

Karl Pajusalu

Department of Estonian
University of Tartu

Phonological Innovations of the Southern Finnic Languages¹

This paper gives an overview of the phonological innovations in the Southern Finnic languages, which have caused these languages to be considerably different from other Finnic languages. The focus is on sound changes which are generally characteristic of Southern Finnic languages, i.e. Estonian, including South Estonian, Livonian and Votic, or at least two of these languages. The most important prosodic changes, as well as sound changes of vowels and consonants will be highlighted. The following aspects will be treated: the development of quantitative grade alternation and foot isochrony, tonal distinctions, sound losses and stress shifts, palatalisation of consonants, the history of affricates and /h/, word-initial and syllable-initial consonant clusters, the emergence of high and high-mid unrounded central vowels, and velar vowel harmony, restrictions in the vowel system of non-initial syllables. The following treatment will also take into account data from experimental phonetic studies. Finally, conclusions will be drawn with a view towards the broader historic and areal background.

1. Defining the southern group of Finnic languages

Most studies on the early history of the Finnic languages regard differences between northern and southern Finnic languages as one of the oldest in the language group (see Laanest 1972: 16–18; Itkonen 1983, Salminen 1998, Kallio 2007, Viitso 2008). The ancient differences of these languages are apparent in their sound system, grammar, and vocabulary (see Lehtinen 2007: 157–159). At the same time there has been no consensus about which languages and dialects belong to the southern branch of the Finnic languages, and what the exact historic nature of this language group is, i.e. is it comprised of the descendants of one proto-language or have neighbouring languages become similar as a result

1. The preparation of this paper was supported by projects no. 8049, SF0180076s08 and IUT02-37 of Estonian Science Council. I am grateful to Riho Grünthal and Tiit-Rein Viitso for their valuable comments and Eva Liina Asu for language assistance.



Map 1. The geographical distribution of southern Finnic languages.

of secondary contacts between related languages which separated very early (cf. e.g. Itkonen 1983 and Kallio 2007).

Traditionally, Estonian and Livonian are considered to be the core of the Southern Finnic language group, and normally also Votic is included in this group (see Itkonen 1983, Lehtinen 2007). However, it is often emphasised that Votic is historically closely related with northern Estonian (e.g. Ariste 1956, Alvre 1973). In some instances, southwestern varieties of Finnish have been linked to this language group on the basis of their similar sound changes (see Sammallahti 1977). Likewise, similarities between Ingrian and Southern Finnic languages have been postulated, but these common traits should be treated as secondary influences of the southern group (Laanest 1972). At the same time several questions arise at the level of dialects. It is justified to view Estonian as two separate forms – North and South Estonian, which diachronically should be regarded as independent Southern Finnic languages, where South Estonian traits are particularly old (Sammallahti 1977, Viitso 1985, Kallio 2007). The third Estonian dialect group – northeastern coastal dialects – has several traits that are not characteristic of Southern Finnic; these have been explained by the different origin of these varieties (Viitso 1985), archaic features, or the influence of late Finnish and other language contacts (Suhonen 1979; Salminen 1998: 396). The relation between the Estonian northeastern coastal dialects and neighbouring

Estonian dialects has recently been reconsidered (Must 1987, 1995; Söderman 1996; Pajusalu 1999; Pajusalu et al. 2009).

In Livonian, one can above all distinguish Courland and Salaca Livonian as the main dialects; in the case of Courland Livonian, it is important to consider the difference between western and eastern varieties when drawing any historical conclusions (see Viitso 2008, about Salaca Livonian see Pajusalu 2009). As to Votic, it is vital to separate the Kukkuzi variety from the other dialects of Votic (Posti 1980; Viitso 2008: 64–66).

In the present study, the Southern Finnic language group is taken to be comprised of languages spoken on the south coast of the Gulf of Finland and the adjacent territories: Estonian, Livonian, and Votic.

The Estonian language is divided into two historically distinct forms: North and South Estonian. When in the following there is a general reference to Estonian, only such language traits are considered which are equally typical of both North and South Estonian. If need be, differences between dialects are also taken into account in the Livonian and Votic data. Although the Southern Finnic group has primary and secondary common traits, it is nevertheless an old language area whose synchronically common phonological features are not always diachronically interpretable as common innovations or developments that have emerged as a result of their influence, but may have secondarily spread from one language to another. It is possible that several common traits have emerged as innovations on the border of related languages, as for instance the border dialects between North and South Estonian are regarded as the starting point of common innovations in Estonian (Pajusalu 1997, cf. Rätsep 1989).

2. Prosodic changes

Various developments in word prosody have caused the Southern Finnic languages to be notably different from the Northern Finnic languages, mainly spoken on the northern and eastern side of the Gulf of Finland. This is completely true in the case of Livonian and North and South Estonian, and to a lesser extent for Votic. Estonian and Livonian have acquired the characteristics of a fusional language mostly due to widespread prosodic changes (see Viitso 1990).

2.1. The development of long and overlong phonological length

One of the most important prosodic features of Southern Finnic languages is the phonological distinction between short and long geminates, e.g. Estonian Q2 *seppä* ‘smith.GEN’, Q3 *seppä* ‘smith.PART’, Livonian *sippā* ‘drop.NOM-GEN’, *sippa* ‘drop.PART’. The phonetic distinction between short and long geminates occurred already in late proto-Finnic (see Lehtinen 2007: 148–149). The distinction between short and long geminates appeared on the border of the stressed and unstressed syllable and was dependant on the structure of the unstressed syllable – the geminate was shortened when the syllable was closed. However, the

constraint is not valid in modern Estonian and Livonian; short and long geminates appear both before open and closed syllables. In North and South Estonian and in Livonian the separation between short and (over)long geminates became phonologically distinct, and after the erosion of word-final elements, including both word stem vowels and inflectional suffixes, led to an extensive change in the grammatical system. Phonological long and overlong quantities started to distinguish between grammatical forms (see Viitso 1990; Grünthal 2000).

The opposition of short and long geminates did not develop only from primary geminates, but could also have occurred as a late gemination of single stops. The paradigmatic oppositions of South Estonian are particularly telling, as in Q2 *källa* ‘fish.PART’ (< **kalata*) and in Q3 *källa* ‘fish.ILL’ (< **kalahen*). In addition to Estonian and Livonian, late short geminates also appeared in Votic, e.g. *sättēd* ‘sparks’, *makkõa* ‘sweet’, where the precondition for a short geminate was the late long vowel or diphthong of the second syllable (Kettunen 1930: 21). To be precise, the same precondition is also valid for short geminates in Estonian and Livonian. In Livonian, the vowel following a short geminate is always long (Lehiste et al. 2008: 57). In Estonian, the vowel of the second syllable after short geminates, which is phonetically half-long, should be interpreted as lengthened (see Lehiste, Pajusalu 2010).

Along the same lines, short geminates have also developed late in Ingrian dialects in the contact area of the Southern Finnic language group (Markus 2010). The vowel of the unstressed syllable after the geminate that has become overlong is extra short. Therefore, the emergence of the opposition of short and (over)long geminates in the Southern Finnic languages is connected with the change in the general prosodic characteristics of words, i.e. feet, and occurs in these languages together with a tendency for foot isochrony.

In Estonian and Livonian, the opposition of long and overlong durations has, in addition to geminates, also spread to consonant clusters, e.g. Estonian Q2 *mušta* ‘black-GEN’ vs. Q3 *mušta* ‘black.PART’, Livonian *muštā* ‘black.NOM-GEN’ vs. *muštõ* ‘black.PART’. Also, the duration of a consonant cluster correlates with the duration of the vowel in the following syllable: in overlong quantity the unstressed syllable is very short. This, too, refers to the interdependency between length alternations of consonants and the general structure of the foot.

Quantity opposition in Estonian and Livonian is not only linked to consonants but also vowels, and is characteristic of the word prosody of these languages in general. Mikko Korhonen has explained the development of the opposition of long and overlong durations in Estonian vowels by the same conditions as the emergence of short and long geminates: the long vowel of the second quantity developed in front of a closed syllable, e.g. Estonian *hõne* ‘building.NOM’ (< **hõneh*), and the overlong vowel of the third quantity in front of an open syllable, e.g. *hõne* ‘building.GEN’ (< **hõnehen*) (Korhonen 1996 [1969]: 131). Apparently, the preconditions for the paradigmatic alternation of long and overlong came about already during the period of emergence of the Southern Finnic language group, although more exact conditions of occurrence were formed separately in the related languages, and there were certain influences from language contacts with Baltic and

Germanic languages (these contacts were considerably newer than those which have taken place between Germanic and Proto-Finnic, as claimed by Posti 1953, see also Kallio 2000).

