

# Contemporary Views on Architecture and Representations in Phonology

edited by Eric Raimy and Charles E. Cairns

A Bradford Book  
The MIT Press  
Cambridge, Massachusetts  
London, England

© 2009 Massachusetts Institute of Technology

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher.

MIT Press books may be purchased at special quantity discounts for business or sales promotional use. For information, please e-mail [special\\_sales@mitpress.mit.edu](mailto:special_sales@mitpress.mit.edu) or write to Special Sales Department, The MIT Press, 55 Hayward Street, Cambridge, MA 02142.

This book was set in Times New Roman and Syntax on 3B2 by Asco Typesetters, Hong Kong and was printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Contemporary views on architecture and representations in phonology / edited by Eric Raimy and Charles E. Cairns.

p. cm. — (Current studies in linguistics)

Includes bibliographical references and index.

ISBN 978-0-262-18270-6 (hardcover : alk. paper) — ISBN 978-0-262-68172-8 (pbk. : alk. paper)

I. Grammar, Comparative and general—Phonology—Methodology. I. Raimy, Eric.

II. Cairns, Charles E.

P217.C667 2009

414—dc22

2008029816

10 9 8 7 6 5 4 3 2 1

## Index

- \*LongV, 389–401
- \*σ, 391
- [æ]-tensing, 308–309
- 3-D phonology. *See* Three-dimensional phonology
- Abkhaz, 84
- Abramson, Arthur S., 89, 346–347
- Acehnese, 315
- Acoma, 108, 111, 133
- Acquisition of language. *See* Language acquisition
- Aguacatec, 235
- Ahtna, 315
- Aklan, 231, 232, 233, 242
- Alawa, 316
- Albanian, 26
- Aleut, 79
- Amharic, 79
- Anchor Point, 181–183, 393–401
- Anderson, Stephen, 101, 131, 261, 298
- Angaatiha, 35
- Antigemination, 331
- Aoun, Youssef [Joseph], 126
- Appendix, 13, 101–131 *passim*, 289, 291–293. *See also* Extrasyllabic based analysis of reduplication (and infixation), 118–121, 177–184
- defined, 108
- disputed, 145–161 *passim*
- formal representation of, 123–125
- and the Prosodic Hierarchy, 149
- Arabic, 80, 82, 124, 240
- Cairene, 103, 112, 115
- Classical, 235
- Der ez-Zor, 125
- Araucanian, 124
- Archangeli, Diana, 283, 341
- Archi, 243
- Architecture
  - as constraint on the class of possible grammars, 388–392
  - of cyclic and postcyclic rule application, 371–379 *passim*
  - of grammar, 327, 331–333
  - of phonological theory as set of modules or components, 1–12, 261–298 *passim*
- Armenian, 39, 90, 104, 121, 122, 123, 124, 125, 126, 129, 135, 149, 272, 281
- Eastern, 78, 80, 122, 151
- Western, 121
- Aronson, Howard, 269
- Arrernte, 26, 33
- Articulation
  - and its relation to phonology, 337–349 (*see also* Articulatory, grounding of phonological features; Interfaces, between phonetics and phonology)
  - supplemental as phonetic enhancement, 50 (*see also* Phonetic enhancement)
- Articulator, designated 71
- Articulatory
  - and acoustic/auditory characteristics (*see* Quantal theory)
  - cost/ease and Robustness, 44
  - development, 328
  - gesture, 71

- Articulatory (cont.)  
 grounding of phonological features, 19–22,  
 71–72, 76–77  
 grounds for markedness, 32  
 parameters, 43, 57–58  
 representations, 261–262  
 stable regions (*see* Quantal theory)  
 weakening, 329
- Articulatory phonology, 75
- ASL, 57, 58, 204
- Assimilation, 8, 10, 11, 34, 35, 282, 345  
 asymmetric, 317  
 of place of articulation, 285–286, 317–318
- Atalyalic, 308
- Auca, 35, 84, 194, 202–203, 209
- Auditory  
 cues, 61  
 dispersion, 20, 27, 44  
 distance of consonants from resonants, 50,  
 53, 57  
 distinctness, 19, 27  
 grounding of features (*contra*), 21, 76  
 knowledge as a component of phonetic  
 knowledge, 339 (*see also* Phonetic  
 knowledge)  
 prominence and resonance as grounding of  
 sonority, 167  
 response and Robustness, 44
- Automata, finite state (FSA), 191–210 *passim*  
 and natural classes, 249–250, 256  
 and long-distance dependencies, 247–256
- Avery, Peter, 317
- Awadhi, 231, 232, 233, 242
- Baayen, R. Harald, 332
- Bagemihl, Bruce, 116, 119, 120, 126, 128,  
 178, 187
- Balcaen, Jean, 214, 223
- Baltic, 275
- Basbøll, Hans, 23
- Bashkir, 78
- Basque, 23, 39
- Battistella, Edwin, 316
- Beasley, Tim, 204
- Beckman, Mary E., 60, 173
- Beesley, Kenneth R., 192, 200, 206
- Bell, Alan, 133–134
- Bell, Alexander Graham, 69
- Bell, Alexander Melville, 69–71
- Bella Coola, 118, 119, 120, 121, 123, 124,  
 126, 127, 128, 129, 130, 135, 391
- Bell's phonetic alphabet, 69
- Berber, 77, 106, 112, 169, 170, 273
- Bermúdez-Otero, Ricardo, 379
- Berta, 39, 84
- Best, Joel, 82
- Bhaskarao, Peri, 60
- BigNambas, 227
- Binary feature values, 82
- Bleeding/counterbleeding order, 287, 289.  
*See also* Feeding/counterfeeding, order
- Blevins, Juliette, 112, 115, 338, 340, 349–350
- Bloch, Bernard, 2
- Bloomfield, Leonard, 357, 379
- Bohn, Ocke-Schwen, 343
- Bontok, 330
- Booij, Geert, 126
- Borowsky, Toni, 151, 157, 162
- Bothorel, André, 26
- Brighenti, Laura, 347
- Bromberger, Sylvain, 262, 311
- Broselow, Ellen, 108, 126
- Bulgarian, 124  
 liquid metathesis, 269–277
- Bye, Patrik, 134
- Caha, Pavel, 380n
- Cairns, Charles, 132
- Calabrese, Andrea, 61, 84, 108, 109
- Cambodian, 112, 133–134
- Canaanite rounding, 217
- Capanahua, 231
- Carlson, Katy, 120
- Catalan, 171, 326, 378
- Categorical perception, 22–23, 326, 342,  
 345–346
- Caucasian, 84
- Cayuga, 124
- Chang, M. Laura, 185
- Checking of representations, 287–288. *See*  
*also* Derivations; Instructions; Markedness  
 module  
 component, 264  
 computational capacity of, 286

