

Birds show surprising resilience in the face of natural stresses

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Blue-footed Boobies can bounce back from stresses experienced early in life.
Credit: H. Drummond

Life as a wild baby bird can involve a lot of stress; competing with your siblings, dealing with extreme weather, and going hungry due to habitat loss are just a few examples. However, birds have an amazing capacity to overcome stresses experienced early in life and go on to reproductive success as adults, according to a new Perspective paper in *The Auk: Ornithological Advances* by Hugh Drummond and Sergio Ancona of the Universidad Nacional Autónoma de México.

Some experiments with birds in captivity have found that increasing early-life stress through food deprivation, elevated [stress hormones](#), and other means has negative effects once birds reach adulthood, causing them to live shorter lives and produce fewer offspring. However, Drummond and Ancona argue that the artificial stresses created in these experiments go well beyond what would ever be experienced by wild birds and therefore don't reflect what happens in nature. Reviewing the available studies describing how [wild birds](#) fare as adults after experiencing stress in the nest, they give several examples of birds' ability to compensate for their early disadvantages, making adjustments such as beginning to breed earlier in life.

Drummond's interest in bird resilience arose from his research on Blue-footed Boobies. "There were dozens of published studies, mostly experimental, appearing to show that setbacks early in infancy left birds scarred in some way for the rest of their lives," he explained. "But when we analyzed our own observations on Blue-footed Boobies, following individuals banded at fledging over their lifetimes, what stood out was their resilience to severe stresses in infancy. For example, boobies that grew up suffering daily oppression by their elder [siblings](#) performed just as well as those siblings on a whole suite of measures taken during adulthood, including annual survival at all ages, age of first breeding, aggressive defense of offspring, and [reproductive success](#) at all ages."

"The authors have helped reorient researchers to a vastly understudied

area—the evolutionary interplay between early life conditions and phenotypic plasticity," adds Daniel Ardia, an expert in life history tradeoffs in [birds](#) from Franklin & Marshall College who was not involved with the paper. "While laboratory experiments are essential to understand genetic and physiological mechanisms, it is only in field conditions that we will gain insight into the flexibility of development in the face of changing environmental conditions. This Perspective helps chart the way forward for field and laboratory researchers alike."

More information: Observational field studies reveal wild birds responding to early-life stresses with resilience, plasticity, and intergenerational effects is available at www.aoucospubs.org/doi/full/10.1642/AUK-14-244.1

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