

## Intonation in Dalabon

**Janet Fletcher**  
*University of Melbourne, Australia*

### **1. Introduction**

In recent years, there has been increased interest in documenting intonational phenomena in minority or endangered languages in Australia, as well as elsewhere in the world. In this paper the latest findings are outlined from an ongoing study of intonation in an indigenous Australian language, Dalabon, also known as Ngalkbun or Ngalbon. Dalabon is a member of the Gunwinyguan family (non-Pama-Nyungan), and is spoken by fewer than ten speakers as a first language. It is a highly polysynthetic language with head and dependent marking patterns within the NP and highly complex verbal morphology (Evans 2006). Australian languages have intonationally defined groupings, like most of the world's languages. Secondly, with respect to the role of "pitch height", there is as yet no convincing evidence that any Australian language has lexical tone or lexically contrastive pitch accent. In previous analyses of Dalabon and Bininj Gun-wok (BGW), a neighbouring language to Dalabon (e.g. Bishop 2002, Fletcher and Evans 2002; Bishop and Fletcher 2005) both have been analysed as stress accent languages. In other words we have assumed that the post-lexical prosody of pitch intersects with lexical prosody by constraining the placement of pitch prominences to certain locations within words, often within the stem morpheme of the verbal complex for example. There is also some evidence in many northern Australian languages that intonation is used to signal local prominence *within* an intonational phrase (see Bishop and Fletcher 2005, Singer 2007, Hellmuth et al. this meeting).

However, there are at least two unresolved issues in our preliminary analyses of Dalabon. Is Dalabon really a stress-accent language? We have also not resolved whether there is more than one level of intonational constituency. While we have described Dalabon as a stress accent language, there is still no complete analysis of lexical prosody in this language. The main concern in this paper is to re-examine the tune-text relationships this language and in particular to address the first of these issues. In the sections that follow, I will present a summary of our work so far.

### **2. Methodological concerns**

At an intonation workshop some years ago (WaveIP 2000) a group of investigators got together to try and sort out how to go about constructing an intonation analysis from scratch. This is essentially what one is trying to do when one approaches the problem of analyzing fieldwork languages. A key conclusion was that while it is important to consider what labels or categories are necessary within a particular prosodic typology framework (e.g. an autosegmental framework), one of the primary goals should be "the discovery of what the significant categories are for the variety in question. This requires careful consideration of the relevant non-prosodic categories in the variety too, such as discourse structures" (Beckman et al 2000). I would also suggest this needs to be extended to some knowledge of grammatical structures in general, given the known interaction between syntax and prosody in a range of languages (e.g. Nespor and Vogel 1986; also see Ladd 2001). This is often where it is crucial to have some knowledge of the language, or to work closely with native speakers, or at least with colleagues who have an understanding of these processes in the language. Also, in the case of polysynthetic languages that have highly complex grammatical word structure, it is not so easy to talk about prominence relations amongst words, particularly when grammatical words that can be up to eleven or more morphemes long and the "prosodic word" is nearly always realized as an intonational constituent (Evans et al. in press).

One of the other conclusions of the 2000 workshop was that the "slipperiness of intonational meaning" makes it difficult to expect native speakers of a less well-studied language to make firm "meta-linguistic" judgments about this tune versus another. In some cases, in my experience, the language consultants can find it also quite distressing or confusing to be asked to repeat words or sentences several times or to participate in mainstream laboratory phonology paradigms that make no apparent sense to them. It is often "easier" for the analyst to work with an existing recorded corpus of narratives, conversations or wordlists in conjunction with a linguist who has a good working knowledge of the language. Many times however these recordings have not been recorded in optimum conditions, and materials are not necessarily constructed to elicit prosodically controlled forms, for example.