- cyclic, 295–296
  - by markedness statements, 264
  - and ordering, 288, 291–294
  - and phonological derivations, 262
  - and spotlighting, 286
- Cheng, Chin-Chuan, 308
- Cheremis, 235
- Chierchia, Guglielmo, 113
- Child language. *See* Language acquisition
- Chinese, 326
- Chi wei, 343
- Cho, Young-mee Y., 120, 126–128
- Chomsky, Noam, 2–3, 70, 255, 256, 360
- Chugach Alutiq, 200, 204
- Clements, G. N., 106, 108, 110, 123, 132, 151, 152, 158, 193
- Closed-syllable laxing, 113, 159
- Closed-syllable shortening, 309
- Coetzee, Andries, 157
- Complex onset constraint, 172–173
- Components of phonological theory. *See* Modules
- Computation
  - capacities of modules, 1, 3, 8, 14, 286, 383, 392–396 (*see also* Modules)
  - finite state automata on the metrical grid, 13, 191–211, 247–250
  - metrical, 214–222, 225–243, 250–256
  - morphological, 153–156, 177–187, 383–402
  - phonetic, 2–3
  - phonological, 8–12, 15, 149–151, 160, 261–296, 355–379
- Connectionism, 75
- Consonants, about
  - contrasts, 44, 45
  - deletion, (*see* Deletion)
  - discrimination/perception, 23
  - epenthesis, 4, 13
  - features of (*see* Features, about)
  - lenition, 331
- Consonant types. *See also under* Features, distinctive
  - alveolar, 26–27, 51, 57, 344
  - apical, 23, 26, 43
  - approximant, 51, 167–168
  - aspirated, 31, 35, 43, 49, 55, 76, 78, 79, 81, 116, 126, 281, 315
  - click, 27, 44
  - dental, 23, 26, 27, 51, 57
  - ejective, 31, 39, 40, 41–42, 55
  - fricatives, 22, 28–33, 34, 38–41, 43–45, 49, 51, 52, 55, 56, 57, 106, 127–128, 159, 167, 168, 169, 171, 250, 328
  - geminate, 5, 6, 9, 11, 114, 339, 345–349
  - glottal, 3, 4, 36, 37, 41, 43, 45–48, 55, 120, 128, 170, 182–183, 325–326, 339–340, 345–348 (*see also under* Features)
  - implosive, 29, 31, 43, 55, 79, 344
  - laminal, 23–25
  - laryngeal, 43, 82, 170, 315–316, 318
  - lateral, 36, 35, 43, 52–53, 168, 329, 344
  - liquid, 38, 55, 106, 111, 112, 114, 115, 165–169, 269–270, 275–276
  - nasal, 9–11, 28, 36, 38–40, 44–45, 49, 52–53, 55, 81, 106, 115, 156, 165–169, 278, 307, 317, 326, 328
  - obstruent, 2–3, 6, 11, 28, 30, 32, 35, 36, 38, 39, 44–45, 48, 51, 52, 71–72, 76, 80, 81, 106, 121, 122, 126, 127, 156, 166, 168–172, 182, 277, 282, 288, 307, 325, 344, 347–348 (*see also under* Features)
  - palatal, 25–26, 51, 81, 194, 269, 284, 329, 357, 364, 366, 369
  - palatoalveolar, 25, 26, 284
  - pharyngealized, 33
  - posterior, 22, 25, 26, 35, 45, 46, 48, 49, 50, 52, 56
  - prenasal, 8–12, 53
  - retroflex, 25, 26, 80
  - sibilant, 45, 56, 166, 168, 328, 329–330
  - sonorant, 35, 38, 43–47, 49, 51, 52, 53, 56, 71–72, 103, 109, 111, 112, 119, 127, 128, 152, 154, 167, 170–172, 262, 271–277, 291, 303 (*see also under* Features)
  - unaspirated, 31, 35, 37, 39, 43, 76, 78, 79, 84, 116, 281, 315
- Constituent structure
  - on the metrical plane, 213, 217–222, 225–228, 237–238, 240–243 (*see also* Iterative constituent construction)
  - morphological, 355–379
  - on the prosodic plane, 4–5, 101, 104, 145, 147
  - of syllables, 152–160
  - ternary, 198

