

Distinguishing emphatic and Prosodic Word initial stresses: evidence from Brazilian Portuguese

Priscila Marques Toneli¹, Marina Vigário², Maria Bernadete M. Abaurre¹

¹ Institute of Language Studies, State University of Campinas, Brazil

² University of Lisbon, Portugal

pmttoneli@gmail.com, marina.vigario@mail.telepac.pt, bernadete.abaurre@gmail.com

Abstract

In European Portuguese (EP), emphatic stress and initial stress have been reported to be optionally assigned to the first (or in some cases the second) syllable of a Prosodic Word (PW) ([1]). In Brazilian Portuguese (BP), initial stress (and/or H-tone) has been claimed to be assigned with reference to the primary stress position and be dependent on the number of pretonic syllables within a PW ([2]). [3], [4] and [5] suggest that in BP secondary stress assignment essentially signals the beginning of the PW in emphatic contexts, however. Although [5] reports that in emphatic contexts the initial stress and the 'H-tone' can coincide with a secondary stress, the nature of this type of stress and the difference between emphatic stress and PW initial stress in BP is in general not discussed. In this paper we argue that, although the two types of stresses in BP are tonally signaled, they are distinct, both in function and in distribution. Empirical data from two varieties of Portuguese spoken in Brazil (Paraná and Minas Gerais states) are presented, showing that the emphatic stress has a wider distribution than the initial stress, in neutral contexts. The emphatic stress may occur in any syllable from the stressed syllable leftwards, within the PW, including the syllable immediately adjacent to word-stress. The initial stress, by contrast, is found on the first or second pretonic syllable of PW, and there is a minimal distance of two syllables between initial stress and word-stress (e.g. *governADores* 'governors') ([2]). We argue that the initial stress is an edge phenomenon, marking PW initial positions, unlike the emphatic stress. In both cases, the tonal association is evidence for the PW domain in BP, because neither type of stress exceeds the limits of this domain (i.e. none of them can appear in post-tonic syllables of non-final PW).

Index Terms: Initial Stress, Emphatic Stress, Brazilian Portuguese, Prosodic Word, Tonal Association

1. Introduction

In Portuguese, like in other languages, there are different kinds of tonal events. Pitch Accents (PA) are obligatory in nuclear stressed syllables, and optional or obligatory in prenuclear positions, depending on the variety ([6]-[17]).

Given that PAs are assigned to the stressed positions, the presence of a PA signals word-stress and hence it may be seen to cue the stressed status of given unit ([1]). Intonational Phrase (IP) right-edges are typically marked with a boundary tone in both varieties of Portuguese ([6]-[9], [11]-[14]) and a phrasal accent may be found after a focused word in BP ([8], [9], [13]).

In EP, tonal events may also be associated to syllables not bearing word-level stress, namely in PW initial position, as means of marking Initial Stress and Emphatic Stress ([1]).

In BP, a number of studies have shown that there is nearly a one to one correspondence between PA and PW in neutral

sentences ([2], [8], [9], [14], [16], [17]). Furthermore, besides a PA (here T*) associated to the stressed syllable, additional tonal events are often found in unstressed PW initial syllables, under particular conditions. For instance, when a PW has at least three pretonic syllables, as in *governADOR* 'governor', an initial stress marked with an H-tone often appears in first (or the second) syllable of a PW; by contrast, this type of stress is not found in words with less than three pretonic syllables, as in *professor* 'teacher' ([2]), and hence its is never found in the syllable immediately preceding the stressed syllable. This is illustrated in 1 (here and elsewhere in this paper word-stress is signaled in caps when relevant, and emphatic and initial stressed syllables are underlined).

- (1) a. governADOR b. profeSSOR
 | | |
 H T* T*

Furthermore, [16] notice that in compound-like words containing two PWs (forming a Prosodic Word Group – PWG - which the PW head is on the right), initial stress, marked with an H-tone, may be located in the first syllable of the second PW, e.g. *recém-aprisionados* 'freshly imprisoned'. The authors notice that the fact that the initial stress associates to the initial syllables of both head and non-head PW in branching PWG constitutes evidence for the PW-domain in BP.

