

# Introduction

**Manuel Díaz-Campos**  
Indiana University

The motivation to organize a conference on Laboratory Approaches to Spanish Phonetics and Phonology comes from the need to share ideas among people working with experimental data to explain the mental representation of sound structure based on such empirical evidence. Data-driven research and interdisciplinary collaborative efforts describe the common trend that motivates the need for intellectual engagement in a conference whose topic is Spanish laboratory research in phonetics and phonology. In the last five years, there has been a growing interest in using experimental methods in Spanish phonology. In the most recent proceedings of the Hispanic Linguistics Symposium and the Conference on the Acquisition of Spanish and Portuguese as First and Second Languages, one can see that many papers use experimental techniques in describing Spanish intonation and segmental phenomena in native speakers and learners of Spanish as a second language. Recently in Europe, there has been the initiative to create a forum, Phonetics and Phonology in Iberia, where the majority of the research presented was also oriented toward laboratory approaches. A book entitled *Prosodies* (Frota et al. 2005) containing papers with a diversity of topics exploring not only phonological and phonetic perspectives in isolation, but also the relationship between the two, has come out this year. The adoption of new perspectives to address old and new issues comes from a demand to create new knowledge without the limitations of working with just one model. Furthermore, the fact that laboratory phonology brings together people from different areas contributes novel and fruitful ways of examining problems in the field.

According to Pierrehumbert, Beckman, and Ladd (2000), the term Laboratory Phonology was used for the first time in 1987 when a conference on the subject was organized at The Ohio State University. This was also the beginning of a book series in experimental phonology edited by Cambridge University Press. This general conference brought together people from different backgrounds in linguistics as well as other disciplines such as psychology, computer science, and speech and hearing sciences. As we can see today, what began in 1987 has expanded and has impacted how we do research in Spanish phonetics and phonology. We can also see people with different backgrounds at the Spanish laboratory conference with the common goal of addressing issues that are not effectively described using traditional methods in phonology. This kind of cooperation among diverse scholars opens the door to original proposals explaining new and old issues in the field with an open mind in an interdisciplinary context. In September of 2004, our Department of Spanish and Portuguese at Indiana University hosted the second meeting of the conference to give continuity to the forum created in 2002 at the University of Minnesota, where the first laboratory approaches conference in Spanish was organized. The proceedings of the first edition entitled *Laboratory Approaches to Spanish Phonology* (Face 2004) consists of papers dealing with intonation, syllables and stress, and segmental constraints.

The investigations included in the present volume are organized into three sections: segmental analysis, intonation and stress, and second language acquisition and pedagogy. First, the segmental analysis section contains 5 papers. Travis Bradley, in his paper entitled *Phonetic Realizations of /sr/ Clusters in Latin American Spanish*, examines /sr/ clusters in different regions of Latin America with the purpose of comparing the realization of /sr/ trills with other syllable initial contexts and of considering the factors responsible for the phonetic patterning of /sr/ clusters in Latin American varieties and other Romance Languages. His findings show that non-trilled rhotics were the most common realization found in his data. Specifically, strident fricative realizations were frequent when preceded by a lingual fricative. He points out that the strict aerodynamic requirements imposed by the lingual fricatives and trills are responsible for the range of /sr/ clusters found in Latin American and Romance varieties. Ryan Shosted and Beatriz Willgohs study whether intervocalic nasals (i.e. [n] [m]) de-occlusivize in order to determine whether these sounds pattern with voiced or voiceless consonants when comparing the effects of spirantization. Their results reveal that gestural reduction found in nasals is somewhat similar to the reduction of voiceless stops but not of voiced stops. They conclude

