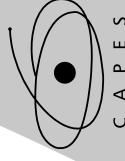

Program of the 4th EICEFALA

Encontro Internacional de Ciencias da Fala
International Meeting on Speech Sciences

Universidade Federal de Minas Gerais



4º. Encontro Internacional de Ciência da Fala

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07 a 09 de outubro de 2013

Belo Horizonte - UFMG

Monday, 07/10/2013

Morning

09:00 – 09:30	Opening and Introductory remarks	Thais Cristóvão Silva Universidade Federal de Minas Gerais
09:30 – 10:30	Language as a Complex Adaptive System	William Wang The Chinese University of Hong Kong
10:30 – 11:00	Coffee break	
11:00 – 12:00	A dynamic approach to orthography-phonology transfer in multilinguals' vowel production	Cintia Ávila Blank Universidade Federal de Pelotas
Oral papers	Contributions of complex adaptive system to first language phonological acquisition	Márcia Cristina Zimmer Daniela Mara Lima Oliveira Guimarães
	Phonological Aspects of the Brazilian Sign Language (Libras): Cognition and Movement	Rosana Passos Universidade Federal de Ouro Preto
		Universidade Federal de Minas Gerais

Afternoon

14:00 – 15:00	Modality and pitch range in nuclear and prenuclear interrogative contours in Brazilian Portuguese: production and perception	Juan Sosa & Izabel Seara Universidade Federal de Santa Catarina
15:00 – 15:25	Listeners' a Pronunciation System for Brazilian Portuguese Speakers English L2 Learners	Gustavo Mendonça Universidade de São Paulo
Oral poster presentation	Simplifying the rhotic system in L2: a case of intralinguistic phonetic drift	Diego Iquillin-Ramirez Universidade Estadual de Campinas
	Analysis of the emergence of palatalization in the English cluster [tr] by native speakers of different dialects of Brazilian Portuguese	Jamília Viegas Rodrigues Victor Hugo Medina Soares ¹
	A phonetic approach to Danish consonant lenition	Marco Aurélio Camargos Universidade Federal de Minas Gerais
	Emergent final consonants in Brazilian Portuguese	Júlia Sales Paez Fernandez Universidade de São Paulo
		Alessandra Mara de Assis Universidade Federal do Tocantins

15:25 – 15:40	Coffee break with poster presentation	
15:40 – 17:00	L1 Phonetic Detail and its Influence on L2 Realization	Clerton Barboza Universidade Federal do Ceará
Oral papers	Quasi-phonemic contrast in Portuguese rhotics	Iris Rennicke University of Helsinki
	The final vowel /e/ produced by speakers from Curitiba	Mateus Renan Dubiela Adelaide Hercília Pescatori Silva
	Evidence of poor speech motor control on stuttering considering dysfluency environment	Universidade Federal do Paraná
		Leticia Correa Celeste Universidade de Brasília
		Vanessa de Oliveira Martins-Reis Universidade Federal de Minas Gerais
16:40 – 17:30	Open Forum: Experimental design	

Tuesday, 08/10/2013

Morning

09:00 – 09:30	Speech production Modelling	Hani Yehia Universidade Federal de Minas Gerais
09:30 – 10:30	Linguistics working hand in hand with technology: speech products derived from the dialog between linguists and engineers	Andréia Schurr Rauber Appen Butler Hill
10:30 – 11:00	Coffee break with poster presentation	
11:00 – 11:30	Use of Empirical Mode Decomposition for Analyzing the LPC Residue: Application in Speech Morphing	Vinicius Naves Rezende Faria Universidade Federal de Uberlândia
Oral poster presentation		Fabien Milloz, Hani Camille Yehia, Rafael Laboissiere

	Auditory Perception Effects of Transient Modeling Applied to Stop Consonants Bursts	Thiago Campolina Universidade Federal de Minas Gerais
	On the Acquisition of the Perception of Mid-vowels in Brazilian Portuguese by L1 Speakers of American English	Victor Hugo Medina Soares Universidade Federal de Minas Gerais
	Vowel variability and dispersion in L1 and L2: a case study	Adriana Marusso Universidade Federal de Ouro Preto
	Cross-linguistic effects on voice quality: an investigation on Brazilians' production of Portuguese and English	Ana Paula Periu Ferreira Engelbert Adelaide Hercília Pescatori Silva
	Frequency Effects and the Reduction of Brazilian Portuguese Gerund	Universidade Federal do Paraná
		Katiene Rozy S. Nascimento Wilson Júnior de A. Carvalho
		Clerton Barboza Universidade Estadual do Ceará
		Universidade Federal do Ceará
11:30 – 12:00	Open forum on language and technology	

Afternoon

14:00 – 15:00	Investigating the categorical aspects of speech perception: behavioral and neurophysiological experiments	Rafael Laboissiere Universidade de Lyon
15:00 – 16:00	Emergence of abstract phonological categories from probabilistic phonotactics	Eleonora Albano Universidade Estadual de Campinas
16:00 – 16:30	Coffee break	
16:30 – 17:30	VOT patterns: perception and production data by Brazilian learners of English	Ubiratã Kickhöfel Alves Universidade Federal do Rio Grande do Sul
Oral papers		Márcia Cristina Zimmer
	Perception and Production of the English CVC Syllable by Brazilian Learners: The Role of Instruction, Orthography, and Phonological Environment	Rosane Silveira Universidade Federal de Santa Catarina
	Investigating the Intelligibility of L2 Vowels: Effects of Spectral Proximity and The Role of Listeners' L2 Proficiency	Alison Roberto Gonçalves Rosane Silveira
		Universidade Federal de Santa Catarina

Wednesday, 09/10/2013

Morning

09:00 – 10:00	Perception, coordination, and the construction of reality	Eric Vatikiotis-Bateson ¹ , Laurel Fais ² , Graham Haber ¹ , Rubin ³ Linguistics, Univ. British Columbia, Canada; ² Psychology, U British Columbia, Canada; ³ Haskins Labs, USA
10:00 – 10:30	Coffee break	
10:30 – 11:30	The pronunciation of English word-final clusters occurring in suffixed and non-suffixed words	Fernanda Delatorre Rosane Silveira
Oral papers	Acoustic study of poststressed high vowel lenition in Brazilian Portuguese	Universidade Federal de Santa Catarina
		Francisco Meneses Eleonora Albano
	Gestural Representation for Laterals in Brazilian Portuguese	Universidade Estadual de Campinas
		Adelaide Hercília Pescatori Silva
11:30 – 12:00	Open forum on Labs set up and development	Universidade Federal do Paraná

Afternoon

14:00 – 16:00	Language: from Birth to Senescence	William Wang The Chinese University of Hong Kong
16:00 – 16:30	Coffee break	
16:30 – 17:30	Open forum: Establishing partnerships	
17:30	Closing remarks	

Contents

1 Editor's introduction	5
2 Plenary Speakers	6
Language as a Complex Adaptive System <i>William Wang</i>	7
Language: from Birth to Senescence <i>William Wang</i>	7
Investigating the categorical aspects of speech perception: behavioral and neurophysiological experiments <i>Rafael Laboissière</i>	7
Modality and pitch range in nuclear and prenuclear interrogative contours in Brazilian Portuguese: production and perception <i>Juan Manuel Sosa and Izabel Christine Seara</i>	7
Perception, coordination, and the construction of reality <i>Eric Vatikiotis-Bateson and Laurel Fais and Graham Haber and Philip Rubin</i>	7
Linguistics working hand in hand with technology: speech products derived from the dialog between linguists and engineers <i>Andréia Schurt Rauber</i>	7
3 Papers and Posters	7
Cross-linguistic effects on voice quality: an investigation on Brazilians production of Portuguese and English <i>Ana Paula Petriu Ferreira Engelbert and Adelaide Hercília Pescatori Silva</i>	8

Perception and Production of the English CVC Syllable by Brazilian Learners: The Role of Instruction, Orthography, and Phonological Environment	10
<i>Rosane Silveira</i>	
Vowel variability and dispersion in L1 and L2: a case study	11
<i>Adriana Marusso</i>	
A dynamic approach to orthography-phonology transfer in multilinguals vowel production	13
<i>Cintia Avila Blank and Márcia Cristina Zimmer</i>	
The final vowel /e/ produced by speakers from Curitiba	14
<i>Mateus Renan Dubiela and Adelaide Hercília Pescatori Silva</i>	
Listener: a Pronunciation System for Brazilian Portuguese Speakers English L2 Learners	15
<i>Gustavo Mendonça</i>	
Gestural Representation for Laterals in Brazilian Portuguese	16
<i>Adelaide H.P. Silva</i>	
A dynamic approach to orthography-phonology transfer in multilinguals vowel production	18
<i>Cintia Avila Blank and Márcia Cristina Zimmer</i>	
Evidence of poor speech motor control on stuttering considering dysfluency environment	19
<i>Leticia Correa Celeste and Vanessa de Oliveira Martins-Reis</i>	
Self-awareness and noticing in L2 speech learning	20
<i>Hanna Kivistö-de Souza</i>	
Effects of Spectral Proximity on Vowel Intelligibility and the Role of Listeners' L2 Proficiency	21
<i>Alison Roberto Goncalves and Rosane Silveira</i>	
Quasi-phonemic contrast in Portuguese rhotics	23
<i>Iris Rennie</i>	
Simplifying the rhotic system in L2: a case of intralinguistic phonetic drift	25
<i>Jiquilin-Ramirez, Diego</i>	
VOT patterns: perception and production data by Brazilian learners of English	27
<i>Ubiratã Kickhöfel Alves and Márcia Cristina Zimmer</i>	