- (2) reCÉM-aprisionADos
 | | |
 T* H T*

In most studies on BP, the initial stress is reported to be signaled by an H-tone optionally followed by an L-tone (H(+L)).

Emphatic stress is frequently used in politician's speech and TV news reports. Distributionally, initial stress seems to coincide with emphatic stress, since both have been reported to appear on the left periphery of PW. However, only emphatic stress can occur on the syllable adjacent to the word-stress, as illustrated in *Isto é suBERbo!* 'This is great' ([1]).

According to [1], the function of the emphatic stress is to highlight the whole word, unlike that of the initial stress. Crucially, neither type of stress marks semantic contrast when the context requires new or given information.

Semantic contrast is distinct in both function and prosodic grammar. In the literature, narrow focus expresses identification in the domain of discourse or contrast by identifying the relevant subset of a set ([8], [11], [19]). For instance, it requires a particular context – e.g. *O João chegou* '(It was) João (who) arrived', with focus on the subject may be felicitous as an answer to a question like *O Pedro chegou?* 'Was it Pedro who arrived?', but not to *What happened?*, which elicits broad focus, instead. Contrastive focus in

Portuguese is marked by a particular type of stress (focal stress), signaled by a specific pitch accent (H*+L in EP and H*+L or L*+H followed by Lp in BP) and by postfocal pitch range compression ([6], [10]-[13] for EP; [8], [9], [13], [17] for BP).

In this paper we are especially interested in the distinction between emphatic stress and initial stress in neutral contexts since in BP literature the two kinds of stress are usually not clearly distinguished and, as far as we know, there are no studies exploring the difference between each phenomenon.

On the basis of empirical data from BP (from Cascavel – Paraná, and Uberaba – Minas Gerais), we will show that initial stress and emphatic stress are both distributionally and functionally distinct, i.e. emphatic stress is in fact not restricted to PW initial position, unlike initial stress, and it may be used to highlight, not only the whole word as when it appears in word initial position, but also word-internal positions, in neutral contexts. Initial stress, by contrast, appears only in PW initial position and is not interpreted as emphasizing the word. Nevertheless, both types of stresses are similar in that they may be marked by an H-tone, both can be found in word initial syllables, and they both cue the PW domain in BP.

2. Corpus and Methodology

The data analyzed here were obtained in a reading task. 20 sentences were created with a branching PWG (i.e. derived words, morphological compounds or syntactic words, composed of two PWs, as in example 3), located after verb. Subjects had to read these sentences preceded by a context-sentence eliciting broad focus. 10 sentences were also included containing a non-branching PWG in the same location and preceded by a context sentence eliciting given information (as illustrated in 4). These sentences were used for comparison and also served as distractors.

Since it is known that the number of pretonic syllables may condition the emergence of initial stress, the number of pretonic syllables within PWG was controlled for, ranging from zero to five syllables, both in non-head PWs (PW1) and in head PWs (PW2) in branching PWG, as well as in PW in non-branching PWG – e.g. (AU.to)_{PW1}(ssus.ten.ta.bi.li.DA.de)_{PW2} ‘self-sustainability’; (ci.vi.li.ZA.da)_{PW1}(MEN.te)_{PW2} ‘civilly’; (ba.TA.ta)_{PW} ‘potato’.

In the variety spoken in Paraná (PR), we recorded three speakers, who produced each sentence three times (30 sentences x 3 speakers x 3 repetitions = 270 sentences); a similar procedure was followed for the variety spoken in Minas Gerais (MG), except that the sentences were divided in two groups of fifteen sentences, produced by 5 speakers each (15 sentences x 10 speakers x 3 repetitions = 450 sentences). The later option allowed us to increase the number of speakers and reduce the duration of the experiment.

The production experiment proceeded in three steps: first speakers were presented with a sentence on the computer screen; then they heard a question on headphones; finally, they had to answer the question using the sentence on the screen (see examples 3-4).

(3) Context eliciting broad focus

Sentence on the screen ~ sentence to be produced:

*Os técnicos ensinaram **teleprocessamento** aos alunos.*

‘The technicians taught teleprocessing to the students’

Sentence heard:

O que aconteceu? ‘What happened?’

