

# Correlation of Metrical and Phonological Units of Language

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Is there a correlation between the units of the metric system and the units represented in language on some level, for example, a phonological one?

If we consider this question using the material of European kinds of prosody, the following types of correlation will standout. The main unit of syllabic versification – a syllable – is at the same time also the main syntagmatic unit of the phonological system of the language. The main unit of the purely tonic versification – a phonetic word – is at the same time both the largest syntagmatic unit of the phonological system and the main unit of the morphological level. The main characteristics of the ‘high lyrics’ system in Ancient Greece and the related cantation system (represented mostly in the Middle Ages in Greek, Latin, and Old Slavonic) is the syntagm, i.e. a unit of the syntactic level of the language, and functions here as its main metric unit<sup>1</sup>.

Thus, the three abovementioned systems of versification are characterised by a direct correlation of their units to the units of the prosaic language on one of its levels<sup>2</sup>.

The feet are the elementary units of the next two systems of versification (syllabo-tonic and quantitative). The feet do not correlate directly to any units of natural language and so they often seem unnatural. Having given examples

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<sup>1</sup> An example of such versification is the hymn *My soul Glorifies the Lord*. In handwritten collections of the first half of 18<sup>th</sup> century songs we find songs written according to the same scheme (“Dusha moja milaja, krasnaja devica”, “Ljubov’ moja prebyvaet do smerti”, etc.). “An indivisible link of this versification system, called a kondak system, is a meaningful unit forming a simple sentence which constitutes a separate verse (line) and is sung to a separate recurring melody (singing tune) or one word. This unit is not divided into elements and is not connected with adjacent units by any transitions (rhymes, assonances). The number of syllables and stresses in such verse is different” (Pozdneev 1966: 103).

<sup>2</sup> J. Lotz noted that poetry and prose, despite being so dramatically different, differ from one another not as two classes of texts, but rather as two types (Lotz 1960:135).

of feet joining syllables of different words and cutting syllables of one word, feet without any meaning whatsoever, the Russian critic A. D. Galakhov concluded that “feet are some kind of nonsense” (Shengeli 1923b).

Why is the foot introduced? What is the correlation of a foot and its constituting elements, its syllables, which are the syntagmatic units of the phonological system of the language?

To answer this question, it should be noted that in languages with versification based on foot as the main unit, syllables are divided into two classes, and units of versification are formed due to various combinations of syllables of these two classes. The syllabo-tonic system considers stressed syllables to be the syllables of one class, and unstressed syllables to be of the other. A number of schemes of this metrics determine positions in which syllables of both classes are considered equivalent. V. K. Trediakovsky wrote: “Of the two-syllable feet it [i.e. the new system of versification] considers the *trochée* and the *iamb* to be the main ones; and these two can be replaced, as a [poetic] licence, by the *pyrrhic* feet [...]” (Trediakovsky 1963b: 444).

The quantitative system considers short syllables to be syllables of one class, and long syllables of the other. In this metric system, units are formed by different combinations of relevant syllables. At that, it determines not only the positions in which the syllables of both types are equivalent, but also the positions in which one syllable can be replaced by other syllables, for example, in a certain position of the hexameter, two short syllables can substitute for a long syllable. This is a one-way replacement, because two short syllables cannot be replaced by one long syllable; and this replacement can occur only in certain positions.

Thus we can say that the quantitative system is characterised not so much by the constant number of moras in a line, as by the division of syllables into two types and their introduction into the units of the metric system in one of the three ways: the determination of a position for this or that type of syllable; the determination of a position where these syllables are equivalent (position of neutralization); and finally, the determination of a position where a syllable of one type can be replaced by a syllable of another type according to the general correlation as when one long syllable is equivalent to two short syllables, although there are replacements where a long syllable is equivalent to three and even four short syllables. For example:

Τί δὴ μαθῶν τῷ δακτύλῳ τὴν θρυαλλίδ' ὠθεῖς,  
καὶ ταῦτα τούλαιον σπανίζοντος, ὕνόητε; [-λῳ, -νί-: - = ∪ ∪ ∪]  
Φαῖσι δήποτα Λήδαν ὑακινθίνον [Λή-: - = ∪ ∪ ∪ ∪] (Roussel 1954: 88–89)

The fact that in the last two systems the division of syllables into two classes is based on prosodic features (stress and length) led to the limitation of correlation between the metric and phonological systems by their prosodic features only. But the prosodic features themselves very seldom form a system independent from other, inherent, phonological features. An example of mutual independence of the prosodic system and the system of inherent features can be Slovenian. Here one and the same system of inherent features corresponds to a prosodic system with length/shortness and ascending/descending intonation in the archaic literary language, a system with only length/shortness (the modern orthoepic norm), and a system with expiratory stress which has established itself in the modern oral literary language (Stankiewicz 1959).

