

# Child abuse in birds: Study documents 'cycle of violence' in nature

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A Nazca booby adult begins an unwelcome visit with an unguarded nestling. Most such visits include aggressive bites by the adult to the nestling's head and neck. Credit: Jacquelyn Grace

For one species of seabird in the Galápagos, the child abuse "cycle of violence" found in humans plays out in the wild.

The new study of Nazca boobies by Wake Forest University researchers provides the first evidence from the animal world showing those who are abused when they are young often grow up to be abusers. The study appears in the October issue of the ornithology journal, *The Auk*.

"We were surprised by the intense interest that many adults show in

unrelated young, involving really rough treatment," said Wake Forest Professor of Biology Dave Anderson, who led the study with Wake Forest graduate student Martina Müller. "A bird's history as a target of abuse proved to be a strong predictor of its adult behavior."

In Nazca boobies, traumatic abuse of developing young significantly increases the chances those maltreated individuals will exhibit the same maltreatment later in life as adults, Müller said. She is now at the University of Groeningen in the Netherlands.

The ocean-going seabirds live in colonies in the Galápagos Islands off the coast of Ecuador. Among Nazca boobies, victimization by adults on other birds' chicks is widespread. They raise solitary nestlings on the ground and frequently leave their offspring unattended while foraging at sea. So, there is much opportunity for adult birds to bully and beat up neighbor nestlings.



A Nazca booby family: male and female mated pair and their chick are on Isla Española, Galápagos. Credit: Jacquelyn Grace

The abusive adults patrol the breeding colony, searching for unguarded

chicks. They frequently bite and peck the chicks, and even make sexual advances, sometimes leaving the chicks bleeding and stressed. Female adults show more aggressive behavior than males do, on average.

The young birds nest years later in the colony where they were born, making them ideal models for studying the effects of "chick" abuse on lifelong behavior.

The researchers collected data during three breeding seasons documenting which nestlings suffered abuse or neglect, then several years later evaluated their behavior as adults in the same colony. They tracked the [birds](#) and identified them using leg bands.

The findings shed important light on animal behavior. "This is not some contrived experimental situation with freaked out captive animals. This is an animal in a natural situation experiencing natural stressors when young. And, the outcome is their behavior later is influenced by the social stress they experienced," Anderson said. "As we determine how similar the physiology of this response is to the human situation, we may find opportunities for research on this stress response that are not possible to do with humans."



Nazca booby adults (foreground) and nestlings are part of a colony on Isla

Española, Galápagos. Credit: Jacquelyn Grace

Co-authors on the study included Wake Forest graduate students Elaine T. Porter, Jacquelyn K. Grace, Jill A. Awkerman, and Mark A. Westbrock and technicians Kevin T. Birchler, Alex R. Gunderson, and Eric G. Schneider.

The Wake Forest team of researchers is already exploring physiological responses to abuse and have found a dramatic increase in corticosterone, the primary avian stress hormone, after a chick has experienced abuse. The surge in stress hormone may influence adult bird behavior. The study, led by doctoral student Jacquelyn Grace, was published recently in the journal, *Hormones and Behavior*.

"It's fascinating that what many would consider an extremely complex human phenomenon is also occurring - perhaps through the same physiological mechanism — in Nazca boobies, which are more closely related to crocodiles than mammals," Grace said. "Both studies suggest Nazca boobies might be a good model system to begin understanding the mechanisms underlying the cycle of violence in humans."

Provided by Wake Forest University

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