

Vowelless words in Selau

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1 Vowelless languages versus vowelless words¹

As Roman Jakobson once noted, there are no vowelless languages. It is now generally agreed that all known languages have at least two phonemic vowels, and nearly all have three or more (Maddieson 1984:126; Ladefoged & Maddieson 1996:286ff.).² Despite this limitation, a very small number of the world's roughly 6000 languages permit *vowelless words* — that is, free morphemes in which every underlying segment is a consonant. Such a structural feature has been reported for Kalam, a Papuan language spoken by about 15,000 persons in the Kaironk Valley on the northern edge of the Central Highlands of New Guinea. In Kalam, according to Pawley (1993:91), 'Many words contain no phonemic vowels. Consonant phonemes standing alone or before another consonant phoneme in a word are released with a predictable epenthetic or transitional vowel'. Among the examples Pawley gives are *wɪn* [wusɪn] 'sleep and *yɪk* [yɪrɪk] 'forest'. Languages like Kalam appear to be extremely rare, and none have been reported among the more than 1000 members of the Austronesian language family.³ It thus comes as a surprise to discover that Selau, an

¹ I am indebted to Peter C. Lincoln and John Lynch for comments which led to improvements in an earlier version of this paper. They bear no responsibility for my interpretations or conclusions.

² Halle (1970:65) credits Jakobson with the observation that no vowelless language has ever been reliably reported, but I have not been able to locate the original statement. Kuipers (1960) claimed that the twelve short and five long vowels that occur phonetically in the North-west Caucasian language Kabardian can be reduced to two vowel phonemes, *a* and *E*. He then proceeded to eliminate *a* and *E* by shifting the burden of contrast from these vowels to features of stress and juncture. As Halle demonstrated, Kuipers' analysis of Kabardian as a vowelless language appears to have been motivated more by the desire to discover a counteruniversal, even if only by notational contrivance, than by a well-supported analysis of the data. Halle proposed two underlying vowels *a* and *E* for Kabardian. Following up Allen's (1965) analysis of Abaza, another North-west Caucasian language, Anderson (1978) proposed a single vowel compromise for Kabardian, but two or more vowels have been recognised by most subsequent scholars, including Colarusso (1992), who admits two, and by Ladefoged and Maddieson (1996:286), who admit three, but curiously attribute Kuipers' position on this issue to Halle, and vice versa.

³ James A. Matisoff (pers. comm.) informs me that many Tibeto-Burman languages permit free morphemes that contain only consonants, and similar analyses have been proposed for Mandarin Chinese. John Lynch (pers. comm.) has also suggested that a few other Oceanic languages, including Big Nambas and Lenakel, may permit vowelless words. He notes in particular that Lenakel, spoken on the island of Tanna in southern Vanuatu, has a number of CVCVC words in which the vowels are a possibly predictable schwa.

Austronesian language spoken in western Melanesia, permits vowelless words. As an added benefit, comparative linguistic data show in a number of cases how these canonically bizarre morphemes have arisen from an antecedent stage which can be characterised as 'vowel-rich.'

2 Vowel-rich languages: Mon-Khmer versus Oceanic

Languages can be said to be 'vowel-rich' in either of two senses: (1) the proportion of vowels in the *phoneme inventory* is high, or (2) the proportion of vowels in *morphemes* is high. Many of the Mon-Khmer languages of mainland South-east Asia are vowel-rich in the first sense. In a relatively conservative analysis Huffman (1970:6ff.) describes Standard Cambodian as having 13 vowel phonemes, and 18 consonant phonemes. The vowels thus constitute some 42% of the total phoneme inventory. Other analyses of Standard Cambodian recognise a larger number of underlying vowels, and other Mon-Khmer languages, such as Bru, are said to carry this tendency for vowels to constitute an exceptionally large percentage of the phoneme inventory to even greater extremes.

