

RELATION BETWEEN SEGMENTAL PHONEMES AND TONES IN DIACHRONY

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ABSTRACT

The interconnection between the events usually described as supersegmental (such as phonemic tones) and segmental units is studied mainly on the example of phonological systems with laryngealization and pharyngealization used as supersegmental features in a syllable or a word. Synchronic and diachronic typology of prosodic systems with laryngealized and pharyngealized tonemes are discussed in connection with those phonetical data that give experimental support for the reconstructed historical evolution.

The problem of the relation between segmental phonemes and tones in diachrony is of utmost importance for the correct theoretic distinction between those aspects of speech sounds that are grasped by means of phonetic equipment and the purely functional use of the same sounds.

One should stress the importance of the problem for the general phonology since many other facts too point to the interconnection between the events usually described as supersegmental (particularly phonemic tones) and those phonetic manifestations that are considered mostly as segmental ones, cf. /1/, /2/.

In the recent studies on the tone phonology two results have been deduced that may be connected with each other. First in a lot of languages the segment inventory of the syllable phonemes can influence in unforeseen degree the supersegmental characteristics of the tone. From the point of view of natural phonology stressing (as the academician Shcherba's conception has done) the importance of the phonetic substance one might speak about the phonologization in separate languages of those regular relations that on the phonetic level may be discovered between

the feature voicedness-unvoicedness of stops and the feature high-low in the adjoining vowel /3/. From many diachronic consequences of this universal one might give only one example: Verner's law may be interpreted as the continuation of the old differences between the high and the low tones (and between the unvoiced and voiced consonants in Proto-Germanic) in the given forms /4/ of the typologically similar opposition between /pólù/ 'back' and /bólù/ 'his back' in Kpelle (the group Mande, Liberia), where according to Welmer in the second form the low tone is reconstructed that could cause voicing. In the synchrony the causal link between supersegmental units and the complex character of prosodemes are found: in them the features are phonologized that can be described as phonologically segmental.

Secondly it is found that phonological oppositions of supersegmental units - tonemes (or prosodemes) in a number of languages are formed by differences not only in pitch and melody but also by some other features: quantity (for example in some Chinese dialects such as Shang-Khai and Amui, in Burmese, modern Yenissey languages), intensity, laryngealization and pharyngealization etc. These features are intertwined with those of pitch and melody. That makes the notion of tone in such a classical tone language as Chinese much more complicated than it had been supposed earlier.

From the point of view of general phonetics most understandable is the functional similarity between pitch and melody differences and the glottal stop since the glottalization is localized in the same part of the vocal mechanism where the different types of phonation are produced. For the concrete understanding of these phenomena important are the results of the investigation of the relation between the low tone and the voicedness of the consonant which is connected with the non-tenseness of the vocal chords. The suggestion according to which the pitch is becoming higher due to the growth of the tenseness

of the vocal chords (and of the subglottal pressure) can be verified experimentally. In this connection one should study the possible link between the glottal stop and the rising tone that had been studied first in "Indo-Pacific" language Kate. In the glottal stop takes part in tone oppositions. The causal link between rising melody and the glottal stop was proved long ago by studies in experimental phonetics. The same results are achieved in the synchronic phonological description of languages where this relation is given phonological status to. In Kachari (the Bodo subgroup of the Tibeto-Burmese, Assam) the glottal stop and the rising tone are in complementary distribution. In Mixteco dialect of Santo Thomas Ortepec the tone is higher in the verbs with the second syllable beginning in a glottal stop; in the Ayutle dialect of the same language a similar rising of the tone takes place in a syllable after which the glottal stop follows. Particularly interesting are the data of the Northern Thai dialect of Tang-pa. In it the tones of the high series (the first one and the fifth one) and the glottal stop are united and are tonemically close to the initial preglottalized consonants ('b, 'd, 'j). One can think that the glottal stop and the voiced preglottalized consonants are always similar as to their influence on the tone: usually they do not lower it, but they can rise it. In Ngizim (Chad subgroup of Afroasiatic, Nigeria) the implosive (injective) b /6/ that is pronounced with ingressive in-taking of the air with the closed vocal chords, does not cause the lowering of the tone in distinction to other voiced consonants. This can be related to the data of experimental phonetics according to which implosive (preglottalized) consonants might rise the tone more definitely than all other types of consonants. In this respect they are different from the other consonants which may usually lower the tones. From that point of view the facts of such a Modern Indo-Aryan language as Gujarati are important in which the implosive character of the articulation of the voiced consonants may be linked to the relation rising of the pitch during the closure and the growth of the number of vibrations. It can be supposed that just such articulation may lead to the rising of tone found in some modern Indo-Aryan languages (particularly in the Eastern Bengalian dialect of Dacca) in connection with the implosive character of consonants (in Sindhi) or the development of tones.

