

# Towards an Evolutionary Typology of Stress

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## ABSTRACT

The linguistic typology collected a lot of data concerning metrical structure of word in languages of the world. Also many facts displaying the historical development of accentual systems are known. But there does not exist any accepted theory generalizing cases of stress arise and possible transitions from one metrical type to another. This task may resolved on the basis of data about the prosodic evolution in languages of different types. This paper tends to summarize an information on stress evolution in three groups of Eurasian languages: Turkic, Daghestanian and Slavic.

## 1. INTRODUCTION

Studies of accentual typology in the frame of metrical theory were concentrated mostly on the formal aspects of word stress. Meanwhile sentence prosody (both tonal and non-tonal) interacts with that of word. It is inevitable because these prosodic channels use partly the common means.

It concerns first of all expiratory accent which serves both as a focal marker and a word metrical head. Besides, the initial maximum of the utterance intensity curve being projected on word makes the first syllable accentually relevant [15]. Unfortunately, an acoustical study of expiratory accents is accompanied with serious difficulties [5], and in most languages we are able to discuss only their perceptual qualities. Duration (if it is not involved in a segmental contrast of vowels) may also be a component of both phrase and word accents. Presumably, these two parameters underlie metrical patterns of word in most non-tonal languages of the world.

The typological space of word stress is divided into two basic classes. The first one comprises languages with the edge orientation of stress. A metrical pattern of word may be seen in this case as a projection of potential phrase accent on the embedded constituent. The second class comprises languages in which the word metrical structure (in particular, patterns of vowel reduction and the distribution of prominence levels) exists independently of that of phrase. It is conditioned by prosodic properties of morphemes and has no edge orientation. In fact, such pure systems present an idealization and a real system may contain some components of the opposite one.

These two classes may differ also in respect to the behaviour of phrase tonal accents. In the languages with non-final fixed stress rising tone of question is often located on the final syllable, while in the languages of the second type coincidence of illocutionary tones with stress syllables is typical. Tonal accent languages present a specific subclass of the second class.

The main accentual shifts in stress languages are as follows: a) a change of the basic type (a transition from non-fixed stress to fixed one and on the contrary); b) a change inside the basic type (a shift from the left edge stress to the right edge; a reorganization of accentual paradigms); c) arise of tonal accent (cf. [12]). Examples of all these changes will be given below.

There are also languages with no stress (tonal languages of African type, some languages of Caucasus, etc.). In Caucasian languages we find only drift from tonal to stress patterns and not in the opposite direction. Unfortunately, a co-ordination of sentence prosody and word prosody is not studied thoroughly in tonal languages. In accordance with Welmers' data [17], word and sentence tones in African languages are combined on the basis of rules, while Hyman affirms that sentential illocutionary meanings are expressed by tones of special morphemes [6]. The monosyllabic languages of Chinese type display universal accentual tendencies: the presence of rhythmical patterns in compounds and loss of tonal contrasts in unstressed syllables [19], [7].

Below I will discuss evolutionary processes found in accentual systems of three linguistic families presented in Russia. This analysis is founded either on historical data or on a hypothesis about the most probable direction of development that follows from a comparison of existing languages.

## 2. TURKIC LANGUAGES

There are no accentual signs in ancient Turkic texts, yet data of to-day Turkic languages (their total number is about 40) give evidence for the unquestionable conclusion about the right-edge orientation of stress in the proto-language [1], [13]. Turkic languages present a classical example of the agglutinative linguistic type: an initial root is accompanied by a chain of affixes. Affixes of the morphological level not always go in front of sentential exponents. Morphemes of question, of actual negation, and copula (it joins personal affixes) do not belong to the

domain of stress. Compare Turkish forms *doktor-úm* «my doktor» and *doktor-um* «I am a doktor». Non-stress affixes block stress placing on succeeding affixes which otherwise bear stress. Examples from Balkar: *asha-dy* «he has eaten», *asha-ma-dy* «he has not eaten». A disaccordance of the harmonic and metrical structures are of an interest: the domain of harmony includes the whole word while the domain of stress is restricted to the initial string of non-sentential affixes.

Focal (expiratory) accent is combined with stress of the final word of a sentence. Many phonetic descriptions of Turkic languages inform about lack of stress on non-final words of an utterance. Falling tonal accent bearing illocutionary or boundary functions is normally also combined with stress. At the same time I found in Tatar and Balkar that rising tone of question is oriented on the final syllable of a sentence.

In all Turkic languages there are specific classes of words disturbing the basic metrical pattern: they have initial stress. The following forms belong to this set: imperatives, some varieties of vocatives, superlatives, numerals (in the situation of deictic enumeration of objects), etc. This list shows that the initial accentuation is conditioned by expressive sentence prosody. This confirms the hypothetical syncretism of word and sentence rythmical patterns in Turkic languages.