In South Estonian, a quality difference has developed in long and overlong mid-high monophthongs: overlong monophthongs have become raised, e.g. EstS Q3 *vyyra* [v̥y̯ra] ‘strange.GEN’, whereas long monophthongs have remained mid-high: Q2 *võõras* [v̥e̯ras] ‘strange.NOM’ (Teras 2003). Both long and overlong vowels have undergone diphthongisation in the southernmost South Estonian. Thus, for instance, in Latvia in the Leivu enclave, high vowels have diphthongized in the third quantity: *ii* > *ei*, *uu* > *ou*, *üü* > *öü*, e.g. *leina* ‘town. ILL’, *sou̯ri* ‘big.PL.ILL’, but mid-high vowels in the second quantity: *ee* > *ie*, *oo* > *uo*, *öö* > *üö*, e.g. *kiële* ‘language/tongue.GEN’, *kuõli* ‘school.GEN’ (cf. Viitso 2009). In this way, the difference between long and overlong durations has caused numerous changes in grammatical forms.

In Estonian and Livonian, durational oppositions have besides monophthongs also developed in primary diphthongs, but there are differences between the two languages in the durational ratios of the vowels that make up a diphthong, e.g. Estonian Q2 *heina* ‘hay.GEN’ : Q3 *heina* ‘hay.PART’, Livonian *āina* ‘hey.NOM-GEN’ : *ainō* ‘hay.PART’. In Estonian, feet with a long vowel and a diphthong in the first syllable are similar to the feet containing geminates: if the vowel in the first syllable is long, the vowel of the following unstressed syllable is half-long, but if the vowel of the first syllable is overlong, the vowel of the following unstressed syllable is extra-short. The extent of the duration difference of the vowel in an unstressed syllable is demonstrated by the fact that Finnish mother-tongue speakers distinguish Estonian words with long and overlong duration judging by the duration of the vowel in the unstressed syllable (Pajusalu 1994, Lippus et al. 2009).

In Livonian, the difference is above all between short and long diphthongs, and, in addition to diphthongs, triphthongs occur. In Livonian words without *stød*, the differences between the duration of long monophthongs and diphthongs in the first syllable are not as clear-cut; the more important distinction is in the duration of the second syllable vowel (see Lehiste et al. 2008; Tuisk & Teras 2009). In Votic, there is no phonological opposition of long and overlong monophthongs and diphthongs, except in the variety spoken by the Krevinian Votes deported to Latvia, where there were traces of broken tone (see Winkler 1997), presumably as a result of the Latvian influence.

2.2. Tonal distinction in Estonian and Livonian

In Estonian, the primary feature of the quantity opposition is the duration ratio of the first and second syllable, and additionally, in words with a long voiced nucleus in the first syllable, there is a difference in the fundamental frequency contour (see Ross, Lehiste 2001: 37–56; Lippus et al. 2011). Livonian, too, exhibits a ternary quantity opposition, although in a somewhat different form (see Lehiste et al. 2008, Tuisk, Teras 2009, Lehiste, Pajusalu 2010). An important additional feature in Livonian is the broken tone or *stød*, which occurs in the

stressed syllable with a long voiced nucleus, influencing the duration of the syllable nucleus (Lehiste et al. 2008: 39–53).

Both in Estonian and Livonian syllables with long monophthongs, and more broadly, with a long voiced nucleus, the tonal distinction has had an important role in the development of phonological opposition. Eberhard Winkler has shown that the broken tone is present in Courland and Salaca Livonian and the variety spoken by Krevinian Votes (Winkler 2008). Pire Teras has recently presented evidence about the occurrence of broken tone and glottal stop in the linguistic enclave of Leivu (Teras 2010). According to Winkler the appearance of the broken tone in the southernmost Finnic varieties is due to influence as a result of contact with the Baltic languages (Winkler 2000, 2010). Tiit-Rein Viitso has, however, pointed out that the Livonian broken tone has specific traits that do not coincide exactly with the conditions of the occurrence of the broken tone in Latvian (Viitso 2008).

Estonian does not have the Livonian kind of broken tone, but there is a difference in the realisation of the fundamental frequency contour in syllables with a long and overlong nucleus. In the long or second quantity, the fundamental frequency contour on the stressed vowel is relatively level, but in the overlong or third quantity, the fundamental frequency contour can be divided into three parts: a high beginning followed by a fall and a low ending. If these parts are of more or less equal duration and the difference between the high and low plateau is relatively large, it is easy for an Estonian mother tongue speaker to perceive the third quantity (Lippus et al. 2011). Recent studies on the quantity perception of Estonians show that the difference in the fundamental frequency contour is a decisive factor for speakers from West and Central Estonia, whereas speakers from East and South Estonia are able to distinguish well between long and overlong quantity degrees on the basis of the duration ratios of the first and second syllable alone (Lippus, Pajusalu 2009). This result suggests that the emergence of tonal distinctions in Estonian have been influenced by language contacts in the West with speakers of Scandinavian languages.

2.3. Foot isochrony

In the preceding analysis of the long and overlong quantity degrees, it emerged that in Estonian and Livonian, the duration of the first syllable has an influence on the duration of the second syllable: the longer the stressed syllable the shorter the following unstressed syllable. The same tendency is indicated in Votic by the occurrence of short geminates that are always followed by a long vowel. In Estonian and Livonian, the development of foot isochrony has been accompanied by the shortening of phonologically long monophthongs and diphthongs in unstressed syllables. Foot isochrony does not appear only in the case of geminates and long vowels of the stressed syllable, but particularly saliently in words with a short stressed syllable: in Livonian feet, an open syllable with a short vowel is always followed by a long one, e.g. *kalā*, and in Estonian, by a syllable with a half-long vowel, e.g. *kalà*. Admittedly, in Estonian dialects, the duration of the

second syllable vowel is quite varied in words with a short first vowel, being relatively longest in the West Estonian Insular variety and Southeastern Estonia. In Finnish, the corresponding lengthened second syllable vowel occurs on the one hand in Southwestern varieties, and on the other hand in Eastern and Northern Finland (Wiik 2006, map 101).

Kalevi Wiik (2006) has explained the tendency for foot isochrony in Finnic languages with the influence of Germanic languages. Foot isochrony as a general prosodic characteristic of words occurs most regularly in the Southern Finnic group of languages, where it could have appeared due to earlier more specific language contacts, on the one hand, and due to language-internal complex prosodic changes, which are also connected with the development of quantity opposition, on the other hand.

2.4. Specific developments of qualitative grade alternation

Qualitative grade alternation varies in all Southern Finnic languages. According to Lauri Posti (1953) an important factor in the development of Finnic grade alternation was the ancient contact with speakers of Germanic languages a couple of thousand years ago. It is, however, obvious that the grade alternation in the Southern Finnic languages did not develop in the same way back then, as we know it from more recent times. There are important differences in grade alternation between all three Southern Finnic languages (cf. Kallio 2000: 92–93; Prillop 2011).

There is a traditional view that Livonian, like Veps, does not have grade alternation, and that these languages were not affected by the emergence of grade alternation (Kettunen 1938, 1951; cf. Posti 1938, Tunkelo 1938; Salminen 1998: 393–394). Tiit-Rein Viitso (2007) has, however, drawn attention to traces of grade alternation in Livonian. To be precise, the extremely limited occurrence of qualitative grade alternation is characteristic only of the Livonian dialects in Courland, whereas in Salaca Livonian it is more common (see Pajusalu 2009). Even in Courland Livonian weak grade forms are used, for instance in the words *tī'edō* 'to do' and *nā'dō* 'to see', which have striking counterparts in the Mordvin languages, where the Proto-Mordvinic forms of these verbs could, in principle, be reconstructed as **teje-* and **näje-*. Both words descend from an earlier Proto-Finno-Ugric form with a velar clusil: **teke-* and **näke-*. In Salaca Livonian, the loss of /k/ also occurs after a liquid consonant in the weak form of the words with a back vowel, e.g. *jalad* 'legs/feet' (LivK *jālgad*), although intervocally a stop has normally been preserved as lenis, e.g. *lagūd* 'ceilings'.

Estonian is characterised by extensive qualitative grade alternation, but there are realisational differences between North and South Estonian. In some instances, the formation of weak grade in South Estonian is more similar to language forms in Eastern Finnic languages, cf e.g. EstN *jālg* : *jāljed* 'footprint, footprints', *kārg* : *kārjed* 'honeycomb, honeycombs' and EstS forms of plural nominative *jäle*, *käre*' (cf. Lehtinen 2007: 177). In western Finnish dialects, the alternation of *lk* and *rk* corresponds to the North Estonian pattern, whereas

in eastern Finnish dialects the clusil alternates with a complete loss similarly to South Estonian. Both in North and South Estonian, grade alternation is not entirely predictable by the phonetic shape of the word, but rather as a lexical feature of the word, cf. Estonian *lagi* : *laed* ‘ceiling, ceilings’, but *nagi* : *nagid* ‘coat-hook, coat-hooks’. Additionally, grade alternation in Estonian is intertwined with length alternation in word paradigms, which is particularly striking in South Estonian (see Iva 2010), e.g. in the paradigm of the noun *vāga* ~ *vagja* ‘pole.NOM’: Q1 *vaja* (GEN) : Q2 *vakka* (PART) : Q3 *vakka* (ILL).

