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## **Low Vowel Dissimilation Outside of Oceanic: The Case of Alambhak**

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Alambhak is the easternmost of the Sepik Hill languages spoken in East Sepik Province, Papua New Guinea. Alambhak phonology (Bruce 1984) includes an alternation involving low vowel dissimilation, a process that, until recently, appeared to be limited to Oceanic languages (Blust 1996a, 1996b, Lynch 2003). Finding a parallel sound pattern in a non-Austronesian language of New Guinea allows several questions raised by Blust (1996b) to be answered. However, phonetic motivation for this recurrent sound change remains unclear.

### **1. LOW VOWEL DISSIMILATION IN OCEANIC LANGUAGES.**

Low vowel dissimilation (LVD) refers to a recurrent sound change targeting low vowels in adjacent syllables. Under this sound change, and synchronic alternations reflecting it, the first vowel becomes nonlow as schematized in (1). In Oceanic the shift of a low vowel to a nonlow vowel typically takes  $aCa > eCa$ , though in rare cases  $aCa > iCa$  is found. In other languages mentioned below,  $aCa > \text{ə}Ca$  occurs.

$$(1) \quad \begin{array}{ccccccc} V & C_1 & V & > & V & C_1 & V \\ [+low] & [+low] & [-low] & & [+low] & & \end{array}$$

Possible conditions:

- a. C may be a “blocking consonant”, in which case dissimilation does not occur.
- b. In some cases, there is a requirement that the first vowel be unstressed.
- c. In some cases, dissimilation may be blocked by a medial consonant cluster.

While a range of descriptions of Oceanic languages discuss sound changes or alternations of this kind (e.g., Bender 1969, Sohn 1971), recognition of LVD as a recurrent sound pattern in Oceanic is due to Blust (1996a, 1996b). In these studies, Blust details at least five seemingly independent cases of low vowel dissimilation in Oceanic: in Ere of Manus Island (the rare  $aCa > iCa$  change mentioned above);<sup>1</sup> in Nuclear Micronesian, as reflected by alternations in Marshallese and Woleaian; in the language of the Maskelyne Islands, just south of Malakula; in the southern dialect of Paamese; and in languages of the Southern Vanuatu group.

The last three Vanuatu developments inspired Lynch's (2003) detailed follow-up study of low vowel dissimilation in the languages of Vanuatu. Lynch demonstrates that LVD in Vanuatu is more widespread than previously thought, with approximately 30 cases, and at least fourteen on Malakula alone. At the same time, he suggests that most of these derive from a single origin, with only the Maskelynes/Northwestern Ambrym cases being distinct, and probably of more recent origin. Even so, one must still recognize at least four independent LVD developments in this history of Oceanic: one in Ere; at least one in Nuclear Micronesian; one in Nuclear Southern Oceanic; and one more recently in Maskelynes/Northwestern Ambrym.

The recurrence of low vowel dissimilation in Oceanic led Blust (1996b:309) to pose three important questions, the first based on the fact that all languages he examined with LVD had also lost short final vowels:

- (i) Is the prior loss of final vowels a precondition of LVD, or an accidental concomitant?
- (ii) Is low vowel dissimilation motivated by some still unrecognized feature of the human language faculty, or does it result from structural pressure peculiar to Proto-Oceanic or some higher-level Austronesian protolanguage?
- (iii) Why is it always the first of two low vowels (never the second) that raises?<sup>2</sup>

Lynch (2003) was able to partly answer the first question. In all Vanuatu languages with LVD, final vowels were retained until low vowel dissimilation had run its course, and were lost subsequent to this change. At the same time, since languages that have not undergone final vowel loss do not show LVD, clear evidence that final vowel loss is not an accidental concomitant of LVD has not yet been brought to light.

