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SYLLABICS: THEORY AND PRACTICE

The survey of some theories of syllable production and division are presented in the article. A universal defenition of a syllable at acoustic level is given.

Contrastive analysis of English and Ukrainian syllables makes it possible to say that the nature of the main principles of syllable formation and division are the same in the two languages. There exists certain difference in the rules of correlation of two components of a syllable total energy — intensity and duration, which depends upon the phonematic structure of the English and Ukrainian languages. There are some specific features in the structure of syllables, in the rules of syllable division in English and Ukrainian.

Key words: *syllable production and division, acoustic level, contrastive analysis, phonematic structure.*

В статті надано огляд деяких теорій продугування і розділення складу. Приведена універсальна дефініція складу на акустичному рівні.

Порівняльний аналіз англійських і українських складів надає можливість констатувати, що природа головних принципів утворення складу і розділення однакова в двох мовах. Існує певна різниця в правилах кореляції двох компонентів сумарної енергії складу — інтенсивності і тривалості, яка залежить від фонематичної структури англійської і української мов. Схарактеризовано деякі специфічні особливості у структурі складів, у правилах розділення складу в англійській і українській мовах.

Ключові слова: *утворення і делімітація складу, акустичний рівень, порівняльний аналіз, фонематична структура.*

В статье представлен обзор некоторых теорий продуцирования и деления слога. Приведена универсальная дефиниция слога на акустическом уровне.

Сравнительный анализ английских и украинских слогов дает возможность констатировать, что природа главных принципов слогообразования и слогоделения одинакова в двух языках. Существует определенная разница в правилах корреляции двух компонентов суммарной энергии слога — интенсивности и длительности, которая зависит от фонематической структуры английского и украинского языков. Охарактеризованы

некоторые специфические особенности структуры слогов, правил делимитации слогов в английском и украинском языке.

Ключевые слова: *образование и делимитация слога, акустический уровень, сравнительный анализ, фонематическаяя структура.*

Since ancient times great interest has been payed to syllabic structure of utterances in connection with the problems of rhetoric, public speeches and the art of versification. The first attempt to examine syllables was made by ancient Greeks. Linguistic investigations of the problems of nature of the syllable, the questions of syllable structure and division of words into syllables were not studied and even neglected.

At the beginning of the 20th century the outstanding representatives of physiological experimental phonetics G. Panconcelli and Scripture E. W. wrote that the syllable was a fiction created by linguists and psychologists, that all the attempts to understand and represent it phonetically were and would remain fruitless [1].

At the end of the 19th and at the beginning of the 20th century there appeared the first laboratories of experimental phonetics. Syllables began to be studied with the help of electroacoustic devices and apparatuses — electric kymographs, oscillographs, spectrographs, etc. Various theories of syllable production and the division of words into syllables appeared.

One of the first theories brought up for discussion was the so-called **expiratory** syllabic theory [2]. According to expiratory theory each syllable is accompanied by an independent uninterrupted act of exhalation push. The number of syllables and the number of exhalations are equal. At the same time E. Sievers didn't reject the effect of variations in the degree of sonority.

Expiratory theory was often criticized by different scientists. It was mentioned the number of syllables and the number of expiratory pushes may coincide, but not obligatory. Experimental data proved that there were many cases when two or more syllables were pronounced within one act of exhalation.

Rather widespread, especially was the **sonority** theory of syllable production and syllable division. According to this theory the main characteristic feature of the syllable is sonority [3]. The most sonorous sound in the syllable forms the peak of sonority, while the other sounds in the syllable have minimum of sonority. The theory of sonority was rather popular as it made it possible to distinguish syllables in a word. But it is to be taken into consid-

eration that the degree of sonority of vowels varies in different positions in the word and this theory does not help to define the boundary between the syllables in a word.

The theory of *muscular tension* was universally acknowledged and supported by many scientists [4]. The core of the theory of muscular tension was the affirmation of the leading role of pronouncing effort in the formation of a syllable. This theory was completed and logically set forth by some scientists [5]. Sounds in connected speech are pronounced with alternative intensification and slackening of muscular tension. Each peak of intensification with the following slackening of tension forms a syllable. Sounds that are pronounced with intensification of muscular tension are termed pitch sounds. Thus an articulatory syllable is an arc of tension. The pitch sound is the centre of the syllable and of the arc of tension. The tension in this arc is gradually increasing from the beginning to the centre of the syllable and then is gradually decreasing to its end. It was possible to assume that sounds might have different functions in fusing a syllables into a solid, complete speech unit and in dividing words into syllables.

