

An extrasyllabic account of North Sámi triple gemination

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Background

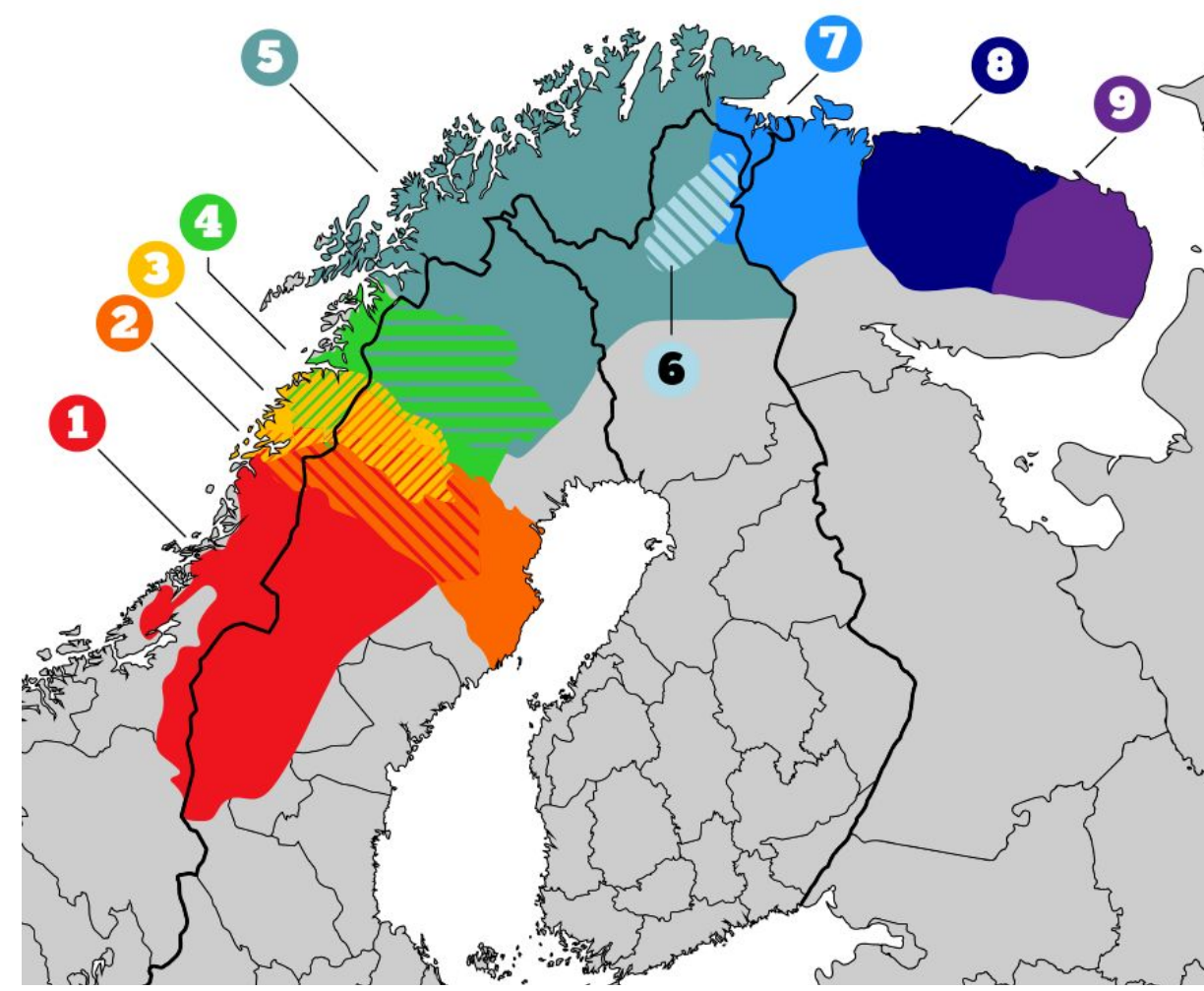
North Sámi 5: Uralic, ~26,000 speakers

Three-way Consonants:

- [ruosa] 'Sweden'
- [ruossa] 'Cross' acc. sing.
- [ruosssa] 'Cross' nom. sing.

Two-way Vowels:

- [gollli] 'Gold' nom. sing.
- [goolli] 'Gold' acc. sing.



Extrasyllabicity: generally described:

- at word edges
- word-medially, where C's can't be either onset or coda (Polish: Rubach & Booij 1990, French: Rialland 1994)

Length alternations

Gradation: several morphological alternations.

→ shorter C in "weak grade", longer C in "strong grade"

Generalizations (Bals Baal et al. 2012):

(1) Short C alternates with long CC after long vowels, but with overlong CCC after short vowels.

- Q1~Q2: VVC→VVCC
- Q1~Q3: VC→VCCC

(2) Long CC alternates with overlong CCC, accompanied by vowel shortening:

- Q2~Q3: VVCC→VCCC

Phonotactics: geminates obligatorily word- and foot-medial

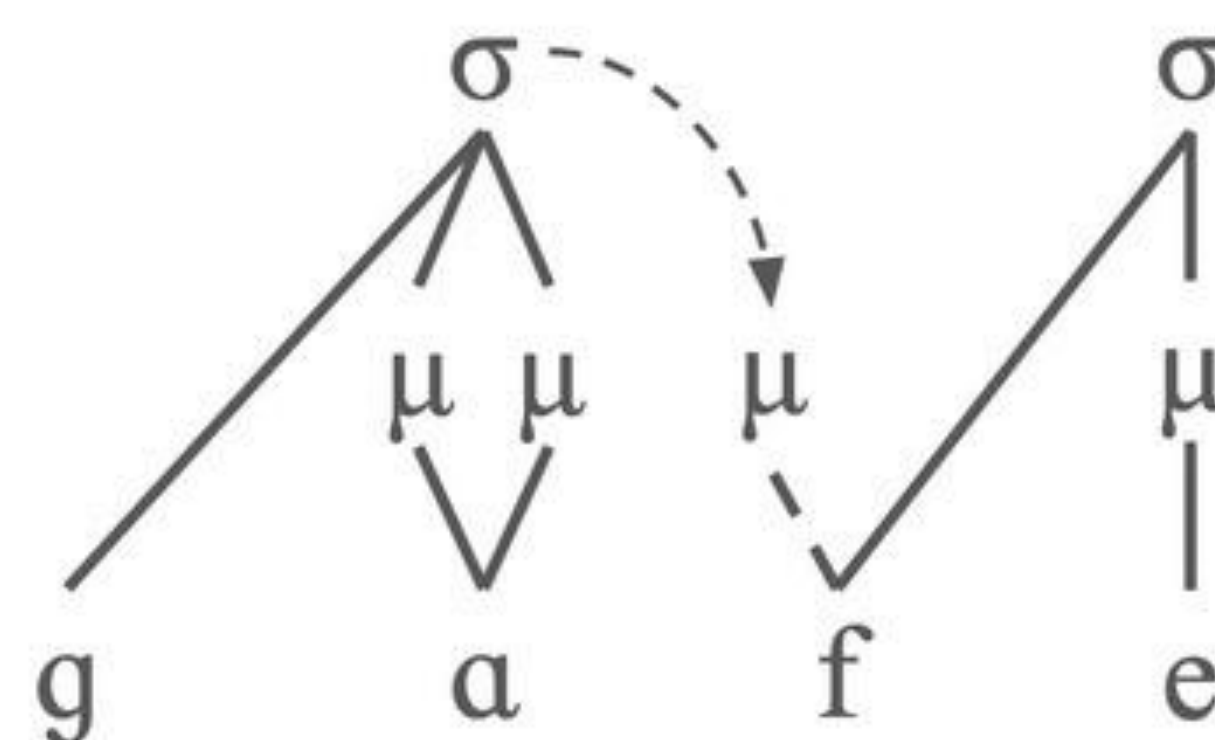
Analysis

Extrasyllabic moras are licensed following heavy syllables.

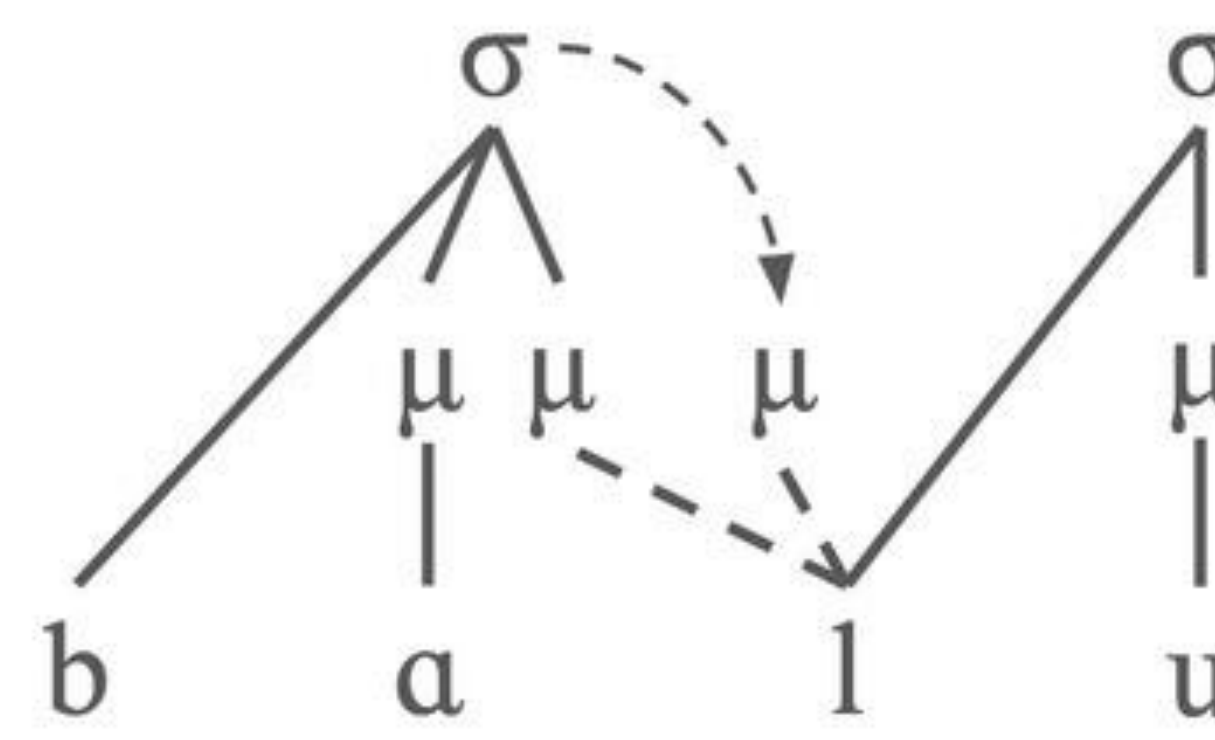
Strong grade is formed by lengthening the medial consonant.

- If /VV.C/:
insert non-moraic/extrasyllabic coda (
- If /V.C/:
need *also* insert mora (4)
- If /VVC.C/:
need compensatory shortening (5)