In Votic, too, there are special developments of grade alternation. While stressing peculiarities of Votic grade alternation, Tapani Salminen has assumed Votic’s long life as an independent language (Salminen 1998: 396; cf. Itkonen 1983: 214–216). Among the characteristic features are, for instance, the alternation of the original single plosive /k/, short geminate and lenis-*g* in words containing a back vowel, e.g. in the forms of the verb *lukõa* ‘to read’: *lukõa* ~ *lukkõa* vs. *lugõn* ‘I read’ (cf. Finnish *lukea* : *luen*, Estonian *lugeda* : *loen*). Such grade alternation is largely reminiscent of the Estonian quantity alternation. In Votic, *g* appears in weak forms as a variant of /k/ in words containing a back vowel (see Kettunen 1930: 54). In some words, a stop occurs in the weak form in the Southern Finnic languages more generally, e.g. Estonian *jagada* : *jagan* ‘to share, I share’, *nagad* ‘tenons’, *kogud* ‘bodies’, *segud* ‘mixtures’.

Despite differences in qualitative grade alternation between the languages belonging to the Southern Finnic group, it is possible to bring out some general tendencies of development, such as, on the one hand, lexicalisation of grade alternation, and, on the other hand, convolution with quantity alternation into one complex alternation type, which Sulev Iva has called full alternation when describing South Estonian paradigmas.

2.5. Sound losses and stress shifts

Southern Finnic languages are well-known for their sound losses connected to various stress shifts in words, such as shortening of long vowels and diphthongs in non-initial syllables, apocope and syncope of vowels. These sound losses have caused changes in word prosody but at the same time have probably been associated with prosodic changes in words (Eek & Help 1986). Here, mutual influences of segmental and suprasegmental phonology are apparent. In addition to the losses with the so-called prosodic background, other losses of single sounds occur, which have an extensive regional spread, e.g. the loss of *h* in non-initial syllables and more restrictively in the beginning of words, and the loss of *n* at the end of a syllable in the *ns*-cluster, and later at the end of words.

Contraction of non-initial syllables and the resulting shortening of words is most common in Livonian, both in Courland and Salaca Livonian, e.g. LivSal *jala-d-k* foot-PL-COM ‘with legs, with feet’, *imis-t-l* people-PL-ALL ‘to people’, where all the vowels are lost in unstressed positions starting from the third syllable. This change could have been caused by the rise in the prominence of word-initial lexical stress, and the resulting weakening of secondary stresses. At the same time in Salaca Livonian, lexical suffixes have retained their stress

and thus also their main structure: *ai/nika* ‘coastal dweller’, *ol/mis-t* ‘being-PART’ (Pajusalu 2009).

In Estonian, apocope has historically occurred in the second syllable only after a long first syllable, e.g. *tuul* (< **tūli*) ‘wind’ vs. *tuli* ‘fire’, but in Livonian, also after a short first syllable when the second syllable vowel was high or mid-high, e.g. *tu’l* ‘fire’, *va’l* ‘light’ (cf. Finnish *valo*). Apocope has also occurred in Estonian starting from the third syllable independently of the length of the preceding syllables, e.g. *madal* (< **matala*) ‘low’. Syncope, which appears in Estonian in the unstressed second syllable of trisyllabic and longer words when the first syllable has been long, e.g. *vahtra* (< **vahteran*) ‘maple-GEN’, can also occur in Livonian when the first syllable is short, cf. Livonian *sa’gdō* ‘frequent-GEN’ and Estonian *sageda*. At the same time, syncope and apocope have been restricted in Livonian if the vowel in the unstressed syllable is low, cf. e.g. Livonian *mustā* ‘black’ and Estonian *must*, although syncope may have also occurred in words with *a* in the root, e.g. *mustliki* (< **mustalikki*) ‘dark’. Low vowels have resisted apocope and syncope probably due to their greater intrinsic duration which guaranteed the retention of the unstressed syllable.

When comparing syncope and apocope in North and South Estonian dialects, it is possible to see that sound losses are more regular in South Estonian. In North Estonian, there are quite large regions where no losses have occurred in some forms which have become a norm in Standard Estonian, for instance in unstressed syllables in words with high vowels, cf. EstN *õppima* ‘study-INF’, *pakkuma* ‘to offer-INF’ and EstS *opma*, *pakma*. Most limited is the occurrence of syncope and apocope in Northeast Estonian Coastal dialects. Also, in Votic, sound losses occur only sporadically, e.g. *ēstē* (< **ensiten*) ‘first of all’, *nahkīri* (< **nahka hīri*) ‘a bat’ (Kettunen 1930: 145). There are more examples of apocope in the old transcriptions of Krevinian Votic *ūchs* (< **ūksi*), *taiwas* (< **tai-vassa*) ‘sky.INE’.

In Estonian and Livonian, in addition to the vowels of unstressed syllables also long vowels and diphthongs of non-initial syllables have undergone shortening, and there has been loss of word-final *n*, e.g. Estonian *soomlane* (< **sōmelainen*) ‘a Finn’, Estonian *vagusi* ~ Livonian *vā’giž* (< **vakoisin*) ‘quietly’.

In both of these languages apocope and syncope are linked to important prosodic changes. In Estonian, it is the lengthening of the first syllable and the rise of overlong quantity, and in Livonian, the losses in the following syllable have caused the emergence of the broken tone in the preceding syllable, as can be seen from the examples of Livonian above. After extensive sound losses, Estonian and Livonian word prosodies have become typical of a fusional language – the structure of the syllable carrying primary stress can be very complicated, whereas the following unstressed syllables have undergone a structural simplification. In this way, the word prosodies of both languages have become more similar to the neighbouring Indo-European languages, while it is noteworthy that they are closer to Germanic than Baltic languages.

Sound losses in non-initial syllables made it possible for monosyllabic feet to emerge, and for two stressed syllables to be adjacent in a word. In older Estonian, typically, when an unstressed syllable was lost due to syncope, then

historically the third syllable, which moved after the primary stressed syllable, retained the secondary stress as in *tütre-lle* (< *tüttäre-lle*) daughter-ALL ‘to the daughter’, *vahtra-ni* (< *vahtera-ni*) maple-TERM ‘until the maple’. In modern Estonian, the second syllable, which originally bore secondary stress, has lost its accentuation, and in corresponding words a primary stressed initial syllable is followed by two unstressed syllables, e.g. *tütrele*, *vahtrani*. Secondary stress has been preserved only in lexical affixes such as *kuulmi-ne* ‘hearing’, *kunstni-kku* ‘artist.PART’, but it is possible it will be lost there, too (see Pajusalu 2009). The roots of such changes are deep in the history of the languages, but compensatory prosodic restructuring processes are in progress even nowadays.

3. Changes in consonants

In addition to the above analysed changes in consonants, which are connected with prosodic phenomena, the following features characteristic of the Southern Finnic languages more broadly will be discussed below: palatalisation of consonants, occurrence of affricates, word- and syllable-initial consonant clusters, and the metathesis and loss of *h*.

3.1. Palatalisation of consonants

Proto-Finnic did not distinguish between the original Finno-Ugric palatalised and non-palatalised consonants any more, and even nowadays there is no palatalisation in Standard Finnish and western Finnish dialects, and little in Votic. Still, palatalisation of dental consonants is very common in Eastern and Southern Finnic languages, and is characteristic of Estonian and Livonian. Its origin could be in late proto-Finnic or in the immediately following period (see Itkonen 1968, Salminen 1998: 399). The spread of consonant palatalisation in Estonian and Livonian, in particular in South Estonian, could be explained by the influence of the neighbouring Baltic and Slavic languages. In these languages, palatalisation of consonants is a common linguistic trait.

In Estonian and Livonian, the development of palatalised consonants is linked to the influence of the following *i* and *j*, and is thus determined by certain language internal coarticulatory conditions. As regards the northern Finnic languages, the same development is met in eastern Finnish dialects and Karelian where the loss of word-final *i*, for instance, repeatedly triggered a secondary palatalisation of dental consonants (Kettunen 1960: 7; Mielikäinen 1981). The relatively old age of palatalised consonants is evident from the fact that they appeared before apocope and syncope, because the following *i* was a precondition needed for the palatalisation of consonants, e.g. Estonian *pal'k* < **palkki* ‘log’, *kan'n* < **kanni* ‘toy’, but without palatalisation *palk* < **palkka* ‘salary’, *kann* < **kannu* ‘jug’.

