

## **Bird Minds: Cognition and Behaviour of Australian Native Birds**

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BOOK REVIEW

## ***Bird Minds: Cognition and Behaviour of Australian Native Birds***

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**Bird Minds: Cognition and Behaviour of Australian Native Birds** by Gisela Kaplan. 2015. CSIRO Publishing, Clayton South, Victoria, Australia. ix + 268 pp., 71 text figures, 5 tables, 1 appendix. \$45 (paperback). ISBN 9781486300181.

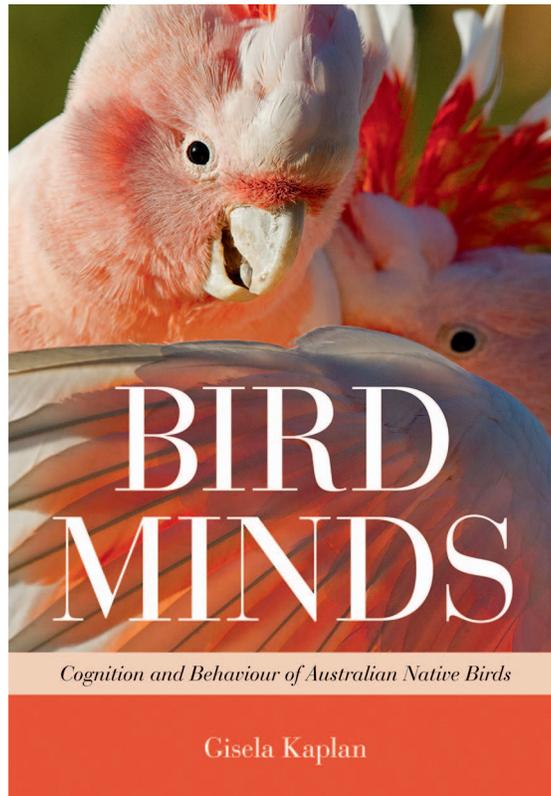
Gisela Kaplan, a professor at the University of New England (New South Wales, Australia) has studied the behavior and cognition of birds and primates for three decades. An author of more than 250 articles and 21 books, Dr. Kaplan's ornithological interests have focused on the communicative life of birds and detailed comparisons of the cognitive worlds of birds and mammals, especially primates. A favorite research subject has been the Australian Magpie (*Gymnorhina tibicen*). Her most recent book, *Bird Minds*, draws heavily on this work, but the book's writing was motivated, not by a magpie, but by a 75-year-old Galah (*Eolophus roseicapilla*) that had a propensity to learn new words. This discovery underpins the central thesis of *Bird Minds*, which is that ecological unpredictability is a prime driver of brain size and cognition in birds.

*Bird Minds* is a fine synthesis of the rapidly growing field of avian cognition. Its greatest contribution to ornithology is the window it opens into the Australian avifauna. Kaplan treats her readers to a fine selection of photographs and priceless insights from a passionate observer, skilled communicator, and critical scholar. As readers take in a wonderful new diversity of birds, they are asked to reevaluate favorite theories. Kaplan argues that

the birds of Australia do not conform well to accepted models of ecology and behavior. Even the rather common observation of male birds being more colorful than females is not the rule Down Under. Many unique aspects of

Australian birds may result from the land's extreme unpredictability in weather and, accordingly, food availability. In response to these challenges, Australian birds are often long lived, permanently monogamous, and cooperative breeders or nest parasites. Cooperation, in particular, may have been critical for the success of Australia's birds. And, in keeping with the social brain hypothesis, this behavioral trait likely has been important in favoring the evolution of cognitive complexity. This extraordinary ability exists not only because the social context often requires negotiation, but also because cooperation reduces the costs associated with maintaining a large, metabolically expensive brain by increasing foraging efficiencies.

