Christopher Spahr
University of Toronto
christopher.spahr@mail.utoronto.ca

Eleventh Old-World Conference in Phonology
LUCL and Meertens Instituut Amsterdam
22–25 January 2014

Prosodic epenthesis and floating vowels in Estonian quantity

1 Introduction

Estonian is well known for showing a three-way quantity distinction.

Much work has made great progress in understanding the kinds of representations involved in the quantity contrast (Lehiste 1965, 1970, Hint 1973, Prince 1980, Odden 1997, Ehala 2003, Pöchtrager 2006, Prillop 2013, and many, many others)

Few authors have spoken explicitly to how quantity alternations are derived, often implying morphophonological rules that directly manipulate prosodic structure (e.g., feet) based on morphological information.

In this talk:

- Elaborate on Spahr's (2013) exploitation of floating vowels in analyzing Estonian quantity alternations
- Propose two prosodic insertion processes (V-slot insertion and mora insertion)
- Show how these fit into/interact with the quantity system as a whole

2 The morphophonology of quantity

For some excellent overviews of the Estonian quantity system, both from descriptive and theoretical points of view, see for example Lehiste (1965, 2003), Ehala (2003), and Prillop (2013).

2.1 An overview of Estonian quantity

Estonian shows a number of surface minimal triplets for three degrees of quantity ("short" Q1, "long" Q2, and "overlong" Q3):

(1)

"short" Q1	"long" Q2	"overlong" Q3
vina	viina	viiːna
'vapour' (nom.)	'vodka' (gen.)	'vodka' (part.)
lina	linna	linːna
'flax' (nom.)	'city' (gen.)	'city' (part.)
	laulu	lauːlu
	'song' (gen.)	'song' (part.)

The most common class of alternations is between monosyllabic Q3, and bisyllabic Q2/Q3 forms:

(2)

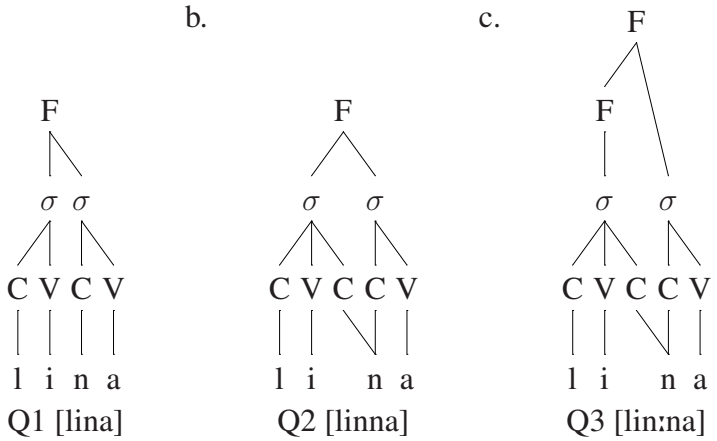
Nominative Q3	Genitive Q2	Partitive Q3	
viiːn	viina	viiːna	‘vodka’
linːn	linna	linːna	‘city’
lauːl	laulu	lauːlu	‘song’

Crucially, the final vowels in the non-nominative forms (any of /a, e, i, u/) of such words are **not predictable from the nominative**.

2.2 Representational approaches

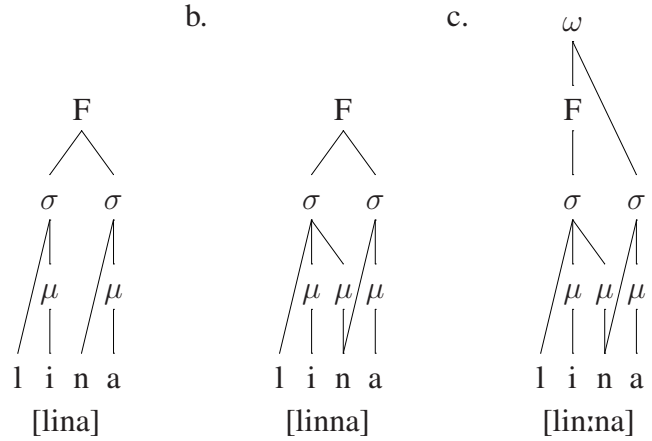
Rather than a literal ternary contrast, Prince (1980) proposes a strictly binary analysis of Estonian quantity using recursive foot structure. Q3 syllables exhaust feet on their own, and these feet can serve as the heads of larger feet:

(3)



Odden (1997) suggests that this can be accomplished without recursive foot structure if the syllable outside of the Q3 syllable is simply extrametrical:[1]

(4)



While the this style system of representations is useful, neither Prince nor Odden provides an explicit account of how Estonian quantity contrasts are derived.

[1]Prillop (2013) proposes something of a hybrid between Prince/Odden’s analysis and Hayes’s use of trimoraic syllables: three moras dominate the segments of overlong syllables, but only two of these moras are dominated by the syllable node. The third mora is extra syllabic. I will not treat this system of representations here.

