

Role of laryngeal features in the development of prosodically-induced ternary quantity

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Phonological ternary quantity is an extremely rare phenomenon found in two dozens of the world's languages (Ladefoged & Maddieson, 1996; Blevins, 2004; Prehn, 2012). In about 4/5 of cases, ternary quantity has prosodic origins. In particular, as my survey of such cases (about 20 varieties from Uralic, Indo-European, Eskimo-Aleut, Toto-Zoquean, Uto-Aztecan, Mixe, and Nilotic families) showed, the third degree of quantity (Q3, or overlength) emerges through the following types of lengthening:

- (1) stress-induced lengthening;
- (2) compensatory lengthening of preceding matter due to the loss of the following syllable;
- (3) “anti-compensatory” lengthening of consonants before longer vocalic or syllabic matter;
- (4) lengthening of (C)V(C) monosyllables.

The survey also revealed a striking association between the ternary contrast and the activity of laryngeal features in the studied languages. Three general patterns of the alignment between overlength and laryngeal features were discovered: two opposed types in the stress languages and one more separate type in a group of tone languages.

In all families but one (Nilotic), prosodic ternary quantity is related to stress. Stress in these languages is associated with the contrastive patterns of distribution of quantity and, in some cases, of laryngeal features in the syllable or the foot. In languages with just two stress patterns (Indo-European, Eskimo-Aleut, most Uralic varieties), one pattern can be considered as “strong” (historically based on strengthening/lengthening) and the other one as “weak” (cf. e.g. Morrison, 2019 on North European varieties). Other languages (e.g. Livonian, Mixe), have up to five-six contrastive stress patterns of similar kind. Some of these multiple patterns can be equally considered as “strong” and others as “weak”. Overlength is always associated with the “strong” patterns. Laryngeal features, in turn, depending on their origins, can be associated with either “strong” or “weak” stress patterns.

1. “**Culminative**” laryngeal features often have prosodic origins and additionally enhance the stressed syllable, usually its coda. They are, therefore, aligned together with the (over)lengthening of the stressed syllable within the “strong” patterns. These are e.g. stød in Livonian (Viitso, 2007) and an “additional subglottal pulse” in Saami (seen as the primary mechanism in the development of the whole “strong” pattern by Sammallahti, 2012). Estonian overlength might also manifest covert ballistic laryngeal activity, as some studies suggest (Liiv, 1961, 1962; Lehiste, 1962; Rimmel, 1975a, 1975b). Certain laryngeal features in Lowland Mixe, especially those of prosodic origins in the syllabic templates /V:ʔ/, /VʔV/, /V:h/ (Wichmann, 1995), also belong to this type.

2. “**Delimitative**” laryngeal features of either segmental or prosodic origins function as boundary signals at the foot edges or foot-internally between syllables. They can block stressed syllables from strengthening through (over)lengthening and, therefore, become associated with the “weak” patterns. These cases include hiatus-related laryngeal activity in Scottish Gaelic, word-final laryngeals ʔ/h in Nenets, laryngeals ʔ/h and preglottalisation as boundary markers in Yupik. In the syllabic template which now contains the second quantity degree (Q2) in Lowland Mixe, vocalic overlength was blocked by originally preaspirated consonants. In North Low German varieties with overlength, overt laryngeal activity was not attested. However, a glottal constriction within a “weak” pattern (in tonal accent 1), which is in general opposed to Low German overlength, was claimed for some cognate Franconian varieties (Engelmann, 1910; Kacnel'son, 1966; Kehrein, 2017).

3. Tonal West Nilotic languages with ternary quantity (Dinka, Shilluk, Nuer) exhibit the third type of alignment between quantity and laryngeal features: a voice quality/register contrast, “**orthogonal**” to both length and pitch. Most values of voice quality, length, and tone can co-occur (Andersen, 1992). This situation is different from that found in the stress languages. Voice quality here is a longer-term (syllable-length) larynx postural setting (Esling et al. 2019) rather than a single ballistic action of laryngeal constriction. Its origins are also different. Voice quality contrast in West Nilotic likely is rather genetically linked to an +/-ATR contrast (Andersen, 1990; Edmondson & Esling, 2006; Esling et al., 2019: 176–177) than to any kind of strengthening/weakening. Remarkably, also Q3 in West Nilotic is phonetically much shorter than in the stress languages discussed above.

Laryngeal dimension (activity of the lower vocal tract, including glottalisation, laryngealisation, pharyngealisation) is still relatively poorly accounted for in general phonetics, phonology and typology (Edmondson & Esling, 2006: 158; Seifart et al. 2018: 329–330; Esling et al., 2019). In the case of ternary quantity, taking the laryngeal dimension into consideration can allow for a deeper understanding of its evolution and synchronic functioning.

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