Umbuygamu

Jean-Christophe Verstraete
University of Leuven
jcv@kuleuven.be

Umbuygamu is a Pama-Nyungan language of the east coast of Cape York Peninsula, in the northeast of Australia. Genetically, the language belongs to the Lamalamic subgroup (Laycock 1969, Rigsby 1997) of Paman languages, themselves a subgroup of Pama-Nyungan (as proposed by Hale 1964, 1966; see also Bowern & Atkinson 2012). Umbuygamu is the language of three clans at the southern end of Princess Charlotte Bay, about halfway up the east coast of Cape York Peninsula. Their estates are centred on a lagoon called Emanha (or Dinner Hole in English); they extend inland into the upper Running Creek system, and include the Cliff Islands group along the coast; see Rigsby 1992 for more details, and Verstraete & Rigsby (2015: 2) for a map of the region and its languages. Neighbouring languages are the Middle Paman language Umpithamu, along the coast to the north (see, for instance, Verstraete 2010, 2012) and two Lamalamic languages, Rimanggudinhma to the southwest (located inland; Godman 1993, Sommer 1999b), and Lamalama to the southeast (along the coast; Sommer 1999a).

Umbuygamu is also known in the literature as Morrobolam (e.g. Ogilvie 1994), which is actually the name of one of the three clans associated with the language. The name Umbuygamu refers to the language proper, but is an exonym originating in the Umpila language, spoken at the northern end of Princess Charlotte Bay. The language has been described in previous work, most prominently in the grammar sketches by Ogilvie (1994) and Sommer (1998), as well as some studies of specific aspects of morphosyntax and historical phonology (e.g. Sommer 1976; Rigsby 1997; Verstraete 2011, 2012). The language is no longer spoken, but is represented in a fairly large corpus of elicited materials and texts, recorded between 1964 and 2009. The recorded corpus represents eight speakers: (i) Mrs Rosie Liddy, recorded by SIL (Summer Institute of Linguistics) linguists in 1964 and by Bruce Rigsby in 1972; (ii) Mr King Armstrong, recorded by Don Laycock in 1964 and by Bruce Rigsby in 1974; (iii) Mr Norman King, recorded by La Mont West Jr. in 1965; (iv) Mrs Nellie Salt, recorded by La Mont West Jr. in 1965 and by Bruce Sommer in 1972; (v) Mr Bob Bassani, recorded by Bruce Sommer and by Bruce Rigsby (separately) in 1972; (vi) Mrs Nancy Gunnawarra, recorded by Bruce Rigsby in 1972 and by Bruce Sommer in 1974; (vii) Mrs Florrie Bassani, recorded by the present author between 2005 and 2009; and (viii) Mr Bobby Stewart, recorded by the present author between 2005 and 2009. These speakers represent two successive generations: people born around the turn of the 20th century (i–v), and the next generation born around the 1930s (vi–viii). As will be suggested below, there may be some changes in the inventories of the younger generation. Except for King Armstrong,

Journal of the International Phonetic Association (2019) 49/2
doi:10.1017/S0025100317000172

First published online 17 May 2017

all of the speakers in the corpus represent the variety associated with the Morrobolam clan. Clan varieties are usually regarded as distinct in local linguistic ideology (see Sutton 2003; Verstraete & Rigsby 2015: 8–11), though the actual differences from a linguistic perspective are often limited. There are some lexical differences within clan varieties of Umbuygamu, but there is not enough data on other varieties than the Morrobolam variety to analyse phonetic differences. This study is based on all of the material representing the variety associated with the Morrobolam clan, i.e. seven of the eight speakers. Illustrations come from the following speakers, except where otherwise noted: Bob Bassani (BB), Rosie Liddy (RL), Nellie Salt (NS), Nancy Gunnawarra (NG) and Florrie Bassani (FB). This provides the reader with material from an older and a younger generation of speakers, as well as male and female speakers. None of the recordings were made in studio conditions, and most were made outside, as is the speakers' preference in this region. The analysis in this study deviates significantly from the analysis presented in the earlier sketches (Ogilvie 1994, Sommer 1998). I highlight differences whenever they are prominent or relevant enough.

Consonants

	Bilabial	Dental	Alveolar	Alveo-palatal	Palatal	Velar	Glottal
Plosive	p b	t̪ d̪	t d		c ɟ	k g	ʔ
Nasal	m	n̪	n		ɲ	ŋ	
Fricative	ɸ	θ		ɕ			h
Lateral			l				
Trill			r̥ r				
Approximant	w	ð̞	ɹ		j		

	PHONEMIC FORM	ORTHOGRAPHIC FORM	GLOSS (SPEAKER)
/p/	/ɔˈpa/	*opa*	'palm tree, coolamon' (RL)[1]
/b/	/aˈbal/	*abal*	'king parrot' (RL)
/t̪/	/aˈt̪a/	*atha*	'rotten' (NG)
/d̪/	/aˈd̪a/	*adha*	'little shark' (RL)
/t/	/aˈta/	*ata*	'lower leg' (NG)
/d/	/ˈʔada/	*ˈada*	'from the south' (FB)
/c/	/aˈcan/	*atyan*	'egg' (RL)
/ɟ/	/ɛˈɟɛnu/	*edyenu*	'old man' (NG)
/k/	/ɔˈraŋ ˈmaka/	*orrang maka*	'message stick' (RL)
/g/	/aˈgan̪/	*aganh*	'mangrove sp.' (RL)
/ʔ/	/ɛˈʔan̪/	*eˈanh*	'plains turkey' (RL)
/m/	/aˈma/	*ama*	'person' (NG)
/n̪/	/aˈn̪a/	*anha*	'liver' (BB)
/n/	/aˈnam/	*anam*	'grub sp.' (FB)
/ɲ/	/aˈɲal/	*anyal*	'brother-in-law' (FB)
/ŋ/	/aˈŋa/	*anga*	'breath' (RL)
/ɸ/	/uˈɸa/	*ufa*	'sand' (NG)

[1] The orthography mainly follows standard Australian practice, except for fricatives and the dental approximant, which are rare in Australian languages. Digraphs are used for dental and palatal nasals and

/θ/	/aˈθa/	*aθa*	‘fire’ (NG)
/ç/	/iˈçan/	*ishan*	‘big cabbage tree’ (RL)
/h/	/aˈha/	*aha*	‘north’ (FB)
/l/	/aˈla/	*ala*	‘spear’ (BB)
/r/	/aˈram/	*arram*	‘wallaby sp.’ (RL)
/r̥/	/aˈr̥am/	*arham*	‘sandridge goanna’ (FB)[2]
/w/	/aˈwaɹ/	*awar*	‘head’ (BB)
/ð̞/	/ˈhað̞arˌla/	*haðarr=la* good=3SG.NOM	‘It is good.’ (NG)
/ɹ/	/ɛˈɹa/	*era*	‘ground’ (BB)
/j/	/aˈja/	*aya*	‘spider’ (RL)

The examples show the consonants in intervocalic position, which allows the largest number of consonantal contrasts in this language (see section ‘Stress and word structure’ below). The examples provide a phonemic representation, followed by a representation in practical orthography, and the abbreviation for the relevant speaker’s name (see above). Given the nature of the corpus, I do not have sound clips of sufficient quality by one and the same speaker for all of the examples. The same applies to allophonic variation (discussed in the second half of this section and the next), which cannot be systematically demonstrated with alternating tokens from one and the same speaker, and is illustrated with examples from different speakers instead. Whenever a specific variant is idiolectal, however, this is mentioned explicitly; all other variation is to be regarded as general for the different speakers in the corpus.