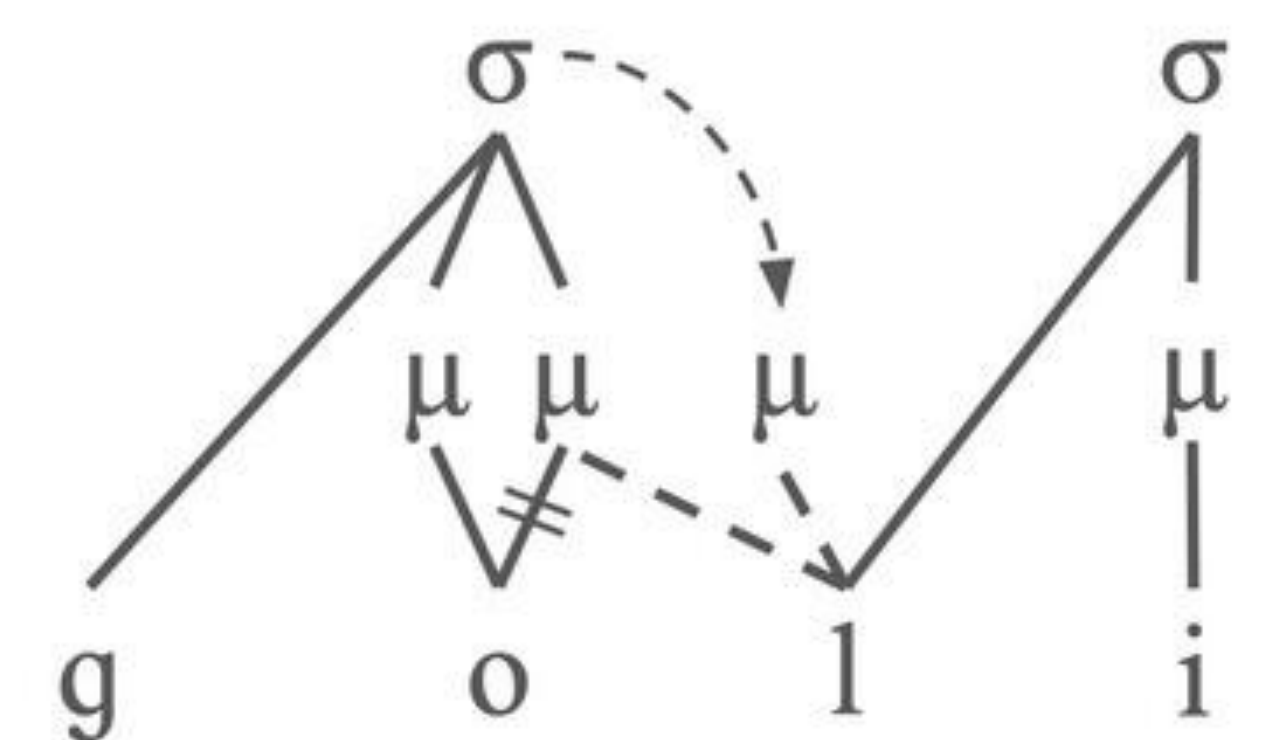
(3) Q1~Q2
[gaafe]~[gaaffe]
'coffee (acc sg~nom sg)'



(4) Q1~Q3
[balu]~[balllu]
'fright (acc sg~nom sg.)'



(5) Q2~Q3
[goolli]~[gollli]
'gold (acc sg, nom sg.)'

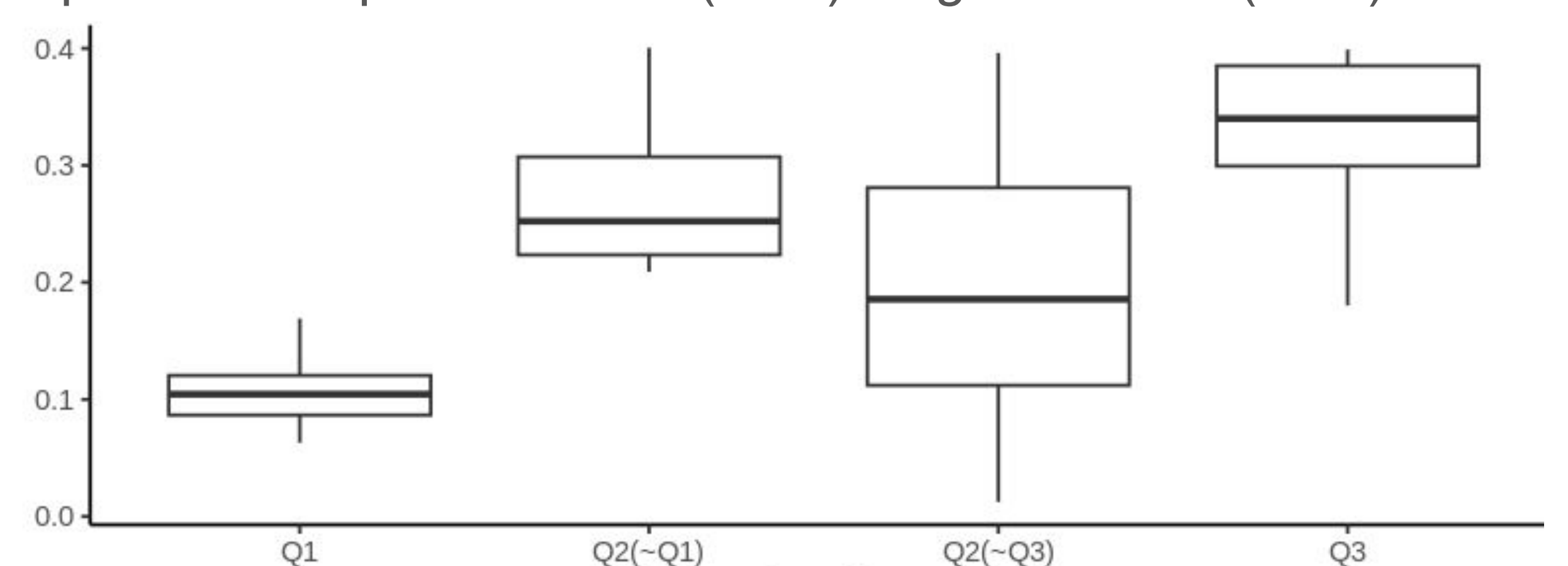


Implications

- Aligns with ~1:2:3 ratio of phonetic duration (Hiovain et al. 2020)
- Explains co-occurrences of C and V lengths
- Expands the typology of attested extrasyllabic positions
 - resembles proposals that present multiple degrees of affiliation between a syllable and its consonants (e.g. Fujimura 2000, Shaw et al 2011).
- Explains diachronic conditions necessary to allow a 3-way consonant length contrast to arise.

Questions

- Variation; Q2-Q3 merger in progress?
- Phonetic duration relationship: in Q2 & Q3, longer V ~ shorter C
- Dispersion? In pilot data: Q2(~Q1) *longer* than Q2(~Q3):



References

- Hiovain, K., Vainio, M., & Šimko, J. (2020). Dialectal variation of duration patterns in Finnmark North Sámi quantity. *The Journal of the Acoustical Society of America*, 147(4), 2817-2828.
- Sammallahhti, P. (1998). *The Saami Languages: an introduction*. Davvi Girji.
- Bals Baal, B., Odden, D., & Rice, C. (2012). An analysis of North Saami gradation. *Phonology*, 29(2), 165-212.
- Magga, T. (1984). *Duration in the Quantity of Bisyllabics in the Guovdageaidnu Dialect of North Lappish* (University of Oulu, Oulu, Finland), Vol. 11.
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Background

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“**Gradation**” alternations: shorter “weak grade” vs. longer “strong grade”

- appears in various morphological paradigms

Extrasyllabicity: Generally described at word edges and in word-medial environments where consonants are not able to be syllabified as either onset or coda (Polish: Rubach & Booij 1990, French: Rialland 1994)

Description

Alternations (Bals Baal et al. 2012):

(1) Short C alternates with long CC after long vowels, but with overlong CCC after short vowels.

