Prosodic phrasing and intonation in neutral and subject-narrow-focus sentences of Brazilian Portuguese

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Abstract

This work aims at discussing the relationship between prosodic phrasing and intonation structure associated with neutral and subject-narrow-focus sentences in Brazilian Portuguese (BP). The sentences were analyzed in terms of phonological phrases (\$\phi\$s) and tonal events. It is found when subject-narrow-focus occurs, the tonal events of neutral sentences can be affected. We argue that evidences of the syntactic structure can be determined by the relationship between the prosodic phrasing and intonation. Finally, we point out that ours results provide for a better understanding of the syntax-phonology interface in BP.

1. Introduction

This work aims at discussing the relationship between prosodic phrasing and intonation structure in Brazilian Portuguese (BP). Specifically, it deals with tonal events associated with ϕ -domain in neutral and subject-narrow-focus sentences

The main hypothesis is formulated as forward: in BP, the tonal events association with φ-domain of neutral sentences can be affected if a subject-narrow focus occurs. This hypothesis is developed based on (a version of) Prosodic Phonology and (a version of) Intonational Phonology frameworks.

We assumed the theory of Prosodic Phonology as proposed by Nespor & Vogel (1986: 6), which is "a theory that organizes a given string of language into a series of hierarchically arranged phonological constituents that in turn form the contexts within phonological rules apply". In this theory, seven domains constitute the prosodic hierarchy and ϕ is the only domain considered here. The adequacy of ϕ -algorithm formation is a relevant question, but we will not deal with this question. For this paper, we assume that BP ϕ -algorithm formation is adequate, as developed by [5] to EP.

The Intonational Phonology framework assumed here is based on tonal levels, initially proposed by [14], revised by [1], [15], and followed by [11], [5] and others. The 'integrated vision' of intonation we adopted is formulated by [5] and its characteristic is to consider the intonational properties as one of the cues of prosodic structure. This approach differs from those that see intonation as independent of the prosodic structure, as [16] does, and from those who consider prosodic domains to be defined by intonation, as [1] and [15] do.

The intonational framework assumed here is based on an autosegmental and metrical theory of Intonationa Phonology (cf. [11]), which says intonation has its own phonological organization. One of its main assertions is that fundamental

frequency (F_0) must be interpreted as a sequence of discreet phonological events and not as one continuous variable contour that can be characterized by its form and direction (cf. [10]). In this theory, tune-text-association obeys universal well formation conditions, which are formulated by [18] as follows: (a) all tonal events must be associated with one Tone Bearing Unit (TBU) at least; (b) all TBU must be associated with one tonal event; (c) the association lines must not cross.

Related to the prosodic framework, we face the open question about the nature of the syntax-phonology interface. Empirical evidences show how phonology accesses syntactic information. In this paper, we point out that our results show the necessity of "taking into account that the mapping is, most probably, a complex encounter in which syntax impinges on phonology and phonology verifies the well formedness of the prosodic phrases so arisen" (cf. Frota, 2000:12).

The structures to be analyzed are: (i) the ϕ -phrasing and the intonation of BP neutral sentences, (ii) the ϕ -phrasing and the intonation of BP subject-narrow-focus sentences. BP focus constructions considered are:

- (i) SV(O/Adv) sentences (sentences in the linear order subject-verb-object or subject-verb (-adverb) and in which the subject carries the main prominence: O João pegou a bola [John got the bowl]
- (ii) it-cleft sentences: Foi o João que pegou a bola [It was John that got the bowl]
- (iii) reduced cleft sentences *O João* que pegou a bola [John that got the bowl]
- (iv) inverse it-cleft sentences: O João é que pegou a bola [*John is that got the bowl]

2. Methods

2.1. Material speech

The total number of BP neutral and subject-narrow-focus sentences is 774: (56 neutral sentences X 3 speakers X 2 repetitions) + (56 subject-narrow-focus sentences X 3 speakers X 3 repetitions) – (56 sentences produced without any focus strategy realized by investigators + 10 subject-narrow-focus sentences with recording problems)). The sentences systematically vary in number of \$\phi\$ in which the subjects and predicates are mapped.Controlling this factor aims at investigating whether it may affect the tonal association of BP subject-narrow-focus and neutral sentences. We examine: (i) if the number of \$\phi\$, in which the subjects and predicates are mapped, may affect the number of tonal events associated with the contour of BP neutral and subject-narrow-focus sentences; and (ii) if, in these sentences, tonal events types (pitch accents and phrasal accents) associated with \$\phi\$

may vary according to the discursive function associated with them (ϕ s in which focus elements are mapped and ϕ s in which neutral elements are mapped).