There are cases of departure from the common Turkic metrical pattern which are connected with the arise of conditions for the independent word stress. They are found in two adjacent Siberian languages: Khakas and Shor. The rule of final stress does not work in words where it contradicts to the distribution of vocalic heaviness: a more “heavy” (wide or long) vowel draws stress from a final “light” one (narrow and short): *charyx* ‘light’, *sa:sxan* ‘magpie’.

In Balkar I found a group of unstressed words pronounced on the very low breath effort (*bala* ‘child’, *maqa* ‘frog’, etc.). Probably, this prosody has a connotative nature. An expiratory accent is impossible in such words. Accentual innovations of a similar type take place in Chuvash. They are conditioned by the arise of “reduced” vowels. These vowels resulted from the phonologization of a prosody whose phonetic nature retains unclear. My work with Chuvash speakers revealed a low level of breath activity. Such “soft” vowels can not function as an anchor for phrase accent which is equivalent to stress in Turkic languages. If a word contains just “reduced” vowels, it receives just a slight prominence on the first syllable. Otherwise, the last full vowel is stressed (cf. [2]).

Another type of deviations from the basic metrical pattern is connected with numerous borrowings: from Russian in Turkic languages of Russia and from neighbouring languages in Turkish [16].

### 3. DAGHESTANIAN LANGUAGES

These numerous languages situated in the mountains of East Caucasus display a broad spectrum of accentual possibilities [9]. Most Southern (Lezgian) languages have initially oriented stress which is displaced in the window of the first two syllables (Lezgian proper, Agul, Rutul, Archi). Stress assignment inside this window can be handled now only by means of lexical marking, however in the case of Archi a former metrics of syllable heaviness can be reconstructed. Tabasaran presents an interesting exception from the common pattern. Among Lezgian languages only this language has the final orientation of stress, and Dubek dialect is of a special interest. It has developed a strong limitation on the syllable structure: final voiced and glottalized consonants are now not admitted and they augmented a vowel mimicking a preceding one (*\*Rurd* > *Rurdu*, *\*nit'* > *nit'i*). Such augmented vowels do not accept stress. Thus, the former domain of stress (it does not include new vowels) has retained.

Undoubtedly, stress in Lezgian languages is a result of metrical evolution. Data of more distant mountain languages give evidence of this. Thus, in Tsakhur stress did not become a common metrical property of word. Most words have no metrical head and display only a slight prominence of heavy syllables. It is noteworthy that those stress words which designate people and animals lose stress when they accomplish the semantic role of Patience. Other isolated mountain languages of this group (Budukh and Kryz) has no stress at all. Probably, they have syllabic tones but their word prosody needs a further study.

The literary dialects of two great languages of the central group (Lakh and Dargi) have no stress. Also most languages of the Northern group lack stress. Only three languages (among 14) display pronounced stress. These are Avar which functions as lingua franca of the whole region, Godoberi and Chamalal. Avar nouns have three accentual paradigms: constant stress on the stem, constant stress on the desinence, and moveable stress. The position of stress is determined by the distribution of three parametric values: syllabic weight, stiffness/slackness of vocalic articulation (intuitively it is associated by speakers with high and low tones), and the location of a specific impulse of tenseness. In Godoberi the difference of breathy and neutral voice is involved additionally in the positioning of stress and there are nine accentual paradigms in nouns. Verbal accentual systems in Avar and Godoberi (and generally in Daghestanian languages) are much simpler.

Supposedly, the stiff/slack opposition in these languages goes back to tonal contrasts. And some languages of the Northern subgroup (Akhwakh, Andi) have syllabic tones. The presence of tones in Akhwakh has received an experimental confirmation. Words in these languages do not display any metrical subordination. Their syllabic structure is also characteristic: both languages admit only

sonorants at the end of syllable. Unfortunately, we do not know in what way the focalization is realized in these languages. The question is which syllable serves as an anchor for a potential focal accent.

But most languages of this subgroup display a transitional stage from the tonal to the stress pattern. Bagvalal provides a typical example of such a system. There are three classes of words which differ in their metrical structure: a) words with a strong prominence which is appreciated by native speakers as «normal stress», b) words with a less pronounced prominence which is appreciated as «weak stress», c) words with no prominence at all («completely non-stressed»). Acoustical traces for minimal pairs show differences in intensity of stress and unstressed words. It is interesting that some semantic groups are associated with certain rhythmical patterns. Thus, all verbs of eating and drinking belong to class a, all verbs of putting off and taking off clothes to class b, all verbs of speaking to class c. There are also semantically motivated differences in nominal paradigms: only names of domestic animals receive strong stress in genitive forms [11].

Daghestanian languages display an interesting tendency for combining stress with the opposition of strong/weak consonants. Almost all languages which have strong stops (such sounds join intensification with an increased duration) possess also stress. This correlation has no simple explanation because a strong stop and stress do not imply each other inside a syllable.

