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Author/s:

Baker, B;Donohue, M;Fletcher, J

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Prosodic systems
Chapter 26
Australia and New Guinea

Brett Baker
Mark Donohue
Janet Fletcher

26.1 Introduction

The majority of the languages of Australia are non-tonal and tend to have exceptionless, morphologically governed stress as well as intonation systems that are not unlike those of European languages, though with phonetic rather than phonological effects of post-focal compression. By contrast, the languages of New Guinea are remarkable for their word prosodic diversity. While the entire area is under-investigated, the intonation systems in New Guinea are particularly poorly documented.

26.2 General metrical patterns in Australia

The few — by and large impressionistic — descriptions of the word prosody of Australian languages present a fairly uniform picture. With just a couple of exceptions, these languages have fully predictable stress on the basis of morphological structure, word edges, and to some extent, syllable structure.¹ For the most part, they are described as having root-initial stress, as well as stress on the initial syllable of polysyllabic suffixes (though see Tabain et al. 2014 for a cautionary note). Hale’s description of stress in Warlpiri is perhaps the earliest description of this type (1977: 15-16), pointing out that morphologically-governed stress provides contrasts between segmentally identical strings such as /'japa-,laŋu-lu/ ‘person-also/even-ERGATIVE’ and /'japa[a-,ŋu]u/ ‘father’s mother-ELATIVE’.

Some examples from Warlpiri are shown in (1) (adapted from Nash 1986: 102; Baker 2008: 159).² Note that initial stress is unaffected by word length, and that the location and realization of secondary stress is affected by whether a syllable can form a foot with a following syllable without disrupting the foot structure of polysyllabic suffixes. Final syllables are never stressed.

(1)	‘man’	‘tree’	‘spinifex plain’
root	'wati	'watija	'manaŋ, kara
root-LOC	'wati-ŋka	'wati,ja-la	'manaŋ, kara-la
root-LOC-ERG	'wati-,ŋka-lu	'watija-,la-lu	'manaŋ, kara-,la-lu
root-LOC-too-ERG	'wati-ŋka-,laŋu-lu		

¹ The only well-described exception to this statement that we know of is Ndjébbana (McKay 2000), although Evans (1995b) and Round (2009) both claim that suffixes differ in whether they are ‘underlyingly-stressed’ or not, in Kayardild.

² Note that Warlpiri (like some other Australian languages, Baker 2014: 152) has case allomorphy determined by moraic size of the stem, which is the reason for the difference in the form of the Locative suffix in column one ‘man’, vs the other stems here.

Deviations from this pattern are not frequent and largely concern cases where sequences of monosyllabic suffixes are not footed, or where main stress can fall on a foot later than the first (typically, the last). Languages like this are Dyirbal (Dixon 1972: 274), Ngiyambaa (Donaldson 1980: 42), Diyari (Austin 1981: 31), Yankunytjatjara (Goddard 1986: 27), Martuthunira (Dench 1994: 43), Kayardild (Evans 1995b; Round 2009), Eastern Arrernte (Henderson 1998: 211), Nhanda (Blevins 2001b: 24-28), and Warlpiri (Nash 1986: 100), to name just a handful, from widely-dispersed parts of the continent. ‘Prefixing languages’ (mainly of the non-Pama-Nyungan (NPN) group of the central north and north west of the continent) also appear to follow the same general pattern, e.g. Ngan’gi-Tyemerri (Reid 1990:89), Ngalakgan (Baker 2008), Jingulu (Pensalfini 2000, 2003), Limilngan (Harvey 2001), Bininj Gun-wok (Evans 2003).

In prefixing NPN languages, the metrical domain is often preferentially associated with the root, thereby leaving strings of prefixes unstressed (and apparently unfooted), regardless of the relative sizes of the prefix string and the verb stem. In (2) for instance, there are four unfooted syllables before the main stress on the first root in the word:

- [Ngalakgan; Baker 2008:169]
- (2) a. η uruŋ-**ɲu**
 12plO-burn.PR
 ‘we’re getting burnt’
- b. η uruŋ-mu-**ŋe**
 12plO-VEG-burn.PR
 ‘It [sc. ‘sun’, VEG] burns us’
- c. η uruŋ-pu-pak-**polk+pu+n/**
 12plO-3pl-APPL-noise+HIT+PR
 ‘they are making noise on us’ (i.e. ‘talking over the top of us’)
- d. jiriŋ-pi-pak-**woc+ma**
 1plO-3pl-APPL-steal+GET.PR
 ‘they always steal from us’

Prefixing languages vary in this respect, however. In neighbouring, closely related Rembarrnga (McKay 1975), examples analogous to those in (2) take initial stress, at least as an option. In Ngan’gityemerri, Reid (1990:89) finds that noun class markers can be either internal or external to the metrical domain (the former thereby classified as ‘prefixes’ and the latter as ‘proclitics’). In Bardi, according to Bower et al. (2012), nouns and verbs differ with respect to whether prefixes are included (nouns) or not (verbs) within the metrical domain.

