

SECOND LANGUAGE SPEECH LEARNING

Including contributions from a team of world-renowned international scholars, this volume is a state-of-the-art survey of second language speech research, showcasing new empirical studies alongside critical reviews of existing influential speech learning models. It presents a revised version of Flege's Speech Learning Model (SLM-r) for the first time, an update on a cornerstone of second language research. Chapters are grouped into five thematic areas: theoretical progress, segmental acquisition, acquiring suprasegmental features, accentedness and acoustic features, and cognitive and psychological variables. Every chapter provides new empirical evidence, offering new insights as well as challenges on aspects of the second language speech acquisition process. Comprehensive in its coverage, this book summarizes the state of current research in second language phonology and aims to shape and inspire future research in the field. It is an essential resource for academic researchers and students of second language acquisition, applied linguistics, and phonetics and phonology.

RATREE WAYLAND is Associate Professor in the Department of Linguistics at the University of Florida. She has published extensively on cross-language perception and production of lexical tones.

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SECOND LANGUAGE SPEECH LEARNING

Theoretical and Empirical Progress

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On behalf of students who have benefited from her mentoring and colleagues who have been inspired by the creativity and breadth of her research on second language speech learning, we dedicate this volume to
Susan Guion Anderson

Contents

<i>List of Figures</i>	<i>page x</i>
<i>List of Tables</i>	<i>xvi</i>
<i>List of Contributors</i>	<i>xviii</i>
<i>Preface</i>	<i>xxiii</i>
<i>Acknowledgments</i>	<i>xxvii</i>
PART I THEORETICAL PROGRESS	I
1 The Revised Speech Learning Model (SLM-r) <i>James Emil Flege and Ocke-Schwen Bohn</i>	3
2 The Revised Speech Learning Model (SLM-r) Applied <i>James Emil Flege, Katsura Aoyama, and Ocke-Schwen Bohn</i>	84
3 New Methods for Second Language (L2) Speech Research <i>James Emil Flege</i>	119
4 Phonetic and Phonological Influences on the Discrimination of Non-native Phones <i>Michael D. Tyler</i>	157
5 The Past, Present, and Future of Lexical Stress in Second Language Speech Production and Perception <i>Annie Tremblay</i>	175
PART II SEGMENTAL ACQUISITION	193
6 English Obstruent Perception by Native Mandarin, Korean, and English Speakers <i>Yen-Chen Hao and Kenneth de Jong</i>	195

VIII	<i>Contents</i>	
7	Changes in the First Year of Immersion: An Acoustic Analysis of /s/ Produced by Japanese Adults and Children <i>Katsura Aoyama</i>	213
8	Effects of the Postvocalic Nasal on the Perception of American English Vowels by Native Speakers of American English and Japanese <i>Takeshi Nozawa and Ratee Wayland</i>	228
	PART III ACQUIRING SUPRASEGMENTAL FEATURES	247
9	Relating Production and Perception of L2 Tone <i>James Kirby and Đinh Lư Giang</i>	249
10	Production of Mandarin Tones by L1-Spanish Early Learners in a Classroom Setting <i>Lucrecia Rallo Fabra, Xialin Liu, Si Chen, and Ratee Wayland</i>	273
11	Production of English Lexical Stress by Arabic Speakers <i>Wael Zuraiq and Joan A. Sereno</i>	290
12	Variability in Speaking Rate of Native and Nonnative Speech <i>Melissa M. Baese-Berk and Ann R. Bradlow</i>	312
	PART IV ACCENTEDNESS AND ACOUSTIC FEATURES	335
13	Comparing Segmental and Prosodic Contributions to Speech Accent <i>Marina Oganyan, Richard Wright, and Elizabeth McCullough</i>	337
14	Do Proficient Mandarin Speakers of English Exhibit an Interlanguage–Speech Intelligibility Benefit When Tested with Complex Sound–Meaning Mapping Tasks? <i>Marta Ortega-Llebaria, Claire C. Chu, and Carrie Demmans Epp</i>	350
15	Foreign Accent in L2 Japanese: Cross-Sectional Study <i>Kaori Idemaru, Misaki Kato, and Kimiko Tsukada</i>	377
	PART V COGNITIVE AND PSYCHOLOGICAL VARIABLES	397
16	Self-Reported Effort of Listening to Nonnative Accented English Depends on Talker Pausing and Listener Working Memory Capacity <i>Mengxi Lin and Alexander L. Francis</i>	399