(4) Context eliciting given information

Sentence on the screen ~ sentence to be produced:

Os senadores receberam governadores em Brasília.

‘The senators received governors in Brasília’

Sentence heard:

Os senadores receberam governadores em Brasília?

‘The senators received governors in Brasília?’

A native-speaker recorded the audio stimuli sentences. Speakers are all female, between 18 and 30 years-old and are undergraduate or graduate students. The data was recorded in a silent room with a d:fine omni headset microphone DPA with MicroDot, frequency range ± 2 dB, 20Hz – 20kHz, connected to a digital recorder Microtrack II M-Audio. We labeled the tonal events, PAs and boundary tones, based on the inspection of the fundamental frequency (F0) contour and perception, following P-ToBI ([12]), and using Praat ([18]), version 5.3.22. Our goal with this experiment was to determine if each PW in a branching PWG exhibits a PA associated with its stressed syllable and if additional tonal events are found when a PW has at least three pretonic syllables.

3. Results and discussion

In this section, we present the results for tonal distribution in neutral sentences (branching PWG produced as new information and non-branching PWG as given information for comparison) that were pronounced in a single IP. We will consider each variety in turn.

For the variety spoken in PR, we analyzed 183 sentences produced in neutral context: 104 with branching PWG after verb and 79 with non-branching PWG in the same position.

In the sentences with branching PWG, besides a PA systematically associated to the PW head (PW2) within PWG, we found: (i) initial stress on the initial syllables of PW1 in 7% of the sentences; (ii) initial stress on the initial syllables of the PW2 in 16% of the sentences; (iii) emphatic stress on the initial syllables of PW1 in 10% of the sentences; (iv) emphatic stress on the initial syllables of PW2 in 3% of the sentences; (v) emphatic stress on the stressed syllable of PW1 in 24% of the sentences; and (vi) emphatic stress on the stressed syllable of PW2 in 6% of the sentences.

Figure 1 shows an example of emphatic stress on the first syllable of PW1 (*‘civiliZAda’*) in a branching PWG (*‘civiliZAdaMente’* ‘civilly’).

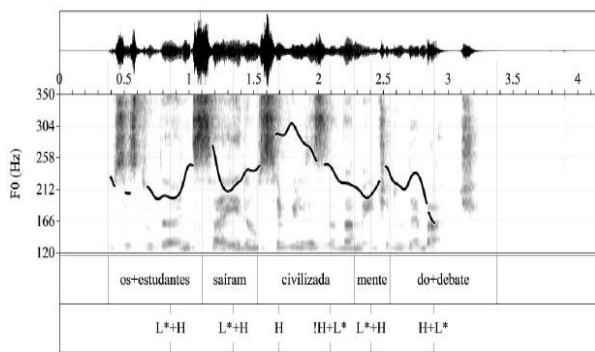


Figure 1: F0 trace of the sentence *Os estudantes saíram civilizadamente do debate* ‘The students left civilly debate’, produced in neutral context by a speaker from PR.

The example in Figure 2 shows that, in addition to initial stress on the first syllable of PW2 (*moçambicANos*), in a branching PWG, emphatic stress may also appear on the stressed syllable of PW1 (*LUso*).

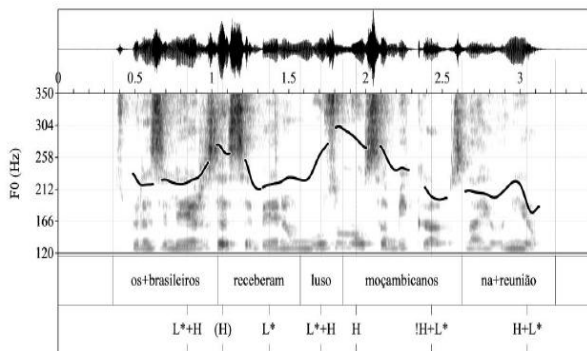


Figure 2: F0 trace of the sentence *Os brasileiros receberam luso-moçambicanos na reunião* ‘The Brazilian received luso-mozambicans at the meeting’, produced in neutral context by a speaker from PR.