To date, there are no empirical perceptual studies, to our knowledge, of word stress in Australian languages. There are a few instrumental studies, but the picture they paint of the acoustic correlates of stress is far from clear. There is some suggestion that the post-tonic consonant, rather than the tonic (i.e., main stressed) vowel, may show distinctive lengthening in some languages, e.g. Warlpiri (Pentland 2004), Bininj Kunwok (Stoakes et al., in press), Mawng (Fletcher et al. 2015) and Djambarrpuyngu (Jepson et al. under revision); this process is also described impressionistically for Umpila (Levin 1985: 136) and Kukatj (Breen 1992).

The widespread isomorphism between morphological and prosodic structures in Australian languages, henceforth Mwords and Pwords, is a pervasive feature, which

demands further research. However, it appears that not all morphological relations are relevant to metrical structure (Baker 2008; and see Hore 1981 for an early move in this direction with respect to Nunggubuyu). The contrast in (3) shows that inflectional suffixes on verbs do not constitute metrical domains, despite being (arguably) polysyllabic here, unlike the bound dative pronominal clitic in (3b). Examples (3) and (4) show that in Ngalakgan, as in Warray (Harvey and Borowsky 1999), monosyllabic CV roots must have a long vowel, regardless of affixation, suggesting that roots constitute Pwords on their own. The (a) examples show that this requirement does not hold of verb roots, which do not undergo vowel lengthening when affixed.³

- [Ngalakgan; Baker 2008:103]
- (3) a. ['jaŋana]
/ca+ŋana/
stand+FUT
'will stand'
- b. [ge:'ŋini]
/ke=ŋini/
son=1SG.DAT
'my son'
- (4) a. ['buni]
/pu+ni/
hit+IRR
'might hit'
- b. ['bo:wi]
/po-wi/
river-LAT
'along the river'

In most Australian languages, polysyllabic case suffixes form their own metrical domain, but tense suffixes characteristically do not, as in Ngalakgan. In a few cases, like Arrernte and Ngan'gityemerri, where tense suffixes are productive on verbs in the same way as case suffixes typically are on nouns, tense suffixes *can* constitute domains for stress (see e.g. Henderson 1998, Reid 1990/2011).

26.2.1 Quantity and peninitial stress

A good number of Australian languages have contrastive vowel length (Fletcher and Butcher 2014), and the position of long vowels would generally appear to be positively correlated with metrically strong positions. In some languages, the position of long vowels affects the location of word stress, as in Yidiny (Dixon 1977: 39), Ngiyambaa (Donaldson 1980: 40), Martuthunira (Dench 1981: 42) varieties of Bandjalang/Bundjalung (Crowley 1978), Nhanda (Blevins 2001b: 24), Yukulta (Keen 1983: 198), Wubuy/Nunggubuyu (Hore 1981), Bardi (Bower et al. 2012), and Kayardild (Evans 1995b: 79; Round 2009). In others, long vowels only occur in metrically strong syllables, typically the word-initial syllable, as in Djambarrpuyngu and other Yolngu varieties (Wilkinson 1991; Morphy 1983; Heath 1980a) as well as in Warlpiri (Nash 1986), Umpila (Harris and O'Grady 1976: 166), Yankunytjatjara (Goddard 1986: 11) and (under some interpretations) Yidiny (Dixon 1977; Nash 1979; Hayes 1995, among others). We know of no Australian languages where vowel length is contrastive without a concomitant interaction with the metrical system as described here.

Closed syllables rarely appear to behave as heavy syllables in Australian languages, an exception being Bardi (Bower et al. 2012). However, Baker (2008) describes closed-syllable weight in a few Northern languages, including Ngalakgan and Bininj Gun-wok (which both lack contrastive vowel length). Remarkably,

³ The use of the '+' boundary symbol here, as in (Baker 2008), is meant to indicate a tighter degree of juncture between verb roots and tense affixes, than between noun roots and nominal suffixes ('-') or clitics ('=').

homorganic clusters (nasal-stop clusters and long or geminate stops) fail to contribute weight to a preceding syllable in these languages. Apart from these, modulo the remarks about long vowels above, quantity is not a common factor in Australian metrical systems.