The second sense in which languages can be called 'vowel-rich' is seen in many languages belonging to the Oceanic branch of the Austronesian language family. Hawaiian, for example, permits a number of non-reduplicated trisyllables that contain only vowels, as with *aea* 'rise up, raise the head', *aia* 'there, there it is', or *aua* 'look, observe', as well as quadrisyllables which are reduplicated (at least historically), as with *ea ea* 'air, breath', or *ua ua* 'tough, sinewy'. The five-syllable word *aoa oa* 'small shrub, *Wikstroemia* sp.', which contains only vowels, may or may not be a historical reduplication.

Since examples such as the foregoing are selective it is necessary to examine comparable data from languages belonging to different language families in order to determine cross-linguistic differences in the vowel : consonant ratio within morphemes. Table 1 presents the vowel : consonant ratio expressed as a percentage of vowels per morphemes from five languages: English, Malay, Roviana, Trukese and Samoan. To obtain these figures a variant of the Swadesh 200-item lexicostatistical test-list was completed for each language. The total number of vowels and consonants was then counted for each of the first 50 words on this list, and these totals were added for all 50 entries and divided by 50 to yield mean vowel percentages per morpheme. Diphthongs were counted as single vowels in all languages, English syllabic *r* was counted as a vowel, and long vowels and consonants in Trukese and Samoan were counted as single segments.

Table 1: Percentage of vowels per morpheme in English and four Austronesian languages

Language	No. of vowels	No. of phonemes	Percentage of vowels
English	56	171	33
Malay	121	289	42
Roviana	155	286	54
Trukese	78	182	43
Samoan	138	239	58

To date, however, he has proposed no such analysis, nor given any indication as to how it might be justified.

Although Malay, Roviana, Trukese and Samoan are all Austronesian languages, the last three belong to the Oceanic (Oc) subgroup of Austronesian, while Malay does not. Roviana is typical of many Austronesian languages in the western Solomons in having added echo vowels to Proto Oceanic (POc) CVCVC stems. Trukese is typical of many of the Oceanic languages of Micronesia and some parts of Melanesia, in having lost the last vowel and consonant of POc CVCVC stems, and Samoan is typical of most other Oc languages in having lost only the final consonant of POc CVCVC stems. As can be seen, the percentage of vowels per morpheme in all four Austronesian languages is significantly higher than in English, reflecting the fact that initial and final consonant clusters are common in English, but rare or absent in An languages. The percentage of vowels per morpheme in Trukese, which has lost POc final -VC sequences, is similar to that in Malay, which preserves most Proto Malayo-Polynesian final consonants, while that of Roviana, which has added echo vowels, and Samoan, which has lost final consonants, is significantly higher. Most of the languages of the western Solomons chain, like Roviana, have added echo vowels to POc CVCVC stems, and so typically have morphemes in which approximately half of the segments are vowels. In this sense, in comparison with languages such as English, they can be called 'vowel-rich' languages. Whatever the analysis of *Selau* shows us today, then, it appears likely that pre-*Selau* was a 'vowel-rich' language in terms of the balance of vowels and consonants within a morpheme.

3 *Selau* phonology: a first approximation

Selau is spoken at the northern tip of Bougainville island in the Solomons chain, within the political domain of Papua New Guinea. It is one of a number of dialects of the Halia language, most of which are spoken on the adjacent smaller island of Buka. Allen and Hurd (1965) list four varieties of Halia (also known as Hanahan, Tulon and Tasi). These are Halia proper, with 3833 speakers in Bougainville District at that time (but larger numbers on Buka), Haku, with 2951 speakers, Hangan, with 1562 speakers, and *Selau*, with 1540 speakers. The first three varieties are described as 'dialects' of a single language, but *Selau* is distinguished as a 'sub-language'. Lincoln (1976b) lists 'Halia (*Selau* variety)' as one of the languages spoken in Bougainville Province of Papua New Guinea. Allen and Allen (1987) state that Halia is 'spoken or understood by some 16,000 people on the north and east coasts of Buka island, the *Selau* peninsula on northern Bougainville, and the Carteret (Tuloun) atoll east of Buka, all areas included within the North Solomons Province of Papua New Guinea'. They list five dialects: Hanahan (east Buka), Tuloun, Hangan (south Buka), Hakö (north Buka), and *Selau*. *Selau* is again classified as a 'sub-language', meaning that it borders on being a separate language from Halia. In the most complete and detailed classification to date Ross (1988:217) assigns Halia to the Nehan/North Bougainville Network within his North-West Solomonic chain, with a further breakdown as follows:

- Proto-Buka
- Petats
- Halia (including Haku, Hanahan, Kilinailau, *Selau*)⁴

⁴ The names Tuloun, Kilinailau and the Carteret islands evidently apply to one and the same atoll. Allen and Allen (1987) use the alternative names Carteret and Tuloun, while Lincoln (1976b) identifies the Carterets with Kilinailau.

In one of the earliest descriptions of the area the anthropologist Beatrice Blackwood (1935:15ff.) classified Petats, spoken on the coral islets of Pororan and Hitau off the west coast of Buka, Saposa, spoken on a cluster of small islands off the north-west corner of Bougainville, and the language spoken on the east and west coasts of Buka as dialects of a single language, stating that 'All these dialects are mutually intelligible'. She noted that the 'dialect' of Kurtatchi, spoken in the villages of Kurtatchi, Baniu and Timputs on the north coast of Bougainville, was lexically quite different from that spoken on Buka, but that her Petats servant was able to pick it up 'in the course of a short time.' She never mentions the names Halia or Selau, and on the whole appears to greatly underestimate the degree of linguistic difference which actually distinguishes some of these communities.

Selau has 13 (possibly 14) surface consonants and six surface vowels, as shown in Table 2:⁵

Table 2: Surface consonants and vowels of Selau

Consonants				Vowels		
<i>p</i>	<i>t</i>	<i>c</i>	<i>k</i>	<i>i</i>		<i>u</i>
<i>b</i>	(<i>d</i>)		<i>g</i>	<i>e</i>	<i>ə</i>	<i>o</i>
<i>m</i>	<i>n</i>		<i>ŋ</i>		<i>a</i>	
	<i>s</i>					
	<i>l, r</i>					
<i>w</i>						

The phonemes *p, t, k* are unaspirated bilabial, alveolar and velar stops. *c* is an alveolar affricate. Although *c* derives historically from the affricatisation of **t* before a high front vowel, it now contrasts with *t*:

<i>təna</i>	'taro sucker'	<i>cəna</i>	'mother'
<i>tor</i>	'belly'	<i>con</i>	'man; husband'
<i>tunus</i>	'urine'	<i>cunu</i>	'bone'
<i>ptaā</i>	'earth'	<i>pcəpcə</i>	'large growth stage of squid'
<i>wat</i>	'stone'	<i>wac</i>	'four'

The phonemes *b, d* (the latter is rare in my data) and *g* are simple (non-prenasalised) voiced stops, and *r* is a 3–4 tap trill. The contrast of *l* and *r* can be illustrated with:

<i>lei</i>	'far, distant'	<i>rei</i>	'tree'
<i>loŋo</i>	'housefly'	<i>roŋono</i>	'to hear'
<i>mola</i>	'fat, grease'	<i>kori</i>	'possum'
<i>tual</i>	'eight'	<i>wiar</i>	'two'

The phoneme *y* was recorded in *yar* 'a shore tree: *Casuarina equisetifolia*' (Tok Pisin: *yar*), but this appears to be confined to loan words.

⁵ Selau material was collected in Canberra, Australia during the second half of 1975 in three sessions totalling approximately six hours. My primary source of data was Luke Pawen, with further input from Margaret Pinil during the last meeting. Both speakers were students temporarily resident in Australia at the time we worked together, and both hailed from the village of Torte on the northern tip of Bougainville.