In Standard Estonian, there are separate palatalised counterparts of alveolar consonants *l', n', s'* and *t',* and in older pronunciation and dialects, also *ř*. In the

Livonian written language there are separate phonemes according to the Livonian orthography *đ, l, ŋ, r* and *t*; palatalised *ś* has developed into *š* and its voiced counterpart is *ž* (Posti 1942: 235–236). In Salaca Livonian, a palatal stop occurs, which is suggested by the interchanging transcription of *k* and *g*, and *t* and *d* in older materials, e.g. *kum* ~ *tum* ‘ten’, *āgist* ~ *ād’ist* ‘year’.

In South Estonian dialects as in Russian, basically all consonants can get palatalised, if it is articulatorily possible. Palatalisation has an important role to play in distinguishing grammatical meanings, for instance it is one of the commonest markers of the preterite, cf. *vōtt* ‘(s/he) takes’ ja *vōtt’* ‘(s/he) took’. South Estonian and North Estonian also differ in the acoustic characteristics of palatalisation. In North Estonian dialects and Standard Estonian, it is the first part of the consonant that gets palatalised, and even a short epenthetic *i* can occur before the consonant, whereas in South Estonian palatalised and non-palatalised consonants have a different general formant structure (for a phonetic description see Org 2003).

The occurrence of palatalised consonants is restricted in more peripheral North Estonian dialects, and also in Votic. In Votic dialects, palatalisation mainly occurs as a coarticulatory phenomenon in words containing a front vowel or in Russian loan words, e.g. *keühä* ‘poor’, *gul’u* ‘dove’. More specific and local developments in consonant palatalisation in Southern Finnic languages have been influenced by the neighbouring Baltic and Slavic languages.

3.2. Affricates

The position of affricates has been ambiguous in the research history of the Finnic languages. It has been maintained that the Proto-Finno-Ugric affricates were lost in late proto-Finnic (e.g. Korhonen 1981: 129). Petri Kallio has, however, pointed out that some South Estonian affricates, which have counterparts in Eastern Finnic languages, could be original, e.g. *katski* ‘katki’ (early Proto-Finnic **kački-*), *katsk* ‘plague’ (**kačku*); it is more complicated to assume the loss and a secondary reappearance of affricates in these words (Kallio 2007: 234). The fact that this early occurrence has been preserved can indicate later contacts of South Estonian with Eastern Finno-Ugric languages, although more likely this implies that the development was peripheral and there was a supporting influence from the neighbouring Eastern-Baltic languages.

Despite the complete loss of old affricates in most Southern Finnic languages, a tendency for the emergence of new affricates is noticeable in all these languages. The richest set of affricates has been observed in the by now extinct Salaca Livonian by Sjögren in the middle of the 19th century. In Salaca Livonian, there were both voiced and voiceless alveolar and palato-alveolar affricates, i.e. four different phonemes, which were transcribed as *dz*, *dž*, *ts* and *tš*. Most of these were relatively new as to their origin, occurring mainly in Latvian loan words, e.g. *dzerul’* ‘cranberry’, *tsienig* ‘merciful’, *džuokžed* ‘gums’, *tšikst* ‘to creak’, or were linked to palatalisation in words containing front vowels (Pajusalu 2009).

The development of affricates in South Estonian and Votic is also closely connected with palatalisation. The change *ti* (> *tʲi* > *ci*) > *ci*, which has brought about affricates in South Estonian words such as *tsiga* (= *ciga*) ‘pig’ and *hüdsi* ‘coal’, already took place according to Petri Kallio in late proto-Finnic (Kallio 2007: 235); the same change caused the South Estonian forms *lats* (< **lapci*) ‘child’, *läts* (< **läkci*) ‘(s/he) went’, where the affricate has assimilated the preceding stop. A similar affricate occurs in the South Estonian forms of preterite such as *tiidze* ‘(s/he) knew’, *võidzõ* ‘(s/he) could’ (Pajusalu 2005), which could be regarded newer than late proto-Finnic. Particularly abundant in affricates is the South Estonian infant-directed speech, e.g. *tsudso* ~ *tsüdsö* ‘wolf’, *tsäädsä* ‘uncle’, *tsidša* ‘sister’, etc. (Pajusalu 2001). Pajusalu 2005 hypothesises that there was an extensive spread of affricates in South Estonian in the second half of the first millennium, when the forefathers of South Estonians came into close contact with the Latgalian. At any rate, the South Estonian affricates have become well adapted in the phonological structure of the language, also participating in quantity alternation in the three quantity degrees like stops and sibilants (Lippus 2006).

While South Estonian is characterised by alveolar affricates, which can also be palatalised, affricates in Votic are, as a rule, palato-alveolar. Such Votic affricates have developed via the palatalisation of *k* in words with front vowels, e.g. *tšerä* (< **kerä*) ‘ball/coil’, *tšäsi* (< **käsi*) ‘hand’ and, consequently, have a limited context with concrete constraints. Posti (1958) assumed that the rise of palato-alveolar affricates rose in a language contact with Novgorod Slavic. Standard Estonian, like Livonian, differentiates between alveolar and palato-alveolar affricates in late loan words, e.g. *tsehh* ‘department (in the factory)’ vs. *tšehh* ‘Czech (nationality)’ (see Pajusalu 2003). The retention of old affricates in South Estonian and the development of new affricates in all the Southern Finnic languages is a likely influence of Baltic and Slavic language contacts.

3.3. Word- and syllable-initial consonant clusters

In Finno-Ugric languages, consonant clusters cannot typically occur in the beginning of syllables, i.e. in syllable onsets. This restriction is also valid in word-initial position. In Southern Finnic languages, however, word-initial consonant clusters have been adapted.

The development of word-initial consonant clusters in the Estonian phonological system as compared to Finnish has been discussed by Birute Klaas (1995), and when commenting on her study an overview of Livonian consonant clusters is given by Kersti Boiko (1995). In her study, Birute Klaas shows that in older Baltic, Germanic, and Slavic loan words, the word-initial consonant clusters have been systematically replaced in Estonian by single consonants, but in Low German loan words (which originate from the first half of the second millennium) some consonant clusters have been retained, as for instance in Low German words *pruut* ‘bride’, *trepp* ‘staircase’ (Klaas 1995: 116; Hinderling 1981).

In these and other older Estonian loan words the retained word-initial consonant clusters mainly consist of sequences of a plosive and a liquid, as in the preceding examples. Such word-initial consonant clusters also occur in Estonian onomatopoeic words, e.g. *klõmm* ‘clunk’, *prauhti!* ‘slam!’ (ibid., p. 122). The fact that consonant clusters of this type may occur in Estonian also in the syllable-initial position is indicated by word forms without apocope, which are formed like the words containing a short first syllable, e.g. Karksi verb forms *kabli* ‘(s/he) hoes’, *sõglu* ‘(s/he) sifts/sieves’ as *ari* ‘harib’, *ludzi* ‘(s/he) sucks’, cf. *kuts* (< *kutsu) ‘(s/he) invites’, *murd* (< *murta) ‘(s/he) breaks’ (see Pajusalu 1996: 111–112).

Word-initial consonant clusters have also been adapted in Votic, e.g. *kranni* ‘pretty’ *skrópka* ‘(horse)comb, brush’. Word-initial consonant clusters are particularly abundant in Livonian, e.g. *skēd* ‘chain’, *žnougōd* ‘gills’, but even there they occur mainly in newer loan words. Thus we can conclude that word-initial and syllable-initial consonant clusters have become phonotactically permitted in the Southern Finnic languages, although historically only secondarily and restricted to a certain degree until very recently.

3.4. Voiced stop consonants

Originally there were no voiced stops in Proto-Finnic. However, these have been adopted in a portion of Finnic languages, at first probably in Livonian, Karelian, and Veps (Viitso 1998: 109). The distribution of voiced stops in most Finnic languages is nevertheless restricted. In written Finnish, only word-medial voiced *d* is used in native words, which phonetically resembles more an alveolar tap and not an ordinary voiced stop. This phoneme, however, was adopted very recently from the written standard to vernacular language (Lehikoinen–Kiuru 1998: 74–75). In written Estonian, voiced stops only occur in newer foreign words, which in colloquial speech are pronounced as semi-voiced lenis stops (see Pajusalu 2003). Voiced stops are more common in the pronunciation of Livonian and Votic and in eastern and southernmost South Estonian dialects. In Livonian and Votic, voiced stops are used even in word-initial consonant clusters, most notably in young borrowings e.g. Livonian *brūt* ‘bride’, *grumā* ‘feud’, Votic *bruuda* ‘pond’, *drilisa* ‘to jingle’ (see Kettunen 1930; Suhonen 1973). In some loan words the word-initial voiced stop can be a hypercorrection, as is exemplified by Votic *bruuda*, cf. Russian *пыл*. Like voiced stops, voiced sibilants and affricates have been adopted in these languages (see 3.2.).