Besides the large number of languages with metrical patterns like those of Warlpiri, there is a smaller, widely dispersed group of languages which are described as having stress on the peninitial (i.e. second) syllable, a cross-linguistically uncommon pattern (Hayes 1995:73). They are also characterized by loss of initial consonants, again a cross-linguistically highly unusual feature (Blevins 2001; Dixon 2002: 589-602; Kümmel 2007: 108, 126). Languages in this category include the Northern Paman group in North Queensland (Hale 1964); also Mbabaram of the southern group (Dixon 1970), the Arandic group in Central Australia (Koch 1997), the Anaiwan (or Nganyaywana) language of the New England highlands in northern New South Wales (Crowley 1976), as well as Nhanda in the north of Western Australia, which exhibits initial consonant dropping but lacks peninitial stress (Blevins and Marmion 1994). Examples (5) and (6) are from Eastern Arrernte and show, respectively, peninitial stress in surface vowel-initial words, vs initial stress in surface consonant-initial words; a very similar pattern is described for other Arandic languages like Alyawarra (Yallop 1972: 43) as well as Northern Paman languages like Uradhi (Hale 1976: 44). The analysis of the metrical system, and the syllable structure, of Arandic languages is the subject of ongoing debate (see e.g. Breen and Pensalfini 1999; Panther et al. 2017; Topintzi and Nevins 2017).

- [Eastern Arrernte; Henderson 1998:210]
- | | | | |
|-----|---------------------------------|---------------|-------------------|
| (5) | a. ampe ‘child’ | /amp/ | [‘ambə] ~ [əm‘bə] |
| | b. ampere ‘knee’ | /amp.əl/ | [əm‘bəɾə] |
| | c. amperneme ‘burn+PRES’ | /amp.ən.əm/ | [əm‘bəɾəmə] |
| | d. arrernelheme ‘put+REFL+PRES’ | /ar.ən.əl.əm/ | [ə‘rəɾələmə] |
| (6) | a. the ‘1SG:ERG’ | /əɬ/ | [‘tə] |
| | b. theme ‘poke+PRES’ | /əɬ.əm/ | [‘təmə] |
| | c. theleme ‘pour+PRES’ | /əɬ.əl.əm/ | [‘tələmə] |
| | d. thelelheme ‘pour+REFL+PRES’ | /əɬ.əl.əl.əm/ | [‘tələləmə] |

The nature of metrical structure in Australian languages and its relationship with word structure clearly deserves more detailed investigation. Even less attention has been devoted to the interesting issue of text-to-tune alignment in song language, which would in many cases appear to have musical (rhythmic, i.e. isochronous) beats that do not correspond with prominent syllables in speech (see e.g. Turpin 2008).

26.3 Intonation in Australian languages

In addition to metrical word structures of the type found in languages like English, Australian languages have intonation, i.e., patterns of pitch, duration, and intensity that can extend across a stretch of speech to create the characteristic intonational tunes of a language. To date, detailed descriptions of only a handful of Australian languages are available. These include Wik Mungkan (Sayers 1976a, 1976b, probably the earliest description of this type), Dyirbal (King 1998), Bininj Gun-wok, henceforth BGW (Bishop 2003; Bishop and Fletcher 2005; Fletcher and Evans 2000), Kayardild (Round 2010; Ross 2011), Dalabon (Evans et al. 2008; Ross 2011; Fletcher 2014), Jaminjung (Simard 2010), Yukulta (Bonnin 2014), and Warlpiri (Pentland 2004). Generally, tunes that mark out definable ‘chunks’ of speech in these languages

reflect universal trends, in that falling intonation often signals finality and completion of a discourse segment, and high pitch signals incompleteness or non-finality. As in many languages of the world, there is pre-boundary lengthening at the right edge of intonational constituents. Pause location and duration also contribute to the delimitation of higher level prosodic constituents, like intonational phrases (IPs; e.g. Fletcher and Evans 2002, Ross 2011, Fletcher et al. 2016) or the utterance level (Round 2010). A particularly striking tune that occurs frequently in narrative discourse in many Australian languages is a stylized high-level plateau accompanied by extreme lengthening of the phrase-final vowel. As first noted by Sharpe (1972), this tune-cum-lengthening, which has been observed in many Australian languages, is generally associated with prolonged, ongoing or continuous actions (Yallop 1977; Heath 1984; Bishop 2003; Ross 2011; Fletcher 2014).