It is clear that one of the other pitfalls of intonational study is to assume that similar pitch patterns between two languages (e.g. one undescribed versus one well-researched like English) can be accounted for in exactly the same way within a particular type of theory: i.e. pitch turning points in an intonation contour are post-lexical pitch accents that may or may not be aligned with "metrically" prominent syllables in words or phrases, or that a particular kind of pitch shape signals contrastive focus compared to another more neutral pitch shape and so on. It is of course ideal if you have access to native speakers and it may be possible to elicit whether particular kinds of pitch configurations are meaningful. In my opinion, this will only work if the analyst already has some sense of what the possible range of interpretations might be. For example, you are probably more likely to get a sense intonational meaning (to put it most crudely) if you can ask your speakers "does this mean x if I say this", or "if I say [sentence or phrase] like this, does it mean y"? Many times this is not possible, particularly if there are relatively few speakers of the language left, or we are dealing with mostly elderly speakers. With respect to Dalabon, this is an acute problem with so few full-speakers although there are a handful of highly motivated language consultants who are keen to promote the language so the time is probably ripe to try out some of these techniques. Many of the remaining speakers are bilingual or even trilingual with other neighbouring languages like Kunwinjku (a dominant dialect of BGW).

Another important conclusion of the 2000 meeting was that it is best not to assume that a "new" language will have lexical stress, although one can assume that the language will have some kind of grouping, and one can further assume that all languages have tune (Beckman et al 2000). Stress is a structural property and to understand it we need to have a thorough prosodic analysis of word-level prosody (see Gussenhoven, this meeting). It is also possible that the analysts may not always get it right when it comes to stress. One may have to contend with preconceptions about the prosody of the language or language family that have been established for many years. The conventional assumption within Australian linguistic circles is that all Australian indigenous languages are "stress languages" (e.g. Dixon 1980). However it is clear that the majority of descriptions of stress in these languages are quite possibly descriptions of post lexical pitch prominence placement in isolated words or forms which are generally realized as full intonational phrases. The main quantitative studies of post-lexical accentuation also show there is very little evidence of culminative prominence in the classic sense of the term (see Pentland 2004 for an analysis of prominence in Warlpiri, and also Bishop 2002 for an excellent discussion of this in the context of Australian languages in general). Also it cannot be assumed that all Australian languages are prosodically uniform. Warlpiri for example (e.g. Pentland, and King, forthcoming) is quite distinct from the Northern Gunwinjguan languages particularly in terms of syllable structure and phonotactics.

There are a number of good recent overviews of prosodic and intonational typology (e.g. Ladd 2001, Jun 2005, Beckman and Venditti in press). This can clearly help the researcher who is attempting to describe and model the post-lexical pitch features of a language. However, there are relatively few complete descriptions of word-level and phase-level prosody of the world's languages so no-one

assumes that our typologies are finite. Nor should we assume that assigning a language to a typology might be a simple process of ticking off a list parameters or features that are typical of one type of language compared to another (i.e. pitch accent versus stress-accent and so on). Many languages fall between typological groupings (Remijsen 2002) or show features that would put them in more than one conventional category (see Jun 2005 for a comprehensive summary of prosodic typology).

### 3. Dalabon

In our work on Dalabon, we have had the advantage of already having worked on the closely related language Bininj Gun-wok (e.g. Bishop 2002, Bishop and Fletcher 2005, Fletcher and Evans 2000). It has been suggested that the differences between BGW and Dalabon are akin to the differences between Dutch and German. There are certain impressionistic similarities between the two languages phonetically, so we have assumed they have some shared features at the segmental, syllabic and intonational level. The close similarity of Bininj Gun-wok and Dalabon would also suggest that the same kinds of constraints that govern phrasal stress placement could apply but of course it is not always the case that closely related languages or different varieties of a language (e.g. varieties of Basque, or Catalan versus Spanish) have the same lexical prosody or intonational structure. There are also only incomplete surveys of word level prosody in Dalabon compared to Bininj Gun-wok.