It is clear that voiced stops are largely of late origin in Southern Finnic languages and that their rise has been influenced by contacts with the neighbouring Indo-European languages where they occur everywhere. Nevertheless, Tiit-Rein Viitso (2008: 311), based on a comparison of Livonian berry-names *būolgōz* ‘lingonberry’ and *gārban* ‘cranberry’ with their counterparts in Finnic languages further East, finds that in some cases voiced stops may have originated from proto-Finnic or the immediately following early dialect alliance.

3.5. *h* metathesis and loss

The restricted distribution of *h* is one of the typical features of Finnic phonology. The distribution of *h* is most restricted in Livonian, where, like in Latvian, it appears only in new loan words. On the other hand, *h* is most widespread in eastern dialects of South Estonian, in particular Seto, where it can be retained even word-finally unlike in most Finnic languages: *pereh* ‘family’, *imeh* ‘miracle’, and in historic suffixes of non-initial syllables: *lätte-he* ‘spring-ILL’, *hõlpsahe* ‘easily’. In South Estonian, *h* also appeared on syllable-boundaries in non-initial syllables after the loss of stops (or sibilants), e.g. *hõbõhõnõ* ‘silvery’, cf. **hopeðahinen*. At the same time, in South Estonian there has also been a metathesis of second syllable-initial *h* with the preceding consonant in certain cases: *kahr* (< **karhu*) ‘bear’, *tahr* (< **tarha*) ‘fence’.

In most North Estonian dialects, *h* has been lost both word-initially and word-finally, and can occur only at the end of the primary stressed syllable after a short vowel or on the border of the first and second syllable, e.g. *tahke* ‘solid’, *tahe* ‘will’. In intervocalic position too, *h* tends to get lost sporadically: *lääh* ‘(s/he) goes’, *taab* ‘(s/he) wants’. If *h* followed a long initial syllable, there occurred a metathesis of diphthongs in North Estonian dialects and the Estonian written language, e.g. *jõhv* (< **jouhi*) ‘horsehair’, *lahja* (< **laiha*) ‘lean’, and a long monophthong was shortened in front of *h*: *maha* (< **maahen*) ‘down’, *pähe* (< **päähen*) ‘to the head’. Similar tendencies can also be observed in Votic, where they, however, have not taken place so systematically. Nevertheless, restrictions on the distribution of *h* are characteristic of all the Southern Finnic languages, if we allow for a compromise in the case of eastern dialects of South Estonian.

3.6. The loss of word- and syllable-final *n*

There has been a relatively widespread loss of word-final *n* in Finnic languages (see Laanest 1982: 126–127), but this has been particularly large-scale in the southern group, and most probably has taken place in several stages, including more or less all the languages of the group. The older loss of *n* occurred in certain frequent lexicalised forms, e.g. Estonian *enne*, Votic *ennee* (< **ennen*) ‘before’, Estonian and Votic *nii* (< **niin*) ‘so’, Livonian *nei* ‘so’, and suffixes such as *-(i)nen*: Estonian *punane*, Votic *punanõ* ~ *punnan*, Livonian *punni* (< **punainen*) ‘red’. Also, there has been a loss of *-n* in certain grammatical forms in all the Southern Finnic languages, for instance in genitive: Estonian *kirja* ‘letter-GEN’, Votic *tširja* ‘book.GEN’, Livonian *kēra* ‘letter.GEN’. Word-final *-n* is, however, nowadays possible in all these languages, e.g. Estonian *urin* ‘growl’, Votic *paimõn* ‘herdsman’. In Livonian, the suffix of the dative is marked by *-n*: *minnõn* ‘to me’, and thus there are no general phonotactic restrictions on the occurrence of word-final *n*, as it is the case with word-final *h* after a stressed syllable.

Certain changes of grammatical forms have spread over language-borders. For instance, if in Estonian and in the western dialect of Votic the ending *-n* of

the verb in first person singular has been retained: *kannan* ‘I carry’, it has historically been lost in Eastern Votic and Southern Estonian dialects (where the form is *kanna*) as well as in Livonian, e.g. Salaca *taha* (1767) ~ *taa* (1789) (< *tahan*) ‘I want’, where it has later been compensated by the form of the third person by the analogy of past tense forms; thus after 1829 in Salaca Livonian *tāb* ‘I want’ (cf. Winkler, Pajusalu 2009: 190).

The loss of word-final *n* is relatively common in world languages, and it appears in several Finnic languages, e.g. in Finnish dialects *toinen* ~ *toine* ‘another’, Karelian and Vepsian *toiñe*, Ingrian *pojalen* ~ *pojalle* (Laanest 1982: 126–127). The most extensive spread of this sound change in Southern Finnic languages shows first and foremost a common direction of change and long contacts of these languages.

The vocalisation of word-internal syllable-final *n* in the cluster *-ns* is another specific sound change linked to *n*: Estonian *maasikas*, Votic *maazikaz*, Livonian *mōškōz* (< **mansikas*) ‘strawberry’. This change is quite common in certain grammatical suffixes in Finnic languages in general, e.g. in the endings of ordinal numbers *-ns(i)*, cf. Finnish and Estonian *kolmas*, Kar *kolmaš* (< **kolmans(i)*) ‘the third’ (see Laanest 1982: 124–125). Here again, we can observe the spread and extension of an old Finnic sound change to Southern Finnic languages.

4. Innovations in the vowel system

4.1. The rise of unrounded central vowels

A well-known innovation of Southern Finnic languages is the occurrence of an unrounded central vowel, e.g. Estonian, Livonian, and Votic *õ*. The vowel is not found in Northern Finnic languages and it has been usually explained as a result of secondary development in the Finnic vowel system (see Holst 2001: 59–62). Such a central vowel occurs in all the Southern Finnic languages, being absent only in the North Estonian Coastal dialect and the Kukkuži dialect of Votic (see Viitso 2008: 45). Often language historians consider only one central vowel, but it has to be noted that in South Estonian and in Courland Livonian there are two unrounded central vowels which are phonologically back. A phonetic description of the difference between the two South Estonian central vowels, and a phonological interpretation are presented in Parve 2000, and an overview of the acoustic data regarding the pronunciation of the two Livonian central vowels can be found in Lehiste et al. 2008: 84–91.

The difference between the two unrounded central vowels in both South Estonian and Livonian is associated with their height. Both languages have a mid-high and a high central vowel. In South Estonian the mid-high vowel, so-called back *e* is spelled as *õ* and the high vowel, so-called back *i* is marked as *y* in some versions of spelling. In Courland Livonian the high unrounded back vowel is spelled as *õ* and the mid-high vowel as *ö*. The two vowels have a different status in these languages. In South Estonian, the mid-high central vowel is more

common, occurring both in stressed and unstressed syllables, but in Livonian it is the high central vowel that occurs more frequently.

The South Estonian high unrounded *y* [ɨ] appears in various phonetic environments, and the mid-high and high central vowels in South Estonian are undoubtedly two separate phonemes (see Parve 2000: 13). The distribution of these two phonemes provides a basis for the diachronic analysis below. The mid-high vowel of Livonian, on the other hand, occurs only in a stressed syllable after labial consonants in words which historically contained the vowel *o*, *pōsk* (< **poski*) ‘cheek’, *pōigō* (< **poiki-*) ‘to calve/to lamb/to farrow’, *vó’dri* (< **otra*) ‘barley’. Therefore this sound could be considered a late allophone of the phoneme /*o*/. Also, in modern Courland Livonian, *o* is lightly rounded (see Lehiste et al. 2008, Table 32A).

Traces of the historically older difference between two central vowels can also be found in the transcriptions of Salaca Livonian from 1839 by D. H. Jürgenson, an Estonian scholar (see Winkler 1999). Although normally in Salaca Livonian a central vowel has been transcribed with an *y* (or *ü*), e.g. *mütsa* ‘forest’ (see Winkler, Pajusalu 2009: 127; cf. EstS *mõts*), Jürgenson uses *õ* to mark a presumably mid-high central vowel: *mõtfa*, or sometimes even *õ*: *kõue* thunder.SG.GEN. He only uses *ü* in words where there is a high central vowel in South Estonian: *fünna* ‘word’, cf. EstS *sjna* (Jürgenson’s transcriptions have been published with comments in Winkler 1999: 174–183).

It is possible that the difference between the South Estonian high and mid-high unrounded back vowel was earlier present also in other Southern Finnic languages and was later neutralised. This is indicated by the alternation of *õ* and *i* in words such as EstN *sõsar* ~ Finnish *sisar* ‘sister’, LivE *sõzār* ~ LivW *sizār*, or Livonian *tõva* (< **tjva*) ‘deep’ vs. the rest of Finnic *süvä* (< **tivä*). The various counterparts of the South Estonian high and mid-high central vowel in other Finnic languages suggest that an unrounded central vowel in Southern Finnic languages has two origins, while the high *i* could be even older than the formation of the language group itself. The emergence of mid-high *õ*, however, is influenced by an earlier high *i*; when in Baltic and German loan words containing back vowels in the stem, the front vowel *e* was replaced by the corresponding back mid-high vowel *õ*, and later the change spread to the stems with an *o* in the first syllable.

