## Contents

The Contributors		xiii	
Abbreviations		xxi	
PART I: INTRODUC	CTION		
1. Introduction		3	
Abigail C. Cohn, Cécile Fougeron, an	ID MARIE K. HUFFMAN		
2. Introduction, Papers in Laboratory Phonology the Grammar and Physics of Speech (reprint)	I: Between	10	
Mary E. Beckman and John Kingston			
In J. Kingston and M. Beckman (1990, eds Phonology I: Between the Grammar and the Cambridge: Cambridge University Press 1 this volume].	e Physics of Speech.		
3. Conceptual foundations of phonology as a la science (reprint)	boratory	17	
Janet B. Pierrehumbert, Mary E. Beck and D. Robert Ladd	MAN,		
In N. Burton-Roberts, P. Carr, and G. Do Phonological Knowledge: Conceptual and I Oxford: Oxford University Press, 273–304	Empirical Issues.	2	
PART II: NATURE AND TYPES		147	

## LABORATORY PHONOLOGY PERSPECTIVE

4. Speaker-related variation—sociophonetic factors GERARD DOCHERTY AND NORMA MENDOZA-DENTON

5.	Inte	grating variation in phonological analysis	61
	5.1	Variation: Where laboratory and theoretical phonology meet Andries W. Coetzee	62
	5.2	Modeling phonological variation Arto Anttila	76
6.	Mes	sage-related variation	92
	6.1	Segmental within-speaker variation	93
		Mirjam Ernestus	
	6.2	Tonal variation	103
		Yiya Chen	
7.	Syst	em-related variation	115
		Philip Hoole, Barbara Kühnert, and Marianne Pouplie	R
		PART III: MULTIDIMENSIONAL	
		REPRESENTATIONS OF KNOWLEDGE	
		OF SOUND STRUCTURE	
		ne Grammar and Physics of Speech (reprint)	
8.	Lexi	cal representations	133
	8.1	Probing underlying representations	134
		Adam Albright	
	8.2		
		mental lexicon	146
	0 -	ADITI LAHIRI The lorison Not instalusing but ill and i	0,0
	8.3	The lexicon: Not just elusive, but illusory?  SARAH HAWKINS	162
	8.4	The dynamic lexicon	173
	0.4	JANET B. PIERREHUMBERT	1/3
0.	Pho	nological elements	184
,		The nature of distinctive features and the issue of natural	104
	9.1	classes	185
		Jeff Mielke	
	9.2	Contrastive tone and its implementation	196
		ELIZABETH C. ZSIGA	
	9.3	Modeling phonological category learning	207
		Paul Boersma	
0.	Orga	anization of phonological elements	219
	10.1	Articulatory representation and organization	220
		Adamantios Gafos and Louis Goldstein	

		The role of the syllable in the organization and realization of sound systems  Marie-Hélène Côté  The temporal implementation of prosodic structure  Alice Turk	232
11.	Pros	odic representations	254
		Prosodic structure, constituents, and their implementation	255
		Sónia Frota	
	11.2	Segment-to-tone association	265
	11 2	Amalia Arvaniti Tonal alignment	275
	11.3	Mariapaola D'Imperio	275
12.		nological representations in language acquisition: Climbing adder of abstraction	288
		Benjamin Munson, Jan Edwards,	
		and Mary E. Beckman	
13.	Cha	nges in representations	310
	13.1		311
		Ioana Chitoran	
	13.2	The relationship between synchronic variation	
		and diachronic change Jonathan Harrington	321
	13.3	Modeling exemplar-based phonologization	332
		ROBERT KIRCHNER	
		PART IV: INTEGRATING DIFFERENT	
		PERSPECTIVES: INSIGHTS FROM	
		PRODUCTION PERCEPTION,	
		AND ACQUISITION	
		18.3 Atemodologies used to investigate laryngear uncuences	4.76
14.		ghts from perception and comprehension	347
	14.1	How perceptual and cognitive constraints affect learning	
		of speech categories  LORI L. HOLT	348
	14.2	Representations of speech sound patterns in the speaker's	
	i si	brain: Insights from perception studies	359
		Noël Nguyen Otama gang	

15.		rgent information-level coupling between perception production	369
		Bob McMurray and Ashley Farris-Trimble	
16.	Insig	ghts from acquisition and learning	396
	16.1	How phonological representations develop during	
		first-language acquisition	397
	9	KATHERINE DEMUTH AND JAE YUNG SONG	1 93
	16.2	Speech processing in bilingual and multilingual listeners PAOLA ESCUDERO	406
	162	Second-language speech learning	417
	10.3	RAJKA SMILJANIC	41/
		THE STATE OF THE PARKET AND THE PARKET AND ASSESSED AND ASSESSED AND ASSESSED ASSESSED.	
880	PAR	T V: METHODOLOGIES AND RESOURCE	S
		Benjamin Menson, Jan Edwards, 10	
17.	-	pora, databases, and Internet resources	429
	17.1		431
		JENNIFER COLE AND MARK HASEGAWA-JOHNSON	
	17.2	Using the Internet for collecting phonological data  Dan Loehr and Linda Van Guilder	441
	17.3	Speech manipulation, synthesis, and automatic recognition	
	17.5	in laboratory phonology	450
		Henning Reetz	
	17.4	Phonotactic patterns in lexical corpora	458
		Stefan A. Frisch	
18.	Artic	culatory analysis and acoustic modeling	471
	18.1	Articulatory to acoustic modeling	472
		KHALIL ISKAROUS	
		Ultrasound as a tool for speech research	484
		Lisa Davidson	
		Methodologies used to investigate laryngeal function	
		and aerodynamic properties of speech Helen M. Hanson	496
	18 1	On the acoustics and aerodynamics of fricatives	511
	10.4	CHRISTINE H. SHADLE	511
10	Dross	odic analysis	507
19.		Experimental methods and paradigms for prosodic analysis	527
		Pilar Prieto	528

	19.2	Data collection for prosodic analysis of continuous speech and dialectal variation Brechtje Post and Francis Nolan	538
20.	Enco	oding, decoding, and acquisition	548
	20.1	Studying the acquisition of a receptive phonetic/phonological system  JESSICA MAYE	550
	20.2	Experimental methods and designs to investigate phonological encoding of spoken language NIELS O. SCHILLER	562
	20.3	Measuring phonetic perception in adults PAUL IVERSON	572
	20.4	Eye movements as a dependent measure in research on spoken language Shari R. Speer	580
	20.5	Neurophysiological techniques in laboratory phonology WILLIAM IDSARDI AND DAVID POEPPEL	593
21.	Expe	erimental design and data collection	606
	21.1		607
	21.2	James M. Scobbie and Jane Stuart-Smith Methods for studying spontaneous speech Natasha Warner	621
	21.3	Methods and experimental design for studying sociophonetic variation	634
	C	Paul Warren and Jennifer Hay	abo
22.		stical analyses	643
	22.1	Statistical methods in laboratory phonology John Kingston	644
	22.2		668
	22.3	Clustering and classification methods CYNTHIA G. CLOPPER	678
Refe	rences	e. It is just over jour years since we started to discuss this project and in the first and the victorian of the source of the victorian of the contract of the victorian of the	693
nde.	x		849