The base of the solution of the syllable division problem was the assumption that in defining the boundaries between the syllables in a word it was necessary to pay attention to the structure of initial and final sounds of the syllables. Shcherba L. V.'s concept of the three forms of the syllables helped to solve the problem of syllable division.

According to Shcherba L. V.'s concept there exist three forms of the consonants:

a. the *strong-end* consonants;

b. the *strong-beginning* consonants;

c. the *strong-end/strong-beginning* consonants.

At the beginning of initial consonant of a syllable the tension is weak and grows gradually up to its peak at the boundary with the syllabic vowel. Such consonants are called *strong-end* consonants. In final consonants of a syllable the beginning of a consonant at the boundary with the syllabic vowel is strong and the tension gradually decreases up to the very end of the syllable. Such consonants are called *strong-beginning* consonants (fig. 1).

At the boundary of two similar sounds a *strong-end/strong-beginning* or a *two-peak* consonant appears. The end and the beginning of such consonants are strong, a slackening of tension is observed in the middle of the syllable (fig. 2).

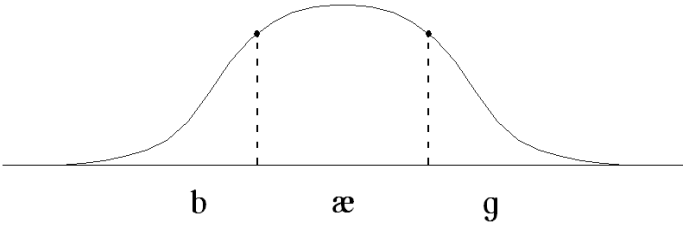

Fig. 1. The scheme of a syllable of the English word "bag"

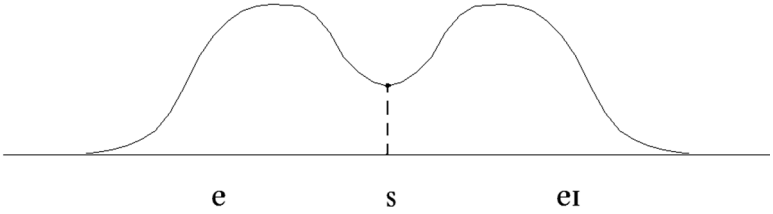

Fig. 2. The scheme of a syllable of the English word "essay"

One of the latest theories of syllable formation is the **energetic** theory. The concept of a syllable as an impulse of energy was taken as a foundation of this theory. The theory of syllabic energy defined a syllable as a single portion of energy separated from another portion of energy [5]. Accordin to it the energy increases sharply at the beginning of the syllable up to its peaks and then gradually falls to the end of the syllable. Syllables are separated from other syllables by the minimal amount of energy of the end of the preceding syllable and at the very weak beginning of the following syllable.

The energetic theory does not deny the theory of muscular tension. There exists a direct connection between the muscle tension of the speech organs in the process of speech and the impulses of the acoustic energy. Scientists assert that any nerve and muscular process causes energetic process. Any impulse of energy is characterised by a rising — falling structure with the peak of energy between the rising and the falling parts.

The **energetic** syllabic theory, defining a syllable as an impulse of energy, was supported by a number of scientists. The theory of syllabic energy solved the problem of the nature of the syllable and was a reliable basis of syllable

division. But still the nature of the syllabic impulse was not quite clear and required further investigations.

In the second half of the 20th century phonetic experimental investigations applying electronic apparatuses and special computer programmes made it possible to affirm that syllables are created by a complex impulse of acoustic energy — a coordinated action of two acoustic components of intensity and duration, i.e. intensity over time.

Wtot = A.t *(conventional units)* where:

Wtot — total acoustic energy (conventional units);
A. — intensity (conventional units);
t — duration (m. sec).