Although nowadays in the heavily levelled South Estonian pronunciation, one can encounter alternately the high and mid-high central vowel, and more generally they coincide in certain positions, e.g. the counterpart of the long mid-high *õõ* in the overlong quantity is always a high *üü*, a group of words with an originally high *i* is discriminable on the basis of older transcriptions, such as EstS *sjsar* ‘sister’ (cf. EstN *sõsar*, Votic *sõzar*, Livonian *sõzār*, LivW *sizār*, LivSal *süsār*, Finnish *sisar*), *njna* ‘nose’ (cf. EstN *nina*, Livonian *nanā*, Votic and Finnish *nenä*), *kjik* ‘all/everything’ (cf. EstN *kõik*, Votic *kõittši*, Finnish *kaikki*), *hjim* ‘tribe’ (cf. EstN *hõim*, Livonian *aim*, Votic *õimo*, Finnish *heimo*), *sjna* ‘word’ (cf. EstN Votic *sõna*, Livonian *sõnā*, LivSal *süna*, Finnish *sana*). As a rule the counterpart of the South Estonian high central vowel in North Estonian is either *i* or *õ*, in Livonian *i*, *õ* or *a* (the Salaca Livonian *ü* probably

originates from a high unrounded central vowel), in Finnish *i*, *e* or *a*. In these words, certain fluctuations can occur in the western dialects of South Estonian, where a stronger contact with North Estonian or Livonian is apparent, and thus the following can alternate: *j* and *i*, e.g. *rjnd* ‘breast’ ~ *rind*, *j* and *õ*, e.g. *hjim* ~ *hõim*, or *j* and *a*, e.g. *njna* ~ *nana*, also in the dialect of Leivu *aim* ‘tribe’. It is nevertheless noteworthy that among the words containing a high unrounded central vowel there are no words which originally had an *o* in the front syllable.

Among the words with a high central vowel, there are, on the one hand, ancient words with an affective origin, which could belong to the old proto-Finnic layer of native words, such as *sjna* ‘word’, *njna* ‘nose’, *sjsalik* ‘lizard’, or, on the other hand, old (Proto-)Baltic loan words, such as *sjsar* ‘sister’, *kjik* ‘all/everything’, *hjim* ‘tribe’. A South Estonian high *j* appears mostly in old loan words which have a first-syllable *a(i)* in a source form (i.e. *sjsar* ? < *sasara and *hjim* ? < *šaima); the mid-high *õ* is an ordinary equivalent of the Baltic *e* in the back words, e.g. *kõrd* (< *kerdā), *mõts* ‘forest’ (< *media-), *võlg* (< *velkā). In Germanic loan words, where there was originally an *a* in the stem, it has been preserved in the Northern group of Finnic languages, e.g. *lanka* ‘yarn’, as well as in the southernmost Finnic languages in South Estonian and Livonian, cf. EstS *lang*, Livonian *lānga*, the change *a* > *õ* has occurred only in North Estonian and Votic: EstN *lõng*, Votic *lõnka*. Similar is the situation with Finno-Ugric stems containing an *o*, where the central vowel has appeared only in North Estonian and Votic, cf. EstN *õppida* ‘to study’, Votic *õppōa*, but EstS *oppi*, Livonian *oppō*. It is possible that the high central vowel was already present in the southern or southeastern dialects during the period of development of proto-Finnic, and during the period of Baltic (or Western Indo-European) loans, spread via these loan words in the Southern Finnic languages. There are at least traces of it in South Estonian, and indirectly in Livonian. The mid-high *õ*, however, developed secondarily next to the high *j* in the Southern Finnic languages together with the adaptation of new Baltic and Germanic loan words with an *e*-stem. Later, /*õ*/ spread in North Estonian and Votic into an increasing number of stem-types, reaching the widest spread in Votic and in the eastern and north eastern dialects of North Estonian.

4.2. Velar vowel harmony

In addition to the distribution of central vowels in the stressed syllables it is important to pay attention to the velar vowel harmony in the Southern group of Finnic languages, where an unrounded central vowel appears instead of the original /*e*/ and in Votic also /*o*/ in the non-initial syllables of words containing a back vowel. Velar harmony is typical in Votic and South Estonian, e.g. Votic *oonõ* ‘building’ (cf. Finnish *huone*), *punõn* ‘to twist/to weave’ (Finnish *punon*), EstS *panõ* ‘pane’ (Finnish *pane*), *põlvõl* ‘on the knee’ (Finnish *polvella*), but also occurs in the North Estonian dialect of the Kihnu island, e.g. *lapsõd* ‘children’ (Finnish *lapset*), *olimõ* ‘we were’ (Finnish *olimme*). In Livonian, too, the unrounded central vowel is widespread, but its distribution there is not linked to vowel harmony; the /*õ*/ of the non-initial syllables is essentially reduced and

it appears both in words with front and back vowels in Livonian, e.g. Livonian *vä'ggõ* 'power', *sä'dgõz* 'spark', *mõtlõ* 'to think'.

It is possible that historically the unrounded back vowel occurred in Livonian in an unstressed second syllable in words where it is now compensated by /a/, e.g. *pūola* 'knee' (< *polvõ), *tõla* 'winter' (< *talvõ). Also, in the old North Estonian written language, there are several examples which show that /a/ has been replaced by the otherwise predicted /õ/ in words with back vowels: *sulana* 'farmhand', cf. EstS *sulanõ*, *sura* 'big.SG.GEN', cf. EstS *suurõ*. It is probable that even the unpredicted /a/ in several forms, for instance, in plural forms, has developed from an earlier central vowel (see Pajusalu 2000). Therefore it can be postulated that /õ/ has once also occurred in non-initial syllables in all the Southern Finnic languages, and that velar vowel harmony can be considered a historic common feature of the language group.

High and mid-high central vowel occur both in unstressed syllables only in the easternmost South Estonian dialects, but at least in modern language usage, the high central vowel is neutral to vowel harmony, occurring mainly as an epenthetic vowel in words such as *mügir* 'mole', *vedir* 'spring', *nõgil* 'needle' (Parve 2000: 24–28). Nevertheless, a possible earlier occurrence of *i*-harmony has been mentioned by Mihkel Toomse in his extensive study of South Estonian dialects, where he points out that the second syllable vowel /i/ in the South Estonian dialects of Seto and the language enclaves is velarised in words containing a back vowel, although admittedly with a relatively varying quality (see Pajusalu 1990: 162).

Velar vowel harmony is not typical of Finnic languages, except for the southern group, and there is no vowel harmony in the neighbouring Indo-European languages. Therefore, it could be considered an innovation which has occurred in the southern periphery of Finnic and whose old age is evident by its occurrence in the whole language group. Here, however, a similarity with Mordvinic languages is noteworthy, where there are traces of velar vowel harmony, cf. Erzya *ašo* 'white' vs. Moksha *äšä* 'cold'. This implies at least similar starting conditions for the emergence of velar vowel harmony.

4.3. Restrictions in the vowel system of non-initial syllables

In Southern Finnic languages, there are innovative developments of vowel harmony, but at the same time all these languages are characterised by the gradual retreat of vowel harmony, and there has occurred its general loss in Estonian and the Livonian written language. Still, vowel harmony occurs to a certain extent in almost all Estonian dialects, and the emerged restrictions are regular (see Wiik 1988; Kiparsky, Pajusalu 2003). One can find traces of vowel harmony in Salaca Livonian, too, e.g. *leibätk* 'with breads', *šüömät* 'uneaten', *kirüg* 'flame', where often also the second part of late diphthongs has remained harmonious: *püäd* 'holidays, party', *tüö* 'work' (see Pajusalu 2009b). The restricted occurrence of vowel harmony in Southern Finnic languages is clearly secondary. It can be best treated together with prosodic changes and similarly explained by direct or indirect influences of the neighbouring Indo-European languages. As

the Southern Finnic languages have largely become fusional, they have started losing their vowel harmony, which is untypical of fusional languages.

In addition to the loss of vowel harmony Southern Finnic languages are characterised by the reduction and peripheralisation of vowels in unstressed syllables. Here, the best example is the Livonian written language, where non-initial syllables can only contain the vowels *a*, *i*, and *õ*, and starting from the third syllable only *i* and *õ* can occur. Many Estonian dialects and Literary Estonian have undergone the vocalic change *o* > *u*, e.g. *kadu* ‘loss’ (cf. Finnish *kato*), and modern Estonian is characterised by the lowering of unstressed /e/ (see Pajusalu 2009a). Such changes can also be explained by a strong long-term influence of the neighbouring Indo-European languages, in particular that of Germanic languages.