Reaction time and reading fluency perception: a multilanguage study	29
<i>Leticia Correa Celeste , César Reis , Muriel Lalain , Alain Ghio and Luciana Mendonça Alves</i>	
Early Detection of Dyslexia Through Categorization Tests	31
<i>Brígida Maris Franco Barbosa and Hani Camille Yehia</i>	
Emergent final consonants in Brazilian Portuguese	33
<i>Alessandra Mara de Assis</i>	
The palatalization emergence in the English cluster [tr] by native speakers of two Brazilian Portuguese dialects	34
<i>Jamila Viegas Rodrigues , Marco Aurélio Camargos and Victor Hugo Medina Soares</i>	
Use of Empirical Mode Decomposition for Analyzing the LPC Residue: Application in Speech Morphing	36
<i>Vinicius Naves Rezende Faria , Fabien Millioz , Hani Camille Yehia and Rafael Laboissière</i>	
Phonological Aspects of the Brazilian Sign Language (Libras): Cognition and Movement	38
<i>Rosana Passos</i>	
Frequency Effects and the Reduction of Brazilian Portuguese Gerund	40
<i>Katiene Rozy S. Nascimento and Wilson Júnior de A. Carvalho</i>	
Acoustic study of poststressed high vowel lenition in Brazilian Portuguese	41
<i>Francisco MenesesEleonora Albano</i>	
L1 Phonetic Detail and its Influence on L2 Realization	43
<i>Clerton Barboza</i>	
A phonetic approach to Danish consonant lenition	45
<i>Júlia Sales Paez Fernandez</i>	
Contributions of complex adaptative system to first language phonological acquisition	46
<i>Daniela Mara Lima Oliveira Guimarães</i>	
Recurrence probability density entropy as an acoustic correlate of roughness	47
<i>João Pedro Hallack Sansão , Maurílio Nunes Vieira and Hani Camille Yehia</i>	
Zipfian Entropy	48
<i>Leonardo Carneiro de Araujo , Thaïs Cristófar-Silva and Hani Camille Yehia</i>	

The pronunciation of English word-final clusters occurring in suffixed and non-suffixed wordss	49
<i>Fernanda Delatorre and Rosane Silveira</i>	
Neuroscience and Education: On Semiotic Practices and the Teaching of Brazilian Literature	50
<i>Emiliane Moraes Silva</i>	
On the Acquisition of the Perception of Mid-vowels in Brazilian Portuguese by L1 Speakers of American English	51
<i>Victor Hugo Medina Soares</i>	
Auditory Perception Effects of Transient Modeling Applied to Stop Consonants Bursts	53
<i>Thiago A. M. Campolina , Mrio Uliani Neto , Leandro C. T. Gomes , Thas Cristfaro Silva , Mauricio A. Loureiro and Hani C. Yehia</i>	
An experimental study on the perception of stress patterns in Brazilian Portuguese	54
<i>Maria Cantoni</i>	

Cross-linguistic effects on voice quality: an investigation on Brazilians production of Portuguese and English

Ana Paula Petriu Ferreira Engelbert Adelaide Hercília Pescatori Silva

Abstract

When we speak a foreign language (L2), we almost certainly sound different from how we sound in our native language (L1). Thus, the aim of this study was to compare voice quality when Brazilians speak their native language, Brazilian Portuguese (BP), and English as L2, in order to verify what changes in their voices when they speak different languages. Laver (1980, p.1) describes voice quality as the characteristic auditory coloring of an individual speakers voice. According to Abercrombie (1967, p. 91), voice quality refers to those characteristics which are present more or less all the time that a person is talking: it is a quasi-permanent quality running through all the sound that issues from his mouth. Esling (2000) claims that each language has its own pattern of physiological behavior in which articulators are trained to operate in different ways based on the languages phonetic constituent. As a result, it is expected that speakers use different voice qualities when speaking different languages. In order to assess these features, the present study compared L1 and L2 speech production, analyzing intra-speaker variation in voice qualities with the aid of perceptual and acoustic instrumental analysis. To test methodological choices on speakers and text types, a pilot study was carried out. Data consisted of three Brazilian proficient speakers of English performing a reading task in Portuguese and English, with three repetitions, recorded in a room with soundproof. Also, an English native speaker was recorded performing the same task in both English and Portuguese. The acoustic analysis was based on LTAS measures, f_0 , spectral slope, H1-H2 and noise-to-harmonics ratio, and was done with the aid of the free software Praat (Boersma and Weenink, 2012). Preliminary results show different LTAS values, greater inclination of the spectral slope for L2 than the L1, and higher f_0 in L2 than in L1. Therefore, there seems to be a tendency concerning the differences in voice quality when Brazilians speak Portuguese and English.

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Perception and Production of the English CVC Syllable by Brazilian Learners: The Role of Instruction, Orthography, and Phonological Environment

Rosane Silveira

Abstract

In English, all consonants except /h/ can appear in syllable-final position. Conversely, in most Brazilian Portuguese dialects, only a few consonants are permitted in syllable-final position: rhotic sounds (ter have), nasal consonants (som sound), the alveolar lateral (mal bad), and sibilants (dois two). However, even these are rather marginal in the coda: the rhotic variants tend to be deleted (ter [te]); the /l/ is mostly realized as the glide [w], (mal [maw]); the nasals lose their consonantal feature with the preceding vowel diphthongizing and assimilating the nasal feature (som [sõw]; leaving only the sibilants as a final consonant phonetically (dois [dojs]). Due to these constraints on syllable structure, Brazilian Portuguese speakers tend to insert a vowel (generally [i]) to break up cross-syllabic consonant clusters both in the L1 (pacto, pact ['pakitu]) and in the L2 (tape ['tejpi]). The present research investigates the relationship between perception and production of word-final consonants in monosyllabic CVC words, and how this relationship is affected by explicit instruction, orthography, and phonological environment (pause, consonant, and vowel). The participants of this study were two groups of Brazilian learners registered in the English Extracurricular Courses (level 1) of a Brazilian university. A group of 10 students (control group), and another of 12 (experimental group) participated in this study. The experimental group received instruction based on the pronunciation manual developed for this study, whereas the control group received no instruction regarding the features investigated by the study. The study consists of pretests, followed by a period of instruction, and posttests. For the instructional period, the researcher developed a pronunciation manual containing activities that aim at minimizing the addition of a vowel in the pronunciation of word-final consonants (e.g., name [nejmi]). The pre and posttests were (a) a production test, which consisted of the recording of short sentences containing a target word; and (b) a categorical discrimination test, in which the participants had to discriminate between the CV and CVC syllabic patterns. The results indicate a positive effect of pronunciation instruction on the acquisition of word-final consonants. This effect was highly significant at the production level, but it failed to reach significance at the perception level. Statistical tests also show that the variables orthography and phonological environment influenced the acquisition of word-final consonants.

Vowel variability and dispersion in L1 and L2: a case study

Adriana Marusso

Abstract

This paper presents some preliminary results of a cross-linguistic research project which aims at studying vowel variability and dispersion in Brazilian Portuguese, British (RP) and American (GA) English in native speakers production as well as in foreign learners. The research sets out to answer the following questions: what is the effect of vowel inventory size on the acoustic realization of vowels in a language with a relatively small vowel inventory, Brazilian Portuguese, and in a language with a relatively large one, English; how does variability take place in two varieties of the same language (British vs American English); is there any difference between native speakers and foreign learners variability in English; what is the relationship between vowel variability and speech production context in foreign learners production; is there any difference in vowel space and vowel variability in monolingual and bilingual speakers of Brazilian Portuguese? According to the principles of the Dispersion Theory (Liljencrants and Lindblom, 1972), vowels should be maximally perceptually dispersed from one another; therefore, more extreme vowel qualities should be preferred over less extreme ones. Another principle is that maximization of dispersion is achieved through even spacing between vowels (Ferrari-Disner, 1984). This means that different pairs of adjacent vowels maintain a particular minimal distance between them. The cross-linguistic interpretation of this last principle makes three predictions (Becker-Kristal, 2010). First, there should be an upper limit on the number of vowels in inventories; otherwise, the minimal distance cannot be maintained because the acoustic space is finite. Second, the phonetic realization of the vowels should be rather precise in more crowded inventories, whereas less crowded ones may allow greater variability in phonetic realization without violating the sufficient contrast criterion. Third, inventories with more vowels should cover a larger acoustic space than inventories with fewer vowels. Following this set of principles, it is expected a greater variability in Brazilian Portuguese (with seven vowels) than in English (with eleven). On the other hand, English should cover a larger acoustic area than Portuguese.

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A dynamic approach to orthography-phonology transfer in multilinguals vowel production

Cintia Avila Blank

Márcia Cristina Zimmer

Abstract

The investigation of transfer during speech production among multilinguals is still rather recent, mainly in Brazil, where just a few studies have been carried out so far (Blank, 2008, 2013; Bandeira and Zimmer, 2012, Blank and Zimmer, 2011, Brito, 2010). This study aims to look into multilinguals transfer of graphemic and phonetic-phonological patterns during vowel production. For that purpose, 5 male multilingual speakers of Brazilian Portuguese (L1), Spanish (L2) and English (L3) participated in the study. Their proficiency levels were assessed by validated tests, and they were found to be advanced in Spanish (L2) and intermediate in English (L3). The participants also took part in three tasks, one in each language, taken in different days. In each of the reading aloud tasks, they were asked to read carrier sentences (say word), in which the words were high frequency, selected from linguistic corpora. In addition, as the oral vowels were analysed in each of the three experiments, all the selected words contained the target vowels in the stressed position (e.g. diga bota, diga codo, say dog). In each experiment, each oral vowel was presented in 5 different words, and each word was repeated 5 times. A total of 875 Brazilian vocalic tokens was produced and analysed (7 vowels x 5 words x 5 repetitions x 5 participants). In Spanish, 625 tokens were produced (5 vowels x 5 words x 5 repetitions x 5 participants). Finally, in English a total of 1225 tokens was produced and measured (9 vowels x 5 words x 5 repetitions x 5 participants). In each reading aloud task, the word presentation of was randomized. The participants took the tasks in each language in different days, in order to avoid recency effects and online cross-language transfer. The participants vowels were measured F1, F2, and duration values in the software Praat version 5.3.53 (Boersma, 2013). The vowels produced by the multilingual participants in each language were compared, considering their orthographic and phonetic-phonological similarities. The data were statistically analyzed, and a strong association between L1 and L2 vowels, as well as L1 and L3 vowels, was found. The findings are discussed in the perspective of the Dynamic Systems Theory.