<i>Contents</i>		ix
17	Investigating the Role of Cognitive Abilities in Phonetic Learning of Foreign Consonants and Lexical Tones <i>Irina A. Shport</i>	418
18	Auditory Priming Effects on the Pronunciation of Second Language Speech Sounds <i>Lindsay Leong, Trude Heift, and Yue Wang</i>	439
19	Indexical Effects in Cross-Language Speech Perception: The Case of Japanese Listeners and English Fricatives <i>Benjamin Munson, Fangfang Li, and Kiyoko Yoneyama</i>	463
20	The Role of Orienting Attention during Perceptual Training in Learning Nonnative Tones and Consonants <i>Ying Chen and Eric Pederson</i>	485
	<i>Index</i>	503

Figures

1.1	The generic three-level production–perception model assumed by the Speech Learning Model	<i>page 12</i>
1.2	The mean VOT (ms) in word-initial tokens of /p t k/ produced in English words in 1992 and 2003 by native Italian (NI) speakers in Canada and by 20 native English speakers and 20 NI speakers each of whom reported using English either more or less in 2003 compared to 1992	27
1.3	Mean VOT values in the production of English /t/ by native speakers of English and native Spanish early and late learners of English	56
2.1	Hypothetical cross-language mapping between a Japanese liquid consonant and two English liquids at four hypothetical stages of L2 development by native speakers of Japanese	85
2.2	The mean perceived dissimilarity of English /r/ and /l/ in the single-talker condition and the five-talker condition	92
2.3	The mean subjective familiarity ratings for English words obtained by Flege et al. (1995) for two groups of native Japanese speakers plotted as a function of the mean ratings obtained for the same words for native English speakers	99
2.4	An account of the effects of subjective lexical familiarity on native Japanese speakers' identifications of /r/ and /l/ that was inspired by the Theory of Signal Detection	100
2.5	The preferred F3 values obtained from native speakers of English and native speakers of Japanese for English /r/ and /l/ (both groups) and Japanese /R/ (just the native Japanese speakers)	103

<i>List of Figures</i>		xi
2.6	The mean ratings of /r/ and /l/ obtained for the 12 participants in three groups	108
2.7	The mean ratings of /r/ tokens produced by the members of three groups as a function of the F ₃ values in the rated tokens	109
3.1	Example of a test item from the Cumulative Use Index	135
3.2	Sample items from a Cumulative Use Index	137
3.3	The classification of the members of a VOT continuum ranging from /bi/ to /pi/ by native English (NE) monolinguals and native Spanish (NS) “near-monolinguals” using one of three response labels	147
3.4	Mean number of English words that were correctly recognized by native English (NE) speakers and two groups of native Italian (NI) speakers who arrived in Canada at the mean age of seven years but differed in how frequently they used Italian	149
6.1	Proportional accuracy for consonants in coda position plotted by proportional accuracy for the same consonant in onset position	203
8.1	Mean F ₁ and F ₂ frequencies of six vowels uttered by four native speakers averaged across five preplosive contexts	232
8.2	Classification overlap scores of six vowel pairs in preplosive and prenasal contexts	235
8.3	Mean percentages and standard errors of English and Japanese listeners’ discrimination accuracy of the six AE vowel pairs in preplosive and prenasal contexts	236
8.4	Mean percentages and standard errors of English and Japanese listeners’ identification accuracy of the six AE vowels in preplosive and prenasal contexts	238
9.1	Waveform and spectrogram of stimulus /ta:ɹɜ:/ and f ₀ contours of synthesized perception stimuli	257
9.2	Average f ₀ contours for Southern Vietnamese tones across speakers by L1	259
9.3	Tone productions for six KG participants, averaged over repetitions of each target syllable	260
9.4	Mean discrimination accuracy by tone pair, averaged over speakers and repetitions	261