Instead, both imply morphophonological rules that must directly manipulate (presumably non-underlying) foot structure.

That is, **no one has given an account of individual morphemes and the rules that manipulate them**.

How can we arrive at Q3 syllables that constitute their own feet?

2.3 Spahr (2013)

In Spahr 2013, I propose an analysis of Estonian that arrives at Prince/Odden-style representations using slightly different assumptions about representations:

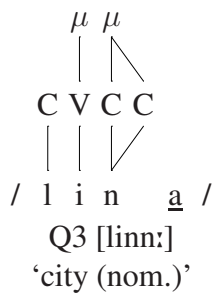
- Timing units (C- and V- slots) and weight units (moras) are represented independently (Ehala 2003)
- Syllables and feet cannot be manipulated directly by morphological processes; they are parsed from lower prosodic structure

Roots are minimally bimoraic.

The stem-final vowels in non-nominative cases are represented as floating vowels, which are not realized in the nominative because they lack timing positions.

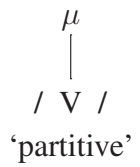
Monosyllabic nominative forms are unsuffixed, and need not be the product of morphology-specific vowel deletion rules (assumed by Prince 1980:534, Viitso 2003:30).

(5)



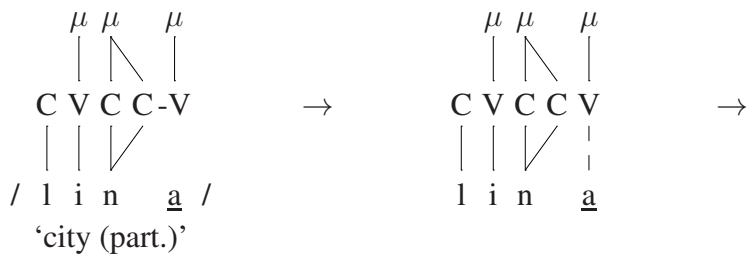
The partitive case suffix for roots like (5a) consists only of prosodic material, a mora and a V-slot:

(6)

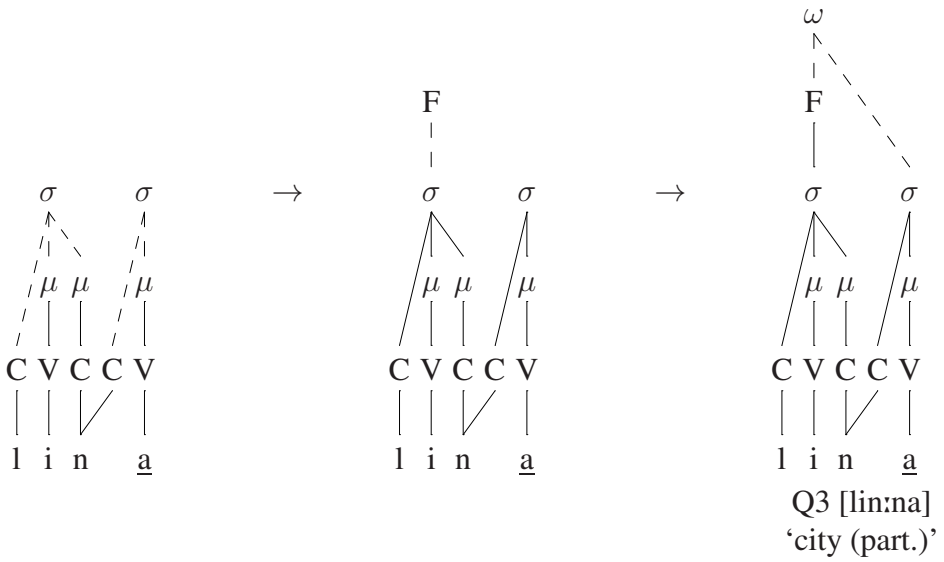


The suffix V-slot associates with the stem's floating vowel:

(7a)



(7b)

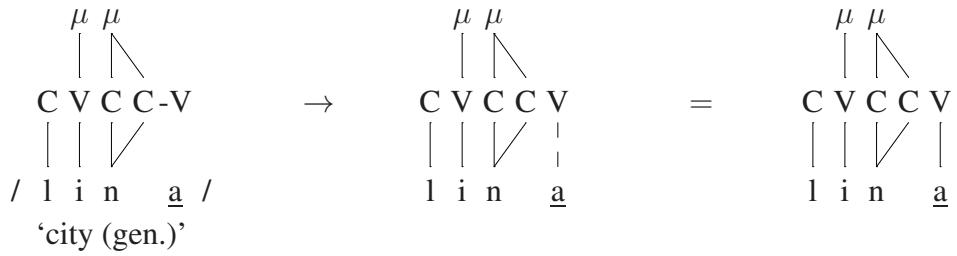


The genitive consists only of a V-slot, without its own mora:

(8) / V /
'genitive'

Again, the V-slot links with the floating vowel:

(9)

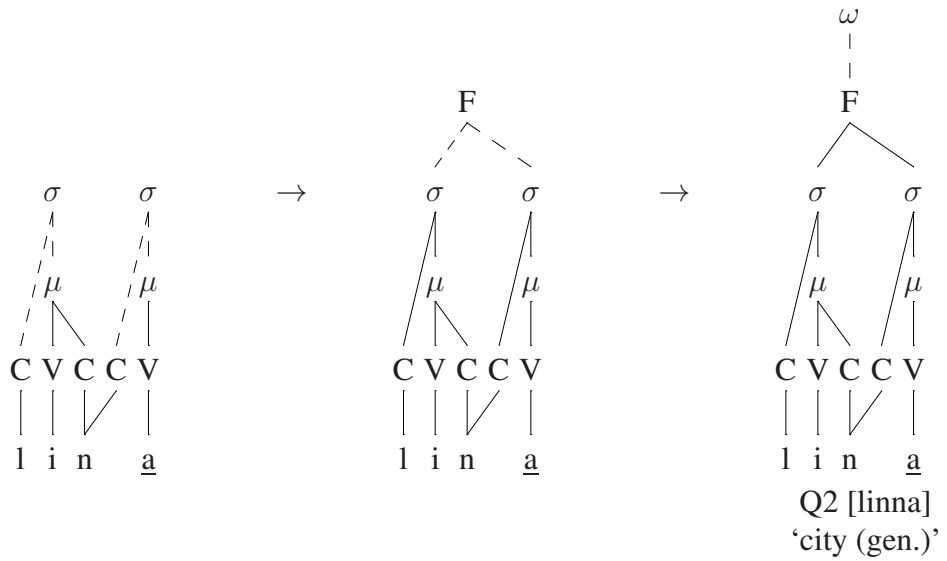


The V-slot cannot host the floating vowel without a mora, so it "borrows" one from the root, leaving the root monomoraic:

(10)

The monomoraic branching rhyme is parsed into a bimoraic foot along with the second syllable, and is realized in Q2:

(11)



2.4 New contributions

I will now expand on Spahr 2013 by:

- Considering a larger empirical domain, namely forms involving prosodic epenthesis
- Making more explicit the processes involved in deriving the surface representations

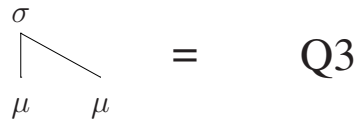
2.4.1 Assumptions about underlying forms

Nominal stems typically contain only a single linked mora; other stem moras are floating, and associate by convention.

Affixes may freely consist of segments, timing slots, and moras, linked or unlinked; all of these phonological elements are decoupled.

I will henceforth omit footing; I assume that **any bimoraic syllable will be parsed into its own foot and realized in Q3**:

(12) **Notational shorthand**



= Q3

3 V-slot epenthesis

There is a class of nominals that undergoes a kind of vowel–zero alternation. These, too, show a Q2/Q3 alternation between the genitive and partitive forms.

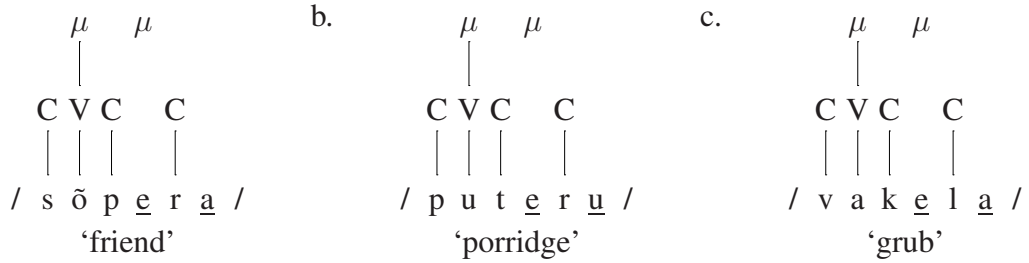
Unlike the paradigms described above, however, the nominative case is also bisyllabic:

(13)

Nominative Q1	Genitive Q2	Partitive Q3	
sõper	sõpra	sõpːra	‘friend’
puter	putru	putːru	‘porridge’
vakel	vakla	vakːla	‘grub’

I propose that these roots have two different floating vowels:[2]

(14)



The nominative case is again unsuffixed.

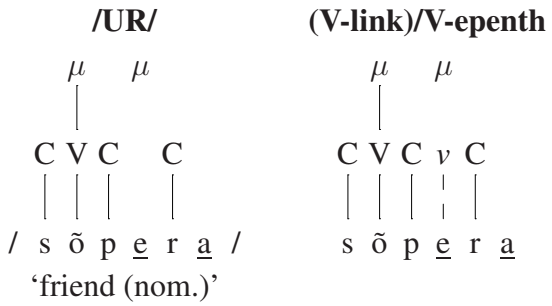
Since in e.g., (14a) /pr/ is not a licit coda in Estonian, a prosodically-driven epenthesis process (Itô 1989) which inserts a V-slot on the CV tier to break up the cluster comes into effect.