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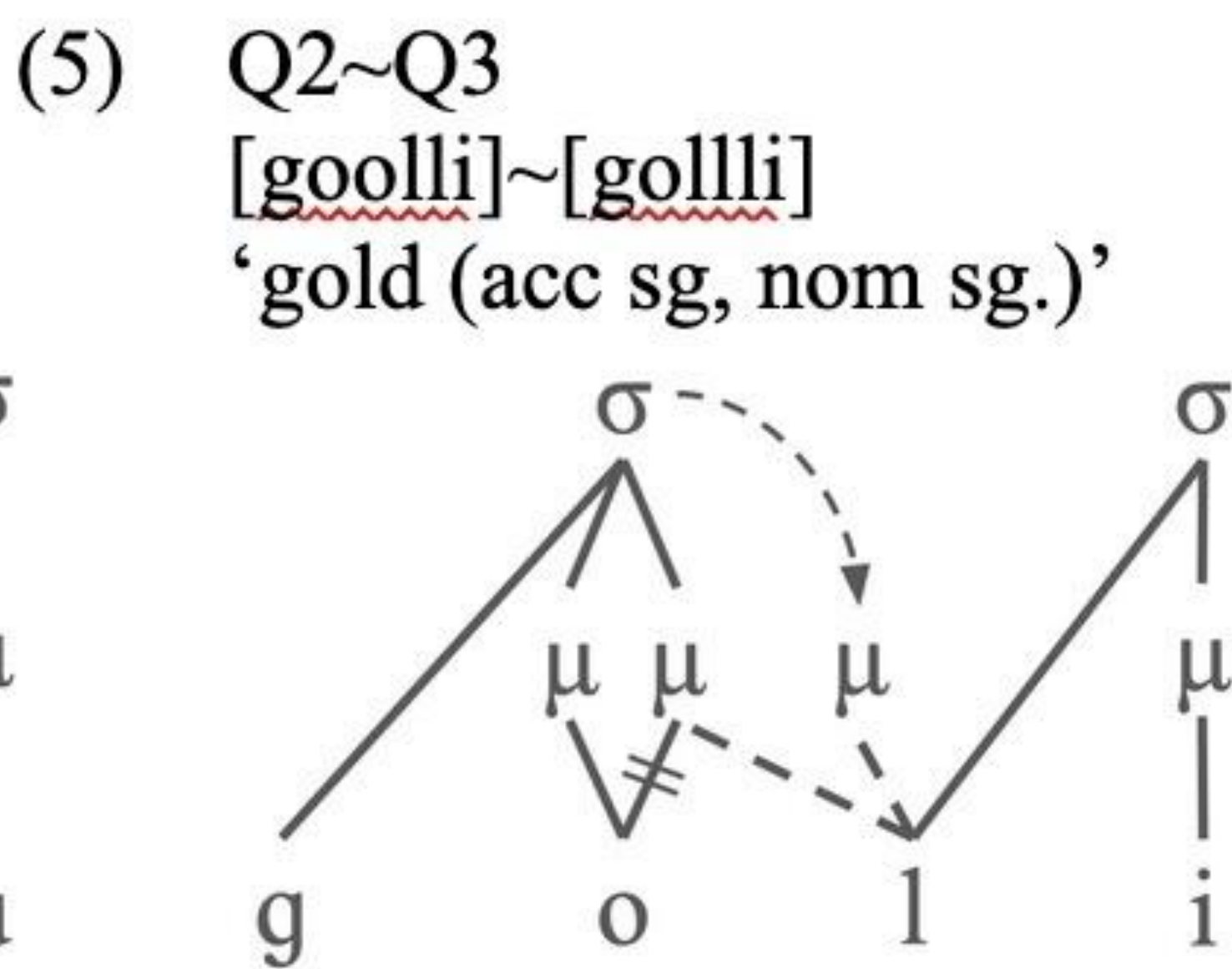
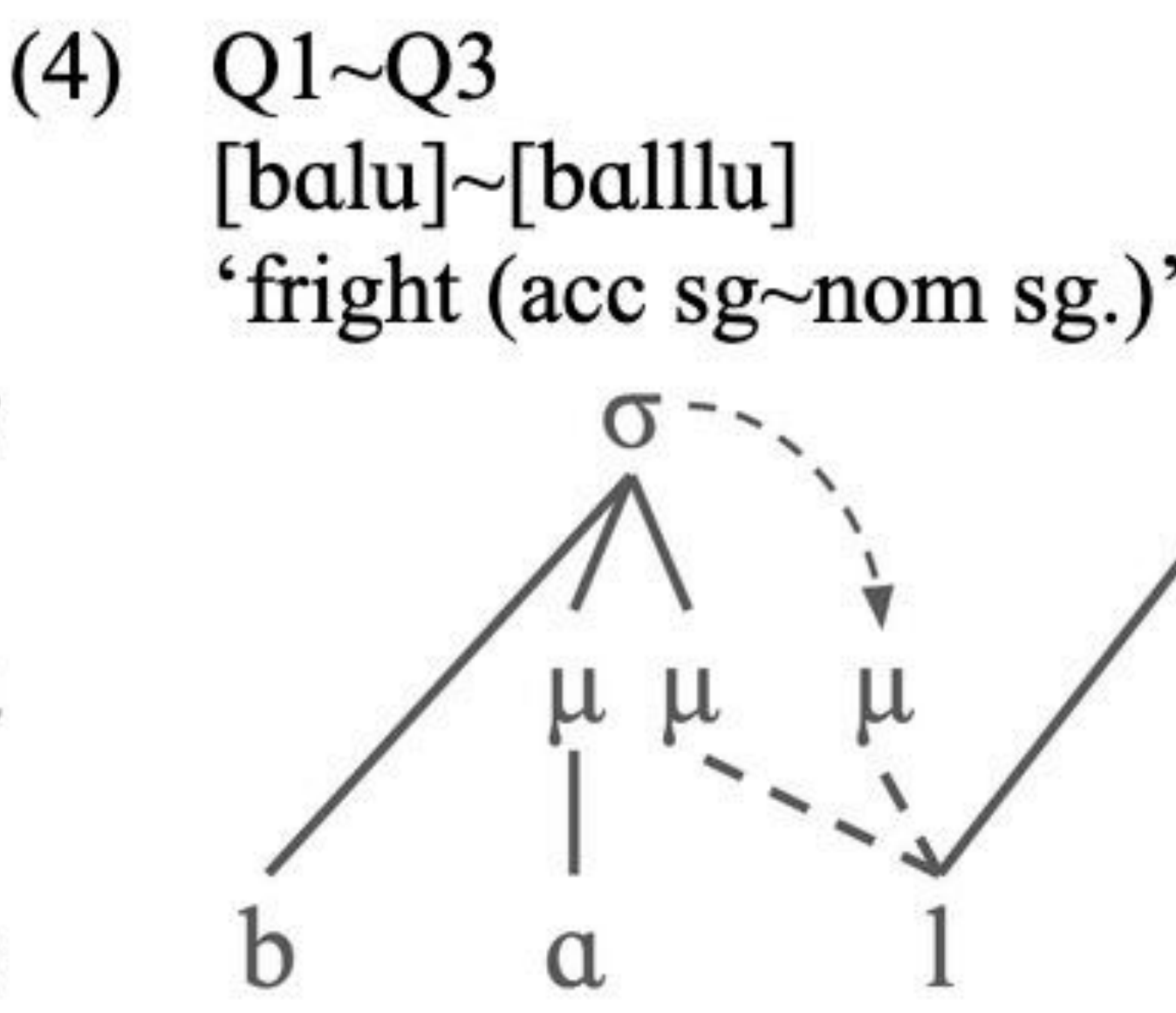
