Forest Nenets monosyllabic shortening

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Intro: FNMS

The centerpiece of this talk is one phenomenon — Forest Nenets monosyllabic shortening (FNMS).

- Forest Nenets (Nenets < Samoyedic < Uralic) — endangered minority language of Russia
- Monosyllabic shortening := erasure of length contrast is favor of shortness in monosyllables

(1) Long $\longrightarrow$ short
ka̮ta [kată] — *ka̮* [kă] ‘ear.POSS.3SG’ — ‘ear’

Short $\longrightarrow$ short
tăλka̮t° [tăλkăt] — *tăλ* [tăλ] ‘fur.ABL’ — ‘fur’

Intro: FNMS

FNMS is weird

- Under the optimality-theoretic lens, MS is a rare case of *overwrite*, e.g. an otherwise faithful position losing its privileged status due to positional markedness (Kaplan 2015)
- From the Strict CV standpoint, MS corresponds to exceptional weakness of final empty nuclei (FENs), which is supposedly unattested (Balogné Bérces & Ulfsbjorninn 2023)
- Acoustically, MS is tricky: monosyllables exhibit a wide range of vowel durations, from 40 to 200+ ms

Intro: FNMS

Plan for today:

- The empirical part
  - Vowel duration data
  - Novel phonological observations: Raddoppiamento sintattico
- The theoretical part
  - FNMS as overwrite
  - FNMS as a problem in a Strict CV analysis

Forest Nenets

Forest Nenets

- Forest Nenets < Nenets < Samoyedic < Uralic
- Data sources:
  - fieldwork in Kharampur and Tarko-Sale (Yamalo-Nenets AO, Russia) in 2023 and 2024
  - descriptions by Sammallahti (1974) and Salminen (2007)

Map on the right from Salminen (2019)

Vowel inventory & syllable structure

- Length distinction only exisits under stress
- Reduction in unstressed syllables:
  - vowel length is neutralized in unstressed syllables
  - contrast between high and mid vowels disappears as well
- Possible syllable structures:
  - CVVC, CVC, CVV, CV under stress
  - CVC, CV elsewhere

Stressed syllables

ĭ i		ŭ u
ĕ e		ŏ o
ăĕ æ	ă a	

Unstressed syllables

	i	u
◌̥	æ	a

Stress

- ✶ Stress falls on odd-numbered non-final syllables

(2)
a.	*ˈkaλʼa* [kaλʼă]	‘fish’
b.	*ˈŋæwa* [ŋæwă]	‘head’
c.	*ˈkasama* [kasămă]	‘man’
d.	*ˈkaλi̯tăna* [kaλĭtănă]	‘fisher’

- ✶ Compensatory gemination after open syllables with short vowels

(3) *ˈwăta* [wătta] ‘hook’

Qualitative reduction

✂ In unstressed syllables, long mid vowels /e o/ become length-neutral /i u/

(4) a. *ˈpʼen°tˌλʼemæ* [pʼen°tλʼemæ̆] ‘hit.EVID’

b. *ˈpʼen°tλʼiʔ* [pʼen°tλʼĭʔ] ‘hit.CN’

(5) a. *ˈwedʼaʔˌkota* [wedʼăʰkota] ‘dog.POSS.3SG’

b. *ˈwedʼaʔku* [wedʼăʰkŭ] ‘dog’

Monosyllables

- In monosyllables, length contrast disappears (despite stress)
- Optional qualitative reduction
- Therefore, monosyllables are the only context where short mid vowels /ĕ ŏ/ occur

(6) *tŏ* [tŭ ∼ tŏ] ‘lake’

n′ĕ [n′ĭ ∼ n′ĕ] ‘woman’

s′ĕ [s′ĭ ∼ s′ĕ] ‘mouth’

Monosyllables

- ★ Short /ĕ ŏ/ correspond to long /e o/ in polysyllabic word forms (Salminen 2007)
- ★ They are better understood as long /e o/, which surface as short in monosyllables

(7)

tŏ [tŭ ∼ tŏ] – *to-n°* [ton]	‘lake’ – ‘lake-DAT.SG’
n′ĕ [n′ĭ ∼ n′ĕ] – *n′e-ta* [n′etă]	‘woman’ – ‘woman-POSS.3SG’
s′ĕ [s′ĭ ∼ s′ĕ] – *s′e-j°* [s′ej]	‘mouth’ – ‘mouth-POSS.1SG’

Questions for an instrumental study

Not a lot of acoustic data is available on FN.

Questions I set out to answer:

- How do surface vowel durations correspond to the underlying length distinction?
- What is the distribution of duration in unstressed syllables? i.e. what is the “neutral length” like phonetically?
- Once the length-duration link is established, how do monosyllables fit into the picture?

Acoustic data

Data sources

Fieldwork in Tarko-Sale (Yamalo-Nenets Autonomous Okrug)

- June–July 2023 and July 2024
- 11 consultants (3 male, 8 female)
- Zoom H1n 48k 16bit
- Manual annotation by me in Praat (Boersma 2021)
- 3906 word tokens

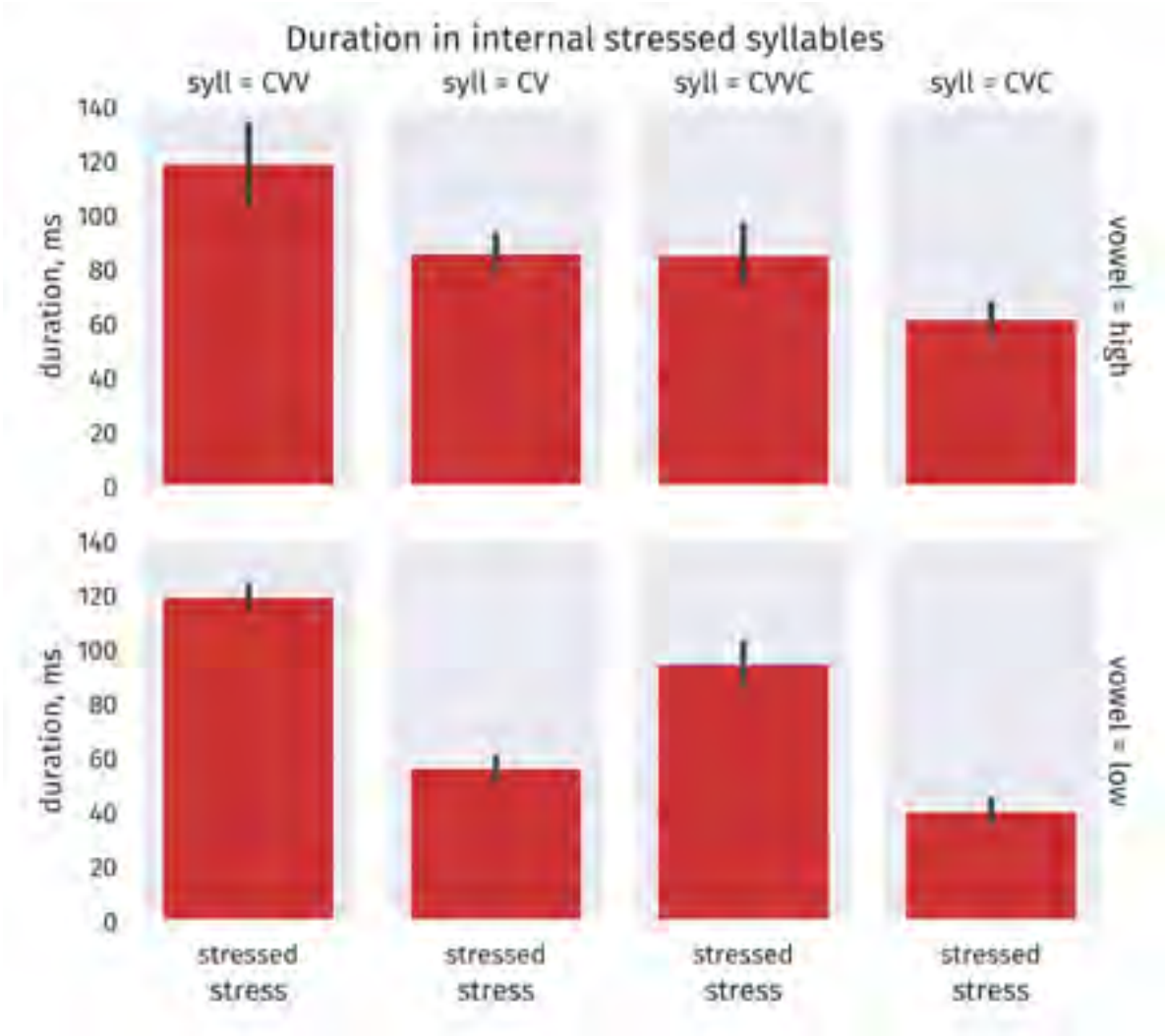
Questionnaire

The questionnaire was balanced to the best of my ability according to several parameters:

- Syllable structure: CV, CVC, CVV, CVVC
- Stress: yes, no
- Syllable count: monosyllable, polysyllabic
- Syllable position: initial, medial, final
- Vowel quality
  - low /a, ă/
  - mid /e, o, ĕ, ŏ/
  - high /i, u, ĭ, ŭ/

Length-duration relationship under stress

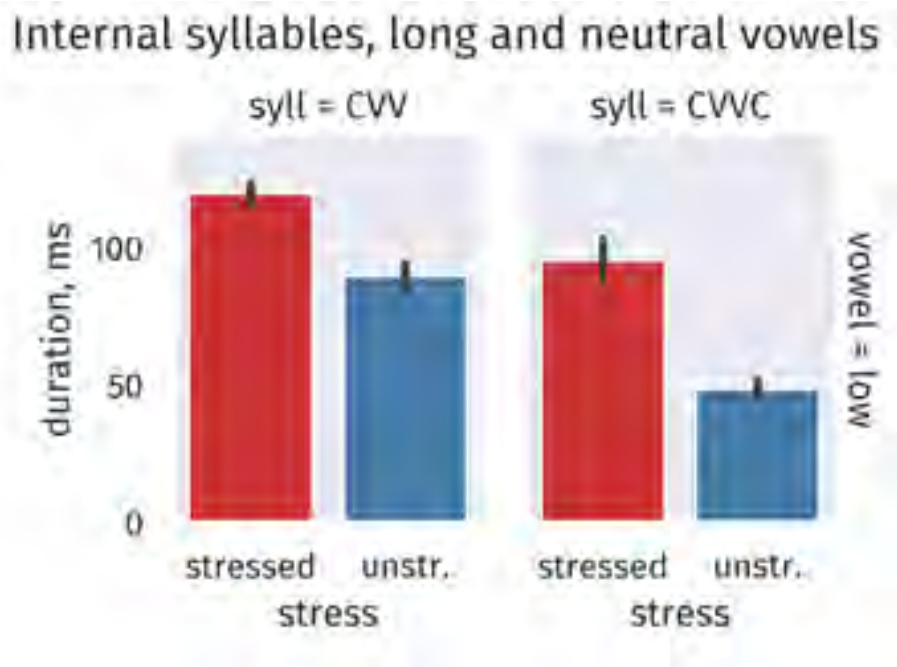
In stressed syllables, expectedly, CVV > CVVC > CV > CVC



Length neutralization, polysyllabic words

Unstressed vowels (blue in the barplot)

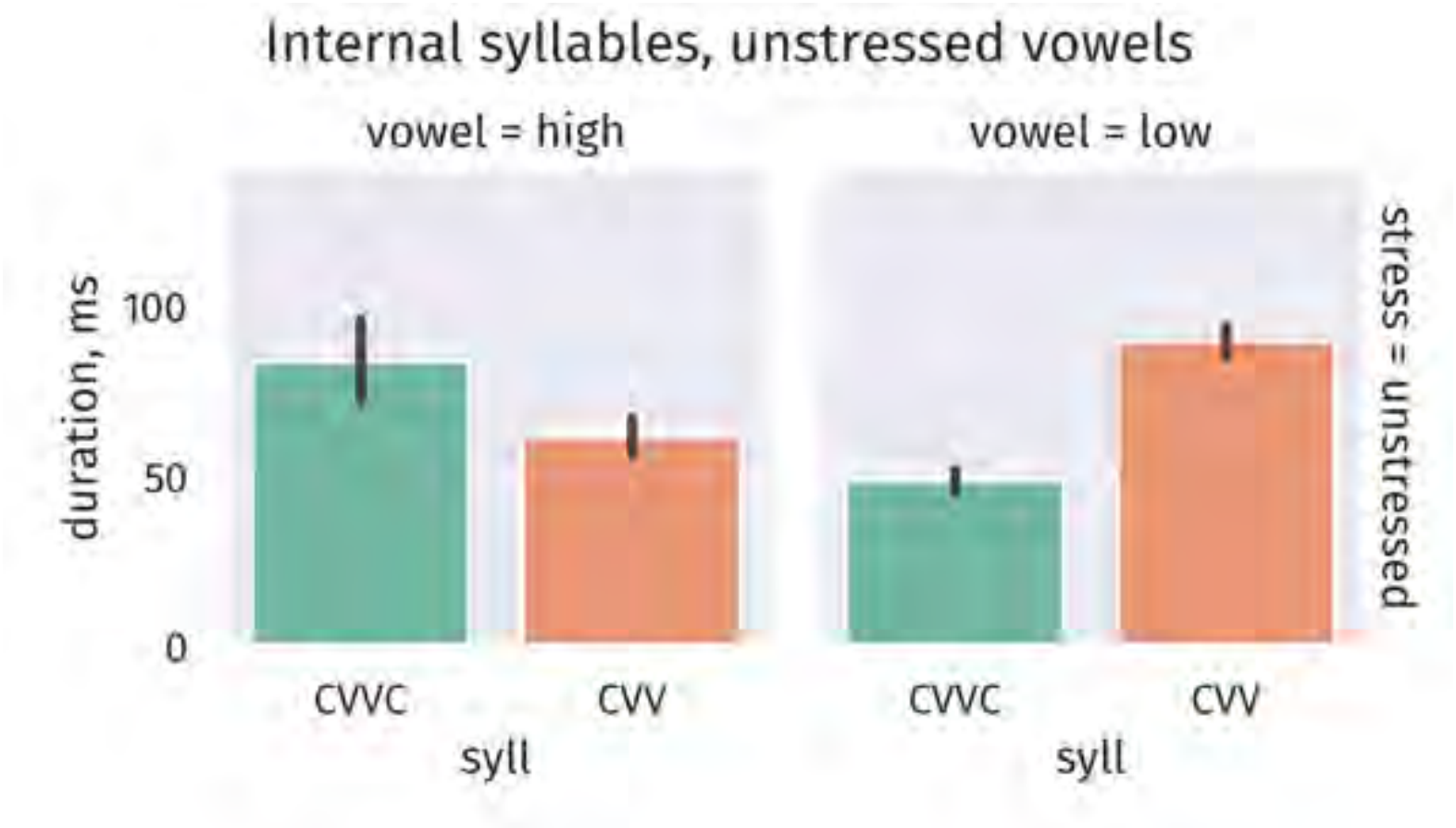
- Long: much longer than neutral
- Short: a little shorter than neutral



Variable duration in unstressed positions

Unstressed vowels vary significantly in duration

- Between closed and open syllables: closure decreases duration
- (exception: high vowels…)