In this squib, data are presented that allow us to begin to answer question (ii). Low vowel dissimilation is described for Alamlak, a Sepik Hill language. Since Alamlak is a non-Austronesian language, the facts suggest that low vowel dissimilation does not

1. Blust (pers. comm., 2009) reports another case of LVD in Likum of southwest Manus. Likum is spoken some distance from Ere, and there are a number of intervening languages with no such change. However, as Lynch discusses for Vanuatu, this need not mean that the sound patterns do not originate from a single source. Blust suggests that Likum LVD reflects a sporadic sound change, although data are too limited to allow firm conclusions to be drawn.
2. There is one potential case of low vowel raising where a historical process like that in (1) has been extended to a stem + suffix domain, and it is the suffix vowel, not the stem vowel, that raises. The language in question is Neve'ei as described by Musgrave (2007). Though Musgrave does not use the term "low vowel dissimilation," Neve'ei has clear instances of LVD where it is the first vowel that lowers, all involving harmonizing prefixes like /nV-/ '1st person singular realis', where V stands for a vowel that undergoes harmony: *ni-vi* 'I make', *ne-veh* 'I carry', *no-roj* 'I feel', *nu-duriv* 'I jump down', but *ne-dan* 'I drown', *ne-lax* 'I hang', *ne-tax* 'I take', and so on, where the expected harmonic *a...a* sequence surfaces as *e...a*. If the initial consonant of the stem is a velar /x, k, g, ŋ/ or glottal /ʔ, h/, LVD does not apply: *na-ŋaj* 'I laugh', *na-xal* 'I dig', *na-ʔaʔan* 'I eat', and so on (Musgrave 2007:23–27). In addition to harmonizing prefixes, there is one suffix, the transitive suffix /-Vn/, which shows partial harmony with the stem. Allomorphs of this suffix are: *-on*, *-en* after stems ending in *oC-*; *-an*, *-en* after verb stems ending in *aC-* where the consonant is glottal or velar; and *-en* elsewhere. Compare *ŋaj-an*, *ŋaj-en* 'laugh at', or *wah-an*, *wah-en* 'search for' with *dedan-en* 'dive for', *magar-en* 'work at'. Since /-Vn/ clearly undergoes harmony with preceding nonhigh vowels, the simplest explanation for unattested *\*\*dedan-an*, *\*\*magar-an* is that these forms surface as *dedan-en*, *magar-en*, respectively, due to perseveratory low vowel dissimilation: *aC]a > aC]e*, where ] is a suffix boundary. Given this case, question (iii) above might be rephrased to read: Why, in nearly all cases of LVD, is it the first of two low vowels (not the second) that raises?

result from a structural pressure unique to Proto-Oceanic or some higher-level Austronesian protolanguage.

**2. LOW VOWEL DISSIMILATION IN ALAMBLAK.** Alambak is the easternmost of the Sepik Hill languages spoken in East Sepik Province, Papua New Guinea. Alambak phonology is described in detail by Bruce (1984). A productive process in the language raises /a/ to [ə] preceding a syllable containing /a/ (Bruce 1984:40). The rule, as stated by Bruce (1984:40), is shown in (2a) (except that [+mid] in the structural change has been replaced with [-low]). The segments in parentheses indicate that the rule applies with or without one or more intervening syllables that contain a high central vocoid. Since these high central vocoids are arguably not part of the lexical representation of the word (cf. Blevins and Pawley 2008), the process can be stated more simply as in (2b).

- (2) a. [+low] > [-low] / \_\_ C ([i]C)<sub>0</sub> [+low] Bruce (1984:40)  
 b. [+low] > [-low] / \_\_ C<sub>1</sub> [+low] Assuming [i] is nonlexical

Examples of synchronic alternations in Alambak from Bruce (1984) are shown in table 1, with relevant vowel sequences in bold.<sup>3</sup> One example of this alternation is provided by derivations involving the verb stem /xiŋgna-/ ‘work’. The underlyingly low vowel surfaces in forms like /xiŋgna-ni-raxr/ [xiŋginanirayir] ‘he will work (and) go’ (a.ii), where /-ni/ ‘go’ immediately follows the stem, and is followed by third singular masculine suffix /-raxr/. When this stem is directly followed by the third singular masculine suffix /-raxr/, however, as in /xiŋgna-raxr/ ‘he will work’ (a.i), the surface form is