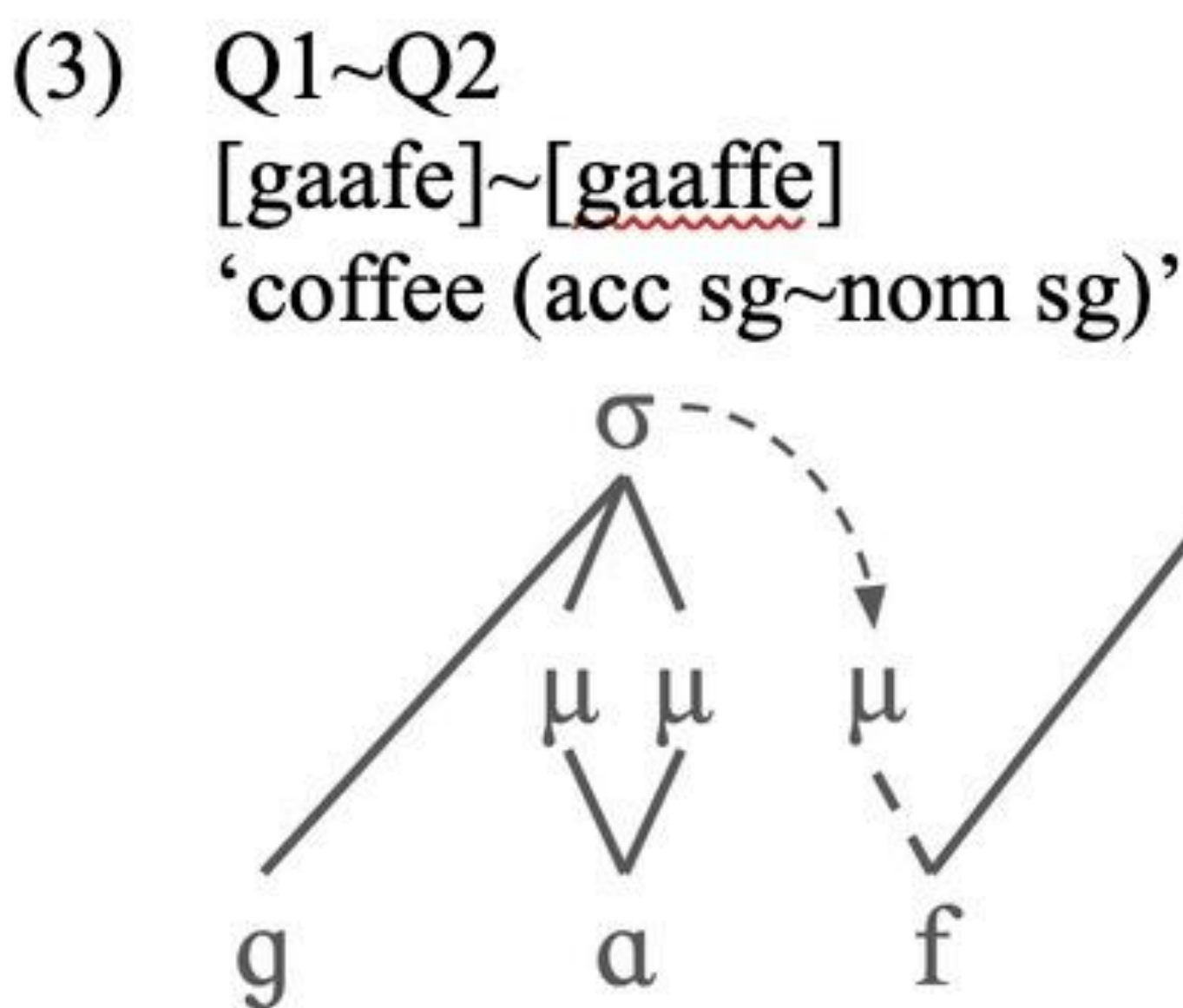
Phonotactics: geminates obligatorily word- and foot-medial

