

CONTENTS

Preface xi

Acknowledgements xv

- 1 The evolution of the pre-cognitive control of action** 1
 - 1.1 The control of action 2
 - 1.2 Reflexes 2
 - 1.3 Habituation and sensitization 5
 - 1.4 Complex reflexes and the organization of behavior 7
 - 1.5 Conditioning 11
 - Summary 17
 - Questions 19
 - Further reading 19

- 2 The evolution of cognition** 20
 - 2.1 Voluntary action and learning 21
 - 2.2 Neural bases of learning 30
 - 2.3 Social organization 32
 - 2.4 The invention of human language 35
 - 2.5 What is cognitive science? 36
 - Summary 37
 - Questions 39
 - Further reading 40

- 3 Motor action and motor skills** 41
 - 3.1 The four human motor systems 43
 - 3.2 Planning an action 43
 - 3.3 Performing an action: overview 47
 - 3.4 Skill learning 56
 - Summary 66
 - Questions 67
 - Further reading 67

- 4 Mental action: attention and consciousness** 69
 - 4.1 About attention 70
 - 4.2 Selective attention: target specification, search, and identification 71
 - 4.3 Visual target detection 75
 - 4.4 Auditory target detection 82
 - 4.5 Hypnosis 85
 - 4.6 Distributing voluntary actions among tasks 86
 - 4.7 Alerting and arousal 90
 - 4.8 Neglect 94
 - Summary 97
 - Questions 98
 - Further reading 99

- 5 Serial learning, perceptual skills, and talent 100**
 - 5.1 Serial learning 101
 - 5.2 Visual scanning as a skill 104
 - 5.3 Savant learning 117
 - Summary 120
 - Questions 121
 - Further reading 121

- 6 Vision 122**
 - 6.1 The perception of reality 124
 - 6.2 Sensory registration 126
 - 6.3 Feature analysis 130
 - 6.4 Depth construction 137
 - 6.5 Recognition of three-dimensional objects 146
 - 6.6 Vision and touch 156
 - 6.7 Visual agnosia 156
 - Summary 158
 - Questions 158
 - Further reading 159

- 7 Semantic memory and language 160**
 - 7.1 Semantic memory 163
 - 7.2 Speech and language 168
 - 7.3 Reading 195
 - Summary 199
 - Questions 200
 - Further reading 200

- 8 Infant learning and language learning 201**
 - 8.1 Infant learning 204
 - 8.2 Language learning 214
 - Summary 231
 - Questions 232
 - Further reading 232

- 9 Categorization and causal learning 233**
 - 9.1 Categorization and generalization 235
 - 9.2 Causal learning 246
 - Summary 249
 - Questions 249
 - Further reading 249

- 10 **Semantic learning** 250
 - 10.1 Initial encoding 251
 - 10.2 Long-term retention 254
 - 10.3 Rehearsal 262
 - 10.4 Visual imagery and knowledge 268
 - 10.5 Formal mnemonics 271
 - 10.6 Anterograde amnesia 277
 - Summary 284
 - Questions 285
 - Further reading 285

- 11 **Recognition** 286
 - 11.1 Perceptual and semantic processing 288
 - 11.2 Continuous dual processes 295
 - 11.3 Hits versus false alarms 303
 - 11.4 Delusions 309
 - Summary 310
 - Questions 311
 - Further reading 311

- 12 **Recall** 312
 - 12.1 Generation 314
 - 12.2 Knowledge 325
 - 12.3 Story recall 330
 - Summary 335
 - Questions 336
 - Further reading 336

- 13 **Autobiographical memory** 337
 - 13.1 Encoding autobiographical memory 339
 - 13.2 Remembering your life 348
 - 13.3 Retrograde amnesia 356
 - Summary 363
 - Questions 364
 - Further reading 364

- 14 **Reasoning** 365
 - 14.1 Neural system 367
 - 14.2 Visual inference 367
 - 14.3 Deduction from an example or counterexample 373
 - 14.4 Representativeness 379
 - 14.5 Induction and prediction 382
 - 14.6 Gain, loss, and uncertainty 388
 - Summary 391
 - Questions 393
 - Further reading 393

15 Problem solving and intelligence 394
15.1 The prefrontal cortex 396
15.2 Forming an initial representation 396
15.3 Generating a problem solution 400
15.4 Intelligence 414
 Summary 419
 Questions 419
 Further reading 420

Bibliography 421

Glossary 472

Figure credits 485

Index 490