xii	<i>List of Figures</i>	
9.5	Tone productions for KM10 and KF1	262
10.1	Interspeaker normalized contours for Mandarin Chinese tone 1 (level) produced by the native Mandarin and Spanish learner groups	281
10.2	Interspeaker normalized contours for Mandarin Chinese tone 2 (rising) produced by the native Mandarin and Spanish learner groups	282
10.3	Interspeaker normalized contours in <i>z</i> -scores for Mandarin tone 3 (low dipping) produced by a group of 4 native Mandarin children and 12 Spanish children learning Mandarin	283
10.4	Interspeaker normalized pitch contours in <i>z</i> -scores for Mandarin tone 4 (high falling) produced by a group of 4 native Mandarin children and 12 Spanish children learning Mandarin	284
11.1	Duration ratio for words (first-syllable stress, second-syllable stress) for native speakers of English (NE), advanced Arabic learners of English (AALE), and beginning Arabic learners of English (BALE)	296
11.2	Fundamental frequency ratios for words (first-syllable stress, second-syllable stress) for native speakers of English (NE), advanced Arabic learners of English (AALE), and beginning Arabic learners of English (BALE)	297
11.3	Amplitude ratio for words (first-syllable stress, second-syllable stress) for native speakers of English (NE), advanced Arabic learners of English (AALE), and beginning Arabic learners of English (BALE)	298
11.4	Second formant frequency (F2) values for front and back vowels in the initial (first) syllable for first-syllable stressed words (nouns) and second-syllable stressed words (verbs) for native speakers of English (NE), advanced Arabic learners of English (AALE), and beginning Arabic learners of English (BALE)	300
11.5	Second formant frequency (F2) values for front and back vowels in the final (second) syllable for first-syllable stressed words (nouns) and second-syllable stressed words (verbs) for native speakers of English (NE), advanced Arabic learners of English (AALE), and beginning Arabic learners of English (BALE)	301

	<i>List of Figures</i>	XIII
12.1	Speaking rate (syllables per second) for native and nonnative speakers reading paragraphs in the Wildcat Corpus	320
12.2	Rate change (calculated for consecutive utterances) for native and nonnative speakers reading paragraphs in the Wildcat Corpus	322
12.3	Absolute value of rate change (calculated across consecutive utterances) for native and nonnative speakers reading paragraphs in the Wildcat Corpus	323
12.4	L1 speaking rate for native speakers of three languages	324
12.5	Absolute value of rate change (calculated across consecutive utterances) for native speakers of three languages from the ALLSTAR corpus producing speech in their native languages.	325
12.6	Correlation between absolute value of rate change in L1 and L2 for native Korean and Mandarin speakers in the ALLSTAR corpus	326
13.1	Accented rating score distribution for American English, Hindi, Korean, Spanish, and Mandarin speakers	344
13.2	Correlation between segmental and prosodic properties and accented ratings for each language	345
14.1	Participants' ability to correctly identify the trait within sentences	365
14.2	The distribution of speaker accentedness ratings by listener and speaker type and the distribution of speaker comprehensibility ratings by listener and speaker type	366
15.1	Variable importance for learner groups	387
15.2	Eight top-ranked predictors for Y1 and their rankings for Y2 and Y4	389
16.1	Subjective evaluations for the three types of speech	409
16.2	Listening effort ratings by WMC and condition	411
17.1	The structure of the word-learning task	424
17.2	Error types in the word-identification task	429
17.3	Error types in the AX discrimination task with catch (same) and different trials	430
18.1	Vowel productions in a vowel space plot	450