I first describe the inventory in the context of Australian languages more generally, and then focus on individual (sets of) phonemes, including patterns of allophony. The consonant inventory of Umbuygamu is unusual for an Australian language, for a number of reasons. First, its general architecture deviates markedly from the fairly uniform inventories found in most Australian languages. Australian consonant inventories have generally been described as ‘long and thin’ (Butcher 2006), combining relatively few contrastive manners of articulation with relatively many places of articulation (see further Butcher 2006, Fletcher & Butcher 2014, Gasser & Bowern 2014). Umbuygamu has the ‘Standard Australian’ manner contrasts of paired plosives and nasals for most places of articulation, plus trills, laterals and approximants for a smaller set of places of articulation. In addition, however, it also has a contrastive fricative series, and a voicing contrast for plosives (see further below). Both features are rare in Australia. Contrastive fricative series are found in a number of subgroups of Paman languages in Cape York Peninsula, including Lamalamic (Sommer 1976, Rigsby 1997) and Northern Paman (Hale 1964, 1976a), as well as in the Western Torres Strait language just north of the Peninsula (e.g. Hunter, Bowern & Round 2011), and in the Daly River area in the continent’s northwest (Evans 1995; Dixon 2002: 605–616). VOT-related contrasts for plosives are found, again, in some subgroups of Paman languages in Cape York Peninsula, including Lamalamic (Sommer 1976, Rigsby 1997), Alaya-Athima (Alpher 2016) and Southwest Paman (Alpher 1972), as well as some other regions of Australia (see Austin 1988 and Dixon (2002: 605–616) for overviews, and Butcher & Reid 1989 on the nature of the VOT contrasts involved). A second noteworthy feature in Umbuygamu is the presence of a contrastive glottal stop, both in initial position, as in /ˈʔada/ *ˈada* ‘from the south’ (FB), and intervocalically, as in /ɛˈʔan̪/ *eˈanh* ‘plains turkey’ (RL). Contrastive glottal stops are generally rare in Australia, but found in

plosives (*dh*, *th*, *nh* and *dy*, *ty*, *ny*, respectively), as well as for the alveopalatal fricative (*sh*) and the two trills (*rh* and *rr*). Other orthographic representations that are different from their IPA representation are used for the bilabial fricative (*f*), the dental, alveolar and palatal approximants (*ð*, *r* and *y*, respectively) and the glottal stop (*ˈ*).

[2] As noted by a reviewer, the final consonant in this token is not nasal. This is a peculiarity of this particular token – unfortunately, no alternative recording is available.

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

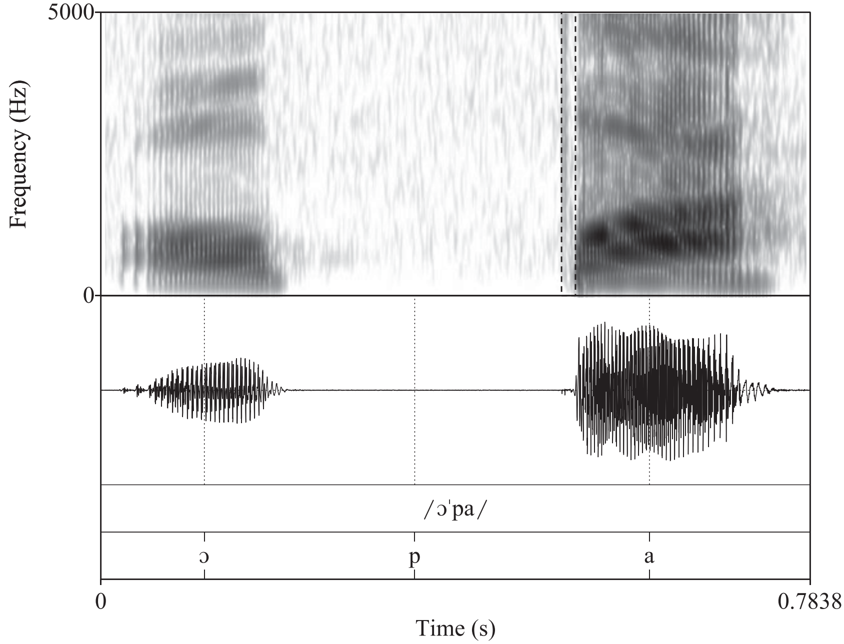


Figure 1 Spectrogram and waveform for /ɔˈpa/ *opa* 'palm tree' (RL), VOT highlighted.

many languages of Cape York Peninsula, as well as Arnhem Land (Evans 1995; Dixon 2002: 615–618). A third unusual feature is the presence of a voicing contrast for alveolar trills, found in no other Australian languages apart from the Lamalamic languages and Yaygir of northern New South Wales (Dixon 2002: 578). A final feature that is typologically noteworthy is the presence of a dental approximant /ð̞/. This is again rare in Australian languages: it is found as a contrastive element in some languages of Western Australia – Yindyibarndi (Tabain & Butcher 1999: 334–335), Bunuba (Rumsey 2000: 42) and some less well-documented cases (Olson et al. 2010) – and in Cape York Peninsula as an allophone of a dental plosive in the Southwest Paman language Kuuk Thaayorre (Gaby 2006: 28). This extends the series of approximants found in Umbuygamu to almost the same set of places of articulation found for plosives and nasals.

The plosive series shows a contrast between voiced plosives and voiceless unaspirated plosives (except, of course, for glottal stops). In the Australianist literature, there has been some debate over the status of voicing as a contrastive feature. In some Australian languages, voicing has been demonstrated to be a typical correlate of consonant length, such that the length of the closure phase is the basic contrastive feature, with long plosives typically being voiceless, and short ones typically voiced (Butcher & Reid 1989, Butcher 2004). In Umbuygamu, by contrast, the basis of the contrast is related to VOT, and there is no correlation with length: consonant lengthening is a general allophonic process associated with a specific consonant position (see below), rather than a contrast restricted to plosives. For instance, in the tokens illustrating plosive contrasts at the start of this section, the voiceless plosives have VOT times between approximately 10 ms and 30 ms, regardless of length (compare long /p/ in /ɔˈpa/ *opa* 'palm tree' (RL) with short /k/ in /ɔˈraŋ ˈmaka/ *orrang maka* 'message stick' (RL)). Figure 1 illustrates /p/ in /ɔˈpa/ *opa* 'palm tree' (RL), with a long closure phase, and a VOT of approximately 15 ms. The figures in this paper were created using Praat (Boersma & Weenink 2015).

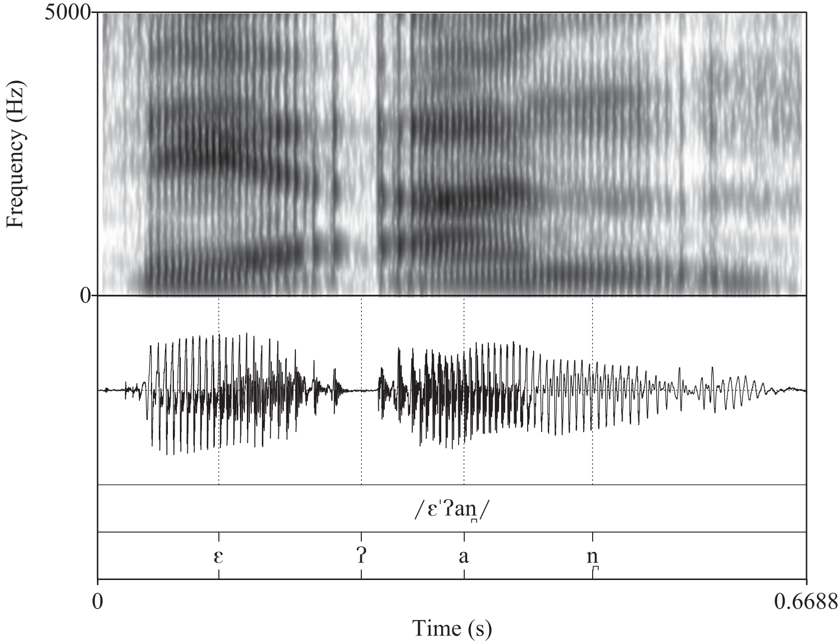


Figure 2 Spectrogram and waveform for /ɛˈʔan̪/ *eˈanh* 'plains turkey' (RL).