For English, there are descriptions in which prosodic features are defined by inherent features (Hubbell 1950; Caffee 1951) and descriptions in which prosodic features define inherent features (Berger 1955). An example of a language where prosodic features are clearly defined by inherent features is Mordovian (Paasonen 1903). All this calls for correlation of metric units of the language not only with prosodic units, but also with the entire phonological system or, at the first stage, with the system of inherent features. The latter corresponds with the study of verse in a transcribed form, without stresses, length and height of pitch.

The grounds for correlation of metric units with the units of the phonological system in inherent features can be seen in the following. As phonological analysis shows, prosodic features function as the signals of classes of different levels (syllables, words, syntagms). These classes as such can be singled out regardless of signals, for example, purely distributionally. But signals are singled out on the basis of a procedure for identification of classes. Acoustic signals can be heterogeneous. From this, it can be seen that the material used for the study of the correlation between the units of the phonological and metric systems is different even from what Epstein and Hawkes called the pre-prosodic level – in English, this level represents four types of stress according to Trager and Smith, and four types of links (Epstein, Hawkes 1959).

The same metric systems are represented in languages with prosodic features and languages without prosodic features. Where there are prosodic features, the rhythmical structure is still formed by the classes of sequences of phonemes (i.e. with inherent features) which are marked by prosodic features<sup>3</sup>. It is this sequence that determines where prosodic features cannot be

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<sup>3</sup> “A rhythm supposes three significant attributes: a time continuum; a set of events repeating after equally perceived intervals; and amplifiers (perceived objectively or subjectively) among the events in any regular distribution... An ‘event’ in a metre is a syllable” (Chatman 1965: 30).

found. The goal of a certain interpretation of a verse metrics is to align the prosodic features so that they would correspond to a certain union of one type of classes with others<sup>4</sup>. This approach enables us to consider the correlations of ‘bases’ of metric units to phonological units when temporarily excluding the prosodic features from them.

What are the peculiarities of phonological units in the languages where poetry widely uses syllabic metrics?

If we consider the structure of the phonological syllable in Polish, a language with a long tradition of syllabic versification, we shall see that the nucleus of each syllable (vowel) is independent of other syllables. Indeed, in Polish any vowel may be in any syllable of a word: *ogrzewanie* ‘warming’, *ógrut* ‘garden’, *niebo* ‘sky’, etc. Combinations of consonants in the syllable depend on the position in the word (beginning, middle, and ending of the word are the three relevant positions here), thus forming a higher level unit: a word (Kuryłowicz 1952; Bargielówna 1950). The fact that in such a language as Polish all syllables are independent of one another allows us to consider them to be single-type, independent units on the phonological level. This corresponds with the fact that the syllables in the metrics are of one type, the main metric unit being a syllable. But is Polish the only language where this feature corresponds with syllabism?

If we consider French where the syllabic system of versification was established and elaborated in detail a long time ago, we shall see the following picture in the modern language: any vowel can be found in any syllable, regardless of other syllables, unless it is the last syllable of the word. Consonants in the syllables depend on their position in the word (in the beginning, middle, or ending of the word), and do not influence each other in any way within the specified position (for example, the second syllable on the third in a four-syllable word). But for the last syllable there are the following limitations

<sup>4</sup> A “school recital”, as S. Chatman has shown, is the elementary way, the first step towards mastering the rhythm, when every stressed syllable of a foot is singled out:

The boy stood on the burning deck

Whence all but he had fled

The first description of such recital, according to Chatman, appeared in 1775 in the anonymous book “The Art of Delivering Written Language” (Chatman 1965: 105, footnote 6). Further mastering of rhythm is connected with singling out syntactic and semantic classes, preserving the prosodic features which characterise them, and discarding all other features. Different interpretations of one and the same poem are then ways of different analysis of the semantic and syntactic structure of the poem. See the model of distribution of stresses in English words depending on the presentation of the sentence syntactic structure using parenthesis in Chomsky, Halle, Lukoff (1956: 65–80).

concerning vowels in modern French: [e] can only be in an open syllable [ble, leze]; [ɛ], or in a closed syllable [kose:r, tel]. But this division is relatively recent, it did not exist in Old French (Fuché 1958): a closed ‘e’ could occur, and in a closed syllable [ver] was [ver]. The second limitation on the set of vowels, namely, the exclusion of [ɔ], is even more recent. A. Martinet (1945) still hears the difference between *pot* and *peau* in the literary language. In dialects this opposition is still actual. The difference between ɔ and o is not phonological. Thus, for French we can note the independence of syllables which existed for a long time and recent changes in the distribution of vowels. The modern situation differs by the fact, that if a word consists of a single syllable (and the share of such words in the French vocabulary is very large: 60%; Kielski 1957), only certain vowels can act as nuclei in such syllable. This syllable is independent and can be used on its own or be accompanied by other syllables before it. All other syllables have a different set of vowels and cannot be used on their own (for example, the syllable [pɔ] requires the addition of another syllable in the standard form of French).