The corpus to date consists of three lengthy narratives produced by a male and female speaker of Dalabon. A further corpus consisting of a combination of citation forms of lexical items and extended explanations of these items by two additional male speakers has also been analysed. These data were recorded by Nicholas Evans as part of a dictionary project for Dalabon (Evans, Merlan, and Tukumba 2002). There are also recordings of interactive conversational data that are in the process of being analyzed. One advantage of working with a corpus like this is that it has been fully glossed and translated by the main linguist working on this project who is familiar with the language, together with the speakers in all cases. One sad fact is that some of the recordings were made ten years ago and two of the male speakers have since passed away. However, there are a number of ongoing research projects and community projects that are looking at different grammatical aspects of the language and issues of literacy so there will be opportunities to continue working with Dalabon speakers. While no complete grammar of the language has yet been written, there has been a range of work done on aspects of the grammar (e.g. Alpher 1982, Evans 2006), and a rough sketch of the phonological characteristics of the language has been published (Sandefur and Jentian 1977). There is therefore sufficient information for us to formulate certain hypotheses about the intonation and prosody of the language.

Table 1 summarizes the consonant and vowel inventories of Dalabon. The consonant system is fairly typical of languages of the area, and the vowel system is characteristically small. According to Evans et al. (in press), all syllables have structure C<sub>1</sub>V (C<sub>2</sub>)(C<sub>3</sub>)(h); C<sub>3</sub> must have lower sonority than C<sub>2</sub>. Compared to many of the Central Australian languages, for example, there is a high proportion of closed syllables. There is little evidence of phonetic centralization of vowels (Fletcher and Butcher 2003) although vowels are deleted in certain fast speech contexts. Like Bininj Gun-wok, the segmental structure of Dalabon gives few cues to prosodic constituency. As noted by Evans et al. (in press) there are no processes such as vowel harmony, assimilatory or dissimilatory alternations that help demarcate prosodic domains. Morphemes are appended without modification and there are no phonotactic differences that distinguish phonological word or syllable edges.

**Table 1.** Consonant and vowel contrasts in Dalabon (Sandefur and Jentian 1977, Evans et al in press). The practical orthography used for each sound is included in parentheses.

		Place of Articulation					
		Peripheral Bilabial	Velar	Apico- alveolar	Retroflex	Lamino- palatal	Glottal
Manner of Articulation	Short stop	p (b)	k (k)	t (d)	t̪ (rd)	c (dj)	?
	Long stop	p: (bb)	k: (kk)	t: (dd)	t̪: (rdd)	c: (djdj)	
	Nasal	m (m)	ŋ (ng)	n (n)	ɳ (rn)	ɲ (nj)	
	Lateral			l (l)	ɭ (rl)		
	Rhotic			r (rr)	ɻ (r)		
	Semi-vowel	w (w)				j (y)	

		Front	Central	Back
Close	i	ɪ ( ə)	U	
Mid	e		O	
Open	a			

Table 1. Examples of stress placement in Dalabon

'mocan?	"wild honey from the ground"
'nakomɻuc	"little boy"
na?'coɻmu	"I cough"
,taɻpara'pa?ŋo	"afternoon"
,ŋa?jen'cunijan	"I will talk"