The Daghestanian data provide a ground for several specific conclusions concerning the evolutionary typology of stress: 1) they give evidence of a general drift from more archaic non-stress systems typical for remoted mountain areas to relatively simple stress systems in the areas close to Caspian sea; 2) not only tonal but also other prosodic parameters (tenseness of cavities walls, non-neutral phonation) can be of accentual relevancy; 3) the initial orientation of stress and a greater accentual complexity of nouns are characteristic for most languages. The last property is obviously conditioned by a rhythmical structure of predicative constituents typical for Daghestan: object precedes predicate and bears the main accent of a sentence.

#### 4. SLAVIC LANGUAGES

In accordance with Dybo's hypothesis [4], the prosodic system of the common Baltic-Slavic has arisen after the drop of syllabic tones and the phonologization of accentual contours corresponding to tones: H (high) > + (accentually active) and L (low) > - (accentually passive). Combinations of these and some other properties determined stress placement inside proto-language words. Though phonetic nature of these diacritical marks remains unclear, they provide a formal explanation for the facts known from ancient written texts and found in the to-day Slavic languages.

This proto-system had different development in the East, South and West linguistic sub-groups. The East Slavic languages are most close to the initial state. They display three basic inflectional paradigms: stress on stem, stress on ending and a movable pattern. The accentual history of Russian has received the most detailed account. As it was shown by Zaliznjak [18], the main evolutionary trend of the past millenium consisted in grammaticalization of the accentual paradigms and unification of the word-formation patterns. But this did not result in a simplification of the accentual system. The distribution of stress in modern Russian is accounted for on the basis of a highly complicated system of diacritical markers for stems and affixes and most lexical classes are supplied with lists of exceptions.

The existence of such a system seems puzzling. I insist that Russian stress as a result of accumulation of accentually relevant phonetic properties inherent to a word: differences in breath and laryngeal activity, in sizes of oral and pharyngeal cavities, and others [10]. The feature ATR/RTR seems to be especially important. Unfortunately, a phonetic study of these "hidden" features are on the initial stage.

There is another aspect of East Slavic accentuation which needs a further investigation: it is a semantic motivation of lexical accentual properties. Thus, many lexically non-stress roots designate deictically actualized objects: earth, sky, water, river, sea, night, day, year, head, hand, etc. The typical discursive functions of such words may determine their lexical prosody.

The South Slavic languages preserved the basic paradigmatic stress system of the common ancestor, yet Bulgarian lost the movable type. The only exception is presented by Western Macedonian which has now antipenultima stress. It is an accepted view that Slovene and Serbo-Croatian have developed their own "tonal" accents which have no relation to the Baltic-Slavic ones and differ also between themselves. But their phonetic nature is not clear. The experimental study of Serbo-Croatian accents [14] did not confirm the intuitive tonal interpretation. In a similar way, the tonal nature of Lithuanian accentual differences seems doubtful [3]. These facts call in question the existing evolutionary model of the Baltic-Slavic prosody. The phonetic basis of known historical processes and of present-day prosodic systems needs a reevaluation taking into account all potentially relevant parameters.

Stress in the main West Slavic languages (Czech, Slovak and Polish) has no connection with the presupposed common Slavic accentuation. All three languages had the initial stress in the past [8], but now literary Polish has penultima stress (it is not true for some loan words). Some traces of the former prosodic distinctions are demonstrative: the "acute" (+) resulted in intensification and diphthongization of vowels. It is hardly to be a sign of the tonal nature of the initial feature.

Domain of stress in Polish displays a surprising typological similarity to that of Turkic languages. Here also some affixes are out of stress domain: *robi-li* “make”, 3 PI PST M; *robi-li-s'-my* “make”, 1 PI PST M; *robi-li-by-s'-my* “make”, 1 PL PST M COND. Stress does not occupy its normal position when such affixes are added [3]. Also timing of phrasal tonal accents is characteristic: rising tone of question is placed on the final unstressed syllable (– *Jaki jest numer mojego pokoju?* “Which is the number of my room?”). The same pattern is used in Czech: – *Je obsluha v cene?* “Is the service included in the price?”. In this connection a question arises whether the non-coincidence of stress and tone may be a relevant parameter for accentual innovations.

## 5. CONCLUSION

The development of stress evolution theory presupposes an analysis of the multidimensional structure which combines all accentually relevant characteristics of word and sentence in languages of different types. Abstract diacritical marks are of no use in resolving this task. We need much more careful investigation of phonetic and functional parameters involved in accentuation. Not only tone but also overall breath activity, vertical position of larynx, volumes of oral and pharyngeal cavities, tenseness of vocal cavities walls need to be regarded as phonetic parameters relevant for accentuation. Also, positioning of phrase accents (both expiratory and tonal) and connotative lexical prosodies should be taken in consideration.

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