(15) **V-epenthesis**

Searching Left-to-Right, insert a V-slot (notated *v*) and associate it to floating vowels on the segmental tier in order to break up illicit codas.

This links with the floating /e/:

(16a)

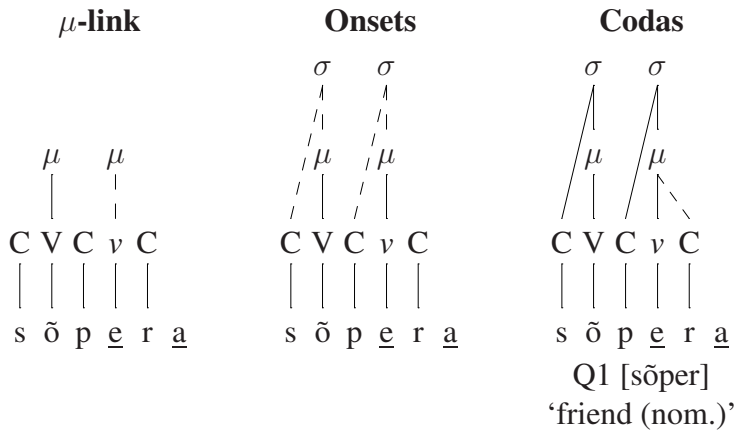


The stem’s second mora then links to this V-slot, and onsets/codas are syllabified. This yields a well-formed word with a (light) CV first syllable:

[2]The following notational conventions are used here: underlining represents an underlyingly floating vowel, small *v* represents an epenthetic V-slot, and parentheses (μ) represent a mora from a mora-insertion process.

Example words are given in a modified form of the orthography, such that double letters are used to represent contrastively long segments. Overlength is realized on long segments as a property of overlong quantity (Q3) of the syllable.

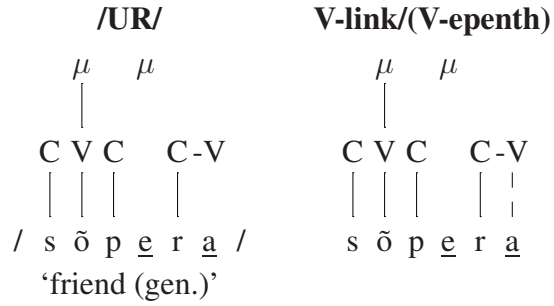
(16b)



The genitive (Q2) and the partitive (Q3) are derived just like the forms analyzed in Spahr 2013.

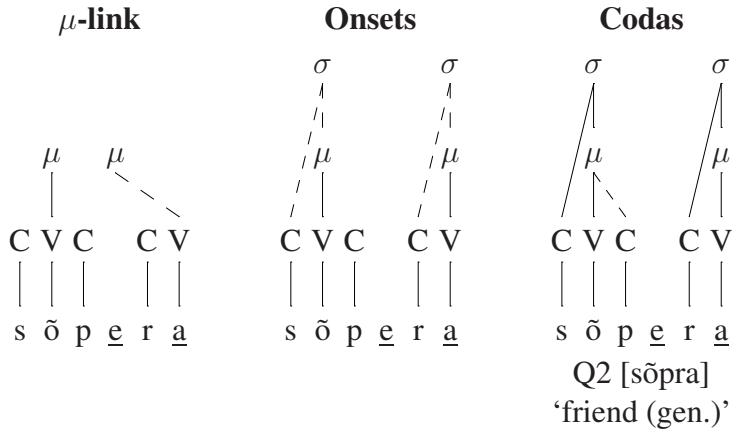
The **genitive case** suffix is just a V-slot, which links to the second floating V to avoid crossing association lines:

(17a)



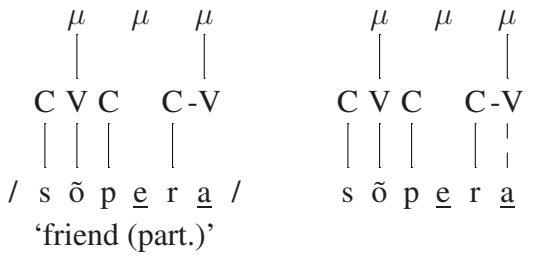
The second stem mora associates to this V-slot, leaving the stem monomoraic. This light first CVC syllable is realized as Q2:

(17b)