Within the plosive series, there is one phoneme that is very rare, namely the voiced palatal plosive /ɟ/, found in eight roots, and one phoneme that is relatively rare, namely the voiceless velar plosive /k/, found in 16 roots (versus almost four times as many roots with voiced velar plosives). The rarity of the voiceless velar plosive in Umbuygamu is typologically somewhat unexpected. Cross-linguistically, voiceless velar plosives seem to be favoured over voiced ones (see Ohala 1983), as reflected, for instance, in the fact that inventories with a voicing contrast tend to lack voiced back plosives rather than voiceless ones (see Maddieson 2013). In Umbuygamu, the relative rarity of voiceless velar plosives can be attributed to historical developments, specifically the development of velar plosives to glottal stops in intervocalic contexts (e.g. *aˈa* 'close' < Proto-Pama-Nyungan **nyaka* 'here' (Alpher 2004)), and to voiced plosives in the context of homorganic nasal-plosive clusters (e.g. *agarr* 'flesh' < Proto-Paman **pangkarr* 'flesh' (Hale 1976b)), which worked together to almost eliminate voiceless velar plosives from the lexicon. One final note on the plosive series concerns the glottal stop. As can be seen in Figure 2, the glottal stop is reflected in creaky voice in the surrounding vowels, a phenomenon that is cross-linguistically not uncommon (see Ladefoged & Maddieson 1996: 74–75).

The nasal series shows allophonic variation between plain and prestopped nasals. Prestopping is found with all nasals, as illustrated in (1), but always optionally.

(1)	a.	/aˈmal/	[aˈp^{m}ɐl]	*amal*	'foot' (RL)
	b.	/aˈn̪ar/	[aˈt̪$^{n̪}$ɐr]	*anharr*	'saltwater crocodile' (RL)
	c.	/iˈna/	[iˈt^{n}a]	*ina*	'ear' (RL)
	d.	/ˈhaɲam/	[ˈxac^{ɲ}æm]	*hanya-m* put-PRS	'put' (NS)
	e.	/iˈŋal/	[iˈk^{ŋ}ɐl]	*ingal*	'boomerang' (RL)

There is no evidence that prestopped nasals constitute a separate contrastive series, as claimed in Ogilvie (1994: 26–27) and Sommer (1998: 8, 11). All of the items they present as contrastive

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

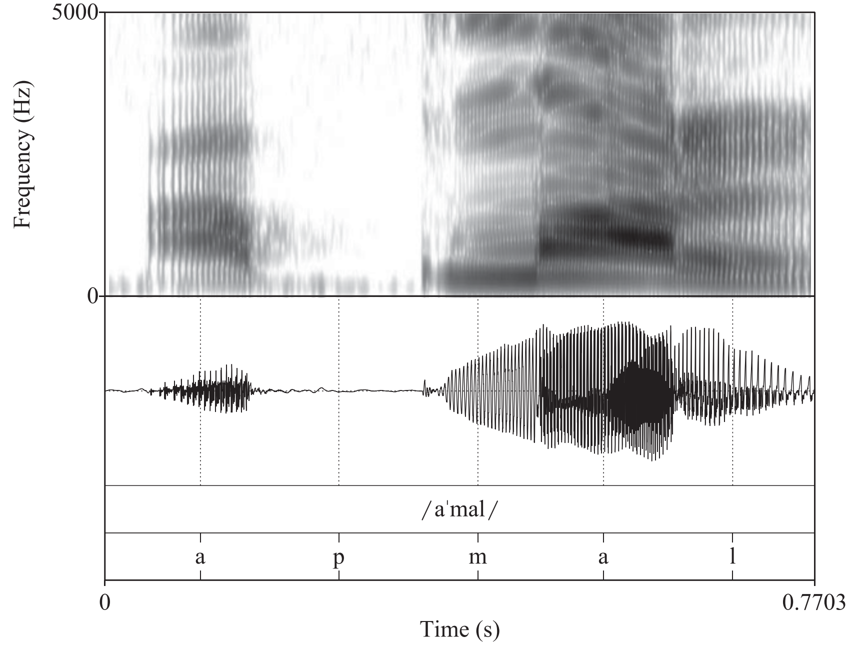


Figure 3 Spectrogram and waveform for /aˈmal/ [aˈpᵐɐl] *amal* 'foot' (RL).

with prestopped nasals (e.g. *okngal* 'mosquito' in Ogilvie 1994: 26) actually show variation between plain and prestopped nasals in the present corpus.

The stop phase preceding the nasal is consistently voiceless, unlike with prestopped nasals in other Paman languages like Olkola (Hamilton 1997), and it is usually longer than (or at least as long as) the nasal phase. This is illustrated in Figure 3, where in /aˈmal/ [aˈpᵐɐl] *amal* 'foot' (RL), the stop phase is nearly twice as long as the nasal phase. In fact, the relative prominence of the stop phase would justify a phonetic analysis as postnasalized (or nasally released) plosives rather than prestopped nasals (also when compared with other cases of allophonic prestopping in Australia (see Round 2014, Harvey et al. 2015), where the stop phase is usually quite short).[3] I transcribe the sounds as such in (1) above and elsewhere in this paper, but given the systematic alternation with 'plain' nasals in Umbuygamu, as well as the tradition of work focused on prestopping in Australia (see Butcher 1999, Round 2014), I retain the label prestopped nasals in this description.

Prestopping in Umbuygamu is found most typically at the onset of a stressed syllable, less typically at the onset of unstressed syllables, and almost never in clusters. Not all speakers in the corpus show this variation, however: in the older generation, four out of five speakers use prestopped nasals, while in the younger generation only one uses them. It is difficult to interpret this in a straightforward way, but given that the one older-generation speaker who lacks prestopping is described as less than fluent in the recording notes, the distribution suggests that prestopping could be an older feature that is lost among younger speakers.

[3] Phonetically, this has been related to a general dispreference for anticipatory velar lowering in Australian languages, 'with the result that orality perseverates into the nasal consonant' (Butcher 1999: 480). This type of prestopping is found in a number of Australian languages, either allophonically or contrastively: within Cape York Peninsula, it is also found in Southwest Paman (Alpher 1972, Hamilton 1997) and Alaya-Athima (Alpher 2016), and beyond Cape York Peninsula in a large set of Central Australian languages (Hercus 1972, Butcher 1999, Round 2014).

The fricative series has two phonemes that are reasonably frequent in the lexicon, and two that are rare. The rare fricatives are the voiceless bilabial fricative /ɸ/ and the voiceless alveopalatal fricative /ɕ/, found in four and six roots, respectively. Both also show variation: /ɸ/ alternates with a labiodental fricative [f], as shown in (2) below, and /ɕ/ alternates with an alveolar fricative [s], as shown in (3).

(2) /uˈɸa/ *ufa* ‘sand’
  a. [uˈɸʷɔ] (NG)
  b. [uˈfʷɐ] (RL)

(3) /ɲiˈɕaɹ/ *inya* *ishar* ‘fish’[4]
  game.animal fish
  a. [ɲiˈɕɐɹ] (RL)
  b. [ɲiˈsɐɹ] (NG)

There are not enough tokens to determine the basis of this variation, although for /ɕ/ it may be idiolectal, as one speaker (NG) almost consistently has an alveolar realization [s]. The dental and glottal fricatives, by contrast, are not rare at all. The glottal fricative shows variation between a voiceless glottal fricative [h], available in all contexts, a voiceless velar fricative [x], available in the onset of stressed syllables, and a voiced glottal realization [ɦ], audible (mainly) in post-tonic positions, as illustrated in (4).

(4) a. /aˈha/ [ɐˈhɐ] *aha* ‘north’ (FB)
  b. /aˈhaɹ/ [ɐˈxɐɹ] *ahar* ‘fat’ (RL)
  c. /ɔˈrahar/ [ɔːˈrɐɦɐr] *orraharr* ‘cloud’ (RL)

In addition to the fricative phonemes, two phonemes in the inventory of Umbuygamu have fricative or affricate allophones. The voiceless palatal plosive /c/ has an (infrequent) affricate allophone [tʃ], as shown in (5).

(5) /iˈcalɛˌwɛna/ [iˈtʃaːlˌwɛna] *ityal* *ewe-n=na* ‘The children played.’ (BB)
  child play-PST=3PL.NOM

The bilabial approximant /w/ can have a voiced bilabial fricative allophone [β] before a high or mid front vowel,[5] illustrated in (6) (compare also with the verb in (5)).

