

CONTENTS

<i>Preface</i>	<i>vii</i>
<i>Preface to the First Edition</i>	<i>xi</i>
<i>List of Technical Abbreviations</i>	<i>xxv</i>

o n e

LANGUAGE: A PREVIEW	1
1 Specialization for Language	1
2 A Creative System	2
3 Grammar and Linguistic Competence	5
3.1 Generality: All Languages Have a Grammar	6
3.2 Parity: All Grammars Are Equal	7
3.3 Universality: Grammars Are Alike in Basic Ways	8
3.4 Mutability: Grammars Change over Time	9
3.5 Inaccessibility: Grammatical Knowledge Is Subconscious	10
<i>Summing Up</i>	11
<i>Key Terms</i>	11
<i>Sources</i>	11
<i>Recommended Reading</i>	12
<i>Questions</i>	12

t w o

PHONETICS: THE SOUNDS OF LANGUAGE	15
1 Phonetic Transcription	16
1.1 Units of Representation	17
1.2 Segments	17
2 The Sound-Producing System	18
2.1 The Lungs	18
2.2 The Larynx	19
2.3 Glottal States	19
3 Sound Classes	21
3.1 Vowels, Consonants, and Glides (Syllabic and Nonsyllabic Elements)	21
4 Consonant Articulation	22
4.1 The Tongue	22
4.2 Places of Articulation	23
5 Manners of Articulation	25
5.1 Oral versus Nasal Phones	25
5.2 Stops	25

5.3	Fricatives	26
5.4	Affricates	27
5.5	Voice Lag and Aspiration	28
5.6	Liquids	30
5.7	Syllabic Liquids and Nasals	31
5.8	Glides	31
6	Vowels	32
6.1	Simple Vowels and Diphthongs	33
6.2	Basic Parameters for Describing Vowels	33
6.3	Tense and Lax Vowels	35
7	Phonetic Transcription of American English Consonants and Vowels	36
8	Suprasegmentals	38
8.1	Pitch: Tone and Intonation	38
8.2	Length	42
8.3	Stress	42
9	Processes	43
9.1	Coarticulation	44
9.2	Processes and Efficiency	45
9.3	Processes and Clarity	46
9.4	Articulatory Processes	46
10	Other Vowels and Consonants (<i>Advanced</i>)	50
10.1	Vowels	50
10.2	Consonants	51
	<i>Summing Up</i>	54
	<i>Key Terms</i>	54
	<i>Sources</i>	56
	<i>Recommended Reading</i>	57
	<i>Appendix: The International Phonetic Alphabet (condensed)</i>	57
	<i>Questions</i>	58
	<i>For the Student Linguist: "Don't Worry about Spelling"</i>	61

three

PHONOLOGY: THE FUNCTION AND PATTERNING OF SOUNDS	63
1 Segments in Contrast	65
1.1 Minimal Pairs	65
1.2 Language-Specific Contrasts	67
2 Phonetically Conditioned Variation: Phonemes and Allophones	68
2.1 Complementary Distribution	68
2.2 Phonemes and Allophones	69
2.3 Classes and Generalization in Phonology	71
2.4 Canadian Raising	72
2.5 English Mid Vowels and Glides	74
2.6 Language-Specific Patterns	75
3 Phonetic and Phonemic Transcription	76

3.1	Phonetic and Phonemic Inventories	78
4	Above the Segment: Syllables	79
4.1	Defining the Syllable	79
4.2	Onset Constraints and Phonotactics	80
4.3	Accidental and Systematic Gaps	82
4.4	Setting Up Syllables	83
4.5	Syllabic Phonology	87
5	Features	91
5.1	Why We Use Features	91
5.2	Feature Representations	95
5.3	The Feature Hierarchy (<i>Advanced</i>)	103
6	Derivations and Rules	106
6.1	Derivations	107
6.2	Rule Application	108
6.3	The Form and Notation of Rules	109
7	Representations (<i>Advanced</i>)	112
7.1	Assimilation and the Feature Hierarchy	113
7.2	Autosegmental Principles	113
7.3	Tonal Assimilation as a Representation	115
7.4	Processes, Rules, and Representations: A Last Word	116
	<i>Summing Up</i>	116
	<i>Key Terms</i>	117
	<i>Sources</i>	118
	<i>Recommended Reading</i>	118
	<i>Appendix: Hints for Solving Phonology Problems</i>	119
	<i>Questions</i>	121
	<i>For the Student Linguist: "The Feature Presentation"</i>	128

