

# DYNAMIC MODEL OF PROSODY IN THE SYSTEM OF SPEECH PRODUCTION

A. METLYUK

MINSK STATE PEDAGOGICAL INSTITUTE  
OF FOREIGN LANGUAGES

## ABSTRACT

The units of all the subsystems of language, prosody in particular, are viewed in this paper as subprocesses or operations in the complex speech production mechanism. Each operation is determined by its aim, so the hierarchy of the units follows the hierarchy of the aims. The operations are reproduced repeatedly in the functioning of language, and the mechanism of the relations of the units remains invariable, irrespective of the functional state of the system.

## 1. INTRODUCTION

Language as a system of speech production is dynamic not only diachronically but synchronically as well: it changes the structural and functional state of its units in accordance with the thought content, communicative purport and the situation in which the intercourse takes place.

The main factor that forms language as a systemic object is its function (aim), that is the production of the text or the utterance, treated as a minimal text. In other words, it is the actualization and materialization of the thought content in a given situation. The aim of the

system, coordinated by the more complicated system "man-society - reality" (part of which is language itself), determines the position, structure and functions of all the units of the particular systems and subsystems of language.

In our experimental and theoretical studies of English, Byelorussian and Russian prosodic units the position of the prosodic system and its components - temporal, accentual, rhythmic, tonal and pausal subsystems - is defined as parallel to the system of unilateral semantic (content) units and the system of bilateral, sign units on the horizontal plane of speech production. On the other hand it functions parallel to the system of phonemes on the vertical plane and forms together with the latter the hierarchy of phonological units of language [1].

At present there is no agreement among linguists as to the set of distinguishable prosodic units and the relations between them in the phonological hierarchy. In this paper I make an attempt to give my interpretation of prosodic units as well as a general presentation of the idea of a processual prosodic system in the functioning of language.

## 2. THE FUNCTIONING OF PROSODIC UNITS

The specific function of prosody in language is to integrate segmental units into larger segments on all the levels of speech production - the level of the syllable, the word level and the utterance level -, to transform a segment into a unit of a higher level and to differentiate segments. But the distinctive function is not characteristic of all the units and levels of prosodic hierarchy. In these three functions prosodic units are qualified as unilateral units of expression.

Unlike these, the prosodic units of the utterance (e.g. tonemes, contours) function as linguistic signs and, consequently, take part in the production of both the formal and the semantic structure of the utterance.

The interaction of different subsystems of prosody in fulfilling the common communicative task is determined by their identical structure on the one hand, and by the specific quality and functions of their units, on the other hand. Common to all the subsystems is the presence of two types of units - elements (microprosodemes) and structural complexes of elements or "phonological syntagms" (macroprosodemes).

The first type includes syllable chronemes, accentemes, tonemes. The second type is represented by temporal, accentual, rhythmic and tonal structures. The structures as syntagmatic units contain the rules of positional and combinatory variation of microprosodemes as well as the variation caused by the interaction of one subsystem with

another. At the same time structures serve as patterns (rules) of grouping microprosodemes and when opposed to one another, form a paradigm in each subsystem. Besides the elements and structures as units of expression, the prosodic subsystem (tonal in particular) contains semantemes i.e. generalized meanings of definiteness/indefiniteness, finality/nonfinality, completeness/incompleteness, etc. The prosodic mechanism of language is aimed at establishing relations between the formal and the semantic units of prosody, i.e. at the production of the prosodic structure of the utterance or that of its meaningful part. Utterance prosody is formed by the interaction of all the prosodic subsystems, starting from the level of the syllable, and stands out as a polycomponental and polyfunctional sign unit. The processual character of all the prosodic units is conditioned by the syllable - the basic point of prosody. Due to the integrative quality of its temporal component (syllablechroneme) it demonstrates the mechanism of the interaction between phonemes and prosodemes. The syllable chroneme is the elementary unit of the temporal subsystem of prosody [2]. It forms macroprosodemes - temporal structures (of words, rhythmic units, intonation groups, utterances) and indicates the tempo of speech. The temporal (syllabic) structure of the word is transformed into the minimal unit of the rhythmic subsystem - the rhythmic group - when rhythm is stress-timed. The new, temporal quality of rhythmic groups, as minimal

units of utterance rhythm is their relative isochrony, which does not depend on the number of the syllables, whereas in the temporal structure of words and rhythmic groups viewed as macroprosodemes this factor is significant. When rhythm is syllable-timed the syllable chroneme functions as a minimal unit.

Actually, the rhythmic structure is derived from the interaction of the temporal and accentual structures. The relations between the accenteme, the two parallel structures and the sign they constitute take the form of a structural frame, or a cell in the general structure of language, thus demonstrating the principle of organization of a particular subsystem on the horizontal plane and the interpenetration of adjacent subsystems on the vertical plane. The number of the cells on each level correlates with the number of the microprosodemes that take part in the production of the sign unit. The higher the level, the larger the number of the prosodic units.

So in the process of organization of the utterance the prosodemes of a lower level (both elements and structures) provide a basis for the prosodemes of a higher level: the syllable chroneme, as a measure of linguistic time, conditions the occurrence of the accenteme; the accenteme initiates the toneme. Similar are the links between the structures of these units, whereas the structures of one subsystem acquire the status of minimal units on each higher level. A particular subsystem on each level can therefore be regarded as a two-level subsystem with

dynamic objects (Cf [3]).

### 3. CONCLUSION

The systemic description of prosody, i.e. the functional, elementaristic and structural analyses combined make it possible to give a more precise presentation of prosodic hierarchy as: 1) a hierarchy of the prosodic subsystems conditioned by the levels of speech production; 2) a hierarchy of the subsystems on each level of speech production; 3) a constitutive hierarchy of micro- and macro-prosodemes; 4) a subordinative hierarchy of microprosodemes within macroprosodemes. Moreover, it permits to reconsider such linguistic problems as speech segmentation, semantic structures, variant-invariant relations. The units of the prosodic system as subprocesses in the complex mechanism of speech production can be presented in the form of algorithms, which can be helpful in dealing with problems of applied linguistics.

### 4. REFERENCES

- [1] METLYUK, A. (1987), "Vzaimodejstviye prosodicheskikh sistem v rechi bilingva", Minsk: Vishejskaja shkola.
- [2] METLYUK, A. (1989), "Prosodicheskije jedinitisi kak podprotsessi v jazikovojsisteme porozhdenija teksta", Problemi dokazatelstva i tipologizatsii v fonetike i fonologii, Moskva: Akademiya Nauk SSSR.
- [3] MESAROVIC, M.D., MACKO, D., TAKAHARA, Y. (1970), "Theory of Hierarchical Multilevel Systems", New-York, London.