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D E L T A

Presentation

Prosody and Interfaces

Prosódia e Interfaces

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This special issue arises from the I International Congress *Voices and Writings in the Different Spaces of the Portuguese Language*, organized by the Graduate Program in Letters (Vernacular Letters) of the Federal University of Rio de Janeiro (UFRJ), in November 2020. Within this event, two symposia promoted the discussion on the relationship between the prosody of Portuguese (stress, intonation, phrasing and rhythm) and other areas of linguistic interface. Some phenomena in Portuguese involve a high degree of complexity, as its analysis requires the inspection of phonological, morphological, syntactic, semantic and pragmatic components. This fact, together with a recent tendency in linguistic studies to express the grammatical architecture from an integrationist perspective, opened the floor for the presentation of interface studies. Following diverse theoretical

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approaches, several research papers were then presented on the prosody of Portuguese (i) as L1 and L2, (ii) in adult and child speech, (iii) in spoken, written and signed modalities, (iv) in typical and atypical speech, including language disorders, and (v) in contexts of linguistic contact.

Since it was a successful event, the call for contributions for this special issue was expanded worldwide to any interested prosodist working in interface with other grammatical areas. After a double blind review process, ten papers of high quality were selected for publication in this special issue, organized into two parts, which are presented and detailed below.

Part I, entitled *Linking prosody, (morpho)syntax and pragmatics: On phrasing, intonation and rhythm*, opens with Luiz Carlos Schwindt and Leda Bisol's contribution, on the prosodization of derived words in Brazilian Portuguese (henceforth, BP) in interface with morphology. The authors revisit and extend the debate on the prosodic status of derived words in BP. Based on previous studies (e.g., Bisol, 2000, 2004, 2007; Schwindt, 2001, 2008, 2013), they argue that derived words in BP are subject to different prosodization processes: composition, adjunction and incorporation. For them, prefixed words are prosodized as composite, adjoined or incorporated to their bases, suffixed words are prosodized as composite or incorporated, and clitics are attached to a higher-level host than the prosodic word, such as the phonological phrase. Evidence for this comes from (i) stress assignment, which provides the phonological word status to some affixes, (ii) phonological processes in the domain of this prosodic constituent, or related to it, and (iii) extra phonological characteristics, such as the affix ordering and autonomy in the utterance. In the same paper, the authors also propose an analysis of the different prosodic structures through a hierarchy of constraints, based on Itô and Mester (2008) and Selkirk (1996), and related to tree form restrictions, interface conditions, parsing principles and size and shape requirements. Furthermore, they problematize some consequences of the presented typology for the organization of the prosodic hierarchy and its effects on morphological transparency and defend a continuum in the degree of transparency/productivity, that goes from composite to incorporated structures. According to Schwindt and

Bisol, this proposal is able to explain possible overlaps or fluctuations in the perception of certain affixes.

Linking prosody and pragmatics, Cristina Name and Juan Manuel Sosa analyze wh- and yes/no questions in BP, in infant-directed speech (IDS), considering the interactions of ten Brazilian Portuguese-acquiring infants aged 4 to 12 months and their caregivers in various everyday situations. The prosodic variables considered are pitch register and pitch span, speech rate, final syllable duration, and quality of voice. The results reveal that questions correspond to 33% of the total utterances produced and are emphasized mainly by marked pitch (raised pitch range and expanded pitch span), as well as increased duration. Moreover, the pitch contours of wh- and yes/no questions follow their respective patterns observed in adult speech. These results are compatible with those found in the literature (Moraes, 2008) and indicate that, in general, the IDS used in BP has similar characteristics to this register in other languages. Pitch differences between men and women, and between girls and boys are also explored in order to understand to what extent these variables may impact IDS prosody in BP. The authors show that pitch cues vary among participants, idiosyncratically, and that it may be related to family characteristics, infants' age and/or cultural issues. This is an important contribution to the field as in BP there are few studies focusing on IDS, and particularly fewer on its prosodic features. Furthermore, there are no studies contrasting prosodic features of IDS of women and men in BP.