- Constraints. *See also* Markedness, constraints; Negative instructions; Sonority sequencing principle  
 avoidance constraints, 192, 203, 204, 256  
 on grammars due to grammatical architecture, 388–392  
 on grammars due to human computational limitations, 392–396  
 on grammars due to language acquisition, 396–401  
 on the metrical plane, 225, 228, 229  
 negative, 263, 267, 272–274, 278, 287–289, 305, 312, 331, 333 (*see also* Markedness module)  
 in optimality theory, 8, 20, 128–130, 206–210, 222, 232–233, 312, 384, 389–392, 393  
 phonetic (articulatory and/or perceptual), 325, 326, 327, 328, 342, 346  
 reduplicative template, constraint on, 119, 121, 384, 389–392, 393  
 on sequences of elements, 57, 123, 150, 157, 161, 166, 280 (*see also* Phonotactics; Sonority sequencing principle)  
 syllable structure, 171
- Context dependency/independency, 61
- Contrast, 14, 43, 81, 83, 311–318, 337–349.  
*See also under* Markedness  
 auditory/acoustic, 43, 50, 53, 342, 346  
 based theory of markedness, 83, 311–318  
 as distinct from feature values, 43  
 favored/common, 43, 44, 45, 58  
 hierarchy of, 27  
 nonnative, 22, 23  
 paradigmatic contrast, 331  
 phonological/distinctive, 3, 8–12, 14, 20, 22, 26, 27, 35, 56, 341  
 robustness of, 58, 61  
 surface vs. underlying, 81  
 syllable, 2, 8–12  
 vs. gradience, 341, 342  
 weak, 50, 53, 56, 57, 58
- Contrastive feature specifications. *See* Spotlighting
- Contrastive underspecification. *See* Underspecification, contrastive
- Cook, Eung-Do, 123
- Correlation statements, 262, 280, 283
- Correspondence theory, 391
- Counting in phonological computation, 13, 201, 209, 392–393 ternary, 193, 197–198, 201
- Count systems (stress), 238–240
- Crosswhite, Katherine, 204
- Cutler, Anne, 347
- Cwikiel-Glavin, Annemarie, 103, 110
- Cycle/cyclic, 146. *See also* Postcyclic rule application  
 cyclic rule application, 288–296, 355–381  
 passim, especially 360–364  
 cyclic syllabification, 150, 186  
 marking of affixes for, 362  
 strict cyclicity, principle of, 363
- Czaykowska-Higgins, Ewa, 116, 120
- Czech, 15, 355, 364–371, 372, 373, 378
- Dakota, 112
- Dari, 227
- Davidson-Nielsen, Niels, 116
- Davidson, Donald, 340
- Degenerate syllable. *See* Syllable, degenerate
- Deletion, 4, 13. *See also* Rules and constraints mentioned in this volume;  
 Syllable, repair by deletion  
 consonant, 11, 173, 360  
 diachronic, 28, 84, 126, 359  
 of elements on the metrical tier, 192, 203, 204, 242, 251, 254–256  
 of features, 272, 284, 291, 314  
 French phenomena, 113–114, 125, 159–160  
 morphologically conditioned, 9, 355  
 in Precedence Based Phonology (PBP), 151, 160, 389  
 of syllabic nodes, 267  
 vowel, 9, 86, 114, 125, 216–217, 220–221, 292, 356, 366
- Dell, François, 77, 82, 113, 169–170
- Demisyllable, 106–107, 169, 170, 173
- Dera, 35
- Derivational models of reduplication, 395.  
*See also* Precedence Based Phonology
- Derivational phonology, 8, 13, 109, 192, 287–296, 298, 311, 362–379  
 as crucial for descriptive adequacy, 213–222  
 and opacity, 221–222

- Derivations, 10, 11, 13, 102, 103, 115, 183, 186, 205, 262, 287–296, 388–389, 399–400.  
*See also* Checking of representations  
 crashing, 264, 268, 291
- Devoicing, 2, 5, 6, 8, 109, 281, 336, 341, 349, 355, 358  
 in coda position, 172, 281
- Diachronic. *See* Historical changes
- Diehl, Randy, 72, 328, 329, 338, 344, 348
- Directionality of rule application, 250–252, 282
- Disjunctive rule order, 154, 298n1
- Dispersion, 27, 57, 61, 79, 83. *See also*  
 Sonority adaptive, 343  
 auditory, 20, 44  
 principle, 27, 106, 158, 169, 171
- Dissimilation, 34, 331
- Distributed morphology, 388–389
- Dixon, R. M. W., 36, 37
- Djamouri, Redouane, 78
- Docherty, Gerard J., 339
- Dogrib, 315
- Dorsey's law, 193, 203
- Downing, Laura, 387, 392
- Dresher, B. Elan, 241, 317
- Duanmu, San, 108
- Dumi, 315
- Dutch, 109, 332  
 Old, 330
- Dyirbal, 36
- Economy, 84–86, 272, 298, 311. *See also*  
 Economy index; Principle of economy
- Economy index, 28, 32, 55
- Ekari, 35
- Elmedlaoui, Mohamed, 169, 170
- Emergence of the marked, 284, 390
- Emergence of the unmarked, 120, 127
- English. *See also* Labov  
 American, 2–3, 4, 286, 308, 348  
 closed syllable shortening, 103, 109, 115  
 consonant clusters, 112, 171  
 consonants, 27, 28, 32, 33, 83  
 coronal assimilation, 285–286  
 extrasyllabicity, 103, 104, 128  
 Old, 201–202, 213–216, *passim*  
 past tense assimilation, 282  
 Scottish, 272  
 sonority ranking of sounds, 166  
 syllables and syllabification, 116, 151–152, 156–159, 161  
 voicing of coda obstruents, 348  
 vowel length alternations, 1–3
- Engstrand, Olle, 108, 159
- Enhancement. *See* Phonological  
 enhancement; Phonetic enhancement
- Epenthesis, 4, 13, 146–147, 172–173, 184, 288, 289, 292–293. *See also* Syllable, repair  
 by epenthesis
- Equipollent, 82
- Ericsson, Christine, 108, 159
- Ernestus, Mirjam, 332
- Estonian, 346
- Ethiopic group of Semitic languages, 84
- Evenki, 79, 81
- Everett, Daniel, 8
- Extrametrical, 5, 115, 151–152, 229, 230, 233, 234, 236, 237, 238
- Extrasyllabic, 102, 103, 104, 108–115, 123, 126, 129–131, 151, 159, 181, 193  
 defined, 162n
- Fabb, Nigel, 191, 195
- Fant, C. Gunnar M., 71
- Farsi (Persian), 79, 80
- Feature bounding, 12, 24–27, 53, 56, 57, 58
- Feature economy, 27, 32–59 *passim*, 82–86  
 and Markedness, 32–33
- Feature mediated theory of inventory  
 structure, 19, 57
- Features (about). *See also* Assimilation;  
 Natural class  
 acoustic/auditory basis of, 21, 76  
 articulatory basis of, 21  
 cognitive status of, 21–23  
 consonant features as distinct from vowel  
 features, 71  
 contrastive (*see* Contrast)  
 deletion of individual features (*see* Deletion,  
 of features)  
 distinctive, 19, 20, 21, 22, 30, 32, 35, 37, 48,  
 51, 56, 57, 58, 60, 75, 83–84, 85  
 full specification, 82, 262, 284–287  
 hierarchy of, 19, 42

