

Series Preface

The following preface is the one that we published in Volume 1 of the *Springer Handbook of Auditory Research* back in 1992. As anyone reading the original preface, or the many users of the series, will note, we have far exceeded our original expectation of eight volumes. Indeed, with books published to date and those in the pipeline, we are now set for over 60 volumes in *SHAR*, and we are still open to new and exciting ideas for additional books.

We are very proud that there seems to be consensus, at least among our friends and colleagues, that *SHAR* has become an important and influential part of the auditory literature. While we have worked hard to develop and maintain the quality and value of *SHAR*, the real value of the books is very much because of the numerous authors who have given their time to write outstanding chapters and to our many coeditors who have provided the intellectual leadership to the individual volumes. We have worked with a remarkable and wonderful group of people, many of whom have become great personal friends of both of us. We also continue to work with a spectacular group of editors at Springer. Indeed, several of our past editors have moved on in the publishing world to become senior executives. To our delight, this includes the current president of Springer US, Dr. William Curtis.

But the truth is that the series would and could not be possible without the support of our families, and we want to take this opportunity to dedicate all of the *SHAR* books, past and future, to them. Our wives, Catherine Fay and Helen Popper, and our children, Michelle Popper Levit, Melissa Popper Levinsohn, Christian Fay, and Amanda Fay, have been immensely patient as we developed and worked on this series. We thank them and state, without doubt, that this series could not have happened without them. We also dedicate the future of *SHAR* to our next generation of (potential) auditory researchers—our grandchildren—Ethan and Sophie Levinsohn, Emma Levit, and Nathaniel, Evan, and Stella Fay.

Preface 1992

The *Springer Handbook of Auditory Research* presents a series of comprehensive and synthetic reviews of the fundamental topics in modern auditory research. The volumes are aimed at all individuals with interests in hearing research including advanced graduate students, postdoctoral researchers, and clinical investigators. The volumes are intended to introduce new investigators to important aspects of hearing science and to help established investigators to better understand the fundamental theories and data in fields of hearing that they may not normally follow closely.

Each volume presents a particular topic comprehensively, and each serves as a synthetic overview and guide to the literature. As such, the chapters present neither exhaustive data reviews nor original research that has not yet appeared in peer-reviewed journals. The volumes focus on topics that have developed a solid data and conceptual foundation rather than on those for which a literature is only beginning to develop. New research areas will be covered on a timely basis in the series as they begin to mature.

Each volume in the series consists of a few substantial chapters on a particular topic. In some cases, the topics will be ones of traditional interest for which there is a substantial body of data and theory, such as auditory neuroanatomy (Vol. 1) and neurophysiology (Vol. 2). Other volumes in the series deal with topics that have begun to mature more recently, such as development, plasticity, and computational models of neural processing. In many cases, the series editors are joined by a coeditor having special expertise in the topic of the volume.

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Volume Preface

A fundamental goal of neuroscience is to understand how hormones modulate neural circuits and behavior. For example, steroids such as estrogens and androgens are well-known regulators of vocal motor behaviors used during social acoustic communication. Recent studies have shown that these same hormones can also greatly influence the reception of social acoustic signals, leading to the more efficient exchange of acoustic information. Understanding how hormones modulate auditory function has far-reaching implications for advancing our knowledge in the basic biomedical sciences and for understanding the evolution of acoustic communication systems.

The primary goal of this book is to review the growing literature that is consistent with the hypothesis that hormones can regulate auditory physiology and the perception of acoustic signals across a broad range of animal taxa, including humans. Chapter 1, by Andrew Bass, provides a historic overview of how we have learned about hormones and hearing, and he provides a guide to the rest of the chapters. In Chap. 2, Paul Forlano, Karen Maruska, Joseph Sisneros, and Andrew Bass review hearing-hormone relationships for teleosts, with sonic (or vocal) fishes as the focal point of research. Amphibians are the focus of Chap. 3 in which Walter Wilczynski and Sabrina Burmeister discuss the important influence of conspecific calling on circulating steroid levels and how changing steroid levels may influence the response properties of central auditory neurons.

Chapter 4 by Melissa Caras and Luke Remage-Healey takes the volume to studies of birds and focuses on how estrogen modulates auditory processing in both the peripheral and central auditory systems of songbirds. This is followed by Chap. 5, in which Donna Maney and Carlos Rodriguez-Saltos bring together many of the themes developed in Chaps. 2–4 and expand on estrogen mechanisms in songbirds with a perspective that draws us into the realm of social cognition with an emphasis on the *incentive salience* of song.

Then, in Chap. 6, Kelly Chong and Robert Liu return to a neurophysiological theme (as in Chaps. 2–4) but in this case with a focus on auditory perception and the learning and memory of vocal signals. In Chap. 7, Robert D. Frisina and D. Robert Frisina provide a timely review of experimental investigations of hormones and

hearing in humans, much of which has focused (for good reason) on one steroid, estrogen. Finally, in Chap. 8, Douglas Forrest and Lily Ng address early developmental events in humans that are strongly shaped by hormone actions at a molecular and genetic level.

This volume in the *Springer Handbook of Auditory Research*, like so many others, benefits from volumes and chapters that have come earlier in the series. Indeed, the broad phylogenetic approach of this volume complements earlier volumes in the *SHAR* series: *Comparative Hearing: Fish and Amphibians* (Vol. 11, 1999, edited by Fay and Popper), *Comparative Hearing: Birds and Reptiles* (Vol. 13, 2001, edited by Dooling, Fay, and Popper), and *Evolution of the Vertebrate Auditory System* (Vol. 22, 2004, edited by Manley, Popper, and Fay). Given the subject matter, a number of chapters have an added focus on vocal communication. In this regard, the reviews provided in this volume further complement other volumes in this series: *Acoustic Communication* (Vol. 16, 2003, edited by Simmons, Popper, and Fay), *Hearing and Sound Communication in Amphibians* (Vol. 28, 2007, edited by Narins, Feng, Fay, and Popper), and *Fish Bioacoustics* (Vol. 32, 2008, edited by Webb, Popper, and Fay).

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