

PHONOLOGICAL COMPONENT
IN THE QUANTITATIVE LANGUAGE TYPOLOGY

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ABSTRACT

As the language is a system connecting meaning and sound, the connection itself must be systemic. Hence, the complete typological characteristics of the language system should include information concerning the mode of correspondence between sound and meaning.

1. INTRODUCTION

The phonological typology of the basic language unit - the word - reflects its constitutive and paradigmatic relations, its functional-semantic and grammatical characteristics and as such correlates with the morphological typology [1,2]. This makes it possible in addition to morphological and syntactic indices of the quantitative typology suggested by J.Greenberg to introduce: 1)indices disclosing constitutive hierarchical relations of the units of different levels; 2)indices reflecting the degree of variability/uncertainty of the units of different levels (in their interrelation); 3)indices characterizing the sound shape of morphemes and words and not only their syllabic and suprasegmental organization (as suggested by V.Scalička), but their phonemic structure depending on functional and semantic characteristics as well. As different word groups may not have similar typological tendencies, all indices should be determined both for the word as a whole and for separate parts of speech.

2. CONSTITUTIVE RELATIONS' INDICES

In constitutive relations between language units the frequency of factual coincidence of the units of one level with the units of another one is of special typological significance. On the one hand, the frequency of one-word sentences, one-morpheme words, one-phoneme (one-syllable) morphemes essentially characterizes the plane of expression of each of the meaningful units. On the other, the frequency of words separately making up a sentence, morphemes making up a word, phonemes (syllables) making up a morpheme indicates the degree of autonomy of the lower-level units towards the higher-level ones. The higher is the frequency the less is the degree of autonomy. Taking into consideration the last index a phoneme must be regarded as the universal minimal functional sound unit. Even in languages with the high index of grammaticality in the majority of usages a phoneme functions as a purely phonological entity. In classical agglutinative languages the degree of autonomy of a phoneme increases and reaches its maximum value in isolating languages as being most "lexemic". The notion of a syllable seems irrelevant because of non-autonomy of a syllable in reference to a morpheme even in syllabic isolating languages.

3. VARIABILITY/UNCERTAINTY INDICES

3.1. On the Level of Words

It's been noted that typological differences in the degree of

extension of lexical polysemy correlate with differences in the degree of synthesis and the length of a word: simple and short words tend to have more lexico-semantic variants (meanings) than derived and long words. This tendency is apparent in the opposition between analytic and synthetic languages and in synthetic languages in the opposition between the underlying members of derivational chains and high-stage derivatives.

3.2. On the Level of Morphemes

The degree of semantic uncertainty (polysemy) of words and morphemes is inversely proportional to the degree of allomorphic variability. It is extremely limited in isolating languages and more or less developed in synthetic languages. In accordance with the principle of morphological structuring of a word and monosemy or polysemy of inflexional affixes in agglutinative languages allomorphic variability occurs mostly in affixes and is normally automatic, predictable, whereas in inflecting languages it occurs in roots and is mainly unpredictable. Meanwhile inflecting languages reveal clear parallelism between semantic and allomorphic variability between words of different stages in derivational chain. According to the data of Russian, polysemy and polymorphism of a root/stem in inflexional paradigm (fusion tendency) is more typical for the basic (non-derived) words. The higher the derivational stage, more limited are polysemy and allomorphic variability. High-stage derivatives usually possess one meaning and are characterized by monomorphism of a root/stem (agglutinative tendency).

3.3. On the Level of Phonemes

Due to a greater length in syllables and in phonemes and thus a greater occurrence probability of phonemes in positions of neutralization, high-stage derivatives differ from non-derived words by a greater phonematic uncertainty. It is not accidental

that the Russian scientific text with the degree of synthesis of a word equal to 3.21 morphemes and the average word length equal to 3.4 syllables contains 45% of weak phonemes, whereas in the colloquial speech with the degree of synthesis equal to 2.47 morphemes and the length equal to 2.8 syllables the frequency of weak phonemes decreases to 36%.

Apart from phonologically conditioned uncertainty of phonemic identification of sound segments in the analysis of variability on the level of phonemes the frequency of phonemes manifesting themselves as marked (derived) members of morphological alternations should also be taken into account.

This group of indices sides with indices characterizing the degree of preferable use of consonants in a definite position within morpheme/word and, respectively, the degree of differentiation between positions: within the morpheme, at morpheme juncture and at word juncture. The coefficients of rank correlation of consonants in comparable positions may serve as the abovementioned indices. Since the position of morpheme juncture (opposite to word juncture) reveals good positive correlation with within-the-morpheme position the degree of positions differentiation in consonantal structure of a simple word and in the root enables one to consider the type of the affixation used and its functional load. Positional differences are weakened in the following order: root-isolating languages, prefixing languages, suffixing languages, languages with developed bilateral affixation.

4. MEANINGFUL UNITS SOUND SHAPE INDICES

The sound shape of morphemes and words is indispensable to meaning. Fundamental typologically significant semantic difference is the difference between lexical and grammatical meanings.

