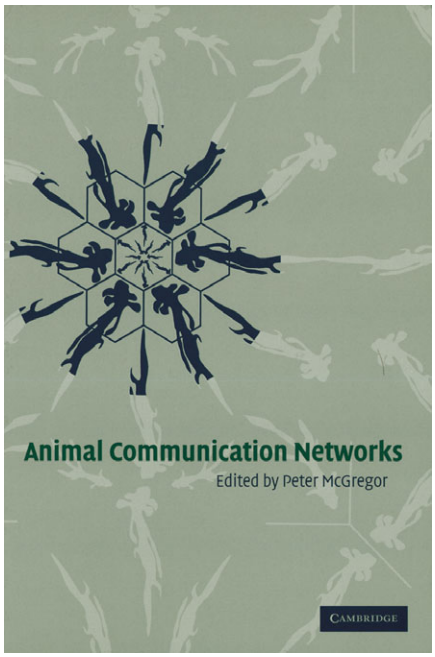
Book Review

I HEARD IT THROUGH THE GRAPEVINE



Animal Communication Networks

Edited by P. K. McGregor

Cambridge University Press (2005)
657 pp. ISBN 0 521 82361 7
$130.00/£75.00 (hbk)

Animal communication is traditionally discussed from the perspective of two individuals exchanging information, but what happens when you're chatting in a crowd and someone else gets the message too? This simplistic one-on-one view may no longer be adequate when considering signals that travel beyond their intended recipient. The book *Animal Communication Networks*, edited by Peter McGregor, discusses animal communication from the perspective of communication networks, where an interaction between two individuals affects others beyond. McGregor offers a complete overview of communication networks and their application to behavioural biology and ecology, while also discussing the theory's implications for other fields.

So what is a communication network? A classic example is when two male songbirds, who are competing for territory and mates, sing overlapping songs in a process known as countersinging. Local females, listening in on the duet, participate in the communication network to assess each male's fitness and choose the best mate. One major phenomenon discussed in McGregor's book is eavesdropping, defined as '*the use of information in signals by individuals other than the primary target*' in Chapter 2 by Tom Peake. Eavesdropping can be further divided into interceptive eavesdropping, when information is gathered by an individual of another species and usually has a negative effect on the signaller, and social eavesdropping, which occurs between two individuals of the same species. Eavesdropping in communication networks is used to explain female mate choice, to explain broadcast signals in many species, including both fish and birds, as well as to explain countersinging in male songbirds. Other chapters discuss communication in marine mammals, large territorial mammals, such as elephants, and fiddler crabs. The communication network perspective is also applied to other communication systems, such as olfaction with scent marking and fish semiochemicals. Other network issues that are addressed include audience effects, dawn choruses and the perception and cognitive abilities of various species in communication networks.

The book is divided into four main sections, united by an introduction in which McGregor states his goals for the book and a brief introduction to communication networks. Part I (chapters 2–6) deals with behaviours specific to networks. These chapters add weight to the idea of communication networks by looking at interactions that can be explained better from a network perspective instead of being seen as an interaction between two individuals. These chapters provide a clear introduction to concepts for researchers who are unfamiliar with the idea of a communication network. Both Tom Peake's and Torben Dabelsteen's chapters on eavesdropping are excellent introductions, while Bower's chapter on victory displays is especially compelling.

Chapters 7–11 in Part II compare how information is transferred through communication networks in various situations. Included in this section are predator–prey and mate-choice interactions, which fit well within the communication network definition. Other chapters about systems such as nestling begging, redirection of aggression and scent marking, which at first may be thought of as interactions between only two individuals, are also included in this section. The authors of these chapters explain why these interactions should be considered as aspects of communication networks.

Part III (chapters 12–19) is devoted to communication networks in different taxa. This section shows the reader just how versatile the communication network theory can be. This theory can be applied far beyond just countersinging songbirds and the fish species with which it is traditionally associated. Examples of such taxa mentioned in the book include fiddler crabs, waving their oversized claws to attract mates, and marine mammals communicating over long distances in the open ocean. Part IV encompasses the final chapters in the book, 20–26, which are devoted to interfaces with other disciplines, such as virtual modelling, and a challenging but extremely relevant chapter on perception that includes implication in the areas of psychophysics and physics.

Although the majority of the figures in this book are extremely helpful in contributing to the understanding of experimental designs, some figures are less clear. Other than this minor criticism, I believe that researchers in many fields can benefit from this book. This book is relevant for behavioural biologists, however it also stresses the potential of using communication networks in other fields of research. The book offers the reader a new perspective on communication not only in terms of behavioural interactions but also the physiological mechanisms that are responsible for these interactions. The inevitable question it poses is 'if communication has evolved as a network instead of the traditional one-on-one view, then how does this change the way we look at the mechanisms responsible for these interactions?'. Moreover, this book provides a larger, more complete view of interactions than a strict one-on-one view. This will hopefully benefit physiologists and other researchers by giving them a new angle from which to approach their research and perhaps help them to find answers that had previously eluded them. The book will be beneficial for scientists from a wide range of disciplines from ecology to neurobiology and evolutionary biology and will hopefully inspire researchers from other fields to incorporate communication networks into their own work.

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