

## IRREGULAR RHYTHMS

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### Abstract

Speech rhythm is treated as an irregular temporal structure, characterized by a certain correlation of values of phonetic parameters of elements, comprising the structure itself. The problem of language specific feature of rhythm is discussed.

In phonetics rhythm is mainly understood as a certain harmony of elements in speech, manifesting itself in their isochronism and isomorphism. Phoneticians are apt to consider regularity the gist of rhythm.

For the versification and music theory, which mainly determines the phonetic studies of rhythm in prose, the idea of harmony is naturally of great importance, because of the emotional impact of regularity. The question arises, whether harmony should remain the decisive criterion in determining the object of the stu-

dies of rhythm in phonetics.

Let's proceed from the fact that in sciences, related to phonetics, there is a widely accepted point of view, according to which rhythm in the broad sense of the word is "a temporal structure of any perceived processes, comprised of accents, pauses, division into sections, their grouping, duration correlation, etc." /1/. This approach allows us to look upon the recurrence of elements as possible, but not obligatory. As E. Benvenist puts it, the word "rhythm", connected with equal intervals and recurrence, used to be one of the subtypes of a broader meanings /2/.

The idea of rhythm as a structure does not mean the appearance of a new conception, but the preservation of the old tradition, which continues to exist along with the idea of rhythm regularity, which according to E. Benvenist, appeared in the 5th century.

Rhythm as a structure means above all a dialectical unity of division and wholeness of movement as perceived by man.

It seems obvious that rhythm presup-

poses a physical sequence of elements, which are perceived as relatively independent. A speech signal, whose parameters may become changeable according to continuous linear function, is naturally devoid of any rhythm. On the other hand, movement acquires a certain rhythm if its elements are perceived by man as having certain temporal relations. Psychologists, dealing with musical perception, believe that a physical pause of more than 6 sec. destroys the temporal correlation of elements and thus distorts the feeling of rhythm /3/.

Rhythm as a structure is also used in phonetics. It manifests itself in all kinds of description of accentual-syllabic structures of speech. The description of accentual-syllabic structures, traditionally accepted in phonetics, uses a limited number of qualitative features, such as the number of syllables, accent and the recurrence of stressed and unstressed syllables in the structure. Such an abstract model of rhythm, which (with certain restrictions) can be called metrical, can easily be observed and does not require a more detailed experimental analysis. The correlations of elements in the accentual-syllabic structure, reflected by the metrical model of rhythm, correspond to the scale of order and convey the most general relations of the "more - less earlier - later" type. The elements them-

selves (syllables) are represented without disclosing their inner prosodic structure. Finally, the metrical model of rhythm is static, it does not convey the dynamics of syllable transitions. Its only dynamic characteristic is the direction of changes in rhythm-creating parameters, which makes it possible to discriminate between rising, falling and other types of rhythms.

Making the metrical model more concrete by means of rhythm-creating parameters (intensity and duration both in the syllable and inter-syllable relations) would be of considerable interest.

In this connection it would be interesting to deal with the problem of rhythm creating parameters as the material substratum of speech rhythm. No doubt, rhythm, as any other structure, is to a certain degree independent of its substance. One and the same rhythm can also be transformed into different kinds of substances, e.g. the conversion of the rhythmical structure from non-sound into sound substratum (e.g. a hand movement and prosody) and also from one type of sound substance into another (the manifestation of rhythm in melody and intensity). On the other hand it would be wrong to think that rhythm in general is not connected with any kind of substratum. It is important not to mix the question of the possibility of substance

conversion with the question of optimal relation of structures and substratum, which provides for functional reliability of rhythm. If it's correct that "all the speech elements can be relevant to rhythm" /4/, than it's also correct that one and the same rhythmical structure gains and loses in its definiteness, "transparency", requires a kind of effort for its production and identification.

Rhythm is mainly related to the energy foundation of speech. The material substratum of rhythm is above all the respiratory system of speech organs. In the most explicit way this point of view has been expressed by R. Stetson and D. Abercrombie. The structure of movement on the level of other subsystems of the speech organs (voice production and articulation) displays a certain parallelism with the structure of respiratory pulses, thus producing a delicate differentiation of rhythms. When melody and articulation "deviate" from respiration, the form-building function of rhythm is performed by the latter. Thus the perception of rhythmical variations is closely connected with intensity changes of speech signal, and not with the changes in fundamental frequency or voice quality.