Comparison of syllable as a single-type independent unit of phonological system and syllable as the main metric unit in French throughout its history shows the same correlation as in Polish. The latest changes in the phonological system give rise to another direction of this correlation, which will be discussed later.

In Spanish, where there also exists a long tradition of syllabic poetry, we also observe independence of vowels in syllables following one another (Bello 1890).

All main metres of Italian poetry were formed in the Sicilian school (12th century) and were later exported to other regions of Italy. The syllabic verse of Guido Fava and Frederick II corresponds to a phonological system in which five vowels (a, e, o, i, u) occur in any syllable independently of other syllables. The Tuscan school adopted this metric system, although in the dialect of Tuscany there was a syllable singled out by additional differentiation of open and closed e and o. But poets disregarded this difference and rhymed closed ê and ô with open e and o and also with i and u. In the 17th century, Gigli noted the phonological opposition of e and ê, o and ô, but also remarked that even Petrarcha rhymed *stella* [ê] and *bella* [e] (Migliorini 1960).

Aristoxenus insisted that the Greek versification is syllabic (Aristoxenus 1782). Indeed, as A. Meillet demonstrated, in Ancient Greece, with the exception of the hexameter which in the classical era was used very rarely and mostly in didactic poetry and in the ‘high lyrics’ in dramas, Greek versification is syllabic, at least in practice (Meillet 1927). The old Greek of the Classical period demonstrates total independence of vowels of one syllable from vowels

of other syllables. The signs of length/shortness are also distributed on vowels in the word regardless of their mutual position (Schwyzer 1950). The undifferentiation of length/shortness in the last syllable of the word has the specific nature of a free variation (Lejeune 1947). But the fact that the positions where this feature is or is not recognised are marked in a word is an important phonological peculiarity with its consequences for the metrics of the relevant language. At present, it is important to note that in Greek, the nuclear positions (vowels) of syllables are independent of one another, the syllables are independent in this regard, and, consequently, syllabic versification holds the biggest share in the general scope of metric systems.

It is well-known that vowels in Latin form three paradigms for the following three syllable types: in the beginning, middle or ending of the word. The degree of independence of these syllables from one another is different: a syllable from the middle of the word may form a word on its own or with syllables of other types, including syllables of its own type; a syllable from the beginning or ending of the word may form a word on its own and with syllables of other types, but not with syllables of its own type. Characteristically, the foreignness of metrics copied from the Greek system was always accented in Latin poetry. The national system of versification in Latin, the Saturnian verse, is entirely different.

The correlation of units of the systems under study is very representative in Serbo-Croatian. Although dialects of this language show different prosodic systems (with signs of length and tone, tone, expiratory stress), the vowels of syllables following one another are independent. Along with such independence of syllables on the phonological level, we see a remarkable and long-steady syllabic tradition in folk poetry and literary works.

In Czech, both inherent and prosodic features of vowels in words are independent from one another and, not surprisingly, all metric systems and influences show the “all-penetrating tendency towards syllabism” described by J. Hrabák (1964).

In this context, the more than 150-year-old history of syllabic versification in Russia and Ukraine raises the question of the correlation of vowels forming words in Russian and Ukrainian during this period. In other words, can we assume that the vowels of words following one another were then independent? In certain cases, were o and a, e and i distinguished in unstressed syllables as in stressed syllables in Russian, or e and i, o and u in Ukrainian? In Ukrainian, ‘ukanye’ and ‘ikanye’ do not occur often, and o and u, e and i are not mixed in the literary language.

In literary Russian, the unstressed e and i became indistinguishable only in the 20th century. As far as we know, the unstressed a and o were distinct

as early as in the 17th century, and in declamation of verses this pronunciation survived until the 19th century. We can assume that for the language of both Simeon Polotsky and Feofan Prokopovich, independence of syllables in words was undisputed. Such syllables, being equally independent units on the phonological level, can easily become the main units of a metric system. As phenomena of the phonological level are usually unconscious phenomena of behaviour, and a syllable, in its turn, is the node of this level, composition of verses in the syllabic system can be quite intuitive, and the syllables can be counted unconsciously.