Both vowels and consonants occur long. To avoid a premature introduction of the analysis which will follow these are cited in phonetic transcription:

[wakac]	'think, mull over'	[wa:kac]	'lightning'
[ara:]	'all'	[ara]	'fishing with line and hook'
.[koto]	'bite'	[ko:to]	'kind of oval nut'
[siya]	'nine'	[s:ə]	'breast'
[anus]	'charcoal'	[un:awa]	'turtle shell'

Unlike most Oceanic languages, Selau permits consonant clusters in both initial and intervocalic positions in phonetic forms: [cta] 'putty nut', [ptən] 'coconut husk', [balsə] 'dove', [ləmtə] 'moss, algae'. Final clusters never appear on the surface but, as will be seen, do appear in underlying forms. Words may end either in an underlying vowel or an underlying consonant, and stress generally falls on the penult, although both final stress in disyllables and initial stress in trisyllables was recorded in some forms. Attempts to determine minimal or subminimal pairs, however, were invariably met with frustration, suggesting that stress is non-phonemic, but movable under still unstatable conditions.

The most interesting issues in Selau phonology appear in connection with the vowels. Phonetically Selau has straightforward reflexes of POc *a, *e, *i, *o and *u. In addition, a number of words contain a mid-central or high-central vowel that was most frequently transcribed as schwa. All vowels can optionally be followed by a non-contrastive glottal stop in word-final position:

/mia/	[miya] ~ [miyaʔ]	'tongue'
/sopene/	[sopene] ~ [sopeneʔ]	'saucepan'
/tebeli/	[tebeli] ~ [tebeliʔ]	'clay pot'
/malto/	[malto] ~ [maltoʔ]	'ten'
/cku/	[cku] ~ [ckuʔ]	'sew sago leaves'

Allen and Allen (1987) list three front vowels, two central vowels, five back vowels and three glides for Halia. However, they provide no evidence of contrast, and it is almost certain that the number of underlying vowels is smaller than they indicate. What is most relevant to the problem at hand is that Halia lacks a mid-central or high-central vowel comparable to Selau /ə/. Rather, where Selau has a schwa the corresponding segment in Halia usually is a high vowel, or less commonly the low vowel /a/. I know of no instances in which Selau schwa corresponds to Halia /e/ or /o/.

4 The phonemic status of Selau schwa

Both synchronically and diachronically the most problematic segment in Selau is the mid-central vowel. Two types of synchronic evidence suggest that the schwa in many morphemes is non-phonemic, and this conclusion is further supported by historical considerations. One type of synchronic evidence will be examined with the diachronic evidence here, while the second type of synchronic evidence will be reserved for discussion in the following section.

The first indication that Selau schwa may not always be phonemic comes from the movable position of this segment in some transcriptions. The word for 'hand/arm' (POc *lima) was recorded both as [ləma] and as [əma], and the word for 'nit, egg of a louse' (POc

**lisa*) was recorded both as [ləsa] and as [əlsa]. Such free variation suggests that the schwa in these forms is little more than an automatic facilitating vowel which enables speakers of the language to pronounce the underlying consonant clusters in *lma* and *lsa* respectively.

Although the evidence of variant pronunciations is confined in the data recorded to these two forms, comparative-historical evidence points in the same general direction. As seen in Table 3, Selau has generally lost POc high vowels in final position.

Table 3: Loss of earlier high vowels in word-final position in Selau

POc	Selau	English
<i>*boŋi</i>	<i>boŋ</i>	'night'
<i>*keju</i>	<i>er</i>	'back of the head'
<i>*-gu</i>	<i>-g</i>	'1SG genitive'
<i>*-mu</i>	<i>-m</i>	'2SG genitive'
<i>*maqati</i>	<i>mac</i>	'low tide, dry reef'
<i>*mali</i>	<i>mal</i>	'bitter'
<i>*mami</i>	<i>mam</i>	'our (excl.)'
<i>*muri</i>	<i>mər</i>	'back, behind'
<i>*nasu</i>	<i>nas</i>	'cook, boil'
<i>*kaŋaRi</i>	<i>ŋar</i>	'canarium nut'
<i>*rani</i>	<i>ran</i>	'day'
<i>*tuRu</i>	<i>tur</i>	'housepost'
<i>*pati</i>	<i>wac</i>	'four'
<i>*patu</i>	<i>wat</i>	'stone'
<i>*pitu</i>	<i>wit(i)</i>	'seven'
<i>*poli</i>	<i>wol</i>	'buy'
<i>*kutu</i>	<i>wut</i>	'louse'