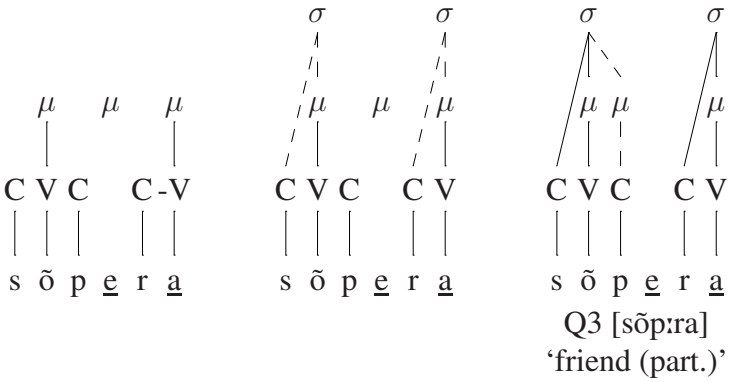
The **partitive case** suffix contains both a V-slot and a mora. The V-slot again links to the second floating vowel:

(18a) **/UR/** **V-link/(V-epenth)**



The second stem mora links to the stem, making it bimoraic. This heavy CVC syllable is realized in Q3:

(18b) **(μ-link)** **Onsets** **Codas**



4 *-t* partitives and moraic genitives

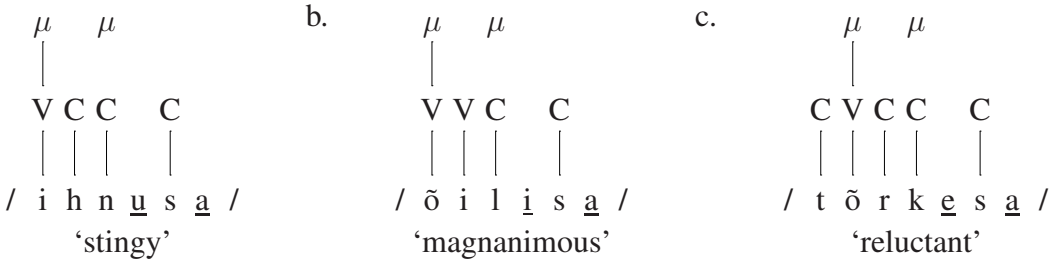
There is also a class of nominals that take partitives ending in *-t*. Some of these show another kind of quantity alternation:

(19)

Nominative Q2	Genitive Q3	Partitive Q3/Q2	
ih.nus	ihːnː.sa	ihːnː.satt/ih.nust	'stingy'
õi.lis	õiːlː.sa	õiːlː.satt/õi.list	'magnanimous'
tõr.kes	tõrːkː.sa	tõrːkː.satt/tõr.kest	'reluctant'

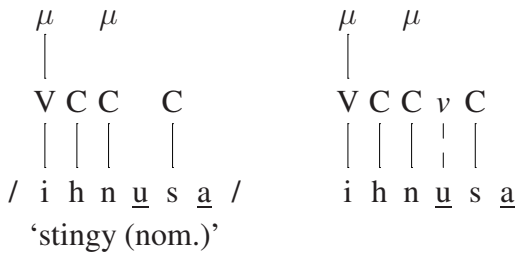
These roots also contain multiple floating vowels:

(20)



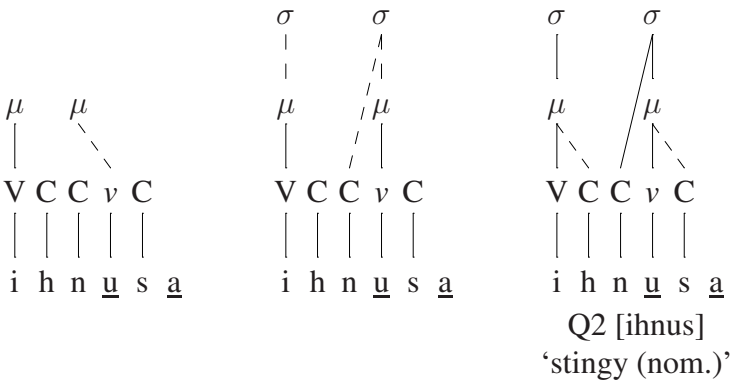
In the nominative, words like *ihnus* work just like *sõper*. First, an epenthetic V-slot breaks up the illicit /hns/ coda at the point of the first floating vowel:

(21a) **/UR/** **(V-link)/V-epenth**



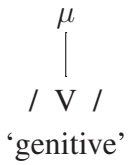
Then this vowel links to the mora, and the word is syllabified:

(21b) **μ-link** **Onsets** **Codas**



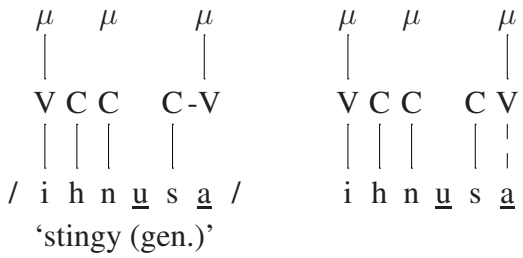
The **genitive case** for this paradigm is an allomorph which has its own mora:

(22)