The final vowel /e/ produced by speakers from Curitiba

Mateus Renan Dubiela

Adelaide Hercília Pescatori Silva

Abstract

This research is in the field of Acoustic Phonetics and presents an acoustic analysis of the production of the front vowel /e/ by native speakers from the city of Curitiba, capital city of the state of Paraná, Brazil. Common sense has it that speakers from this region produce a final vowel [e] as one of the main characteristics of this dialect. This research analyses the production of this vowel in dissyllable nouns ending with e by six male speakers, three of them belonging to an older generation and the other three belonging to a younger generation, and six female speakers, with the same generation difference. The choice of the words in the corpus and the subjects was made based on variationist studies that indicate that there is a difference in production between speakers of different genders. These studies also indicate that some influence from surrounding phonological environments might play a role in the production of the final vowel. All of the words from the corpus were presented to the subjects of this research within a carrier sentence and read out loud by the subjects in a sound-proof chamber at the phonetics lab in UFPR. A qualitative and a quantitative analyses were then made. The qualitative analysis presented results that show that subjects from an older generation seem not to have regular patterns within their productions, while younger subjects seem to perform more similar production to one another. There was a greater variability regarding front-back movement of the tongue body for older male subjects. Younger subjects produced some palatalized sounds, while this phenomenon did not occur in the speech of older subjects. Data observed in the qualitative analysis seem to show that there is not any obvious influence from surrounding sounds in the production of the vowel. No subject produced [e] as a final vowel. What can be stated is that the final vowel produced by the informants stands between [e] and [i]. This vowel, however, is more similar to an [i] than to an [e]. The quantitative analysis showed that there is no statistically significant difference for the values of F1, F2, and final vowel duration for different-gender speakers. The only relevant statistic difference shown in the quantitative analysis was that older male speakers vary more in the movement of the tongue body than do younger male speakers. A hypothesis that can be thought of from this research is that an even older generation could have produced a sound very much alike an [e], and that this sound is slowly fading away across the generations and becoming something more similar to an [i]. This was the first research regarding the production of the final vowel /e/ with an acoustic perspective and it is yet preliminary.

Listener: a Pronunciation System for Brazilian Portuguese Speakers English L2 Learners

Gustavo Mendonça

Abstract

Recent surveys have shown that Brazil is among the countries with the lowest knowledge of the English language. In Education First's English Proficiency Index (2012), Brazil ranked 46th out of 54 countries. This poster presents a Masters thesis proposal which aims at developing a tool for improving these indexes. The goal is to build up an ASR-based Pronunciation System for Brazilian Portuguese (BP) speakers English L2 learners. The Pronunciation System proposed herein, called Listener, will be able to provide online feedback regarding the pronunciation of the user. Similar tools are available for other languages, however, for BP, there is still a gap to be explored. The research hypothesis inquires if it is possible to build up an efficient Pronunciation System through: (i) an error classification that takes into account phonetic and phonological transfer from L1 to L2, (ii) an acoustic model that contains speech data from both native speakers and English L2 learners, (iii) a pronunciation dictionary which includes the transcription of the mispronunciations that learners are likely to make, and (iv) a language model befitting the syntax of the learner. Ten mispronunciations will be selected and processed by the Listener. The General American (GA) will be considered the standard accent. The engine Julius (Lee and Kawahara, 2009) is used as the basis of the recognizer. The acoustic model will be built up based on two speech corpora, one containing data of native English speakers: TIMIT Acoustic-Phonetic Continuous Speech Corpus, and another of English L2 learners: COBAI - Corpus Oral Brasileiro de Aprendizes de Ingls. VoxForge Speech Corpus' word list will serve as the basis of the pronunciation dictionary. The transcription of the mispronunciations of the learners will be added to the dictionary, manually, by transformational rules and, automatically, by machine learning algorithms. The language model will be compiled over 99,508 articles from Simple English Wikipedia. Word Error Rate (WER), Character Error Rate (CER) and confusion matrices will be the measurements used to evaluate the performance of the recognizer. The Listener proposed herein aims at allowing the development of Computer-Assisted Pronunciation Training (CAPT) Systems for English.

Gestural Representation for Laterals in Brazilian Portuguese

Adelaide H.P. Silva

Abstract

Collischonn and Silva (2012) present an acoustic characterization of lateral sounds in Brazilian Portuguese (BP), with special focus on alveolar and palatal laterals [l] and [ʎ], in order to investigate the existence of a phonological opposition between the two. Moreover, they tried to investigate the existence of a palatalized lateral [lj], that could led them to another scenario, that is, they had to investigate whether there is indeed a palatal lateral in BP or whether the lateral is a palatalized one, and which of these two sounds are phonologically opposite to the alveolar lateral in pairs such as *filha/fila* (daughter/line) or *lhama/lama* (lhama/mud). The experimental results point out to the existence of the three sounds: the palatal lateral, as already described by Silva (1999), as well as the alveolar lateral [l], but we also noticed the presence of a palatalized lateral [lj] in the data. Collischonn and Silva (2012) show that the main difference between the palatal lateral and the palatalized version of the lateral lays on F2 fequency values, as well as on the transitions from the preceeding vowel to the lateral and from the lateral to its following vowel. In the palatalized lateral, these acoustic events are much shorter than in the palatal lateral. Moreover, Collischonn and Silva (op.cit.) argue that the palatal lateral is produced in a context that triggers hyperarticulation, i.e., [ʎ] appears mainly in word initial position, in the stressed syllable of the word, and in loanwords, such as *lhama* and *lhasa*. It is worthy adding that the majority words carrying the palatal lateral in initial position are loanwords, a fact that can reinforce the hypothesis of sound hyperarticulation in that context. Taking these findings into account, we argue here that there is an interface between the segmental and the prosodic levels of the language, and that this interface plays a central role on the speakers choice of the lateral sound they use in a particular context, i.e., [ʎ] or [lj]. Thus, the production variability is grammatical in nature and must, henceforth, be represented in the grammar of BP. We assume that a dynamical representation, in terms of Gestural Phonology (Browman and Goldstein, 1992), can account adequetly for such facts. This paper, then, aims at presenting a first proposal of a gestural representation for laterals in BP, with special attention to the palatal/palatalized distinction. We depart from the perspective that laterals are formed by a gestural constellation and that the phasing relations between the gestures that constitute the laterals engender different lateral sounds, as revelead by the acoustic analysys. In these terms, the phonological distinction is not entailed by categorical and distinct units, but by the same dynamical units that arrange themselves differently in time.

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A dynamic approach to orthography-phonology transfer in multilinguals vowel production

Cintia Avila Blank

Márcia Cristina Zimmer

Abstract

The investigation of transfer during speech production among multilinguals is still rather recent, mainly in Brazil, where just a few studies have been carried out so far (Blank, 2008, 2013; Bandeira and Zimmer, 2012, Blank and Zimmer, 2011, Brito, 2010). This study aims to look into multilinguals transfer of graphemic and phonetic-phonological patterns during vowel production. For that purpose, 5 male multilingual speakers of Brazilian Portuguese (L1), Spanish (L2) and English (L3) participated in the study. Their proficiency levels were assessed by validated tests, and they were found to be advanced in Spanish (L2) and intermediate in English (L3). The participants also took part in three tasks, one in each language, taken in different days. In each of the reading aloud tasks, they were asked to read carrier sentences (say word), in which the words were high frequency, selected from linguistic corpora. In addition, as the oral vowels were analysed in each of the three experiments, all the selected words contained the target vowels in the stressed position (e.g. diga bota, diga codo, say dog). In each experiment, each oral vowel was presented in 5 different words, and each word was repeated 5 times. A total of 875 Brazilian vocalic tokens was produced and analysed (7 vowels x 5 words x 5 repetitions x 5 participants). In Spanish, 625 tokens were produced (5 vowels x 5 words x 5 repetitions x 5 participants). Finally, in English a total of 1225 tokens was produced and measured (9 vowels x 5 words x 5 repetitions x 5 participants). In each reading aloud task, the word presentation of was randomized. The participants took the tasks in each language in different days, in order to avoid recency effects and online cross-language transfer. The participants vowels were measured – F1, F2, and duration values – in the software Praat version 5.3.53 (Boersma, 2013). The vowels produced by the multilingual participants in each language were compared, considering their orthographic and phonetic-phonological similarities. The data were statistically analyzed, and a strong association between L1 and L2 vowels, as well as L1 and L3 vowels, was found. The findings are discussed in the perspective of the Dynamic Systems Theory.

Evidence of poor speech motor control on stuttering considering dysfluency environment

Leticia Correa Celeste

Vanessa de Oliveira Martins-Reis

Abstract

Purpose: duration of voiceless stops consonants was examined and compared in Brazilian Portuguese speakers who stutter and those who do not, focusing on two different moments of speech: fluent and pre-dysfluent environments. Methods: The 20 participants in this study were recorded and divided in two different groups: 10 in the experimental group (PWS) and 10 in the control group (non-stutterers). All were males between the ages of 20 and 45. The data were transcribed and segmented for acoustic analysis, and tokens of Brazilian Portuguese voiceless stops /p/, /t/ and /k/ were extracted. Tokens were classified according to whether they were produced by people who stutter (PWS) or by people who do not stutter (PWnS), and according to their environment in speech (i.e., in fluent speech and pre-dysfluency). The Friedman and Wilcoxon tests were used for comparisons within groups, and the Mann-Whitney test was used in intergroup comparisons. Statistical analyses were executed using SPSS 14.0 with the significance level set at $\alpha = .05$. Results: An analysis of the effects of speech environment (PWnS, PWS fluent and PWS pre-dysfluent) showed that most p values demonstrate a statistically significant difference: In pre-dysfluent speech, the stuttering group showed higher durations for all measurements (total duration, VOT, and occlusive duration) taken for each voiceless stop. After passing through a moment of dysfluency, however, stuttering speakers VOT returns to measures more similarly to non-stuttering speakers, but with some interesting features: Fluent /p/ measurements are similar to those for PWnS; for the fluent production of /k/, the occlusion time of PWS is much larger than PWnS, compensating for the reduced VOT in determining the phone duration; and finally, the VOT duration of non-stuttering speakers followed the order attested in the literature (/p/ i/t/ i/k/), while in stuttering speech the VOT duration of /t/ tended to be smaller than that of /p/. Conclusion: In pre-dysfluent speech, PWS produces elongated VOT than PWnS. The implications of these results for speech motor control are discussed. Considering that none of the subjects in this study had participated in speech therapy, the results encourage further investigation into whether speech therapy might affect the temporal consonant features described here.