Variable duration in unstressed positions

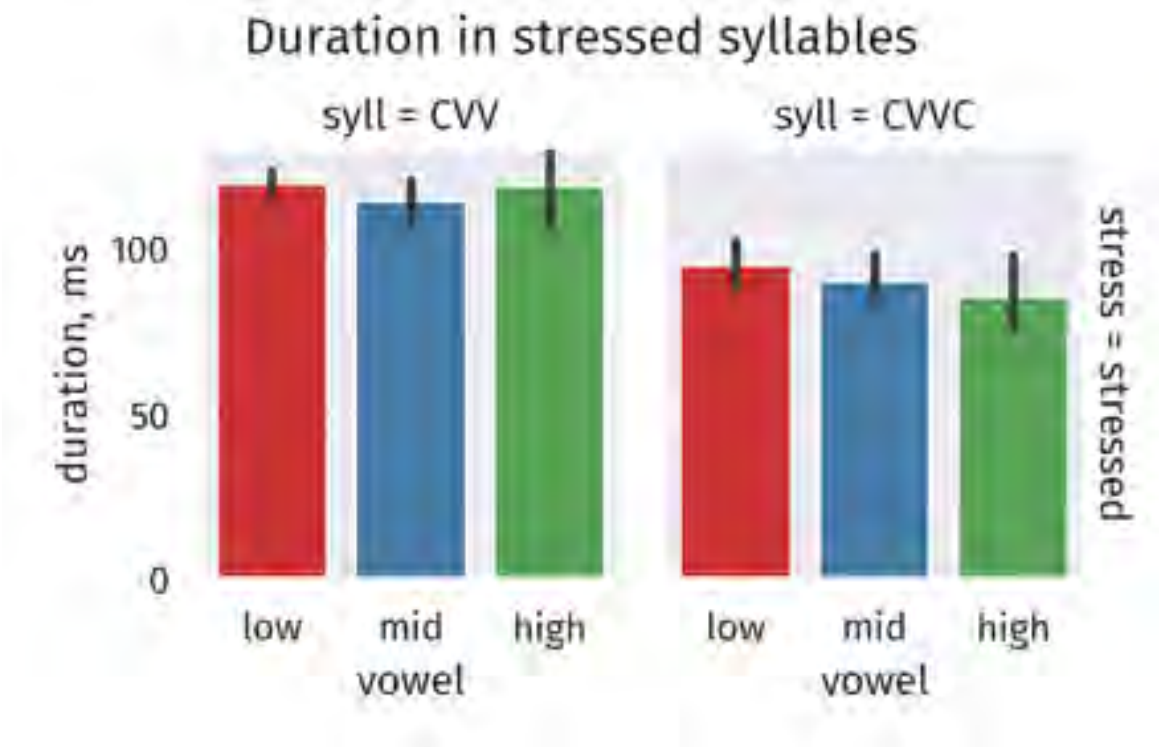
Unstressed vowels vary significantly in duration

- Depending on the weight distribution in the disyllabic word
- Initial CV $\Rightarrow$ the second unstressed vowel will have increased duration

word	segment	mean, ms	std, ms	count
kŭ.**ńaŋ**	a	**183.35**	29.37	5
ʔa.**ńaŋ**	a	72.00	17.67	3
tă.n°.**šaŋ**	a	81.72	11.28	3

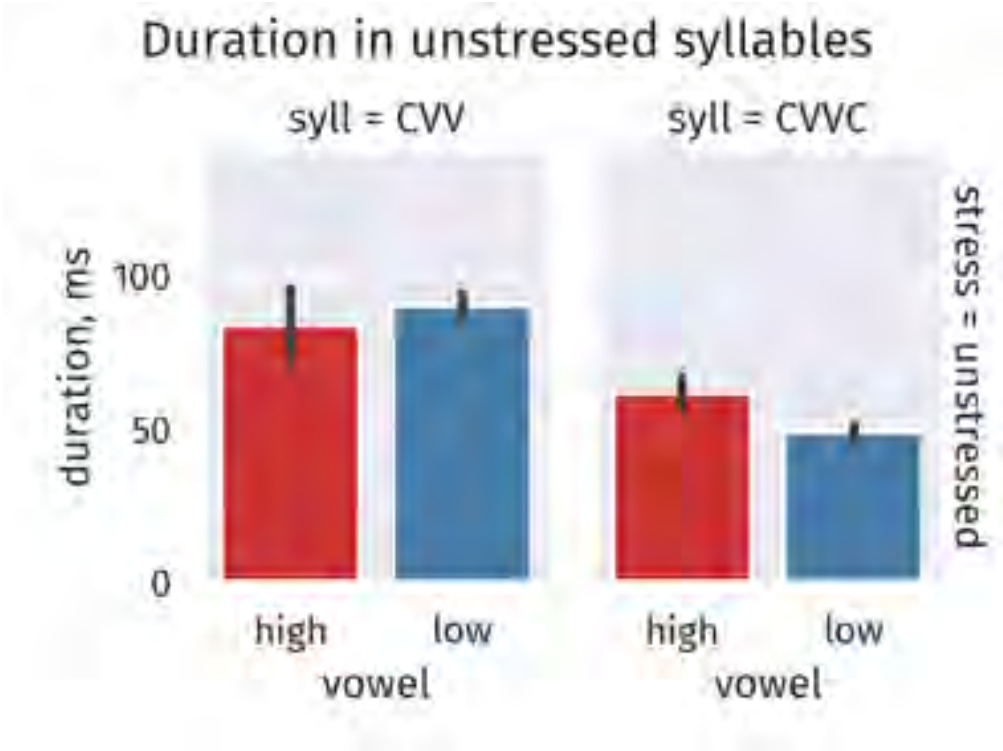
Vowel quality under stress

- Higher rank on the sonority hierarchy corresponds to greater duration (Kenstowicz 1997, de Lacy 2002, Parker 2002)
- We expect low > (mid) > high
- Under stress, vowel quality has no significant bearing on duration



Vowel quality without stress

- ✍ In unstressed vowels, vowel quality has no significance either



Durations in polysyllabic words: takeaway

- Long vowels are longer
- Short vowels are shorter
- In unstressed syllables, two other factors influence surface duration
  - Open syllables contain longer vowels (also true for stressed positions)
  - Final syllables that follow a CV have longer vowels
- Vowel sonority has no significant effect on duration

Monosyllables

If FNMS is real, we expect the majority of the following to be true:

- ♠ Length neutralization: durations of long and short vowels in monosyllables diverge less than in their polysyllabic forms
  - ♥ Before that, we have to make sure that both short and long vowels are indeed observed in monosyllables
- ♠ SHORTening: vowels in monosyllables are comparable in duration to short word-internal vowels
- ♠ ShortENING: vowels in monosyllables are shorter than in respective polysyllabic forms

All kinds of monosyllables are there

All (underlying) syllable structures are observed in monosyllables: CV, CVV, CVC, CVVC.

