

Vowel co-occurrence restrictions in Nivkh

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In this talk we offer an analysis of vowel co-occurrence restrictions in the Amur dialect of Nivkh. Nivkh, a genetic isolate spoken in the Russian Far East, has a canonical five-vowel system with an additional high central vowel, viz. /i, i, u, e, o, a/. Native Nivkh roots are maximally disyllabic, with initial stress. Disyllabic roots display an interesting pattern of vowel co-occurrence restrictions. Based on a corpus of 291 disyllabic roots, extracted from Pukhta (2002), we find the following observed and expected frequencies of vowels in initial (V1) and final (V2) position.

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 1: Observed and expected frequencies of vowels in disyllabic Nivkh roots

Table 2 lists the observed and expected ratios of vowel combinations. A value of 1.00 indicates that the expected frequency matches the observed frequency. A value smaller than 1.00 indicates that a vowel combination occurs less often than expected. A value greater than 1.00 indicates that a vowel combination occurs more often than expected.

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

Table 2: Observed/expected ratios of vowels in disyllabic Nivkh roots

A number of observations can be made from these data. First, some vowels are much more frequent in V2 than others, e.g. /i/ (n=101) vs. /e/ (n=7). Second, there is a preference for

lining up identical vowels (108/291=37.1%), especially /o...o/. Third, the low vowel /a/ is disfavoured in V2 if the preceding vowel is high (/i, i, u/). And fourth, the restrictions are asymmetric. For example, while the combination /a...i/ is freely permitted, /i...a/ is almost completely absent.

We argue that the Nivkh pattern is best accounted for in terms of a stress-dependent restriction on vowel height. Following Element Theory (Harris & Lindsey 1995), we assume that /i, u, e, o, a/ are represented as in (1).

(1)	[A]	a	[A, I]	e
	[I]	i	[A, U]	o
	[U]	u		

We formalize the Nivkh pattern in terms of a prohibition on unlicensed occurrences of the [A] element in the unstressed V2 position. Reference to stress captures two key properties of the distribution of Nivkh vowels. First, the preference for lining up identical vowels in V1 and V2 is a typical effect of unstressed vowel reduction (on this, see Barnes 2006). Second, the reduced licensing power of V2 is entirely expected if V2 occupies the weak position of a foot. Specifically, the restriction on V2 is that low and mid vowels – vowels containing [A] – are permitted only if there is also an [A] in V1. For example, a word like /tʃaʒo/ ‘knife’ has [A] in V2, which is licensed by another [A] in V1. A form like */pizo/, on the other hand, is ungrammatical, since it contains an unlicensed [A] in V2.

Our analysis of the Nivkh data raises a number of issues. One of these concerns the melodic structure of the high central vowel /i/. Is this vowel specified as [I,U], or does it lack melodic content? While both options are consistent with our analysis (in either case the vowel lacks [A], and is as such free to occur in V2), we show that there are good reasons – both synchronic and diachronic – for why /i/ is ‘empty’. The most interesting argument is perhaps that, historically, /i/ appears to have functioned as the harmonic counterpart of low RTR /a/. The diachronic loss of RTR contrasts in Nivkh obliterated the vowel’s melodic structure, causing it to be re-interpreted as non-high.

Another issue concerns the status of /e/. As compared to /o/ (the other vowel with a complex structure), /e/ is marginal in V2, and is in fact also rare in V1. (Our corpus contains no fewer than 25 forms with /o...o/, but just one with /e...e/.) It is striking that many of the forms with /e...a/ in our corpus contain a uvular consonant preceding /a/, e.g. /eʁa/ ‘cow’. This might suggest that in such forms /a/ is licensed not so much by the [A] in V1, but by the [A]-specification of the preceding uvular. In addition, there is reason to suggest that the combination of [I] and [A] is unstable in Nivkh. In forms in which /e/ is followed by a uvular consonant (/q, ɣ, ʁ/), the elements of the vowel undergo fission, in such a way that the palatality of /e/ is associated with the preceding consonant, and the vowel has a low(ered) reflex, e.g. /p^heq/ → [p^hɛq] or [p^hjaq] ‘chicken’.