FEATURE GEOMETRY
AND BRAZILIAN INDIGENOUS LANGUAGES (Macro-Je)

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ABSTRACT

Kaingang, Xokleng and Maxakali are indigenous languages of Brazil belonging to the Macro-Je stock. This important Southern American linguistic stock includes more than 30 languages, all located only in the Brazilian territory. Research in these languages has shown a close relation between the features [-voiced], [-nasal] and [-sonorant] in phonological processes. A treatment of such processes in autosegmental phonology with the more recent "feature geometries" points to problems in the phonology with the more recent "feature geometries" - from Mohanan 1983 to Clements & Hume 1993 [2] - reveals an inconsistent treatment of the so-called "manner features", among them the features [-nasal] and [-sonorant], which are central in the two processes involved in these indigenous languages.

The first process

The first process of spreading of the feature [nasal] from the vowel in the syllable nucleus to other elements in the same syllable marked with the value [+sonorant] results in the nasalization of approximants {j, w, r} in syllables containing nasal vowels, as well as an oral contour to nasal consonants adjacent to oral vowels. Examples can be seen in Table 1.

The second process

The second process changes nasal consonants preceding voiceless obstruents (stops or fricatives) into [-voiced], [-nasal] and [-sonorant] and may occur in totality or in part, depending on whether they have been affected by the first process (Table 2).

Table 1: First Phonological Process - Examples

<table>
<thead>
<tr>
<th>Kaingang</th>
<th>Xokleng</th>
<th>Maxakali</th>
</tr>
</thead>
<tbody>
<tr>
<td>me -&gt; [ˈmeb] = &quot;mother-in-law / aunt&quot;</td>
<td>koya + m -&gt; koyabam = &quot;to make&quot;</td>
<td>m + a + n -&gt; mbadn = &quot;to kill&quot;</td>
</tr>
<tr>
<td>na -&gt; [ˈnado] = &quot;arrow&quot;</td>
<td>pla + ɳ -&gt; plagə = &quot;to bite&quot;</td>
<td>m + ɬ0 -&gt; mblo = &quot;to swim&quot;</td>
</tr>
<tr>
<td>ɳ -&gt; [ˈnəuŋtə] = &quot;stomach&quot;</td>
<td>n + ay -&gt; nday = &quot;clay pot&quot;</td>
<td>pla + ɳ -&gt; plagə = &quot;to bite&quot;</td>
</tr>
</tbody>
</table>

Table 2: Second Phonological Process - Examples

<table>
<thead>
<tr>
<th>Kaingang: Group 1</th>
<th>Xokleng</th>
<th>Maxakali</th>
</tr>
</thead>
<tbody>
<tr>
<td>ɳɔŋn. ɬu -&gt; [nɔ̃ntɬu] = &quot;mouth&quot;</td>
<td>ko'fɪndn + ɬɪ -&gt; [kɔʃɪntɬɪ] = &quot;small son&quot;</td>
<td>mɪ̃m. kɔy -&gt; mɪ̃mpkɔy = &quot;canoe&quot;</td>
</tr>
<tr>
<td>ɱɪ̃ŋ + ɬɪ = [mɪ̃ŋkɔɪ] = &quot;cat&quot;</td>
<td>ko'fɪntɬɪ -&gt; [kɔʃɪntɬɪ] = &quot;leg of predator&quot;</td>
<td>f0 + ɳ. fɔm = [fok'fej] = &quot;otter&quot;</td>
</tr>
<tr>
<td>ka'fɪn + ɬɪ -&gt; [kafɪntɬɪ] = &quot;leg of predator&quot;</td>
<td>ɬɔŋ. ɬe = [lɔŋk] = &quot;kind of rodent&quot;</td>
<td></td>
</tr>
</tbody>
</table>

THE MANNER FEATURES

In the past fifteen years, phonological theory has advanced in the analysis of the central issue that processes often operate on consistent subsets of distinctive features within a segment [1]. The attempt to overcome the unsatisfaction of very powerful models based on a feature matrix has led to some fundamental claims of more recent models in phonology, such as the autonomy of "tiers" in the phonological representation, on the one hand, and the hierarchical characteristics of the processes involving "manner features" have thus presented difficulties for an adequate representation using such models. By way of example, in Table 3 we present a possible description of the first phonological process of Kaingang, Xokleng and Maxakali adopting the Clements & Hume (1993) geometry.

Table 3 shows the example of the Kaingang word /nep/ = "thing". The spreading of the [nasal] feature from the vowel to the nasal consonants in the syllable provokes a change in these consonants resulting in a contour [-nasal] and [-sonorant], so they become, respectively, [nd] e [dn]. This
Table 3 — Representation of the first process

For the second phonological process from Kaingang, Xokleng, and Maxakali, the Clements & Hume (1993) geometry seems to provide an adequate treatment (Table 4). The solution - very similar to that given by Clements (1987) for the "intrusive stop" in English [4] - consists of a spreading of the class node "oral cavity" from the nasal consonant to the following obstruent. This solution, however, appears acceptable as a proof of the fitness model only if the same geometry can explain other processes involving the same features, [sonorant], [voiced] and [nasal], but it was unable to account for the first phonological process as seen in Table 3.

Table 4 — Representation of the second process

There are other ways to attempt a solution for the first process (also inspired by Clements 1987), such as that in Table 5, but the result is counterintuitive.

Table 5 — Alternative representation for the first process

CONCLUSION

The failure of Clements & Hume geometry to provide a solution for a fundamental phonological process in some indigenous languages of Brazil, presents practically unsurmountable difficulties for geometries which emphasize the inert or not-active characteristics of features such as [sonorant], even though they provide adequate solutions for other processes. The phonological processes of indigenous languages discussed here thus point out the need for more research on relationships among the features [sonorant], [voiced] and [nasal], and further, about how to treat features of manner in the feature geometries.

REFERENCES