With the exception of the Greek syllabic verse, in which, under the influence of the quantitative system we can theoretically single out the foot as a unit of metre, and although practice shows more cases of deviation from it than cases of following it (Meillet 1927), no syllabic system of versification has the foot as its main unit. If sometimes French versification speaks about the foot, this term exactly corresponds to any two syllables and proves to be excessive. The foot has meaning only in a system using syllables of different type: their combinations form feet as elementary units of such metric system. What is the diversity of syllables of the foot when we consider them only from the point of view of purely phonological, inherent features? If we consider this question using the material of modern Russian within the framework of the syllabo-tonic system, the syllables are divided into two categories: stressed and unstressed. Feet are formed by different combinations of syllables. In inherent features, this corresponds to a significant difference between the syllables of both types. The nucleus of a stressed syllable is formed by the sound classes *a, e, i, y, u, ɔ*, and the nucleus of an unstressed syllable, by *a, ê, i, y, u, ɿ, ɿ*, respectively. Apart from a significant difference in the structure of the vowel paradigms of these syllables, there is an even deeper difference between them, including different dependencies between these syllables in relation to one another. Syllables of the first type (the stressed syllables, with one vowel paradigm) are independent, they do not depend either on syllables of the other type or on each other. The sequence of these syllables is a sequence of independent events (both in statistical and logical aspect). Syllables of the second type cannot be independent, they can occur only in the presence of the syllables of the first type. So these syllables belong to the category of dependent (bound) syllables. So each foot is a regular set of syllables of certain types.

The same two types of syllables (dependent on one another and independent) occur in Germanic languages where this difference in the composition of vowels is even more pronounced. In other words, the relation of mutually exclusive sound classes to the sound classes included in both types of syllables is greater.

The position of dependent syllables allows for a two-way interpretation. The first way is to equal them, in a certain sense (as syllable) to independent syllables, but this equality will never be complete. They bear forever the seal of dependency and can only occupy certain positions in each metre, for example, only even positions in the iamb, only odd positions in the trochee, etc.

The second way is to disregard dependent syllables and count only independent syllables, the way it is in syllabic versification. In metrics, this corresponds to the accentual verse and ‘rayoshnik’ in Russian tradition; it is Knittelvers in Germanic languages. This system corresponds in its structure to the syllabic system: in both systems syllables which are mutually independent and independent on the phonological level are arranged in the line according to the number of entries. This explains the fact that in languages where syllables are divided into dependent and independent, the initial stage of poetry relies on counting independent syllables (tonic versification). Russian epic poems, as was demonstrated by M. P. Shtokmar (Shtokmar 1941, 1952), are regulated by the rules of the tonic verse. The tonic verse is represented not only in folk poetry, but also in literature, starting with the first experiments of V. K. Trediakovsky and M. V. Lomonosov (in “mixture of feet”).

In England, tonic verse was used already in the 12th century for the Our Father prayer and in the 13th century for longer poems. In German, verse with four stresses in one line appeared in the works of Otfrid, and became the main verse in the 16th century. Free Knittelvers with four independent syllables and unregulated number of syllables (usually from 6 to 16) are exceptionally popular in German tradition (Paul, Glier 1961). In Swedish literature, this verse was used for “The Passion of Christ”, circa 1300, and remained the only verse in the metrics until the 16th century. In Denmark, the first record of this metrics is the Lucidarius (13-14th centuries), and in Norway it had been known since the 13th century (Heusler 1956).

How did the transition to the syllabo-tonic system where dependent syllables are also considered separate units and are counted like independent syllables occur in these languages? Interestingly, this transition happened through the syllabic system where all syllables are equally independent. Speakers of Germanic languages knew the syllabic system due to church hymns in Latin and poetry in Romance languages. The knowledge of two systems at the same time (tonic and syllabic) against the background of a language where all syllables are independent allows us to consider dependent syllables in another language as independent units. This is the basis for syllabic versification, for example, in German: the poetry of Hans Sachs and Andreas Schwab. A significant deviation from the phonological system of the language is curiously evident in the verses of this metric school: *sprechén, zorén* (instead

of *sprechen*, *Zorn*, etc.). Even more curious is the way it transforms, quickly and generally, into the syllabo-tonic system, where syllables are still divided into independent and dependent, although at the same time both types of syllables are counted. It seems that the first to suppose that independent and dependent (in this case, stressed and unstressed) syllables alternate regularly were the Dutchmen Abraham van der Mijle and Daniel Heinsius in the early 17th century. In Germany, Opitz's reform in the 17th century led to the distinction of feet characterised by different combinations of an independent syllable with dependent ones. According to Harsdörffer (1645) and Weise (1692), the main difference between the metrics of Romance and Germanic peoples (syllable – foot) was already correlated with "a clear pronunciation of all syllables" in Romance languages and the distinction of certain syllables only in Germanic languages (Heusler 1956).

