

## Soikkola Ingrian ternary foot: gemination and recursion

Natalia Kuznetsova (*nkuzn@yandex.ru*)

University of Turin / Institute for Linguistic Studies, Russian Academy of Sciences

Finnic languages with innovative complex prosody (Estonian, Livonian) manifest an extreme relevance of the foot [1-3], unlike more archaic prosodic systems (Finnish) [4-5]. Soikkola Ingrian, a nearly vanished Finnic variety of Russia, is close to the former group. It contains a contrast of long and short vowels (V — V:) and a ternary quantity contrast of consonants (C — C: — C:, see Fig. 1). There are studies on Soikkola disyllabic feet [6-9], but not on the trisyllabic ones. This study is based on author's field research on Soikkola Ingrian (2006-2018), including an ongoing phonetic experiment on 22 trisyllabic structures (3853 tokens).

The ternary quantity contrast emerged in Soikkola Ingrian through the so-called process of secondary gemination [10-14]. Like many other Finnic varieties, Ingrian has two historical types of geminates: *primary geminates* (emerged in Proto-Finnic), and *secondary geminates* (developed out of singleton consonants after a split of Proto-Finnic into separate varieties). In some Finnic languages (Standard Finnish, Estonian) secondary geminates are absent, in other they merged with primary geminates (Western Votic), in the third (Soikkola Ingrian) formed separate phonemes: short geminates, as opposed to long (primary) geminates. The Ingrian language represents a Finnic variety with the most richly developed secondary gemination.

Prosodic conditions on Soikkola Ingrian secondary gemination are as follows:

(1) types of consonants: in di- and trisyllabic foot after a light (C)V syllable, any consonants can geminate; after a heavy syllable (any other syllable type), only stops (*p, t, k*) and *s*;

(2) number of syllables in the foot:

(i) monosyllabic foot: consonantal length contrasts are neutralised, no gemination;

(ii) di- and trisyllabic foot: after a light or heavy syllable, before a long vowel or diphthong, e.g. \**kana*: > *kan'a*: 'hen:PART', \**poika*: > *poik'a*: 'boy:PART', \**kurkia* > *kurk'ia* 'crane:PART', \**maka.m:a* > *mak'a.m(m)a* 'sleep:1PL', \**kerki.m:ä* > *kerk'i:mä* 'be\_in\_time:1PL';

(iii) trisyllabic foot ONLY: after a light or heavy syllable, before two light syllables -CVCV(C): \**omena* ['ome:na] > *om'e:na* 'apple', \**murkina(t)* > *murk'ina(t)* 'breakfast:(PL)'.

Multifoot words manifest the same types of gemination in secondarily stressed di- and trisyllabic feet, e.g. *aivastel'o*: ['aiṽäš,te'l'o:] 'sneeze:3SG', *pilahuis'ivat* ['piṽa:,huṽš'iväd] 'rot:CND:3PL'.

Gemination is a productive process, cf. late Russian loans: *saraj* > *sar'a:ja* 'woodshed'.

The gemination type (iii) does not have any parallels in other Finnic languages and was presumably the latest development of this phenomenon. Here, gemination is no more linked to the length of the following vowel, but depends on the general prosodic profile of the foot (the number and structure of syllables). This type also shows that the trisyllabic foot is a prosodic type in its own right, different from both the disyllabic foot and the combination of a disyllabic and a monosyllabic foot. No gemination is attested in both latter types before the second syllable with a short vowel: \**kurki* > *kurki* ['kurği] 'crane' (a disyllabic foot), \**murkinä* > *murkinä* ['murği,na:] 'breakfast:PART' (a disyllabic foot plus a monosyllabic foot).

It was proposed in [15] that most examples of ternary rhythm in [16] could be treated as non-ternary. While the ternary foot as an independent prosodic type in Soikkola Ingrian could hardly be put under doubt, it is still unclear whether recursion is a helpful concept to formalise it (and any ternary foot at all). The main issue is that the so-called "minimal foot" and the "maximal foot" are constituents of a different functional role. The "maximal foot" is the domain of the metrical stress, it can contain from 1 to 3 syllables. The "minimal foot" is the most prosodically active part of the foot which contains main quantity contrasts and alternations and is affected the most by various phonetic tendencies (foot isochrony, reduction, lengthening), as our experimental study has shown. This part could rather be compared to the syllable nucleus, and is called in our study "foot nucleus" (a sequence from the first syllable