Most research on intonation in Australian languages is couched within the autosegmental-metrical framework. Tone-targets (prominence-lending pitch-accents e.g. H*, L+H* and boundary tones e.g. L%, H% and LH%) combine as intonational morphemes creating different utterance melodies. Tones may demarcate different levels of prosodic structure, such as the phonological or accentual phrase, and intonational phrase (Fletcher and Evans 2000; Bishop 2003; Bishop and Fletcher 2005; Fletcher 2014). As a general rule, the tone inventory of Australian languages analysed to date tends to be smaller than that in languages like English (e.g. Pierrehumbert 1981; Beckman et al. 2005), German (Grice et al. 2005), Greek (Arvaniti and Baltazani 2005), and Dutch (Gussenhoven 2005). Most analyses of Australian languages assume a structural relationship between pitch-accents and main stress, as in BGW, Kayardild, Mawng, and Dalabon (see Fletcher and Evans 2002; Bishop 2003; Fletcher and Butcher 2014 for overview). For other languages, it has been suggested that post-lexical prosody is phrasal, with post-lexical pitch events demarcating phrase edges (e.g. see Tabain et al. 2014 for Pitjantjatjara). There may be prosodic variation among and within Australian languages, but to date this has only been documented in cross-dialect analyses of BGW (Bishop and Fletcher 2005). In terms of Jun's (2014) typology, most languages thus fit into the head/edge prominence marking category (e.g. BGW) or have edge prominence marking at the level of the phrase (e.g. Pitjantjatjara). Tones mostly demarcate left and right edges of intonational constituents with a relatively sparse distribution of tones within them. A preliminary study of HL patterns within IPs in Mawng and Pitjantjatjara suggests that these Australian languages have relatively strong macro-rhythm (after Jun 2014), but it is not clear to what extent this is typical of the area.

Analyses of intonational functions show that changes in pitch span, pitch register or range, prosodic phrasing, and to a lesser extent pitch accent dynamism contribute to the signalling of utterance modality (e.g., interrogative vs declarative) and information structure. Interrogatives in many Australian languages are realized with sharply falling intonation from a pitch peak that is generally located on the interrogative marker, which is often sentence-initial. It resembles the question-intonation of languages like Hungarian (see Ladd 2008:115-118 for an overview), except that the pitch fall is initiated at the IP's left edge, regardless of whether there is an interrogative word. An example of this tune is presented Figure 26.1 for the Northern Australian language Mawng. Here, the highest pitch peak of the IP is due to L+H* occurring on the WH-word *ɲanti* ['ɲəndi] 'who', while the rest of the IP is realized with a highly marked falling pitch pattern. Polar questions are also often realized with a similar pitch contour. This contrasts sharply with typical 'flat hat' of the Mawng declarative intonation, a contour that is usually (H*) H* L%.

<about here Figure 26,1>

Information structure categories including narrow focus also tend to be signaled by wider pitch span of the prosodic phrase containing the focal constituent, followed by pitch range compression of post-focal material. However, we do not observe de-phrasing or de-accentuation in this context, i.e., the accent pattern remains intact. Constituents in pragmatic focus bear the highest pitch prominence of the utterance (often a super-high pitch peak H^* or $\text{L}+\text{H}^*$) and are often realized in their own minor or major IP (e.g. Singer 2006; Hellmuth et al. 2007; Fletcher et al. 2016 for Mawng; Bishop 2003 for Bininj Gun-wok). Word order equally plays an important role in the marking of information structure. The left edge of clauses is pragmatically significant in a range of Australian languages (e.g. Mushin 2005 for Garrwa) and constituents that are discourse prominent are often left-dislocated (Simpson and Mushin 2008), resulting in that constituent ending up in an IP on its own. In sum, phrasing, and pitch register and pitch span manipulations, rather than pitch accent dynamism or nuclear accent placement (so typical of Germanic languages) indicate discourse prominence in a range of Australian languages (for topic marking in Jaminjung, see Simard [2010] and Schultze-Berndt and Simard [2012]).

Modifications to global pitch trends within a discourse segment are thus an important index of discourse segmentation and information structure in Australian languages, similar to patterns observed in many other languages of the world. Fletcher and Evans (2000) compared global and local pitch topline trends across successive intonational phrases in a corpus of BGW narratives and found that a pitch range reset at the start of a discourse segment often signals topic shift, and final lowering (an extra low boundary tone) often signals the end of a major discourse segment. Similar pitch register patterns have been observed in Dyirbal, Dalabon, and Jaminjung. Additionally, an upward pitch register shift is often a key indicator of reported speech in a wide range of languages including Alawa, Dalabon and Kayardild (Sharpe 1972; Evans et al. 1999; see also Ross 2011; Round 2010).

