

ASYMMETRIC DISTRIBUTION OF VOWELS IN NIVKH

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It has been reported in literature that languages often limit their maximal inventory of vocalic contrasts to prosodically prominent positions. Nivkh is one such language, which permits each of the vowels /i ɨ u e o a/ in stressed syllables but imposes various kinds of restriction on vowels in unstressed syllables. In this paper we focus on one such case, that is, a restriction on a sequence of a high vowel /i ɨ u/ and a non-high vowel /e o a/ in disyllabic roots. We examine the distribution of vowels in disyllabic roots in a word list containing 2,335 lexical items. In addition, data from loan words will be supplied to show that this phonotactic restriction is operative in loan phonology, but not to the same extent in every dialect.

В исследовательской литературе отмечается, что максимальное число противопоставлений гласных часто ограничивается в языке просодически выделенными позициями. Нивхский язык является одним из таких языков – каждый из звуков /i ɨ u e o a/ может употребляться в ударных слогах, однако на употребление гласных в безударных слогах накладываются различные ограничения. В настоящей статье мы рассматриваем один из таких случаев, а именно ограничение на сочетание верхнего гласного /i ɨ u/ и неверхнего гласного /e o a/ в двусложных основах. Мы исследуем распределение гласных в двусложных основах, входящих в список слов, который включает 2335 лексических единиц. Кроме того, приводятся данные из заимствованных слов, которые показывают, что это фонотаксическое ограничение действует и в случае заимствований, однако в каждом диалекте по-разному.

1. INTRODUCTION

Restrictions on vowel sequences in Nivkh have been known since Kreinovich (1937), who reported that /i/ co-occurs with the high vowels /i ɨ u/ and /e/ with the non-high vowels /e o a/ in certain morphological contexts, for example, *i-rlɨ-* ‘pull’ but *e-rɔop-* ‘touch’. Hattori (1962) examined disyllabic roots in the Poronaisk dialect and found that the distribution of vowels was skewed in the way illustrated in Table 1. This table shows that sequences of a high and a non-high vowel (the cells in the right-upper area) are absent in this dialect.

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Table 1 Vowel sequences in disyllabic roots in the Poronaisk dialect (Hattori 1962: 78)

V ₁ \ V ₂	i	ɨ	u	e	a	o
i	i-i	i-ɨ	i-u	/	/	/
ɨ	ɨ-i	ɨ-ɨ	ɨ-u	/	/	/
u	u-i	u-ɨ	u-u	/	u-a	/
e	e-i	/	e-u	/	e-a	e-o
a	a-i	a-ɨ	a-u	a-e	a-a	a-o
o	o-i	o-ɨ	o-u	(o-e)	o-a	o-o

This observation led Hattori (1962: 82) to conclude that a co-occurrence restriction on a vertical dimension (high vs. non-high) is operative in Nivkh. Later, Hattori's observation was included in a hypothesis that the dominant type of vowel harmony in the North Pacific Rim is associated with the position of the tongue root (Comrie 1997; Matsumoto 2006). In the following section we examine the asymmetric distribution of vowels in the Amur dialect.

2. THE DATA

We examined disyllabic roots in Pukhta (2002), which is a word list containing 2,335 lexical items from the Amur dialect. Maria Pukhta was a teacher of the Nivkh language in Nikolaevsk-na-Amure in the Lower Amur region. She left a number of linguistic materials including a Nivkh text book containing fragments of conversation from daily life and a word list. Part of her work was edited and published by Toru Kaneko (Chiba university, Japan) and Galina Lok (Sakhalin Regional Museum, Russia) in 2002. Since Pukhta was a native speaker of the Amur dialect, we regard the transcription practised in Pukhta (2002) as being reliable, and assume that it reflects her native speaker's intuition about the quality of the vowel in the citation form of a lexical item.

Before looking into the data, we provide some information about the phonology of Nivkh relevant to the topic. Roots are maximally disyllabic. Trisyllabic roots are confined to loans, for example, *estarik* from Russian *starik* 'old man'. Monosyllabic roots prevail in the lexicon. The mono- vs. disyllabic ratio is approximately 2:1 in our corpus of the West Sakhalin dialect (Shiraishi & Lok 2002–2010). In the Amur dialect (incl. West Sakhalin), accent falls exclusively on the first syllable in a

polysyllabic root: *'heβa* 'rope', *'kikun* 'owl'. The East Sakhalin dialect has polysyllabic roots with accent on the second syllable (Kreinovich 1979).

Pukhta (2002) contains 291 disyllabic roots. The frequencies of vowel sequences are illustrated in Table 2. The expected frequencies ($V1*V2/291$) are put in brackets. To make the comparison with Table 1 easier, we add Table 3, in which we calculated the Observed/Expected ratio and shaded those cells with a high O/E ratio.

