

Contents

Foreword	vii
Preface	ix
Section 1 An Introduction to Cognitive Neuroscience	1
1.1 Basic Notions	3
Hemispheric Asymmetry: A Historical Introduction	3
Language dominance	4
Language dominance and handedness	4
Hemispheric asymmetry	5
The anatomical basis of hemispheric asymmetry	8
Functional Imaging	9
Positron emission tomography	10
Functional magnetic resonance (fMR)	14
Cognitive neurophysiology	16
1.2 Language	18
Cognitive Models of Language	19
Single words: Multiple processing pathways	19
Interactionist models	23
The influence of theoretical linguistics:	
Sentence processing	25
On-line studies of language processing	27
Connectionist modelling of language processing	28
The Neural Basis of Language	30
Functional neuroimaging	30
Neurophysiological investigations	35
Other languages: Numbers and music	36
1.3 Attention	38
Definitions	38
The "Locus" of Attention	39
Selective Spatial Attention and the Automatic-Controlled	
Dichotomy	40
Posterior and Anterior Attentional Systems	40
Global/Local Attention	42

Inhibition of Irrelevant Responses	43
The Premotor Theory of Spatial Attention	44
Imaging Studies of Attention	44
1.4 Perception and Action	46
Visual Perception	46
Object perception	48
Spatial perception	52
Action	53
Object-oriented action: reaching and grasping	53
Complex movements and action planning	55
Auditory Perception	56
Somoesthetic Perception	57
1.5 Memory	58
The Multiple Memory Systems Model	58
Short term memory/working memory	59
Declarative (episodic-semantic) memory	61
Implicit memory	64
Procedural memory	65
Priming	65
The Neurology of Memory	66
Animal studies	67
Neuroimaging	69
1.6 Executive Functions	74
Slips of Action and Prospective Memory	75
The Central Executive of Working Memory	77
Willed Action and Reality Monitoring	77
Reasoning and Decision Making	79
Functional Imaging of the Frontal Lobe	81
1.7 Emotions	82
The Emotional Processing Pathways	82
The Hemispheric Dominance for Emotional Control	82
Neuroimaging of Emotions in Humans	85
References	85
Section 2 Cognitive Assessment	105
2.1 General Assessment	108
2.2 Mental Status Testing	113
Vigilance and arousal	114
Alertness and attention	114

Language	115
Calculation	120
Right-left orientation and finger gnosis	120
Praxis	121
Visual and spatial functions	121
Memory	123
Reasoning, judgement and control of behaviour	123
2.3 Neuropsychological Tests	126
The WAIS as a neuropsychological instrument	127
Cognitive screening tests	127
Attention and vigilance	128
Language	128
Calculation	129
Visuo-spatial perception and construction	129
Praxis	130
Memory	130
Frontal lobe function	135
Rating scales	136
Computerised testing procedures	136
References	137

Section 3 Clinical Presentations 145

3.1 Selective Neuropsychological Disorders	146
The Aphasias	146
Aphasic syndromes	149
Non-fluent aphasias with impaired repetition	150
Broca's aphasia	150
Global aphasia	152
Fluent aphasias with impaired repetition	153
Wernicke's aphasia	153
Conduction aphasia	153
Aphasias with preserved repetition	154
Transcortical aphasias	154
Anomic aphasia	156
Alexia with agraphia	157
Pure forms	158
Anarthria	158
Pure word deafness	158

Pure agraphia	159
Alexia without agraphia	159
Subcortical aphasia	160
The cognitive approach to aphasia	161
Phonological disorders	161
Lexical-semantic disorders	163
Morphological and syntactic disorders	165
Disorders of written language	166
Acalculia	167
Amusia	168
The Apraxias	168
The apraxic syndromes	169
Bucco-facial apraxia	170
Limb apraxia	171
Melokinetic apraxia	171
Ideomotor apraxia	171
Spatial Disorders	174
Unilateral neglect	176
The acute stage	177
The post-acute stage	177
The chronic stage	178
“Dissociations” in ULN	180
Anatomical basis of ULN and related manifestations	181
Interpretations of ULN	182
Simultanagnosia and Balint’s syndrome	184
Topographic disorientation	187
The Agnosias	188
Visual agnosia	188
Selective disorders of early perceptual processing	189
Apperceptive visual agnosia	190
Associative visual agnosia	192
Material-specificity in visual agnosia	193
Auditory agnosia	195
Tactile agnosia	195
Modality-specific naming impairments	196
Selective Disorders of Memory	197
Disorders of short-term memory	198

The syndrome of pure amnesia	201
Disorders of episodic memory due to neurological lesions	201
Transient global amnesia	204
Functional amnesia	205
Disorders of semantic memory:	
the syndrome of semantic amnesia	205
Selective disorders of implicit memory	207
Frontal Lobe Syndrome	208
The behavioural presentations of FLS	209
Dishinhibited pattern	210
Inhibited pattern	210
The cognitive manifestations of FLS	211
Memory	212
Reasoning and problem solving	212
Language and action	214
3.2 The Concept of Brain Failure	214
Alzheimer's disease	218
Clinical and neuropsychological features of AD	221
Memory	222
Language	225
Visuo-spatial functions	226
Apraxia	228
Attention and executive functions	228
Behavioural disorders	228
Differential diagnosis	229
Vascular dementia	231
Neuropsychological aspects	235
Binswanger's disease	236
Pick's disease, frontotemporal dementia and other "Selective progressive neuropsychological syndromes"	236
Progressive frontal lobe syndrome	237
Progressive aphasia, semantic dementia	242
Other progressive neuropsychological syndromes	244
Diagnosis	245
Other dementing conditions	246
Lewy body disease	246

Prion diseases	247
Normal pressure hydrocephalus	247
3.3 Other Neurological Conditions Associated with Cognitive Dysfunction	248
Traumatic Brain Damage	248
The cognitive and behavioural syndrome of TBD	249
Memory	251
Attention and executive functions	252
Behavioural disorders	252
Language and communication	252
Other "selective" disorders	253
Movement Disorders	254
Parkinson's disease	254
Huntington's disease	256
Progressive supranuclear palsy	257
Multiple systems degeneration	257
Cortico-basal degeneration	257
Wilson's disease	258
Multiple Sclerosis and HIV Infection	258
Multiple sclerosis	158
HIV infection	259
Epilepsy	260
Cognition in epilepsy	261
Ictal neuropsychological and behavioural manifestations	261
Interictal neuropsychological disorders	262
Antiepileptic drug effects	263
Surgery for epilepsy	263
Psychiatric Disorders	267
References	267
Section 4 Management Issues	299
4.1 The Neural Basis of Recovery	302
Diaschisis	302
Brain plasticity	305
4.2 Cognitive Rehabilitation	307
Aphasia Rehabilitation	307
Rehabilitation of Unilateral Neglect	311

Memory Rehabilitation	313
Executive Function Rehabilitation	313
Rehabilitation of Dementia Patients	314
4.3 Pharmacological Therapy	315
Alzheimer's Disease and other Dementias	315
Selective Neuropsychological Dysfunction	315
Behavioural Disorders	316
4.4 Psychological and Social Cousequences of Cognitive Disorders	317
Psychological Consequences	318
Social Consequences	319
References	320
A Final Remark	327
Subject Index	329