four

MORPHOLOGY: THE ANALYSIS OF WORD STRUCTURE	131
1 Words and Word Structure	132
1.1 Morphemes	133
1.2 Analyzing Word Structure	135
1.3 Some Common Morphological Phenomena	137
2 Derivation	142
2.1 English Derivational Affixes	143
2.2 Two Classes of Derivational Affixes (<i>Advanced</i>)	146
3 Compounding	147
3.1 Properties of Compounds	148
3.2 Endocentric and Exocentric Compounds	149
3.3 Compounds in Other Languages	150
4 Other Types of Word Formation	151
4.1 Conversion	151
4.2 Clipping	152

4.3	Blends	152
4.4	Backformation	153
4.5	Acronyms	154
4.6	Onomatopoeia	154
4.7	Other Sources	154
5	Inflection	155
5.1	Inflection in English	155
5.2	Inflection versus Derivation	156
6	Further Examples of Inflection (<i>Advanced</i>)	158
6.1	Number	158
6.2	Noun Class	159
6.3	Case	160
6.4	Person and Number Agreement	162
6.5	Tense	163
7	Morphophonemics	164
7.1	Deriving Allomorphs	165
7.2	Conditioning by Morphological Class	167
	<i>Summing Up</i>	169
	<i>Key Terms</i>	169
	<i>Sources</i>	170
	<i>Recommended Reading</i>	171
	<i>Appendix: How to Identify Morphemes in Unfamiliar Languages</i>	172
	<i>Questions</i>	173
	<i>For the Student Linguist: "Bambification"</i>	179

five

SYNTAX: THE ANALYSIS OF SENTENCE STRUCTURE	183
1 Categories and Structure	184
1.1 Categories of Words	185
1.2 Phrase Structure	187
1.3 Sentences	192
1.4 Tests for Phrase Structure	193
1.5 X' Categories (<i>Advanced</i>)	194
2 Complement Options	196
2.1 Complement Options for Verbs	197
2.2 Complement Options for Other Categories	198
2.3 Complement Clauses	200
3 Transformations	202
3.1 Yes-No Questions	203
3.2 Wh Movement	207
3.3 Deep Structure and Surface Structure	211
3.4 Constraints on Transformations (<i>Advanced</i>)	213
4 Universal Grammar and Parametric Variation	214
4.1 Variation in Phrase Structure	214

4.2 Variation in the Use of Transformations	216
5 Some Extensions (<i>Advanced</i>)	221
5.1 Modifiers	221
5.2 Case: The Interaction between Syntax and Morphology	223
6 Other Types of Syntactic Analysis	226
6.1 The Transformational Analysis	227
6.2 The Relational Analysis	228
6.3 The Functional Analysis	230
<i>Summing Up</i>	231
<i>Key Terms</i>	231
<i>Sources</i>	232
<i>Recommended Reading</i>	233
<i>Appendix: How to Build Tree Structures</i>	233
<i>Questions</i>	236
<i>For the Student Linguist: "Backwards"</i>	242