Any of the two components of the total acoustic energy can change the volume of the energy. An increase or a decrease in the volume of the total acoustic energy of the syllable may be achieved by means of:

a. the changes in the intensity of a syllable;

b. the changes in the duration of the syllable;

c. the changes in the two components of the total acoustic energy.

Each peak of intensification of the total acoustic energy, preceded by the increase of energy and followed by its decrease, is a syllable.

Syllables are purely energetic speech units deprived of frequency characteristics except the inherited individual characteristics of syllabic vowels. The impulses sent from the cortex cause alternative tension and relaxation of the speech organs: muscles, which in their turn cause the corresponding alterations in the acoustic energy, which is perceived by a human being as speech.

Taking into consideration close connection between the tension of the muscles and the acoustic energy which appear due to the tension of the articulation of the muscles during the process of speaking, it is possible to state that there is no principle difference between the mechanism of syllable division according to the theory of muscular tension and to the acoustic energetic theory. The boundary of syllable division is at the point of the weakest muscular tension and at the smallest degree of acoustic energy.

One of widely discussed problems is auditory perception of syllables. Syllable in perception is a minimal undividable perceptional unit over time. The results of the perceptional analysis, taking into consideration the time of reaction, connected with the perception of a syllable and its parts, made

it possible to assert the units of primary perception on sensory level are not phonemes but their combinations — syllables.

Elaboration of syllabic models with the support of visual and auditory aspect made it possible to control and correct the pronunciation of the learners on the level of syllables. Thus, in many languages closed syllables (CVC) and the syllables containing long vowels (CV:) as well as syllables with many marginal consonants in its structure (CCVCC) are perceived as heavier than open syllables with short vowels, and syllables having one or two marginal consonants.

The survey of some theories of syllable production and division given in the article is not exhaustive. In spite of many existing theories not all the problems of syllabic theory are solved.

Having examined the problem the following defenition of a syllable is to be given. The syllable is a universal primary minimal undivided basic phonetic unit of speech. This definition of the syllable is universal for all the syllabic languages.

Units of primary perception on sensory level are not speech sounds but syllables. The syllable in perception is a minimal undivided unit over time.

The syllable is an integrated and an integrating speech unit. On the one hand it consists of speech sounds, on the other hand it is the base for all the other units of speech. It is creating the segmental speech unit — phonetic word and all the supra-segmental speech units — sense-groups, phrases, subphrasal unities and the speech unit of the highest level — the text.

The share of the two components of total energy — intensity and duration is different in English and Ukrainian as it depends upon the phonematic system of the language.

There is no principle difference between the mechanism of syllable division according to the concept of muscular tension and the energetic theory — the boundary in both cases is at the energetically weaker point of the syllable chain as it is the result of the smallest muscular tension.The main principles of syllable formation and division are universal, i. e. similar in all the syllabic languages but the rules of syllable formation and the division of words into syllables may be different in different languages.

Contrastive analysis of English and Ukrainian syllables makes it possible to observe that the nature of the main principles of formation and division are the same in the two languages. There exist a difference in the rules of correlation of two components of the total energy — intensity and duration,

which depends upon the phonematic structure of the English and Ukrainian languages. There exists some specific features in the structure of syllables, in the rules of syllable division in the peculiarities of the position of the active articulating organs in pronouncing sounds, which constitute the syllables in English and Ukrainian.

A thorough contrastive study of English syllables in comparison with those of the native language will enable the learner to avoid mistakes and will help to acquire perfect pronunciation without any foreign accent.

REFERENCES AND NOTES

1. Panconcelli-Caltzia G. Die experimentalle Phonetic in ihrer Anwendung auf die Sprachwissenschaft. — Berlin, 1924. — 64 p.
2. Stevens N. Articulatory-acoustic-auditory relationships. — Hardcastle, 1997. — P. 462–506.
3. Vassillyev V. A., Burenkova O. V., Katanskaya A. R., Lukina N. D., Maslova L. P., Torsueva E. I. English phonetics. — Leningrad, 1962. — 384 p.
4. Бровченко Т. А. Проблемы словесного ударения: автореф. дис. ... д-ра філол. наук. Ленинград: ЛГУ, 1973. — 45 с.
5. Зиндер Л. Р. Общая фонетика. — М.: Высш. шк., 1979. — 311 с.

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