Unexpectedly, prosodic and morphosyntactic structures are closely related in Australian languages. Generally, IPs line up with major clauses (e.g., Ross et al. 2016). Because of their complex nature, clauses often consist of relatively few words. IPs average 2.4 Mwords in Dalabon, 2.3 in Kayardild (Ross et al. 2016) and 1.9 in Bininj Gun-wok (Bishop and Fletcher 2005). Strikingly, grammatical words in Dalabon can be broken into two IPs, a drastic mismatch between prosodic structure and morphological word-hood (Evans et al. 2008; see also Baker 2018). Conversely, prosodic integration may play an important role in signalling morphosyntactic structure in many of these languages. In Dalabon and Bininj Gun-wok, for instance, two complex verbal constructions may occur in a single IP as a means of indicating subordination or semantic cohesiveness (e.g., Evans 2003; Bishop and Fletcher 2005; Ross et al. 2016), often creating very long IPs as a result.

26.4 Word prosody in New Guinea

Despite their separation from mainland Asia by Island Southeast Asia, the languages of New Guinea have word prosodic systems that agree with the general typological spectrum found in mainland Asia. While to the west and to a lesser extent the east relatively simple word prosodic systems dominate (see chapter 24), New Guinea itself is home to a rich variety of stress systems, seasoned with a wide variety of tonal

phonologies, and frequently served with a mixture of the two. They therefore contrast with the fairly homogeneous prosodic systems of Australia described in §26.2. This section presents some of the variety of the prosodic systems in New Guinea, both western (Indonesia) and eastern (Papua New Guinea [PNG]), with no pretense at an exhaustive survey or even a typological overview.

26.4.1 Stress

Stress is frequently on the word-initial syllable in the languages of New Guinea, perhaps more so towards the north of the island, though trochaic penultimate stress is common (e.g., initial stress in Alamlak [Sepik; East Sepik, PNG] and Mesem [Trans New Guinea; Morobe, PNG]; penultimate stress in Ambulas [Sepik; East Sepik, PNG] and Wambon [Trans New Guinea; Boven Digul, Indonesia]). In many cases, stress is insensitive to weight; in some languages, stress location is sensitive to morphosyntactic factors. One [Torricelli; Sandaun, PNG] regularly assigns stress to the penultimate syllable, but verbs allow for stress on either syllable of the final foot, resulting in contrasts such as ['te.re] 'chop' and [te.'re] 'howl'. While forms like the noun ['te.li] 'round thing' would be equally legitimate for a verb, *[te.'li] with final stress is not a possible noun. Weight-sensitivity does however occur in some stress systems. In Tifal [Trans New Guinea; Sandaun, PNG], stress is assigned to the first syllable of the word, unless there is a heavy syllable later in the word. If it contains one or more long vowels, then the first of these receives primary stress; if there are no long vowels, then a final closed syllable will attract stress.

In Yimas [Lower Sepik-Ramu; East Sepik, PNG] stress is initial, but epenthetic vowels are preferentially not assigned stress. When the initial vowel is underlying, as in /ŋa.rin/, then stress is initial, but a word like /t.kay/ 'nose' is realized with an iambic pattern: [tʰə'kʰaj], *[tʰəkʰaj]. If both vowels in the initial foot are epenthetic, then stress is assigned to the first of these: /ŋmkŋn/ 'underneath' is realized as ['ŋəmɡəŋn]. Stress will not be realized rightwards of the initial foot in the word, showing that the left alignment of stress is realized both within and outside the foot, and that epenthetic vowels are visible for stress assignment. Blevins and Pawley (2010) present a treatment of the phonological ambiguity of epenthetic vowels in Kalam [Trans New Guinea; Morobe, PNG] that elaborates on the Yimas case.

Kanum [Maro and Upper Morehead Rivers; Merauke, Indonesia] stress is a right-aligned trochee, as shown in /kæj.kæj/ 'skin', ['kæjkæj] and jɒ.kɒ.mpjæ.to 'bad' [jɒkɒ'mpjæto] (Donohue 2009). In contrast to Yimas, epenthetic vowels are ignored by the foot structure, such that any lexical vowel will be stressed in preference to an epenthetic vowel. A sole lexical vowel in the word is lengthened, as in j.kæ 'faeces' [jɪ'kæ:], *[jɪkæ]. The invisibility of the epenthetic [ɪ] is shown by /ntæ.mɛ.tj/ 'grandfather', which has the structure CVCVCC and surfaces with initial stress, ['ntæmɛtj], not *[ntæ'mɛtj], where the final surface syllable [tj] does not contain an underlying vowel and so is not footed. Again, /jelwpæ/ 'paddle' shows initial stress, ['jelɔpæ], and the syllabification of w is not visible to foot assignment. When there are no lexical vowels in the word, stress is assigned trochaically, but is aligned to the left. While alignment in a word like /k.j.kj/ ['kɪkɪ] 'language' is ambiguous, the pronunciations of /k.s.pl/ 'cuscus' and /k.lk.lwn/ 'sky' as ['kəsɔ.pɔ] and ['kə[kɔ, ɔn] (and not *[kə'səpɔ], *[kə'kəɔn]) show initial stress and thus left alignment of the trochee. While the language is therefore generally trochaic, the edge of the word from which feet are aligned depends on the presence of lexical vowels in the word. Note

the change in stress when the dative [-nɛ] is added to /kspɪ/: in [kǎsǎpǎ[ˈnɛ:] final stress assigned to the sole lexical vowel, on the right edge.

