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 South American linguistic stock includes more than 30 languages, all located only in the Brazilian territory. Research in these languages has shown a close relationship 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 hierarchical structures attributed to such features.

PHONOLOGICAL PROCESSES of Kaingang, Xokleng and Maxakali

Kaingang is a language spoken by about 14 thousand persons living in the three southernmost states of Brazil. Xokleng is a very closely related language which is spoken by about 650 persons in the state of Santa Catarina. Finally, Maxakali is the language of an indigenous nation with about 600 persons living in Minas Gerais, a state in the southeast of Brazil.

Kaingang, Xokleng and Maxakali have two phonological processes involving voicing, nasalization and sonority: in the first, the nasal quality of a vowel in the syllable nucleus spreads to other elements in the same syllable marked with the value [+ sonorant] ; in the second, voiceless obstruents in initial word position affect nasal consonants in final position of the preceding word in relation to the features [voiced], [nasal] and [sonorant].

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] reults 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.

Table 1 : First Phonological Process - Examples

Kaingang : me → ['m͡be] = "mother-in-law / aunt"
no → ['n͡do] = "arrow" nuŋ → ['n͡dug͡ŋ̃] = "stomach"
iɲ → [i:ɲ͡ʒ̃] =Pr. 1st p.sg. ŋa → ['ŋ͡ga] = "land"
meŋ → ['m͡beg͡ŋ̃] = "large" han → ['hadñ̥] = "to make"
Xokleng : kɔya + m => kɔyab͡m = "to requite"
m + a + n => m͡badn = "to kill"
m + lo => m͡blo = "to swim" pla + ŋ => plag͡ŋ = "to bite"
Maxakali : n + ay => n͡day = "clay pot"

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). Notice that in the Kaingang examples, there are two distinct types of cases.

Table 2 : Second Phonological Process - Examples

Kaingang: *Group 1 :* ɲɔ̃n. 'kw => [ɲɔ̃n͡t'kw] = "mouth"
'mĩŋ + 'ʃĩ => [mĩŋ͡k'ʃĩ] = "cat"
kaʃĩn + 'fa => [kaʃĩn͡t'fa] = "leg of *preá*[1]"
1= kind of rodent
Group 2 : fɔg͡ŋ̃. 'fɛj => [fɔk'fɛj] = "otter"
kɔ'ʃidn + 'ʃĩ => [kɔʃit'ʃĩ] = "small son"
'kɔb͡m + 'kɔb͡m => [kɔp'kɔb͡m̥̃] = "to lighten/flash"
Xokleng : čag͡ŋ̃ . ča => čaKča = "forked"
Maxakali : mĩm . koy => mĩm͡pkoy = "canoe"
ʃo + ŋ . ʃo + m => ʃog͡ŋ̃ . ʃob͡m => ʃokʃob͡m = "animal"

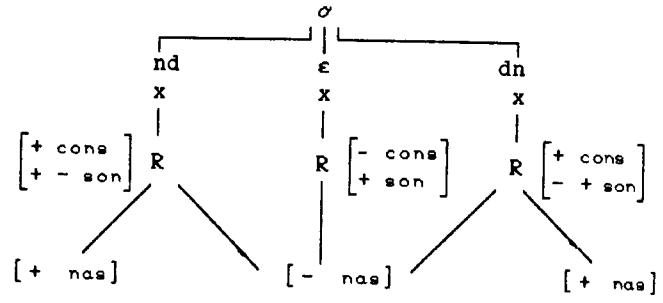
THE MANNER FEATURES

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 distinctive feature structure which attempts to express the actual relations among them, on the other. The results of this search are a number of different "geometries" reflecting different analyses of the hierarchical relations of specific features.

A critical review of these "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. Phonological 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 /nɛn/ = "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



requires a simultaneous change in the specification of the feature [sonorant], but, in the model of geometry used, this feature, since it is inert, is placed close to the Root node. Though change is possible in the Root, the result is a feature with double values - i.e, [+ and – Feature] - instead of a segment with double marking for the same feature, i.e, [+ Feature] [– Feature]. The difference is very important : in the first instance, it represents the abandonment of the gains in the auto-segmental view and a return at linear phonology, in line which Anderson's solution for the problem of the pre-nasalized stops [3].

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 stops" in English [4] - consists of a spreading of the class node "oral cavity" from the nasal consonant to the following obstruent. This simple 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

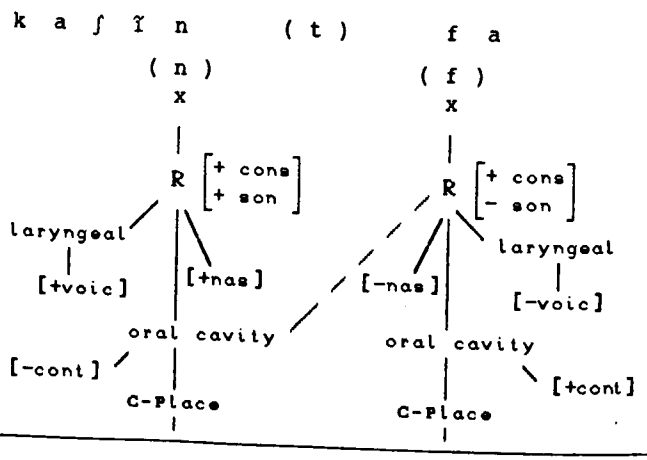
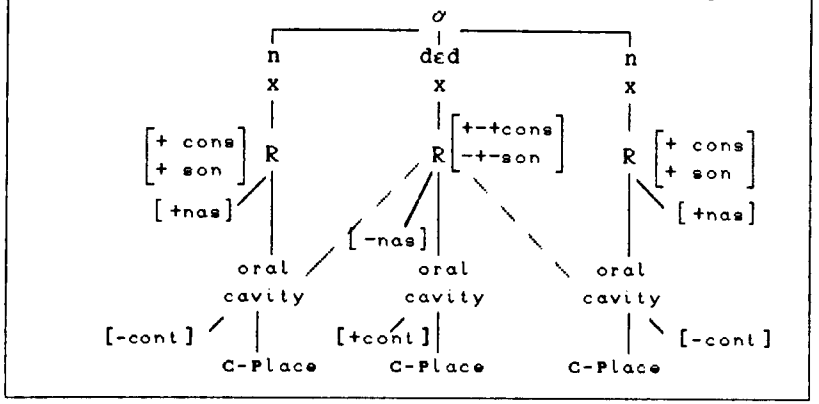


Table 5 - Alternative representation for the first process



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

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

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