

Contents

About the author	vii	Group studies and lesion-deficit analysis	88
Preface to the first edition	ix	Animal models in neuropsychology	90
Preface to the second edition	xi	Transcranial magnetic stimulation (TMS)	92
		Facilitation, interference and functional integration using TMS	96
1 Introducing cognitive neuroscience	2	6 The seeing brain	102
Cognitive neuroscience in historical perspective	4	From eye to brain	103
Does cognitive psychology need the brain?	11	Cortical blindness and “blindsight”	108
Does neuroscience need cognitive psychology?	13	Functional specialization of the visual cortex beyond V1	110
2 Introducing the brain	16	Recognizing objects	113
Structure and function of the neuron	18	Category specificity in visual object recognition?	119
The gross organization of the brain	21	Recognizing faces	120
The cerebral cortex	25	Vision imagined	124
The subcortex	27	7 The spatial brain	128
The midbrain and hindbrain	30	A spotlight on attention	129
3 The electrophysiological brain	32	Attending to visual objects:	
In search of neural representations:		Feature-Integration Theory	133
Single-cell recordings	34	Space, attention and the parietal lobes	136
Electroencephalography and event-related potentials	37	Losing space: Seeing one object at a time	139
Mental chronometry in electrophysiology and cognitive psychology	40	Losing half of space: Spatial frames and neglect	141
Magnetoencephalography	46	Remembering space: Does the hippocampus store a long-term map of the environment?	147
4 The imaged brain	48	8 The acting brain	152
Structural imaging	49	A basic cognitive framework for movement and action	153
Functional imaging	51	The role of the frontal lobes in movement and action	155
From image to cognitive theory: An example of cognitive subtraction methodology	56	Planning actions: The SAS model	159
Beyond cognitive subtraction	58	Ownership and awareness of actions	161
Event-related versus blocked designs	64	Action comprehension and imitation	164
Analyzing data from functional imaging	65	Parietofrontal circuits for sensory-motor transformation	166
Interpreting data from functional imaging	68	Using objects and tools	170
Why do functional imaging data sometimes disagree with lesion data?	71	Preparation and execution of actions	173
Is “Big Brother” round the corner?	73	9 The remembering brain	180
5 The lesioned brain	78	Short-term and working memory	181
Dissociations and associations	81	Different types of long-term memory	185
Single case studies	84		

VI CONTENTS

Amnesia	187	13 The numerate brain	288
Memory storage and consolidation: A time-limited role for the hippocampus?	193	Universal numeracy?	289
Theories of remembering, knowing and forgetting	196	The meaning of numbers	291
The role of the prefrontal cortex in long-term memory	199	Models of number processing	298
Constructive memory and memory distortions	200	Are numbers represented in a visuospatial code?	307
10 The hearing brain	208	14 The executive brain	310
The nature of sound	210	Anatomical and functional divisions of the prefrontal cortex	312
From ear to brain	211	Executive functions in practice	314
Basic processing of auditory information	214	Models of executive function	318
Music perception	219	Functional specialization within the lateral prefrontal cortex?	322
Voice perception	223	The role of the anterior cingulate in executive functions	328
Speech perception	224	Task switching	330
11 The speaking brain	232	15 The social and emotional brain	336
Spoken word recognition	235	Processing emotions and social cues: Reading faces and reading eyes	338
Semantic memory and the meaning of words	239	Processing emotions: A role for somatic responses?	347
Understanding and producing sentences	245	Reading minds	351
Retrieving spoken words	251	Antisocial behavior	358
12 The literate brain	260	16 The developing brain	364
Visual word recognition	263	Structural development of the brain	367
Does understanding text require phonological mediation?	271	Functional development of the brain: Sensitive periods and innate knowledge?	371
Reading aloud: Routes from spelling to sound	272	Behavioral genetics	377
Spelling and writing	279	Beyond nature versus nurture: Gene–environment interplay	380
Does spelling use the same mechanisms as reading?	284	References	387
		Author index	433
		Subject index	447