CONTENTS

List of Illustrations  xi
Acknowledgments  xv
Preface  xxi

1  AN INTRODUCTION TO LANGUAGE SCIENCE  1
Language Characteristics  2
Grammar, Language Origins, and Non-Human Communication Systems  6
Research on communication abilities in apes  7
“Monkeys don’t talk”  12
Language origins  14
Language and Thought  18
Whorf, linguistic determinism, and linguistic relativity  21
Whorf makes a comeback  23
A Description of the Language-Processing System  27
Summary and Conclusions  28
Test Yourself  29

2  SPEECH PRODUCTION AND COMPREHENSION  37
Speech Production  38
Speech errors  43
Access interruptus: Tip-of-the-tongue experiences  45
Picture naming and picture-word interference studies  46
The spreading activation model of speech production  48
Potential limitations of lemma theory  50
Self-monitoring and self-repair  51
Articulation  51
Foreign Accent Syndrome Revisited  53
Speech Perception  54
Coarticulation effects on speech perception  56
The motor theory of speech perception  58
The McGurk effect: Visual gestures affect speech perception  61
Mirror neurons: The motor theory enjoys a renaissance  63
The mirror neuron theory of speech perception jumps the shark  65
Other problems for mirror neuron/motor theory  66
The general auditory approach to speech perception  68
Summary and Conclusions  70
Test Yourself  71
3  WORD PROCESSING  79

The Anatomy of a Word: How We Mentally Represent Word Form  80
Lexical Semantics  81

Associationist accounts of word meaning: HAL and LSA  87
The symbol grounding problem  89
Embodied semantics  90

Lexical Access  97

First-generation models  99
Second-generation models  105
Third-generation models: Distributed features and distributed cohort  113

Lexical Ambiguity Resolution  116

Does context influence meaning selection for ambiguous words?  117

The Neural Basis of Lexical Representation and Lexical Access  119

How are word meanings represented in the brain?  123

Summary and Conclusions  128
Test Yourself  128

4  SENTENCE PROCESSING  141

Models of Parsing: Two-Stage Models  147
Models of Parsing: Constraint-Based Models  151

Story context effects  152
Subcategory frequency effects  153
Cross-linguistic frequency data  157
Semantic effects  159
Prosody  161
Visual context effects  164

Interim Summary  166
Argument Structure Hypothesis  166
Limitations, Criticisms, and Some Alternative Parsing Theories  171

Construal  172
Race-based parsing  173
Good-enough parsing  175

Parsing Long-Distance Dependencies  177
Summary and Conclusions  180
Test Yourself  181

5  DISCOURSE PROCESSING  187

Construction–Integration Theory  188

Construction and integration  192

The Structure Building Framework  199
The Event Indexing Model  204

Modeling space, time, protagonists, and motivation  206

Caustion, Cohesion, and Coherence in Discourse Encoding and Memory  210
The Role of General World Knowledge in Discourse Processing  214
Building Situation Models  217
Inferencing: Memory-Based Account of Discourse Processing: Minimalist vs. Constructionist Inferencing  220
6 REFERENCE 241
Characteristics of Referents That Make Co-Reference Easier 243
Characteristics of Anaphors That Make Co-Reference Easier 249
The Relationship between an Anaphor and Possible Referents Affects Anaphor Resolution 251
Binding Theory 253
Psycholinguistic Theories of Anaphoric Reference 256
   The memory focus model 256
   Centering theory 256
   Informational load hypothesis 258
Summary and Conclusions 260
Test Yourself 260

7 NON-LITERAL LANGUAGE PROCESSING 267
Types of Non-Literal Language 268
The Standard Pragmatic View 268
Metaphor 275
   Class inclusion and dual reference 279
   Conceptual mapping and meaning 281
   The structural similarity view 283
   The career of metaphor hypothesis 284
Why Metaphor? 285
Metonymy and Underspecification 287
Idioms and Frozen Metaphors 289
Embodiment and the Interpretation of Non-Literal Language 292
The Neural Basis of Non-Literal Language Interpretation 293
Summary and Conclusions 297
Test Yourself 298