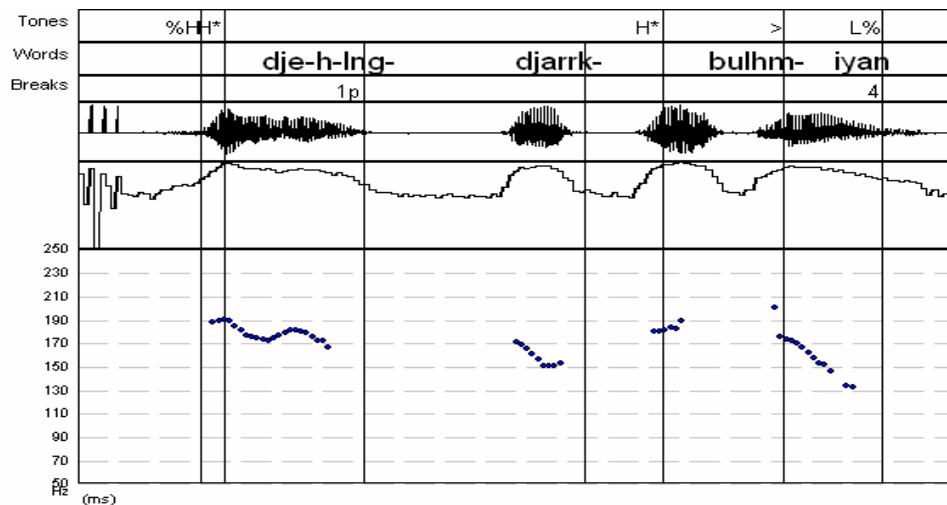
In a sketch description of the phonology of Dalabon, Sandefur and Jentian (1977), henceforth S&J, suggest certain syllables in words are metrically more prominent than others. According to S&J's stress rules, primary stress is generally assigned to the penultimate syllable of words. In words of three syllables primary stress can fall on either the initial or medial syllable, although if the initial syllable is checked by the glottal stop, stress will generally fall on the medial syllable. Primary stress falls on the penultimate syllable in longer words and secondary stress is assigned to initial syllables. Examples of S&J's stress assignment rules are shown in Table 1.

On the basis of data like these, we have assumed that like BGW, feet in Dalabon are unbounded and trochaic, with equivocal evidence of quantity sensitivity although this is an area of prosodic

structure that clearly requires further analysis and is beyond the scope of the present study. It is tempting to conclude that the above lexical stress patterns are perhaps an illustration of accentual or phrasal prominence, rather than word-level prominence. "Stress" can move around somewhat although certain monosyllabic roots tend to attract pitch prominence. With regard to impressions of the intonation structure, the patterns we observe are very "phrasal" and demarcative, so primary stress in S&J's analysis is possibly phrasal or sentence stress. On the other hand in certain situations, a particular morpheme (recall this is a highly polysynthetic language) carries a prominence-lending pitch event that seems to be very similar to contrastive focus in a European stress-accent language. Prominence is not strictly confined to phrase edge (see section 5). Also prominence relations are not necessarily amongst adjacent words but often within the same grammatical word, although as mentioned above, the latter is often isomorphic with a tonally marked prosodic constituent.<sup>1</sup>

#### 4. Main intonational contours of Dalabon

Like its near-neighbour Bininj Gun-wok, Dalabon has a limited range of intonational tunes with the most common being a declarative fall. The typical tune of a "group" consists of a high pitch onset or a rise to a high pitch level at the left edge and a final fall from a pitch peak that is usually two syllables in from the at the right edge of an intonational phrase.