- Features (about). Assimilation; Natural class (cont.)  
 insertion, 272–273, 276, 284, 337  
 marked/unmarked value of, 33–37, 157, 337 (see also Markedness)  
 neutralization and substance, 316–318  
 phonetic grounding of, 21  
 redundant, 32, 53
- Features, distinctive
- [±back] as replacement for [±palatalized], 71
- [±slack vocal cords] as replacement for [±voice], 71–72
- anterior, 22, 25–26, 35, 45, 46, 48, 50, 51–53, 57, 69, 366
- articulator features, 36, 49, 71
- ATR, 36, 78, 283–284, 285, 314
- compact/diffuse, 71
- consonantal, 36, 272, 273, 276
- constricted glottis, 36, 39, 41, 42, 47
- continuant/noncontinuant in obstruents, 28, 29, 30, 31, 32, 35, 38, 39, 44–47, 49 (see also Consonant types, fricatives)
- continuant/noncontinuant in sonorants, 52–53
- coronal, 4, 25, 26, 27, 31, 33, 36, 44, 45, 46, 47, 49, 51, 69, 286, 316, 317, 366
- distributed, 25, 26, 27, 36, 44, 47, 49, 61, 62, 75, 82
- dorsal, 24, 27, 28, 31, 33, 36, 41, 43, 44, 45, 46, 47, 49, 69, 81, 127, 312
- glottal, 28, 46, 47, 48
- grave/acute, 71
- labial, 24, 28, 30, 33, 36, 44, 45, 46, 47, 49
- nasal, 28, 35, 38, 45, 46, 47, 49, 51, 52, 53, 81, 84
- obstruent, 60n10, 174n3
- palatal(ized), 12, 71
- pharyngeal, 27
- posterior, 25, 26, 27, 28, 35, 45, 46, 47, 48, 49, 50, 51, 52, 59, 61, 75, 82
- round, 36, 42, 50, 277, 280, 283, 291
- sharp, 71
- slack vocal cords, 12, 37, 59, 72, 82, 339, 341
- sonorant, 35, 38, 44, 46, 47, 49, 168, 169, 174, 272
- spread glottis, 35, 36, 44, 47, 49, 60, 76, 77, 82, 116, 117, 128, 341
- stiff vocal cords, 37, 59, 72, 76, 82, 281, 282
- strident, 27, 35, 44, 45, 47, 48, 49, 50, 51, 52, 54
- voice, 12, 28, 29, 30, 31, 32, 36, 45, 46, 47, 48, 71, 72, 169, 339, 341, 344
- Feature theory, 12, 21–23, 25, 70, 75, 84
- Feeding/counterfeeding (also bleeding/counterbleeding) order, 10, 204, 287, 289, 355, 367
- Feinstein, Mark, 9, 10, 11, 145, 152
- Féry, Caroline, 126
- Final clash deletion, 203
- Finite state automata. *See* Automata
- Finnish, 227, 237, 309, 316  
 vowel harmony, 247–249
- Fisher, Ronald A., 343
- Fission, 269, 273–274, 275. *See also* Repair, syllabic
- Fitzpatrick, Justin, 185, 399–400
- Fleischhacker, Heidi, 153
- Flemming, Edward, 75, 79, 309, 310
- Fletcher, Harvey, 166
- Foot
- defined by brackets on the metrical grid, 6–7, 147
- difference between metrical and prosodic, 147–151
- metrical, 3–8, 214, 217–221, 225–243, 250–256
- open, 202
- prosodic, 3–8, 117, 120, 125, 130, 387, 392, 394
- structure, assignment of, 200, 227
- Formants, 13, 45, 50, 76, 167, 168, 346
- Fowler, Carol A., 110
- French, 22, 28, 77, 80, 82  
 closed syllable laxing, 113–114  
 extrasyllabicity, 103, 104, 112, 113–114  
 glide formation 113–114  
 hiatus, 264–269  
 phonemic status of glides, 80  
 schwa deletion, 125, 159–160  
 syllables and syllabification, 102, 129, 159–160  
 voicing assimilation, 125, 159–160
- Frequency (statistical)  
 as factor in acquisition, 332, 396–401  
 and Feature Economy, 29–31



- and markedness, 34–35, 38, 40, 42, 50, 53, 84, 316  
 and recurrent sound patterns, 325  
 reversals and phonological enhancement, 51–53  
 and robustness, 44–46, 49  
 Fudge, Erik, 108, 116, 151  
 Fujimura, Osamu, 328  
 Fuzhou, 316
- Gadsup, 54  
 Gallo-Romance, 283  
 Garawa, 194, 198, 200  
 Garde, Paul, 226  
 Georgian, 125, 128  
 German, 72, 79, 156, 275, 326  
   final devoicing, 109, 315  
 Gestural economy, 31, 57  
 Gierut, Judith, 108  
 Gilbertese, 326  
 Gilyak, 112  
 Glide assimilation, 10–11  
 Glide formation, 113–114, 267  
 Glide insertion, 262, 267, 356–357  
 Glide truncation, 357–358 *passim*  
 Glides, 45, 51, 55, 106, 264, 271, 306, 307  
 Goad, Heather, 109  
 Godoberi, 316  
 Gokana, 124  
 Goldi, 79  
 Goldsmith, John, 151, 236, 337  
 Golin, 235  
 Gothic, 153–154  
 Government phonology, 126, 129–130  
 Gradience, 337  
   vs. contrast, 341, 342  
 Gradualness. *See* Neogrammarian sound change  
 Grammaticalization, 296  
 Grammont, Maurice, 330  
 Greek, 111, 194, 275, 283, 306, 330  
   perfect aspect, 118–119, 155  
 Green, Antony, 113, 125  
 Greenberg, Joseph, 34  
 Grid, metrical. *See* Simplified Bracketed Grid Theory  
 Grijzenhout, Janet, 123  
 Gross, Jennifer, 103, 110
- Gross, Maurice, 192  
 Grounding, 22, 341–342  
   articulatory, 76, 325  
   biological, 19  
   cognitive, 21  
   perceptual, 168, 325  
   sensorimotor, 283  
 Grouping rules, 192, 200, 201, 205, 206, 209, 210  
   parameters of, 193
- Hale, Mark, 14, 297, 311, 312, 314, 315, 316, 318  
 Halle, Morris, 19, 24, 37, 147, 158, 159, 160, 191, 192, 203, 213, 237, 240–241, 243, 247, 250–253, 255, 262, 295, 297, 311, 337, 340  
 Harar Oromo, 317  
 Hawaiian, 36, 54  
 Hayes, Bruce, 8, 115, 203, 214, 228, 232, 239, 240, 327–328, 339  
 Hebrew, Tiberian, 213–222, 241  
 Heffner, Roe-Merrill S., 166  
 Hindi, 22  
 Historical changes, 296–298, 305–310, 315–318  
   creating new consonant clusters, 126  
   creating new phonemes, 28, 84  
   as explanation for synchronic patterns, 327–333 *passim*, 338, 349  
   and feature economy, 28–29, 84–85  
 Hoard, James E., 128  
 Homel, Peter, 347  
 Homshetsma, 121  
 Hopcroft, John E., 192  
 Huasteco, 235  
 Huffman, Franklin, 112  
 Hulst, Harry van der, 213  
 Hume, Elizabeth, 330  
 Hyman, Larry, 193
- Iba, Aaron, 396  
 Icelandic, 288–296  
   extrasyllabicity, 171  
   metrical lengthening, 114  
   syllables and syllabification, 115  
   vowel lengthening, 114  
 Idsardi, William, 147, 151–152, 156, 158, 391