5. Summary

The Southern Finnic languages have undergone several phonological innovations that are not characteristic of the Finnic languages further north. A comparison of these sound changes in Table 1 reveals that they occur most extensively in South Estonian and Livonian. These two languages are the southernmost, and can thus be considered the most typical representatives of the group. This outcome shows that the characteristic features of this language group are in accordance with its location in the Baltic area, which provides a basis for their geographical interpretation, i.e. by regional features of such language contacts, possible substrate phenomena, etc.

Feature	Vot	Liv	EstN	EstS
Unrounded central vowel	+	+	+/-	+
Velar vowel harmony	+	-	-	+
Reduction of unstressed vowels	+/-	+	+	+
Affricates	+	+	-	+
Foot isochrony	+/-	+	+	+
Monosyllabic feet	+/-	+	+	+
Palatalization of consonants	+	+/-	+/-	+
Quantity alternations	+/-	+	+	+
Restricted grade alternation	+/-	+	+/-	+/-
Stress shifts	-	+/-	+/-	+
Score	6,5	8	6	9,5

Table 1. Common phonological innovations of Southern Finnic languages.

Besides the influence of the neighbouring Indo-European languages, factors that might explain the characteristic features of Southern Finnic languages are the peripheral location, mutual contacts between the languages of the group, and hypothetically, also the influences from other, now extinct, Finno-Ugric languages. For instance, if we compare the Southern Finnic languages with Mordvin languages, we can see several similar traits, including the above example concerning velar vowel harmony, but also the unrounded central vowel of the stressed syllable, e.g. Moksha *kârda* ‘time’, the wide-spread palatalization of consonants: *es* ‘(one)self’, etc. Part of the common features of Southern Finnic and Mordvin sound systems can be explained by similar Baltic and Slavic influences, although not everything; also likely are similar contacts within the language family and a common substrate. This might be also indicated by some similarities between the Southern Finnic languages and Saamic, which were not treated here.

Abbreviations

ALL	Allative	EstN	North Estonian
COM	Comitative	EstS	South Estonian
GEN	Genitive	LivE	Eastern Livonian
ILL	Illative	LivK	Courland Livonian
INE	Inessive	LivW	Western Livonian
INF	Infinitive		
NOM	Nominative		
PART	Partitive		
PL	Plural		
SG	Singular		
TERM	Terminative		

References

- Alvre, Paul 1973: Läänemeresoome aluskeele varasest murdeliigendusest, eriti eesti ja soome keelt silmas pidades. – *Keel ja Kirjandus* 16: 99–104, 149–157, 218–225.
- Ariste, Paul 1956. Läänemeresoome keelte kujunemine ja vanem arenemisjärk. – Harri Moora (ed.), *Eesti rahva etnilisest ajaloost*. Tallinn: Eesti Riiklik Kirjastus. 5–22.
- Boiko, Kersti 1995: On the originality of the word-initial consonant clusters in Estonian and Finnish. Commentary. (See, Klaas 1995) – Seppo Suhonen (ed.), *Itämeren-suomalainen kulttuurialue. The Fenno-Baltic Cultural Area*. Castrenianumin toimitteita 49. Helsinki: Société Finno-Ougrienne. 132–141.
- Eek, Arvo & Toomas Help 1986: *Rütminihked eesti keele ajaloos*. KKI Preprint 45. Tallinn.
- Grünthal, Riho 2000: Typological characteristics of the Finnic language: a reappraisal. – Johanna Laakso (ed.), *Facing Finnic. Some challenges to historical and contact linguistics*. Castrenianumin toimitteita 59. Helsinki: Société Finno-Ougrienne. 31–63.
- Hinderling, Robert 1981: *Die deutsch-estnisch Lehnwortbeziehungen im Rahmen einer europäischen Lehnwortgeographie*. Wiesbaden: Harrassowitz.

- Holst, Jan Erik 2001: Die Herkunft des estnischen Vokals õ. – *JSFOu* 89: 57–89.
- Itkonen, Terho 1968: Itäsuomalaisen liudennuksen fonologinen paradoksi. – *Fenno-Ugrica. juhlaKirja Lauri Postin kuusikymmenvuotispäiväksi 17.3.1968*. MSFOu 145. Helsinki: Société Finno-Ougrienne. 76–103.
- 1983: Välikatsaus suomen kielen juuriin. – *Virittäjä* 87: 190–229, 349–386.
- Iva, Sulev 2010: Grade Alternation in Võro South Estonian. – *Linguistica Uralica* XLVI: 161–174.
- JSFOu = *Journal de la Société Finno-Ougrienne*.
- Kallio, Petri 2000: Posti's superstrate theory at the threshold of a new millennium. – Johanna Laakso (ed.), *Facing Finnic. Some challenges to historical and contact linguistics*. Castrenianumin toimitteita 59. Helsinki. 80–99.
- 2007: Kantasuomen konsonanttihistoriaa. – Jussi Ylikoski & Ante Aikio (eds), *Sámit, sánit, sátnehámit. Riepmočála Pekka Sammallahti miessemánu 21. beaivve 2007*. MSFOu 253. Helsinki: Société Finno-Ougrienne. 229–249.
- Kettunen, Lauri 1930: *Vatjan kielen äännehistoria*. Toinen, uusittu painos. Helsinki.
- 1938: Onko vepsässä ollut astevaihtelua. – *Virittäjä* 42: 373–388.
- 1951: Selvitystä astevaihteluun. – *Virittäjä* 55: 222–227.
- 1960: *Suomen lähisukukielten luonteenomaiset piirteet*. MSFOu 119. Helsinki.
- Kiparsky, Paul & Karl Pajusalu 2003: Towards a typology of disharmony. – *The Linguistic Review* 20: 217–241.
- Klaas, Birute 1995: Zum Ursprung der anlautenden Konsonantenverbindungen in der estnischen und finnischen Sprache. – Seppo Suhonen (ed.), *Itämerensuomalainen kulttuurialue. The Fenno-Baltic Cultural Area*. Castrenianumin toimitteita 49. Helsinki: Société Finno-Ougrienne. 108–131.
- Kettunen, Lauri 1930: *Vatjan kielen äännehistoria*. Toinen, uusittu painos. SKST 185. Helsinki: Suomalaisen Kirjallisuuden Seura.
- Korhonen, Mikko 1981: *Johdatus lapin kielen historian*. SKST 370. Helsinki: Suomalaisen Kirjallisuuden Seura.
- 1996 [1969]: Die Entwicklung der morphologischen Methode im Lappischen. Reprinted in *Typological and historical studies in language by Mikko Korhonen. A memorial volume published on the 60th anniversary of his birth*. MSFOu 223. Helsinki: Société Finno-Ougrienne. 17–143.
- Laanest, Arvo 1972: Itämerensuomalaisten kielten ryhmityskysymyksiä. – *Virittäjä* 76: 113–120.
- 1982: *Einführung in die ostseefinnischen Sprachen*. Hamburg: Buske Verlag.
- Lehikoinen, Laila & Silva Kiuru 1998: *Kirjasuomen kehitys*. 4. painos, uudistettu laitos. Helsinki.
- Lehiste, Ilse, Pire Teras, Valts Ernštreits, Pärtel Lippus, Karl Pajusalu, Tuuli Tuisk & Tiit-Rein Viitso 2008: *Livonian Prosody*. MSFOu 255. Helsinki: Société Finno-Ougrienne.
- Lehiste, Ilse & Karl Pajusalu 2010: Experimental study of prosody in Finno-Ugric languages. – *Congressus XI Internationalis Fenno-Ugristarum Piliscsaba 9.–14. VIII. 2010. Pars I. Orationes plenariae*. Piliscsaba: Reguly Társaság. 225–245.
- Lehtinen, Tapani 2007: *Kielen vuosituhannet. Suomen kielen kehitys kantauralista varhaisuomeen*. Tietolipas 215. Helsinki: Suomalaisen Kirjallisuuden Seura.
- Lippus, Pärtel 2006: Võru ja eesti standardkeele /ts/. – *Emakeele Seltsi Aastaraamat* 51: 61–79.

