Phonological status and acoustic properties of "vowel harmony" in Forest Nenets

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This study focuses on phonological and acoustic properties of distant vowel assimilation (usually referred to as "vowel harmony") in Forest Nenets (FN). The data comes from the author's fieldwork conducted on the Pur dialect of FN in Tarko-Sale in August, 2025.

This process can be described as full assimilation of reduced vowel phoneme (°) with the previous vowel through *x* or *ʔ*, see (1).

(1) a. stem + */k°na/*-locative

to	—	*to̲-xo̲na*
lake		lake-LOC

b. morpheme-internal process with vowel epenthesis, see (Medushevsky 2025)

/šeʔw°/	*še̲ʔe̲w°*[1]
seven	

Salminen (1997, 2007) suggests to consider "vowel harmony" as a purely phonetic phenomenon as ° after *x* can retain its quality and surface as *ă* without quantitative changes. However, for previous investigations of vowel duration in FN data with "vowel harmony" was excluded due to its inconsistency (Shikunova p. c.) Thus, this study aims to fill the gap in the investigation of vowel duration in assimilation contexts around *x*.

Building on (Sammallahti 1974) and (Salminen 2007), the vowel inventory of FN comprises 12 vowels (6 long–short pairs), whereas in unstressed positions, only 4 contrastive vowels are found (2).

(2)

Stressed syllables (short–long)				Unstressed syllables	
ĭ i		ŭ u		i	u
ĕ e		ŏ o			
ă̈ æ	ă a			æ	a

[1] ° is reflected in surface forms to preserve information about syllabic structure even though it remains unpronounced

Stress falls on odd-numbered non-final syllables. Middle vowels are neutralized to high ones in unstressed positions (ibid.) According to (Shikunova 2024) unstressed vowels in open syllables are significantly shorter than stressed long vowels but longer than stressed short vowels in the same context. The length contrast in monosyllabic words disappears in favour of shortness and may involve middle vowel raising as in unstressed syllables.

Phonemic /°/ surfaces as *ă* in stressed non-harmonic contexts and in syllables before unrealized °. In harmonic contexts ° as assimilation trigger is surfaced as *ĭ* under stress (3a) and remains unrealized without stress, causing regular surfacing of ° as *ă* under stress in target (3b).

(3) stem + /*k°na*/-locative

a.	*ˈŋă.ma.λ° /ŋăm°λ°/*	—	*ˈŋă.m°ˌλi̲-xi̲.na*
	food		food-LOC
b.	*ˈxe.m°*	—	*ˈxe.m°-ˌxă̲.na*
	eye		eye-LOC

Acoustic data. 719 word tokens from 5 speakers were manually annotated using Praat (Boersma, Weenink 2026).

Figure 1 shows shortening of long vowels in stressed positions for triggers of assimilation and tendency to shortening in targets of assimilation. For assimilation triggers only the difference between unstressed and stressed syllables is significant, while for assimilation targets all three groups behave as significantly different on post-hoc Dunn test with Bonferroni correction (p-value < .05). Vowels in unstressed syllables behave as expected for regular unstressed vowels based on (Shikunova 2024). Examples of contexts for Figure 1 are provided in (4).

(4)

stress + phonemic length before [x]	**stress after [x]**	**example**
stressed, short	unstressed	*ˈpă̲-xa̲.na /pă-k°.na/*
stressed, long	unstressed	*ˈka̲-xa̲.na /ka-k°.na/*
unstressed	stressed	*ˈka.λa̲-ˌxa̲.na /ka.λa-k°.na/*

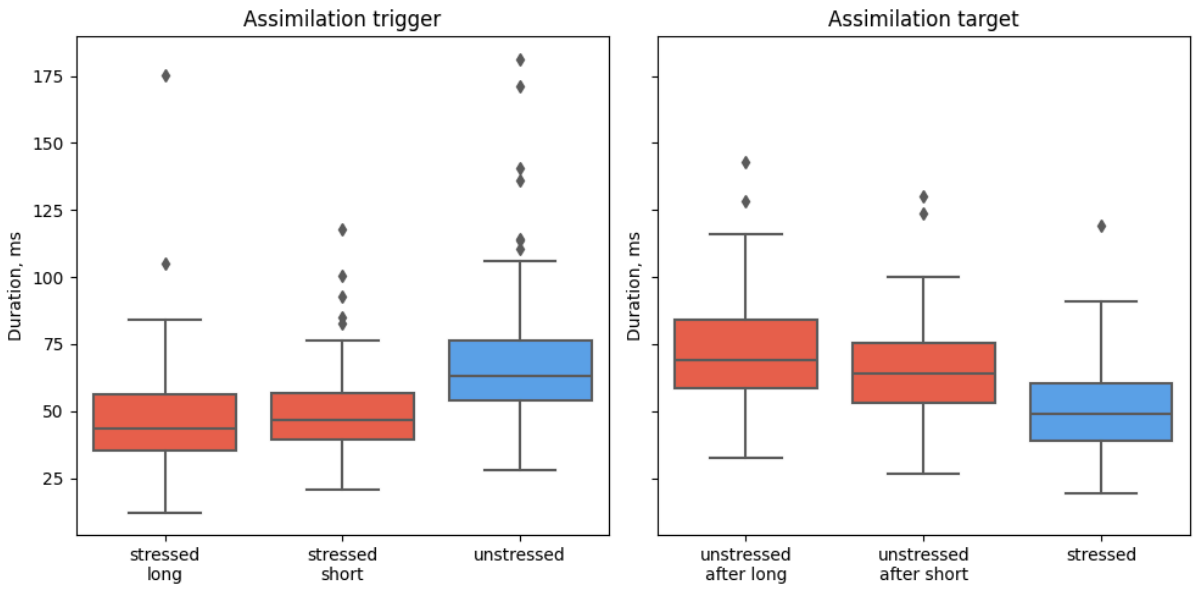

Figure 1. Vowel duration in assimilation trigger and assimilation target with account for stress and phonological length in stressed positions.

Discussion. This acoustic clue allows us to question relations between "vowel harmony" and suprasegmental phenomena such as stress, which are supposed to be correlated with vowel duration and appearance of length neutralization in favour of shortening. It can be stated from stress-based allophony, e.g. from ° allophones, that "vowel harmony" does not cause stress-shift (5).

(5) stem + */k°λ.t°/*-scalar particle + */k°na/*-locative

a.	*to*	—	*to-xoλ.tĭ-x́i.na* / **to-xoλ.t°-xă.na*
	lake		lake-SCAL-LOC
b.	*ŋă.nu /ŋăno/*	—	*ŋă.no-xoλ.t°-xă.na* / **ŋă.no-xoλ.tĭ-xĭ.na*
	boat		boat-SCAL-LOC

However, in the contexts discussed we sometimes observe middle vowel raising that patterns this length neutralization with another process where shortening occurs, namely monosyllabic shortening. As it was mentioned above, monosyllabic shortening also can be accompanied with middle vowel raising (6).

(6) stem + */k°na/*-locative

po ~ pu /po/	—	*po̲-xo̲na ~ pu̲-xo̲na ~ *po̲-xu̲na*
year		year-LOC

In the talk I will provide more data and discuss the possible mechanisms underlying vowel quantity deviations in assimilation contexts.

Abbreviations

LOC – locative case, SCAL – scalar additive particle.

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