8 DIALOGUE 305
Gricean Maxims 306
Dialogue is Interactive 308
Common Ground 309
Audience Design 312
   Egocentric production 315
Effects of Listeners’ Perspective-Taking on Comprehension 317
Summary and Conclusions 320
Test Yourself 321

9 LANGUAGE DEVELOPMENT IN INFANCY AND EARLY CHILDHOOD 325
Prenatal Learning 325
   Babies suck 327
Infant Perception and Categorization of Phonemes 329
Contents

Solving the Segmentation Problem 333
  Infant-directed speech 338
Statistical Learning and Speech Segmentation 339
Interim Summary 343
Learning Word Meanings 344
  Syntactic bootstrapping 349
Acquisition of Morphological and Syntactic Knowledge 351
  Acquisition of word category knowledge 352
  Acquisition of morphological knowledge 354
  Acquisition of phrase structure knowledge 356
Summary and Conclusions 358
Test Yourself 360

10 READING 369
Speed Reading? 369
Eye Movement Control and Reading 370
  The perceptual span 372
Oculomotor and Cognitive Control Theories of Reading 376
  E-Z reader 378
  Parallel attention models and parafoveal-on-foveal effects 381
Cognitive Processing in Reading I 384
  Different writing systems and scripts 384
  Learning to read 388
Cognitive Processing in Reading II: Visual Word Processing 390
  Dual-route and DRC models 391
  Single-route models 393
  Neighborhood effects 395
  Non-word pronunciation 397
Dyslexia: Single-Deficit Models 398
Dyslexia: Dual-Route and Single-Route Explanations 400
Summary and Conclusions 404
Test Yourself 404

11 BILINGUAL LANGUAGE PROCESSING 415
Mary Potter and the Secrets of Bilingualism 416
Languages Are Simultaneously Active During Comprehension and Production 419
  Competition in production 423
  Effects of fluency, balance, and language similarity on competition 425
  Shared syntactic structure representations 426
Models of Language Control in Bilingual Speakers 429
  BIA+ 431
  Inhibitory control 431
  Context effects and the zooming in hypothesis 432
Bilingualism and Executive Control 434
Teaching Techniques and Individual Differences in Second Language Learning 436
The Neural Bases of Bilingualism 438
Contents

Summary and Conclusions 439
Test Yourself 440

12 SIGN LANGUAGE 447
- Characteristics of Signed Languages 448
  - Sign language morphology 453
- Lexical Access in Sign Language 455
- Sign Language Acquisition and Language Evolution 456
- Reading in Deaf Signers 460
- The Neural Basis of Sign Language: Left-Hemisphere Contributions to Production and Comprehension 460
- Does the Right Hemisphere Play a Special Role in Sign Language? 462
  - Why is language left lateralized? 464
- The Effects of Deafness and Learning Sign Language on Cognitive Processing 466
  - Perspective taking and sign language 468
- Cochlear Implants 469
  - Outcomes for CI users 470
- Summary and Conclusions 472
- Test Yourself 473

13 APHASIA 479
- Aphasiology: What Happens to Language When the Brain Is Damaged? 480
  - The classic WLG model 482
  - Problems with the classic WLG model 487
- Broca’s Aphasia, Wernicke’s Aphasia, and Syntactic Parsing 492
  - The trace deletion hypothesis 496
  - Evidence against the trace deletion hypothesis 499
  - The mapping hypothesis 501
  - The resource restriction hypothesis 502
  - The slowed syntax hypothesis 502
- Treatment and Recovery from Aphasia 503
- Summary and Conclusions 507
- Test Yourself 508

14 RIGHT-HEMISPHERE LANGUAGE FUNCTION 515
- Speech Perception and Production 516
- Word Processing 523
  - The coarse coding hypothesis 526
- Right-Hemisphere Contributions to Discourse Comprehension and Production 531
- Right-Hemisphere Contributions to Non-Literal Language Understanding 533
- What You Can Do with One Hemisphere 534
- Why Lateralization? 537
- Summary and Conclusions 538
- Test Yourself 538

Name Index 547
Subject Index 559