Let us now consider sentences with non-branching PWG in the same location, produced as given information. In this condition, we found (i) initial stress on the initial syllables of PW in 9% of the sentences; (ii) emphatic stress on the first syllable of a PW in 1% of the sentences, and (iii) emphatic stress on the PW stressed syllable in 1% of the sentences. We may notice that the same distribution was found of initial and emphatic stresses in branching and non-branching PWG in the two types of contexts considered (new and given information), although PR speakers assign more stresses to branching PWG than to non-branching PWG.

Figure 3 illustrates a sentence produced in neutral context (as given information) with initial stress marked with LH on the first syllable of PW in a non-branching PWG (*aportuguesaMENTo* ‘Portuguese adaptation of a loanword’). This example also illustrates the metrical restriction imposed on initial stresses, requiring a distance of at least three syllables to primary stressed position.

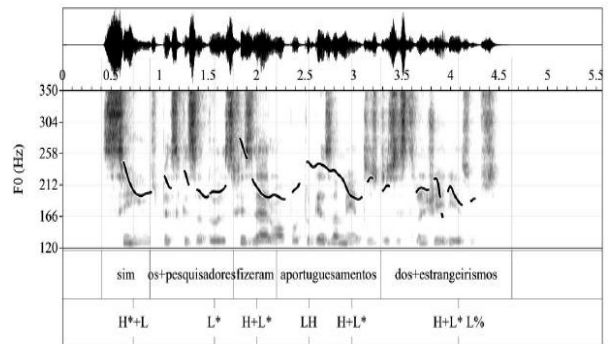


Figure 3: F0 trace of the sentence *Sim. Os pesquisadores fizeram algumas adaptações dos estrangeirismos* ‘The researchers made some Portuguese adaptations of loanwords’, produced in neutral context by a speaker from PR.

In the variety spoken in MG, we found the same distribution of the initial and the emphatic stresses, with some variation in the amount of stresses found in each condition. Specifically, in the sentences with branching PWG produced as new information (corresponding to a total of 215 sentences), besides the PA systematically assigned to head of PWG, we found: (i) initial stress on the initial syllables of PW1 in 12% of the sentences; (ii) initial stress on the initial syllables of PW2 in 26% of the sentences; (iii) emphatic stress on the initial syllables of PW1 in 9% of the sentences; (iv) emphatic stress on the initial syllables of PW2 in 24% of the sentences; (v) emphatic stress on the stressed syllables of PW1 in 18% of the sentences; and (vi) emphatic stress on the stressed syllables of PW2 in 6% of the sentences.

Figure 4 shows that emphatic stress can be realized on the pretonic syllable immediately preceding the stressed syllable of PW2 in branching PWG (*banDELras*). In this case, the emphasis is realized on the syllable that bears the leading tone (H) of the bitonal PA assigned to PW2 (H+L*).

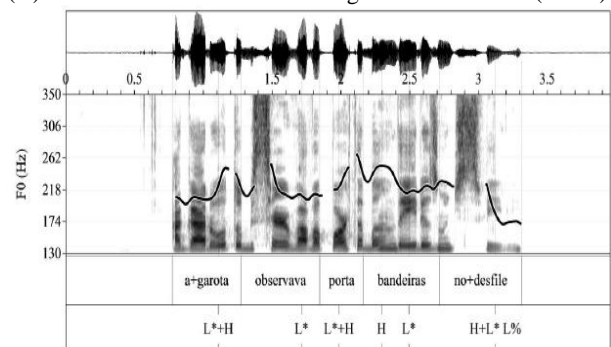


Figure 4: F0 trace of the sentence *A garota observava PORTa-banDELras no desfile* ‘The girl looked at flag bearers at the parade’, produced in a neutral context by a speaker from MG.

Let us now look at non-branching PWG in the variety spoken in MG. We found (i) initial stress on PW initial syllables in 30% of the sentences; (ii) emphatic stress on the first syllables of PW in 3% of the sentences; and (iii) emphatic stress on the stressed syllable of PW in 4% of the sentences.

