

CONTENTS

Preface to the Second Edition xi

I. FUNDAMENTALS OF DEVELOPMENTAL NEUROBIOLOGY 1

A. *GENERAL PRINCIPLES* 3

1. The Formation of Axons and Dendrites by Developing Neurons 5
PAUL LETOURNEAU
2. Imaging Developmental Changes in Gray and White Matter
in the Human Brain 23
ELIZABETH D. O'HARE AND ELIZABETH R. SOWELL
3. Myelination and Development of the Human Brain 39
TONYA WHITE AND CLAUS C. HILGETAG
4. Adult Neurogenesis in the Hippocampus 51
YEVGENIA KOZOROVITSKIY AND ELIZABETH GOULD
5. The LHPA System and Neurobehavioral Development 63
AMANDA R. TARULLO, KARINA QUEVEDO, AND MEGAN R. GUNNAR
6. The Effects of Monoamines on the Developing Nervous System 83
GREGG D. STANWOOD AND PAT LEVITT

*B. STRUCTURAL FOUNDATIONS OF SENSATION,
PERCEPTION, AND COGNITION* 95

7. Mechanisms of Auditory Reorganization during Development:
From Sounds to Words 97
RICHARD N. ASLIN, MEGHAN A. CLAYARDS, AND NEIL P. BARDHAN
8. Brain Correlates of Language Processing during the
First Years of Life 117
ANGELA D. FRIEDERICI
9. Brain-Behavior Relationships in Early Visual Development 127
BOGDAN F. ILIESCU AND JAMES L. DANNEMILLER
10. Motor Systems Development 147
ROSA M. ANGULO-BARROSO AND CHAD W. TIERNAN
11. Neurodevelopment of Social Cognition 161
MELISSA D. BAUMAN AND DAVID G. AMARAL
12. Pre- and Postnatal Morphological Development of the Human
Hippocampal Formation 187
LÁSZLÓ SERESS AND HAJNALKA ÁBRAHÁM
13. Structural Development of the Human Prefrontal Cortex 213
IVICA KOSTOVIĆ, MILOŠ JUDAŠ, AND ZDRAVKO PETANJEK
14. White Matter Maturation and Cognitive
Development during Childhood 237
TORSEL KLINGBERG

- II. METHODOLOGICAL PARADIGMS 245

15. Electrophysiological Methods in Studying Infant
Cognitive Development 247
GERGELY CSIBRA, ELENA KUSHNERENKO, AND
TOBIAS GROSSMANN
16. Eye Tracking Studies of Normative and Atypical Development 263
CANAN KARATEKIN
17. Diffusion Tensor Imaging 301
JEFFREY R. WOZNAK, BRYON A. MUELLER, AND KELVIN O. LIM
18. Functional MRI Methods in Developmental Cognitive Neuroscience 311
KATHLEEN M. THOMAS AND ANGELA TSENG
19. Mechanisms of Language Acquisition: Imaging and
Behavioral Evidence 325
JACQUES MEHLER, MARINA NESPOR, JUDIT GERVAIN, ANSGAR ENDRESS, AND
MOHINISH SHUKLA

20. Magnetic Resonance Spectroscopy of Developing Brain 337
BALASRINIVASA RAO SAJJA AND PONNADA A. NARAYANA
21. The Integration of Neuroimaging and Molecular Genetics in the Study of Developmental Cognitive Neuroscience 351
ESSI VIDING, DOUGLAS E. WILLIAMSON, ERIKA E. FORBES, AND AHMAD R. HARIRI
22. Neural Network Models of Cognitive Development 367
YUKO MUNAKATA, JENNIFER MERVA STEDRON, CHRISTOPHER H. CHATHAM, AND MARIA KHARITONOVA

III. NEURAL PLASTICITY IN DEVELOPMENT 383

23. Early Brain Injury, Plasticity, and Behavior 385
BRYAN KOLB, WENDY COMEAU, AND ROBBIN GIBB
24. Developmental Plasticity and Reorganization of Function Following Early Diffuse Brain Injury 399
LINDA EWING-COBBS, MARY R. PRASAD, AND KHADER M. HASAN
25. Plasticity of the Visual System 415
DAPHNE MAURER, TERRI L. LEWIS, AND CATHERINE J. MONDLOCH
26. Cross-Modal Plasticity in Development: The Case of Deafness 439
TERESA V. MITCHELL
27. Plasticity of Speech (Animal Model) 453
TERESA A. NICK