The universal that leads from the existence of the glottal stop to the rising of the tone may have some diachronic implications. Among them most interesting is the development of the high rising tone in Lahu (the Lolo division of the Lolo-Burmese subgroup of Tibeto-Burmese). The Proto-Lolo

*-p, *-t, *-k of Proto-Lolo-Burmese had merged in a glottal stop due to the law that the end stops are worn out and lose the articulation in the mouth that can be given parallels to from many languages, Tibeto-Chinese among them. Since in Lolo (as also in Proto-Lolo-Burmese) a number of words have initial glottal stop /ʔ/ in Lahu the dissimilation of the old initial glottal stop and of the new final one developed by merging of neutralized final *-p, *-t, *-k took place. This dissimilation might be to a principle according to which two glottalized stops do not occur in the same morphs as it can be seen in Kartvelian and some Amerindian languages /5/. The final -t had developed into the glottal stop in some Tibeto-Chinese languages in which later laryngealized (glottalized) tones such as Chinese Zhu-Sheng and Lolo stopped tones appeared. Later in Lahu in morphemes of this type the dissimilative disappearance of the glottal stop might be seen as means uniting segmental consonants structures and supersegmental tone systems. The Vietnamese 5-th tone (sắc, rising) corresponds to the final /ʔ/ in other Austro-Asiatic languages of the group Palaung-Wa. One may think that here the phonetic events that were caused by the glottal stop have become phonologized: after the disappearance of the glottal stop the rising melody has become phonologically independent. According to the Vietnamese diachronical model similar process might be reconstructed also for the Old Chinese. It is supposed that in it the rising tone might be traced up to the glottal stop. According to the theory about the Indo-European laryngeals developing into Balto-Slavic syllabic intonations the rising intonation has arisen from a lost laryngeal (a glottal stop consonant after some interpretations). In a similar way the disappearance of a glottal stop might lead to a rising tone in Triqué according to its comparison to other Mixed dialects.

The inverted relation between the glottal stop and the rising melody developing into a glottal stop may be supposed in later periods of the history of the same Baltic languages: Latvian, where the interrupted intonation (lauzta) has developed from the ancient rising (acute) one in mobile acute paradigms with the movement of the accent toward the old syllable before the accentuated one. A similar process of development of the interrupted intonation from an acute rising one is found in North-Western-Lithuanian (Zhemaitė). In Danish the stød (phonetically a glottal stop) is traced back to an old rising tone. But from the point of view of the Indo-European phonology it can have developed from an old glottalized consonants not only in Danish but in English dialects too: */foʔt/ ← */phot'/ 'foot' etc.

With this type of synchronic and diachronic events telling about the functional line between the glottal stop and the rising intonation one may also connect the possibility of the use of the glottalization (as a part of a more complex articulation) as means of syntactical intonation in those sentences particularly interrogative that are usually marked by a rising melody in many languages. Thus in Australian language Nyangumata glottalization is used for the most part in the end of the interrogative sentences with the rising intonation.

The connection between the glottalization and the rising melody as well as with the quantity (in Thai, Burmese, Chinese dialects, Yenisseyan languages) might be counted among the universals that might find the general phonetic explanation in mechanism of the production of the source of the speech message. At the same time this universal is manifested in a number of languages either in synchronic events or in diachronic development at different levels starting from the segmental phonemic up to the supersegmental (tonemic and intonational) one.

The use of laryngealization (or pharyngealization) as a supersegmental feature in a syllable or a word is functionally different from its application as syntactic intonational device which (especially in the final position in a sentence) is found in several languages as in Mikasuki; but in both cases the parallelism with the use of pitch and melody contours is striking. One might distinguish the symmetrical prosodic systems with the equal or multiple relation of the laryngealized tonemes and the non-laryngealized ones and the asymmetric systems. In the latter one can find empirically that laryngealization is connected with the differential feature of the brevity of the vowel (Shan-Khai dialect of Chinese, Burmese, the Yenisseyan Ket dialects). Diachronically the asymmetrical systems might develop from those in which due to the neutralization the number of the tonemes in the syllable ending in a voiceless stop (developing later into the feature of laryngealization) is less than that of the tonemes in the other syllables (as in Middle Chinese and in some Tibeto-Burmese languages such as Atsi). For Twi, Livonian, some Yenisseyan languages and for the earliest periods of the history of Tibeto-Burmese and Chinese it appears possible to trace the line between the development of pharyngealized or laryngealized tonemes and the decrease in the differential potentialities of the phonemic inventory: just as in the history of nasalization (opposed to laryngealization in some languages such as Haimu in Melanesia) the lessening of the differential possibilities of phonemic components of words is compensated for by the expansion of su-

persegmental features. In different periods of history of Tibetan, Burmese and some cognate languages laryngealized tonemes cyclically reappeared. Due to that the laryngealization as such persisted, but later it manifested itself in different morphs if compared with the older epochs. One might add that in many languages the glottal stop should be considered as phonetic realization of supersegmental (prosodic) feature of glottalization or laryngealization stretching on the whole syllable, the whole morph or the whole word. In the languages in which tonal differences exist glottalization and laryngealization (as well as also pharyngealization) are usually connected with the pitch-melody differences that build one system with them. Many examples of such prosodic systems have been analyzed /6, 7, 8, 9/.

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