Syll	**Word**	**Meaning**	**Polysyllabic form**	**Gloss**
CV	*tŭ*	fire	*tŭta* [tŭttă]	fire-POSS.3SG
CVV	*d'a*	flour	*d'ata* [d'ată]	flour-POSS.3SG
CVC	*tăλ*	fur	*tăλkăt°* [tăλkăt ∼ tăλkătĭ]	fur-ABL
CVVC	*kĕm*	blood	*kemta* [kemtă]	blood-POSS.3SG

All kinds of monosyllables are there

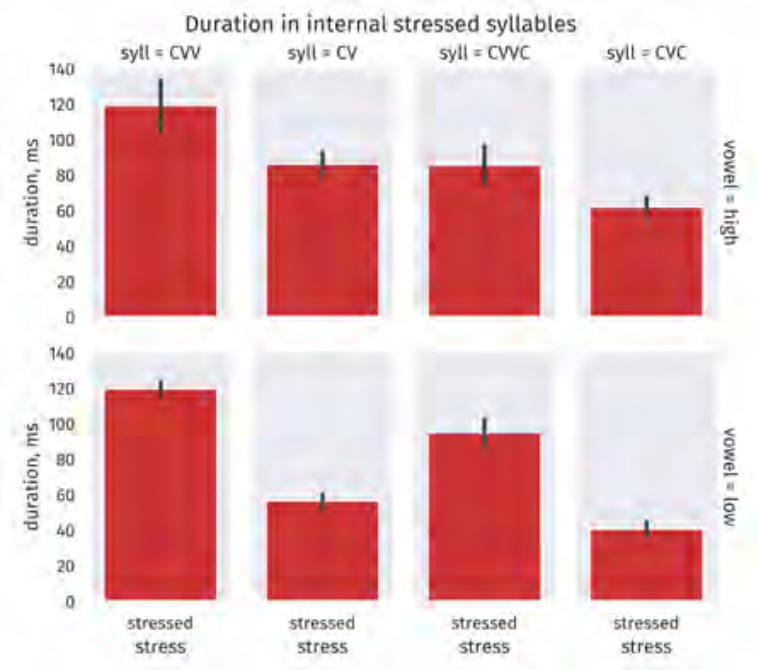
In short CV/CVC monosyllables the vowel is shortened compared to the bare monosyllable, whereas in long CVV/CVVC it is lengthened.

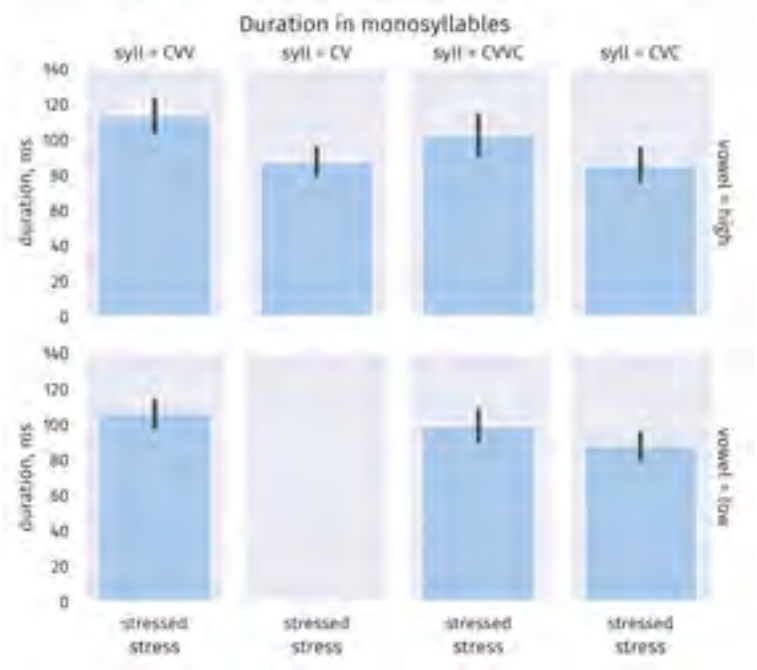
word	segment	mean, ms	std, ms	count
tŭ	ŭ	97.83	35.73	11
tŭ.ta	ŭ	62.82	18.25	5
d’a	a	142.49	48.68	17
d’a.ta	a	133.68	35.08	7
tăʌ	ă	100.49	17.73	20
tăʌ.kă.t°	ă	40.68	8.1	3
kem	e	101.16	38.0	13
kem.ta	e	121.3	31.39	4

Length neutralization

In monosyllables, durations are less divergent than in stressed internal syllables

- Neutralization does happen
- The resulting neutral length is not short though





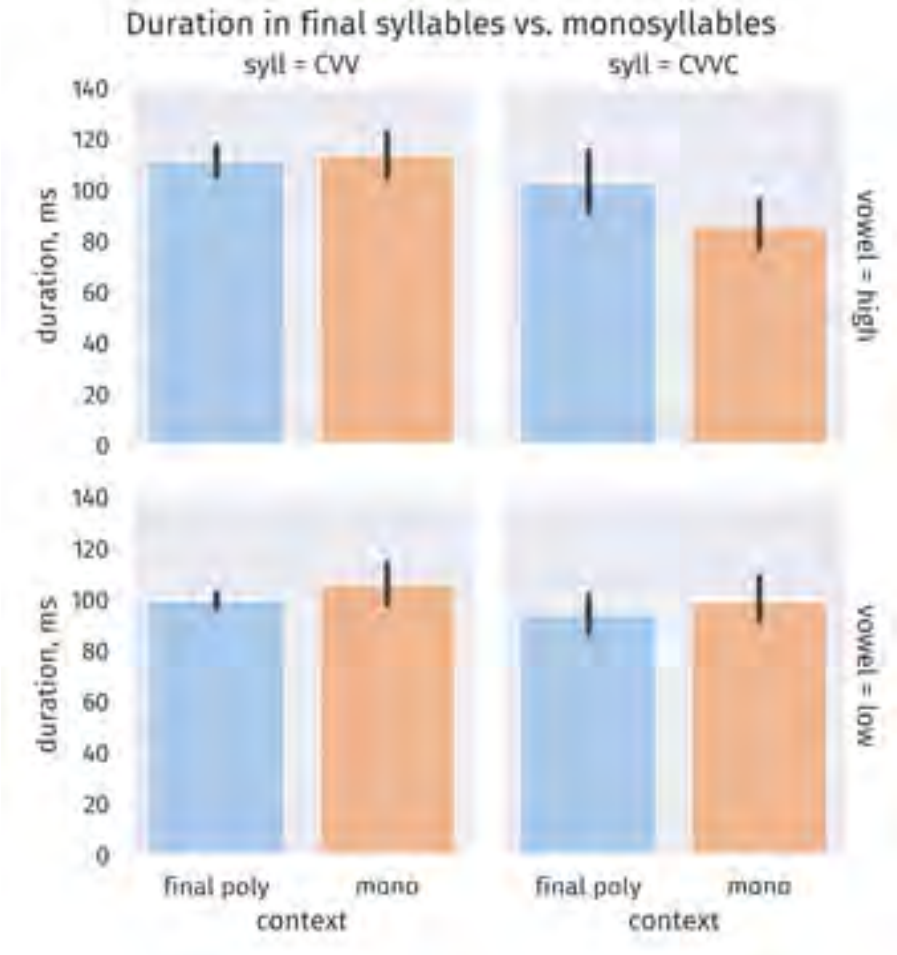
Shortening

There is no SHORTening: vowels in monosyllables are not comparable to short vowels proper

word	segment	mean, ms	std, ms	count
pǐ.lʲ´a	ǐ	48.08	11.18	5
tǐ	ǐ	105.71	29.06	15
šǐ	ǐ	118.39	13.72	16
ńi.mă.š°	i	134.53	38.06	2

Shortening

Rather than stressed short vowels, vowels in monosyllables resemble those in final syllables



Durations in monosyllables: takeaway

- ☆ Length neutralization: yes
- ☆ Shortening: not exactly

FNMS appears to be a case of neutralization but not necessarily shortening

- ✪ I contend that MS can hypothetically be construed as a mere loss of contrast, not necessarily in the shortening direction
- ✪ There is, however, another fact that supports the shortening story

Phonological addendum: Raddoppiamento

Raddoppiamento sintattico in FN

A subset of FN speakers interviewed do compensatory gemination after stressed open monosyllables

- just like after stressed internal CV in FN
- or like the Italian Raddopiameto Sintattico (Larsen 1998)

(8) a. Raddopiameto Sintattico proper

paltó pulito [paltoppulito] ‘clean coat’
cittá triste [tšittattriste] ‘sad city’

b. Raddopiameto Sintattico in Forest Nenets

tǐ ḿind’a [tǐḿḿind’a] ‘reindeer goes’
d’a kăm°tuma [d’ăkkămtuma] ‘flour poured out’

Raddoppiamento sintattico in FN

FN Raddoppiamento sintattico facts point to the existence of MS as a phonological process, overthrowing several hypotheses at once:

- **MS IS A PHONETIC ARTIFACT/ISOLATED FORM EFFECT**
  In connected speech, the shortening does not disappear but rather becomes more noticeable
- **MONOSYLLABLES DO NOT BEAR STRESS**
  Monosyllables are indeed stressed because they still receive extra syllabic weight by means of gemination

There are concerns to be addressed in further studies, e.g. the behavior of closed monosyllables.

