

Contents

<i>List of figures</i>	<i>page</i>	x
<i>Preface</i>	xiii	
<i>Acknowledgements</i>	xix	
1 Evolution and history	1	
1.1 Overview	1	
1.2 Evolutionary linguistics	1	
1.3 Early ideas about the origin of language	2	
1.4 Evolution and history	6	
1.5 Saying ‘evolution’ without meaning it	13	
1.6 Beyond evolution?	18	
1.7 Summary	20	
Further reading	21	
Points for discussion	21	
2 Evidence for evolution	23	
2.1 Overview	23	
2.2 The argument from design	23	
2.3 The critical period hypothesis	26	
2.4 The argument from poverty of the stimulus	31	
2.5 Creativity and creolisation	37	
2.6 Language and the brain	40	
2.7 ‘Language genes’	44	
2.8 Summary	47	
Further reading	48	
Points for discussion	49	
3 The comparative methods	51	
3.1 Overview	51	
3.2 Going backwards to move forwards	51	
3.3 An outline of the comparative method in linguistics	53	
3.4 Reconstruction and comparison are time-limited	55	
3.5 Reconstruction and comparison of morphosyntax	58	
3.6 Global etymologies	61	
3.7 Limitations on reconstruction	67	
3.8 The comparative method in biology	70	
3.9 Summary	77	
Further reading	78	
Points for discussion	79	

4 Who, where and when?	81
4.1 Overview	81
4.2 Biological family trees	81
4.3 Beware: falling trees!	87
4.4 Hominid histories	90
4.5 Summary	99
Further reading	100
Points for discussion	101
5 The vocal tract	102
5.1 Overview	102
5.2 Producing speech sounds	102
5.3 Uniquely human?	104
5.4 Complexities and critiques	108
5.5 Adaptations and complications	112
5.6 Summary	115
Further reading	116
Points for discussion	117
6 Language and the brain	119
6.1 Overview	119
6.2 Brains and genes: one topic, not two	119
6.3 Elementary brain geography	121
6.4 Specialisation of the brain for language	127
6.5 Evolution and the human brain	135
6.6 Summary	145
Further reading	146
Points for discussion	147
7 Language and genes	148
7.1 Overview	148
7.2 What is a gene, and how does it work?	149
7.3 Genes in populations	156
7.4 Genes in individuals	171
7.5 Summary	186
Further reading	187
Points for discussion	188
8 Big bang or cumulative creep? Saltation versus gradual, adaptive evolution	189
8.1 Overview	189
8.2 Saltation: language and the big bang	189
8.3 A gradual, adaptive view of the evolution of language	203
8.4 Summary	215
Further reading	216
Points for discussion	217
9 From protolanguage to language	219
9.1 Overview	219
9.2 Why protolanguage?	220
9.3 The nature of protolanguage	224

CONTENTS

ix

9.4	From protolanguage to language	232
9.5	Motivations for increasing complexity	244
9.6	Phonology – still a mystery?	248
9.7	Biological and cultural evolution	256
9.8	Summary	263
	Further reading	264
	Points for discussion	265
	<i>Bibliography</i>	267
	<i>Index</i>	302

Figures

3.1	The encephalisation quotient	<i>page</i> 74
4.1	Outline Tree of Life showing the three major domains	83
4.2a	Animals (rooted using bacteria as outgroups)	84
4.2b	Expanded subtree for mammals	85
4.3	A primate taxonomic classification	86
4.4	Evolutionary time line and aspects of the ape fossil record	92
5.1	Landmarks on the base of a human skull used to determine the shape of the basiscranium of a chimpanzee skull and a modern adult human skull	108
6.1	A pair of typical neurons	123
6.2	A drawing of a typical, large pyramidal neuron from the cerebral cortex	124
6.3	Surface of a human brain in lateral view from the left-hand side	125
6.4	Cytoarchitectonic map of the human left cerebral hemisphere	126
6.5	Outline of the left hemisphere, with an inverted outline of the right hemisphere superimposed	130
6.6	The paths of bundles of axons connecting distant parts of the cerebral cortex	131
6.7	Graph of brain volume against body weight for a range of extant hominoids, with estimated values for fossils derived from cranial size	140
6.8	Left lateral view of one cerebral hemisphere of three mammals drawn to approximately the same size	141
7.1	Schematic diagram of a short stretch of DNA	152
7.2	Diagram of species trees and gene tree	167

7.3	Graph of brain weight in embryological and post-partum growth in humans	174
7.4	Pedigree of the KE family	184
9.1	Generation 9 of an evolved language	242