Self-awareness and noticing in L2 speech learning

Hanna Kivistö-de Souza

Abstract

This paper examined explicit phonological awareness in intermediate learners of English. According to the Noticing Hypothesis (Schmidt, 1992), in order to learn a linguistic structure in the second language (L2), this structure has to be first noticed. Applying this notion to the realm of L2 pronunciation acquisition, the speaker has to notice the L2 specific segmental and suprasegmental features in order to learn how to produce them accurately. Discovering what pronunciation features L2 learners notice and perhaps more importantly, what they do not notice has important implications for L2 phonological training in helping the instructor to draw the students attention to relevant features.

The following research questions were posed: How aware are L2 learners of their own pronunciation mistakes? What kind of pronunciation mistakes L2 learners are able to notice in their own production?

64 Spanish/Catalan bilingual EFL learners recorded themselves reading aloud five English sentences. They then compared their pronunciation to a native speaker recording and wrote in detail about the differences they could notice. The participants pronunciation mistakes were marked and categorized. Subsequently the comments were analyzed and compared to the recordings in order to determine what aspects were noticed. The results revealed a serious mismatch between the pronunciation mistakes that were made and the mistakes that were noticed. The learners were most aware of errors in rhythm and intonation, whereas the awareness of segmental errors was extremely low.

The results suggest that a substantial amount of pronunciation errors goes unnoticed in L2 learners. This should be taken into account in the EFL classroom through the use of consciousness-raising activities. In addition, the findings offer support to the idea that L2 phonological awareness is verbalized with difficulty.

Keywords

self-awareness; phonological awareness; L2 pronunciation teaching

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Effects of Spectral Proximity on Vowel Intelligibility and the Role of Listeners' L2 Proficiency

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Rosane Silveira

Abstract

Intelligibility has been proposed as one of the main goals of pronunciation instruction (Derwing and Munro, 2005; Munro and Derwing, 2011). In addition, there has been much discussion regarding which phonological aspects need to be taught in order for intelligibility to be promoted (Jenkins, 2002; 2012; Munro and Derwing, 2006;). The present paper reports preliminary results of an ongoing MA study which assesses the intelligibility of English high front vowels. The speakers were 20 Brazilians enrolled at two level-one groups from an extension course, who recorded sentences containing a carrier word with either the vowel /æ/ (ex.: peak) or /i/ (ex. pick). To look at how vowels are organized in the speakers interlanguage and, thus, to select the tokens for the intelligibility test, normalized (Adank et al., 2004) and non-normalized plots were obtained using F1 and F2 values. To test for vowel quality effects on intelligibility, a criterion based on spectral proximity was set. The intelligibility test contained tokens of [æ] and [i] with F1 values that are typical of English native speakers productions, as well as values that deviate from the mean obtained from Rauber (2006), and thus, which are typical of Brazilian-Portuguese speakers of English interphonology. Intelligibility was measured through word transcription, and the listeners were 32 speakers of English from 10 different L1 backgrounds. Moreover, effects of listeners L2 proficiency on intelligibility were tested (Bent and Bradlow, 2003; Hayes-Harb et al., 2008). Regarding the acoustic analysis, results indicate that high front vowels were produced as equivalent vowels and tended to overlap. When it comes to intelligibility assessment, the tense vowel caused most of the intelligibility problems as it was generally misjudged by its lax counterpart. The F1 criterion had no effects on intelligibility assessment, which attested for a general tendency for listeners to rely on temporal cues. In a qualitative analysis, taking into consideration the carrier word containing each vowel, it was found that other phonological processes present in the carrier words, such as consonant devoicing and palatalization, hindered intelligibility more often than vowel quality. Listeners proficiency had a positive effect on vowel intelligibility. As the proficiency level increased, so did the number of listeners correct responses in the intelligibility test.

Keywords

acoustics, vowel intelligibility, listeners proficiency.

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Quasi-phonemic contrast in Portuguese rhotics

Iris Rennicke

Abstract

Currently there is no consensus over the phonemic status of rhotics in Iberian Romance languages. Authors proposing two underlying phonemes need to account for the limited nature of the contrast (meaning-differentiating only intervocalically), whereas a one-phoneme analysis faces the problem of explaining two contrasting intervocalic variants. The one-phoneme analysis for rhotics is valid for an earlier stage, Latin, which had single vs. geminate rhotics. (Hualde 2004)

In most varieties of Portuguese, syllable-initial rhotics are back (uvular/glottal) fricatives (rato, carro, honra, guela). Alveolar taps occur intervocalically (caro) and in consonant clusters (trigo). There is considerable variation in syllable coda (carta, mar): depending on the variety and speech style, coda rhotics can be alveolar taps, alveolar or retroflex approximants, or back fricatives. In a variety with approximants or fricatives in word-final coda, the tap appears in plurals (mar [maɾ] [mah], but mares [ˈmaɾɨs]) and generally when the rhotic is followed by a vowel (mar azul [maɾaˈzuw]). In addition to this allophonic overlap in coda across varieties and in different phonological contexts, Brazilian Portuguese exhibits overlapping in rhotics following vocalized laterals (guela [ˈgɛwɐ] [ˈgɛwɾɐ]) (Oliveira and Cristófaros-Silva 2002) and intervocalically in certain lexical items (e.g. besouro [bizoru] [bizohu]).

The aim of this presentation is to discuss the overlapping of allophones in terms of quasi-phonemic contrast (Ladd 2006; Mompeán 2004; Hualde 2004) and to offer a means of representing this phenomenon. The cited cases of overlapping cannot be accommodated in the classical view on phonemic contrast which implies that a contrast in any phonological context (in this case, intervocalically) implies contrast in all other contexts (Ladd 2006). Similarly, research has shown that the archiphoneme is not a psycholinguistically plausible concept in explaining neutralization since speakers seem to categorize "neutralized" sounds as belonging to one of the "neutralized" categories (Mompeán 2004).

If the phonology of a language is seen as an emerging network of cognitive categories that are constantly shaped by language use (Bybee 2001; Pierrehumbert 2001; Mompeán 2004), the back fricative and the alveolar tap can be seen as two different sound categories in Portuguese. These categories tend to occur in specific contexts (see above), but cases of overlapping demonstrate that the category boundaries are fuzzy. We propose that there is a category of rhotic phones in Portuguese that cannot be specified in terms of shared phonetic features, and that consists of at least two main phonemes in most varieties. As the single vs. geminate contrast of Latin disappeared and the resulting Portuguese rhotics were subject to backing and lenition, the alternates of these phoneme categories have come to overlap in certain contexts, creating a

quasi-phonemic contrast. Phonemes may show a continuum of overlap depending on the dialect, the style and the speaker (Hualde 2004), as is the case in Portuguese, and the extent of the overlap may determine their categorization for a given speaker.

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Simplifying the rhotic system in L2: a case of intralinguistic phonetic drift

Jiquilin-Ramirez, Diego

Abstract

In spite of its growing size, the literature on phonological acquisition in adults (Flege 1987, 1995; Best 1995; Best et al 2001; Khul and Iverson 2001) generally focuses on the effects of L1 on L2, neglecting system internal pressures within the new language. The present research addresses intralinguistic changes in L2.

We have investigated a case of phonetic drift in native speakers of Peruvian Spanish (PeS) acquiring Brazilian Portuguese (BP) rhotics.

With this goal we recorded three native speakers of PeS from Lima (Peru). In addition to the main participants, we recorded the speech of a bilingual subject: his L1's is BP his L2's is Paraguayan Spanish (PaS). The data were collected longitudinally, in three steps, for the three target-subjects.

The corpus consisted of: i) Portuguese-Spanish cognate words with a common rhotic to both languages (e.g. *recado* 'message', *tarde* 'afternoon'); ii) Portuguese-Spanish cognate words with a Spanish back fricative and a Portuguese post-alveolar fricative (e.g. *gigante* 'giant', *gente* 'people') and iii) distracting cognate words (e.g. *maleta* 'bag').

The analysis consisted of counting the relative frequency of instrumentally identified allophones and subsequently classifying them for constriction location (coronal, velar or glottal) and voicing (total, partial or zero).

In onset position, the results show that learners pronounced voiced back fricatives. This fact contradicts expectations based on linguistic transfer/interference, since voiceless fricatives and trills are expected for this environment in PeS.

In coda position, back fricatives account for approximately 50% of relative frequency. In this position, voicing is even greater than that obtained in onset position. These facts contradict expectations based on exposition or imitation (Sancier and Fowler 1997), since the control subject pronounced retroflex approximant. Thus, for both positions, the phonetic drift is characterized by the predominance of posterior gestures and voicing. The predominance of the tongue dorsum gesture increased according to the exposure time to BP, supporting the hypothesis that this is an intralinguistic phenomenon.

To sum up, the learners seek to minimize the distance between onset and coda positions in L2. This, in turn, simplifies the rhotic subsystem in L2. Finally, in order to improve this work, an analysis of the spectral moment of back fricatives in both languages is under way.