Investigation of irregular rhythms makes it possible to introduce another essential parameter in the description of specific features of different languages.

Correlation between language specific features and rhythm in general can hardly manifest itself on the level of isochronism. The latter is determined mainly by speech, aims and conditions of communication, style. The harmony of speech units in texts of one and the same language can fluctuate within a very wide range. Besides, any text reflects the specific features of a language.

Language specific features of rhythm depend on metric schemes that prevail in speech continuum. According to E. Sievers, in German and English trocheeic or dactylic rhythm prevails, while in Romance languages it is iambic or anapaest /5/. But the most essential features of speech rhythm lie in the sphere of its non-metrical features, i.e. such phonetic variations that create rhythmical differences in one and the same metrical structure.

Syllable dynamics seems to be one of the most essential non-metrical features of an accent group. Syllable dynamics is the distribution of values of velocity (acceleration) of changes in intensity within syllable impulses. From the point of view of psychology the character of syllable dynamics is determined by correlation between static and dynamic muscular tension of speech organs.

The problem of syllable dynamics has been more or less investigated in different branches of phonetic sciences,

such as the investigation of syllable accents in Germanic languages (Danish jerk, gravis and acut in Swedish, "sharp" character of syllables in Rhenish dialects). Investigators point to double-peak/single peak syllables and the character of release as parameters of dynamic differences of syllable accents. The change of syllable dynamics as manifestation of the speaker's emotional state was experimentally investigated by F. Troyan, who used the musical terms "staccato" and "legato" to denote two polar forms of dynamics /6/. Syllable dynamics as a whole ballistic movement and as a phenomenon of speech norm remains up to now a problem, which hasn't been sufficiently investigated.

The character of distribution of values of prosodic parameters in syllables is another non-metrical feature of an accent group. In this respect we can evidently distinguish only two poles, which will serve to distribute these meanings: decenteric and centric (contrastive) rhythm. Regarding centricity and decentericity as auditory images, we must point out that the difference between these auditory images will be based not only on complicated interaction of syllable duration, intensity and tone, but also on spectral characteristics of vowels in syllables. It can be assumed (with a great degree of certainty) that the degree of reduction of unstressed

vowels will affect the perception of centric rhythm.

We assume that investigation of irregular rhythms is of great phonodialectic importance. In teaching phonetics practising regular rhythm pursues mainly aesthetic aims, while irregular rhythm creates a special language colouring, whose absence in the speech of a foreign learner (especially on advanced stages) is the main feature of a foreign accent. Irregular rhythms become even more important if we treat a language not only as a system of phonological oppositions, but also as a general pronunciation norm, which distinguishes one language from another. This approach deals with identity of phonetic phenomena and not with their differences, thus giving the investigator a chance to make general conclusions, which, in their turn, lead to the phonetic basis of the language (a phenomenon which is both well-known and uninvestigated). Irregular rhythms comprise one of the most important components of the phonetic basis of a language.

According to modern conceptions of speech physiology, the upper structure of speech movement is the final result of interaction between several hierarchically organized levels of controlling speech movement, each of them having its own units. The data obtained in the

course of investigation of speech ontogenesis and aphasia give ground to assume that the hierarchical structure of speech movement includes a rather autonomous "deep" level of the production of rhythmical groups as whole units, which are characterized by both metrical and non-metrical features, conveying the specific character of each language. If it is so, teaching phonetics of a foreign language should include a special stage of practicing specific features of rhythm. This stage should precede teaching intonation and sounds.

#### References

- /1/ B.M.Teplov. Psikhologiya muzykalnykh sposobnostey. M., 1947, p.269-270.
- /2/ E.Benvenist. Obshaya lingvistika. M., 1974, p. 383.
- /3/ E.Nasaykinskiy. O psikhologii muzykalnogo vospriyatiya. M., 1972, p. 192.
- /4/ D.Abercrombie. Vzglyad fonetista na strukturu stikha. /Novoye v lingvistike. Vol. IX, M., 1980, p.404/.
- /5/ E.Sievers. Grundzüge der Phonetik. 4.Aufl. Leipzig, 1898, S. 217.
- /6/ F.Trojan. Biophonetik. Wien, 1975.