Table 2 Observed (expected) frequencies of vowels in Pukhta (2002)

V1 \ V2	i	ɨ	u	e	a	o	
i	12 (11.1)	14 (3.7)	5 (4.5)	0 (0.8)	1 (8.4)	0 (3.5)	32
ɨ	24 (17.0)	15 (5.7)	9 (6.9)	1 (1.1)	0 (12.8)	0 (5.4)	49
u	21 (14.6)	4 (4.9)	13 (5.9)	0 (1.0)	4 (11.0)	0 (4.6)	42
e	10 (10.4)	0 (3.5)	1 (4.2)	1 (0.7)	17 (7.8)	1 (3.3)	30
a	21 (28.1)	1 (9.5)	8 (11.4)	3 (1.9)	42 (21.1)	6 (8.9)	81
o	13 (19.8)	0 (6.7)	5 (8.0)	2 (1.4)	12 (14.9)	25 (6.3)	57
	101	34	41	7	76	32	291

Table 3 O/E ratios

V1 \ V2	i	ɨ	u	e	a	o	
i	1.09	3.50	1.00	0.00	0.13	0.00	32
ɨ	1.41	2.50	1.29	1.00	0.00	0.00	49
u	1.40	0.80	2.17	0.00	0.36	0.00	42
e	1.00	0.00	0.25	1.00	2.13	0.33	30
a	0.75	0.11	0.73	1.50	2.00	0.67	81
o	0.65	0.00	0.63	2.00	0.80	4.17	57
	101	34	41	7	76	32	291

The tables above show the asymmetric distribution of vowels in a similar way as reported by Hattori. Sequences of a high vowel and a non-high vowel are under-represented, that is, most of the cells in the upper-right area have a low O/E ratio. The total number of /e/ in V2 is very low (only 7 tokens). From these observations, we conclude that the co-occurrence restriction on a sequence of high and non-high vowel is operative in the Amur dialect as well.

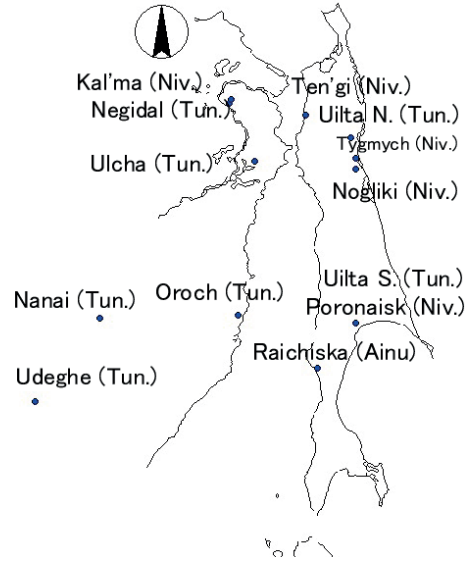


Figure 1 Dialects and languages investigated

3. COMPARISON WITH NEIGHBOURING LANGUAGES

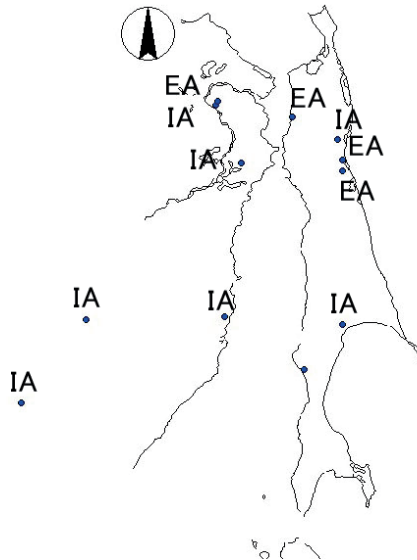


Figure 2 *iXa* 'cow' (Tungusic)

We observe a similar co-occurrence restriction of vowels in lexical items borrowed into Nivkh from the neighbouring languages, that is, Tungusic and Ainu. The Tungusic languages considered for this sample were Uilta, Ulcha, Nanai, Oroch, Udeghe, and Negidal (Fig. 1). Loans containing a sequence of high and non-high vowels in the donor language typically change one of their vowels in Nivkh to avoid surfacing of the offending vowel sequence. We illustrate this for four representative examples (Figs 2 to 5). The

material for all of the languages, including the Nivkh dialects, is taken from written sources, with the exception of the forms from the Ten'gi and Tygmych varieties of Nivkh, for which sound recordings are available. The full forms and their sources are listed in Table 4 (see page 44).

