/s41559-019-0929-8

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