Vowels generally did not drop in final position if they were not high:

<i>*tina</i>	>	<i>cəna</i>	'mother'
<i>*lima</i>	>	<i>ləma</i>	'five'
<i>*tupa</i>	>	<i>tua</i>	'derris root'
<i>*muno-muno</i>	>	<i>mənməno</i>	'caterpillar'

Although some high vowels remained word-finally, the general pattern of apocope for final high vowels is clear. Like many other languages in the western Solomons chain Selau added echo vowels to POc CVCVC forms. These vowels have been preserved if they are non-high, as with:

<i>*ikan</i>	>	<i>iana</i>	'fish'
<i>*limas</i>	>	<i>nəmsa</i>	'canoe bailer'
<i>*onom</i>	>	<i>nomo</i>	'six'

but have disappeared if they were high, as with:

<i>*qatun</i>	>	<i>atən</i>	'tuna, bonito'
<i>*ranum</i>	>	<i>ramən</i> (metathesis)	'fresh water'
<i>*saRum</i>	>	<i>saləm</i>	'needle'

As each of these forms shows, the high vowel that preceded a final consonant is reflected phonetically as a schwa, not as zero. Schwa and zero thus appear to be complementarily distributed reflexes of earlier high vowels, and in this sense can be regarded as structurally equivalent. Stated differently, POc high vowels underwent a conditioned sound change, disappearing in final position in CVCV forms and in certain other environments, but becoming schwa between consonants (or following derived consonant clusters). Etymologies such as **ikan* > *iana* 'fish', **tupa* > *tua* 'derris root fish poison', or **kutu* > *wut* 'louse' suggest that the centralisation and loss of high vowels between consonants took place only after the loss of **p* and **k*. Reflexes which contain a consonant cluster further support the analysis of schwa as structurally equivalent to zero. POc **putun* > *ptən* 'coconut husk', for example, shows a zero reflex of **u* in the first syllable, but a schwa in the second.

One might argue that high vowels underwent a conditioned sound change, disappearing in the penult but weakening to a phonemic schwa in the last syllable before a POc final consonant. However, this analysis is contradicted by etymologies such as **tina* > *cəna* 'mother', **lima* > *ləma* 'five', or **lumut* > *ləmtə* 'moss, algae', where a POc high vowel weakened to schwa in the penult, and (in the case of *ləmtə*) disappeared before a POc final consonant. The last example provides still another piece of evidence that schwa and zero are historically equivalent in Selau. Etymologies such as **lumut* > *ləmtə* 'moss, algae', **baluj* > *balsə* 'dove' and **laŋit* 'sky' > *laŋcə* 'rain' contain a final schwa. Should this schwa be regarded as a reflex of the echo vowel which these forms earlier contained? If so, there is no explanation as to why a similar weakened reflex does not appear in **qatun* > *atən* 'tuna, bonito', **putun* > *ptən* 'coconut husk', **saRum* > *saləm* 'needle' and the like. Rather, the schwa in *ləmtə*, *balsə* and *laŋcə* appears to be little more than a transitional vowel permitting speakers to pronounce what would otherwise be a disallowed final consonant cluster.⁶

5 Simple imperative and ambulatory imperative

This brings us to the third type of evidence that Selau schwa is sometimes, if not always, added by rule to underlying representations which lack it. Selau has two imperative constructions. The first of these, which I will call the 'simple imperative', has the general form verb-*i* (object), and can be translated as 'VERB (it)'. The second, which I will call the 'ambulatory imperative', has the general form *na* verb-*ia* (object), and can be translated as 'go and VERB (it)'. Examples of each are given in Table 4:

⁶ Detailed conditioning of the phonetic form of reflexes remains to be worked out (e.g. given **baluj* > /balsə/ 'dove', why not a parallel development **qatun* > **/atnə/ 'tuna, bonito?'). Although it is beyond the scope of this paper to investigate this conditioning, it is likely that zero vs. schwa as the reflex of an earlier high vowel in Selau has been determined by universal constraints on the form of consonant clusters. In the great majority of recorded cases high vowels were lost between medial and final consonants if the first consonant was equal to or greater in sonority than the second; otherwise the high vowel weakened to schwa.