2.2. Procedure

The procedure followed here consisted in the recording of interviews with three female native speakers of BP. The recordings were made at 16 kHz with a Panasonic US 360 digital recorder. The three BP speakers are from Campinas (São Paulo State), belong to the same age-group (19 to 22 years old) and are all high school graduates. During the interviews, speakers were given sentences to read aloud, preceded by a context inducing the production of the neutral reading (see 1). They were also given questions to answer orally, preceded by a context inducing the production of subject-narrow-focus sentences (see 2). These two types of contexts were alternated with entertaining contexts or with the reading of entertaining sentences.

(1) [Contexto: Li a seguinte notícia:] [Context: I read the following news:]

As governadoras chegaram. The governors arrived.

(2) [Contexto: Estamos à espera das governadoras no gabinete. Percebo que você vê chegar alguém, então, pergunto a você:] [Context: We are waiting for the governors in the cabinet. I realized that you see somebody arrives, then I ask you:]

Quem chegou? Who arrived?

Produced answers: As governadoras chegaram.

The governors arrived.

Foram as governadoras que chegaram. It was the governors that arrived. As governadoras é que chegaram. *The governors is that arrived. As governadoras que chegaram. The governors that arrived.

The sentences produced by speakers were submitted to: (i) the prosodic domain mapping, namelly prosodic word (ω) , ϕ and intonational phrase (I), (cf. [13]; [5]); and (ii) the intonational analysis. For the task (ii), we used the speech analysis software Praat [2]. The intonational analysis consists of the tonal events transcription of the intonational contour associated with the two types of sentences. The tonal transcription was based on [14], [1], [15] and [11] and also on previously studies of the Portuguese intonation developed within the autosegmental metrical theory of Intonational Phonology (cf. [6], [17], [3] and [4]).

3. Results and discussion

3.1. Results

Table 1 provides results regarding the number of ϕ s by sentence and the number of pitch accents and phrasal accents found associated with these ϕ s.

Table 1: Number of ϕs versus number of tonal events.

Type of	Number of			
sentences	sentences	φs	T*	Т-
Neutral	336	732	889	0

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SV(O/Adv)	270	592	421	235
It-cleft	74	236	165	58
Inverse it-cleft	51	162	88	33
Reduced cleft	43	93	66	40

In the table 1, it is possible to observe that there are more pitch accents associated with the φs of neutral sentences than with the φs of subject-narrow-focus sentences. It means that the discursive context seems to affect the pitch accents in association with the contour of BP sentences. Whereas there can be more than one pitch accent associated with each φ of BP neutral sentences, there are less pitch accents associated with φs in the contour of BP subject-narrow-focus sentences and there are φs without pitch accents association.

We also observe that there are phrasal accents associated with the contour of subject-narrow-focus sentences, but not with the contour of neutral sentences.

3.2. Discussion

When we analyze the intonational contour of 336 BP neutral sentences, we identify the following intonational characteristics: (i) pitch accents obligatory associated with each ω -head of ϕ s, as noted early by [6] and [17] about the intonational structure of this sort of BP sentences; (ii) pitch accents optionally associated with each ω that composes ϕ s of the I (cf. also [3] and [4]); and (iii) absence of phrasal accents associated with the intonational structure (cf. also [6], [17], [3] and [4]). The representation in (3) and the respective figure 1 illustrate a typical case of tonal association found in our data of BP neutral sentences.

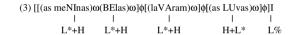
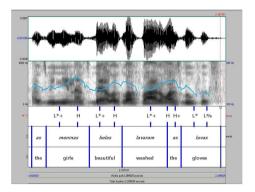


Figure 1: F_0 of the neutral sentence 'As meninas belas lavaram as luvas' [The beautiful girls washed the gloves] produced by a BP speaker.



In figure 1, we note the tonal association of a pitch accent with each ω of the I. This behavior explains the fact that more than one pitch accent may be associated with each ϕ of BP neutral sentences, as results presented in table 1 indicate.