that de-occlusivization is unlikely to reach phonological status in Spanish. In the third paper, entitled *Increasing Periodicity to Reduce Similarity: An Acoustic Account of Deassibilantion in Rhotics*, Laura Colantoni characterizes rhotics acoustically in data from Argentinean Spanish. The paper also examines the process of loss of assibilant that involves an increase in periodicity whose final result is an approximant rhotic. Colantoni's results reveal that rhotics in Argentinean Spanish form a continuum that ranges from fricatives to approximants. The fricative variants are described as being similar to a new post-alveolar sibilant segment, while the approximant variants are described as being acoustically similar to a trill. Colantoni claims that "increasing the periodicity in a fricative trill may lead to the perception of the trill, even if it is not present." In the article entitled *Methodological Issues in L2 Perception Research and Vowel Spectral Cues in Spanish Listeners' Perception of Word-Final /t/ and /d/ in Spanish*, Geoffrey Stewart Morrison examines whether native Spanish speakers use vowel spectral properties to identify a postvocalic /t/ and /d/ contrast in Spanish in a manner consistent to what has been described for L2 English speakers. Morrison's findings show that subjects were able to correctly identify the targets /bit/ and /bid/ in 70% of cases. He found that a low F2 toward the end of the vowel correlates with /d/ perception. He maintains that Spanish speakers use a low F2 in a vowel as a phonetic cue to distinguishing voicing in a following word-final stop. In his paper *Acoustic and Perceptual Characterization of the Epenthetic Vowel between the Clusters Formed by Consonant + Liquid in Spanish*, Carlos Julio Ramírez studies the acoustic properties of the epenthetic vowel that appears in consonant clusters (e.g. stop + liquid, fricative + liquid, etc.) as well as the linguistic factors triggering this vocalic epenthetic element in natural speech. His results reveal that epenthetic vowels in clusters are more frequent than previously reported. He also found that epenthetic vowels appear in clusters composed of fricative + laterals. In general terms, the duration of these epenthetic vowels seems to be one-third of the full vowel. He also points out that the epenthetic vowels are more common when the first consonant cluster is dental than when it is bilabial, labiodental or velar. Finally, he reports that epenthetic vowels are facilitated by when there is a flap than when there is a lateral consonant in the cluster.

The four contributions in part II study issues related to Spanish intonation and stress from different perspectives, including several data sources from Latin America and Spain. The opening chapter by Erin O'Rourke examines the heights of peaks within broad focus declaratives in Peruvian Spanish. Her analysis also provides an account of linguistic and extra-linguistic factors affecting the realization of peak heights in this variety of Spanish. Her findings reveal a pattern according to which the second pitch accent in an intonational phrase is downstepped for all speakers. Regarding the nuclear position, the results show that it can be upstepped for speakers from both Lima and Cuzco. Her results concerning differences among regional areas and language subgroups reveal the following trends: 1) the Cuzco group favors downstep of nuclear peaks, 2) monolingual Spanish speakers from Cuzco patterned with Lima speakers in not downstepping nuclear peaks, 3) Quechua-Spanish bilinguals favor downstep of nuclear peaks, and 4) native Quechua speakers presented upstep of nuclear peaks. In his article *Rethinking Spanish L\*+H and L+H\**, Timothy Face provides new data examining narrow focus marking in absolute interrogatives in Peninsular Spanish. He further examines the limitations of the current representational system within Autosegmental-Metrical theory in intonational phonology and proposes the inclusion of secondary association tones to accurately convey the three-way distinction characteristic of rising pitch accents in northern Peninsular Spanish. Face's analysis, adapting Prieto's proposal of secondary associations of tones in pitch accents, suggests that there is only one L\*+H since there is no evidence of secondary association of the L pitch accent. Regarding the existence of two types of L+H\*, Face proposes the following: the pitch accent found in narrow focus declaratives is described as having a secondary association of the H to the stressed syllable since F0 is aligned with it. In the case of the L+H\* found in broad focus declarative sentences, it can be realized in the post-tonic syllable. For this lack of specific alignment, Face does not propose secondary association but rather posits a primary association, so that H alignment is unspecified phonologically. Claudia Enbe, Jorge Gurlekian and Yishai Tobin examine the intonation of Buenos Aires Spanish in both normal speech and pathological speech. Particularly, this investigation analyzes pattern of intonation in declarative sentences, Wh-questions, and exclamatory sentences. The general findings reveal that regardless of the differences between natural and pathological speech, the following common patterns emerge: both types of speech maintain the contrastive function of intonation, speakers placed stress in content words in a regular fashion, and participants consistently lowered tone in sentence-final position in declarative sentences and in marked tonal contours in exclamatory and