Figure 5 exemplifies a case of emphatic stress on the first syllable of a PW in a non-branching PWG (*diploMATas* ‘diplomats’). The example also shows that emphatic stress, unlike initial stress, is not subject to the metrical restriction requiring a distance of at least three syllables to word-stress.

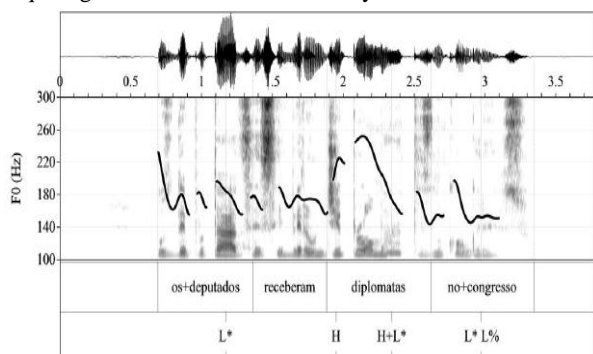


Figure 5: F0 trace of the sentence *Os deputados receberam diplomatas no congresso* ‘The representatives in government received diplomats at the congress’, produced in neutral context by a speaker from MG.

In the two varieties, both emphatic stress and initial stress are usually produced with a high tone (H), but some cases of low-high (LH) were also found associated with initial syllables of PW1 and of high-low (HL) associated with the initial syllables of PW2, in branching PWG.

Initial stress has essentially the same distribution in MG and in PR: it is only found in the first and second syllables of a PW and its presence depends on the number of pretonic syllables (at least three pretonic syllables in both varieties of BP), both in branching and non-branching PWG. Thus, initial stress was found on words like *paralelePIpedoZinhos* ‘little paving stones’, *eLEtronegativiDAde* ‘electronegativity’ and *pernambuCANos* ‘people from Pernambuco’, but not *PRÉ-classiCISmo* ‘pre-classicism’ and *diploMATas* ‘diplomats’.

Emphatic stress, by contrast, can be found on any pretonic syllable, and also on the syllable bearing word stress, both in branching and non-branching PWG, in head and non-head PW. Thus, emphatic stress was found on (i) initial syllables of PW, as in *arquiTONicaMENte* ‘architecturally’; *MicropaleontoGla* ‘micro paleontology’; *espiritualiDAde* ‘spirituality’; (ii) stressed syllables, as in *LUso-moçambiCANos* ‘luso-Mozambicans’; *eLEtricaMENte* ‘full of energy’; *congestionamento* ‘traffic jam’; and (iii) syllables immediately preceding word stress, as in *PORta-banDEIras* ‘flag bearers’.

In both varieties under investigation, emphatic stress was never found in post-tonic syllables.

Besides the difference in terms of location, the two types of stress also seem to have different functions and show distinct sensitivity to rhythmic restrictions: initial stress has delimitative properties and is sensitive to rhythmic conditions, while the latter is used to highlight words or portions of words in neutral contexts and is not rhythmically constrained.

We may also notice that emphatic stress is different from focal stress in the form, for instance, emphatic stress is not marked by H*+L or followed by pitch range compression, and in the function, as it does not mark narrow or contrastive

focus, or require a semantic context eliciting narrow or contrastive focus. Our hypothesis is that factors external to the semantic context may favor the speaker’s choice of producing emphatic stress, such as the type and size of PWG, and the frequency of use of the words and others (e.g. longer and less frequent words may favor emphatic stress). This is a relevant topic for future research.

To sum up, these results show that the two types of stresses are optional, they confirm reports in the literature on the distribution of initial stress in BP ([2], [3], [4], [13], [16]), and add to the knowledge about the location and function of emphatic stress in BP and the varieties of PR and MG.

4. Conclusions

Our results suggest that location within the word distinguishes between initial stress and emphatic stress. Initial stress is optionally assigned to the first or second syllable of a PW and is sensitive to rhythmic conditions – at least two syllables are required between the syllable bearing initial stress and the word stressed syllable –, while emphatic stress is optionally assigned to any syllable of PW, excluding post-tonics.

The two stresses are also distinct in their function. While emphatic stress is used to highlight a PW, as documented for EP in [1], initial stress has a demarcative function, signaling PW initial position, with no apparent impact on interpretation.

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