SONORITY AND THE H-SERIES IN GEORGIAN

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ABSTRACT

Georgian, a language in the Kartvelian or South Caucasian family of languages, possesses a complex verbal system. A feature of the Georgian verb is that it marks the subject, object, and indirect object of the sentence. There are two sets of indirect object markers; the set that occurs less frequently is referred to as the h-series [1]. This paper examines the positive correlation between acoustic features, sonority and the rules that govern the H-series.

INTRODUCTION

Georgian, a language in the Kartvelian or South Caucasian family of languages, possesses a complex verbal system. A feature of the Georgian verb is that it marks the subject, object, and indirect object of the sentence. Marking is that it marks the subject, object, and indirect object of the sentence. According to Shanidze [9] and others the h was derived from x. This can still be seen in two verbs in Georgian:

Distribution of h-series makers

h → p, g, k, k', q'
s → d, t, j, c, č, j', c, č'
0 → elsewhere (all other consonants and vowels)

e.g. mo-m-cer-a
mo-g-cer-a
mi-s-cer-a
h > h/ p, g, k, k', q'

Written slightly differently the distribution for the third person markers might be:

H-series Marker Rule

h > h / p, g, k, k', q'

At this point it becomes useful to examine this prefix diachronically to see its former full range of environments and to understand its current more limited ones.

The h prefixes/infixes also used to represent the second person subject marker. According to Shanidze [9] and others the h was derived from x. This can still be seen in two verbs in Georgian:

Distribution of h/s as Second Person Subject Marker

h > h/ p, g, k, k', q'

h > 0 / elsewhere

This more expanded distribution was the same for the indirect object markers as well, that is what is called the h-series.

RESONANCE FEATURES

In Preliminaries to Speech Analysis [4], Resonance Features are introduced as a system that uses the acoustic signal to characterize divisions in the sound inventory. Resonance Features are then divided into I. basic resonator features: 1) compactness; 2) tonality features; and 3) tenseness and II. nasalization, using a supplementary resonator. Consonants and vowels are divided into acoustic features as indicated by the patterning of their respective formants - compact and diffuse. The features compact and diffuse are considered to be a primary split within the system. A secondary split, dividing consonants and vowels are the features grave and acute.

For languages such as French the consonants and vowels can each be set up on a triangle with for consonants a /l at the top and /p/ and /k/ at the bottom two points. French

<table>
<thead>
<tr>
<th></th>
<th>Compact</th>
<th>Diffuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grave</td>
<td>K</td>
<td>T</td>
</tr>
</tbody>
</table>

The use of h, s, or zero is dependent on the following sound.

Distribution of h-s together with the remaining labials, liquids and nasals - all of which are preceded by the marker h. Now it is possible to re-write the original rule thusly:

H-series Rule Re-written

h > 0/ __ vowels
h > s / d, t, j, c, č

h/ elsewhere (labials, velars, nasals, liquids)

This result is a distribution that is uncomfortable in simple articulatory terms; P and K pattern together with h, and T and C pattern together with s. I will leave this problem for the moment and discuss some relevant acoustic features from Jakobson, Fant, and Halle [4].
For a language such as Czech, the consonants (and vowels) are best divided on a square -- with the top corners being /l/ and /\, form left to right, and the bottom corners /p/ and /t/.

Czech

K ——— C Compact

|   |
|   |
| P ——— T Diffuse

Grave Acute

In French, represented by a triangle, the secondary division of grave vs. acute cannot be manifested in both compact and diffuse consonants. However, in Czech, represented by a square, this is possible. Georgian patterns itself like Czech and uses a square representation of its consonants in this system.

Grave and acute, known as primary tonality features, pattern P, K together and T, C together. The second and third formants for P, K show similarities as do F2 and F3 of T and C. The formants in transition from vowel to consonant for the former are seen to be consistently upward moving, whereas those for the latter move downward into the consonant. Thus looking at acoustic features as opposed to articulatory ones, it is possible to find a natural patterning of P and K, which would be difficult in articulatory terms.

Going back to the rules for the distribution of the 3rd person markers of the h-series, it would seem that there is a positive correlation between the patterning of the features grave and acute, and the patterning of the h-series. Thus a single set of features seems to present itself as a possible explanation for the uncomfortable split if one opts for a solution in acoustic terms. As one can see, the features grave and acute comprise the linking of labials with velars, and dentals with palatals.

SONORITY

As a feature expressing sonority explains the distribution of the h-series, I will continue with the notion of sonority to explain as well the gradual loss of this prefix over time. Looking back in the second section, note the differences between the Old Georgian rule vs. the Modern Georgian rule.

<table>
<thead>
<tr>
<th>Old Georgian</th>
<th>Modern Georgian</th>
</tr>
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<tbody>
<tr>
<td>h&gt;0/_V</td>
<td>h&gt;0/_V</td>
</tr>
<tr>
<td>h/h/ L, N</td>
<td>h&gt;0/_L, N</td>
</tr>
<tr>
<td>h/s/_ P, K</td>
<td>h/&gt;s/_ P, K</td>
</tr>
<tr>
<td>s&gt;s/_T, C</td>
<td>h &gt; s/ _T, C</td>
</tr>
</tbody>
</table>

Sonority hierarchies are usually set up by the degrees of sonority, that is resonance. For Georgian, sonority becomes relevant for both the h-series morpheme and that of the following consonant. Clements [2] proposes a sonority hierarchy set up in such a manner.

V > G > L > N > O

(V-vowel, G-glide, L-liquid, N-nasal, O-obstruent)

We assume principles of sonority operate in both the h-series and the following consonant. The [h] becomes the target and the following consonant or vowel the trigger.

The sonority of [h] is closes to that of vowels, that is it is next in the sonority hierarchy after vowels. The first environment to lose [h] is pre-vocalic, vowels being the most sonorous. We therefore have two sonority hierarchies operating simultaneously -- that of the h-series where /l/ is more sonorous than /\ and that of the following element.

The friction of the laryngeal spirant [h] is produced when the air passes through the half-closed glottis. The noise then receives coloring from surrounding vowels. This may account for its earlier disappearance before vowels.

Next is [h] before L,N (Liquids and Nasals), most likely in that order:

+ Sonority

L > N

We now come to the remaining environments of the h-series -- obstruents. Because there has already been the change from h > s, we know that the next environment is most likely to have been that of the feature grave and finally the feature acute, with /s/ as its marker.

Both of these hierarchies of sonority, working simultaneously explain the loss of the h-series and the ordering of its loss.

CONCLUSION

In conclusion, the distribution of the h-series in Georgian (Old, Middle, and Modern) can be defined in acoustic terms using the feature grave/acute. Further the gradual loss follows a clear hierarchy of + sonority > - sonority.

As a final note, it is not clear how much the h-series in used in Standard Modern Georgian or if it is even present all the time in either Literary Georgian or Dialects.