- Lippus, Pärtel & Karl Pajusalu 2009: Regional variation in the perception of Estonian quantity. – Martti Vainio, Reijo Aulanko, Olli Aaltonen (eds), *Nordic Prosody. Proceedings of the Xth Conference, Helsinki 2008*. Frankfurt: Peter Lang Verlag. 151–157.
- Lippus, Pärtel, Karl Pajusalu & Jüri Allik 2009: The tonal component of Estonian quantity in native and non-native perception. – *Journal of Phonetics* 37: 388–396.
- 2011: The role of pitch cue in the perception of the Estonian long quantity. – Sónia Frota, Gorka Elordieta & Pilar Prieto (eds), *Prosodic categories: production, perception and comprehension*. Studies in Natural Language and Linguistic Theory 82. Dordrecht, Heidelberg, London, New York: Springer.
- Markus, Elena 2010: Primary and secondary geminates in Ingrian. – *Linguistica Uralica* XLVI: 38–52.
- Mielikäinen, Aila 1981: *Etelä-Savon murteiden äännehistoria. 1. Konsonantit*. SKST 375. Helsinki: Suomalaisen Kirjallisuuden Seura.
- MSFOu = Mémoires de la Société Finno-Ougrienne.
- Must, Mari 1987: *Kirderannikumurre. Häälikuline ja grammatiline ülevaade*. Tallinn.
- 1995: Kirderannikumurdest. – *Kirderannikumurde tekstid*. Eesti murded V. Tallinn: Eesti Keele Instituut. 15–56.
- Org, Laivi 2003: Vastseliina palatalisatsioonist. – Karl Pajusalu & Pire Teras (eds), *Lõunaeesti häälikud II*. Tartu Ülikooli eesti keele õppetooli toimetised 27. Tartu. 131–156.
- Pajusalu, Karl 1990. Jättityö eestin etelämurteista. – *Sananjalka* 32: 158–165.
- 1994. Kuidas soomlased õpivad kuulma eesti välteid. – Karl Pajusalu & Valma Yli-Vakkuri (eds), *Lähivertailuja 7. Suomalais-virolainen kontrastiivinen seminaari Tammivalkamassa 5.–7.5.1993*. Turun yliopiston suomalaisen ja yleisen kielitieteen laitoksen julkaisuja 44. Turku: Turun Yliopisto. 75–88.
- 1997. Keskse perifeeria mõjust eesti keele tekkeloos. – *Pühendusteos Huno Rätsepale 28.12.1997*. Mati Ereht, Meeli Sedrik, Ellen Uuspõld (eds). Tartu Ülikooli eesti keele õppetooli toimetised 7. Tartu: Tartu Ülikool. 167–183.
- 1999. Eesti murded ja murderühmad. – *Emakeele Seltsi Aastaraamat* 43. Tartu. 64–98.
- 2000: Alternation of *e* and *a*, *ä* in non-initial syllables in the southern group of the Finnic languages. – Johanna Laakso (ed.), *Facing Finnic. Some challenges to historical and contact linguistics*. Castrenianumin toimitteita 59. Helsinki. 156–167.
- 2001: Baby talk as a sophisticated register: A phonological analysis of South Estonian. – *Psychology of Language and Communication* 5: 81–92.
- 2003: What has changed in Estonian pronunciation: the making of Estonian accents. – Helle Metslang & Mart Rannut (eds), *Languages in development*. München: Lincom Europa. 107–114.
- 2005: Keelesaarte *se*-minevik. – *Tartu Ülikooli Lõuna-Eesti keele- ja kultuuriuuringute keskuse aastaraamat IV*. Tartu. 145–150.
- 2009: Concerning Salaca Livonian as a southern Finnic dialect. – *Pa somugru pēdām Baltijas jūras krastā*. Rīga: Zinātne. 42–48.
- Pajusalu, Karl, Tiit Hennoste, Ellen Niit, Peeter Päll & Jüri Viikberg 2009: *Eesti murded ja kohanimed*. 2nd, revised edition. Tallinn.
- Parve, Merike 2000: Võru lühikeste monoftongide akustikast. – Karl Pajusalu, Merike Parve, Pire Teras & Sulev Iva, *Võru vokaalid I*. Tartu Ülikooli eesti keele õppetooli toimetised 13. Tartu. 9–38.

- Posti, Lauri 1938: Über den Stufelwechsel im Wepsischen. – *Finnisch–Ugrische Forschungen* 26: 1–25.
- 1942: *Grundzüge der livischen Lautgeschichte*. MSFOu LXXXV. Helsinki: Sociéte Finno-Ougrienne.
- 1953: From Pre-Finnic to Late Proto-Finnic. – *Finnisch–Ugrische Forschungen* 31: 1–91.
- 1958: Zur Geschichte des Wandels $k > t\check{s}$ im Wotischen. – *JSFOu* 60.
- 1980: Kukkosin murteesta ja sen asemasta. – *Vatjan kielen Kukkosin murteen sanakirja*. Lexica Societatis Fenno-Ugricae XIX. Helsinki: Sociéte Finno-Ougrienne. XV–XIX.
- Prillop, Külli 2011: *Optimaalsusteoreetiline käsitus eesti keele fonoloogilisest kujunemisest*. Dissertationes Philologicae Estonicae Universitatis Tartuensia 28. Tartu.
- Ross, Jaan & Ilse Lehiste 2001: *The temporal structure of Estonian runic songs*. Berlin & New York: Mouton de Gruyter.
- Rätsep, Huno 1989: Eesti keele tekkimise lugu. – *Akadeemia* 7: 1503–1524.
- Salminen, Tapani 1998: Pohjoisten itämerensuomalaisten kielten luokittelun ongelmia. – Riho Grünthal & Johanna Laakso (eds), *Oekeeta asijoo. Commentationes Fenno-Ugricae in honorem Seppo Suhonen sexagenarii 16. V. 1998*. MSFOu 228. Helsinki: Sociéte Finno-Ougrienne. 390–406.
- Sammallahti, Pekka 1977: Suomalaisten esihistorian kysymyksiä. – *Virittäjä* 81: 119–136.
- Suhonen, Seppo 1973: *Die jungen lettischen Lehnwörter im Livischen*. MSFOu 154. Helsinki: Sociéte Finno-Ougrienne.
- 1979: Über die Beziehungen zwischen dem Finnischen und den estnischen Küstendialekten. – *Explanationes et tractationes fenno-ugricae in honorem Hans Fromm*. Ed. Erhard F. Schiefer. München: Wilhelm Fink. 357–366.
- Söderman, Tiina 1996. *Lexical Characteristics of the Estonian North Eastern Coastal Dialect*. *Studia Uralica Upsaliensia* 24. Uppsala.
- Teras, Pire 2003. *Lõunaeesti vokaalisüsteem: Võru pikkade vokaalide kvaliteedi muutumine*. Dissertationes Philologicae Estonicae Universitatis Tartuensia 11. Tartu: Tartu Ülikooli Kirjastus.
- Tuisk, Tuuli & Pire Teras 2009: The role of duration ratios and fundamental frequency in spontaneous Livonian. – *Linguistica Uralica* XLV: 241–252.
- Tunkelo, Eemil A. 1938: Vepsän kielen astevaihteluttomuudesta. – *Suomi* V, 20. vol. I.
- Viitso, Tiit-Rein 1985: Läänemeresooe murdeliigenduse põhijooned. – *Keel ja Kirjandus* 28: 399–404.
- 1990: Eesti keele kujunemine flekterivaks keeleks. – *Keel ja Kirjandus* 33: 456–461; 542–548.
- 1998: Fennic. – Daniel Abondolo (ed.), *The Uralic Languages*. London & New York: Routledge. 96–114.
- 2007: Livonian gradation: types and genesis. – *Linguistica Uralica* XLIII: 45–62.
- 2008: *Liivi keel ja läänemeresooe keelemaastikud*. Tallinn: Eesti Keele Sihtasutus.
- 2009: Livonian and Leivu: Shared innovations and problems. – *Linguistica Uralica* XLV: 269–282.
- Wiik, Kalevi 1988. *Viron vokaalisointu*. Suomi 140. Helsinki: Suomalaisen Kirjallisuuden Seura.
- 2006: *Sano se murteella. Suomen murteiden oppi- ja harjoituskirja*. Turku: Pilotkustannus.

- Winkler, Eberhard 1997: *Krewinisch. Zur Erschließung einer ausgestorbenen ostseefinnischen Sprachform*. Veröffentlichungen der Societatis Uralo-Altaica 49. Wiesbaden: Harrassowitz Verlag.
- 1999: *Ältere livische Sprachmaterialien*. Veröffentlichungen des Finnisch-Ugrischen Seminars an der Universität München, Serie C: Band 22. München.
- 2000: Zum Stoßton im Ostseefinnischen. – *Aspekte baltistischer Forschung*. Hg. Jochen D. Range. Essen. 344–363.
- 2010: Katketooni märkimisest vanades läänemeresoome allikates. – Jüvä Sullõv (ed.), *Väikuq keeleq mitmõkeelitsen ütiskunnan*. Võro Instituudi Toimõndusõq 24. Võro: Võro Instituut. 68–78.
- Winkler, Eberhard & Karl Pajusalu 2009: *Salis-livisches Wörterbuch*. Linguistica Uralica Supplementary Series, Vol. 3. Tallinn.