- Ikwere, 40  
 Ilokano, 330, 331  
 Implicational universals. *See* Universals, implicational  
 Indo-European, 72, 235, 271, 275  
 Indonesian, 194, 326  
 Infant speech perception, 22–23, 58, 396  
 Infixation, 120–121, 180, 182–184, 388, 393  
 Instructions. *See* Checking of representations; Negative instructions; Positive instructions  
 Interaction among modules, 1, 12, 14, 15, 265–266, 279  
   phonetics and phonology, 2–3, 337–349  
   phonology and morphology, 8–12, 383–392  
   within phonology, 262–264 (*see also* Cycle/Cyclic; Postcyclic rule application)  
 Interfaces between  
   modules within phonology, 261–269  
   morphology and phonology, 388–392  
   phonetics and phonology, 57, 261, 283, 325–333, 337–349  
 Inventories of contrasting sounds, 19–59, 77–83, 152, 280, 312–318, 325  
   Principles governing (*see* Feature bounding; Feature economy; Marked feature avoidance; Phonological enhancement; Robustness)  
 Irish, 113, 124, 125, 275  
 Italian, 112, 113, 114, 347  
   Altamura dialect, 283–284, 314  
   aphasics, 108, 109  
   raddoppiamento sintattico, 116  
   southern dialects, 281, 282  
 Iterative constituent construction, 13, 192, 251 (*see also* Simplified Bracketed Grid Theory)  
 Ito, Junko, 130, 146  
 Iverson, Gregory, 76, 103, 108, 117, 341  
  
 Jakobson, Roman, 21, 70, 71, 296, 356, 357, 364  
 Jamul Tiipay, 315  
 Japanese, 245, 317, 326, 347,  
   geminate, 347  
   Rendaku, 84  
   Tokyo, 194  
 Jones, Doug, 85  
  
 Joppen, Sandra, 123  
 Joseph, Brian, 341  
  
 Kabardian, 81  
 Kager, René, 232  
 Kahn, Daniel, 151  
 Kaisse, Ellen M., 400  
 Karcevsky, Serge, 70  
 Karttunen, Lauri, 192, 200, 206, 207, 209  
 Kashaya, 124  
 Kawasaki, Haruko, 45, 50, 61  
 Keating, Patricia, 344  
 Kemps, Rachel, 332  
 Kenstowicz, Michael, 192, 332  
 Kessler, Brett, 154  
 Keyser, Samuel Jay, 2, 44, 45, 47, 50, 123, 151, 193  
 Khalaj, 78  
 Khoisan, 27  
 Kim, Chin-Wu, 76, 116  
 Kim, Hyo-Young, 203  
 Kinande vowel harmony, 285  
 King, Tracy Holloway, 120, 126, 127, 128  
 Kingston, John, 72, 338, 342, 344, 348  
 Kiowa, 315  
 Kiparsky, Paul, 82, 126, 130, 215, 306, 308–309  
 Kirchner, Robert, 339  
 Kirghiz, 78  
 Kisar, 315  
 Kisseberth, Charles, 192, 332  
 Klamath, 102, 112, 315  
 Komi, 235  
 Korean, 194, 395  
 Koyukon, 315  
 Kristoffersen, Gjert, 345  
 Kučerová, Ivona, 380n17  
 Kwak'wala, 235  
  
 Labov, William, 14, 306, 307–309, 343, 349  
 Ladakhi, 111  
 Ladefoged, Peter, 26–27, 70, 71, 77, 82, 166, 346  
 Language acquisition, 15, 34, 58, 76, 103, 328  
   of assimilation, 282  
   and consonant clusters, 108  
   and constraints on grammars, 396–401

- and features, 23
- and historical change, 84
- and markedness, 34, 83, 281
- and quantal theory, 58
- and robustness, 44
- role of frequency in, 332, 396–401
- role of universal grammar in, 158, 159
- Lass, Roger, 344
- Latin, 194, 240, 275, 297, 306, 330
- Leskien, August, 373, 374, 377
- Lezgian, 315
- Lhasa Tibetan, 316
- Lieber, Rochelle, 387, 395–396, 400–401
- Liljencrants, Johan, 79
- Lillo-Martin, Diane, 57
- Limbu, 315
- Lindblom, Björn, 79, 328, 329
- Line addition, 267
- Lisker, Leigh, 346
- Lithuanian, 275
- Lovins, Julie, 112
- Lukoff, Fred, 360
- Lushootseed, 35
  