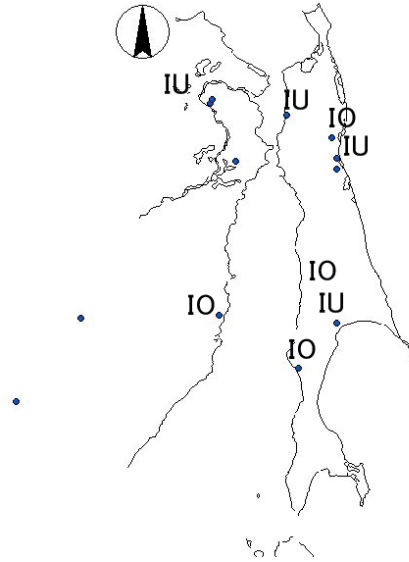


Figure 3 *sintoko* 'barrel' (Ainu)

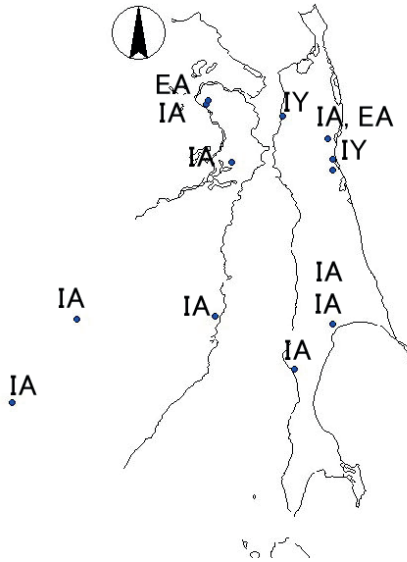


Figure 4 *sisam* 'Japanese' (Ainu)

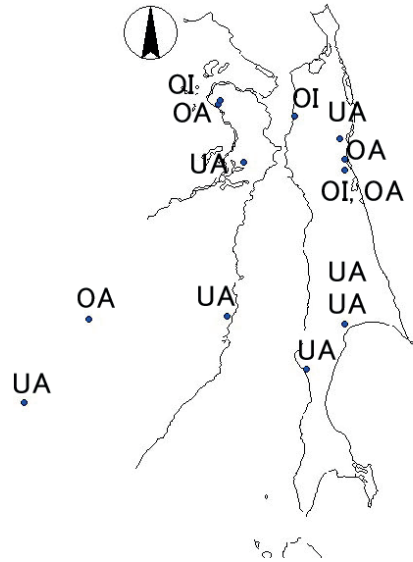


Figure 5 *luca* 'Russian' (Tungusic)

Table 4 Areal correspondences with neighbouring languages

Locality	'Japanese'	'barrel'	'Russian'	'cow'	Source
Poronaisk (Nivkh)	sisam	sintux	luca	eXaŋ	T. Hattori in Yamaguchi & Izutsu (2004a;b)
Nogliki (Nivkh)	-	-	loci, loca	eŋaŋ	Sangi and Gashilova (2003)
Tygmych (Nivkh)	sizim	sinduX	loca, loc	eXaŋ	Tangiku, Tanzina & Nitkuk (2008)
Kal'ma o1 (Nivkh)	sisam	sinux	loci, loca	eŋa	Savel'eva & Taksami (1970)
Kal'ma o2 (Nivkh)	sezam	-	loci, loca	eŋa	Pukhta (2002)
Ten'gi (Nivkh)	sizim	sinux	loci	eŋa	Shiraishi & Lok (2002–2011)
Nanai (Tungusic)	sisa	-	loca	iXa	Tsintsius et al. (1975– 1977)
Udeghe (Tungusic)	sisa	-	luca	iku	Tsintsius et al. (1975– 1977)
Negidal (Tungusic)	sisan	-	loca	ixan	Tsintsius et al. (1975– 1977)
Oroch (Tungusic)	sisa	sindongo	luca	ixa	Tsintsius et al. (1975– 1977)
Ulcha (Tungusic)	sisa		luca, nuca	iXa	Tsintsius et al. (1975– 1977)
Uilta North (Tungusic)	sesa, sisa	sitto	luca	iXa	Ozolinia & Fediaeva (2003)
Uilta South (Tungusic)	sisa	sitto, siltukku	luca	ixa	Ikegami (1997)
Raichiska (Ainu)	siisam	sintoko	nuca	peko	S. Hattori (1964)

Notice that the Poronaisk dialect of Nivkh exhibits two forms which do not conform to the phonotactics seen in the previous section, [sisam] and [luca]. Although more data is required in order to be conclusive, this might be due to the strong interference of other languages; Poronaisk was inhabited by multiple ethnicities and bilingualism (often trilingualism) was the norm, rather than the exception (Asahi 2006; 2012).

4. CONCLUSION

The co-occurrence restriction of vowels in disyllabic roots in Nivkh is pervasive in the sense that it also applies to newly introduced items such as loan words. We also observe that there is dialectal variation in the way vowels are accommodated to this phonotactic restriction. In future work, we hope to find generalizations underlying this variation by expanding our database.¹

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