26.4.2 Tone

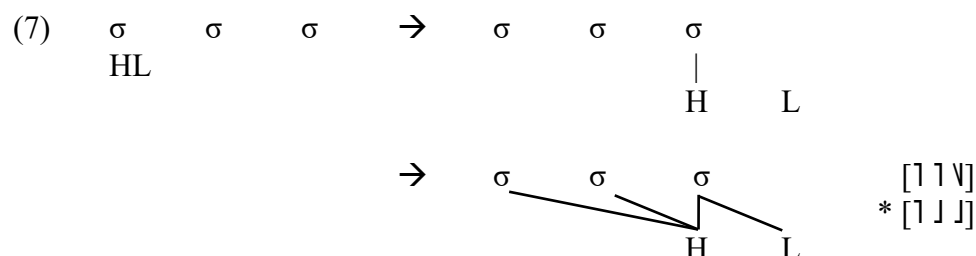
Tone is reported in approximately 30% of the languages of New Guinea. Languages with rich tone systems show strong areal concentrations, as shown in Figure 26.2. The Lakes Plains in the northwest, the central north coast where the Skou family is found, and the eastern highlands around Kainantu and Goroka are regions where elaborate tone systems are the norm. Languages between these areas, especially along the central cordillera and the floodplains to their south, are likely to be tonal, but with only two or three melody contrasts. A smaller area is found amongst languages of the Onin peninsula in the far west of the island, where both Austronesian and non-Austronesian languages show tone systems.

<about here Figure 26.2>

The Kiwai languages, like other languages of southern New Guinea, have uncomplicated word-prosodic systems. Arigibi Kiwai [Kiwai; Western, PNG] reveals a culminative constraint on tone assignment, such that while a word must have minimally one L, at most one H may occur, on any one of its syllables. As a result, there is no prosodic contrast in monosyllabic words, which are always L, and a three-way contrast on disyllables (LL, HL, and LH). An accentual analysis (words with a H vs. words with no H) would have to specify that a monosyllable cannot be accented. Elaborations of this system may have more than one melody on the accented syllable, as in Fasu [Trans New Guinea? Papuan Gulf?; Southern Highlands, PNG], where H and L contrast on the accented syllable (unaccented syllables bear a L).

Monosyllables thus contrast H vs. L, while disyllables contrast HM, LM, MH and ML, with the mid pitch assigned to the unaccented syllables. Folopa [Trans New Guinea? Papuan Gulf?; Southern Highlands, PNG] has a similar system with H, L, and Ø contrasting only on the final syllable of the word. All syllables without a H or L are realized as mid. Skou [Skou; Jayapura, Indonesia] shows contrastive accent realized only with the HL tone (other tones are H, L, LH, and LHL, Donohue 2003).

Newman and Petterson (1990) offers a clear example of a language with word melodies, Kairi [Papuan Gulf?; Gulf, PNG]. Words are lexically specified for one of the four melodies H, LH, HL, and HLH. On monosyllables they produce high, rising, falling, and peaking contours, respectively. In polysyllabic words, the last syllable must be associated with the second-last tone of the melody. For instance, in /hakane/ ‘grasshopper’, the HL melody is realized as a high-high-fall pitch contour, [há.ká.nê], not *[há.kà.nè], which might be expected if tones were assigned from the left (7).

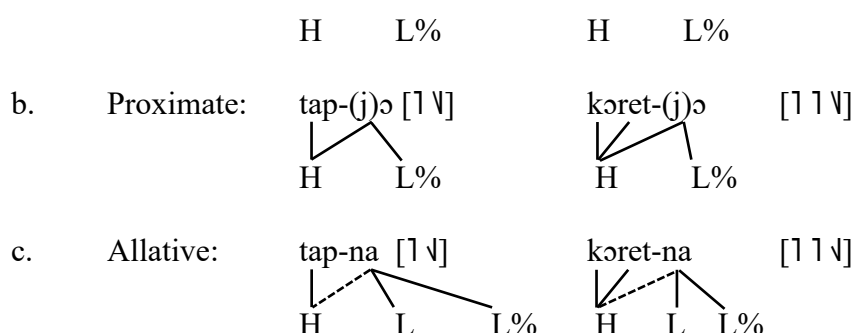


(8) $\sigma \quad \sigma \quad \sigma \quad \rightarrow \quad \sigma \quad \begin{array}{c} \sigma \\ \diagdown \quad \diagup \\ L \quad H \end{array} \quad L$