- Macchi, Marian J., 328
- Macedonian, 236
- MacWhinney, Brian, 124
- Maddieson, Ian, 23, 26–27, 70, 71, 77, 78–79, 80–82, 346
- Maidu, 315
- Maithili, 233
- Malay, 346, 347, 348
- Malayalam, 232
- Malayo-Polynesian, 330
- Manam, 317
- Marantz, Alec, 185–186
- Maranungku, 194
- Marcus, Gary, 396
- Marind, 227
- Marked feature avoidance, 32–42, 54–56
  - passim, 58
  - overruled by phonological enhancement, 51–53
- Markedness
  - articulatory grounds for, 32
  - and contrast, 83, 262, 311–318 (*see also* Spotlighting)
  - and feature economy, 32–33, 43, 48, 49, 50
  - and feature values, 33–37, 43, 44, 49, 157, 262, 278, 283–284 (*see also* Spotlighting)
  - and frequency, 34, 35, 38, 40, 41, 42, 53, 54, 84
  - and historical change, 296–298, 305, 307, 312–315, 342
  - and language acquisition, 34, 83, 398
  - and phonological enhancement, 50–53
  - reversals, 51–53
  - and robustness, 43, 50
  - and substance, 311–318
  - role in universal grammar, 83–85, 261–298
    - passim, 311–318
  - statements (*see* Markedness module)
  - and syllable structure, 108, 123, 127, 157, 184
- Markedness constraints, 312. *See also*
  - constraints listed by name in this index
  - as embodying phonetic knowledge, 325–333
    - passim, 342
  - specific to reduplication, 119, 121
- Markedness module, 261, 263–277, 278–280, 312–315 passim
- Marlo, Michael, 103
- Martinet, André, 28
- Maslov, I., 269
- Matešić, Josip, 376
- Matisoff, James, 342
- Matushanky, Ora, 361
- Maxakalí, 35, 54, 56
- MAX-BR, 389–391
- MAX-STEM, 389–401
- McCarthy, John, 1, 181, 206, 209, 214, 384, 392, 394
- Menn, Lisa, 157
- Mercado, Ismael, 306
- Mester, Armin, 130, 187
- Mid Vowel Raising, 368–369
- Misantla Totonac, 315
- Mixtec, 53
- Modular theory, 1–12
- Modules. *See also* Interactions among modules
  - markedness, 261–298
  - for metrical structure, 3–8, 191–206, 213–222, 235–243, 250–256
  - for morphology, 8–12, 177–186, 383–392
  - for phonetics, 2–3, 159–160, 337–349

- Modules. *See also* Interactions among modules (cont.)  
 for phonology, 2–3, 8–12, 261–298, 337–349, 355–379, 383–396  
 for prosody, 3–8, 147–151  
 for syllables, 3–8, 8–12, 147–160
- Mohanan, K. P., 361
- Mohawk, 124
- Mokilese, 112
- Mongolian (Khalkha), 78
- Mora, 101  
 and degenerate syllables, 126, 128, 129  
 as defining reduplicants, 120, 392–393  
 as elements in the prosodic hierarchy, 126, 128, 130, 147  
 as licenser, 125, 126  
 as stress bearing units, 193, 347, 387
- Morelli, Frida, 159
- Murik, 235
- Nair, Rami, 111
- Nater, Hank F., 128
- Natural class, 19, 33, 50, 83  
 and finite state automata, 249–250, 256
- Natural rules, 261, 277, 278, 280–283, 284, 288  
 and historical change, 296–298, 305–306, 312
- Negative instructions, 262, 278, 287, 288, 289, 292. *See also* Markedness module
- Nenets, 315
- Nengone, 194
- Neogrammarian sound change, 299n6, 305–309
- Nespor, Marina, 147
- Neutralization in coda, 127, 129, 315–318
- Nevins, Andrew, 387, 396, 399–400
- Newman, Stanley, 128
- Ngwo, 26
- Nimburan, 316
- Nisqually, 112
- NoCoda, 389–391
- NoHiatus, 267. *See also under* REPAIR sets
- Nonconcatenative morphology, 177. *See* Reduplication
- Nondirectionality, 252–253
- Northern Cities Sound shift, 306–309, 343
- Norwegian, 344
- NoTriCon, 267. *See also under* REPAIR sets
- Nxaʔamxcín, 103, 104, 116, 120–121, 128, 177–184, 186
- Ohala, John J., 84, 131, 328, 329, 338, 342, 344, 345, 349
- Oltra-Massuet, Isabel, 378
- Osmanli, 79
- Ossetic, 232
- Otake, Takashi, 347
- Pangasinan, 330, 384–392, 394
- Pansyllabic constraints on consonant sequences, 157
- Partee, Barbara H., 192
- Pashto, 39, 133, 134
- Passamaquoddy, 124
- Pausal form. *See* Hebrew, Tiberian
- Pausal lengthening, 218–220
- Payne, Arvilla, 309
- PBP. *See* Precedence Based Phonology
- Pericliev, Vladimir, 33
- Phonetic component, 2, 3, 57
- Phonetic constraints on phonology, 337–349  
 direct access vs. feature mediated theory, 57
- Phonetic cues, 345–348
- Phonetic enhancement, 3, 45, 50, 57  
 resonance and, 167
- Phonetic explanation, 327–331
- Phonetic implementation, 31, 238, 262, 307, 337, 341, 343
- Phonetic knowledge, 15, 70, 325, 331–333, 337–349
- Phonetic reductionism, 75
- Phonetics-phonology interface. *See under* Interfaces between
- Phonological enhancement, 21, 38, 50–53, 54, 56, 81, 84  
 and redundant features, 48  
 and frequency reversals, 51, 52, 53
- Phonotactics, 5, 112–113, 126, 128, 130, 151, 156–159, 161, 171–172, 226. *See also* Sonority Sequencing Principle
- Pierrehumbert, Janet, 111, 113, 123, 158, 333
- Pima, 108, 130