s i x

SEMANTICS: THE ANALYSIS OF MEANING	245
1 The Nature of Meaning	246
1.1 Semantic Relations among Words	246
1.2 Semantic Relations Involving Sentences	248
1.3 What Is Meaning?	250
2 The Conceptual System	253
2.1 Fuzzy Concepts	253
2.2 Metaphor	255
2.3 The Lexicalization of Concepts	256
2.4 Grammaticization	260
3 Syntax and Sentence Interpretation	261
3.1 Constructional Meaning	261
3.2 Structural Ambiguity	263
3.3 Thematic Roles	264
3.4 The Interpretation of Pronouns (<i>Advanced</i>)	268
4 Other Factors in Sentence Interpretation	271
4.1 The Role of Beliefs and Attitudes	271
4.2 Setting	272
4.3 Discourse	273
4.4 Conversational Maxims	275
<i>Summing Up</i>	277
<i>Key Terms</i>	278
<i>Sources</i>	279
<i>Recommended Reading</i>	280
<i>Questions</i>	280
<i>For the Student Linguist: "Elvis's Biggest Fan Cleans Out Bank— Accomplice Laundered the Dough"</i>	285

seven

HISTORICAL LINGUISTICS: THE STUDY OF LANGUAGE CHANGE	289
1 The Nature of Language Change	290
1.1 Systematicity of Language Change	291
1.2 Causes of Language Change	291
2 Sound Change	293
2.1 Sequential Change	294
2.2 Segmental Change	301
2.3 Auditorily Based Change	301
2.4 Phonetic versus Phonological Change	302
2.5 Explaining Phonological Shift	304
2.6 Sound Change and Rule Ordering	306
3 Morphological Change	306
3.1 Addition of Affixes	306
3.2 Loss of Affixes	307
3.3 From Synthetic to Analytic to Synthetic	309
3.4 Analogy	309
3.5 Reanalysis	310
4 Syntactic Change	311
4.1 Word Order	311
4.2 Inversion in the History of English	314
5 Lexical and Semantic Change	314
5.1 Addition of Lexical Items	315
5.2 Loss of Lexical Items	318
5.3 Semantic Change	319
6 The Spread of Change	320
6.1 Diffusion through the Language	321
6.2 Spread through the Population	322
7 Language Reconstruction	323
7.1 Comparative Reconstruction	324
7.2 Techniques of Reconstruction	325
7.3 Internal Reconstruction	330
7.4 The Discovery of Indo-European	331
7.5 Reconstruction and Typology	334
8 Language Change and Naturalness	336
<i>Summing Up</i>	337
<i>Key Terms</i>	337
<i>Notes</i>	339
<i>Sources</i>	339
<i>Recommended Reading</i>	340
<i>Questions</i>	341

eight

THE CLASSIFICATION OF LANGUAGES	347
1 Some Preliminaries	347

1.1 Dialect and Language	348
1.2 Types of Classification	348
2 Typological Classification	349
2.1 Phonology	350
2.2 Morphology	355
2.3 Syntax	358
2.4 Explaining Universals	362
3 Genetic Classification	365
3.1 The Indo-European Family	366
3.2 Some Other Families	371
3.3 North, Central, and South America	379
3.4 Language Phyla	381
<i>Summing Up</i>	383
<i>Key Terms</i>	384
<i>Sources</i>	384
<i>Recommended Reading</i>	386
<i>Questions</i>	386

n i n e

INDIGENOUS LANGUAGES OF NORTH AMERICA	391
1 Origin and Classification	392
1.1 Ultimate Origins	392
1.2 Historical Relationships in North America	393
2 Phonetics and Phonology	395
2.1 Velar, Uvular, and Pharyngeal Articulations	395
2.2 Lateral Fricatives	395
2.3 Glottalized Stops and Affricates (Ejectives)	396
2.4 Vowels and Suprasegmental Features	396
2.5 Sounds Not Frequently Found	397
3 Morphology and Syntax	397
3.1 The Structure of Words	397
3.2 Grammatical Categories	400
3.3 Noun Classification	403
4 The Future of Indigenous North American Languages	405
<i>Summing Up</i>	406
<i>Key Terms</i>	406
<i>Sources</i>	407
<i>Recommended Reading</i>	407

t e n

FIRST LANGUAGE ACQUISITION	409
1 The Study of Language Acquisition	410
1.1 Methods	410
2 Phonological Development	412