XIV	<i>List of Figures</i>	
18.2	High-front vowel productions as a function of prime-target congruency	451
19.1	Selected acoustic characteristics of word-initial fricatives produced by two men and two women, separated by sexual orientation	464
19.2	Selected acoustic characteristics of the vocalic bases of the stimuli in this study, separated by the word from which the base was excised and the perceived masculinity of the speaker	465
19.3	The proportion of “yes” responses to the question “Is this a ‘sh’?” to the 128 stimuli with the four-step /s/-/ʃ/ series, separated by stimulus step (1–4), listener language (Japanese vs. English), and perceived masculinity of the talkers	475
19.4	The proportion of “yes” responses to the question “Is this a ‘sh’?” for the Japanese-speaking listeners and the English-speaking listeners for the 128 stimuli with the four-step /s/-/ʃ/ series	476
19.5	The proportion of “yes” responses to the question “Is this an ‘s’?” to the 128 stimuli with the four-step /s/-/θ/ series, separated by stimulus step (1–4), listener language (Japanese vs. English), and perceived masculinity of the talkers	478
19.6	The proportion of “yes” responses to the question “Is this an ‘s’?” for the Japanese-speaking listeners and the English-speaking listeners for the 128 stimuli with the four-step /s/-/θ/ series	479
20.1	Consonant training paradigm	490
20.2	Tone training paradigm	490
20.3	Results of the AXB discrimination task in pretraining and posttraining tests of the consonant-attending group	492
20.4	Results of the AXB discrimination task in pretraining and posttraining tests of the tone-attending group	493
20.5	Results of the identification training combining both the consonant-attending and tone-attending groups	493
20.6	Mean errors of consonant discriminations by the consonant-attending group	494

	<i>List of Figures</i>	xv
20.7	Mean errors of consonant discriminations by the tone-attending group	494
20.8	Mean errors of tone discriminations by the tone-attending group	495
20.9	Mean errors of tone discriminations by the consonant-attending group	495

Tables

6.1	English obstruents examined in the current study and the closest Mandarin and Korean obstruents in the onset and coda positions	<i>page</i> 198
7.1	Characteristics of the native English (NE) and native Japanese (NJ) participants	217
7.2	Mean noise duration averaged across speakers in each group	219
7.3	Mean center of gravity (CoG) values averaged across speakers in each group	220
7.4	Mean noise amplitude averaged across speakers in each group	221
8.1	Perceptual assimilation: the most frequent responses in percentages and mean categorical goodness ratings	234
9.1	Production stimuli	254
9.2	Mean global Fréchet and DTW distances between KG and VN tone productions, from most to least similar	259
9.3	Mean discrimination accuracies for KM10 and KF1 by tone pair	262
10.1	Growth curve analysis results for the four Mandarin tones	281
12.1	Distribution of speakers across languages in the Wildcat Corpus	317
14.1	Average proficiencies of listeners	358
14.2	Speech characteristics of speakers	359
14.3	Accuracy of target traits produced by speakers	360
15.1	Speaker information	379
15.2	Test sentences and English translation	380
15.3	The results of mixed-effects modeling	385

List of Tables

xvii

16.1	Likert scale rating of listening effort, subjective intelligibility, and acceptability	405
16.2	Pause analysis	408
16.3	Mixed-models results for listening effort	411
17.1	Twelve stimulus words	423
17.2	Two-tailed Pearson correlations for all observed variables	427
18.1	Example priming task trial	445
18.2	Mean vowel duration produced by English and Mandarin speakers in the congruent and incongruent prime-target conditions	448
18.3	Mean F1 and F2 values for the target vowels produced by English and Mandarin speakers in the congruent and incongruent prime-target conditions	449
18.4	Mean percent correct intelligibility for the target vowels produced by English and Mandarin speakers in the congruent and incongruent prime-target conditions as judged by native listeners of English	453
18.5	Mean percent correct vowel identification by the English and Mandarin speakers	454
19.1	Acoustic characteristics of the fricative stimuli	472
19.2	Results of the most complex model predicting responses to the /s/-/ʃ/ stimuli	475
19.3	Results of the most complex model predicting responses to the /s/-/θ/ stimuli	478

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Preface

This present volume is the outcome of the inspiration that Susan Guion Anderson impressed upon researchers working on cross-linguistic speech learning during her short but productive career.