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VOT patterns: perception and production data by Brazilian learners of English

Ubiratã Kickhöfel Alves

Márcia Cristina Zimmer

Abstract

Departing from a dynamic conception of language acquisition (Browman and Goldstein, 1992; Debot et al., 2007), in this study we present the final results of a research project aiming to investigate the perception and production of VOT patterns by Brazilian L2 learners of English. In Alves and Zimmer (2011), we presented the preliminary results of a pilot study carried out in this project. The results of this pilot study showed that, despite its importance, VOT might not be the main acoustic cue employed by Brazilian learners in voicing distinctions, unlike what happens among L1 speakers of English (Schwartzhaupt et al., 2013). These results have already been found in other language systems, such as Canadian French (Sundara, 2005) and Japanese (Kong et al., 2012). Following the preliminary results of this pilot study, we have built two perception tests (Identification and AXB Discrimination) as well as a production test. In both the Identification and Discrimination Tasks, learners were tested on the three VOT patterns found in English (Negative VOT and Zero VOT, which occur variably in /b/, /d/, /g/, and positive VOT, which is found in /p/, /t/, /k/). In these tests, we also included a manipulated pattern (Artificial Zero VOT), which was built as we cut off the aspiration of /p/, /t/ and /k/ produced by native speakers of English, so that a hybrid consonant showing a Zero VOT pattern, besides other acoustic cues that are typical of aspirated consonants (such as burst intensity and F0 transitions), could result from this manipulation. In the production test, learners were asked to read a list of target words initiated by /p/, /t/, /k/, /b/, /d/, /g/, which were presented individually on a PowerPoint presentation. The instrument consisted of two words for each of the target consonants, and each one of these words was produced twice. Thirty-five participants took part in the experiment. All learners took the Oxford Placement Test Online, which placed them in two groups: elementary (25 learners) and advanced (10 participants). The results of this study show that, in terms of production of /p/, /t/, /k/, more advanced learners are able to present longer VOT intervals, even though the VOT values found in their productions are still lower than those found among native speakers of English (cf. Cho and Ladefoged, 1999). The data obtained from the perception task confirm the previous hypothesis established in the pilot test (Alves and Zimmer, 2011): Negative and Natural Zero VOT are perceived as voiced stops, whereas Positive and Artificial VOT tend to be identified and discriminated as voiceless, despite the absence of aspiration in the latter. The results described above lead us to the conclusion that, as far as voicing distinctions are concerned, VOT tends not to be the most important cue followed by Brazilian learners of English. This status of VOT as a supplementary cue might play a role in learners productions, since learners might

not regard aspiration as a vital aspect for intelligibility in the target language. The results obtained in this research project, therefore, confirm the dynamic status of speech perception and production, according to which acoustic cues do not act individually, but reinforce one another in the establishment of the sound contrasts of a given language system.

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Reaction time and reading fluency perception: a multilanguage study

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Luciana Mendonça Alves

Abstract

Reaction time can be defined as the duration (in seconds or milliseconds) between the presentation of a given stimulus and its response to this stimulus. This technique has been used in several studies to determine how much time the brain needs to process a stimulus and react to it. Within the linguistic studies, specifically in reading, some studies have been developed from the reader perspective. But when it comes to reading fluency, the role of the listener is also important. In the case of students, the teacher is the figure that assesses reading fluency. Such evaluation takes into account speech segmental and non-segmental features. Some questions can be made from this point: does brain processes faster a more fluent reading? When the listener does not have the language knowledge, consequently having only prosodic clues, is it possible to detect an increase in reaction time? Based on these questions, the purpose of this study are: a) To verify the reaction time of Brazilian and French judges during evaluation of fluency reading in Brazilian children with different degrees of fluency, and b) compare the reaction time in the evaluation of reading fluency of Brazilian and French judges. Methods: The methodology consisted of the presentation of sentences extracted from the text reading by normal developing readers to judges who should classify each extract according to Multidimensional Reading Fluency Scale, adapted from the proposed by Rasinski (1991)¹. This scale assesses important points of fluency in reading, especially the prosodic aspects. Samples of 3 different sections of the reading of 10 dyslexic children and 10 normal developing readers of the same age and education (mean age 9.5 years), all native speakers of Portuguese, were randomly and blindly presented to 20 judges, 10 of them Brazilian judges and 10 French judges. The French judges analyzed only the suprasegmental parameters, since they were not able to understand the content of the reading. All judges of both nationalities were students of graduate courses related to language studies. The experiment was run at Perceval software. Each extract heard by the judges should be classified (noting the characteristics outlined in the scale scores from 1(very abnormal) to 4 (normal), according to the specifications given for each score) on the following items: A. Expression B.Phrasing, and C.Smoothness D.Pace. From the responses, it was possible to create subject areas to be discussed. Results: three groups were selected based on judges responses: poor readers, median readers and fluent readers. As for Brazilian judges reaction time, the duration in increasing order was: fluent readers (18409ms), poor readers (23118ms) and median readers (40337ms), with statistically significant difference when comparing the answers of fluent readers and median readers ($p = 0.000$) and of fluent readers and poor readers ($p = 0.02$)

and almost significant difference when comparing responses between median and poor readers ($p = .05$). The sequence in increasing order obtained by French judges is: fluent readers (26333ms), median readers (34866ms) and poor readers (33619ms), no statistically significant difference between the responses to median and poor readers ($p = 0.3$), but a statistically significant difference in the responses to fluent and poor readers ($p = 0.008$) also fluent and median readers ($p = 0.000$). Conclusion: there is a tendency of shorter duration in processing reading evaluation of fluent readers. When comparing judges who have knowledge of the segmental features (Brazilian judges) to those without this knowledge (French judges), it was clear that judges who know the language can process the evaluation faster only for poor or fluent readers.

Early Detection of Dyslexia Through Categorization Tests

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Hani Camille Yehia

Abstract

OBJECTIVE: Analysis of categorization tests as a means for early detection of dyslexia (specific reading disorder). **METHODS:** MorPhala, a morphing tool under development at CEFALA to generate sounds intermediate between two predefined speech utterances, has been used to generate perceptually natural stimuli, which were categorized by dyslexic and non-dyslexic subjects. This work contains a descriptive and comparative study of cases and controls developed in three stages: (i) categorization tests in 52 individuals, 7 to 17 years old, 24 dyslexic and 28 non-dyslexic; (ii) categorization tests in 75 pre-school children, 3 to 6 years old; and (iii) comparison of the results in order to check the differences between the groups and investigate the possibility of using such differences for the early detection of dyslexia. The following procedures were performed prior to data collection: anamnesis, addressing characteristics of language and learning and a history of the subject; meatoscopy check for obstruction of the external ear, and hearing screening to confirm hearing within normal limits. Inclusion criteria were absence of neurological, cognitive or psychological disorders, visual impairment and peripheral auditory deficits, as well as the diagnosis of dyslexia confirmed by a specialist - a neurologist or psychiatrist - in the case of the group with dyslexia. The use of drugs or the diagnosis of attention deficit disorder and hyperactivity in comorbidity with dyslexia were not taken as exclusion criteria. Participants were assessed individually in a quiet environment with noise level below 40 dB SPL. Each subject heard two sets of sentences whose target words addressed the transition between the vowels /a/ and /e/, and were forced to point out the picture corresponding to the word heard. For each pair of figures, there were 17 different stimuli, each repeated five times for a total of 85 stimuli presented in random order. Each participant took on average 15 minutes to complete the test. Psychometric categorization curves, modeled by the sigmoid function, were traced for each answer. The values of the slope of the curve at the inflection point were taken as the independent variable of analysis. Large slopes (above 50 degrees) indicated the categorization ability of intermediate sounds, while small slopes (below 40 degrees) indicated failure of categorization. **RESULTS:** The analysis factor used was the group of individuals: dyslexic vs. non-dyslexics vs. preschool children. The subjects were considered as a random factor. The average age of the participants diagnosed with or without dyslexia was 10 years and of the preschool children was 4.9 years. The results indicated a strong tendency of non-dyslexic individuals to categorize sounds better: while 54% of the group without dyslexia showed clear categorization capacity, only 29% of the individuals with dyslexia had such performance. The categorization curves obtained for pre-school children can be used to define those who already

have developed the ability to categorize (31%), but cannot be used to diagnose them with respect to dyslexia. CONCLUSION: The test used in the study contributed to the verification of the development of the ability of children to categorize sounds. It was also verified that such ability is an evidence of absence of dyslexia ($p = 0.08$). It cannot be affirmed yet that a child who has not yet developed this hearing ability is dyslexic. It is known that, in general, auditory skills for the processing of sound and phonological awareness develop gradually until to the age of 7 years. Thus, a longitudinal study in children who are unable to categorize the sounds is important to consolidate the results obtained.

Emergent final consonants in Brazilian Portuguese

Alessandra Mara de Assis

Abstract

This work aims to present and discuss the results of a pilot project conducted in the city of Araguaína, north of the state of Tocantins; where traces of emergent final consonants are found. The pilot is still in its initial phase, but consonants other than sibilants are produced by the informants closing syllables that were once open and followed by a CV syllable. In the region where the study is being conducted few consonants are produced by natives in the position of coda and some, like the velar *r* are even being lost. Words like *favor* (favor) are pronounced in a great number of times like *favo* and that could mislead us to the conclusion that different consonants wouldnt emerge in this position, the pilot project, however, is pointing to the opposite direction and indicating new consonants in the position. The consonants /v/ and /p/ are two examples of the emergent consonants found in this study and words like *trave* (goalpost) and *príncipe* (prince) were pronounced like *tra/v/* and *princi/p/*. In order to investigate and analyze such phenomenon we will rely on the Usage-Based Phonology (Bybee (2001)), and Pierrehumberts Exemplar Model (2001) as we take into consideration that the word is the basic element of mental representation and not the sound itself as it was established by traditional phonology. Exemplar Model Theory expresses that the users of a language have implicit knowledge of phonetic details, and the data of this pilot project converges with this idea as the informants make use of them when producing every other word and, if the first conclusions are confirmed in the long run this research will strengthen the idea that sound changes are not undone. The fundamental ideas of the Usage-Based Phonology are to be reinforced throughout the research as the initial collected data and the analysis have already displayed evidences that support the concepts of such theory as the one establishing that categorization is based on identity and similarity; which can be sustained by examples produced by informants 2, 3 and 5, for instance.

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The palatalization emergence in the English cluster [tr] by native speakers of two Brazilian Portuguese dialects

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Victor Hugo Medina Soares

Abstract

In most varieties of Brazilian Portuguese (BP), the alveolar occlusive consonants undergo palatalization before the high vowel [i]. However, in a few varieties in the northeast, this phenomenon does not take place. (Callou and Leite, 2009, Cristófar-Silva, 2010). That allows us to state that the existence of such dialectal differences in BP may influence the development of a second language (L2) in different ways (Bettoni-Techio and Koerich, 2006; Camargos, 2013). Bearing that in mind for this study, we analyzed data from native speakers of different dialects of BP (L1) obtained from Barboza (in press 2013). The study comprised subjects from the cities of Fortaleza, Ceará, where palatalization occurs, and Mossoró, Rio Grande do Norte, where it does not. We explored the reorganization or self-organization of the phonological system in the development of L2 English by these two groups of BP speakers. This study examined the appropriation of the cluster [tr], which represents an alveolar occlusive followed by a rhotic, as we intended to contribute to a greater understanding of the development of L2 English by speakers of different BP dialects. In this paper we deal with language as a dynamic construe (Larsen-Freeman and Cameron, 2007). The main objective of this study was to investigate the emergence of alveolar occlusive consonants before rhotics by BP speakers who are learning L2 English in accordance with the hypothesis that participants from Fortaleza will palatalize before a rhotic in English in initial levels of development, while people from Mossoró will not. For instance, in L2 English, a word like 'tree' would be pronounced as [ˈtʃri] in Fortaleza and as [ˈtri] in Mossoró. The analysis we carried out shows that the data have not undergone systematic palatalization before rhotics. The results also account for the fact that palatalization will take more time to emerge in speakers who do not palatalize in L1 PB (Mossoró-RN).