Still on the prosody of interrogatives, Gabriela Braga, Sónia Frota, and Flaviane Fernandes-Svartman analyze neutral yes-no questions of an African variety of Portuguese - the Guinea-Bissau Portuguese (henceforth, GBP). Following the theoretical framework of Prosodic Phonology (Selkirk, 1984; Nespor & Vogel, 1986) and Intonational Phonology (Pierrehumbert, 1980; Ladd, 2008), the authors examine whether the GBP neutral yes-no questions differ from those of European Portuguese spoken in Lisbon (henceforth, SEP) – the variety assumed as the standard language, despite the fact that Portuguese is spoken as a second language in the multilingual territory of Guinea-Bissau, where Kriol (Guinean Creole) is the national unity language. According to the latest census in the country (Instituto Nacional de Estatística, 2009), around 90% of the population speaks Kriol, covering both L1 and L2

speakers, and one-third of the population speaks Portuguese, mainly as L2. As a main result, the authors conclude that, for the pre-nuclear and nuclear contours as well as tonal density, the intonation of GBP neutral yes-no questions differs from SEP and is closer to Brazilian and African varieties already studied (e.g., Tenani, 2002; Frota et al., 2015; Braga, 2019; Santos, 2020). Pitch accents found in pre-nuclear contour are a rising pitch accent L*+H and a high pitch accent H*, associated with the first prosodic word of the sentence in equal proportion. The nuclear contour (L+)H* L% is the dominant one, and there is a high tonal density in GBP neutral yes-no questions. These results, together with the outcomes previously pointed out in the literature for declarative sentences (Santos & Fernandes-Svartman, 2014; Santos, 2015; Santos & Braga, 2017), suggest that GBP is developing its own intonational grammar.

Also focused on an African variety of Portuguese, this time spoken in Maputo, Moçambique (henceforth, PM), Carolina Serra and Ingrid Oliveira analyze and describe the intonation of neutral declaratives and neutral yes-no questions. Since the same theoretical framework as Braga et al. (this volume) is followed, the authors compare the results found for PM with the ones for GBP, besides the other African varieties already explored, and European Portuguese. Like Guinea-Bissau, Moçambique is also a cultural and linguistic melting pot: Portuguese language coexists with a collection of local Bantu languages. According to the 2007 Census, in Maputo, Portuguese is spoken by 42.9% of the population, which is close to the usage rate reported for Changana, the most frequently spoken local language. Using a read corpus of Subject-Verb-Object (SVO) declaratives and neutral yes-no questions, the authors inspected the following prosodic aspects: (i) phrasing patterns, (ii) nuclear and pre-nuclear contours, and (ii) pitch accent distribution. The results show that neutral declaratives are predominantly organized into two intonational phrases (IPs), i.e., the Subject phrased apart from the Predicate (S)(VO). Intonationally, the most frequent nuclear contours found are LH+L* L% and H+L* L%. Thus, when different from the other varieties of Portuguese, neutral declaratives in PM are produced with a tritonal nuclear pitch accent and a low boundary tone, which is so far a novelty among the African varieties of Portuguese. Phrase accents, also present in other varieties of Portuguese, frequently occur in PM, even within the Subject, separating the nucleus from its

complements. In neutral questions, the nucleus most often features a rising-falling L+(<¡)H*L% movement. High tonal density is also found, with pitch accents associated with stressed syllables of all prosodic words in both declaratives and yes-no questions. In sum, and comparing with other varieties of Portuguese, PM presents more differences than similarities. This leads the authors to conclude that the prosodic grammar of PM is inevitably affected by the complex sociolinguistic situation in this region, where Portuguese, an intonational language, is in contact with (and is as frequently used as) Changana, a tonal language. This scenario might impact on how Portuguese is spoken by Mozambicans, even those with Portuguese as their L1.

In turn, switching the attention from language variation to clinical linguistics, Geovana Soncin, Luiza Polli, and Larissa Cristina Berti inspect the use of acoustic cues in prosodic focus marking in speech of Brazilian children with phonological disorders. Phonological disorders involve difficulties of various kinds related to aspects of perception, motor production and phonological representation regarding segmental and prosodic aspects. As for the difficulties related to the prosodic aspects, the authors notice the lack of studies describing prosody displayed in speech of Brazilian children during the BP acquisition process, in particular those showing deviant processes, and the lack of studies providing an acoustic characterization of prosodic aspects of Brazilian children in phonological acquisition process of BP, regardless of being typically or atypically developing. In order to contribute to fill in these gaps, the authors develop a pilot study aiming to present an acoustic characterization of prosodic focus marking in speech of children from the interior of the São Paulo State diagnosed with a phonological disorder and a persistent phonological disorder (Shriberg et al., 2010). The phonetic-acoustic cues taken into consideration on the characterization of prosodic focus marking are duration, intensity and intonation, with regard to the tonal configuration of the nuclear pitch accent carried by focused elements. The analyzed data were obtained in speech evaluation sessions through a task of repeating focus marking sentences (*Phrasal Accent Test*). The obtained results show that an increase in duration and in intensity marks the prosodic focus in speech of children with phonological disorders, but not the nuclear pitch accent carried by the focused element, since instabilities were noted in the production of prosodic focus. Assuming that the