(6) a. /ɛˈwɛ/ [ɛˈβɛ] *ewe* ‘whistleduck’ (RL)
  b. /aˈriwir/ [aːˈrɪβɪr] *arriwirr* ‘owl sp.’ (NS)

As mentioned earlier, Umbuygamu has contrasting voiced and voiceless alveolar trills, as in /aˈram/ *arram* ‘wallaby sp.’ (RL) and /aˈr̥am/ *arham* ‘sandridge goanna’ (FB). Voiced trills are voiced throughout, while for voiceless ones, voicing is suspended for the duration of the trill, as shown in Figures 4 and 5.

In the series of approximants, there is one element that deserves further comment, namely the dental approximant /ð̞/. In earlier work on Umbuygamu, this has been analysed as a fricative, the voiced equivalent to the dental fricative /θ/ (Ogilvie 1994: 27–28). However, there is no evidence to analyse this as a fricative, phonetically or phonologically. Phonetically,

[4] This is an example of a compound construal for an NP consisting of a generic and a specific nominal. See section ‘Stress and word structure’ on compound structures, where dropping of initial and final V in the first lexeme is discussed in more detail.

[5] Ogilvie (1994: 27) lists the bilabial approximant as a separate phoneme (though without evidence from minimal pairs). In the present corpus of recordings, which includes the recordings she used, [β] consistently alternates with [w], in a phonetically definable context, so there is no evidence in the data for a contrastive voiced series of fricatives.

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

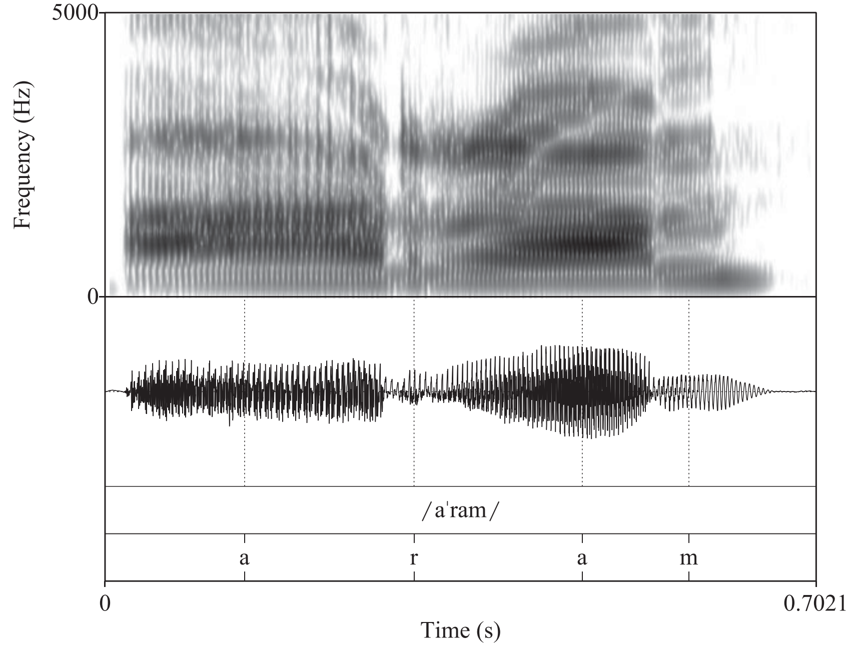


Figure 4 Spectrogram and waveform for /aˈram/ *arram* 'wallaby sp.' (RL).

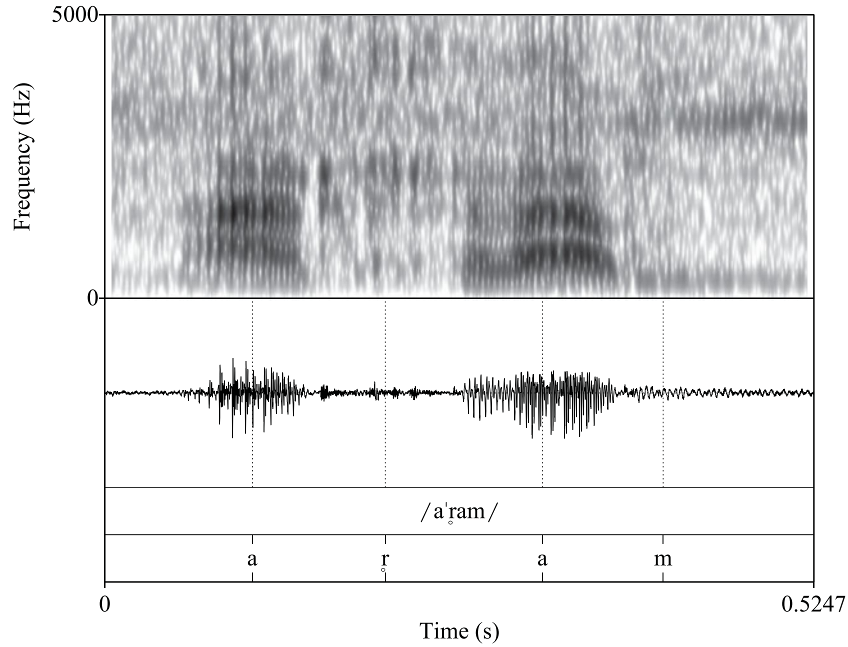


Figure 5 Spectrogram and waveform for /aˈr̥am/ *arham* 'sandridge goanna' (FB).

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

there are two arguments: first, there is no perceptible friction in its realization, and second, in post-tonic position [ð̞] occasionally alternates with a dental lateral [l̪], as shown in (7a–b), which is also an approximant in articulatory terms.[6]

(7) /ɛˈmɛð̞ɛm/ *emeðem* ‘armpit’
  a. [ɛˈmɛð̞ɛm] (NG)
  b. [ɛˈmɛl̪ɛm] (BB)

Phonologically, moreover, the distribution of /ð̞/ is that of an approximant and not that of a fricative. Fricatives (and plosives) never occur in word-final position in Umbuygamu, whereas /ð̞/ frequently occurs in word-final position (nine out the 30 roots with /ð/ in the lexicon), as shown in (8). Hence the present analysis of /ð̞/ as an approximant.

(8) /ɛˈr̥ɛð̞/ [ɛˈr̥ɛð̞] *erheð* ‘emu’ (BB)

In fact, the articulatory features of /ð̞/ in Umbuygamu correspond quite well to the description of dental approximants provided in Olson et al. (2010), the only general study available so far, which is mainly based on a detailed analysis of a number of Austronesian languages of the Philippines. The authors describe the sounds as voiced approximants, with a dental or interdental place of articulation, and showing perceptual (as well as articulatory, see Mielke et al. 2011) links with laterals. Most of these features are found in Umbuygamu, although with just a few good tokens and no chance to do visual checking, it is difficult to determine whether the precise place of articulation is dental (in the narrow sense) or interdental. Acoustically, Mielke et al. (2010) report a clearly visible formant structure, with smooth transitions from and to the surrounding vowels. The same applies to /ð̞/ in Umbuygamu, as shown in Figure 6, with F1 and F2 roughly within the ranges reported for Kagayanen /ð̞/ in Mielke et al. (2011), though a separate study is required to verify this.

Finally, Umbuygamu exhibits two general allophonic processes that apply across the different classes of consonants. One concerns length: intervocalic consonants in the onset of stressed syllables allow lengthening, as illustrated for two different consonants in (9).

(9) a. /aˈla/ [aˈlːa] *ala* ‘spear’ (RL)
  b. /aˈd̪a/ [aˈd̪ːa] *adha* ‘little shark’ (NG)

Consonant lengthening is found in the same context in other languages in the region, for instance in several Middle Paman languages to the north of Umbuygamu – see Verstraete & Rigsby (2015: 73–74) for an overview. The other process concerns labialization of consonants following the high back vowel /u/, as illustrated in (10a–b).

(10) a. /uˈna/ [uˈtⁿʷa] *una* ‘shit’ (RL)
  b. /uˈtal/ [uˈtʷɐl] *utal* ‘rain’ (BB)

Labialization is obligatory, with two exceptions: it is not found when the consonant precedes a high front vowel, as shown in (11), and rarely found when the relevant syllable is unstressed.