Analysis

Extrasyllabic moras are licensed following heavy syllables.

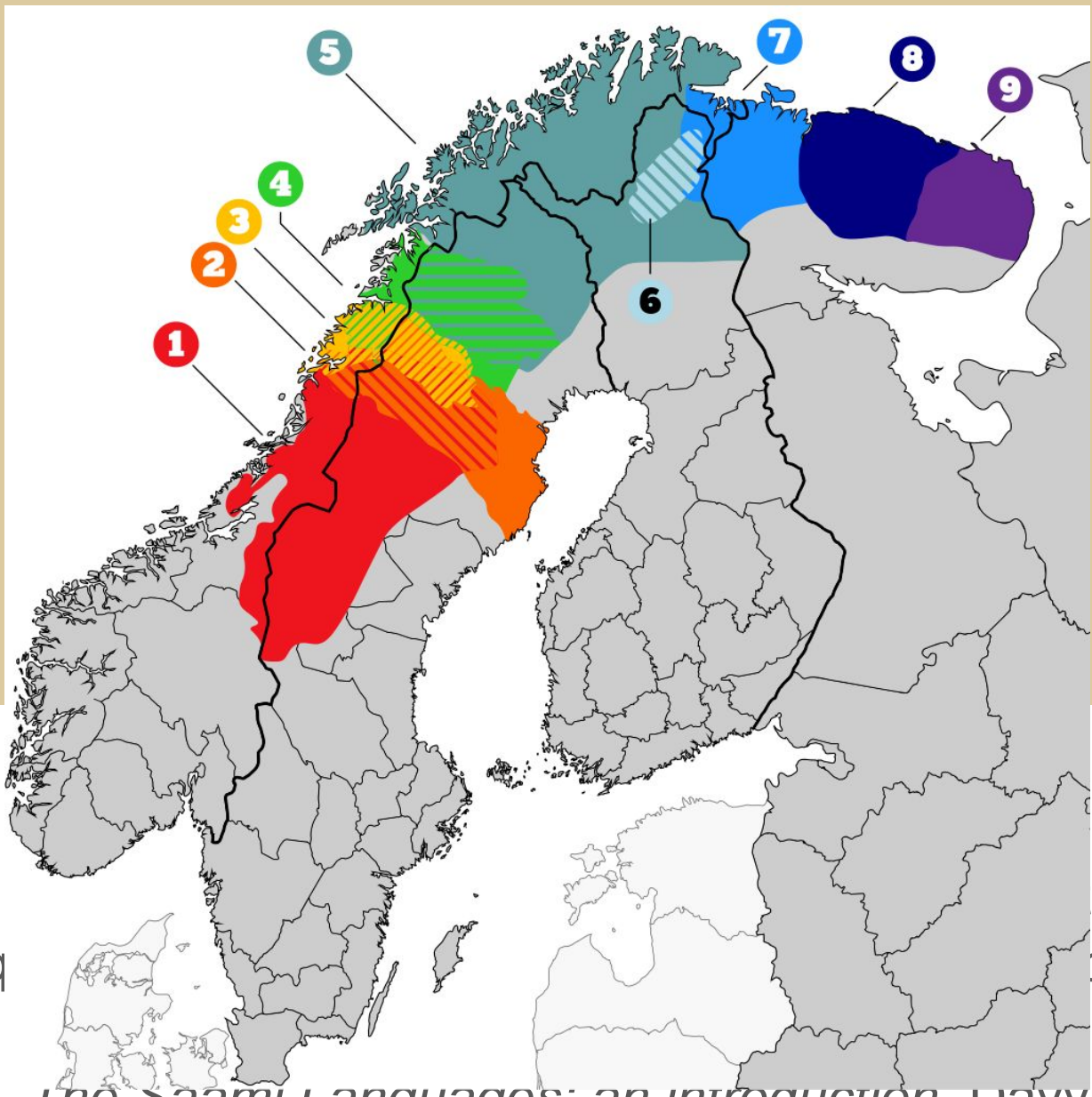
Strong grade is formed by lengthening the medial consonant.

- If /VV.C/:
insert non-moraic/extrasyllabic coda (3)
- If /V.C/:
need *a*lso insert mora (4)
- If /VVC.C/:
need compensatory shortening (5)



Implications

- **Aligns** with ~1:2:3 ratio of phonetic duration (Hiovain et al. 2020)
- **Explains** co-occurences of C and V lengths
- **Expands** the typology of attested extrasyllabic positions
 - resembles proposals that present multiple degrees of affiliation between a syllable and its consonants (e.g. Fujimura 2000, Shaw et al 2011).
- **Explains** diachronic conditions necessary to allow a 3-way consonant length contrast to arise.



References:

- Hiovain, K., Vainio, M., & Rie, S. (2020). Gradation patterns in Finnmark North Sámi q. *Journal of Linguistics*, 56(4), 2817-2828.
- Sammallah, P. (1998). *The Sámi Languages: an introduction*. Davvi Girji.
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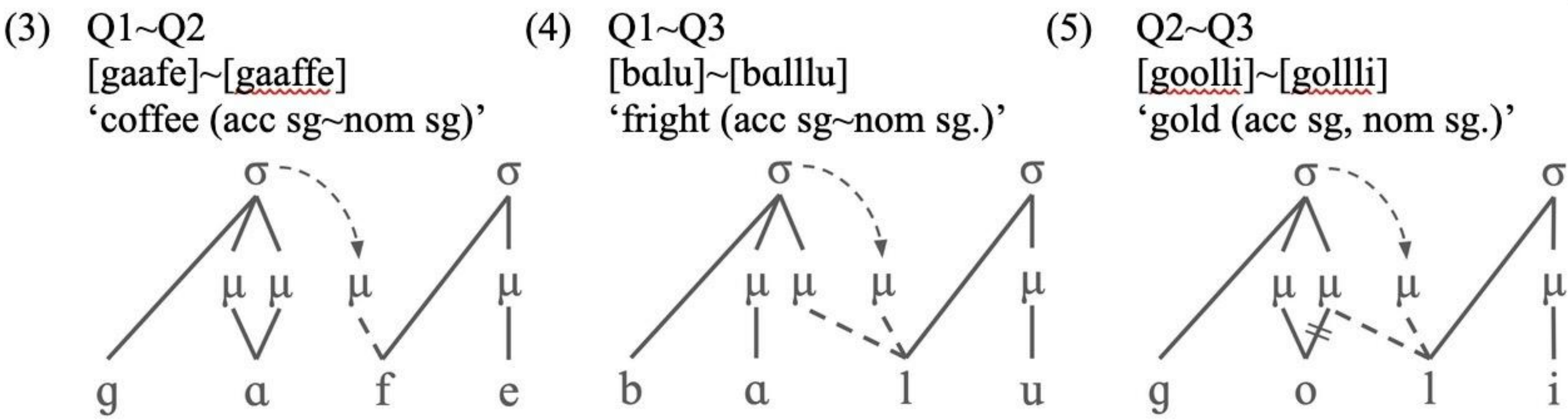
(2) Long CC alternates with overlong CCC, accompanied by vowel shortening:

- Q2~Q3: VVCC→VCCC

Analysis

Proposal: Extrasyllabic moras are licensed following heavy syllables.