A professor of linguistics at the University of Oregon, Susan Guion Anderson passed away on December 24, 2011. Her 1996 doctoral dissertation, titled “Velar Palatalization: Coarticulation, Perception, and Sound Change,” reflected her passions for phonetics and historical linguistics. After graduation, she became a NIH postdoctoral fellow under the mentorship of Professor James Flege, where her research in second language (L2) phonology acquisition began. She was interested in theoretical questions related to the acquisition and representation of second L2 phonetic categories as well as the influence of native language’s (L1) phonological distribution and regularity. She is best known for a series of studies on lexical stress in which she challenged the previous generative account of L2 stress placement and provided an alternative approach that better explained empirical data. Working under the Speech Learning Model (SLM) and the Perceptual Assimilation Model (PAM), Susan also generated an impressive volume of work on L2 speech learning at the segmental level, focusing on the acquisition of English vowels and consonants by native Japanese speakers. The role of attention in L2 category formation was added to the breadth of her research toward the end of her career.

Theoretical Progress

In honor of Susan’s intellectual legacy, prominent researchers from the field of second language speech research, including James Flege, Ocke-Schwen Bohn, Joan Sereno, Kenneth de Jong, Richard Wright, Benjamin Munson, Alexander Francis, Yue Wang, Annie Tremblay, Michael Tyler, James Kirby, Marta Ortega-Llebaria, and others, contributed either a critical review chapter or original, empirical data on the role of phonetics

and cognitive and psychological factors on second language speech learning, at both the segmental and suprasegmental levels.

For the first time since its proposal in 2005 (Flege, ISCA Workshop on Plasticity, London, June 15–17, 2005), the Flege's revised Speech Learning Model (SLM-r) is formally and comprehensively presented, evincing a remarkable theoretical advancement of nearly three decades, most notably in the shift of the model's focus from accounting for age-related limits on the ability to produce position-sensitive allophones of L2 vowels and consonants among sequential bilinguals to the role of input in the reorganization of the phonetic systems during naturalistic L2 learning (Chapter 1). Point-by-point comparisons between the original SLM and the SLM-r were explicitly and succinctly explained. The application of the SLM-r to existing empirical data on the acquisition of English /l/ and /r/ is exemplified in a separate chapter (Chapter 2).

In complement to Chapter 1, in Chapter 3, Flege describes new methods on how to elicit L1 and L2 speech samples that are representative of bilinguals' production; how to assess L2 perception in order to determine if a new phonetic category has been formed; how to obtain more accurate estimates of the amount of L1 and L2 use; and finally, how to measure the quantity and quality of L2 input to which L2 learners have been exposed in order to determine L2 distribution patterns that promote the formation of new L2 phonetic categories.

In Chapter 4, Michael Tyler discusses four different sources of information that can be used to discriminate contrasting nonnative phones. Using the PAM as an example, he demonstrates how a cross-language speech perception model may account for these various sources of information. Methodological requirements for determining which sources of information listeners use for discrimination are then evaluated.

Complementary to the SLM-r and the PAM, which focus on L2 segmental acquisition, Ann Tremblay (Chapter 5) critically reviews a body of work on L2 lexical stress acquisition and suggests future research directions. The review highlights a shift in theoretical approaches on cross-linguistics stress acquisition research from the generative framework to the statistical regularity approaches pioneered by Susan Guion Anderson and colleagues and to the more recent approaches focusing on the effects of phonological encoding and phonetic implementation of lexical stress in the native language on L2 stress perception and production accuracy. Refinement of these phonetic approaches are suggested by Tremblay for future research on nonnative processing of lexical stress, including testing the limit of a transfer of an existing L1 acoustic cue and potential

Preface

xxv

cross-domain transfer (i.e., from segmental to suprasegmental) to the processing L2 lexical stress.