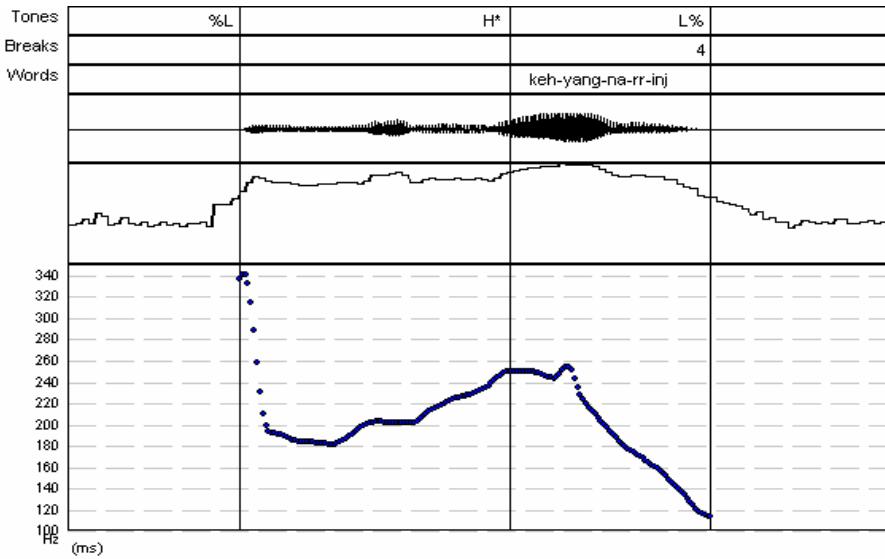


**Figure 1a. Standard declarative tune**

Trans: 'Then we (disharmonic) will...come out together.'

Figure 2 shows another version of a declarative contour with a final fall from an elevated high peak on the penultimate syllable "na" which is the verb root. We interpret this as phrasal stress or nuclear accent. Of interest is lack of an early pitch peak in this example.

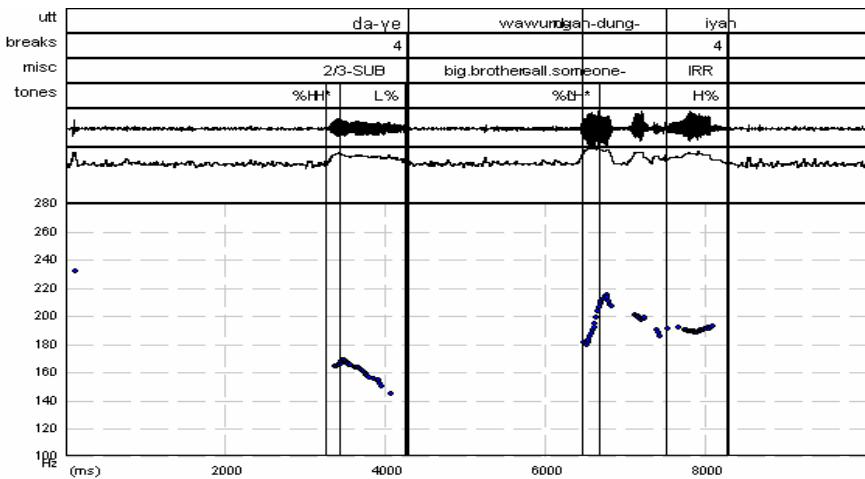
<sup>1</sup> Unusually for the Gunwinjuwan languages, dimoraic pronouns sometimes split off from the main verbal word to form separate prosodic phrases.



**Figure 1b. Declarative tune with elevated (late) pitch peak followed by final fall**

Trans. "They talked together"

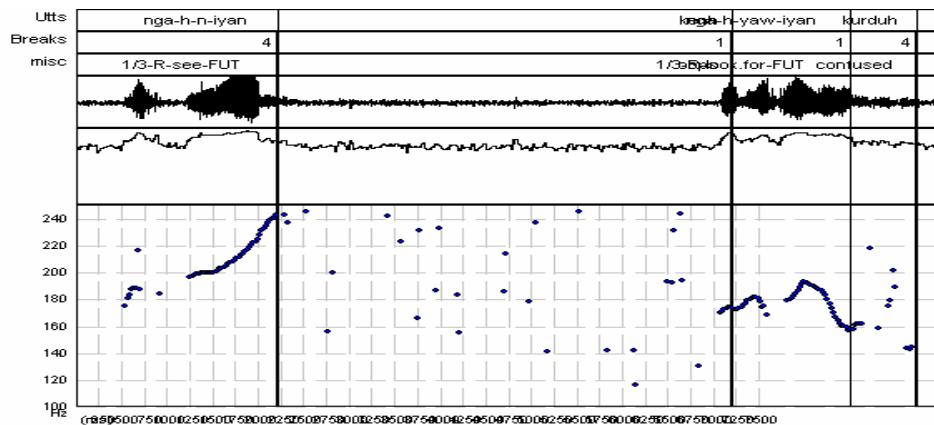
(Literally, They together, word **saw**)



**Figure 2. High Plateau contour in Dalabon**

Translation: “*You would call him big brother*”

The second contour in Figure 2 shows a high plateau contour. These are particularly common in narratives and also in conversation and appear to have some kind of floor-holding function. The final syllable in this contour can also be prolonged for several seconds to produce a particular kind of semantic effect to do with distance or prolongation.

