Contents

Preface xiii

1. Introduction 1
What is cognitive psychology? 1
Task analysis 6
Introduction 6
The additive-factor method 7
The subtraction method 9
Componential analysis 11
The "open window" approach 14
Introspection 15
Computer simulation 19
Conclusions 20

2. Aspects of perception 23
Subliminal perception 24
Introduction 24
Perceptual defence 25
Perception: Direct or indirect? 26
Introduction 26
Theoretical controversies 27
Organisation in visual perception 33
Pattern recognition 38
Introduction 38
Template theories 38
Prototype theories 39
Feature theories 40
Computational theory 45

3. Attention and performance limitations 49
Focused attention 50
The shadowing technique 50
Conscious attention and automatic activation 56

Divided attention 59
Dual-task performance 60
Central capacity versus multiple resources 64
Automatic processing 68
Practical applications: Action slips and absent-mindedness 74

4. The structure of the memory system 79
The spatial metaphor 79
Memory stores 82
Introduction 82
Sensory stores 83
Short-term and long-term stores 86
Theoretical models 90
The multi-store approach 90
Working memory 93
Practical applications: Reading 98

5. Information processing and storage 103
Memory for unattended events 104
Rehearsal: Maintenance and elaborative 106
Levels of processing 108
Introduction 108
Levels-of-processing theory 110
The critics have a field-day 111
Theoretical modifications 114
Imagery 118
Beyond the information given 123
Introduction 123
External context 124
Internal context 125
Prior knowledge 125
Practical applications: Efficient learning techniques 130
Introduction 130
Mnemonic techniques 132

6. Remembering and forgetting 137
Permanent memory 138
Theoretical background 138
The evidence 139
Retrieval from short-term memory 141
Recall and recognition 145
Introduction 145
Two-process theory 145
Encoding specificity 148
Recent views on recognition 154

Recent views on recall 157
Recognition and recall compared 159
Interference theory 161
Introduction 161
Data and theory 161
Metamemory 167
Practical applications: Amnesia 168

7. Imagery and visual memory 173
Is "imagery" a viable construct? 174
Imagery and perception 177
Introduction 177
Equivalence 178
Selective interference 180
Selective facilitation 183
Kosslyn's computational theory 184
Conclusions 187
Problem solving 187
Introduction 187
Syllogistic reasoning 188
Sentence-picture verification task 190
Memory 192
Eidetic imagery 192
Visual memory 193

8. Language 197
Is language unique to man? 201
Language and thought 207
Comprehension 211
Introduction 211
Context effects 215
Inferences 217
Evaluation of contextualism 220
Language production 221
Practical applications 227

9. Cognitive development 231
Piagetian theory 231
Introduction 231
The stages of cognitive development 233
An evaluation 245
Perceptual development 247
Memory 251

Language acquisition 256
Introduction 256
Cognitive prerequisites for language 257
The linguistic environment 259
Conclusions 262
Practical applications: Reading retardation 263
Introduction 263
The involvement of working memory 264

10. Problem solving and reasoning 269
Problem solving 270
Early research 270
Effects of past experience 272
Computer theories: General Problem Solver 276
Deductive reasoning 280
Introduction 280
Syllogistic reasoning 282
Wason selection task 284
Mental models 287
Inductive reasoning 289
Introduction 289
Concept learning 290
Intuitive strategies of inference 294
Analogical reasoning 298
Practical applications 300

11. The nature and structure of knowledge 305
Organisation of semantic memory 307
The network theory of Collins and Quillian 307
Spreading activation theory 309
Feature theory 311
General evaluation 313
Categorisation 314
The nature of categories 314
Basic level categories 317
Prototypes 318
Concepts, categories and semantic memory 320
Scripts, frames, and schemata 321
Basic notions 321
Empirical evidence 324

12. Stress, arousal and cognition 327
Arousal theory 328
Basic assumptions and predictions 328
The Yerkes–Dodson Law 331

Easterbrook's hypothesis 333
Developments in arousal theory 336
The 'arousal' syndrome 339
Motivation and emotion 342
Motivation and incentive 342
Anxiety 350
Conclusions 357

13. Cognitive psychology: Present and future 359
Is cognitive psychology in trouble? 359
General criticisms 359
Reductionism 362
Ecological validity 363
The way ahead 365
Neuropsychology 365
Artificial intelligence and computation 369
Applied cognitive psychology 373
Conclusions 375

References 377

Subject Index 405

Author Index 409