RHYTHMIC PATTERNS OF THE DISCOURSE IN MEXICAN SPANISH AND BRAZILIAN PORTUGUESE

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ABSTRACT

The notion of syllabic foot is commonly used by investigators in determining the rhythmic patterns of languages, in terms of perception. Following this notion, Spanish and English are said to be, respectively, the typical cases of syllable-time and stress-time languages. It is very difficult, however, to confirm these rhythmic patterns empirically [7, 8, 9, 10, 11, 12, 15, 16, 23, 28]. Taking into consideration the recent discussions about P-centers, i.e. "perceptual centers" [7, 12, 16], an acoustical analysis was performed indicating that in Spanish, syllables may in fact have very similar temporal patterns, although Brazilian Portuguese (RP) may combine both the characteristics of syllable and stress-time.

1. INTRODUCTION

Linguistic studies have attempted to place natural languages into classes according to characteristic rhythmic patterns [3]. This notion is desirable because it has explanatory power for phonological processes in English, for example. Pike [26] explains that a reduction of the kind "If Tom will do it" (cf. "If Tom will do it") may be explained if the notion of stress-time rhythm is used. And in fact, knowledge of the so-called "chopping" characteristic of the sentences in English is an enormous help for the foreign student in the classroom. In terms of the Spanish language, this author holds that the notion of vowel stability is more adequate than the notion of syllable-time. Syllable-time or staccato is a perceptual impression and a consequence of vowel stability in Spanish. BP can be said to have both the staccato characteristics similar to English and vowel stability depending on dialectical variation as well as intra-speaker variation. And this may be true of Spanish as well.

It may be that discussions concerning these notions are purely a matter of point of view. Although investigators suggest that BP has a stress-time rhythm, attempts to apply these perceptual notions to BP, not Peninsular Portuguese, seemingly have proved difficult as well [1, 2, 17, 20, 21, 27, 28, 29].

The notion of syllable and stress-time is a perceptual or impressionistic notion. Once we carry this notion to the physical measurements of syllables in sentences, the expected isochrony cannot be found. More recently the developments around the notion of P-centers [7, 9, 10, 12] may explain why subjects may have this perceptual knowledge of regularity although acoustically we find no correspondence. The regularity seems to be present in an underlying form which cannot be reflected acoustically. The works of Parker and Diehl [23] had already pointed out the possibility that the duration of a vowel may be greater than the acoustical signal tends to show.

The present study is a continuation of former investigations in the area of temporal patterns and their relation to rhythmic patterns. There will be no attempt to give a description of the structure of BP in this investigation for lack of space. Detailed and brief descriptive analyses of Portuguese and Spanish can be found in some of the works cited here [1, 2, 5, 6, 13, 14, 17, 21, 22, 23, 24].

2. EXPERIMENTAL PROTOCOL

The experimental protocol was organized according to three major procedures: the production of the recordings, the production of the spectrograms for sound segment analysis, and data analysis. In the production of the recordings, passages from Mexican and Brazilian television broadcasts were recorded in the language laboratory at the University of Kansas by a laboratory technician. Recorded passages containing dialogues and news broadcasts were used randomly. One hundred spectrograms were produced for analysis and measurement.

Segmentation procedures used in this study use Klatz's [18] way of segmenting, combined with the works of Leibhat and Peterson [19, 25] which deal with the notions of onsets, offsets, steady state and simple and complex nuclei, the work of Parker and Diehl [23], and the more recent notion of P-centers [7, 9, 10, 11, 12, 15, 16] as well. Detailed explanations as to the segmentation rules are given by the author elsewhere [27].

Two different methods of measurement were used. In the first method, only the vowel nucleus was measured, and in the second method, the vowel nucleus and the preceding consonant were measured when there was a preceding consonant. Otherwise only the vowel nucleus was measured. The statistical package SPS 4.1 for IBM VM/CMS at the University of Kansas was used to run several different tests on segment(s) duration according to method, language, and relative position of the (consonant)-vowel to the stressed (consonant)-vowel. Before using parametric tests such as ANOVA, a comparison was done of the distribution of values using the median and the mean. Since no skewed distribution nor significant differences in values were observed, either the mean or the median could be used in this study. There were missing values in our data, but these were taken care of by techniques already existing inside the ANOVA program.