- Pirahã, 35, 54, 55
- Piro, 112, 124
- Pitch, 50, 169  
and sonority, 166, 170  
and voicelessness, 71–72
- Pivot point. *See* Anchor Point
- Place of articulation, 25, 31, 43, 44–45, 47, 54, 159, 316–318 328–331. *See also*  
Assimilation, place of articulation;  
Consonant types  
in coronal sounds, 25–27  
in final position, 316  
and Quantal theory, 21–23
- Planes, 3–8. *See* Three-dimensional phonology
- Polish, 104, 125, 126, 128, 194, 234, 236, 237, 277–278, 288, 289, 332, 379
- Polka, Linda, 343
- Port, Robert F., 337–338, 340–341
- Positive instructions, 262, 278, 287–289, 292.  
*See also* Checking of representations;  
Negative instructions
- Postcyclic rule application, 238, 295, 355–381  
passim
- Precedence Based Phonology (PBP), 124, 146, 149–150, 153, 159–160, 179–187, 384–387  
as alternative prosodic licensing, 150
- Precoda, Karen, 23
- Prenasalized consonants, 8–12, 53
- Pretonic Lengthening, 215, 219
- Pre-Yer Lengthening, 367–377
- Primary accent first theory, 228–230, 239, 242
- Primary word accent, 238–240
- Prince, Alan, 218, 228, 237, 384, 392, 394
- Principle of economy, 272, 298
- Privative, 82
- Probalistic learning. *See* Language acquisition, role of frequency in
- Prohibitions, 262, 278, 280, 293
- Projection. *See* Simplified Bracket Grid Theory
- Prosodic  
foot, 3–8, 117, 120, 125, 130, 387, 392, 394  
hierarchy, 4–8, 108–109, 112, 123–125, 147–151  
licensing, 146–147, 150–151, 161, 391  
and syllable integrity, 5–8  
word, 4, 13, 102, 104, 125
- Prosodic morphology, 118–123, 383–402
- Purnell, Thomas, 192
- Quantal theory, 21–22  
and dispersion, 27  
and language acquisition, 58
- Quileute, 35
- Raimy, Eric, 145, 146, 149–150, 151, 152, 153, 154, 156, 159, 160
- RED =  $\sigma_{\text{RED}}$ , 384, 389–391
- Reduplication, 103, 108, 118–120, 127, 153–156, 160, 178–182, 184–186, 383–402
- Reiss, Charles, 204, 241, 311–312, 314–315, 316, 318
- Repair, 186, 312. *See also* REPAIR sets  
and historical linguistics, 296–298, 305–307, 312  
and markedness statements, 262, 264  
component, 264, 268  
syllabic, 147, 268 (*see also* Syllable, repair by epenthesis)
- REPAIR sets, 264, 266, 267, 268, 273, 274, 289, 291  
for constraint against back ATR vowels, 284, 314  
for constraint against branching X, 274 (*see also* Fission)  
for constraint against long, mid vowels, 278  
for constraint against sonorant consonants in nucleus position, 272  
for constraint against unsyllabified skeletal positions, 289–291, 292, 293, 295  
cyclic application, 293  
for NoHiatus, 267, 268
- Resonance, 3, 13, 43, 51, 52  
as phonetic correlate of sonority, 167–173
- Resyllabification, 21, 267–268, 274, 291, 389.  
*See also* Syllabification
- Revell, E. J., 222
- Rhythmic accent, 225, 226–228, 237–238, 239, 242

- Rialland, Annie, 78, 112, 113–114, 125, 129, 145, 159
- Riley, William, 306
- Robustness, 21, 42–83 *passim*  
and language acquisition, 44  
principle of inventory structure, 48  
robust vs. weak contrasts, 46, 47, 58  
scale, 44, 46–49, 54
- Romani, Cristina, 108, 109
- Roro, 54
- Rose, Sharon, 399
- Rose, Yvan, 109
- Rotokas, 35, 54
- Rotuman, 230, 232, 243
- Rubach, Jerzy, 126
- Rule component, 8–12, 277–278. *See also*  
Natural rules
- Russian, 71, 78, 80, 129, 171, 194, 229, 236, 355  
genitive plural, 356, 357–364, 365, 373, 378
- Saami, 316, 346
- Sagey, Elizabeth, 24
- Salmons, Joseph, 76, 108, 117, 341
- Sanders, Nathan, 332
- Sandler, Wendy, 57
- Sanskrit, 118, 119, 129, 154–155, 273
- Sapir, Edward, 6
- Scheer, Tobias, 104, 126, 130
- Schindwein, Deborah, 285
- Secondary stress, 201–202, 214, 225–243
- Sedang, 112
- Sekani, 315
- Selayarese, 317
- Sentani, 317
- Separator theory, 204–206 *passim*, 251–256
- Serbo-Croatian, 15, 271, 355, 356, 371–378
- Sezer, Engin, 173
- Shan, 343
- Shilha, 33
- Shingazidja, 194
- Shuy, Roger, 306
- Sibe, 84
- Sievers, Eduard, 166
- Simplified Bracket Grid Theory (SBG), 191–206, 213, 218–221, 240–243
- Sindhi, 26, 344, 346
- Sinhala (-ese), 2, 8–11, 79
- Sipakapense Maya, 103, 130
- Slavic, 71, 275, 355, 356, 359, 364, 365, 374
- Sneddon, James N., 330
- Sober, Elliott, 340, 343
- Solnit, David, 343
- Somali, 315
- Sonorant, 38, 52, 53, 56, 160. *See also*  
Features, distinctive; Sonority  
as locus for pitch contrasts, 71  
and syllable structure, 103, 109, 111, 112, 119, 127, 152, 154
- Sonority. *See also* Sonority Sequencing  
Principle  
dispersion, 106, 169–173  
ranking of English sounds, 166  
resonance as phonetic correlate of, 165–173  
scale, 106, 165–169
- Sonority Sequencing Principle (SSP, same as Sonority Sequencing Generalization, SSG), 103, 112, 156–159, 169–173 *passim*
- Southern Nambiquara, 81
- Southern Paiute, 5–8
- South Slavey, 314, 315, 318
- Spaelti, Philip, 390
- Spanish, 36, 39, 48, 80, 112, 121, 297, 306, 307, 317
- Speech perception, 21–22, 325, 333, 338, 358  
motor theory of speech perception, 21, 77
- Spencer, Andrew, 109
- Sperber, Dan, 296
- Spokane, 103, 104, 119, 130
- Spotlighting, 262, 284–287
- Stampe, David, 281
- Statistical learning, 396–401. *See also*  
Universal grammar, role of (with statistical learning) in language acquisition
- Stemberger, Joseph, 110, 124
- Steriade, Donca, 153, 285, 327–331, 338–339, 349
- Stevens, Kenneth N., 2, 19, 37, 44, 45, 47, 50, 71, 349
- Stray erasure, 123, 146
- Stress. *See* Secondary stress; Simplified Bracketed Grid Theory
- StressTyp Database, 242–243