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Use of Empirical Mode Decomposition for Analyzing the LPC Residue: Application in Speech Morphing

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Abstract

The morphing of speech is a technique that creates a continuum of synthetic speech signals turning a sentence into another. For a successful morphing, all aspects of the speech sound must be interpolated, including the length of the segments, the amplitude, the spectral envelop, the pitch, and the glottal source. The Morphala project (Laboissière, et al., 2012), among others, is a successful implementation of the morphing technique. However, in the Morphala algorithm, the glottal sources obtained by inverse LPC (Linear Prediction Coefficients) filtering have to be temporally aligned, which proved to be problematic. In order to improve the quality of the synthetic signal produced by Morphala, we present here another tool that may allow a better alignment of the glottal source signals, based on the Empirical Mode Decomposition (EMD) technique (Huang, et al., 1998). The EMD is a promising technique because it allows the decomposition of any signal into a sum of AM-FM (amplitude-modulated and frequency-modulated) components, whose instantaneous amplitude and instantaneous frequency can be obtained through the Hilbert transform. This technique has been already applied to speech signals (Vargas, 2011).

We used the EMD to characterize the residue of the LPC analysis (which can be assimilated to the glottal source) and we obtained two interesting results. First, the Intrinsic Mode Functions (IMF), which are the results of the EMD, can be separated into two meaningful groups. The low-frequency IMFs, which seem to be related to the glottal flow, and the high-frequency IMFs, which seem to be related to the imperfections of the LPC analysis. Second, the energy of high-frequency IMFs seems to focus around the closing phase of the glottis.

In order to compute the IMFs continuously from one period of the pitch to another, we use a TVAR (time-varying auto-regressive) technique that allows the computation of the LPC coefficients continuously in time. For doing that, we displaced the LPC analysis window by a very low amount of time. Since the LPC poles cannot be ordered in consistent way, we transform them into the Line Spectrum Pairs (LSP) space. Then, we filter the LSP values with a low-pass filter with cutoff frequency of 50 Hz and use the result to obtain LPC coefficients that vary smoothly in time. This coefficients are then used to inverse filter the speech signal, which yields a continuous residue.

Thus, we can make the inverse filtering between two moments of silence and speech and perform the EMD on the full residue signal. As a byproduct, we obtain continuous

values of the LSP parameters, which will be useful for the interpolation of spectral characteristics.

This study will be completed by a perceptual and statistical analysis of the IMFs obtained for a series of vocalic segments taken from the VoxForge project and the development of a better technique for the alignment and interpolation of LPC residues that will be incorporated into the Morphala algorithm.

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Phonological Aspects of the Brazilian Sign Language (Libras): Cognition and Movement

Rosana Passos

Abstract

According to Stokoe (1960), the sign language meets all the linguistic criteria of a genuine language, like lexicon, syntax, and the ability to generate an infinite number of sentences. This study seeks to understand what grammatical resources used in Libras (Brazilian Sign Language) to express and produce signals in a context of intensifying the degree of signs, and additionally aims to understand the functioning of languages and promote a discussion of methodologies to be applied to the interpretation of grammatical properties in Libras. According to the dictionary Houaiss, intensifying is become stronger, more intense. To Gonçalves (2002), the intensification of languages is seen as a resource used for the purpose of emphasis or focus related to the subjective intentions and attitudes of the speaker in relation to the statement. Thus, the increase grammatically can be expressed in different ways: (a) adverb, (b) addition of a lexical item or a morpheme (c) the use of prosodic characteristics (duration parameter). In this perspective, this study intends to qualify and quantify these grammatical resources in the context of intensification in Libras through the analysis of the phonological parameter movement. We conducted an experiment production use in Libras through pictures in power point with different degrees of intensification and selected by semantic field. The production of the participants was filmed and rendered in a system for capturing and measuring the movement to assess the magnitude of the signals, Flow Analyzer. The selection of participants is related to the use of Libras as L1 or L2 as well as according to the time of acquisition / learning Libras, besides the control group. Conducted two pilot tests with two deaf people who learned sign language after the age of 7, a deaf person who learned sign language after the age of 7, two listeners persons users Libras as L2 and three listeners persons nonusers of Libras (control group). The hypotheses investigated in this study are: a) there is variability in the expression of intensifying in Libras (as in natural languages); b) there are differences in movement patterns for different enhancers; c) longer exposure to Libras a person has (as L1 or first language) more expressiveness will be found in movement parameter. The results of this study were treated in the light of Cognitive Linguistics and Dynamic Approach which adopts the assumption that cognitive processes happen in time, continually interacting with other aspects of the world by sending and receiving messages from the nervous system, body and environment. So far, the results of the pilots show great variability in the duration and in the magnitude of movement between the three degrees of intensification proposed by stimuli of the experiment. These differences may be related to the overlap of gestures, that just as in spoken languages, has the possibility to be present in sign

language because of the information that comes from hands, arms, body, head and face performing together.

Keywords

Phonology of Sign Languages; Libras (Brazilian Sign Language), Dynamic Approach; Flow Analyzer.

Frequency Effects and the Reduction of Brazilian Portuguese Gerund

Katiene Rozy S. Nascimento

Wilson Júnior de A. Carvalho

Abstract

This study has as its main aim to investigate the influence of token and type frequency on Brazilian Portuguese gerund reduction. The reductive phenomenon involving Brazilian Portuguese gerund is very common on native speakers speech and it is also highly attested by researchers in different Brazilian regions (Cristófar-Silva, 1996; Mota e Nascimento, 2004; Souza, 2009; Ferreira, 2010; Vieira, 2011). According to Cristófar-Silva (1996), the nasal consonant in gerund morphemes -ando, -endo and indo nasalize the preceding vowel sound and also occupies the onset of the following syllable, therefore, causing /d/ lenition. Having this in mind, our study deals with the deletion of alveolar plosive /d/ in the gerund morphemes aforementioned, in the variety of Brazilian Popular Portuguese spoken in Fortaleza-CE. The theoretical assumptions are based on Usage Based Phonology and on Multi-representational Models. According to these models, type and token frequency are factors that can affect phonological variation and sound change (Bybee, 2002). Having said that, our working hypothesis is that type and token frequency may influence on Brazilian Portuguese gerund reduction. 24 interviews, around 12 hours of audio, from the Norma Oral do Português Popular de Fortaleza (NORPOFOR) project were investigated. Data analysis revealed that 74,2% of all analyzed tokens presented the reduced form of Brazilian Portuguese gerund morphemes. As regards frequency, our results pointed out that the most produced morpheme, -ando also presented the higher rate of /d/ deletion, followed by -endo and, at last, -indo. Considering token frequency, we selected the five most frequent words in our data and compared their rate of /d/ deletion with their token frequency based on Avaliação Sonora do Português Atual (ASPA) corpus. According to a Pearson correlation test, there is a significant positive correlation between rate of deletion and token frequency in our data. As token frequency increases, the rate of /d/ deletion also does. Results suggest that the emergence of gerund reduced forms is influenced by frequency effects.

Acoustic study of poststressed high vowel lenition in Brazilian Portuguese

Francisco MenesesEleonora Albano

Abstract

This study examines lenition of final poststressed high vowels in voiceless consonant environments in Brazilian Portuguese (henceforth BP). We present evidence that such vowels do not undergo apocope (i.e., deletion), but, rather, gestural overlap and devoicing as a result of a lenition process, probably imputable to stresslessness. However, apocope appears to be the final step of this change.

A significant number of languages have been reported to exhibit high vowel devoicing in different contexts (e.g., Tsuchida, 1997; Torreira and Ernestus, 2010). Unstressed high vowel deletion or devoicing has also been investigated by researchers working within Articulatory Phonology (Browman and Goldstein, 1989), who claim that many surface characteristics of casual speech production can be accounted for by changes in gestural magnitude or overlap instead of traditional symbolic processes (e.g., Chitoran and Iskarous, 2008). Descriptions of BP report apocope rather than high vowel devoicing (Rolo and Mota, 2012), but acoustic observations reveal that a gradient process exists whereby over 50% of such vowels are lenited and devoiced between voiceless consonants.

The goal of our study is to investigate, on the basis of acoustic data, the relationship between vowel reduction, devoicing and apocope in final poststressed position in BP. We argue that there is an ongoing lenition change that takes place in three steps: vowel reduction, partial or total overlap with the preceding consonant, and, eventually, apocope. All three steps coexist in synchronic variation.

In order to explore the nature of such a process, dissyllabic words of the form (C)VCV were investigated in which the second C was always [s]. They were read in a carrier sentence by six female speakers of a northeastern BP dialect. The following measurements were made: formant centralization ratio (FCR) and vowel space area (VSA) of voiced vowels in devoicing contexts, centroid of [s] noise, and duration of the target syllable and its noise (fricative + vowel) in the devoiced case. Moreover, an identification test with a 5 alternatives forced choice procedure was performed.

The results indicate a lot of interspeaker and intraspeaker variability, manifested in three lenition effects, namely: (i) when the vowel is voiced and acoustically visible there is a clear vowel space reduction, i.e., voiced vowels in devoicing contexts are shorter and more centralized than elsewhere. The high negative correlation between the FCR and VSA points to this first step, i.e., vowels that are not completely devoiced lose gestural magnitude under devoicing conditions ($r(11) = -0.77$, $p = 0.002$); (ii) when the vowel is apparently absent, a lower average centroid differentiates the presence or absence of the vowel within the [s] noise (e.g., for [i], $t(2) = -6.64$, $p < 0.02$); (iii) there is a kind of compensatory lengthening of [s] when the vowel is fully devoiced. Post hoc comparisons

indicate that the mean length for the [s] noise of devoiced cases is significantly different from that of partially devoiced or voiced cases.