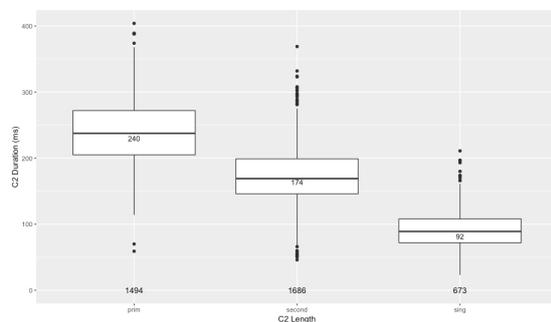
vowel throughout the second syllable vowel; full disyllabic in the binary and ternary foot and truncated in the monosyllabic one). Apart for the “nucleus”, the foot can contain “onset” (a prosodically inert 1<sup>st</sup> consonant) and “coda”, the third syllable which influences prosodic processes in the nucleus. If an internal structure of the syllable is represented in formal phonological descriptions through immediate constituents like onset, nucleus and coda, it is unclear why the same analysis cannot be applied to the foot, instead of positing foot recursion.

- [1] Eek, A. (1990) Units of temporal organisation and word accents in Estonian. *Linguistica Uralica* 26, 251-263.  
 [2] Lippus, P., E. L. Asu, P. Teras and T. Tuisk (2013) Quantity-related variation of duration, pitch and vowel quality in spontaneous Estonian. *Journal of Phonetics* 41, 17-28.  
 [3] Lehiste, I., P. Teras, V. Ernštreits, P. Lippus, K. Pajusalu, T. Tuisk and T.-R. Viitso (2008) *Livonian prosody*. Helsinki: Suomalais-ugrilainen seura.  
 [4] Lehtonen, J. (1970) *Aspects of quantity in Standard Finnish*. Jyväskylän yliopisto.  
 [5] Suomi, K., E. Meister, R. Ylitalo and L. Meister (2013) Durational patterns in Northern Estonian and Northern Finnish. *Journal of Phonetics* 41, 1-16.  
 [6] Kuznetsova, N. (2009) *Fonologičeskie sistemy izorskih dialektov*. PhD diss., ms. St. Peterburg: Institut lingvističeskikh issledovanij RAN.  
 [7] Gordon, M. (2009) Prominence and gemination in Ingrian. *Linguistica Uralica* 45, 81-100.  
 [8] Markus, E. (2010) Primary and secondary geminates in Ingrian. *Linguistica Uralica* 46, 38-52.  
 [9] Markus, E. (2011) The phonetics and phonology of a disyllabic foot in Soikkola Ingrian. *Linguistica Uralica* 47, 103-119.  
 [10] Porkka, Wolmari (1885) *Ueber den ingrischen Dialekt mit Berücksichtigung der übrigen finnisch-ingermanländischen Dialekte*. Helsingfors: J. C. Frenckell & Sohn.  
 [11] Kettunen, L. (1940) *Suomen murteet. III A. Murrekartasto*. (Suomalaisen kirjallisuuden seuran toimituksia 188). Helsinki: Suomalaisen kirjallisuuden seura.  
 [12] Sovijärvi, A. (1944) *Foneettis-äännehistoriallinen tutkimus Soikkolan inkeröismurteesta*. Helsinki: Suomalaisen kirjallisuuden seura.  
 [13] Rapola, M. (1966) *Suomen kielen äännehistorian luennot*. (Suomalaisen kirjallisuuden seuran toimituksia 283). Helsinki: Suomalaisen kirjallisuuden seura.  
 [14] Kuznetsova, N. (2015) Two phonological rarities in Ingrian dialects. M. Hilpert, J. Duke, Ch. Mertzlufft, J.O. Östman and M. Riebler (eds.). *New trends in Nordic and general linguistics*. Berlin: De Gruyter, 91-117.  
 [15] Golston, Ch. (2019) Ternary stress without recursion. Talk given at *Fonologi i Norden*, Edinburgh, February 22-23, 2019.  
 [16] Martínez-Paricio, V., R. Kager. (2015) The binary-to-ternary rhythmic continuum in stress typology: Layered feet and non-intervention constraints. *Phonology* 32 (3), 459-504.

Figure 1. Ternary contrast of consonants (stops) in Soikkola Ingrian trisyllabic feet

Mean duration of consonants (in ms) is reported in each box, and the number of tokens is given under it.

Types of consonantal length (“C2 length”): “prim” stays for primary (long) geminates, “second” for secondary (short) geminates, “sing” for singletons.



Examples of foot triplets with a ternary quantity contrast:

- (i) disyllabic: /'tapa/ [ˈtɑpɑ:] 'kill:IMP' — /'tap:a/ 'catch:3SG' — /'tɑp:a/ 'kill:INF';  
 (ii) trisyllabic: /'harkata/ 'step:INF' — /murk:ina/ 'breakfast' — /'mark:oja/ 'stamp:PL:PART'.