(11) /uˈpiru/ [uˈpiru] *upirru* ‘big carpetsnake’ (BB)

Labialization is audible as a [w]-offglide following the consonant, which can also affect rounding of a following back vowel (see further in next section).

[6] Sommer (1998: 10) analyses /l̪/ as a contrastive item with ‘limited distribution’, and Ogilvie (1994: 29) even distinguishes four laterals, but there is no evidence for [l̪] in the present corpus other than as an allophone of /ð̞/, and none for other types of laterals beyond /l/.

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

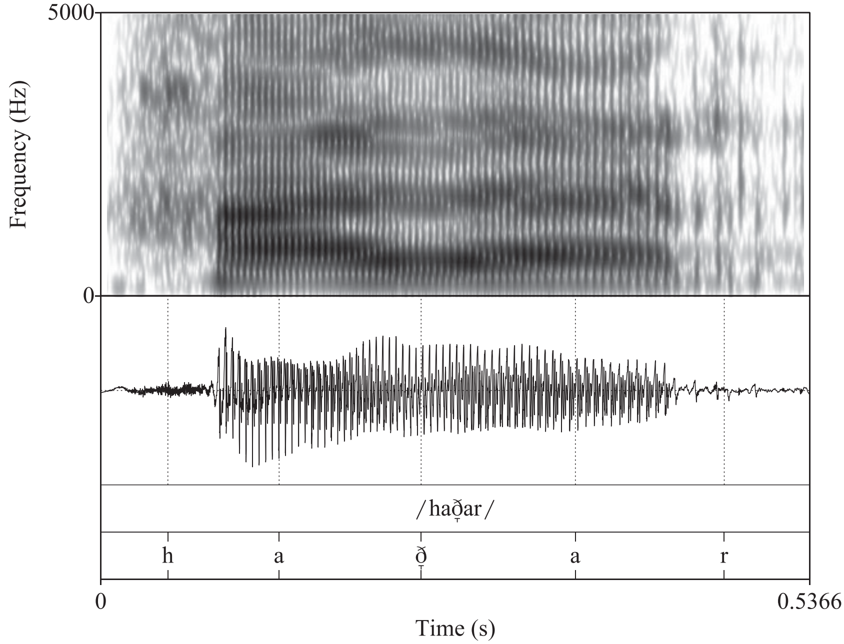
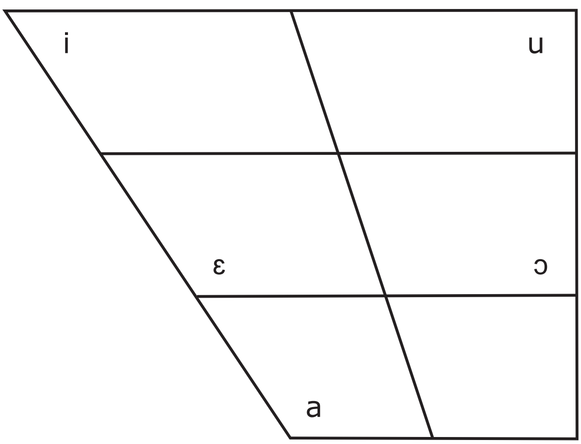


Figure 6 Spectrogram for /ˈhað̞ar/ *haðarr* ‘good’ (NG).

Vowels



/a/	/aˈr̥a/	*arha*	‘wife’ (NG)
/i/	/iˈr̥a/	*irha*	‘other’ (FB)
/ɛ/	/ɛˈr̥an̪/	*erhanh*	‘shell’ (NS)
/ɔ/	/ɔˈr̥a/	*orha*	‘upper arm’ (RL)
/u/	/uˈr̥al/	*urhal*	‘big mullet’ (RL)

The examples show vowel contrasts in two positions. The first position is the (unstressed) initial syllable of a vowel-initial bisyllabic root (for the canonical root type in this language, see next section). In this context the examples form (near-)minimal pairs, except for the front mid vowel, which tends to show vowel harmony within the root (see below).

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

The second position for which contrasts are illustrated is the (stressed) second syllable of a bisyllabic root. Given that back vowels are relatively rare in this context, it is difficult to find one set of (near-)minimal pairs illustrating all vowel contrasts at once. However, all height contrasts can be illustrated pairwise, for front vowels and for back vowels, as well as backness contrasts for high vowels and for non-high vowels. The contrast between high and mid back vowels relies on consonant-initial forms, as no (near-)minimal pairs are available in other contexts in the corpus.

Height contrasts

/i/	/aˈr̥i/	*arhi*		‘black antbed’ (FB)
/ɛ/	/ɲɛˈr̥ɛ/	*inya*	*erhe*	‘cooked meat’ (FB)
		game.animal	cooked	
/a/	/ɔˈr̥a/	*orha*		‘arm’ (RL)
/u/	/waˈgun/	*wagun*		‘mouth’ (RL)
/ɔ/	/ˈcɔkɔn/	*tyokon*		‘kangaroo sp.’ (NG)

Backness contrasts

/u/	/aˈgu/	*agu*	‘goanna sp.’ (FB)
/i/	/aˈbi/	*abi*	‘queenfish’ (RL)
/ɔ/	/uˈwɔn/	*uwon*	‘grass’ (NG)
/ɛ/	/ɛˈmɛn/	*emen*	‘bandicoot’ (NG)
/a/	/aˈparan/	*aparran*	‘thunderstorm’ (RL)
/ɔ/	/aˈpɔr/	*aporr*	‘turtle sp.’ (RL)

Unlike its large consonant inventory, Umbuygamu’s vowel inventory is typical of the relatively small vowel inventories commonly found in Australian languages (see Fletcher & Butcher 2014, Gasser & Bowern 2014). There are three features in the architecture of the inventory that deserve some further comment. One concerns vowel length: some Australian languages have phonemic vowel length in at least the stressed syllable, but this is not found in Umbuygamu, which only shows length as an allophone in specific contexts (see the discussion of allophonic processes below). The second feature is the notable presence of a low back vowel [ɑ] in a number of lexemes, as /aˈpɔr/ [aˈpɑːr] *aporr* ‘turtle sp.’ (RL). Given that the low back vowel never contrasts with the mid back vowel, however, the two are analysed here as allophones of the same phoneme (see below on the relevant context), and the inventory as counting five rather than six vowel qualities. A third noticeable feature is the presence of vowel harmony for front mid vowels. In the lexicon, front mid vowels almost exclusively co-occur with a mid or low front vowel, and rarely with high or back vowels. Similar patterns of vowel harmony are found in other languages in the region, specifically vowel height harmony for mid vowels in some Middle Paman languages, including Umbuygamu’s northern neighbour Umpithamu – see Verstraete & Rigsby (2015: 84–86) for an overview.

There are two general allophonic processes that apply to all vowel qualities. One concerns lengthening: vowel length is not phonemic, as mentioned earlier, but vowels can be lengthened in three contexts. First, they are often lengthened preceding voiced trills, as illustrated in (12), except in post-tonic syllables, as illustrated in (13).

(12) a. /ɔˈraŋ/ [ɔːˈrɐŋ] *orrang* ‘tree’ (RL)
b. /aˈt̪ir/ [ɐˈt̪iːr] *athirr* ‘white cockatoo’ (RL)

(13) /aˈguθar/ [aˈguθɐr] *aguθarr* ‘long tom’ (RL)

Second, vowels are occasionally lengthened in stressed syllables, as illustrated in (14).

(14) a. /ˈʔada/ [ˈʔaːdɐ] *‘ada* ‘from south’ (FB)
b. /aˈr̥il/ [aˈr̥iːl] *arhil* ‘red’ (NG)

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

Finally, root-initial vowels can also be lengthened as part of a sandhi process repairing underlying vowel hiatus, illustrated in the compound structure in (15) (see further in next section on such structures).

(15)	/aˈθa ɛˈɟer/ → /θɛˈɟer/	[θɛːˈɟɛːr]	*aθa*	*edyerr*	‘ashes’ (NG)
			fire	ashes	

The second general allophonic process concerns vowel reduction: front vowels are occasionally centralized in post-tonic position, as illustrated in (16). This type of reduction is not found for back vowels but, as already mentioned, these are rare in post-tonic position anyway, so this may be an effect of the relatively small number of tokens in the corpus.