IV. COGNITION 465

28. The Development and Integration of the Dorsal and Ventral Visual Pathways in Object Processing 467
MARK H. JOHNSON, DENIS MARESCHAL, AND GERGELY CSIBRA
29. Attention in Young Infants: A Developmental Psychophysiological Perspective 479
JOHN E. RICHARDS
30. Nonhuman Primate Models of Memory Development 499
JOCELYNE BACHEVALIER
31. Neurocognitive Mechanisms for the Development of Face Processing 509
MICHELLE DE HAAN
32. The Development of Visuospatial Processing 521
JOAN STILES, BRIANNA PAUL, AND WENDY ARK

33. Mechanisms of Change: A Cognitive Neuroscience Approach to Declarative Memory Development 541
JENNY RICHMOND AND CHARLES A. NELSON
34. The Development of Executive Function in Childhood 553
PHILIP DAVID ZELAZO, STEPHANIE M. CARLSON,
AND AMANDA KESEK
35. The Development of Prefrontal Cortex Functions in Adolescence: Theoretical Models and a Possible Dissociation of Dorsal versus Ventral Subregions 575
ELIZABETH A. OLSON AND MONICA LUCIANA
36. Cognition and Aging: Typical Development 591
JONAS PERSSON AND PATRICIA A. REUTER-LORENZ
37. Cognition and Aging-Dementia 607
MISCHA DE ROVER, SHARON MOREIN-ZAMIR, ANDREW D. BLACKWELL,
AND BARBARA J. SAHAKIAN

V. NEURODEVELOPMENTAL ASPECTS OF CLINICAL DISORDERS 621

38. The Role of Nutrition in Cognitive Development 623
ANITA J. FUGLESTAD, RAGHAVENDRA RAO, AND MICHAEL K. GEORGIEFF
39. Fetal Alcohol Syndrome 643
SARAH N. MATTSON, SUSANNA L. FRYER, CHRISTIE L. MCGEE,
AND EDWARD P. RILEY
40. Impact of Prenatal Cocaine Exposure on the Developing Nervous System 653
ERIC M. LANGLOIS AND LINDA C. MAYES
41. Neurocognitive Models of Early-Treated Phenylketonuria: Insights from Meta-analysis and New Molecular Genetic Findings 677
MARILYN WELSH, KATHRYN DEROCHE, AND DAVID GILLIAM
42. Research into Williams Syndrome: The State of the Art 691
ANNETTE KARMILOFF-SMITH
43. Neurocognitive Development in Autism 701
MIKLE SOUTH, SALLY OZONOFF, AND ROBERT T. SCHULTZ
44. Tics and Compulsions: Disturbances of Self-Regulatory Control in the Development of Habitual Behaviors 717
RACHEL MARSH, JAMES F. LECKMAN, MICHAEL H. BLOCH,
YANKI YAZGAN, AND BRADLEY S. PETERSON
45. Developmental Dyslexia 739
GUINEVERE F. EDEN AND D. LYNN FLOWERS

46. The Development and Cognitive Neuroscience of Anxiety 755
DANIEL S. PINE AND CHRISTOPHER S. MONK

47. Developmental Neuropsychology of Unipolar Depressions 771
IAN M. GOODYER AND ZOË KYTE

VI. EMOTION/COGNITION INTERACTIONS 785

48. Toward a Neurobiology of Attachment 787
MYRON A. HOFER AND REGINA M. SULLIVAN

49. Sleep, Cognition, and Emotion: A Developmental View 807
OSKAR G. JENNI AND RONALD E. DAHL

50. Neural Systems, Gaze Following, and the Development of
Joint Attention 819
PETER MUNDY AND AMY VAN HECKE

51. The Biology of Temperament: An Integrative Approach 839
NATHAN A. FOX, HEATHER A. HENDERSON, KORALY PÉREZ-EDGAR,
AND LAUREN K. WHITE

52. The Developing Adolescent Brain: Molecular Mechanisms Underlying
Nicotine Vulnerability 855
CHARLES F. LANDRY, TERRI L. SCHOCHET, AND ANN E. KELLEY

53. Environmental Influences on Brain-Behavioral Development: Evidence
from Child Abuse and Neglect 869
JESSICA E. SHACKMAN, ALISON B. WISMER FRIES, AND SETH D. POLLAK

54. Neurocognitive Development of Performance Monitoring
and Decision Making 883
EVELINE A. CRONE AND MAURITS W. VAN DER MOLEN

Contributors 897

Index 901