FNMS exists. Now what?

The significance of FNMS

Contrast disappearing in monosyllables is not really expected

- Stressed and initial syllables are among the positions that preserve more contrast than others (Beckman 1998)
- Monosyllables have been observed to resist morphophonological alternations (Becker, Nevins & Levine 2012, Becker, Clemens & Nevins 2017)

Monosyllable privilege

The monosyllable in FN is both a privileged position and a target for neutralization

- The monosyllable is initial
- Therefore, it is stressed and supposed to preserve length and quality contrasts
- However, the monosyllable is also final
- Therefore, both of these distinctions must be erased

Neutralization almost completely wins — only the quality contrast is partially preserved (recall the short mid vowels /ĕ ŏ/)

(9) *xĕλ* [xĕλ ∼ xĭλ] ‘salt’
tŏ [tŏ ∼ tŭ] ‘lake’

Overwrite and an OT view on FNMS

Two ways to manage neutralization

In Optimality Theory, two types of constraints can be responsible for preservation/loss of contrast:

- **Positional faithfulness**
  maintain the feature ϕ in the position P
  Hence, +ϕ/-ϕ contrast is preserved in P
- **Positional markedness**
  feature ϕ is banned in position P
  Hence, ϕ is neutralized in P

FN: stressed syllable privilege vs. final syllable disadvantage

As mentioned before, the monosyllable hosts a conflict between preservation and neutralization

- The stressed syllable is a position of faithfulness wrt. length
- At the same time, length is marked in the final syllable
- The solution is simple: markedness $\gg$ faithfulness

(10) Ranking of positional constraints of length in FN

*VV-FINAL $\gg$ LICENSE(VV, STRESSED) $\gg$ IDENT-IO(LENGTH)/STRESSED

FN: stressed syllable privilege vs. final syllable disadvantage

- *VV-FINAL: long vowels are prohibited in final syllables
- LICENSE(VV, STRESSED): assign a violation mark to any occurrence of VV in an unstressed position
- IDENT-IO(LENGTH)/STRESSED: length must be identical between input and output under stress

(11) Ranking of positional constraints of length in FN

*VV-FINAL ≫ LICENSE(VV, STRESSED) ≫ IDENT-IO(LENGTH)/STRESSED

Extending the typology of overwrite

The case of a protected position being infringed upon by neutralization is referred to by Kaplan (2015) as overwrite

- The known examples of overwrite targeting stressed initial syllables overwhelmingly involve assimilation (Kaplan 2015, Zhang 2020)
- Therefore, FN makes a valuable addition to the typology with a different kind of process — vowel length neutralization

Strict CV analysis

View on FNMS from Strict CV

In a Strict CV analysis developed with Shanti Ulfsbjorninn and presented in previous talks (Belov & Shikunova 2023, Shikunova 2024), MS sticks out like a sore thumb

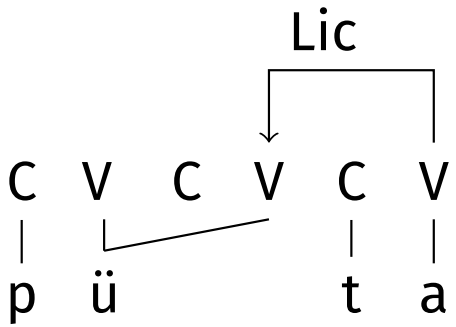
- ♥ Length preservation as a function of stress is impossible to model because the distribution of weight between stressed and unstressed syllables is uneven
- ♥ Licensing-based length preservation does work: all we have to do is to make the final position exceptionally weak
- ♥ However, such an account breaks the universal that there are no exceptionally weak FENs

Positional and prosodic strength in vowels

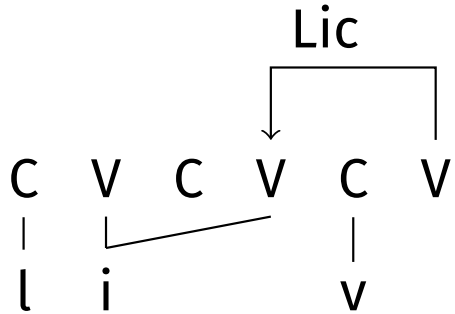
In Strict CV (Kaye, Lowenstamm & Vergnaud 1990, Scheer 2004), length in vowels can be licensed positionally

- Length is represented as bipositionality
- A second position has to be licensed by a filled or a licensing empty nucleus (e.g. final empty nucleus, FEN)

(12) Licensing by filled nucleus
püüta 'catch.INF' (Votic)



(13) FEN licensor
liiv 'sand' (Votic)



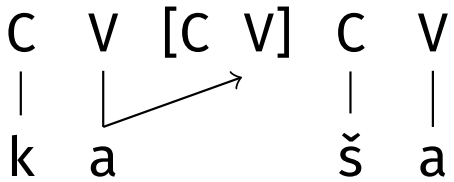
Votic < Finnic < Uralic

Positional and prosodic strength in vowels

Length can also appear as a result of stress assignment

- Empty CV as a stress exponent (Szigetvári & Scheer 2005) commonly lengthens vowels
- Prosody is therefore also a source of bipositionality

(14) Russian: *kaša* [kašə] ‘porridge’

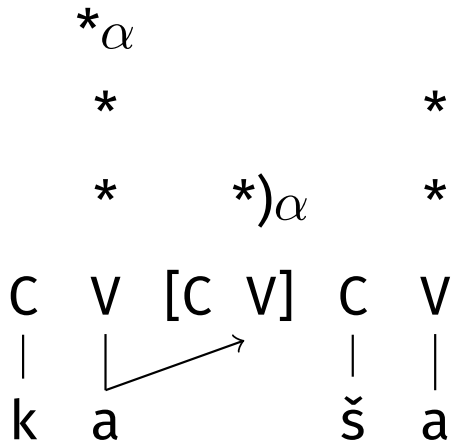


Positional and prosodic strength in vowels

- **Strict CV Metrics** (Faust & Ulfsbjorninn 2018, Faust 2023) is another approach prosodic strength
- Grid theories of stress + CVCV-representations
- Empty V-slots can be parametrized to project
  - second V-slots in bipositional vowels
  - final empty nuclei
  - medial empty nuclei
- **Incorporation** allows filled V-slots to consume the projection(s) of empty nuclei on their right

Incorporation: example

(15) Russian: *kaša* [kašə] ‘porridge’



Positional and prosodic strength in vowels

Projection and licensing abilities in empty nuclei are due to distinct sets of parameters

- With licensing, there is an implicational universal
- If superheavy syllables occur word-medially, they also occur word-finally (Balogné Bérces & Ulfsbjorninn 2023)
- CVVC.CV $\Rightarrow$ CVVC#, MEN $\Rightarrow$ FEN
- MENs cannot be licensors to the exception of FENs
- With respect to projection, FENs and MENs are independently parametrized (Faust & Ulfsbjorninn 2018)

Bolstering or reduction?

What exactly is the relationship between stress and length?

- ☛ Stressed syllables are heavier than the unstressed ones in FN
- ☛ **Bolstering** in stressed syllables or **reduction** in unstressed syllables?

Let us adopt Standard Metrical theory of Hayes (1995) to look at what does and does not have weight in FN:

- ✯ Vowels are moraic because there is metrics-induced shortening
- ✯ Codas are moraic, since codas in stressed CVC syllables are not geminated (as opposed to CV)
- ✯ Therefore, FN has monomoraic CV, bimoraic CVV and CVC and trimoraic CVVC

Just reduction?