Table 4: Simple and ambulatory imperative, formed with the suffixes *-i* and *-ia*

Base	Simple imperative	Ambulatory imperative	Gloss
<i>ase</i>	<i>ase-i</i>	<i>na ase-ia</i>	'count'
<i>atəŋ</i>	<i>atəŋ-i</i>	<i>na atəŋ-ia</i>	'fight'
<i>cku</i>	<i>cku-i</i>	<i>na cku-ia</i>	'sew sago leaves'
<i>nas</i>	<i>nas-i</i>	<i>na nas-ia</i>	'cook, boil'
<i>nu</i>	<i>nu-i</i>	<i>na nu-ia</i>	'eat'
<i>pəla</i>	<i>pəla-i</i>	<i>na pəla-ia</i>	'gun; shoot'
<i>piu</i>	<i>piu-i</i>	—	'blow on'
<i>sani</i>	<i>sani-i</i>	<i>na sani-ia</i>	'dance'
<i>sowo</i>	—	<i>na sowo</i>	'sleep'
<i>suru</i>	<i>suru-i</i>	<i>na suru-ia</i>	'sip'
<i>tapala</i>	<i>tapala-i</i>	<i>na tapala-ia</i>	'slap'
<i>wa</i>	<i>wa-i</i>	<i>na wa-ia</i>	'drink'
<i>wana</i>	<i>wana-i</i>	<i>na wana-ia</i>	'shoot with bow'
<i>wol</i>	<i>wol-i</i>	<i>na wol-ia</i>	'buy'

The full expression of the ambulatory imperative involves some redundancy, since it requires both the verb *na* 'go (and do something)', and the suffix *-ia*, either of which is sufficient to distinguish the two imperative constructions by itself. Although the available evidence is fragmentary, it appears that either the verb 'to go' or the imperative suffix (but not both) may be omitted without ambiguity. It is possible that *na* VERB is used only with intransitive verbs or with transitive verbs that take non-expressed indefinite objects, and that *na* VERB-*ia* or VERB-*ia* is used with verbs that take a definite object, but more data would be needed to settle the matter. Example sentences which illustrate this variation include the following:

- (1) *ase-ia moni* 'go and count the money!' (suffix only)
- (2) *atəŋ-i* 'kill it!'
(*na*) *atəŋ-ia pum* 'go and kill the pig!' (verb optional)
- (3) *nas-i* 'cook it!'
na nas 'go and cook (something)!' (verb only)
na nas-ia iana 'go and cook the fish!' (both verb and suffix)
- (4) *na sowo* 'go to sleep!' (verb only).

The examples in Table 4 show that verbs which end in *a*, *e*, *i* or *u* retain this vowel before the suffixes *-i* and *-ia*. By contrast, verbs which end in schwa show no stem-final vowel before a suffix, as seen in Table 5:

Table 5: Verbs that end in phonetic schwa and their suffixed imperative forms

Base form	Simple imperative	Ambulatory imperative
<i>garsə</i> 'wash (hands)'	<i>gars-i</i>	<i>na gars-ia</i>
<i>kcə</i> 'to tie'	<i>kc-i</i>	<i>na kc-ia</i>
<i>ssə</i> 'breast'	<i>ss-i</i>	<i>na ss-ia</i>
<i>warsə</i> 'drop, throw down'	<i>wars-i</i>	<i>na wars-ia</i>

Example sentences include:

- | | | |
|-----|------------------------------|----------------------------------|
| (1) | <i>(na) gars-ia ləma-mli</i> | 'go and wash your hands!' |
| | go wash-IMP hand-your | |
| (2) | <i>kc-i</i> | 'tie it!' |
| (3) | <i>ss-i</i> | 'nurse it! (e.g. a crying baby)' |
| | <i>na ss-ia aksə</i> | 'go and nurse the child!' |
| | go-nurse-IMP child | |
| (4) | <i>wars-i</i> | 'drop it! throw it down!' |

Only limited data was collected for Selau, and it is therefore not surprising that the number of relevant examples is small. Nonetheless they are sufficient to show that the morpheme for 'tie' must be a vowelless stem *kc*, and the morpheme for 'breast' must be a vowelless stem *ss*. Given this analysis it follows that [ənnə] 'earthquake', from POc **nunu*, is also a vowelless stem *nn*. If the central vowels were regarded as underlying we would be forced to conclude that **u* was irregularly reflected as schwa in an open final syllable, and that that **u* had both centralised and metathesised in the first syllable. Similar problems occur in other forms, as Selau [ləmtə] 'moss, algae' (POc **lumut*), which must be analysed as underlying *lmt*. The question remains open as to whether *any* instances of schwa in Selau are phonemic, but regardless of the answer to this question it is clear that a number of vowelless free morphemes must be admitted as underlying forms.

Before concluding it is worth stressing again that the present analysis *is not* based on the mere fact that some free morphemes in Selau contain no phonetic vowels other than schwa. In any phonemic analysis it is possible to represent one of the segments by zero. The consonant that is most commonly subject to zero-representation is glottal stop, and the vowel that most frequently receives this treatment is schwa. In such an analysis it would be possible to posit vowelless words as an analytical artifice, but the results would be subject to the same types of criticisms that Halle raised against the analysis of Kabardian as a vowelless language. Whether Big Nambas and Lenakel or any other An language actually contains vowelless free morphemes, or simply free morphemes that contain no phonetic vowels other than schwa, remains an open question. The evidence for vowelless free morphemes in Selau goes beyond such artifices in at least three ways. First, the position of schwa is variable in some recorded morphemes, as *ləma/əlma* 'hand' or *ləsa/əlsa* 'nit, egg of a louse'. Second, the imperative forms of bases that end with a vowel other than schwa show no vowel deletion or vocalic contraction when suffixed with *-i* or *-ia*, but bases which end with a phonetic schwa show no final base vowel under suffixation, and in this respect they behave no differently from bases which end in a consonant. Third, if we recognise the schwa as phonemic the rules of diachronic correspondence become exceedingly complex and implausible in a number of etymologies, for which **nunu* > *ənnə* 'earthquake' can serve to illustrate. POc high vowels normally disappeared in final position, and there is no obvious source for the initial vowel unless we arbitrarily introduce a hypothesis of metathesis. If schwa is allowed as a reflex of POc **u* in these cases it thus becomes necessary to recognise two phonological irregularities in this form. Under the same type of analysis, **susu* > *ssə* 'breast' would show a parallel irregularity in retaining the final high vowel as schwa, and would also show a morphophonemic anomaly in deleting the final vowel under suffixation. Observations such as this make it abundantly clear that a number of generalisations about Selau phonology — both synchronic and diachronic — would be obscured if we were to avoid the recognition of vowelless free morphemes in the language.

Occasionally low vowels appear to have deleted and were replaced with non-phonemic transitional schwas as well, as with [əntə] = *nt* 'egg' (*Halia nata*). Generally, however, Selau schwa is a historically secondary phonetic development which followed the deletion of earlier high vowels. As noted earlier, the greatest remaining challenge is to state the phonetic rules which govern the insertion of schwa. More challenging still is to find a reason why Selau, apparently alone among the more than 1000 Austronesian languages, has evolved a canonical shape which permits vowelless words, a development which is all the more remarkable considering that its immediate antecedent was a language which contained an exceptionally large percentage of vowels per morpheme.

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