Empirical Progress

Every chapter provides empirical evidence offering new insight as well as challenges to aspects of the L2 speech acquisition process. For instance, while supporting the SLM-r hypothesis that production and perception coevolve (Chapters 1), Kirby and Giang (Chapter 9) reveal evidence to suggest that native-like articulatory specifications may not be necessary for accurate perception of L2 lexical tones. Ortega-Llebaria, Chu, and Demmans Epp (Chapter 14) challenge the hypothesis that the Interlanguage-Speech Intelligibility Benefit (ISIB) declines with L2 proficiency with an intelligibility measure using a task involving form–meaning mappings at the prosodic level. Contrary to some previous findings, Base-Berk and Bradlow (Chapter 12) report that nonnative speech is more variable in speaking rate than native speech but that a speaker’s first language may not be a potential source of this variability.

Among new insights revealed are the observations that language-dependent and language-specific factors as well as L2 proficiency modulate the transferability of L1 acoustic cues to the acquisition of L2 prosodic features, consonantal features, and the perceived degrees of foreign accents (Chapters 6, 8, 11, 13, and 15). In addition, formation of L2 phonetic categories is a slow process even among early learners (Chapters 7 and 10) and may be influenced by a speaker’s indexical attributes, such as masculinity (Chapter 19). Furthermore, cognitive factors may influence acquisition and processing of L2 at the segment, suprasegment, and discourse levels (Chapters 16, 17, and 20).

Pedagogical Implications

As its predecessor was, the SLM-r remains focused on speech learning at the segmental level in a natural setting; nonetheless, several pedagogical implications for speech learning among adult L2 learners in a classroom setting may be inferred from the model as well as from empirical data from contributing chapters. Only a few are mentioned here. First, owing to differences both in quantity and quality between L1 and L2 input, the SLM-r stipulates that native-like perception and production are virtually unattainable. Thus, the goal of L2 speech learning is not to become indistinguishable from a native speaker but to form a new L2 phonetic

category with acoustic and articulatory specifications that are consistently and reliably distinguishable from those of the closest L1 category. Second, according to the SLM-r, production and perception coevolve, and accurate perception is no longer believed to take precedence over accurate production. As such, production and perception training should proceed in parallel. It should be noted, however, that the two skills draw on the same cognitive resources, so the focus at one time should be on one or the other skill, but not both. Third, both the SLM and the SLM-r maintain that L2 speech learning occurs, not at the abstract phonemic level, but at the “position-sensitive allophonic” level. Thus, exposure to all positional variants of a phoneme is necessary for its mastery. Fourth, though not specified by the SLM or the SLM-r, to detect phonetic divergence between an L2 and the closest L1 sound category, learners’ direct attention is required. That is, learners should be explicitly instructed to allocate their attention to specific L1–L2 phonetic deviations during training. Fifth, different L1 acoustic cues may be transferred to the learning of a novel L2 contrast among learners at different L2 instructional or proficiency levels. For example, it was found that advanced L1 Arabic–L2 learners of English, but not L1 Arabic speakers, approximated native English speakers in their use of amplitude and duration but not of fundamental frequency, despite all three acoustic dimensions being used to signal lexical stress contrast in Arabic. On the other hand, vowel reduction, a phonetic feature not exploited in lexical stress contrast in Arabic, was not transferred to English lexical stress production by either group of Arabic speakers (Chapter 11). Thus, production and perception training materials and methods should be accordingly designed to optimize their outcomes. Finally, besides linguistics features, a speaker’s indexical properties in L1 speech may also affect perceptual representation of phonetic categories formed by L2 learners. For example, it was found that gender typicality of men’s voices exerts a stronger influence on how voiceless fricative consonants are categorized by Japanese listeners than by the English listeners (Chapter 19). This factor should be taken into consideration when L1 speech materials are chosen and included for training.

Acknowledgments

I am in debt to all the contributors for making this volume possible, particularly to Professor James Flege for his mentoring and devotion to research on second language speech learning. For years, Flege worked with single-minded dedication to resolve some of the core questions regarding how second language speech is learned. Like its predecessor, his revised Speech Learning Model (SLM-r) will guide research in this area for decades to come. Professor Ocke-Schwen Bohn also deserves a special thanks. His tremendous contribution and dedication to the field beyond the two chapters in this volume are acknowledged with gratitude.