- A reduction-only approach fails
- Impossible to account for compensatory gemination

Stressed		**Unstressed**
CV(C)	$\longleftarrow +1$ mora	CV
CVC	$=$	CVC
CVV	-1 mora $\longrightarrow$	CV
CVVC	-1 mora $\longrightarrow$	CVC

Just bolstering?

- ✶ Suppose that all metrical effects on length come from bolstering
- ✶ All vowels are short, but some of them are lexically specified to lengthen under stress
- ✶ Lengthening is due to insertion of extra syllabic space

Stressed		**Unstressed**
CV(C)	$\longleftarrow +1$ mora	CV
CVC	$=$	CVC
CVV	$\longleftarrow +1$ mora	CV
CVVC	$\longleftarrow +1$ mora	CVC

Just bolstering?

- Bolstering-only approach does not work either
- Compensatory gemination $\Rightarrow$ stressed syllable has to be bimoraic
- The moraic coda in CVC satisfies this requirement
- CVVC would not be expected to appear from underlying CVC

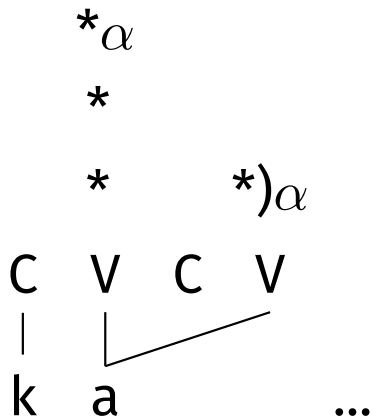
Stressed		**Unstressed**
CV(C)	$\longleftarrow +1$ mora	CV
CVC	$=$	CVC
CVV	$\longleftarrow +1$ mora	CV
CVVC	$\longleftarrow +1$ mora	CVC

Bolstering + reduction

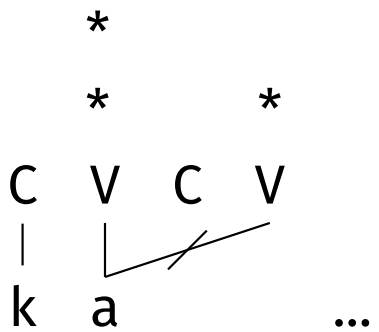
I propose that stress in FN preserves length, while inserting syllabic space where necessary

- **Incorporation as a stress exponent**
  Every odd vowel is an incorporator
- **Incorporation as a condition on association**
  En empty nucleus has to be incorporated in order to stay associated

(16) Stressed long vowel



(17) Unstressed long vowel



Bolstering + reduction

- Stressed vowel must project to L3
- Vowels in CV syllables do not have anything to incorporate $\Rightarrow$ an extra CV-unit, which causes gemination
- Only word-medial empty nuclei project $\Rightarrow$ no final stress, no gemination in stressed CVC

Interim summary

- Length can occur anywhere in the underlying representation
- Whether or not it appears on the surface is decided by stress
- L3 projection requirement gives us bolstering
- Incorporation as a condition on association gives us preservation of length by stress and reduction of unstressed vowels

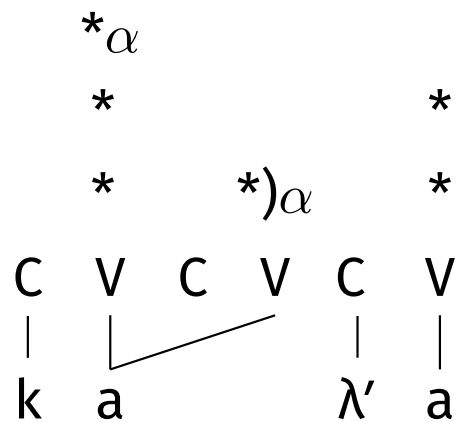
Do we need positional licensing? (the answer is yes, apparently)

Incorporation, illustrated

CVV

- ☞ Second position of a long vowel incorporated

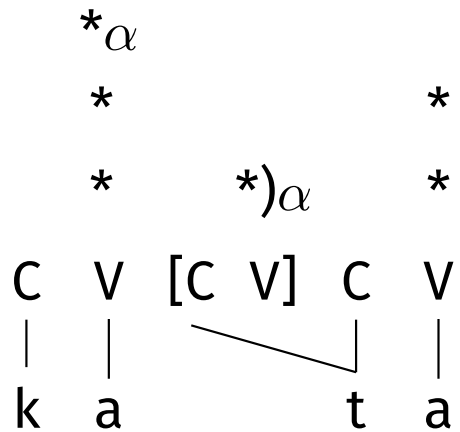
(18) *ʼka.λʼa* [kaλʼă] ‘fish’



CV

- ☆ CV inserted to be incorporated
- ☆ Empty CV is taken by the onset of the next syllable
- ☆ Compensatory gemination

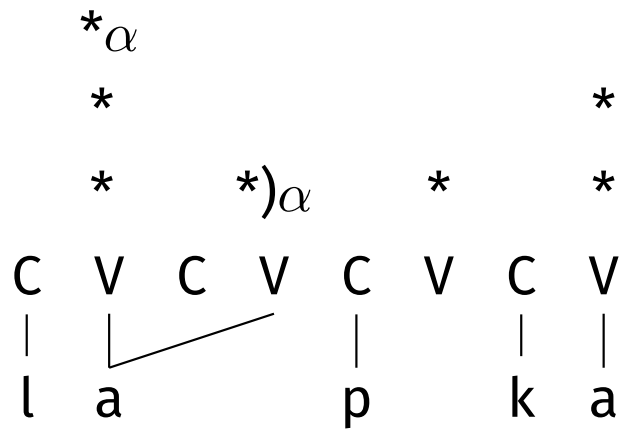
(19) *ʼkă.ta* [kăttă] ‘grandma’



CVVC

- Two empty slots to be incorporated
- Minimal requirement to reach L3 is satisfied by just one

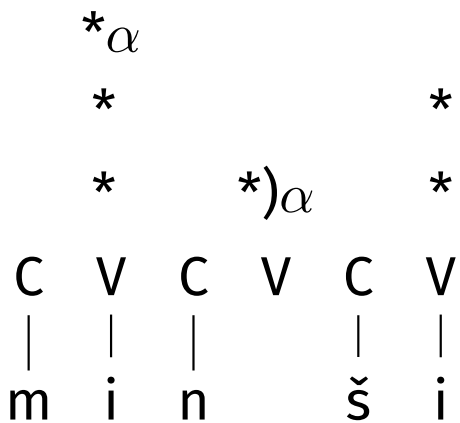
(20) *lapka* ['lapkă] 'store'



CVC

- Medial empty nucleus (MEN) incorporated

(21) *'mĭn'ši* [mĭn'šĭ] 'stomach'



Predictions: monosyllables

So far, monosyllables do not fit with our expectations

- If length contrast disappears without stress, it has to remain in monosyllables
- Their only syllable is stressed
- However, length is neutralized — monosyllables are shortened

Why?

FEN weakness

- We have established that FENs are weak in terms of projection
- Stress is unable to preserve bipositional vowels word-finally
- The vowels are shortened, because there is nothing to incorporate
- I propose that in monosyllables, L3 is reached by adding an additional projection to satisfy the minimal word condition (22)

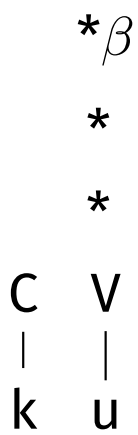
(22) **Condition on minimal words in FN**
In a stress assignment domain, at least one V-slot must project to L3.