tonal configuration of the nuclear pitch accent is the cue considered to be primary in prosodic focus marking in BP, the authors claim that their results show that the secondary cues are the ones which mark the focused element in speech of children with phonological disorder of their investigation. These results obtained by the authors' pilot study already represent unprecedented and relevant contributions to linguistic and clinical studies on language acquisition and point to the need to consider prosody as one of the elements to be observed in the phonological acquisition process, either in a typical or atypical context.

Part I of this special issue is enclosed with Yuqi Sun and Cong Zhang's contribution, a first step towards the analysis of rhythm of L2 Portuguese speech produced by eight native Cantonese speakers from Macao, China, across three different tasks: a reading task, a retelling task, and an interpreting task. The aims of this study are to investigate (1) whether the speech rhythm in L2 Portuguese is source-like (more similar to Cantonese) or target-like (more similar to Portuguese), and (2) whether L2 speech rhythm is affected by task. Founded in previous research, seven rhythm metrics, i.e., %V, ΔC, ΔV (Ramus, Nespor & Mehler, 1999; Frota & Vigário, 2001), VarcoC, VarcoV (Dellwo & Wagner, 2003; Mok & Dellwo, 2008; Mok, 2009), rPVI_C, and nPVI_V (Grabe & Low, 2002), are adopted for data analysis and discussion. The authors conclude that L2 Portuguese rhythm is characterized by both source-like and target-like properties, thus presenting a proportion of vocalic intervals and a vocalic variability similar to those of L1 Cantonese (source-like), and a consonantal variability closer to the one shown by L1 Portuguese (target-like). These rhythmic properties are triggered by phonological phenomena such as R-deletion, resulting in a higher variability of vocalic intervals, and vowel epenthesis, which increases the amount of consonantal intervals and affects their duration. However, these L2 Portuguese rhythmic properties are affected by task, as the more spontaneous tasks, i.e., retelling and interpreting, show a higher variability than reading, which the authors relate to the extra processing effort involved in the conceptualizer and formulator stages of Levelt's speech production model (1989).

Part II of this special issue, entitled *Perceiving and processing prosody: Speech, gestures, and brain*, opens with the contribution of Luma da Silva Miranda, João Antônio de Moraes, and Albert Rilliard,

who explore the role of prosodic properties (namely, F0, duration and intensity) to perceive wh-questions and wh-exclamations in BP. As in many other languages, in BP the syntactic structure remains the same and wh-questions and wh-exclamations are differentiated by the prosody. However, the exact cues responsible for the distinction between these two pragmatic meanings have not been studied in detail so far. Anchored in previous findings (Moraes, 2008; Oliveira et al., 2014; Miranda, 2015; Zendron da Cunha, 2016), two perceptual identification experiments were designed to assess the subjects' ability to identify these pragmatic meanings based on their prosodic characteristics, as well as the perceptual relevance of each prosodic feature in the recognition of wh-questions and wh-exclamations. The results of the first perceptual experiment indicate that Brazilian listeners can identify these two pragmatic meanings using intonational cues only, as previously hypothesized. The second experiment shows that the prenuclear region of the wh-questions and wh-exclamations may present different shapes without affecting the identification of these pragmatic meanings, so the hypothesis which predicted that the F0 manipulation on the prenuclear region of the contour would be less important than the nuclear region is also confirmed. Additionally, it is also observed that listeners' perception is influenced by the type of F0 movement along the nuclear region of the sentence. This thus confirms the hypothesis predicting that a falling F0 contour would favor the wh-question identification, while a slightly rising F0 movement would increase the wh-exclamation identification. Finally, the original duration and intensity cues of the wh-question and wh-exclamation contours also favor the recognition of the two pragmatic meanings, regardless of the F0 configuration.