interrogative sentences. In her paper *Phonetic Cues to Stress and Accent in Spanish*, Marta Ortega-Llebaria examines the differences between the phonetic cues of lexical stress and those of pitch accents. Ortega-Llebaria's findings reveal that pitch, duration, and intensity are phonetic cues used in distinguishing not only between unstressed syllables, accented stressed syllables, and unaccented stressed syllables, but also between accented stressed syllables with or without intonational phrase boundaries. Regarding duration, Ortega-Llebaria found that vowels tended to be longer according to the number of phonological units associated with them. That is, an accented stressed vowel was longer than an unaccented stressed vowel, and an unaccented stressed vowel was longer than an unaccented unstressed vowel. She also maintains that pitch was consistently associated with accent, while intensity was related to stress. She also points out that the presence of an intonational phrase boundary made a difference in a vowel carrying pitch accent, so that this vowel showed a longer duration and a more prominent rise in its F0 contour than an accented vowel in another position. She concludes that previous research analyzing phonetic cues of stress should be revisited given that prosodic structure was not taken into consideration.

The third section of the book is dedicated to issues in second language pedagogy and second language acquisition. Terrell A. Morgan reflects on the body of knowledge produced in Spanish phonology research and its use in the undergraduate curriculum. He points out that recent findings in the field have not made it into the current undergraduate curriculum, creating a divorce between our state-of-the-art knowledge of Spanish phonetics and phonology and undergraduate curricula that keep insisting on teaching the same issues from the past 20 or 40 years. Morgan points out that research showing new variation phenomena and the diversity of the Spanish language across Latin America and Spain should be taken into account in the teaching of Spanish pronunciation. Furthermore, novel perspectives that incorporate new technology devices and new ways of challenging our students with the topics we select and deliver in class should be the common denominator in the Spanish Phonetics and Phonology curriculum at the undergraduate level. His proposal is to make our own research experiences, to the extent possible, coincide with our teaching at the undergraduate level. In her paper *The Acquisition of the Phrase Accent by Beginning Adult Learners of Spanish as a Second Language*, Holly Nibert investigates whether beginning second language learners of Spanish are able to perceive disambiguating H- phrase accents in Spanish intonation contours. She also analyzes whether beginning second language speakers conform to the pattern observed for intermediate and advanced learners, according to which interpretations are less restrictive the earlier the stage of L2 acquisition, as well as whether beginners show transfer from L1. The results of Nibert's paper reveal that beginning learners are able to perceive and interpret H- phrase accents in Spanish. She also found out that their assessment of meaning in this type of utterance is less restrictive than in the case of intermediate learners, where it is less restrictive in turn than for advanced learners. She interprets these results as the product of a continuum in the development of Spanish intonation in learners of Spanish as a second language. Finally, Nibert also found evidence of transfer from the L1, since accurate assessment of complex structures in the L2 was more likely to be found because of the similarity of such structures with English intonation.

As Morgan (this issue) states: "research in Spanish phonetics is on the move." That sentence conveys in a felicitous manner the dynamicity of people working in this enterprise. The organization of the conference and the publication of the present volume exclusively dedicated to laboratory approaches to Spanish Phonetics and Phonology reveals new paths in our field. We certainly hope that the publication of this book will contribute to our current knowledge by providing the necessary tools to pursue more research in the same topics and others that might be related. Questioning and pursuing better ways of understanding old and new issues will guarantee constant intellectual growth, which is the final goal of our academic work. The prognosis for the future of this conference seems to be very good. The University of Toronto is organizing the next meeting in 2006 and future conferences are set to take place every other year through 2010.

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