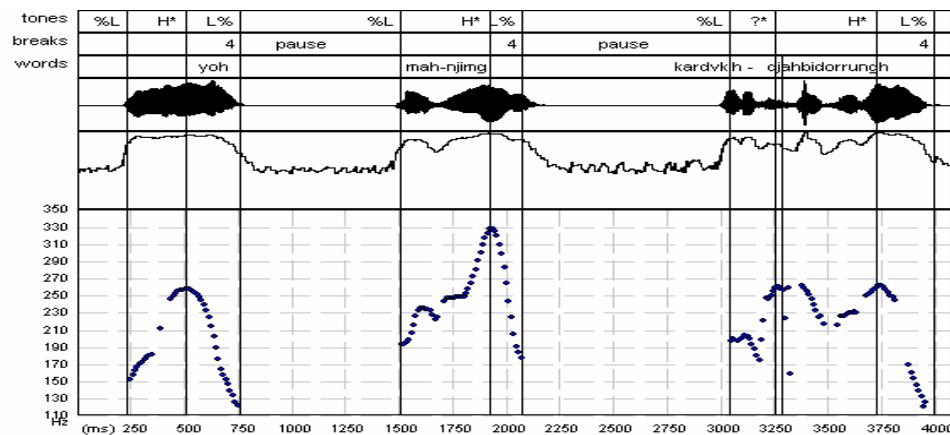


**Figure 3. High rise followed by falling tune**

Translation: "I will see it, I mean I will look for it – this way"

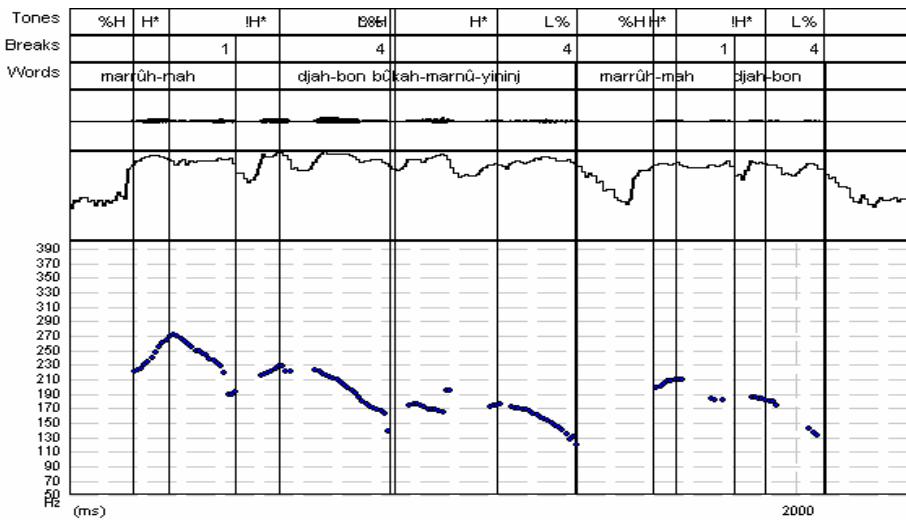
High rises occur in Dalabon, although they are relatively rare in BGW. They are not necessarily associated with questioning intonation however. Rather, like the high level tune they seem to perform some kind of continuation function and are observed frequently in explanations, listing, story-telling and so on.