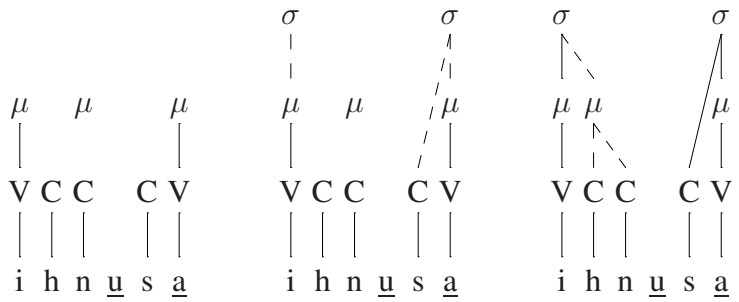
The stem's floating vowel links with the suffix's V-slot, bleeding V-slot epenthesis:

(23a) **/UR/** **V-link/(V-epenth)**



After onsets are maximized, the second stem mora is syllabified in the first syllable, making it Q3:

(23b) **(μ-link)** **Onsets** **Codas**

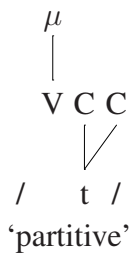


Q3 [ihːnːsa]
'stingy (gen.)'

4.1 Two partitives

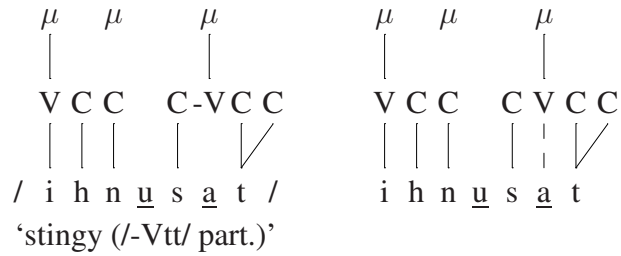
Words like *ihnus* 'stingy' can take two different partitive allomorphs. The first of these consists of a mora V-slot and a long (CC) /t/:

(24)

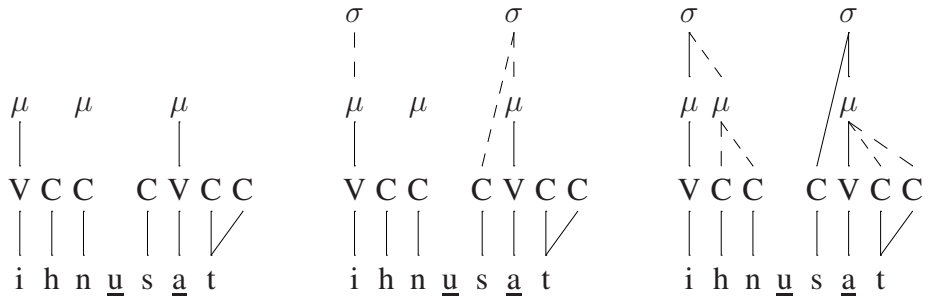


In terms of quantity, the *Vtt* partitive form behaves just like the genitive:

(25a) **/UR/** **V-link/(V-epenth)**



(25b) **(μ-link)** **Onsets** **Codas**



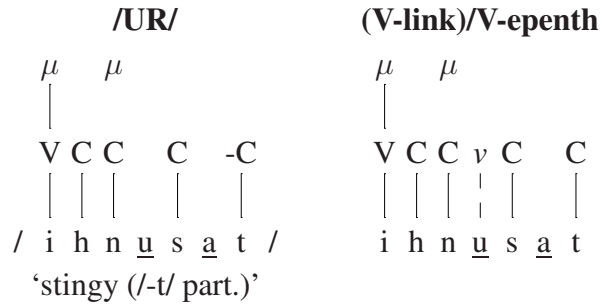
Q3 [ihːnːsatt]
'stingy (/-Vtt/ part.)'

The other partitive allomorph consists of just a /t/ and a timing slot:

(26)

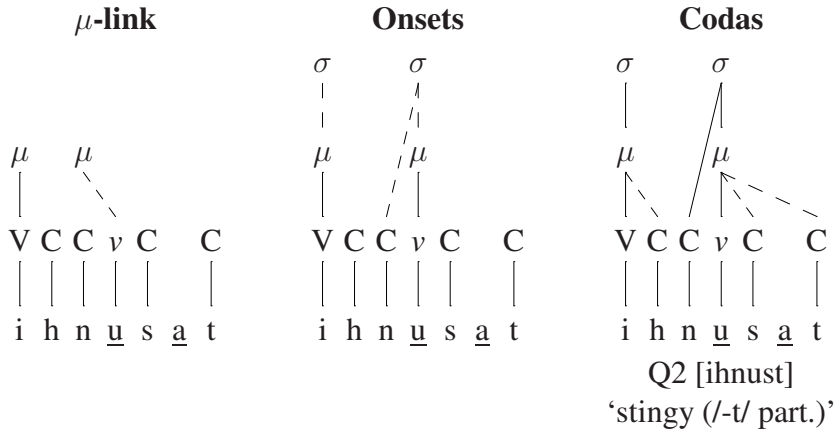
Because /hnst/ is not a licit coda, V-slot epenthesis applies, realizing the floating /u/:

(27a)



The second stem mora links to the epenthetic V-slot, leaving the root in Q2 rather than Q3:

(27b)



4.2 Non-alternating stems

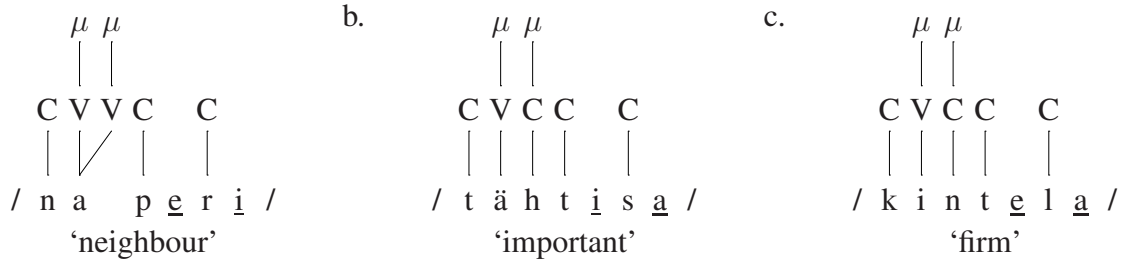
A final class of nominals undergo V-slot epenthesis, but never show quantity alternations:

(28)

Nominative Q3	Genitive Q3	Partitive Q3	
naaː.per	naaːpː.ri	naaːpː.ritt	'neigbour'
tähː.tis	tähːtː.sa	tähːtː.satt	'important'
kinː.tel	kinːtː.la	kinːtː.latt	'firm'

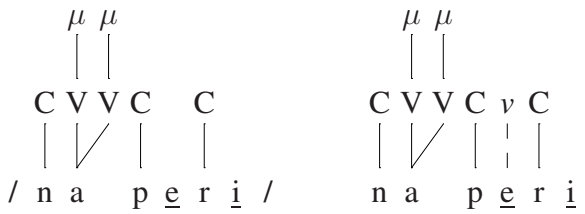
This is expected if these roots contain *two* linked moras in their URs:

(29)



In the **nominative**, V-slot epenthesis applies:

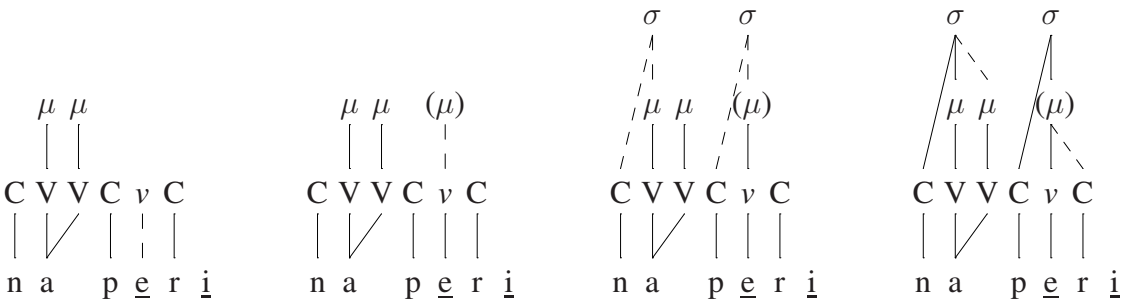
(30a) **/UR/** **(V-link)/V-epenth**



'neighbour (nom.)'

However, the stem has no floating mora to link to the epenthetic V-slot, so a mora "(μ)" is inserted by a mora insertion process as a repair:

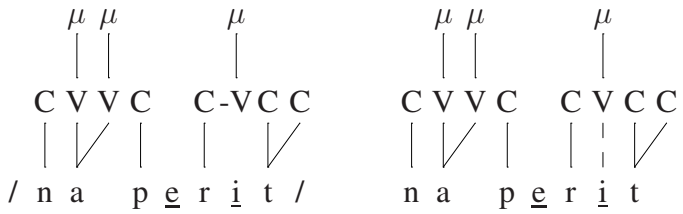
(30b) **(μ-link)** **μ-insert** **Onsets** **Codas**



Q3 [naaːper]
'neighbour (nom.)'

