

TABLE OF CONTENTS

List of Contributors

ix

SECTION I INTRODUCTION

1. The Neuroscientific Study of Music: A Burgeoning Discipline 3
DONALD A. HODGES AND MICHAEL H. THAUT

SECTION II MUSIC, THE BRAIN, AND CULTURAL CONTEXTS

2. Music Through the Lens of Cultural Neuroscience 19
DONALD A. HODGES
3. Cultural Distance: A Computational Approach to Exploring Cultural Influences on Music Cognition 42
STEVEN J. MORRISON, STEVEN M. DEMOREST, AND MARCUS T. PEARCE
4. When Extravagance Impresses: Recasting Esthetics in Evolutionary Terms 66
BJORN MERKER

SECTION III MUSIC PROCESSING IN THE HUMAN BRAIN

5. Cerebral Organization of Music Processing 89
THENILLE BRAUN JANZEN AND MICHAEL H. THAUT
6. Network Neuroscience: An Introduction to Graph Theory Network-Based Techniques for Music and Brain Imaging Research 122
ROBIN W. WILKINS
7. Acoustic Structure and Musical Function: Musical Notes Informing Auditory Research 145
MICHAEL SCHUTZ

- | | | |
|-----|---|-----|
| 8. | Neural Basis of Rhythm Perception | 165 |
| | CHRISTINA M. VANDEN BOSCH DER NEDERLANDEN,
J. ERIC T. TAYLOR, AND JESSICA A. GRAHN | |
| 9. | Neural Basis of Music Perception: Melody, Harmony, and Timbre | 187 |
| | STEFAN KOELSCH | |
| 10. | Multisensory Processing in Music | 212 |
| | FRANK RUSSO | |

SECTION IV. NEURAL RESPONSES TO MUSIC: COGNITION, AFFECT, LANGUAGE

- | | | |
|-----|---|-----|
| 11. | Music and Memory | 237 |
| | LUTZ JÄNCKE | |
| 12. | Music and Attention, Executive Function, and Creativity | 263 |
| | PSYCHE LOUI AND RACHEL E. GUETTA | |
| 13. | Neural Correlates of Music and Emotion | 285 |
| | PATRIK N. JUSLIN AND LAURA S. SAKKA | |
| 14. | Neurochemical Responses to Music | 333 |
| | YUKO KOSHIMORI | |
| 15. | The Neuroaesthetics of Music: A Research Agenda Coming of Age | 364 |
| | ELVIRA BRATTICO | |
| 16. | Music and Language | 391 |
| | DANIELE SCHÖN AND BENJAMIN MORILLON | |

SECTION V MUSICIANSHIP AND BRAIN FUNCTION

- | | | |
|-----|---|-----|
| 17. | Musical Expertise and Brain Structure: The Causes and
Consequences of Training | 419 |
| | VIRGINIA B. PENHUNE | |
| 18. | Genomics Approaches for Studying Musical Aptitude
and Related Traits | 439 |
| | IRMA JÄRVELÄ | |

19. Brain Research in Music Performance 459
ECKART ALTENMÜLLER, SHINICHI FURUYA,
DANIEL S. SCHOLZ, AND CHRISTOS I. IOANNOU
20. Brain Research in Music Improvisation 487
MICHAEL G. ERKKINEN AND AARON L. BERKOWITZ
21. Neural Mechanisms of Musical Imagery 521
TIMOTHY L. HUBBARD
22. Neuroplasticity in Music Learning 546
VESA PUTKINEN AND MARI TERVANIEMI

SECTION VI DEVELOPMENTAL ISSUES IN MUSIC AND THE BRAIN

23. The Role of Musical Development in Early
Language Acquisition 567
ANTHONY BRANDT, MOLLY GEBRIAN, AND L. ROBERT SLEVC
24. Rhythm, Meter, and Timing: The Heartbeat
of Musical Development 592
LAUREL J. TRAINOR AND SUSAN MARSH-ROLLO
25. Music and the Aging Brain 623
LAURA FERRERI, ALINE MOUSSARD, EMMANUEL BIGAND,
AND BARBARA TILLMANN
26. Music Training and Cognitive Abilities: Associations,
Causes, and Consequences 645
SWATHI SWAMINATHAN AND E. GLENN SCHELLENBERG
27. The Neuroscience of Children on the Autism Spectrum
with Exceptional Musical Abilities 671
ADAM OCKELFORD

SECTION VII MUSIC, THE BRAIN, AND HEALTH

28. Neurologic Music Therapy in Sensorimotor Rehabilitation 695
CORENE THAUT AND KLAUS MARTIN STEPHAN

29. Neurologic Music Therapy for Speech and Language Rehabilitation 715
YUNE S. LEE, CORENE THAUT, AND CHARLENE SANTONI
30. Neurologic Music Therapy Targeting Cognitive and Affective Functions 738
SHANTALA HEGDE
31. Musical Disorders 760
ISABELLE ROYAL, SÉBASTIEN PAQUETTE, AND PAULINE TRANCHANT
32. When Blue Turns to Gray: The Enigma of Musician's Dystonia 776
DAVID PETERSON AND ECKART ALTENMÜLLER

SECTION VIII THE FUTURE

33. New Horizons for Brain Research in Music 805
MICHAEL H. THAUT AND DONALD A. HODGES
- Index* 813