The yes-no question contour in Northern Brazilian Portuguese: revisiting the geographical continuum

Priscila Santos[1], Sónia Frota[2] and Marisa Cruz[2]
[1]Federal University of Rio de Janeiro, [2]University of Lisbon

According to previous studies, the intonational system of Portuguese has been characterized by the prevalence of bitonal pitch accents and monotonal boundaries ([1], [2]). In Brazilian Portuguese, only the complex boundary tone HL% was reported, in the rising-falling yes-no questions characteristic of the South (Santa Catarina and Rio Grande do Sul). The distribution of the nuclear contour of yes-no questions along the Atlantic Coast has provided evidence for a geographical continuum, with the Northeast presenting a rising contour, and the Center and South a rising-falling contour ([3], [4]). In the Center regions, unlike in the South, the nuclear contour exhibits a high tone clearly associated to the pitch accent, followed by a low boundary tone. These findings lead to the hypotheses that (i) yes-no questions in the extreme North of Brazil are mostly produced with a rising contour, according to the linguistic continuum previously described, and that (ii) a monotonal boundary predominates in the Northern Brazilian Portuguese yes-no questions.

To test these hypotheses, a semi-spontaneous eliciting task was used to collect data in Oiapoque, in the extreme North of Brazil (Fig.1), consisting in a fixed carrier sentence ending with nuclear words with different stress patterns – oxytone, paroxytone and proparoxytone (20, 30 and 20 sentences, respectively) –, that were presented to participants in individual written cards. Following the Autosegmental Metrical approach ([5], [6], i.a.), and using the P-ToBI system ([7]), data were analysed in Praat ([8]). Due to the availability of more segmental material (thus allowing a full realization of the intonational contour), yes-no questions with proparoxytone nuclear words were selected for the present analysis.

Preliminary results from two speakers show that a rising-falling nuclear contour is consistently used to produce yes-no questions, instead of the expected rising contour that prevails in the Northeast, according to the proposal of a geographical continuum. A closer inspection of the tonal boundary type shows that the simple low boundary tone prevails (62%) over the complex falling boundary tone (38%), which is, however, also possible (Fig.2). Given the predominance of the LHL melody in the extreme North of Brazil, and in order to provide additional acoustic evidence for the simple *versus* complex boundary tone, the peak height attained in the stressed and post-stressed syllables was manually extracted in semitones. Considering the range of 3 semitones as the reference for the peak height to be recognized as a H boundary tone ([9]), and focusing on the post-tonic stretch, we compared the peak height of the first and second post-stressed syllables (respectively, PT1 and PT2). A simple (L) boundary tone is annotated when the peak height of PT1 is 3 semitones higher than PT2; inversely, a complex (HL) boundary tone is annotated when the peak height difference between PT1 and PT2 is lower than 3 semitones. In our data, the simple boundary tone was reflected in a peak height difference between PT1 and PT2 ranging from 3 to 5 semitones (av. 4st), whereas the complex boundary tone was reflected in a peak height difference of 1-2 semitones between PT1 and PT2. Thus, peak height information in the post-tonic stretch adds to tonal alignment differences in characterizing simple and complex boundary tones.

In sum, preliminary findings from Oiapoque, a region in the extreme North of Brazil that was previously unstudied, confirm the predominance of monotonal boundary tones in Portuguese ([1], [2]), while showing that the complex HL% found in South also appears in the North. Moreover, the proposal of a geographical continuum ([3], [4]) for the Atlantic Coast cannot be generalized to the extreme North of Brazil, thus suggesting that the geographical distribution of yes-no question nuclear contours, similarly to findings for

European Portuguese ([10]), is discontinuous in the Brazilian variety of Portuguese. Implications of the latter finding for possible language contact phenomena, given the border status of the extreme North, need to be explored.

Figure 1. Data collection point (red bullet) in the North of Brazil, in the opposite vector of the already known data points (blue bullets). The map shows the main linguistic areas in Brazil, defined by Nascentes (1953).

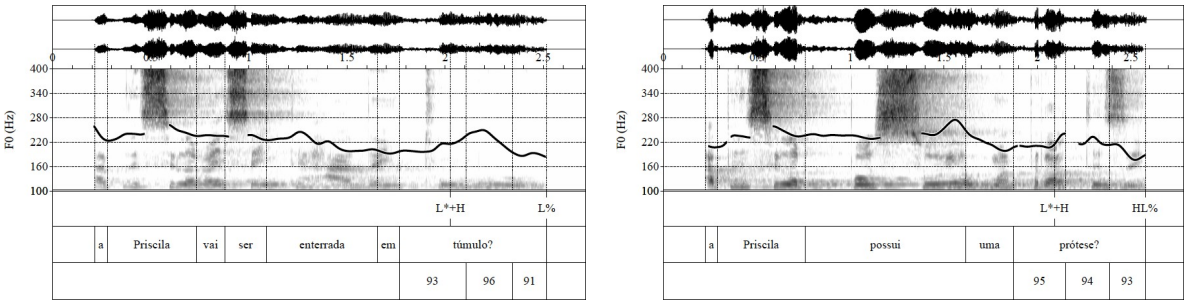

Figure 2. Rising-falling nuclear contour produced in yes-no questions in the North of Brazil: prevalence of the monotonal boundary tone (left panel – 'A Priscila vai ser enterrada em túmulo?' *Is Priscila going to be buried in a tomb?)* over the complex boundary tone (right panel – 'A Priscila possui uma prótese ?' *Does Priscila have a prosthesis?),* also possible. Values in the third tier refer to the peak height measured in semitones (re 1Hz).

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