Exploring the interplay between speech and gestures, both in production and perception, Manuella Carnaval, João Antônio de Moraes, and Albert Rilliard analyze five focus types in BP, from a multimodal perspective: (i) informational focus, (ii) contrastive focus, (iii) attenuated focus, (iv) interrogative focus, and (v) surprise focus. Focus production is inspected acoustically (i.e., F0 and syllabic duration) and visually, following Ekman et al.'s (2002) Action Units to annotate facial movements. The position of the focused element along the sentence, always targeting heads of syntactic phrases, and the stress status of the syllable that carries the focus (prestressed, stressed,

poststressed or other) are also relevant factors for the analysis. The perception of the five narrow focus categories is also explored in order to test the role of audio (A) and visual (V) modalities alone, and then combined (AV), to identify the different semantic-pragmatic values of the five focus types under study. The goal is to observe whether there is a potential enhancement linked to audiovisual presentation (i.e., to bimodal cues over the unimodal ones). The results show that the informational focus is the less prominent one from both acoustic and visual perspectives, thus being used in the perceptual experiment as a default answer for stimuli whose meaning was unclear. Although similar in terms of acoustic cues, contrastive and attenuated focus types exhibit a complementary relationship in the perception experiment, as there is a correlation between the contrastive focus meaning and the focus position at the beginning of the sentence as well as between the attenuated focus meaning and the middle and final positions of focused elements in the sentence. The interrogative focus and the surprise focus present distinct acoustic and visual cues, thus not offering difficulties in perception. However, the higher identification levels of the surprise focus in all modalities lead the authors to consider it as the most prototypical type for the interrogative sentences analyzed. In sum, multimodality plays a relevant role in focus production and perception, with different acoustic and visual parameters contributing to conveying distinct meanings, according to each focus type.

Alcione de Jesus Santos, Rui Rothe-Neves, Vera Pacheco, and Virgínia Silveira Baldow deeply inspect how readers of different education levels process pragmatic aspects of reading aloud related to the expression of the basic emotions (joy, anger and sadness), as well as in a neutral way. For this end, the authors produced texts whose semantic contexts trigger the aforementioned emotions. Texts were read aloud and recorded for acoustic analysis. The hypothesis is that more schooled readers tend to prosodically mark pragmatic issues of written text in reading aloud more adequately, compared to less schooled readers. Indeed, the results clearly show significant differences between different emotions, as well as between different emotions and the neutral form, for more schooled individuals, with F0, intensity and speech rate being significantly increased in emotions such as joy and anger, and decreased in sadness. These findings are in line with previous studies referring that acoustic parameters such as

F_0, duration and intensity are adjusted depending on the attitude and/or emotion that the speaker wants to imprint. However, Santos and colleagues go beyond this state of the art by complementing it with the needed quantitative analysis of such adjustments. These findings have notable implications in the educational field, namely, to teach reading skills, which involve exploring pragmatic aspects of the text, as well as the impact that such aspects have on text comprehension. When reading a text, a student needs to be able to recognize pragmatic issues such as emotions (e.g., sadness, anger, joy, etc.) and attitudes (e.g., politeness, irony, sarcasm, etc.). In case of reading aloud, these pragmatic issues must be prosodically conveyed by means of acoustic parameters (e.g., F_0 settings, intensity, duration, etc.) so that the listener can also understand the message being read.

The last contribution to this volume, from Thais Helena Machado, Ana Cláudia Pereira Bertolino, Leandro Pereira, Francisco E. C. Cardoso, and Rui Rothe-Neves, focuses on speech temporal organization in three basal ganglia-related neurological conditions: Parkinson's disease (PD), Huntington's disease (HD), and Sydenham's chorea (SC). It is already known that alterations in the neuronal circuits involving the basal nuclei can generate abnormal hypo- or hyperkinetic movements, which, consequently, can influence the motor control of speech. However, how different neurological diseases alter all these parameters is not precisely known. Taking this background into account, the authors investigate how the acoustic parameters of temporal organization of speech vary in the dysarthric speech of three different clinical groups, with and without medication, compared to a control group. The main hypothesis is that the hypokinetic patients have different speech duration patterns than the hyperkinetic ones and that there are correlations between the motor impairment of each disease (specific scales) and temporal changes in speech. After analyzing the total speech time (comprising total articulation time and total pause time), the number of pauses and its average duration, speech rate, articulation rate, and total fluency time, the authors observe that there is no correlation between global motor scales and temporal parameters of speech, leading to the conclusion that global motor impairment in basal ganglia disorders does not involve speech. Almost all temporal measures are different when comparing the clinical and control groups, as clinical groups are slower to produce speech, although they preserve

the syntactic function of prosody at different levels. Thus, differently from what was hypothesized, basal nuclei dysfunction appears to affect all clinical groups, regardless of etiology.

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Conflict of interests

The authors declare they have no conflict of interest.

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