The **genitive** and **partitive** case forms, mora insertion does not apply, because the suffixes have their own V-slot and mora, and the second floating vowel is realized:

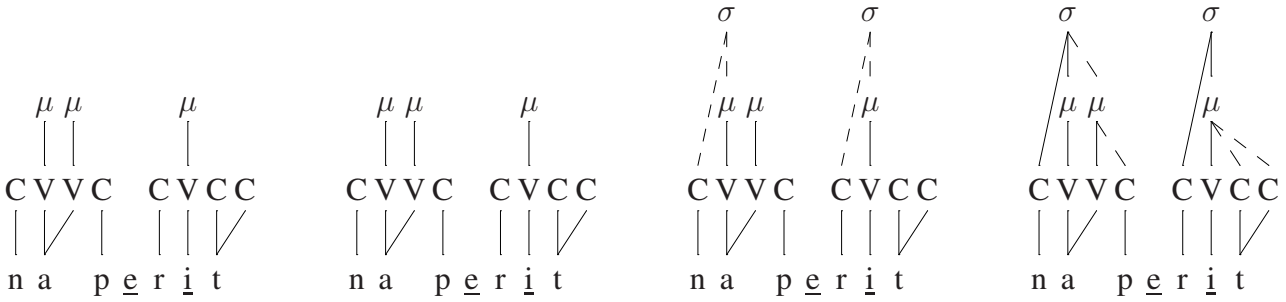
(31a) **/UR/** **V-link/(V-epenth)**



'neighbour (part.)'

(31b)

(μ-link) **(μ-insert)** **Onsets** **Codas**



Q3 [naaːpːritt]
'neighbour (part.)'

5 Conclusion

5.1 The role of moras

- What does it mean to represent moras separately from segmental length?
- "Weight" in Estonian seems to be more than just a property projected from syllabic quantity; Pitch accent? (Lehiste 2003; Lippus et al. 2011)
- Associating moras to skeletal positions by convention resembles a tone system
- Perhaps linking one vs. two moras underlyingly can be thought of as a kind of lexical tone

5.2 Summary

- Estonian shows complex quantity alternations
- These can be accounted for elegantly by using floating vowels and separating timing/weight units
- Some patterns are governed by feeding relations between two different prosodic insertion processes

Thanks/Aitäh!

References

Ehala, Martin. 2003. Estonian quantity: Implications for Moraic Theory. In *Generative approaches to Finnic and Saami linguistics*, ed. Diane Nelson and Satu Manninen, 51–80. Stanford: CSLI.

Hint, Mati. 1973. *Eesti keele sõnafonoloogia I*. Tallinn: Eesti NSV Teaduste Akadeemia Keele ja Kirjanduse Instituut.

Itô, Junko. 1989. A prosodic theory of epenthesis. *Natural Language and Linguistic Theory* 7:217–259.

Lehiste, Ilse. 1965. The function of quantity in Finnish and Estonian. *Language* 41:447–456.

Lehiste, Ilse. 1970. *Suprasegmentals*. Cambridge, MA: MIT Press.

Lehiste, Ilse. 2003. Prosodic changes in progress: From quantity language to accent language. In *Development in prosodic systems*, ed. Paula Fikkert and Haike Jacobs, 47–65. Berlin: Mouton de Gruyter.

Lippus, Pärtel, Karl Pajusalu, and Jüri Allik. 2011. The role of pitch cue in the perception of the Estonian long quantity. In *Prosodic categories: Production, perception and comprehension*, ed. Sónia Frota, Gorka Elordieta, and Pilar Prieto, 231–242. Dordrecht: Springer Netherlands.

Odden, David. 1997. Some theoretical issues in Estonian prosody. In *Estonian prosody: Papers from a symposium*, ed. Ilse Lehiste and Jaan Ross, 165–195. Tallinn: IEL.

Pöchtrager, Markus. 2006. The structure of length. Doctoral Dissertation, University of Vienna.

Prillop, Külli. 2013. Feet, syllables, moras and the Estonian quantity system. *Linguistica Uralica* 49:1–29.

Prince, Alan. 1980. A metrical theory of Estonian quantity. *Linguistic Inquiry* 11:511–562.

Spahr, Christopher. 2013. Rethinking the morphophonology of Estonian quantity. In *Nordic Prosody: Proceedings of the XIth Nordic Prosody Conference, Tartu 2012*, ed. Eva-Liina Asu and Pärtel Lippus, 362–371. Frankfurt: Peter Lang Edition.

Viitso, Tiit-Rein. 2003. Structure of the Estonian language. In *Estonian language*, ed. Mati Erelt, 9–129. Linguistica Uralica Supplementary Series Volume 1.

Appendix: Overview of processes

1. **V-linking**
   Link floating V-slots to floating vowels on the segmental tier without crossing association lines.

2. **V-epenthesis**
   Searching Left-to-Right, insert a V-slot (notated *v*) and associate it to floating vowels on the segmental tier in order to break up illicit codas.

3. **μ-linking**
   Link floating moras to non-moraic V-slots.

4. **μ-insertion**
   Insert a mora (notated (μ)) and associate it to any weightless V-slot.

5. **Onset maximization**
   Project syllable nodes (σ) and maximize syllable onsets.

6. **Codafication**
   Link moras to any remaining C-slots without crossing association lines, and link unsyllabified moras to preceding syllables.