**TABLE 1. EXAMPLES OF ALAMBLAK LOW VOWEL DISSIMILATION**

	<b>Underlying</b>	<b>Surface</b>	<b>Gloss/page reference (Bruce 1984)</b>
a. i.	/xiŋgna-raxr/ work-FUT.3SG.M	[xiŋginanirayir]	‘he will work (and) go’ (40)
ii. cf.	/xiŋgna-ni-raxr/ work-go-FUT.3SG.M	[xiŋginanirayir]	‘he will work (and) go’ (40)
b. i.	/wa-xay-n-t/ IMP-give-2SG-3SG.F	[wəyant]	‘give to her’ (48)
ii. cf.	/wa-xay-n-a/ IMP-give-2SG-1SG	[wəyəjna]	‘give to me’
c. i.	/na-rxw-a/ do-FUT-1SG	[nərywa]	‘I shall do’ (325)
ii. cf.	/na-t-pnə/ do-3SG.F-REF	[natpinə]	(328)
d.	/na-nayur-m/ RECP-fight-3PL	[nənajurim]	‘they fought’ (327)
e.	/yak-xayni/ get-take	[jəkxap]	‘getting and taking’ (324)
f.	/wañ-tañ-xatə/ hear-COMPL-SA	[wəntəpxata]	‘having heard’ (327)

3. All glosses follow the Leipzig Glossing Rules, except for the following (from Bruce 1984): REF, referent, and SA, same actor. The form in (c.ii) is unglossed in Bruce (1984), but means something like ‘do that’ or ‘that (being) done’.

[xɪŋɪnəɾayɪr] with /a/ raised to [ə]. As in many languages of Vanuatu, sequences of more than two low vowels provide evidence of directional or cyclic rule application. In (b.ii), LVD applies first to the stem+suffix *a...a* sequence (deletion of /y/ before a consonant is regular [Bruce 1984:44]); this application then bleeds lowering of the prefix vowel in /wa-/ 'imperative'. The example in (c.i) illustrates dissimilation across an intervening consonant cluster. In addition to applying between stem and suffix (a, c) and between prefix and stem (b, d), dissimilation also targets *a...a* sequences in adjacent stems (e) and adjacent suffixes (f). Since all cases of synchronic low vowel dissimilation whose histories are known appear to stem from a historical process like that schematized in (1), we assume the same is true for Alambak.

Let us now return to Blust's original questions listed above. Is the prior loss of final vowels a precondition of LVD, or an accidental concomitant (i)? Lynch (2003) shows that low vowel dissimilation often precedes final vowel loss, but leaves open the possibility that the two changes are still linked. In Alambak there is no evidence for historical final vowel loss, and it is often a word-final /a/ which triggers dissimilation (b.ii and c in table 1). However, since little work has been done on the historical phonology of Alambak or the Sepik Hill Family generally, further study could provide such evidence (Bruce 1984:299, Foley 2005). We can approach question (ii) with more certainty. Does low vowel dissimilation result from structural pressure peculiar to Proto-Oceanic or some higher-level Austronesian protolanguage? Apparently not. Alambak is not an Austronesian language, and yet a similar sound change has applied here. Either the ancestor state of Alambak and Proto-Oceanic had similar structural pressures, or low vowel dissimilation is an instance of natural phonetically motivated sound change whose phonetic source has yet to be identified. As suggested by Blevins (2004:166), a natural phonetic source is suggested by the fact that low vowel dissimilations are often word-internal, exceptionless, in some cases productive, and sensitive to phonetic properties of intervening segments. In this way, low vowel dissimilation resembles sound patterns like vowel harmony, which have demonstrated sources in vowel-to-vowel coarticulation.

**3. OTHER CASES OF LOW VOWEL DISSIMILATION OUTSIDE OF AUSTRONESIAN.** A final piece of evidence supporting low vowel dissimilation as a phonetically natural process is its distribution outside of the languages mentioned above. Odden (2005:243) mentions two additional cases where the first of a sequence of low vowels dissimilates to a nonlow vowel: Kera and Southern Russian. Kera is an East Chadic language. Dissimilation is described by Ebert (1979:20–21). A sequence /...aCa.../, where the initial /a/ is short and in an open syllable, is realized as *əCa*, except when the target vowel is preceded by a laryngeal segment (including implosives). Here is another case, like some in Oceanic (e.g., Neve'e, see footnote 2), where laryngeals block low vowel raising. However, unlike Oceanic cases, the blocking segment precedes the target vowel, instead of intervening between the two low vowels. An additional feature of Kera dissimilation parallel to the Alambak case just discussed is that the process applies from the end of the word, or cyclically: /paka-ŋ-a/ '(in the) peel' surfaces as [pəkəŋa], with dissimilation applying first to the last two vowels, and bleeding dissimilation of the first. An independent feature of Kera worth noting is that it has a pro-

cess of vowel harmony (Pearce 2003). Recall from footnote 2 that Neve'e, a language of Vanuatu, also shows both low vowel dissimilation and vowel harmony.