2.1 Babbling	413
2.2 The Developmental Order	413
2.3 Early Phonetic Processes	414
3 Vocabulary Development	417
3.1 Strategies for Acquiring Word Meaning	418
3.2 Meaning Errors	419
4 Morphological Development	423
4.1 Overgeneralization	423
4.2 A Developmental Sequence	424
4.3 Word-Formation Processes	426
5 Syntactic Development	427
5.1 The One-Word Stage	427
5.2 The Two-Word Stage	427
5.3 The Telegraphic Stage	429
5.4 Later Development	430
5.5 The Interpretation of Sentence Structure (<i>Advanced</i>)	432
6 What Makes Language Acquisition Possible?	434
6.1 The Role of Adult Speech	434
6.2 The Role of Feedback	436
6.3 The Role of Cognitive Development	437
6.4 The Role of Inborn Knowledge	439
6.5 Is There a Critical Period?	441
<i>Summing Up</i>	442
<i>Key Terms</i>	442
<i>Sources</i>	442
<i>Recommended Reading</i>	445
<i>Questions</i>	445

eleven

SECOND LANGUAGE ACQUISITION	449
1 The Study of Second Language Acquisition	450
1.1 The Role of the First Language	450
1.2 The Role of the L2	451
1.3 The Nature of an Interlanguage	452
1.4 The Final State	453
1.5 Variation in Performance	455
2 Interlanguage Grammars	457
2.1 L2 Phonology	457
2.2 L2 Syntax	463
2.3 L2 Morphology	467
3 Factors Affecting SLA	469
3.1 Age	469
3.2 Individual Differences	471
3.3 The Good Language Learner	473
4 The L2 Classroom	474

4.1 Modified Input	474
4.2 Modified Interaction	475
4.3 Focus on Form	475
4.4 Bilingual Education	477
<i>Summing Up</i>	479
<i>Key Terms</i>	480
<i>Appendix: L2 Pedagogy</i>	480
<i>Sources</i>	481
<i>Recommended Reading</i>	482
<i>Questions</i>	482

twelve

PSYCHOLINGUISTICS: THE STUDY OF LANGUAGE PROCESSING

485

1 Methods of Psycholinguistic Research	486
1.1 Slips of the Tongue	486
1.2 Experimental Methods: Words in the Mind	488
1.3 Experimental Methods: Sentence Processing	491
1.4 Brain Activity: Event-Related Potentials	493
2 Language Processing and Linguistics	494
2.1 Phonetics and Phonology	495
2.2 Morphological Processing	498
2.3 Syntax	500
3 Putting It All Together: Psycholinguistic Modeling	503
3.1 The Use of Metaphors in Psycholinguistic Modeling	504
3.2 Which Model Is Right?	507
<i>Summing Up</i>	508
<i>Key Terms</i>	509
<i>Sources</i>	509
<i>Recommended Reading</i>	510
<i>Questions</i>	511

thirteen

BRAIN AND LANGUAGE

513

1 The Human Brain	514
1.1 The Cerebral Cortex	514
1.2 The Cerebral Hemispheres	514
1.3 The Lobes of the Cortex	517
2 Investigating the Brain	518
2.1 Autopsy Studies	518
2.2 Images of the Living Brain	519
2.3 Learning from Hemispheric Connections and Disconnections	521
3 Aphasia	522

3.1 Nonfluent Aphasia	523
3.2 Fluent Aphasia	525
4 Acquired Dyslexia and Dysgraphia	527
4.1 Reading and Writing Disturbances in Aphasia	527
4.2 Acquired Dyslexia as the Dominant Language Deficit	527
5 Linguistic Theory and Aphasia	528
5.1 Features, Rules, and Underlying Forms	529
5.2 Agrammatism	529
5.3 Function Words	530
5.4 The Loss of Syntactic Competence	530
5.5 Agrammatism in Other Languages	531
6 Where Is Language?	531
<i>Summing Up</i>	532
<i>Key Terms</i>	532
<i>Sources</i>	533
<i>Recommended Reading</i>	534
<i>Questions</i>	534