(16)	a.	/ˈŋariˌbi/	[ˈŋarəˌbi]	*ngarribi*	‘woman’ (NG)
	b.	/ɔˈr̥an̪am/	[ɔˈr̥ɐn̪əm]	*orhanham*	‘grindstone’ (FB)

A second set of allophonic processes concern specific vowels in the inventory. There are two notable processes for the low vowel. First, the low vowel varies between a front [a] and central [ɐ] realization. The front realization is more frequent in pre-tonic position, the central realization in post-tonic position; in tonic position both occur in what looks like free variation. Examples (17) illustrate these patterns: front realization in pre-tonic position in (17a, b), central realization in post-tonic position in (17c), and variation between front and central realization in tonic position.

(17)	a.	/aˈgan̪/	[aˈgɐn̪]	*aganh*	‘mangrove sp.’ (RL)
	b.	/aˈcan/	[aˈcan]	*atyan*	‘egg’ (RL)
	c.	/ɔˈrahar/	[ɔːˈrɐɦɐr]	*orraharr*	‘cloud’ (RL)

I choose /a/ as the phonemic label because the pre-tonic position (initial V in V-initial roots, the canonical root type in the language) has a higher functional load for vowel contrasts than the other positions, which, as mentioned earlier, show some historical levelling of vowel contrasts, especially for back vowels.

A second process affecting the low vowel is raising: low vowels can be raised following palatal elements, as illustrated in (18), and raised and rounded following labialized consonants, as illustrated in (19).

(18)	/iˈbalamˌja/	[iˈbaːlɐmˌjɛ]	*ibala-m=ya*	‘I am afraid.’ (BB)
			be.afraid-PRS=1SG.NOM	

(19) /uˈtal/ *utal* ‘rain’
a. [uˈtʷɐl] (BB)
b. [uˈtʷɔl] (NG)

Raising following palatals is relatively rare in the corpus, but raising following labialized consonants is very frequent, effectively leading to neutralization of the contrast with mid back vowels in contexts of labialization.

For front vowels, there are two patterns to be discussed. One concerns the high front vowel /i/, which in the speech of Nellie Salt can be realized as lax [ɪ] in stressed contexts, as illustrated in /aˈriwir/ [aːˈrɪβɪr] *arriwirr* ‘owl sp.’ (NS). This is probably an idiolectal feature, as in the speech of all other speakers, vowel reduction is only found in unstressed syllables (see the discussion of vowel reduction above). The second pattern concerns the front mid vowel /ɛ/, which in root-initial position (i.e. pre-tonically) is frequently diphthongized to [ɛə] or even [ɛa] when preceding a stressed syllable with a low vowel. This process is found for roots in isolation, as shown in (20), but also in the resolution of vowel hiatus between roots, as in (21).

(20)	a.	/ɛˈral/	[ɛəˈrɐl]	*erral*		‘root’ (NG)
	b.	/ɔˈraŋ ɛˈral/	[ɔˈraŋ ɛaˈral]	*orrang*	*erral*	‘tree root’ (RL)
				tree	root	

(21)	/aˈθa ɛˈlar/ → /θɛˈlar/	[θɛəˈlaːr]	*aθa*	*elarr*	‘charcoal’(NG)
			fire	charcoal	

Given that this is the same context that can trigger lengthening for all vowels, as noted, there is free variation between [ɛ], [ɛː] and [ɛə] in this context.

The back vowels also show allophonic variation. For two speakers in the corpus (Bob Bassani and Nellie Salt, both from the older generation of speakers), the high back vowel /u/ in post-tonic position alternates with -V*w* following nasals, trills and laterals preceded by high or mid front vowels. As shown in (22), V is usually a centralized vowel in such forms.

(22)	a.	/aˈr̥ilu/	[aˈr̥ɪlɪw]	*arhilu*	‘flat-tail stingray’ (NS)
	b.	/ɛˈgɛru/	[ɛˈgɛrəw]	*egerru*	‘brolga’ (BB)

Lastly, the other back vowel varies between a mid [ɔ] and low [ɑ] realization. The low realization is restricted to one context, namely in a stressed syllable before word-final /r/, illustrated in (23).

(23)	a.	/aˈd̪ɔr/	[aˈd̪ɑːr]	*adhorr*	‘tongue’ (BB)
	b.	/aˈpɔr/	[aˈpɑːr]	*aporr*	‘turtle sp.’ (RL)

In this context, [ɑ] contrasts with all other vowel qualities except [ɔ], which is why [ɑ] is treated here as an allophone of /ɔ/.

Stress and word structure

The analysis of stress presented in this section is inherently limited because it is based on the judgement of a non-native speaker: given the nature of the corpus, I cannot rely on native speaker judgements of stress perception. The same applies to determining the relevant acoustic cues: following work on other languages of the region (Verstraete & Rigsby 2015: 86–94), my working assumption is that stress perception is associated with the primary pitch movement. The analysis presented here is partly corroborated by patterns of vowel centralization, which, as mentioned in the previous section, are mainly found in post-tonic contexts, but again this is an issue for further research.

To discuss stress and word structure in Umbuygamu, it is necessary to distinguish between vowel-initial and consonant-initial roots, and between roots and compound structures. Umbuygamu is unusual among Pama-Nyungan languages in that a large proportion (about two-thirds) of its roots is vowel-initial, deriving from a historical process of the loss of initial consonants (see Hale 1964, 1966 and Alpher 1976 on initial-loss in other subgroups of Paman). Lexicons with relatively large proportions of vowel-initial roots are also found in other languages of the region, e.g. the other Lamalamic languages (Sommer 1976), at least one Middle Paman language (the present author's fieldnotes on Umpithamu), Northern Paman languages (Hale 1964, 1966) and Alaya-Athima (Alpher 2016).

The presence of vowel-initial roots in Umbuygamu is relevant because the stress pattern of roots differs depending on whether they are vowel- or consonant-initial: vowel-initial roots have stress on the second syllable, as in (24), while consonant-initial roots have stress on the first syllable, as in (25).

(24)	/aˈran̪/	*arranh*	‘nest’ (RL)

(25)	/ˈʔaran̪ ˈt̪alaˌhad̪ar/	*ˈarranh*	*thalahaðarr*	‘small child’ (NG)
		child	small	

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

This difference is consistent with the hypothesis that historical loss of initial consonants may have gone hand in hand with a shift in stress pattern (Blevins & Marmion 1994). The majority of roots are bisyllabic, which implies that a bisyllabic vowel-initial form, as in (24) above, is the most typical root. There are a handful of monosyllabic roots, mainly verbs and cardinal directions, illustrated in (26), as well as a larger number of trisyllabic roots, illustrated in (27), although some of these may be complex diachronically.

(26)	a.	/ˈgaɹ/	*gar*	‘west’ (BB)
	b.	/ˈdɛm/	*de-m*	‘fall down’ (FB)
			fall-PRS	
(27)	a.	/aˈt̪awaɹ/	*athawar*	‘sugar glider’ (RL)
	b.	/ˈr̥awaˌmar/	*rhawamarr*	‘stormbird’ (RL)

The distinction between roots and compounds is relevant because compound structures are defined by a distinct stress pattern, with stress falling on the stressable syllable of the second root. Furthermore, the first member of a compound can also undergo reduction if it is vowel-initial and/or vowel-final. When a vowel-initial root serves as the first element of a compound, it can drop the initial vowel, as in (28) and (29), in a process that is specific to compounds.

(28)	/aˈwaɹ ɛˈpal/	→	/waɹɛˈpal/	*awar*	*epal*	‘hair’ (BB)
				head	hair	
(29)	/aˈθa ɛˈɟɛr/	→	/θɛˈɟɛr/	*aθa*	*edyerr*	‘ashes’ (BB)
				fire	ashes	

When a vowel-final root serves as the first element and is followed by a vowel-initial root, the first element loses its final vowel, as in (29) and (30), in a general sandhi process to resolve vowel hiatus (which can also be observed in the transcribed passage in next section).