$\rightarrow \quad \begin{array}{c} \sigma \quad \sigma \quad \sigma \\ \diagdown \quad \diagup \quad \diagdown \\ L \quad H \quad L \end{array} \quad \begin{array}{l} [J \wedge V] \\ * [J J V], * [J \neg V] \end{array}$

The description of Sikaritai [Lakes Plains; Central Mamberamo, Indonesia] by Martin (1991) shows a language in which each syllable, the TBU, can be assigned a H or a L, independent of any other syllable in the word. Monosyllables thus show a two-way contrast between H and L; disyllables show a four-way contrast between HH, HL, LH and LL, and trisyllables show all eight possible combinations: HHH, HHL, HLH, HLL, LHH, LHL, LLH, and LLL. Affixes are independently specified for tone, and there are no noted interactions between root tone and affixal tone. The absence of word melodies in Sikaritai is unusual for a language of New Guinea. Odé (2000) presents a detailed description of another language with an unconstrained assignment of tones to syllables, Mpur [isolate; Tambrau, Indonesia].

(9) a. Isolation: tap [V] koret [ʔ V]



The languages of Yapen island, in the north-west of New Guinea, show complex prosodic systems that are not easily characterized as stress or tone, as generally understood. Taking data from Saweru [West Papuan; Yapen Islands, Indonesia], we find contrasts such as those shown in (10), indicating that lexically contrastive prosody is a feature of the language.

- | | | | | |
|------|---------------|--------------------|---------------|--------------|
| (10) | <i>tá.ni</i> | ‘meat, body, name’ | <i>ta.ní</i> | ‘mat’ |
| | <i>mán.da</i> | ‘starfish’ | <i>man.dá</i> | ‘sea urchin’ |

A simple analysis in terms of lexical stress is complicated by the presence of contrastive stress patterns on monosyllabic roots. In isolation, the verb roots in (11) are prosodically identical. When prefixed for person, they are associated with different stress patterns, with stress remaining on the root of ‘tooth’, but shifting to the prefix with ‘forget’. Bringing in an additional root, *ne* ‘pregnant’, we can see a third behaviour under prefixation, with stress on the initial syllable of the word. The data in (11) and (12) indicate not only that at least some of the feet in the language are ternary, not binary, but also that stress is contrastive in different positions in that foot, and that monosyllabic roots can project contrastive foot structure. Ternary feet are attested elsewhere in Sentani [East Bird’s Head-Sentani; Jayapura, Indonesia] (Elenbaas 1999).

- | | | | | |
|------|---------|------------|---------|-------------------|
| (11) | tu | ‘tooth’ | ne | ‘forget(fulness)’ |
| | i.na.tú | ‘my tooth’ | i.ná.ne | ‘I forgot’ |
-
- | | | | | |
|------|----|------------|---------|----------------|
| (12) | ne | ‘pregnant’ | í.na.ne | ‘I’m pregnant’ |
|------|----|------------|---------|----------------|

These data suggest a non-metrical system, more similar to the Arigibi Kiwai case mentioned earlier. The difference is that Saweru has clear metrical structure; when the trochaic words /tá.ni/ and /u.ma.ná.naj/ are prefixed, we can see their binary foot structure projected onto the prefixes through the evidence of secondary stresses, as shown in (15). When the iambic root /man.dá/ ‘sea urchin’ is prefixed, it is an iambic foot that is projected. When /ta.ní/ ‘mat’, a root specified for a ternary foot with final stress, is prefixed, a ternary foot is projected, and when /wo.wé.nam.be/ ‘swamp’, which has a ternary foot with initial stress, is prefixed, we again see the lexically specified foot structure and prominence assignment replicated on the prefix.

- | | | | | |
|------|----------|--------------|------------------|------------------|
| (15) | tá.ni | ‘body’ | ì.na-táni | ‘my body’ |
| | ùmanánaj | ‘hornbill’ | i.mà.ma-ùmanánaj | ‘our hornbill’ |
| | mandá | ‘sea urchin’ | ì.ma.mà-mandá | ‘our sea urchin’ |

taní	‘mat’	i.mà.ma-taní	‘our mat’
wowénambe	‘swamp’	i.mà.ma-wowénambe	‘our swamp’

The distribution of the wide variety of word-prosodic systems in New Guinea tends not to be defined by genetic groupings, but does show areal trends. More investigation is evidently required into the Papuan languages off the main island of New Guinea.