In Russia, the situation was similar. The introduction of Polish metrics and the expansion of syllabic verse (Pozdneev 1966), first in Polish hymns written in Russian alphabet, led to the interpretation of dependent syllables existing in the phonological systems of many Russian dialects as independent units. Such uniform interpretation of different types of syllables necessary for syllabic versification hinders intuitive perception, and V. K. Trediakovsky wrote that syllabic verses in Russian "should be called prose written with certain periodicity [lit. number] but lacking measure and cadence", and introduced a foot made of syllables of different types (Trediakovsky 1963a: 366). The functional heterogeneity of syllables (M. V. Lomonosov's norm was 'akanye'; Lomonosov 1952) calls for their division into two types and, consequently, introduction of versification based on feet. The form of the feet and their distribution in the national versification depend on both the peculiarities of the language system and the metric tradition (Shengeli 1923). But metrics can only reorganise what already exists in the language (Tomashevsky 1929).

Now it is time to consider the metric consequences of the change in the phonological system of French mentioned above. The division of all syllables previously independent of one another is into two types: independent (ending) and dependent (all other). This should lead to a system counting only the independent syllables (the type of tonic versification) and/or to a system counting all syllables, but selecting certain positions for syllables of one type. Josef Kvapil notes the transition to tonic and syllabo-tonic systems in Romance languages. The second type is also represented by a large number of verses, but within the framework of syllabic verse (Kvapil 1966). When a syllabic verse is 'translated' into the tonic system, it is read as free verse (Hrabák 1964). The expansion of free verse in modern French and Italian poetry is characteristic.

On the phonological level, not only the syllable is singled out as an independent unit (sometimes, with different degree of independence), but also the word as a combination of syllables. If the distribution of vowels, the nuclei of syllables, in the word depends on one another in some languages, and does not depend on one another in other languages, the distribution of consonants in syllables in European languages almost always depends on their position in the word. In other words, a word is singled out as a unit of the phonological level in all European languages. This fact manifests itself differently on the metric level. The first and the most general reflection of the independence of the word in metrics is that any line in any verse contains a whole number of words. A renunciation of this as seen in experiments is based precisely on the perception of this principle.

If all syllables forming a word are independent from one another in regard to their vowels, the word acts as an additional unit in the metrics in the form of singling out certain positions for the ending of the word. Therefore, in syllabic versification every metrics is characterised not only by the number of syllables, but also by the place of the word boundary – the caesura.

If at the same time the word organises the vowels of the syllables forming it, its metric structure, given in the feet, is marked enough, and the word boundary is not fixed at some given position in the metrics, but creates a free ‘rhythmic play’ by its position. See Roman Jakobson’s example:

Гость избежал ужасной кары...

and

Гости сбежали от Макара...

(Jakobson 1923: 29)

Thus, metric units correspond to an independent syllable and a word in the language. If the language has dependent syllables, there can exist a metric system counting all syllables, but special positions are regularly assigned to dependent syllables.

Which signals mark these units in the metrics? Most often, prosodic features function as such signals. These can be purely ‘metric’ prosodic features, such as raise of all ictus syllables in reciting verses at school; these can be features relevant on the phonological level, such as stresses in Russian. In prosaic language, the stress can be not phonological, but this does not prevent it from functioning as a signal in metrics. In poetic language, the contrast is usually under different conditions, in contexts of equal lengths (lines). In such a context, the non-phonological stress, if it concerns words of different

lengths (as is usually the case in European languages) becomes relevant. This is exemplified by Czech and Polish, among Slavic languages, and by Romance languages.

Prosodic features are not the only features capable of functioning as signals. Inherent features also can play the delimitative role. These can be certain features of vowels and consonants. The ancient Roman Saturnian verse shows inherent features as delimitative. Alliterative verse in Germanic languages is also a good example of consonants and their groups as signals.

Comparing the results of a language phonological analysis and the peculiarities of the metric system used by the poetry in its language certainly can be continued and deepened. The present paper is an attempt to analyse the correlation of the main language units on the phonological level and the specificity of its metric structure.

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