3. RESULTS AND DISCUSSION

The present results show for Mexican Spanish (MSP) a significant regularity of the temporal pattern of the sounds studied, regardless of method. In the case of BP, different results will be obtained depending on the method used. Table 1 summarizes these results where MSP stands for "Mexican Spanish", BP for "Brazilian Portuguese", PR for "percepcional", ST for "stressed".

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev</th>
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<tbody>
<tr>
<td><strong>Table 1</strong></td>
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<tr>
<td><strong>ANOVA result of cell means and standard deviations by language, position and method.</strong></td>
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<tr>
<td><strong>MSP (CV)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PR4</td>
<td>12.65</td>
<td>3.2</td>
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<tr>
<td>PR3</td>
<td>13.64</td>
<td>5.95</td>
</tr>
<tr>
<td>PR2</td>
<td>14.35</td>
<td>4.45</td>
</tr>
<tr>
<td>PR1</td>
<td>16.73</td>
<td>4.14</td>
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<tr>
<td>ST</td>
<td>7.24</td>
<td>6.03</td>
</tr>
<tr>
<td>PST1</td>
<td>17.94</td>
<td>4.87</td>
</tr>
<tr>
<td>PST2</td>
<td>16.38</td>
<td>4.92</td>
</tr>
<tr>
<td><strong>MSP (V)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP4</td>
<td>12.56</td>
<td>3.63</td>
</tr>
<tr>
<td>BP3</td>
<td>7.38</td>
<td>1.16</td>
</tr>
<tr>
<td>BP2</td>
<td>6.58</td>
<td>2.53</td>
</tr>
<tr>
<td>BP1</td>
<td>9.66</td>
<td>2.91</td>
</tr>
<tr>
<td>ST</td>
<td>15.78</td>
<td>5.89</td>
</tr>
<tr>
<td>PST1</td>
<td>10.29</td>
<td>3.96</td>
</tr>
<tr>
<td>PST2</td>
<td>9.75</td>
<td>4.23</td>
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</table>

The values were kept in centimeters, but it suffices to multiply any value by 8 to obtain the corresponding value in milliseconds.

Preliminary analysis of the spectrograms containing samples of speech from MSP in this study have shown to be common for a vowel or a sequence of consonant and vowel in unstressed posttonic position to have longer duration than their stressed equivalents. This becomes even more evident when it is in a prepausal position, confirming similar findings in what Klaas [18] called "prepausal lengthening". In the present study this syntactic propositional cut is not observed in BP which confirms results from an earlier study undertaken [27]. This lengthening in BP makes prosodic syllables longer than the stressed syllables in a discourse.

This lengthening can also be observed by relying in a dialogue in Spanish in general, but more evident in the unstressed vowel. The great posttonic reduction observed in BP was not observed in BP which confirms results from an earlier study undertaken [27]. This lengthening in BP makes prosodic syllables longer than the stressed syllables in a discourse. This lengthening can also be observed by simply listening to a dialogue in Spanish in general, but more evident in the unstressed vowel. The great posttonic reduction observed in BP was not observed in BP which confirms results from an earlier study undertaken [27]. This lengthening in BP makes prosodic syllables longer than the stressed syllables in a discourse. This lengthening can also be observed by simply listening to a dialogue in Spanish in general, but more evident in the unstressed vowel. The great posttonic reduction observed in BP was not observed in BP which confirms results from an earlier study undertaken [27].

Other statistical tests were made, in an attempt to observe the relation between positions according to language and method as seen in Figure 1.
The notion of P-centers [7, 12, 16] has given the present analysis a clearer view of the consonants. For instance, the positions of the consonants may be reanalyzed in terms of the present analysis, "vowel stability". This is my interpretation of the results in that work, which in a closer analysis suggest syllable-time characteristics instead of the proposed stress-time characteristic. The explanation presented here for these rhythmic alternations within the same language and intra-speaker, is that the speaker also manipulates rhythm at higher level. The reasons are of a pragmatic nature where sometimes in a spontaneous interaction the speaker may feel a need for a clearer message.

4. REFERENCES