The strong grade is formed by lengthening the medial consonant. A short consonant following a long vowel simply requires insertion of a non-moraic coda, as in (3). However, following a short vowel, an extra syllabic mora must also be inserted in order to license the non-moraic coda, as in (4). If the consonant is already long, it is instead made overlong through compensatory shortening of the preceding vowel, as in (5)



Implications

- **Northern Sámi:** Unlike extrasyllabic units at word boundaries, the North Sámi geminates are obligatorily word- and foot-medial. This expands the typology of attested extrasyllabic positions, resembling proposals that present multiple degrees of affiliation between a syllable and its consonants (e.g. Fujimura 2000, Shaw et al 2011). It also begins to offer an explanation for the conditions necessary to allow a 3-way consonant length contrast to arise.

References:

- Hiovain, K., Vainio, M., & Šimko, J. (2020). Dialectal variation of duration patterns in Finnmark North Sámi quantity. *The Journal of the Acoustical Society of America*, 147(4), 2817-2828.
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The effects of three-way consonant distinction in Northern Saami

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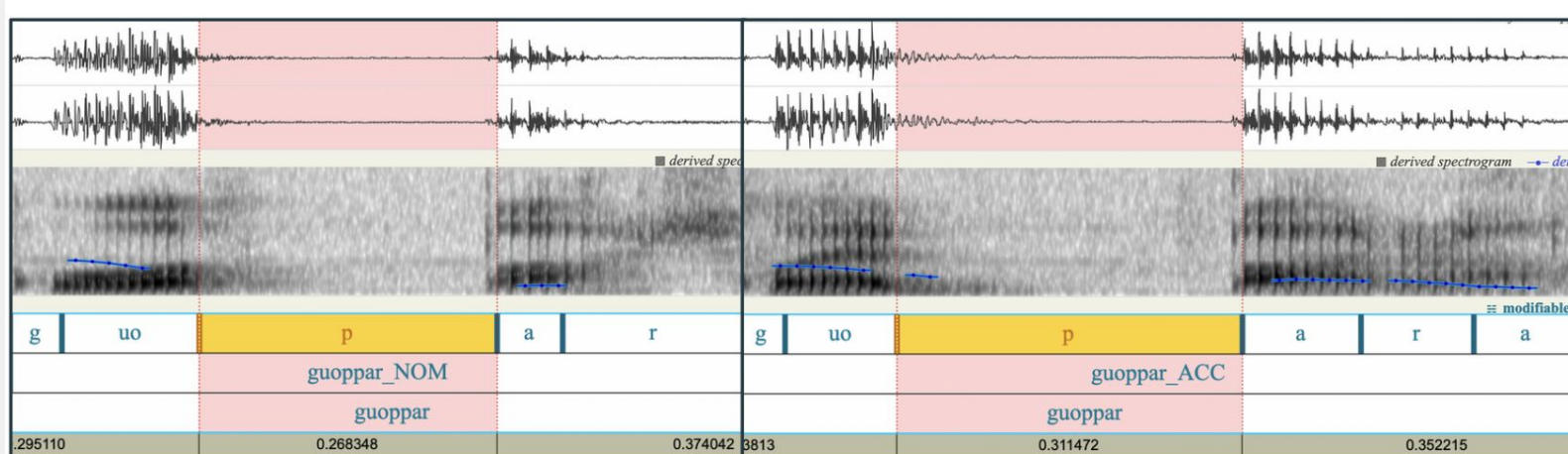
Typology

- **Northern Sami:** Gratic family, abt. 26,000 speakers
- **Three-way Consonants (all related):**
 - Estonian
 - Other Sámi languages (e.g. Skolt, Inari)
 - Endangered Finnic languages (e.g. Livonian, Ingrian)
- **Three-way Vowels:**
 - Dinka/Shilluck (Nilotic languages in South Sudan)
 - Yupik (Eskaleut languages in Alaska/East Russia)
 - Mixe (Mixe-Zoquean languages in Mexico)

Background

There are conflicting reports regarding the status of three-way contrasting consonant length in Northern Sámi, particularly between the Eastern and Western Finnmark dialects.

- The three lengths are generally referred to as **Quantity** (Q1, Q2, Q3) with Q1 being the shortest.
- The consonant lengths occur with most consonant types.
- In **nouns**, the Quantity types alternate between Nominative and Accusative case. Some nouns alternate between Q1 and Q2, others between Q2 and Q3, and rarely between Q1 and Q3.



Method

- Research study conducted in Tromsø, Norway
- **Three participants:**
 - XMS: Western dialect, 25, from Guovdageaidnu
 - IL: Eastern dialect, 20, from Kárásjoka
 - AJ: Eastern dialect, 60, from Kárásjoka
- **Carrier Sentences:**
 - *Dá oidno* _____ (for Nominative case)
 - *Mun oainnán* _____ (for Accusative case)
- **Praat:** 26 words manually segmented