(30)	/aˈla ɛˈwɛrɛɹ/	→	/lɛˈwɛrɛɹ/	*ala*	*ewerrer*	‘wire spear’ (FB)
				spear	wire.spear	

As mentioned earlier, the second process can be accompanied by lengthening of the first vowel of the second member (or diphthongization in the case of a front mid vowel).

I use the label ‘compound’ for any structure that has these formal features, i.e. a distinct pattern of stress and vowel elision. These features are most typically associated with forms that also look like compounds semantically, like (28)–(30) above, but not necessarily or exclusively. On the one hand, combinations of lexemes that look like compounds semantically also allow regular construal, as is shown in (31a), which is construed with stress on both lexemes. Conversely, lexeme combinations with other semantic relations also allow compound construal, as is shown in (31b), which is semantically a generic-specific combination.

(31)	a.	/ɔˈraŋ ɛˈral/		[ɔˈraŋ ɛaˈral]	*orrang*	*erral*	‘tree root’ (RL)
					tree	root	
	b.	/iˈɲa iˈɕar/	→	/ɲiˈɕaɹ/	*inya*	*ishar*	‘fish’ (RL)
					game.animal	fish	

The vowel elision processes associated with compound structures create consonant-initial forms with second-syllable stress. Given that roots only allow second-syllable stress for

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

vowel-initial forms, any consonant-initial forms with stress beyond the first syllable should be analysable as compounds, as in /θɛˈɟɛr/ *aθa edyerr* 'ashes' (BB). There are a few such forms in the lexicon for which a synchronic compound analysis is difficult because not all elements are attested as independent roots, as is the case in the examples in (32).

(32)	a.	/wɔˈt̪anan/	*wothanan*	'lip' (RL)
	b.	/waˈpar/	*waparr*	'beard' (RL)
	c.	/waˈgun/	*wagun*	'mouth' (RL)

In such cases, however, there is often comparative evidence to show that they derive from compounds and retain the typical compound stress pattern. The initial morpheme *wa-* in (32) is only attested in complex forms, but may be related to a Proto-Paman etymon **caawa* 'mouth' (Hale 1976b), which suggests that they derive from compounds with an element meaning 'mouth' as the first element. The semantic transparence of the second element varies in these structures. In (32a), the second element is attested independently as *othanan* 'skin', which suggests that the structure derives from a compound like 'mouth skin'. In (32b), the second element is not attested independently, but is probably related to an etymon **calparr* 'chin' (Alpher 2004). In (32c), the second element is not attested independently and not obviously reconstructible, which means that *wa-*, as well as the paradigm of forms in (32), are the only evidence for an origin in a compound structure.

Transcribed passage

The following text is the first episode (about one-third) of a longer text describing a hunting trip: it was recorded in 1974 by Bruce Sommer; the speaker is Nancy Gunnawarra (NG). The text is elicited, with the fieldworker prompting the speaker for every new utterance. Although this is not the most representative type of text, it is the only longer text in the corpus that can be reliably glossed and translated (partly based on glossing provided in Bruce Sommer's fieldnotes, as well as prompts in the recording). I provide a broad transcription of the text, followed by a morphemic breakdown in practical orthography, interlinear glosses, and a free translation.

ɛɹapar	garanja	ɔhaɹa
eraparr	garra-n=ya	ohar-a
yesterday	go-PST=1SG.NOM	hunt-DAT

'Yesterday I went out hunting.'

ɔraj	t̪al	tɛn
orray	thal	te-n
older.brother	1SG.GEN	come-PST

'My older brother came along.'

lala	garanlala	|	lɛwɛrɛɹa	
lala	garra-n=lala		ala	ewerrer-a
1DUEXC.NOM	go-PST=1DUEXC.NOM		spear	wire.spear-DAT

'We got a spear.'

lala	garan	lɔgapara
lala	garra-n	logaparr-a
1DUEXC.NOM	go-PST	river-DAT

'We went to the river.'

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

lala	iralanlala	ɲarama	
lala	irrala-n=lala	nya	arram-a
1DUEXC.NOM	look.for-PST=1DUEXC.NOM	game.animal	wallaby-DAT

‘We looked for wallaby.’

maganjaŋan	|	pigipigi	garanla	maθam
maga-n=ya-ngan		pigipigi	gara-n=la	maθam
see-PST=1SG.NOM-3SG.ACC		pig	go-PST=3SG.NOM	big

‘I saw a pig run past, a big one.’

jaŋan	ɲanjaŋan
ya-ngan	nya-n=ya-ngan
1SG.NOM-3SG.ACC	hit-PST=1SG.NOM-3SG.ACC

‘I shot at it.’

ɹaŋanjaŋan

ara	nya-n=ya-ngan
NEG	hit-PST=1SG.NOM-3SG.ACC

‘I didn’t kill it.’

ɔθa	maθam
oθa	maθam
scrub	big

‘The scrub was (too) thick.’

uta	maranlaŋan
uta	marra-n=la-ngan
dog	follow-PST=3SG.NOM-3SG.ACC

‘The dog chased it.’

ɔraj	t̪al	|	ɲanlaŋan
orray	thal		nya-n=la-ngan
older.brother	1SG.GEN		hit-PST=3SG.NOM-3SG.ACC

laŋanlaŋan	|	alaw
langa-n=la-ngan		ala-w
spear-PST=3SG.NOM-3SG.ACC		spear-INSTR

‘My older brother killed it, speared it with a spear.’

bɛlbɛnlalaŋan	|	ahaɹaɹin̪
belbe-n=lala-ngan		ahar-rinh
cut-PST=1DUEXC.NOM-3SG.ACC		fat-PRIV

‘We cut it open, but there was no fat.’

https://doi.org/10.1017/S0025100317000172 Published online by Cambridge University Press

ABBREVIATIONS

1, 3 = first, third person	NEG = negator
ACC = accusative	NOM = nominative
DAT = dative	PRIV = privative
DU = dual	PRS = present
EXC = exclusive	PST = past
GEN = genitive	SG = singular

Acknowledgements

I am grateful to the late Bobby Stewart and the late Florrie Bassani for working on Umbuygamu with me, as well as the younger Lamalama people for continuing support and encouragement. I also thank Bruce Rigsby for making available his Umbuygamu recordings, and for discussions, comments, and mentorship over the years, as well as Bruce Sommer and the Fryer Library at the University of Queensland for providing access to his recordings and materials. My own fieldwork has been funded by the Research Foundation-Flanders, the Endangered Languages Documentation Programme (grant MDP0133) and the Research Council of the University of Leuven (grant GOA/12/007). Dana Louagie and Eva Vanermen prepared a number of sound files for re-transcription, with segmentation and transcription of English prompts. An earlier version of this paper was presented at the Queensland Indigenous Languages Workshop at the University of Queensland. I am grateful to Alice Gaby, Erich Round and Peter Sutton for very useful comments and questions at the workshop. I would also like to thank Erich Round, two anonymous reviewers and the editor for very detailed and incisive comments on an earlier draft, which helped to improve the analysis significantly. The vowel chart in this Illustration is adapted from http://bit.ly/2iiQ0zt.

References

Alpher, Barry. 1972. On the genetic subgrouping of the languages of southwestern Cape York Peninsula, Australia. *Oceanic Linguistics* 11, 67–87.

Alpher, Barry. 1976. Some linguistic innovations in Cape York and their sociocultural correlates. In Sutton (ed.), 84–101.

Alpher, Barry. 2004. Appendix 5.1. Proto-Pama-Nyungan etyma. In Claire Bowern & Harold Koch (eds.), *Australian languages: Classification and the comparative method*, 387–570. Amsterdam & Philadelphia, PA: John Benjamins.

Alpher, Barry. 2016. Connecting Thaypanic. In Jean-Christophe Verstraete & Di Hafner (eds.), *Land and language in Cape York Peninsula and the Gulf Country*, 39–60. Amsterdam & Philadelphia, PA: John Benjamins.

Austin, Peter. 1988. Phonological voicing contrasts in Australian Aboriginal languages. *La Trobe Working Papers in Linguistics* 1, 17–42.