Incorporation in monosyllables

CV#

- Nothing to incorporate, projection appears to satisfy the minimal word condition

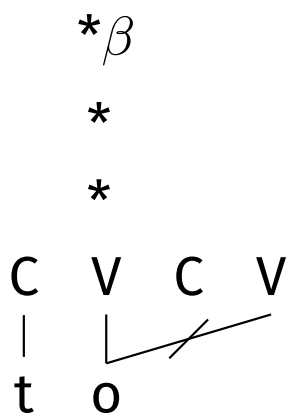
(23) *tŭ* [tŭ] ‘fire’



CVV#

- There is an underlying long vowel in *tŏ* ‘lake’
- The long vowel /o/ is shortened in a monosyllable
- FEN does not project and is not incorporated
- Vowel shortened, projection added as a last resort because of word minimality

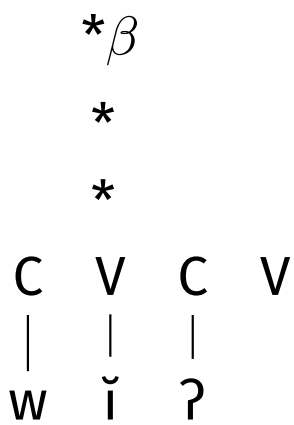
(24) *tŏ* [tŏ ∼ tŭ] ‘lake’



CVC#

- FEN does not project and is not incorporated
- Projection added because of word minimality

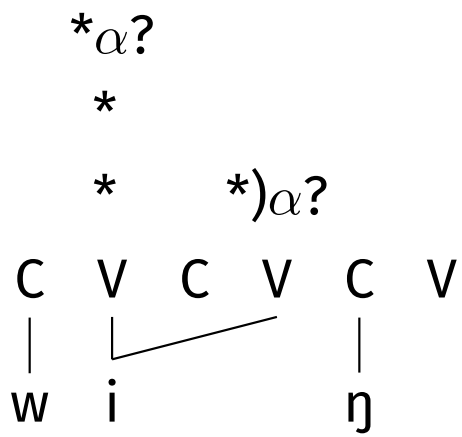
(25) *wǐʔ* ‘water’



CVVC#

- ♣ There actually is a V-slot to incorporate — a non-final V in the long vowel
- ♣ We expect no shortening, but the vowel does shorten

(26) *wiŋ* [wĭŋ] ‘tundra’



Positional licensing makes a comeback?

- Prosody is not enough to explain the distribution of length
- Final syllables always contain short vowels, stressed or not
  - Moreover, monosyllables are remarkably similar to final syllables in vowel duration
- FENs in Forest Nenets appear to be exceptionally weak, both in terms of licensing and incorporation
- If this is true, the MEN $\Rightarrow$ FEN implicational universal is broken by FN

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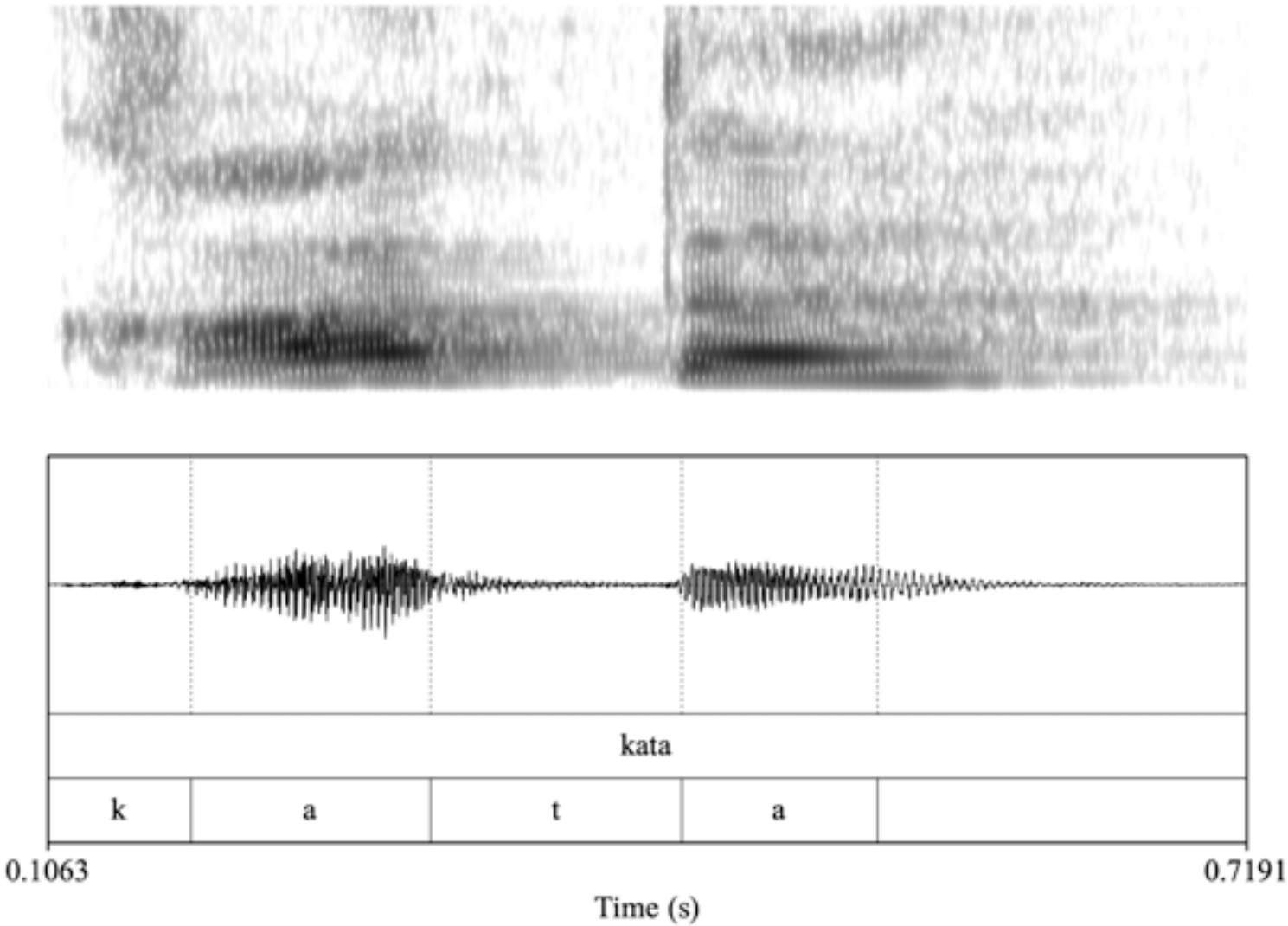
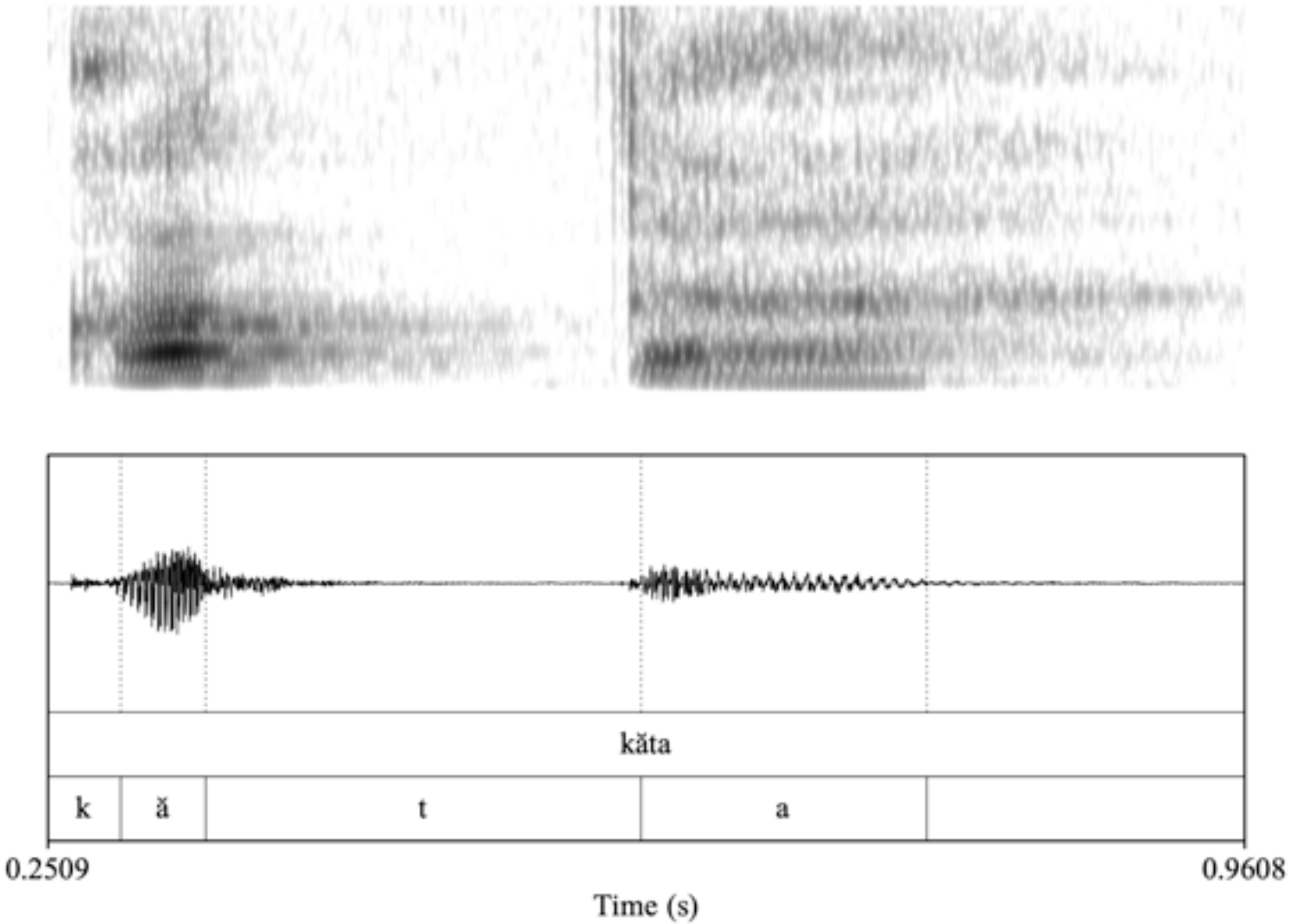
Appendix

