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978-0-521-68889-5 - Auditory Perception: An Analysis and Synthesis, Third Edition

Richard M. Warren

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Auditory Perception

An Analysis and Synthesis

This revised and updated Third Edition describes the nature of sound, how sound is analyzed by the auditory system, and the rules and principles governing our interpretation of auditory input. It covers many topics including sound and the auditory system, locating sound sources, the basis for loudness judgments, perception of acoustic sequences, perceptual restoration of obliterated sounds, speech production and perception, and the relation of hearing to perception in general. Whilst keeping the consistent style of the previous editions, many new features have been added, including suggestions for further reading at the end of each chapter, a section on functional imaging of the brain, expanded information on pitch and infrapitch, and additional coverage of speech processing. Advanced undergraduate and graduate students interested in auditory perception, behavioral sciences, psychology, neurobiology, architectural acoustics, and the hearing sciences will find this book an excellent guide.

RICHARD M. WARREN is Research Professor and Distinguished Professor Emeritus in the Department of Psychology at the University of Wisconsin-Milwaukee. He is a Fellow of the Acoustical Society of America, American Psychological Association, and the Association for Psychological Science.

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To Roslyn

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Preface

As in the earlier editions, the present text emphasizes the interconnectedness of areas in auditory perception. These linkages are especially evident in the chapters dealing with acoustic sequences, pitch and infrapitch, loudness, and the restoration of portions of signals obliterated by extraneous sounds. In addition, the chapter on speech describes how processes employed for the perception of brief nonverbal sounds are used for the organization of syllables and words, along with an overlay of special linguistic mechanisms.

The basic format of the book remains unchanged, but all chapters have been updated. Among the additions are new sections in Chapter 1 describing the principles underlying functional imaging of the brain based on the hemodynamic techniques of fMRI and PET, and the electrodynamic techniques of EEG and MEG. New information concerning pitch and infrapitch appears in Chapter 3, and additional information concerning speech processing is incorporated into Chapter 7. Suggested additional reading now appears at the end of each chapter.

It is hoped that this text will be of value to research scientists and to professionals dealing with sound and hearing. No detailed specialized knowledge is assumed, since basic information necessary for understanding the material covered is provided. It may be used for advanced undergraduate and graduate courses in behavioral sciences, neurobiology, music, audio engineering, and the health sciences and professions.

My own research in perception was carried out at the following institutions: Brown University; New York University College of Medicine; Cambridge University; the Medical Research Council Applied Psychology Research Unit, Cambridge; Oxford University; the Laboratory of Psychology at the National Institute of Mental Health, Bethesda; and the University of Wisconsin-Milwaukee.

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I acknowledge the debts to my graduate students over the years.

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I am grateful for the past research support by the National Research Council of the National Academy of Sciences, the National Science Foundation, the Air Force Office of Scientific Research, and the National Institutes of Health. My current support is from the National Institute on Deafness and Other Communication Disorders.

Finally, I acknowledge the essential role of Dr. Roslyn Pauker Warren, my colleague and wife. Without her, none of the editions of this book would have been started, and once started could not have been finished.

Please refer to www.cambridge.org/9780521868709 for audio demonstrations of some of the phenomena described in the text, that provide new insight into the mechanisms employed in auditory perception. The stimuli and descriptive narrative were produced by Dr. James A. Bashford, Jr.