

Preface

Each of the two editors of this volume on *Psychological Mechanisms in Animal Communication* often sees the world of animal signals and communication very differently from the other editor. This is because each of us tends to view these topics through the eyes of our respective study organisms and the lenses of our past training. One of us (MAB), with a background in behavioral ecology, comparative psychology, and neuroethology, primarily studies acoustic communication in frogs. The other (CTM), with a background in evolutionary biology, cognitive psychology, and systems neuroscience, studies acoustic communication in monkeys. A number of years ago, however, at the First International Conference on Acoustic Communication by Animals, held at the University of Maryland in July 2003, we discovered that we share in common a deeply held opinion about research on animal communication: psychological mechanisms for signaling and receiving often get eclipsed by a fascination with signals.

Animal behaviorists, the media, and the public are frequently captivated by the elaborate and showy signals animals produce to communicate with each other. How can one fail to marvel at the music-like vocalizations of songbirds and humpback whales, the cacophony generated by choruses of calling frogs and insects, the dynamic and mesmerizing visual displays of a cuttlefish, the use of chemical signals by foraging ants, or the multisensory displays of peacock spiders and birds of paradise? Likewise, biologists and laypersons alike are often amazed by the diversity of functions that communication signals serve in the lives of animals, from courting and choosing mates to defending resources, strengthening social bonds, warning of danger, and begging for food or leading others to it. By comparison, the no-less elaborate and complex psychological mechanisms that have evolved for the purposes of signaling and receiving seem to inspire less wonder. One notable exception, of course, is the hunt for parallels and precursors of human language in other animals, which has been extensive and is ongoing. But many of the sensory, perceptual, and cognitive mechanisms that enable human communication are not language specific and can be studied in many other communicating animals. We

hope this volume will stimulate wonderment regarding the diversity of psychological mechanisms for signaling and receiving found across a diversity of species.

After first crossing paths as graduate students at that 2003 conference, we set for ourselves the task of putting to pen our shared view on the state of research on psychological mechanisms in animal communication. It was only after several false starts, and after navigating the academic job market, that we finally accomplished our task in the form of an essay published in *Animal Behaviour* (Miller and Bee 2012). In that paper, we questioned whether the receiver psychology paradigm (Guilford and Dawkins 1991, 1993; Rowe 2013), which has been influential in shaping the field's thinking about the evolution of signal design and signaling behavior, has led to any useful, new insights into the psychology of receivers. Our general conclusion was that it had not. We argued that the receiver psychology paradigm could have a much greater impact on the study of animal signals and communication if it also promoted research on the actual psychological mechanisms involved in communication and their potential evolutionary diversity. Specifically, we advocated for seeking a broader and deeper understanding of receivers' "psychological landscapes" through the comparative study of the sensory, perceptual, and cognitive mechanisms that enable receivers to acquire, process, and act upon signals. This volume represents an extension of the basic thesis of our 2012 essay: understanding animal signals and communication depends fundamentally on understanding the psychological mechanisms operating in signalers and receivers.

In putting this book together, we have had the fortunate pleasure to engage as contributing authors a number of our colleagues whose research programs on animal communication have focused on various aspects of sensation, perception, and cognition. Collectively, their chapters span an impressive range of topics, taxa, and tools. We are deeply grateful to each author for their contribution to this volume and, more broadly, for their contribution to making new discoveries about signaler and receiver psychology. Their research inspires our own. We are also grateful to the series editors, Vincent Janik and Peter McGregor, for inviting us to edit this volume and for their input and guidance both on the large, big-picture issues involved with putting together an edited volume and on the small, mundane issues that are an inevitable part of doing so. We thank Andrea Schlitzberger, from Springer, for her help and dedication to coordinating all aspects of this project. The National Institutes of Health and the National Science Foundation have generously supported our research on animal communication over the years. Finally, we thank our families—Meggan, Karis, Abigail, River, and Sierra—for their enduring support.

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