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978-0-521-19504-1 - Primate Communication: A Multimodal Approach

Katja Liebal, Bridget M. Waller, Anne M. Burrows and Katie E. Slocombe

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## Primate Communication A Multimodal Approach

Primates communicate with each other using a wide range of signals, such as olfactory signals to mark territories, screams to recruit help while fighting, gestures to request food and facial expressions to initiate play.

*Primate Communication* brings together research on different forms of interaction and discusses what we know about primate communication via vocal, gestural, facial, olfactory and integrated multimodal signals in relation to a number of central topics. It explores the morphological, neural and cognitive foundations of primate communication through discussion of cutting-edge research.

By considering signals from multiple modalities and taking a unified multimodal approach, the authors offer a uniquely holistic overview of primate communication, discussing what we know, what we don't know and what we may currently misunderstand about communication across these different forms. It is essential reading for researchers interested in primate behaviour, communication and cognition, as well as students of primatology, psychology, anthropology and cognitive sciences.

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# Primate Communication

## A Multimodal Approach

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## Preface

### Why this book? An anecdote

In 2006, some of the authors attended a conference on the Evolution of Language. There were a considerable number of talks that reported results from comparative research on nonhuman primates and how this might inform research into the origins of human language. However, although each of us was working on primate communication, we rarely met at this conference. Each of us attended the sessions according to her (modality specific) expertise, while largely ignoring presentations related to other modalities. Since, it has become more and more apparent to us that isolating communicative modalities is a common practice across the field of primate communication, regardless of whether the overarching research question is the same.

This conference gave the crucial impetus for this book. Writing it was a fascinating, though challenging process: each of us with a background of research in one particular modality, had her own perspective on primate communication, and a corresponding bias regarding the other modalities. After writing this book, this has fundamentally changed. Of course, each of us is still an expert in 'her' modality and there are still many open questions and some debates remain unsolved. Writing this book has, however, changed our perspectives not only on other modalities, but also raised our awareness in regard to open questions or pitfalls in our own respective areas of expertise.

Although this book advocates the necessity of a multimodal approach, realizing and applying it to the investigation of primate communication very much depends on the corresponding research questions. With this book, we hope to spark the reader's interest in the importance of a multimodal perspective and fuel discussions about advantages and limitations of a multimodal approach to primate communication. Taking this new perspective on primate communication and making the effort to work on shared definitions and methods will enable researchers to ask new and fascinating questions. Answering them will provide new insights and perspectives on primate communication.

### What can readers expect from this book?

This book is aimed at an audience that includes researchers in primate communication and related fields of research, as well as students of primatology, psychology, biology, ethology, anthropology and cognitive sciences, but also general readers, who are interested in:

- an integrated multimodal approach to important cognitive aspects of communication
- different communicative modalities, including olfaction, vocalizations, facial expressions and gestures
- an overview of cutting-edge research and the current state of the art in primate communication
- a critical discussion of current problems, pitfalls and misunderstandings in primate communication
- the biological foundations and cognitive mechanisms underlying primate communication
- the causes and consequences of studying modalities separately
- current approaches and the most common methods used in research into primate communication
- the relevance of comparative research on primate communication for understanding the evolution of human language.

The book consists of four major parts, comprising an introduction to communication and the features that characterize primates (Part I), methods and approaches used to study primate communication (Part II), cognitive characteristics underlying primate communication (Part III), and approaches to its evolution (Part IV). These parts and the corresponding chapters differ in regard to several dimensions:

*First*, while some chapters of the book (Chapters 1–3) focus on the morphology and physiology of primate communication, others (Chapters 6–9) specifically address the psychological characteristics and the cognitive skills underlying primate communication.

*Second*, Chapters 1–4 will mostly use a unimodal perspective to introduce definitions and methods separately for each modality, while the remaining book pursues a multimodal approach to primate communication by discussing evidence from different modalities in an integrated way.

*Third*, Chapters 1–4 put the emphasis on the biological foundations of primate communication and include olfaction as a separate modality, while the remaining chapters mostly focus on facial expressions, gestures and vocalizations. This is not to neglect the importance of olfaction, but to emphasize that virtually nothing is known in regard to the psychological mechanisms underlying olfactory communication.

**Chapter 1** introduces important terms, definitions and approaches to primate communication. It gives an overview of the diversity of primate species together with the features characterizing them and describes our approach to communication with special reference to its importance for maintaining complex social groups. **Chapter 2** explains the morphology of those structures involved in the production and perception of the different modalities, with special reference to their evolutionary pathways, while **Chapter 3** provides an overview of the neural substrates involved in the production and perception of olfactory signals, facial expressions, vocalizations and gestures separately. **Chapter 4** summarizes the variety of methods used to investigate the production and comprehension of the different modalities as well as their structural and functional properties. **Chapter 5** is central to the purpose of this book since it

provides an overview of the current state of the art of research into primate communication and highlights the importance but apparent absence of a multimodal approach, particularly in regard to understanding the evolution of human language. **Chapter 6** is dedicated to the developmental aspects of primate communication and addresses the issue of how primates acquire their communicative repertoire in regard to the underlying mechanisms. **Chapter 7** concerns the flexibility of primate communication in regard to both the production and comprehension of signals, with special attention to their use across different functional contexts and their combination into signal sequences. **Chapter 8** represents a critical evaluation of the criteria used to identify intentional acts of communication, summarizes the empirical evidence for intentional signalling and suggests a set of criteria that are applicable across the different modalities. **Chapter 9** summarizes evidence for the referential use of primate signals. Finally, **Chapter 10** elaborates on different approaches to the evolution of primate communication by highlighting the importance of a multimodal approach to fully understand the complexity of primate communication and its implications for the evolution of human language.

**What is not covered in this book?**

To avoid any misplaced expectations, this section will summarize those aspects that will not be part of this book.

*First*, despite also being primates, humans only play a minor role in this book. Covering the full extent of human communication is beyond its scope. However, we often use human communication as the point of reference, as the focus of research is often explicitly comparative between humans and other primates. For example, we use this perspective when describing potential precursors to human language in other primates and reviewing the research investigating the language skills of nonhuman great apes. The focus of this book, however, is on nonhuman primates and the fascinating variety and skills that characterize their communication.

*Second*, despite some chapters referring to possible scenarios of the evolution of human language and evaluating potential problems related to these current approaches, this book does not aim to offer a new alternative theory of language evolution. Instead, the focus is on evaluating the empirical evidence from comparative research that current theories build on. We aim to highlight invalid or premature conclusions, and suggest some future directions for research into primate communication, which are prerequisites for the development of an informed multimodal theory of language evolution.

*Third*, although this book reports some of the major and most influential findings, it does not aim at providing a detailed comprehensive overview of the existing literature on primate communication such as presenting communicative repertoires for different species. Instead, the emphasis is on integrating different perspectives on primate communication that often differ as a function of the modality and a critical discussion in regard to open questions and problems related to these different approaches, illustrated by empirical evidence from a variety of studies. This is the prerequisite for

pointing out the way forward, to rethink and redefine terms and criteria (and how they are operationalized) and to develop new methods to study primate communication in a multimodal, integrated way.

**Notes**

*Primates:* Although primates include humans, in this book we use the term *primates* to refer exclusively to nonhuman primates unless otherwise stated.

*Signals:* If specific signals are described, they are highlighted by inverted commas, e.g. ‘playface’ or ‘ground slap’.

*Glossary:* Some key terms or phrases are defined and explained in some more detail at the end of this book.

*Species:* Common names for species are used throughout this book. However, in the appendix, each common name is listed together with the Latin name for the species or genus referred to in this book.

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