As to perception, two subsets of stimuli - words with devoiced and partially devoiced vowels - were extracted from the original target sentences. Partial voicing was sufficient for vowel recovery in 100% of cases. On the other hand, fully devoiced vowels lead to a relevant misidentification rate (70%). Correlation between reaction time and rating shows that subjects used longer time for words with devoiced vowels ($r(58) = -0.64$, $p < 0.0001$).

Putting together the results of the production and perception experiments, we may surmise that lenition seems to first reduce gestural magnitude to then increase gestural overlap. Completely overlapped and thus devoiced vowels may eventually trigger a listener-based process of vowel apocope along the lines advocated by Ohala (1981).

L1 Phonetic Detail and its Influence on L2 Realization

Clerton Barboza

Abstract

This study has as its main aim to analyze the effects of L1 phonetic detail of native Brazilian Portuguese (BP) speakers and its influence on the L2 realization of English as a Foreign Language (EFL). We focus on the emergence of palatalization on alveolar stops, which affricate /t, d/ → [tʃ, dʒ] when followed by high-front vowels in many BP dialects. The transfer of this mechanism to similar EFL phonological contexts is considered a problem in the pronunciation of Brazilian EFL students. However, the literature reveals only marginal data on the subject (Ferreira, 2007; Bettoni-Techio, 2005; Arantes, 2007; etc). Grounded on a view of language as a Complex Adaptive System (Larsen-Freeman; Cameron, 2008), Usage-Based Phonology (Bybee, 2001) and the Exemplar Model (Pierrehumbert, 2001) we have as our main hypothesis BP speakers show different trajectories of EFL phonological construction depending on the phonetic detail of alveolar stops on their native dialects. In order to test this idea we designed both a cross-sectional and longitudinal experimental research on two groups of BP learners of EFL from Fortaleza-CE (whose BP dialect palatalizes frequently) and Mossoró-RN (whose BP dialect does not palatalize frequently) in North-eastern Brazil. We selected 18 informants on three distinct EFL proficiency levels from each region (CE, RN) for the cross-sectional study. The longitudinal study had only 2 beginner informants per state, with data-collection being carried out 4 times per semester, during a year. BP Experiments involved a picture-induced conversation (P1) and reading words in carrier sentences (P2). EFL Experiments involved the repetition word-recordings heard through a low-pass filter (E1), reading words in carrier sentences (E2), and a delayed-word repetition in the form of a memory game (E3). Cross-sectional BP results indicate the importance of gradient effects on the emergence of BP palatalization, once categorical results are not found in any region. This is important to the understanding of BP palatalization as a non-categorical phenomenon, as opposed to traditional phonological theories. Cross-sectional EFL results indicate a bigger emergence of palatalization on CE EFL students, even though some RN EFL students also tend to palatalize recurrently. Many variables seem to influence this phenomenon, including phonotactics, syllable-stress, the individual and EFL proficiency level. An especially important variable is the word, once most CE EFL students tend to pronounce the lexical item teacher with no palatalization at all since the very beginning, while even advanced level RN subjects palatalize the word two. The cross-sectional research indicates subjects whose BP dialect palatalize more frequently also tend to do so when using EFL. As regards the longitudinal study, results indicate CE EFL students tend to palatalize significantly more

than their RN colleagues. The analysis of the individual trajectories of EFL palatalization indicates RN informants roam through a highly overlapped phase-space, with relatively low emergence of the phenomenon. On the other hand, CE informants show no overlap, with one of the subjects tending to palatalize significantly more than his local colleague. Longitudinal data also reveals a non-linear emergence of the phenomenon in all participants. RN informants tend to show a sharp decrease in the palatalization rate from the first to the second data-collection points and then roughly stabilize. CE informants tend to show bigger amounts of non-linearity, with one informant even showing more palatalization on EFL as time passed. The longitudinal research also reveals the importance of BP phonetic detail and its influence on EFL production. We conclude L1 phonetic detail has significant influence over the realization of a given L2, thus confirming our main hypothesis.

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A phonetic approach to Danish consonant lenition

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Abstract

This research intends to observe influences on consonant lenition in Danish. To do so, aspects such as: tone, syllable structure, phonological context, etymological origin and frequency of use. And both synchronic and diachronic approaches will be relevant and useful in this analysis too.

Danish is spoken by over five million people. And besides making itself present in northern Germany, it is also taught as a second language, which is also regarded as the official language, in schools in Greenland and the Faroe Islands. Being these two both autonomous regions and constituents, with the Kingdom of Denmark, of the Dansk Rigsfllesskab.

The process of lenition is a process of sound change, it is regarded by many as a process of reduction, in both consonants and vowels. Robert Kirchner, for example, which is among the best known of the theoretical lenition, defines it as a reduction in the degree of constriction and length of a sound.

This research is based on the theoretical idea of evolutionary phonology by Blevins (2004) and seeks to follow the line of Baudouin de Courtenay, founder of the school of Kazan. In view Baudouin, synchronic systems could only be fully understood by explaining how they emerged.

The role of phonetics in this perspective is crucial because it is through the physical approach of sound changes, given by the phonetic aerodynamic calculations, that it is possible to explain the sound patterns. The ideas of John Ohala and the articulatory phonology will also be addressed here.

The hypothesis to be followed cover some elements of the approaches presented, adding them the idea of language contact, selection and competition within the linguistic evolution, according to Mufwene (2008), and of course the rise of frequency and language use, following Bybee (2001) which would be a step forward for the possible setting change.

Contributions of complex adaptative system to first language phonological acquisition

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Abstract

This work aims to discuss the contribution of The Complex Adaptative System (Larsen-Freeman, 1997, Beckner et al, 2009) to first language acquisition, specifically to phonological acquisition. Researches have demonstrated that the use of phonological templates strongly affects how language is acquired by children (Vihman, 2013). Studies in cognitive science shows that the process of acquire a language is embedded in a complex adaptive system. It means that when a child acquires a language he is influenced by different social agents and that the past experience affects the present of learning. Therefore it is said that properties of a current state of a system are dependent in some way on those of a preceding state. The Complex Adaptative System proposes that self organization plays a role in the language acquisition. In this paper it is argued that self organization is the pathway to the construction of phonological structure. The complexity in first language phonological acquisition is examined based on a longitudinal study of four children acquiring Brazilian Portuguese. The children were recorded during a year, in a free mother-child interaction. In this corpus it is examined the acquisition of three important phonological categories: plosives, sibilants and affricates. It is evaluate the phonological acquisition of these three groups showing how complex is this process and how interlinked are the three categories. We argue that self-organization is as a pathway for phonological structure formation in language and that the basis of the self organization is the word as a unit which links meaning, form and also a social status. We also reflect about social aspects discussing how they influence phonological acquisition. We pointed out that complexity helps to understand of pattern-formation mechanisms in first language phonological acquisition. Thus Complex Adapative System can contribute to comprehend the dynamic of first language phonological construction.

Recurrence probability density entropy as an acoustic correlate of roughness

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Abstract

Breathiness and roughness dimensions are very important in perceptual voice assessment. Several acoustic correlates of breathiness are known, such as harmonic-noise-ratio, cepstral peak prominence and others. These methods present high correlation with the perceptual rating. However, roughness shows low correlation with this type of measurement. As it has complex characteristics, caused by irregularities and aperiodicities in vocal fold vibration, non-linear analysis tools are candidates to study this kind of behavior.

One of those tools is the recurrence probability density entropy (RPDE), described by Little et al. (2007). In this method, a recurrence analysis is performed in a reconstructed temporal series using embedded dimensions and time-delays. A recurrence probability and the associated entropy are calculated for each recurrence time interval. The propose of this study is to evaluate the RDPE as an acoustic correlate of roughness.

To evaluate the relation between entropy values and perceptual ratings of roughness, sustained /a/ of 21 adult speakers were analyzed. The recordings, with 3 tokens per severity level were perceptually rated in a 7-point scale.

Results show entropy values varying from 0.04 (absent) to 0.37 (extreme roughness). The correlation coefficient between entropy and roughness grade was 0.91, using an embedded dimension of 4. The high correlation coefficient indicates its suitability as acoustic correlate of roughness.

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Zipfian Entropy

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Abstract

Since the studies of George Kingsley Zipf (1949), it is a well known fact that the distribution of words in a natural language follows a power law, known as the Zipf's law. The same power law relation is also observed in many natural phenomena, such as the distribution of earthquakes by magnitude, the population size of cities in a country and distribution of the total wealth of the richest people. George A. Miller (1957) and Wentian Li (1992) observed that random generated texts also present a Zipf-like behaviour, but some characteristics presented in a natural language are clearly not observed in a random generated text. These characteristics are created by the restrictions imposed on a communication system and also by the physical and physiological restrictions inherent in human beings. Those restrictions might be summed under the form of a measure of redundancy of the source. Redundancy is the difference between the largest possible entropy for a given set and its actual entropy. Redundancy is created to accomplish these restrictions, at the cost of reducing the average transmitted information over time. Shannon (1951) and Grignetti (1964) proposed a method to estimate the entropy of words in printed English using a Zipf distribution with exponent $s=1$. In this presentation we use the same ideas to estimate the entropy of source under a Zipf distribution with a general exponent s . We also study the generalization to a Zipf-Mandelbrot distribution, which presents a flattening in the region of high frequency types. The results show that the entropy measure is very sensitive to the exponent s and the plateau factor q that characterize the distribution. We observe that an exponent value close to one, but still greater than one, is necessary to maximize entropy and still hold a feasible wide lexicon. This observation is in agreement with the observations from Ferrer-i-Cancho (2003) who argues that such a value for the exponent of the characteristic distribution is necessary to achieve the balance between the speaker and the listener communication effort. We have compared the entropy estimate value with the entropy measure from textual corpus. Our results are shown to be very good estimates.

