This paper discusses syllable duration in prosodic boundaries in ambiguous sentences in Brazilian Portuguese (henceforth BP). Specifically, our main question is whether BP speakers differentiate readings of ambiguous sentences by lengthening syllables in the different prosodic domains. Previous studies on BP have shown that people use phonological cues to access the syntactic structure of sentences (cf. Santos 2003, Lourenço-Gomes, Maia & Morais 2005, Magalhães & Maia 2006, Prestes 2006). Investigating the interpretation of sentences ambiguous with respect to local and non-local readings of attributes (cf. 1ab), Magalhães & Maia (2006) showed that under the reading in (1b), the final syllables of the attribute were longer than the ones in (1a). Interestingly, the lengthened syllable is not in the relevant syntactic context and therefore the phenomena cannot be derived by a different parsing in the prosodic domains (The authors did not analyze the last syllable of the internal argument, where the prosodic difference is (cf. 1a vs 1b)).

Santos & Leal (2010) showed that contrary to what has been found in many other languages (cf. Oller 1973, Klatt 1976, Wightman, Shattuck-Hufnagel, Ostendorf & Price 1992, Fougeron & Keating 1997), there is no lengthening effect in prosodic boundaries in BP. They compared the duration of pre and post-tonic syllables in the boundaries of the prosodic domains above the word in non-ambiguous sentences and showed that only in the right boundary of an intonational phrase is there a significant difference in duration. However, they suggest that lengthening in the relevant prosodic domains may be used to disambiguate syntactically ambiguous sentences. Investigating this suggestion, our hypotheses here are the following: (i) subjects exhibit a difference in their productions associated with each reading of the attribute (local vs non-local), (ii) sentences with the non-local reading are longer than the local one, in consonance with the findings in the literature according to which the higher the prosodic domain, the longer the syllable is (cf. e.g. Oller 1973, Klatt 1976).

We designed 9 pairs of ambiguous sentences such as (2) allowing both a local and a nonlocal reading. In the case of non-local readings, the highest prosodic domain after the internal argument is the phonological phrase, while in the case of local readings, it is the clitic group. The sentences were inserted in small stories that disambiguate the readings and these were mixed in 2 lists. 24 subjects read the stories, first in silence, and then aloud, in a normal pace. Each list had either the local or the non-local reading, so it was never the case that one subject was tested on both readings for a sentence. Our final analysis is based on the duration of the last syllable of the internal argument and the first syllable of the attribute of 432 sentences.

First we compared the results of each informant and a difference was found in the readings. Assuming a significant difference of 40 milliseconds, only 3 subjects produced both readings with the same duration. 12 subjects produced longer sentences with non-local readings, and 9 subjects produced longer sentences with local readings. Therefore, a difference in readings was found in 21 out of the 24 subjects. Secondly, we analyzed the results for each sentence, in order to check if there was a significant difference between the two readings and if this difference was in consonance with the finding for other languages – in non-ambiguous sentences - that the higher the prosodic domain, the longer the syllable is. 4 pairs of sentences had less than 40
milliseconds difference between local and non-local readings, 4 pairs of sentences had non-local readings longer than local ones, and in only 1 pair was the local reading longer than the non-local one. Thus, our results only confirm our first hypothesis. Subjects’ productions make a distinction between the two readings in the relevant contexts, but even in this case, this does not mean that syllable duration increases as a higher prosodic domain is involved.

(1) O pai abraçou o filho embriagado.
    the father hug       the son   drunk

    Reading                           Prosodic Parsing
    a. Local reading `The son was drunk` = o pai [abraçou] phon. phrase [o filho embriagado] phon. phrase
    b. Nonlocal reading `The father was drunk` = o pai [abraçou o filho] phon. phrase [embriagado] phon. phrase

(2) a babá ninou a menina chorando. (syllables measured in capital letters)
    the nanny nursed the girl crying.

    Reading                           Prosodic Parsing
    a. Local reading `The nanny was crying` = A babá [ninou] phon. phrase [a menina chorando] phon. phrase
    b. Nonlocal reading `The girl was crying` = A babá [ninou a menina] phon. phrase [chorando] phon. phrase