When we analyze the intonational structure of subjectnarrow-focus constructions (SV(O/Adv) sentences, it-cleft sentences, inverse it-cleft sentences and reduced cleft sentences, we observe intonational characteristics usually found in all of them, but absent in intonational structure of neutral sentences. We note in global intonational characteristics of BP subject-narrow-focus sentences (cf. also [3] and [4]): (i) the absence of pitch accents associated with I-internal ω s (ω s between the heads of initial and final ϕ s); (ii) a pitch accent obligatory associated with the ω -head of the ϕ in which the focus subject is mapped; (iii) a phrasal accent optionally associated with the right boundary of the ϕ in which the focus subject is mapped. The representations in (4), (5), and (6), such as figures 2, 3 and 4, exemplify typical cases of the tonal structure associated with the contour of SV(O/Adv), it-cleft and reduced cleft sentences in our BP data respectively.

Figure 2: F_0 of the SV(O/Adv) sentence 'As meninas belas lavaram as luvas' [The beautiful girls washed the gloves] produced by a BP speaker.

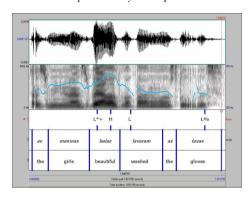
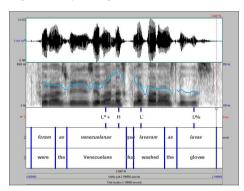


Figure 3: F_0 of the it-cleft sentence 'Foram as venezuelanas que lavaram as luvas' [It was the Venezuelans that washed the gloves] produced by a BP speaker.



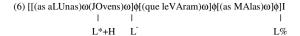
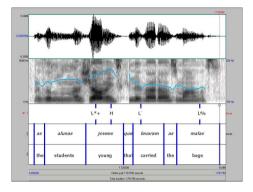


Figure 4: F_0 of the reduced cleft sentence 'As alunas jovens que levaram as malas' [The young students that carried the bags] produced by a BP speaker.



The tonal association pattern of the intonational contour of BP subject-narrow-focus constructions explains the fact that we found fewer pitch accents associated with the contour of this type of sentences in comparison with the number of pitch accents associated with the intonational contour of BP neutral sentences (see table 1). There are fewer pitch accents associated with the contour of BP subject-narrow-focus sentences because of the absence of pitch accents associated with I-internal $\omega_{\rm S}$ ($\omega_{\rm S}$ between the $\omega_{\rm S}$ -head of the φ -final of the focus subject is mapped and the $\omega_{\rm S}$ -head of the φ -final of the I).

Regarding the association of phrasal accents with the contour of BP subject-narrow-focus sentences, it is necessary to add that there are phrasal accents only associated with a specific point of the intonational contour: the point that corresponds to the right boundary of the ϕ in which the focus subject is mapped, and with no other intonational contour point, as we can see in figures 2, 3 and 4. Taking into account this fact, we could ask why there are not phrasal accents associated with other ϕ -boundaries in the intonational contour (Vigário, p.c.).

Our hypothesis is that the phrasal accent associated with the right boundary of the ϕ in which the focus subject is mapped plays the specific role of prosodically codifying a special syntactical position occupied by the focus subject in BP: a syntactical position external to the minimal syntactical domain that contains the rest of the sentence (for details about this subject, cf. [8], [7], [9] and [3]). We believe that there is not a special intonational codification associated with \$\phi\$s that contains elements following the focus subject because these elements do not occupy any extraordinary syntactical position in the sentence. It is possible that the phrasal accent associated with the right boundary of the \$\phi\$ that contains the subject of sentences in subject-narrow-focus contexts codifies a syntactical position different from that position occupied by the subject of sentences in neutral contexts. This hypothesis will be more deeply investigated in future research.

4. Conclusions

The results presented in this paper confirm our initial hypothesis: in BP, the tonal events association with ϕ -domain of neutral sentences is affected when a subject-narrow-focus occurs. In summary, it was found that:

- There is a relationship between the number of φs and the number of pitch accents associated with neutral sentences: the more φs, the more pitch accents in each sentence;
- This relationship does not appear in subjectnarrow-focus sentences. This happens because it is not obligatory to have pitch accents associated with ωs that are heads of middle-φs (those φs between the φ of subject-narrow-focus and the last φ within I);
- (iii) There is no phrasal accent association in neutral sentences:
- (iv) The occurrence of a phrasal accent associated with the φ-right boundary in which subjectnarrow-focus is mapped is possible.

We conclude this paper by pointing out that the facts listed above can be indicative cues that the syntactical position of the subject in neutral sentences is different from those in subject-narrow-focus sentences. In [3], a detail discussion of theses results and an interpretation of their relevance for understanding the syntax-phonology interface are found.

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