To understand complex cognition, Kaplan takes us on a scientific journey through the Australian bush. The book begins by introducing the reader to Australia and the evolution of birds in this vast, isolated, and challenging land. Kaplan then provides a broad conceptual background, updating the reader on recent developments in avian neuroscience and cognition while introducing ongoing debates about topics such as the neocortex and the relationship between brain size, innovation, and



intelligence. The behaviors of Australia's native birds that she next describes are organized into familiar categories, with detailed chapters covering foraging innovation, tool use, nest and bower building, play, mimicry and imitation, social learning, emotions, and communication (both through song learning and other vocal and nonvocal dimensions).

Each of the main chapters documents the variety of behaviors known from native Australian birds. Kaplan provides citations to a rich array of literature and expands this knowledge with her many personal observations of birds she has either studied or raised/rehabilitated. The stories are fascinating, superbly told, and complement many seemingly unbelievable observations from other parts of the world. For example, European and American corvids are known to mimic human voices, even calling dogs away from their owners (Marzluff and Angell 2013). Kaplan's old Galah also imitated her voice, using its repertoire to push her large Rhodesian ridgeback dogs about and command them to lie down. In a manner reminiscent of *Jungle Crows* (*Corvus macrorhynchos*) that set fires in Japan, we also learn that Black Kites (*Milvus aegyptius*) carry burning sticks to the dry brush to create fires that expose vulnerable prey. We come to see most Australian birds as generalist foragers, often moving great distances to find food, rapidly adapting to new foods when favorites disappear, and even exploiting novel and dangerous foods (e.g., cane toads are flipped on their backs by Torresian Crows [*Corvus orru*] before they are eaten, as a means to avoid their dorsal poison glands). Interestingly, caching abundant foods is not often seen. However, 18 Australian bird species are known to use tools. Creativity and innovation are common themes to the behaviors we learn about. Great Bowerbirds (*Ptilonorhynchus nuchalis*), for example, use leaves as brushes to paint their bowers, while young magpies play hide-and-seek with one another.

*Bird Minds* exposes the neural and physical underpinnings of many complex behaviors. Mimicry, which is known from 18 Australian bird families, is likely facilitated by the presence of mirror neurons, while song learning depends on well-known neural circuits that link many areas of the brain. A subcutaneous hydraulic system, elastic skin, and muscles that erect and depress feathers finely tune facial expression, which, Kaplan convincingly argues, is a reliable cue to the emotional state of a bird.

Kaplan saves some the most controversial topics for the final chapters as she considers whether the evidence supports complex cognition in birds or simply well-tuned associative learning. By augmenting well-known research from elsewhere on corvids and parrots with the findings from Australia, a strong case is made for avian cognition beyond simple associative learning or adaptation. To support her case, Kaplan reviews findings that some birds know what other birds know, possess causal reasoning, think about objects that are not in sight, point, know future intentions, and form abstract concepts. Finally, Kaplan leaves us with her thoughts on which Australian birds are the smartest. Her love and respect for all birds is evident in this finale, but it will surprise few to learn that she ranks members of the family Psittacidae and the Corvida parvorder as the most brilliant. The Palm Cockatoo (*Probosciger aterrimus*, which drums with stick tools!), Galah (an expert mimic), and Australian Magpie (playful, gifted communicator) top the list.

*Bird Minds* challenges us to look beyond the few familiar model species favored by animal behaviorists and base our understanding of behavioral and cognitive variation on a greater diversity of wild birds. Getting to know Australian bird behavior helps lead us toward that end, but Kaplan's message does not stop there. As she often points out, there is much more to learn about avian cognition in all parts of the world. As we uncover the wonderful ways in which birds use their amazing brains, Kaplan urges us to respect birds for the sentient beings that they are, and for their prior claim to the world long before humans evolved. In so doing, she also offers some hope that the resiliency and ingenuity shown by birds may enable them to survive in today's human-dominated world.

I highly recommend *Bird Minds* to all ornithologists, birders, and anyone interested in nature. Those of us who are fascinated by bird behavior and cognition but don't know Australia will learn from each page of this book. If you are planning a trip Down Under, pack a copy next to your binoculars and field guide.

#### LITERATURE CITED

Marzluff, J. M., and T. Angell (2013). *Gifts of the Crow: How Perception, Emotion, and Thought Allow Smart Birds to Behave Like Humans*. Atria Books, New York, NY, USA.

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