PHONETIC STRUCTURE OF WORD AND PECULIARITIES OF ITS DEVELOPMENT
(based on Germanic and Slavonic languages)

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ABSTRACT

Ancient rise-fall alteration of the articulation tension with a displaced apex (positive asymmetry) is reconstructed in CV syllable and in words with initial stress. In the cour-se of the development of language intensification of tension is observed at the beginning of a word and relaxation in the end of it, i.e. a redistribution of energy takes place. Presumably, the overall utterance energy remains, in principle, constant.

1. INTRODUCTION

In the process of the development of language its sound aspect undergoes the greatest alteration. Changes occur in sounds, syllables and whole words. The object of study is root-stressed words. The study of the peculiarities of such words implies in the first place a synchronic and diachronic investigation of its CV correlative.

2. PROCEDURE

An electro-acoustic study of the CV word (syllable) in the German and Ukrainian languages was made (the experiment was carried out in the Berlin University under the supervision of Prof. G.Lindner) as well as that of CV articulation tension by using pletysmographic method (Odessa University, Prof.V.Taranenko). The pletysmographic method made it possible to determine the platisma and suprahyoidei muscular tension while uttering a stressed CV-syllable.

In Germanic languages Runic (Old Futhark), Gothic, Old High German, modern German and English texts, in Slavonic languages Old Slavic, Old Russian, modern Russian and Ukrainian texts have been studied. The dynamics of the alteration of the initial stressed syllable as well as of the final unstressed one made it possible to determine the peculiarities of the alteration of the word as a whole in the course of language development.

3. RESULTS AND DISCUSSION

3.1. Phonetic characteristics of the CV-syllable

An analysis of the CV-syllable used in isolation and in words of the CṼCV(C) pattern revealed the following.

In Ukrainian the length of a consonant and of a vowel had an average value of, respectively, 0.380 and 0.620, in German 0.355 and 0.645 (the length of the CV-syllable is taken for 1.00). In German a phonologically long vowel is present. In a general way, it may be assumed that the ratio of the length of the consonant and that of the vowel in Ukrainian and German in CV is 1:2.

The articulation apex E_{max} in the CV often occupies the vowel area in the following way: in the Ukrainian syllable 80.4%, in German - 93.5%. The rising part forms the working phase, the falling one - the articulation relaxation which, generally, reminds one of a single muscle-tension [1] . Typical of both languages is the rise-fall alteration in the articulation tension, with some shift of the apex towards the beginning of the utterance (positive asymmetry) (Fig.1).

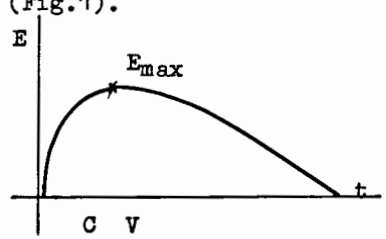

Fig.1. Articulation tension of CV-syllable

3.2. Phonetic characteristics of a CṼCV(C) word

Such words in Ukrainian and German are characterised by two-apex alteration of the articulation tension. In Ukrainian E_{max} falls on the first syllable in 97.7% of cases, in German in 87.5%. However the apex occupies the initial consonant in the Ukrainian syllable in 72.9% of cases, in German it is 14.8%. It is typical of Ukrainian speech to have a greater tension for a con-sonant, as related to a vowel within the CV, whereas in German it is vice versa - the vowel is more tense than the consonant. Presumably, in Ukrainian spech realized is a "strong-consonant" phonetic tape, while in German - a "strong-vowel" type.

The tonic apex falls on the first syllable in CṼCV(C) units in all cases. The intensity in the Ukrainian word falls on the first syllable in 85.0% of cases, in German in 88.2%.

In general, the alteration of the phonetic characteristics has a rise-fall pattern with the apex displaced towards the beginning of the utterance (similar to the CV structure) (Fig. 2).

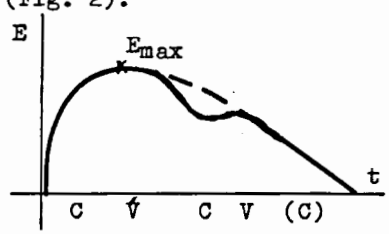

Fig.2. Phonitic structure of CṼCV(C)

3.3. Articulation tension of consonants (E_o)

Analysis of CV and CṼ- syllables made it possible to find the tension of the consonant relative to the vowel, whose value is taken to be 1.00.

The analysis also revealed the difference of the E_o consonants in terms of their formation (Table 1).

Table 1. Articulation tension of consonants (E_o) (Ukrainian and German languages)

Types of consonants (examples)	E_o Ukr.	E_o Germ.
R_w - semi-consonants (w,j)	1,20	-
R_r - liquids (r,l)	1.04	0.84
R_n - nasal (m,n)	0.84	0.79
D - voiced occlusives (b,d,g)	0.74	0.57
T - voiceless occlusives (p,t,k)	0.68	0.69
Z - voiced fricatives (v,z)	0.53	0.28
S - voiceless fricatives (s,f,h)	0.35	0.20

In German, the consonants T (p,t,k) are opposed to D (b,d,g) as fortes/lenis [3], in Ukrainian as voiceless/voiced.

3.4. Development of initial consonants in words

Analysis of ancient and modern memorials in Germanic languages has shown that at the beginning of a word the following generalized combinations occur: $\overleftarrow{ST}$-, $\overleftarrow{TR}$-, $\overleftarrow{SR}$-, $\overleftarrow{DR}$-, $\overleftarrow{STR}$- (where R is a sonorant) with a rising tension. For example: skin, tree, snake, dream, stream; foreign words having a non-rising tension being exceptions. For example: sphinx, (Germ.) Psalm, Ndola. The same consonant combinations are found in old Slavic texts, for example: skot, trije, slowo, zmii, bratr, strana. After the fall of reduced vowels combinations with non-rising tension were formed, sach as $\overrightarrow{SS}$-, $\overrightarrow{TZ}$-, $\overrightarrow{RR}$-, $\overrightarrow{RST}$- and others. For example: (Russ.) ssora, rwat', mrak, vhod, mstit' [2].

Generally, the word's beginning in Germanic and Slavonic languages presents a gradual articulation intensification as contrasted with a reduction in the word's end which resulted in the relative growth of closed syllables and consonant clusters. In ancient times, open syllables with CV among them, prevailed in these languages.

4. CONCLUSIONS

Extrapolation of tendencies of the word's beginning and end development in the prehistoric period makes it possible to arrive at the following conclusions:
a) in Germanic and Slavonic languages there has existed a tendency of the open syllable, the closed syllable being a result of language development;
b) in ancient time, the combinations of initial consonants in words were formed on the principle of rising tension, combinations with non-rising tension being secondary;
c) in the end of words, there occur different types of consonant combinations which are results of the articulation reduction of this part of the word;
d) in general, in the course of language development an intensification of tension has been taking place at the beginning of words and a reduction at their end, which implies an interaction of both tendencies. It is supposed that in the course of language development the overall utterance energy remains, in principle, constant and is redistributed within the word.

5. REFERENCES

[1] HILL, A.V. (1970), "First and last experiments in muscle mechanics", Cambridge: University press.
[2] TARANETS, V.G.(1981), "Energy theory of speech", Kiew-Odessa: Vyšča škola (in Russ.).
[3] TRUBETZKOY, N.S.(1958), "Grundzüge der Phonologie", 2.Auflage, Göttingen.