The following kinds of "questioning" intonation patterns are observed. The second and third contours in Figures 4 and 5 show a typical pattern. The pattern of note here is the elevated pitch peaks in both types of utterance. This is quite striking, because this speaker (JC) normally has a pitch topline of between 200-250 Hz. An important difference between the two however is the raised pitch level of the initial part of the two main contours shown in Figure 5. Here we see a clear pitch peak on the initial WH-question word which makes the word sound highly prominent. A range of languages have a similar kind of pattern including Bengali (Hayes and Lahiri 1991) and Greek, for example (e.g. Arvaniti and Ladd 1999, also see Grice et al. 2000).

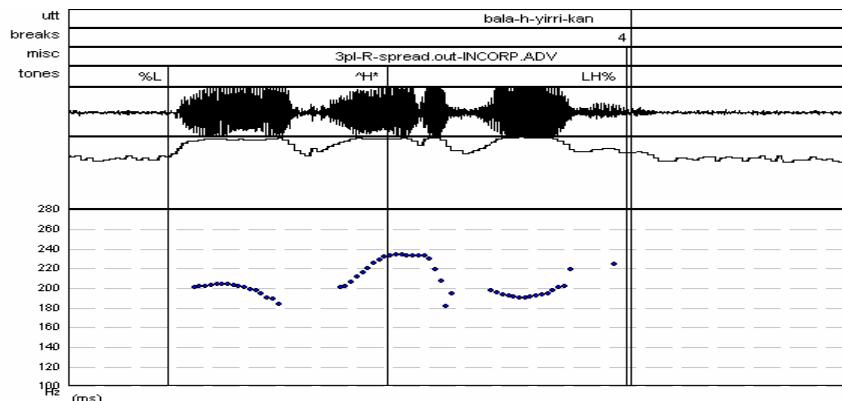


**Figure 4. Yes/no question**

Translation: "Yeah, what about you? Maybe you have got someone with you?"  
(Literally, Yeah, no you? maybe someone with?)"



**Figure 5. Wh-question contour in Dalabon**  
Translation: “*Where are you going?*”



**Figure 6. Fall-rise**  
Translation: “They spread out by themselves”

Figure six shows a fall-rise contour. This is less prevalent than the high plateau tune in narratives but seems to occur in the same kind of discourse contexts. It is heard reasonably frequently in conversational discourse.

There are also several local pitch range effects which also alter the realization of the contours illustrated above. For example, like BGW, Dalabon has terraced downstepping contours of the kind noted in many other languages (Ladd, 1996), as well as a local suppression of pitch at the end of a stretch of speech, which we have analysed as final lowering.