Blevins, Juliette & Doug Marmion. 1994. Nhanta historical phonology. *Australian Journal of Linguistics* 14, 193–216.

Boersma, Paul & David Weenink. Praat: Doing phonetics by computer (version 5.4.17). http://www.praat.org/ (accessed 25 August 2015).

Bowern, Claire & Quentin Atkinson. 2012. Computational phylogenetics and the internal structure of Pama-Nyungan. *Language* 88, 817–845.

Butcher, Andrew. 1999. What speakers of Australian Aboriginal languages do with their velums and why: The phonetics of the nasal/oral contrast. In John Ohala, Yoko Hasegawa, Manjari Ohala, Daniel Granville & Ashlee C. Bailey (eds.), *14th International Congress of Phonetic Sciences* (ICPhS XIV), Berkeley, University of California, 479–482.

Butcher, Andrew. 2004. 'Fortis/Lenis' revisited one more time: The aerodynamics of some oral stop contrasts in three continents. *Clinical Linguistics and Phonetics* 18, 547–557.

Butcher, Andrew. 2006. Australian Aboriginal languages: Consonant-salient phonologies and the 'Place-of-Articulation Imperative'. In Jonathan Harrington & Marija Tabain (eds.), *Speech production: Models, phonetic processes, and techniques*, 187–210. New York: Psychology Press.

Butcher, Andrew & Nick Reid. 1989. Redressing the balance on Australian stop contrasts: Comments on Austin's (1988) 'Phonological voicing contrasts in Australian Aboriginal languages'. Ms., Australian National University.

Dixon, R. M. W. 2002. *Australian languages: Their nature and development*. Cambridge: Cambridge University Press.

Evans, Nicholas. 1995. Current issues in Australian phonology. In John Goldsmith (ed.), *Handbook of phonological theory*, 723–761. Oxford: Blackwell.

Fletcher, Janet & Andrew Butcher. 2014. Sound patterns of Australian languages. In Harold Koch & Rachel Nordlinger (eds.), *The languages and linguistics of Australia: A comprehensive guide*, 89–132. Berlin & New York: de Gruyter Mouton.

Gaby, Alice. 2006. *A grammar of Kuuk Thaayorre*. Ph.D. thesis, University of Melbourne.

Gasser, Emily & Claire Bowern. 2014. Revisiting phonological generalizations in Australian languages. In John Kingston, Claire Moore-Cantwell, Joe Pater & Robert Staubs (eds.), *Supplemental Proceedings of Phonology 2013*. http://journals.linguisticsociety.org/proceedings/index.php/amphonology/article/view/17 (accessed 25 August 2015).

Godman, Irene. 1993. A sketch grammar of Rimanggudinhma: A language of the Princess Charlotte Bay region of Cape York Peninsula. BA Hons thesis, University of Queensland.

Hale, Ken. 1964. Classification of Northern Paman languages, Cape York Peninsula, Australia: A research report. *Oceanic Linguistics* 3, 248–264.

Hale, Ken. 1966. The Paman group of the Pama-Nyungan phylic family. *Anthropological Linguistics* 8, 162–197.

Hale, Ken. 1976a. Phonological developments in particular Northern Paman languages. In Sutton (ed.), 7–40.

Hale, Ken. 1976b. Wik reflections of Middle Paman phonology. In Sutton (ed.), 50–60.

Hamilton, Philip. 1997. *Uw Oykangand and Uw Olkola multimedia dictionary*. http://www.oocities.org/athens/delphi/2970/ (accessed 25 August 2015).

Harvey, Mark, Susan Lin, Myfany Turpin, Ben Davies & Katherine Demuth. 2015. Contrastive and non-contrastive pre-stopping in Kaytetye. *Australian Journal of Linguistics* 35, 232–250.

Hercus, Louise. 1972. The pre-stopped nasal and lateral consonants of Arabana-Wanggangurru. *Anthropological Linguistics* 14, 293–305.

Hunter, Jessica, Claire Bowern & Erich Round. 2011. Reappraising the effects of language contact in the Torres Strait. *Journal of Language Contact* 4, 106–140.

Ladefoged, Peter & Ian Maddieson. 1996. *The sounds of the world's languages*. Oxford: Blackwell.

Laycock, Donald. 1969. Three Lamalamic languages of North Queensland. In Joy Harris, Stephen Wurm & Donald Laycock (eds.), *Papers in Australian Linguistics* 4, 71–97. Canberra: Pacific Linguistics.

Maddieson, Ian. 2013. Voicing and gaps in plosive systems. In Matthew Dryer & Martin Haspelmath (eds.), *The world atlas of language structures online*. Leipzig: Max Planck Institute for Evolutionary Anthropology. http://wals.info/chapter/5 (accessed 10 June 2015).

Mielke, Jeff, Kenneth Olson, Adam Baker & Diana Archangeli. 2011. Articulation of the Kagayanen interdental approximant: An ultrasound study. *Journal of Phonetics* 39, 403–412.

Ogilvie, Sarah. 1994. The Morrobalama (Umbuygamu) language of Cape York Peninsula, Australia. MA thesis, Australian National University.

Ohala, John. 1983. The origin of sound patterns in vocal tract constraints. In Peter MacNeilage (ed.), *The production of speech*, 189–216. New York: Springer.

Olson, Kenneth, Jeff Mielke, Josephine Sanicas-Daguman, Carol Jean Pebley & Hugh Paterson. 2010. The phonetic status of the (inter)dental approximant. *Journal of the International Phonetic Association* 40, 199–215.

Rigsby, Bruce. 1992. The languages of the Princess Charlotte Bay region. In Tom Dutton, Malcolm Ross & Darrell Tryon (eds.), *The language game: Papers in memory of Donald C. Laycock*, 353–360. Canberra: Pacific Linguistics.

Rigsby, Bruce. 1997. Structural parallelism and convergence in the Princess Charlotte Bay languages. In Patrick McConvell & Nicholas Evans (eds.), *Archaeology and linguistics: Aboriginal Australia in global perspective*, 169–178. Melbourne: Oxford University Press.

Round, Erich. 2014. Prestopping of nasals and laterals is only partly parallel. In Rob Pensalfini, Myfany Turpin & Diana Guillemin (eds.), *Language description informed by theory*, 81–96. Amsterdam & Philadelphia, PA: John Benjamins.

Rumsey, Alan. 2000. Bunuba. In R. M. W. Dixon & Barry Blake (eds.), *Handbook of Australian languages*, vol. 5, 35–152. Melbourne: Oxford University Press.

Sommer, Bruce. 1976. Umbuygamu: The classification of a Cape York Peninsular language. *Papers in Australian Linguistics* 10, 13–31.

Sommer, Bruce. 1998. *Umbuygamu*. Townsville: Ethnografix Australia.

Sommer, Bruce. 1999a. *Lamalama*. Townsville: Ethnografix Australia.

Sommer, Bruce. 1999b. *Koko Warra*. Townsville: Ethnografix Australia.

Sutton, Peter (ed.). 1976. *Languages of Cape York*. Canberra: Australian Institute of Aboriginal Studies.

Sutton, Peter. 2003. *Native title in Australia: An ethnographic perspective*. Cambridge: Cambridge University Press.

Tabain, Marija & Andrew Butcher. 1999. Stop consonants in Yanyuwa and Yindjibarndi: A locus equation perspective. *Journal of Phonetics* 27, 333–357.

Verstraete, Jean-Christophe. 2010. Animacy and information structure in the system of ergative marking in Umpithamu. *Lingua* 120, 1637–1651.

Verstraete, Jean-Christophe. 2011. Impersonal constructions in Umpithamu and the Lamalamic languages. In Andrej Malchukov & Anna Siewierska (eds.), *Impersonal constructions: A cross-linguistic perspective*, 607–625. Amsterdam & Philadelphia, PA: John Benjamins.

Verstraete, Jean-Christophe. 2012. Contact-induced restructuring of pronominal morphosyntax in Umpithamu (Cape York Peninsula, Australia). *Diachronica* 29, 326–358.

Verstraete, Jean-Christophe & Bruce Rigsby. 2015. *A grammar and lexicon of Yintyingka*. Berlin & New York: de Gruyter Mouton.