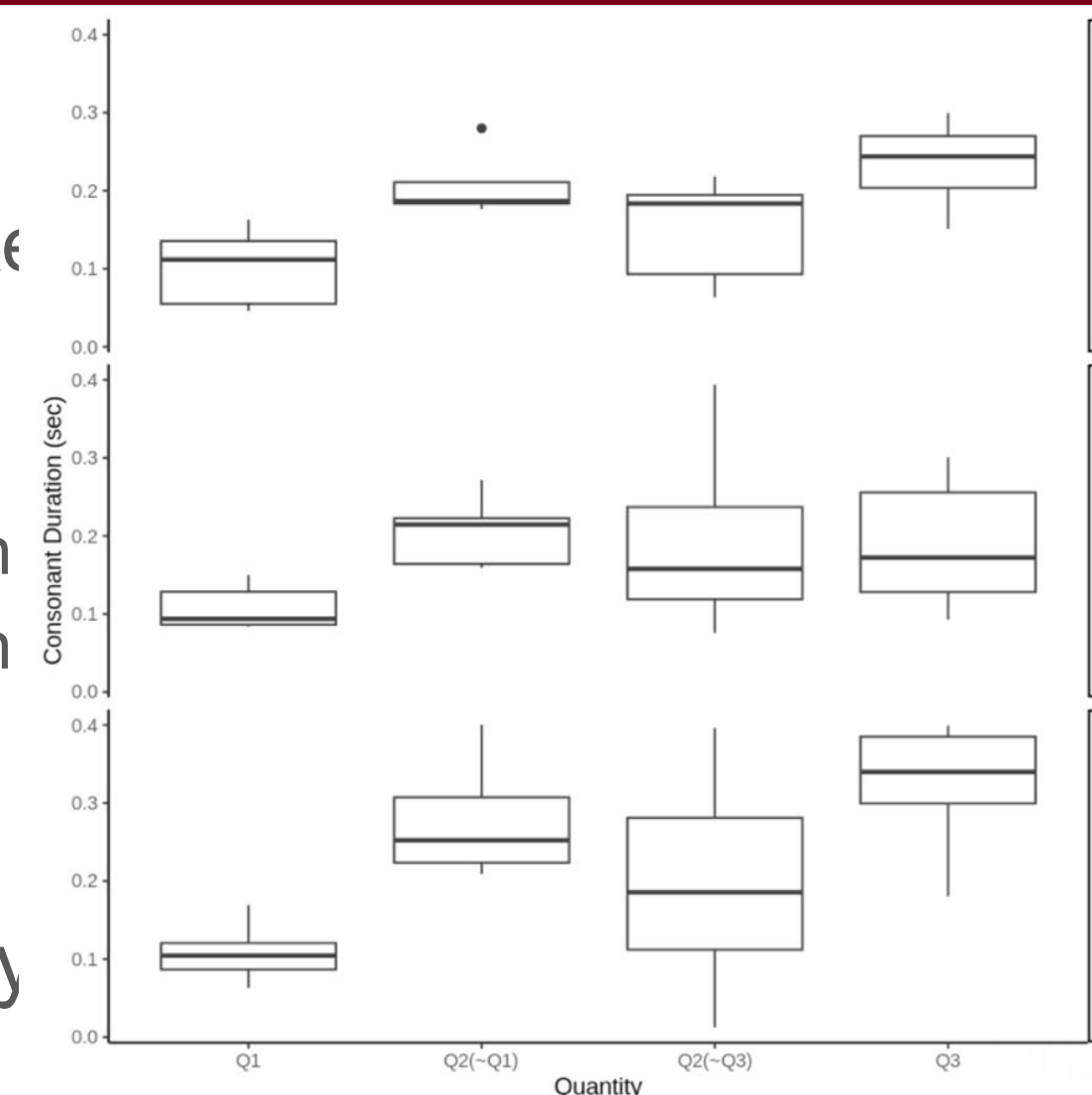
Empirical Results

Box Chart Explanation:

- Y-Axis on the left tracks the lengths
- Y-Axis on the right labels the speakers
- X-Axis gives the expected Q-type:
 - Q1: Shortest length
 - Q1~Q2: Middle length alternating with
 - Q2~Q3: Middle length alternating with
 - Q3: Longest length

Results:

- Speaker 1 (S1) has the three-way as expected
- Speaker 2 (S2) has collapsed the contrast between Q2 and Q3 (i.e. has lost the third length)
- Speaker 3 (S3) has the most extreme contrasts between all three length types



Map



Speaker 2

From Kárásjoka
No three-way contrast



Speaker 3

From Kárásjoka

Three-way contrast



Conflicting Reports

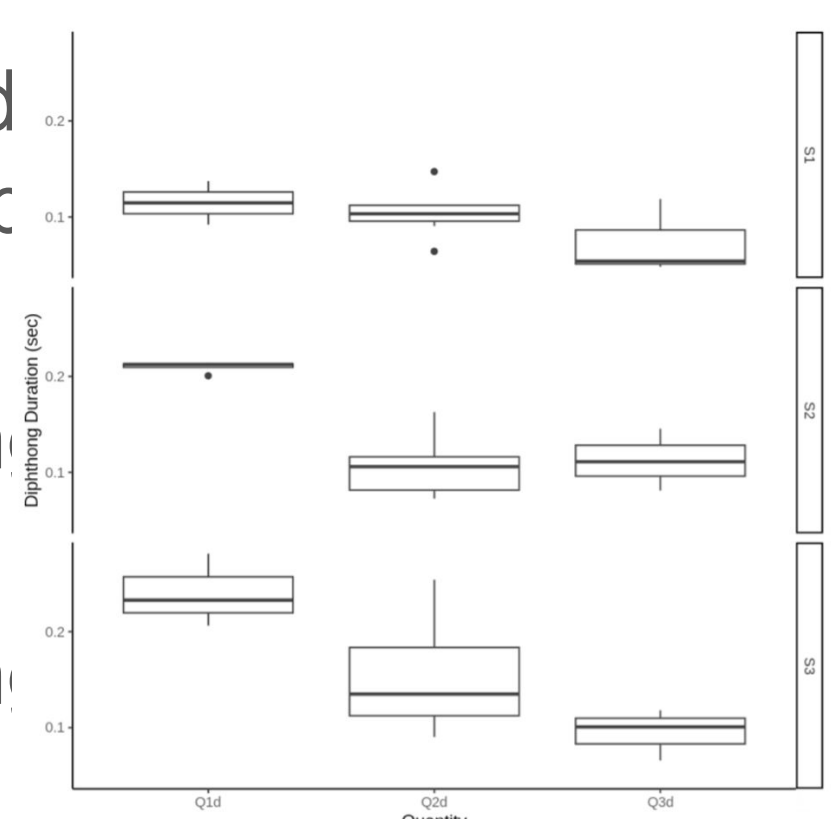
Sammallahti (1958): “The western dialects have retained the phonological opposition between long and short geminates, but the eastern ones have transferred the opposition to the vowels.” (p. 13)

Hiovain et al. (2020): Found that the western dialect did *not* have the three-way contrast (contrary to the majority of other studies). Found the eastern dialect *did* have the contrast (but only in the case of short preceding vowels)

Diphthong Durations

Diphthongs in the context of the three quantities (X-Axis) are placed in

- S1 does not appear to be a meaningful contrast
- S2 has a strong way contrast
- S3 has a strong way contrast



Summary

- Speaker 1 has the three-way contrast, following the pattern of most studies
- Speakers 2 and 3 diverge unexpectedly - one has the three way contrast, the other does not. This indicates that more research needs to be done on the Eastern dialect.
- Diphthongs do not appear to have a third length in Speaker 2. However, Speaker 3 initially appears to have a three-way difference.
- It appears that there may be an interaction between consonants and vowels, but only in speakers 2 and 3 of the Eastern dialect.

References:

- References.
- Hiovain, K., Vainio, M., & Šimko, J. (2020). Dialectal variation of duration patterns in Finnmark North Sámi quantity. *The Journal of the Acoustical Society of America*, 147(4), 2817-2828.
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