26.5 Intonation in Papuan languages

Descriptions of intonation in Papuan language have only extended past basic descriptions of declarative vs. interrogative patterns in the last fifteen years (e.g., Levinson 2010), though Pence (1964) is an exception. These have revealed different patterns of interaction between tone and intonation. Some languages, like Kuot [isolate; Papua New Guinea] show no interaction between intonation and stress (Lindström and Remijsen 2005), excrescent H tones appearing in certain contexts in Fataluku (Timor-Alor-Pantar, Stoel 2008). Intonation overrides lexical tone in Skou, where we find contrastive topics mapped to a LHL contour that is not found lexically, and which eliminates the lexical contour associated with a word.

26.6 Conclusion

Despite being among the world’s most sparsely investigated areas, this chapter has identified a relatively homogeneous prosodic blueprint for the languages of Australia and a strikingly high level of word-prosodic diversity among the languages of Papua New Guinea. Both areas urgently call for more research, since unique data are undoubtedly still waiting to be discovered.

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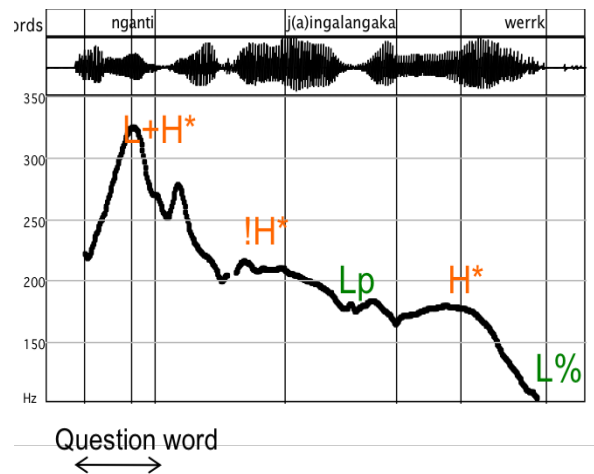


Figure 26.1. f0 contour for a WH-question in Mawng: *ɲanti calɲalangaka werk* ‘Who is the one that she sent first?’ with high initial peak on the question word: *ɲanti* ‘who’.

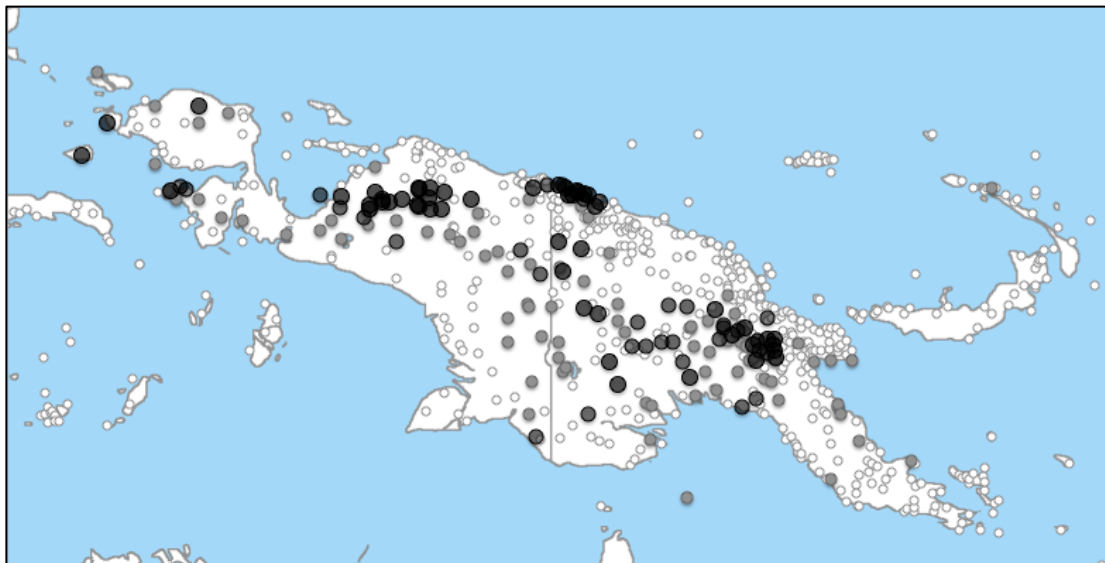


Figure 26.2 Locator map for tonal elaboration in New Guinea. White circle: language with no tone. Light grey circle: language with a two-way contrast in tone. Outlined grey circle: language with a three-way contrast in tone. Black circle: language with four or more tonal contrasts.