The pronunciation of English word-final clusters occurring in suffixed and non-suffixed words

Fernanda Delatorre

Rosane Silveira

Abstract

This paper reports on the results of the comparison between the pronunciation of word-final consonant clusters present in non-suffixed words (e.g., fact) and clusters formed by the addition of the -ed morpheme to English regular verbs (e.g., asked) by Brazilian learners of English as a foreign language (EFL). Previous studies investigating the production of English regular verbs ending in -ed by Brazilian EFL learners demonstrated that some variables, such as (a) the -ed preceding phonological context, (b) markedness and cluster length, as well as (c) the orthography of the regular verbs, influenced their production by these learners. In order to investigate pronunciation of clusters present in suffixed and non-suffixed words, 26 intermediate Brazilian EFL learners were asked to audio-record ten short paragraphs containing regular verbs in the past tense form and non-suffixed words containing the same type of clusters (e.g. liked, fact; laughed, left; planned, find; played, made) . These paragraphs contained 91 verbs and 36 non-suffixed words, which were analyzed by three experienced Brazilian raters who were also experienced researchers in the area of English Phonetics and Phonology and teachers of English. They listened to, analyzed and classified the data, according to the following categories: epenthesis (e.g., moved [muvid]), accurately produced (e.g., played [plejd]), replaced by another word (e.g., planned by planet), verb produced in the base form (e.g. moved [muv]), final cluster mispronunciation (e.g., played [plejst]) and non-suffixed word replaced by another word (e.g., act by attack). The first two analyzes were compared, then the words in which there was disagreement were analyzed by the third rater and, finally, the words in which there was disagreement were analyzed by the first rater again in order to avoid discarding data. Results indicate that there is a tendency for Brazilian EFL learners (a) not to epenthesize final clusters/rhymes in non-suffixed words, (b) frequently epenthesize English regular verbs ending in -ed; (c) less frequently epenthesize verbs that have a non-suffixed word-final cluster, especially those that have sonorant-obstruent clusters (e.g., planned/sound), and (d) more frequently epenthesize more marked three-member clusters, which generally do not occur with non-suffixed words, than the two-member clusters, which are frequently found in the suffixed words. Moreover, results also indicate that the orthography of the English regular verbs ending in -ed influences their production by Brazilian EFL learners and that /id/ seems to be the main mental representation for the pronunciation of these verbs due to generalization from one -ed pronunciation to the other two ones.

Neuroscience and Education: On Semiotic Practices and the Teaching of Brazilian Literature

Emiliane Moraes Silva

Abstract

We know that literacy and learning processes depend on the general conditions of education and teaching. Among these, we cite the interaction between subjects and the different political, cultural and socio-economic factors surrounding the student-teacher relationship. However, from among the many discussions, studies and pedagogical strategies, neuroscience emerges as a significant field, capable of assisting and expanding the debates and pedagogical interactions through analysis and observations of neurobiological makeup. In her studies on attention and productivity, the UFMG professor Leonor Guerra (2011) contends that a student usually organizes their experiences and stimuli according to interconnected mental schemata. The dialogue between the new information and prior training becomes, then, fundamental to the process of teaching and learning ones mother tongue, for example. In this context, Guerra (2011) also deals with the utilization of multisensory resources in the activation of multiple neural networks to establish an association between them, rendering the knowledge more accessible, active and practical. Thus, hearing, feeling, reading, and touch, among other forms of learning, are efficient ways to achieve different literacies. This perspective corresponds with the semiotic studies by Kress and Hodge (1988) and those on multimodality by Kress and Van Leeuwen (2001). Congruently, these studies evidence interpretation beyond the "logos," or the word, and propose the analysis and logical investigation of the organization of non-verbal language, including the organization of tones, music, colors, shapes and gestures relevant to the subject and its environment. With this in mind, the present work takes as its object the observation of proposals related to the presentation of didactic content for the professor of high school literature, more specifically, the incentives suggested in William Cereja and Thereza Cochar's compendium of Brazilian literature to introduce literary schools of the seventeenth through the twenty-first centuries. In this way, the focuses of our observations are: the method of introducing a subject and its suggested relevance to the day-to-day life of a possible high school student. The conclusion of this paper will present suggestions and strategies that would provide greater contextualization and more efficient association, stimulated by pedagogical practice aimed at the brain, its function and organization, and its multisensory exploration.

On the Acquisition of the Perception of Mid-vowels in Brazilian Portuguese by L1 Speakers of American English

Victor Hugo Medina Soares

Abstract

The acquisition of the phonological system of foreign languages is a theme seen quite frequently in academic works related to language acquisition. However, when it comes to teaching materials, that issue is not widely addressed. In the case of Portuguese, that is not different. Although there are over 250 million speakers throughout the world, its teaching is not as widespread as other languages with similar number of speakers like French and Arabic. And on top of that, the acquisition of the vowel system of Brazilian Portuguese – that would be the case for other varieties as well – can be especially complicated due to the form its vowels are differentiated. In order to acquire a second language sound system, learners undergo demanding tasks when it comes to production and perception. On that note, regarding perception skills for this study, learners have to tune their constructional knowledge to construction-specific preferences (Ellis, 2013) in terms of the phonological patterns of the L2. Departing from a dynamic view of phonological acquisition, this study investigates the acquisition of L2 Brazilian Portuguese (henceforth, BP) mid-vowels - /ε, e, ɔ, o/ - in terms of their perception by basic and advanced-level students, all L1 bilingual speakers of English and Spanish. To reach its objective, a previous work on the acquisition of these vowels carried by Kendall (2004) serves as the basis for this study. The core addition made here is the theoretical treatment using the framework of Usage-based Phonology (Bybee, 2003) and the reply of the perception test used in Kendall's dissertation, in which students that would listen to words given out in a list containing the sounds being analyzed were asked to choose whether they heard one of the close mid-vowels (/e, o/) or the open mid-vowels (/ε, ɔ/). Note that it was done in such way as Portuguese, apart from some specific cases, does not differentiate in spelling whether the open mid-vowels should be pronounced or their close counterparts. BP establishes /e, ε/ as different segments in the language phonologically. The same can be said for /o, ɔ/. (Barbosa and Albano, 2004) Given the differences expected in the phonological inventory of different languages, the acquisition of that new system consumes a considerable amount of time and practice from the speaker. The new data collected are relevant for observing how Spanish as L2 may interfere in the acquisition of Portuguese, even though the emphasis is on L2 BP. Results show that in advanced levels students, regardless of the fact that they have a typologically similar language as their L2, their difficulties are not quite different. There remains a higher ratio of /e/ and /o/ in the speakers' data than of /ε/ and /ɔ/, which may reflect influence from their L2. Overgeneralization seems to be strongly connected

with subjects lacking contrast in the vowels under study. There is a noticeable change in their consistency in from the basic to the advanced levels nonetheless.

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Auditory Perception Effects of Transient Modeling Applied to Stop Consonants Bursts

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Abstract

Speech has transient states of vibration, such as bursts in stop consonants. This type of consonants is present in any language, and some studies revealed a high level of influence on the following vowels perception. In this context, transients are produced by constriction in some part of the vocal tract subjected to a sudden pressure decrease. Most physical modeling techniques of speech signals are focused on stationary deterministic and stochastic signal components. Nevertheless, transient dedicated models have shown to improve the parametric representation of audio signals. In this study, the importance of transients for speech intelligibility and quality is measured by means of a phoneme recognition and mean opinion score (MOS) tests. Moreover, the results obtained reassure that an adequate modeling of transients may result in a significant improvement of source-filter models for speech synthesis, allowing more flexibility in posterior processing like voice conversion. Such models are attained by separating transients from stationary stochastic and deterministic signal components. Transients are events with small duration and impulsive characteristics. Due to the time-frequency duality, impulsive signals in the time domain have a spread spectrum in the frequency domain. Thus, with additional frequency representation, it is possible to parameterize signal transients previously transformed to the frequency domain. This is the principle of Transient Modeling Synthesis (TMS), used to model transient speech components in the experiments. TMS is a simple but convincing transient modeling approach, which has few works dedicated in the literature. TMS was then evaluated and compared with Spectral Modeling Synthesis (SMS). TMS modeling attained an intelligibility of 95%, which is significantly higher than the 87% attained with SMS modeling. Also, simply removing the burst components of speech resulted in an intelligibility of 79%. Finally, TMS and SMS syntheses yielded, respectively, scores of 4.16 and 3.32 in MOS tests.

An experimental study on the perception of stress patterns in Brazilian Portuguese

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Abstract

This study intends to contribute to the understanding of how speakers perceive linguistic stress patterns. We discuss lexical effects on the perception of word-level stress in Brazilian Portuguese (BP). We offer an analysis of BP lexical stress that differs from traditional analysis both methodologically and theoretically. The analysis to be developed is based on experimentally collected data from Brazilian Portuguese (BP) and relies on complementary principles from usage-based models [1] [2], cognitive linguistics [3], and exemplar theory [4] [5]. Phonological and prosodic studies of rhythm, intonation and stress in natural languages have been traditionally focused on the identification of language-specific and universal patterns and usually rely on a rule-based models to account for such phenomena. On the past decades perception is being increasingly explored by linguistic studies, but many of them opt to test syllables and non-sense words instead of real words. The emergence of usage-based and cognitive models in phonology brought to light the view of language not as an innate and independent module, but rather as an integral part of high cognitive processes, therefore fully embedded in the human mind, body and environment. Exemplar theory claim that linguistic representations are multidimensional and web-like connected, challenging the uni-dimensional basis of representations proposed by traditional models. In BP, lexical stress is presented as acoustic prominence of one of the last three syllables in the word domain. Stress is generally assumed by traditional analyses to be implemented through some kind of metric algorithm/rule, given that its location within the word is at some extent predictable. Based on experimental data, we offer evidence that lexical stress is stored with lexical representations, and cannot be the fully accounted for by a metric rule interpretation. An experiment was designed to test weather the usage frequency could influence the perception of a word based on the stressed syllable. We tested ambiguous continuous sequences of syllables that could be either interpreted as one of two possible words, depending on the subjects parsing. The results indicate that the probability of perceiving a word out of a pair of possible words directly correlates with how frequent the word is with regard to the other possible word of the pair.

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