- Strict cyclicity, principle of, 363  
 Strict layering, 109, 125, 130–131  
 Structural head, 109  
 Sulawesi, 330  
 Suruwaha, 194  
 Svantesson, Jan-Olof, 78  
 Syllabic sonorants, 271–273, 275–276, 291  
   constraint against, 272, 276  
 Syllabification, 101–131, 146, 151–154, 171–  
   173, 177–178, 182, 276, 347. *See also*  
   Modules, for syllables; Resyllabification;  
   Sonority Sequencing Principle  
   by bracket projection on the metrical grid,  
   192–193  
   cyclic, 150, 186  
   module, 3–8  
   non-exhaustive, 147 (*see also* Appendix;  
   Extrasyllabic)  
   and phonological rules, 8–12, 116–117  
   surface vs. underlying, 185–186  
 Syllable, 3–8, 101–131 *passim*. *See also*  
   Demisyllable; Dispersion principle;  
   Extrasyllabic  
   in aphasia, 109–110  
   in child language, 109  
   contact, 169–173 *passim*, 291  
   degenerate, 104, 105, 123, 126–131, 177,  
   184–186 (*see also under* Mora)  
   internal structure of, 151–156  
   intraconstituent constraints, 157  
   and morphology, 118–122, 177–187  
   repair by deletion, 4, 146–147, 292  
   repair by epenthesis, 4, 13, 146–147, 172–  
   173, 184, 288, 289, 292  
   as stress bearing units, 4–8, 214–218 *passim*,  
   225–243 *passim*  
   tier, 147–151  
   weight, 114–115, 193, 201–206 *passim*, 214,  
   220, 228–236 *passim*, 347, 384, 390  
 Syllable Integrity, 5–8, 149  
 Symmetry, 29, 31, 56  
  
 Taba (East Makian), 330  
 Taga, 227  
 Takelma, 315  
 Tatham, Mark, 76  
 Tauya, 194  
  
 Temne, 26  
 Templates  
   prosodic word, 240  
   reduplicative, 15, 119, 185–186, 383–402  
   syllable, 102, 152–153  
 TETU. *See* Emergence of the unmarked  
 Thao, 184–186  
 Thráinsson, Höskuldur, 115  
 Three-dimensional phonology, 5–8, 147–  
   150  
   hybrid 3-D model, 149–150, 161  
 Tier. *See also* Planes, Three-dimensional  
   phonology  
   consonant vs. vowel tiers, 181–184  
 Tigrinya, 399, 400  
 Toda, 26  
 Tone lengthening, 217  
 Tonogenesis, 72, 342–343  
 Toronto school, 82. *See* Underspecification,  
   contrastive  
 Totonac, 112, 315  
 Treiman, Rebecca, 103, 110  
 Tripura Bangla, 193, 200, 204–206  
 Trubetzkoy, Nikolai S., 21, 70, 271  
 Tulu, 280  
 Tunica, 315  
 Turkish, 79, 80, 81, 172, 173, 194, 227, 236,  
   309  
 Tuvan, 78, 79  
  
 Ullman, Jeffrey D., 192  
 Underspecification, 82, 262, 284–287  
   contrastive, 82  
 Universal grammar (UG), 3, 14, 152, 157–  
   160, 261, 264, 267, 277, 280  
   role of (with statistical learning) in language  
   acquisition, 396–401  
 Universals, implicational, 38–40, 103, 159  
 Unsyllabified segments, 10–11, 391. *See also*  
   Appendix  
   constraint against unsyllabified consonants,  
   274, 289, 290–291, 295  
   and prosodic licensing, 146–147  
 UPSID (UCLA Phonological Segment  
   Inventory Database), 23–58 *passim*  
   criticism of, 77–80, 81, 82, 84  
 Uzbek, 227

- Valdés-Pérez, Raúl E., 33  
 Vanimó, 36  
 Variation, 49, 79, 128, 180, 240, 306–319,  
 311–318, 339, 399–400  
 Vaux, Bert, 400  
 Vergnaud, Jean-Roger, 192, 237, 240, 295,  
 361, 363  
 Verner, Karl, 72  
 Verner's law, 72  
 Visibility theory and spotlighting, 262, 284–  
 287  
 Vogel, Irene, 147  
 Voice onset time (VOT), 76, 82, 341  
 Vowel  
   deletion, 114, 125, 216–217, 220–221, 292,  
   356, 366  
   devoicing, 2, 6  
   epenthesis, 182–183 (*see also* Syllable, repair  
   by epenthesis)  
   harmony and Finite State Automata, 247–  
   249  
   lengthening and iambic footing, as phonetic  
   phenomenon, 158  
   as stress bearing unit, 4–8 (*see also* Syllable,  
   as stress bearing units)  
 Vowel reduction, 8–12, 116, 214, 216–221  
   passim  
 Vowel shortening, 3, 10–11, 109, 112, 115,  
 278, 288, 309  
 Vowel truncation, 355–381 passim
- Wall, Robert E., 192  
 Wang, William S.-Y., 308  
 Waris, 53  
 Westbury, John R., 344  
 Whitney, William Dwight, 103  
 Wichita, 36  
 Willett, Marie Louise, 116, 120  
 Winnebago, 193, 194, 203–204, 205, 206  
 Wiyot, 315  
 Wolof, 115
- Xibe, 312–313  
 X-tier, 193, 393–394, 397
- Yakut, 78, 79, 81  
 Yang, Charles, 396
- Yanyuwa, 26  
 Yers, 359–380 passim  
 Yer-deletion, 355–381 passim  
 Yidiny, 36, 37  
 Yokuts, 288, 332  
 Yu, Alan C., 180–181, 182, 393
- Zhang, Xi, 312–313  
 Ziková, Markéta, 380n19  
 Zoque, 48, 315  
 Zukowski, Andrea, 110  
 Zulu, 29