In a range of East Slavic dialects, oppositions between unstressed nonhigh vowels are neutralized to [a], a central low vowel. In some of these dialects, including varieties of Southern Russian, the pattern of neutralization is described as dissimilatory, since an expected *a...a* sequence surfaces as either *i...a* or *ə...a*. Two distinct contexts are traditionally recognized: “dissimilative *jakan'e*” following palatalized consonants, and “dissimilative *akan'e*” in other environments (Shakhmatov 1915, Avanesov and Orlova 1965:48ff., Halle 1965, Kasatkin 1989:48ff.). Data in (3) are taken from Nessel (2002:78–79). In (3a) neutralized vowels follow palatalized consonants, and in (3b) they follow other consonants. Vowels showing evidence of LVD are in bold.

(3) a. Dissimilative *jakan'e*, following palatalized consonants

STEM	/n'ostí/ 'carry'	/l'es/ 'forest'	/p'iatí/ 'five'
ACC.SG	[n'asú]	[l'asú]	[p'iatjú]
GEN.SG	[n'as'í]	[l'as'ína]	[p'iat'í]
NOM.SG	[n'islá]	[l'isá]	[p'iták]

b. Dissimilative *akan'e*, following nonpalatalized consonants

STEM	/sová/ 'owl'	/travá/ 'grass'
ACC.SG	[savú]	[travú]
GEN.SG	[saví]	[traví]
NOM.SG	[səvá]	[trəvá]

Acoustic measurements of pretonic vowels in dissimilatory and nondissimilatory contexts in dissimilating and nondissimilating Southern Russian dialects has been recently carried out by Kniazev and Shaulskiy (2007). An interesting result of their study is that, in dialects without obvious dissimilation in the *a...a* context, the duration of /a/ in the first syllable is inversely correlated with the duration of the vowel in the second syllable: longest before /i/ and shortest before /a/. This, then, may be the first hint of a phonetic explanation for LVD sound patterns: perhaps *a...á* > *ə...a* is, at its origin, a prosodic phenomenon related to stress timing. In *a...á* sequences, the length of the second /a/ results in shortening of the first, and this shortening is associated with undershoot and centralization. However, since the Russian example clearly involves vowel reduction, assimilation (in the palatal context), and dissimilation, it appears more complex than the cases examined above.

Another language with something similar to low vowel dissimilation is Wintu (Pitkin 1984:43–45), a Wintun language of Northern California. In Wintu, some underlying /...eCa.../ and /...oCa.../ sequences surface as *iCa* and *uCa* respectively. Pitkin suggests marking these vowels as lexically “special” or distinct from underlying /e/ and /o/ that do not raise in the same context. Unlike all the other examples of low vowel dissimilation known, Wintu dissimilation does not apply to *aCa* sequences. Another difference is the lexical marking of two kinds of mid vowels: those that undergo raising before a syllable with /a/ and those that do not. Both of these features make Wintu a suspect case of the low vowel dissimilation sound change as schematized in (1).

**4. SUMMARY.** In sum, in addition to the well-studied cases of low vowel dissimilation within the Oceanic subgroup of Austronesian, synchronic alternations suggest that parallel sound changes have occurred in Alamlak, a Sepik Hill language, in Kera, an East Chadic language, and in Southern Russian, an Indo-European language (in this case, supported by comparative work). As the sample of languages with this sound pattern grows, recurrent phonetic features of the pattern are more visible: it is typically the first of two low vowels that raises, not the second; long or stressed vowels may be resistant to raising, or alternatively short unstressed vowels may be targets of the same; a guttural consonant, or a consonant with laryngeal constriction, may render an adjacent vowel resistant to raising; dissimilation may be blocked by consonant clusters; and, perhaps due to its association with unstressed vowels, languages with low vowel dissimilation may also show evidence of unstressed vowel reduction, and unstressed vowel assimilation/harmony. While a good phonetic explanation for this process has not been proposed, all of these features suggest that, with further study, one is likely to be found.

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