Contents

List of contributors vii
Preface ix
Acknowledgments xi

I Comparative evolutionary and developmental perspectives on gorillas and orangutans
1 Hominid family values: morphological and molecular data on relations among the great apes and humans 3
David R. Begun
2 The life history and development of great apes in comparative perspective 43
Sue T. Parker
3 The frontal lobes of the great apes with a focus on the gorilla and the orangutan 70
Katerina Semendeferi

II Cognition and tool use in gorillas and orangutans
4 Intelligent tool use in wild Sumatran orangutans 99
Elizabeth A. Fox, Arnold F. Sitompul, and Carel P. van Schaik
5 Orangutans’ imitation of tool use: a cognitive interpretation 117
Anne E. Russon
6 Object manipulation and skill organization in the complex food preparation of mountain gorillas 147
Richard W. Byrne
7 Development of sensorimotor intelligence in infant gorillas: the manipulation of objects in problem-solving and exploration 160
Juan C. Gomez
8 Tool use in captive gorillas 179
Sarah T. Boyesen, Valerie A. Kuhlmeier, Peter Halliday, and Yolanda M. Halliday
9 A survey of tool use in zoo gorillas [188]
   SUE T. PARKER, MARY KERR, HAL MARKOWITZ, AND JAY GOULD

III Communication in gorillas and orangutans
10 Symbolic communication with and by great apes [197]
   H. LYNN MILES

11 The development of spontaneous gestural communication in a
group of zoo-living lowland gorillas [211]
   JOANNE E. TANNER AND RICHARD W. BYRNE

12 Early sign-language acquisition: comparisons between children
   and gorillas [240]
   JOHN B. BONVILLIAN AND FRANCINE G. P. PATTERSON

13 Early sign performance in a free-ranging, adult orangutan [265]
   GARY L. SHAPIRO AND BIRUTĖ M. F. GALDIKAS

IV Social cognition in gorillas and orangutans
14 Comparative aspects of mirror self-recognition in great apes [283]
   KARYL B. SWARTZ, DENA SARAUW, AND SIÂN EVANS

15 Deception and concealment as strategic script violation in
   great apes and humans [295]
   ROBERT W. MITCHELL

16 Levels of imitation and cognitive mechanisms in orangutans [316]
   JOSEPH CALL

17 Parental encouragement in Gorilla in comparative perspective: implications
   for social cognition and the evolution of teaching [342]
   ANDREW WHITEN

18 The development of social roles in the play of an infant gorilla and its
   relationship to sensorimotor intellectual development [367]
   SUE T. PARKER

V Epilogue
19 The mentalities of gorillas and orangutans in phylogenetic perspective [397]
   SUE T. PARKER AND ROBERT W. MITCHELL

Index of authors [412]
Index of subjects [416]