Contrasting of lexical and grammatical is reflected in constitutive and distinctive functions of sound units and in the degree of phonematic uncertainty. For example, in the Russian speech the coincidence of a morph with a syllable is more frequent in prefixes and roots as more lexical units, the coincidence of a morph with a phoneme -in suffixes and inflexions as more grammatical ones. The phoneme is quite autonomous in respect to the autosemantic morpheme. With lessening of lexicality and increase of grammaticality of morphemes, phonemes become less autonomous and may not possess this quality, if the given type of a morpheme always or mostly expressed by one phoneme as, for instance, is the case with inflexions in Marathi and Arabic.

Phonemes constitute a morpheme not as an autonomous element but as an integral part of the word. In line with the degree of autosemanticity of a word the phoneme in the Russian language obtains maximum autonomy in reference to a substantive root, less autonomy in reference to a verbal root and still less autonomy in respect to a pronoun root. The distinctive properties of phonemes within a morpheme go in line with the main rules of segmental word structure. Since the middle part of the word as distinct from marginal positions is usually irrelevant to distributive restrictions, the distinctive possibilities of phonemes in middle-of-the-word morphemes prove to be more effective. For example, in the Russian speech the frequency of weak phonemes in roots and suffixes amounts to 33-34% and in prefixes and flexions - to 62 and 59%. The part-of-speech function of a word is also significant for distinctive function of phonemes. In notional parts of speech performing nominative function the frequency of weak phonemes is higher than in pronouns performing substitutive and demonstrative

functions.

Morphonological differences between parts of speech are also essential for sense discrimination. For example, in the Indonesian language the voiceless consonants/nasals interchange frequency in the root-initial position amounts to 81-85% in predicatives, and to 51-53% in nouns. The opposition between lexical and grammatical greatly influences the indices which characterize the sound shape of meaningful units.

4.1. Phonemes' Inventory

In autosemantic morphemes making up an open list all phonemes and their combinatory possibilities are realized on a larger scale. In syntactic morphemes making up a closed list the inventory of phonemes is restricted: the more so, the less the number of the given morphemes and more grammatical their meanings. For example, in Russian and English in derivational suffixes the number of generally used phonemes amounts to more than 80%, in flexions it lessens to 33% in Russian and to 18% in English. The degree of restriction as to the phonemic inventory of morphemes is different in different parts of speech. In particular, the number of phonemes constituting Russian derivational suffixes lessens in the consequence: nouns (78.5%) - adjectives - adverbs - verbs (31%).

4.2. Phonemes' Quality

More or less strong tendency to attach phonemes to certain meanings first and foremost manifests itself in preferable usage of vowels to express grammatical meanings, and consonants to express lexical meanings. The degree of lexicalization of consonants and the degree of grammaticalization of vowels as well as the degree of lexicality/grammaticality of morphemes themselves may be indirectly observed in the consonantal coefficient, which reflects the proportion of consonants and

vowels in accordance with their frequency of occurrence within different types of morphemes. In the Russian speech inflexions possess the minimum (0.43) and roots - the maximum (2.13) value of the given coefficient. The more lexical is the root the higher is the coefficient. Consequently, it is higher in noun roots than in verb roots.

In derivational morphemes, combining lexical and grammatical meanings, the proportion of consonants and vowels is more equal (consonantal coefficient in suffixes equals to 1.44, in prefixes to 1.17).

4.3. The Meaningful Units' Length in Phonemes and Syllables

It is already known that concrete meanings are expressed by longer than the abstract one elements. The syllabic or non-syllabic form of meaningful lower-level units is determined by their free or bound position within higher-level units and finally by degree of autosemanticity. In tendency grammatical morphemes and words are shorter than lexical ones. For example, in isolating Yoruba and in inflecting Russian the syntactic root is shorter than the autosemantic root (respectively 1.00 and 1.35 syllables in Yoruba, 0.9 and 1.28 - in Russian), the pronoun root is shorter than the notional one (1.12 and 1.42 in Yoruba, 0.7 and 1.4 in Russian), the verbal root is shorter than the noun root (1.13 and 1.57 in Yoruba, 1.1 and 1.5 in Russian).

4.4. Morph Junctures and Syllable Boundaries Interrelation

Strong coincidence of syllable and morpheme boundaries in syllabic (isolating) languages is determined by lexicality of morphemes and their possibility to manifest a word. In non-syllabic languages different types of morpheme junctures in many ways correspond to syllable boundaries as the mode of combination and variability of morphemes depend

on their meaning, position within a word, and on whether they are added to the stem or to the word as a whole. For example, in Russian in accordance with the agglutinative character of prefixes and fusional character of flexions the coincidence of morpheme and syllable division is more probable at the prefix-root juncture and very rare at root/suffix-flexion juncture.

4.5. Morphemes' Suprasegmental Characteristics

The frequency of morphemes (autosemantic morphemes in particular) marked by suprasegmental means seems also to reflect the degree of lexicality/grammaticality of the language. It is not by chance that such prominence can be observed more often in tone isolating languages which are most "lexemic".

5. CONCLUSION

The language system integrity and unity can be clearly seen in good or average sufficient correlation of monophonemic morphs' frequency and the frequency of morpheme junctures within a syllable with indices of lexicality/grammaticality (+0.918 and +0.775), agglutination/fusion (+0.898 and +0.837) and synthesis (+0.716 and +0.536) in 11 languages of different types. The lower is the lexicality index and thus the higher the index of grammaticality, the higher are the indices of synthesis and fusion, hence more oftener occur in the text monophonemic morphs and respectively more frequent are morph junctures within the syllable.

6. REFERENCES

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