fourteen

LANGUAGE IN SOCIAL CONTEXTS	537
1 The Sociolinguistics of Language	538
1.1 Discourse Analysis	538
1.2 Solidarity and Power	547
2 The Sociolinguistics of Society	553
2.1 Sociolinguistic Norms	553
2.2 Methods of Studying Variation	559
2.3 Social Influence on Variation	563
2.4 Variable Use of Varieties	578
<i>Summing Up</i>	582
<i>Key Terms</i>	583
<i>Sources</i>	584
<i>Recommended Reading</i>	587
<i>Questions</i>	587
<i>For the Student Linguist: "When Language Goes Bad"</i>	588

fifteen

WRITING AND LANGUAGE	591
1 Types of Writing	592
1.1 Logographic Writing	592
1.2 Phonographic Writing	592
2 The Early History of Writing	593
2.1 Prewriting	593
2.2 Pictograms	594

3	The Evolution of Writing	595
3.1	Rebuses and the Emergence of Writing	596
3.2	Toward Syllabic Writing	597
3.3	Another Middle Eastern Writing System: Hieroglyphics	598
3.4	The Emergence of Alphabets	599
3.5	Other Developments, East and West	602
4	Some Non-European Writing Systems	605
4.1	Chinese Writing	605
4.2	Japanese Writing	607
4.3	Korean Writing	609
4.4	American Scripts	610
4.5	Some African Scripts	612
4.6	Some Indian Scripts	613
5	English Orthography	614
5.1	Irregularities	614
5.2	Obstacles to Reform	616
6	Writing and Reading	619
	<i>Summing Up</i>	620
	<i>Key Terms</i>	620
	<i>Sources</i>	621
	<i>Recommended Reading</i>	622
	<i>Questions</i>	623

s i x t e e n

ANIMAL COMMUNICATION	625
1 Nonvocal Communication	626
2 Communication Structure: The Study of Signs	627
2.1 Signs	628
2.2 Types of Signs	629
2.3 Sign Structure	632
2.4 A View of Animal Communication	633
3 The Bees	635
3.1 The System	635
3.2 Bees and Humans	637
4 The Birds	638
4.1 Bird Vocalization	638
4.2 Birds and Humans	641
5 Nonhuman Primates	641
5.1 Some Functions of Nonhuman Primate Communication	643
5.2 Prosimian Communication	643
5.3 Monkeys	644
5.4 Gibbons, Orangutans, and Chimpanzees	646
6 Testing Nonhuman Primates for Linguistic Ability	647
6.1 Some Experiments	648
6.2 Nonsigning Experiments	649

6.3 The Clever Hans Controversy	650
6.4 The Great Ape Debate	651
6.5 Implications	654
7 Comparing Communication Systems: Design Features	655
<i>Summing Up</i>	658
<i>Key Terms</i>	659
<i>Picture Credits</i>	660
<i>Sources</i>	660
<i>Recommended Reading</i>	661
<i>Questions</i>	661

seventeen

COMPUTATIONAL LINGUISTICS	663
1 Computational Phonetics and Phonology	665
1.1 The Talking Machine: Speech Synthesis	665
1.2 Speech Recognition or Speech Analysis	669
2 Computational Morphology	670
2.1 Morphological Processes	671
2.2 Some Problems in Computational Morphology	674
3 Computational Syntax	675
3.1 Natural Language Analysis	675
3.2 Natural Language Generation	681
4 Computational Lexicology	682
5 Computational Semantics	687
5.1 Pragmatics	689
6 Practical Applications of Computational Linguistics	690
6.1 Indexing and Concordances	691
6.2 Information Accessing and Retrieval	692
6.3 Machine Translation	693
6.4 Automatic Summarization	696
6.5 Speech Recognition	696
6.6 Speech Synthesis	697
<i>Summing Up</i>	698
<i>Key Terms</i>	698
<i>Recommended Reading</i>	699
<i>Questions</i>	699
<i>For the Student Linguist: "One Second"</i>	701
 <i>Glossary</i>	 705
<i>Language Index</i>	735
<i>Index</i>	739