Length-duration relationship under stress: example



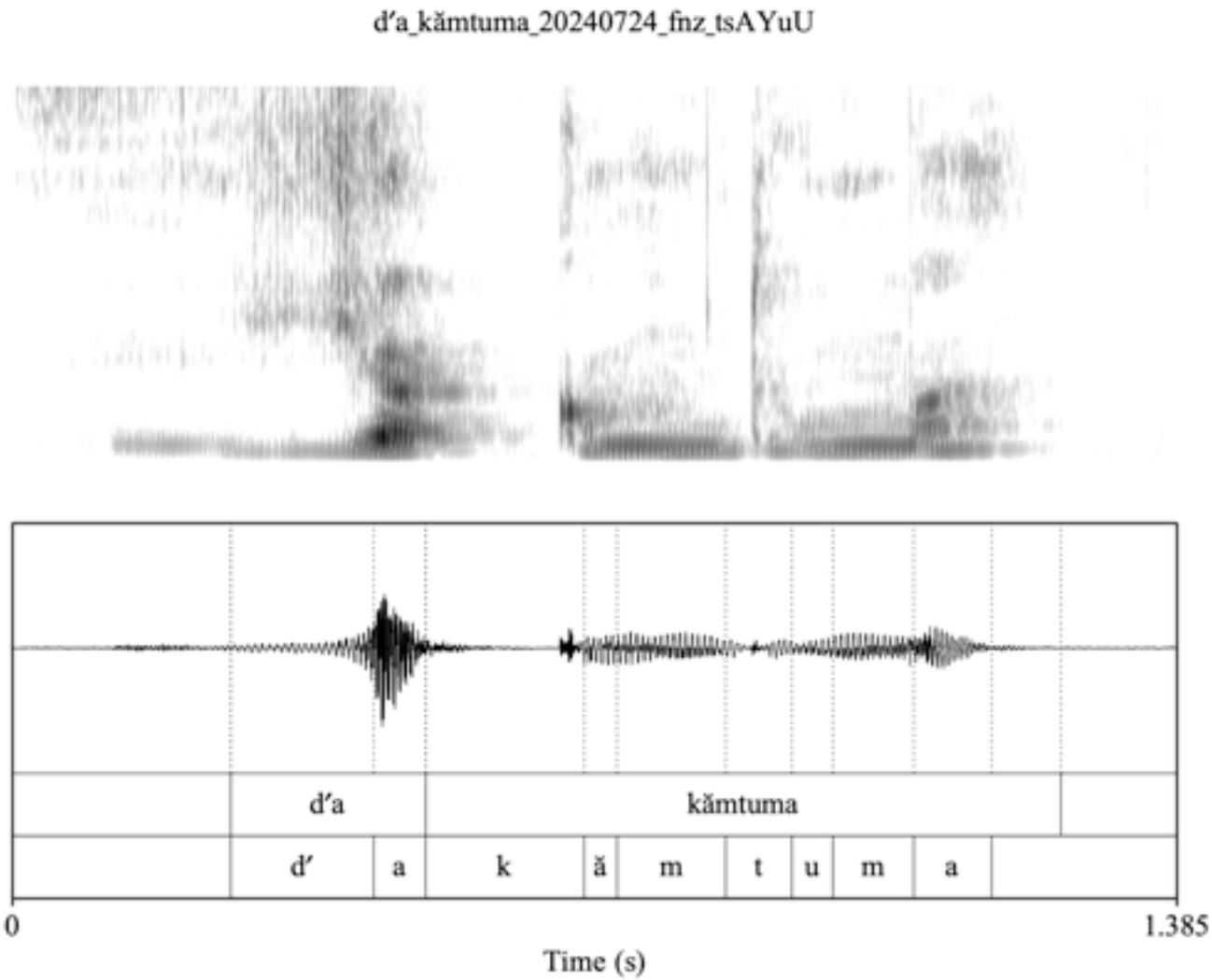
kata ‘grandmother’, tsOKT

Length-duration relationship under stress: example



kăta ‘fingernail’, tsOKT

Raddoppiamento: example



d'a kămtuma 'flour spilled', tsAYuU

Short mid vowels

Why are /ĕ ŏ/ restricted to monosyllables?

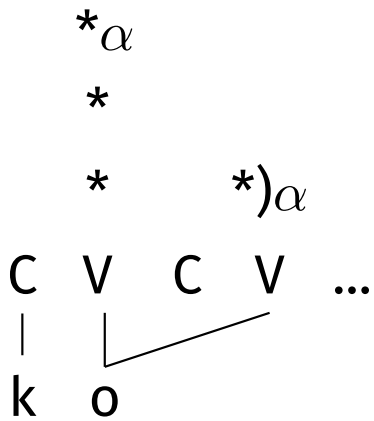
- In monosyllables, projection to L3 is achieved via a rule that does not cause length preservation
- If we link quality preservation to projection, it will be divorced from length
- Stress fails to keep length in monosyllables but is able to keep mid quality
- Reduction is simple to model with elements of Element theory (Kaye, Lowenstamm & Vergnaud 1985)

(27) a. **Length preservation condition**
An empty slot can only be spread into if it is incorporated

b. **Mid quality preservation condition**
Mid quality can only remain in slots that project to L3

Short mid vowels

(28) Stressed syllable /ko-/



(29) Monosyllable /tŏ/