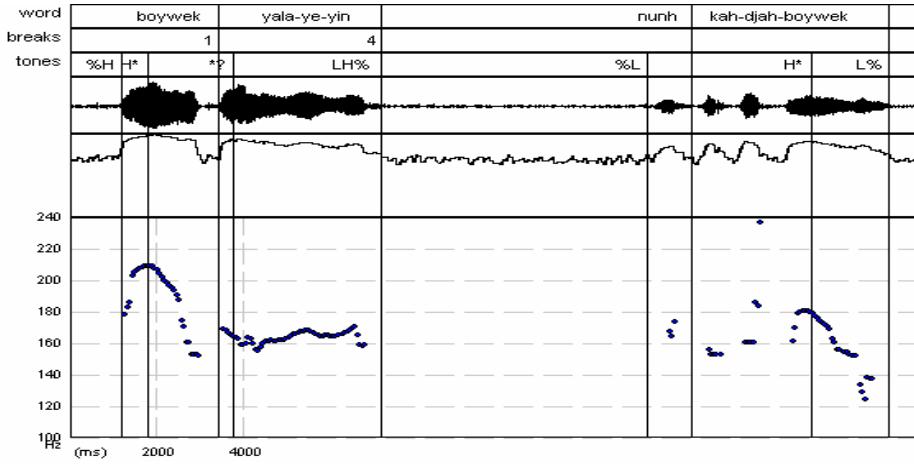
#### 4. Post-lexical prominence

While it is the case that pitch prominences in Dalabon appear to align most of the time (although not always) with syllables that would be analyzed as lexically stressed according to Sandefur and Jentian's rule system, pitch is the only consistent cue to perceived rhythmic prominence. Recall that one of the traditional assumptions of stress accent is that parameters in addition to pitch, i.e. duration, intensity, supralaryngeal enhancement, also contribute to the signaling of post-lexical prosodic prominence. This is what distinguishes the phonetic manifestation of pitch accent from stress accent. However, as mentioned above, like most Australian languages examined so far, Dalabon has no lexically contrastive use of pitch. Is it more like French or Bengali with phrasally marked non-lexical accentual prominence? Moreover vowels in non-rhythmically prominent syllables are often elided (e.g. second syllable of disyllabic morphemes with initial "stress"), and certain high frequency words have noticeably reduced vowels in the second syllable. This is also observed when the words are not accented which suggests we are probably dealing with some kind of lower level prominence in this instance. Of course, this is precisely where we return to the problem of trying to assign a language to one typology or another without having come to terms with all of the prosodic facts of the language.

The next related question is to determine whether pitch accents and boundary tones in Dalabon are purely demarcative, or whether pitch prominence also contributes to some kind of marking of semantic focus in an utterance. It is true that in our corpus, many prominence-lending pitch movements appear to have a simple demarcative function, marking out left and right edges of the intonational phrase. However in some cases, the prominence-lending movement is aligned with the head of the second foot of the intonational phrase as in Figure 6 (recall that S&J claim that primary stress is usually penultimate). In this example, the main prominence of the phrase is aligned with the morphological stem *yirri* "spread out" and the preceding pronominal is unaccented. There is also limited evidence of de-accentuation after an early pitch peak as shown in Figure 7. In the first intonational phrase, *boywek* "velvet tailed gecko" is highly prominent and phrase-initial in the first intonational phrase and is followed by a long potentially unaccented stretch. The H\* accent is realized at an elevated pitch level.<sup>2</sup> The repeated morpheme also receives the main pitch prominence but occurs late in the second intonational phrase, thus it is also possible to have a late peak in an intonational phrase with no early pitch prominence (e.g. see also Figure 1b).

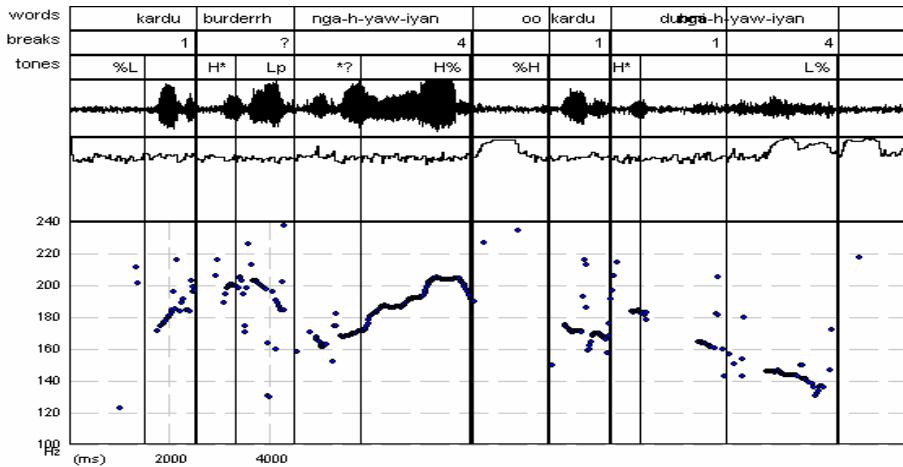
---

<sup>2</sup> In this respect the inventory outlined in Fletcher and Evans (2002) is different from that proposed for BGW (Bishop and Fletcher 2005) which included a L+H\* accent (for certain varieties) that tended to signify contrastive stress.



**Figure 7. Early and late prominence**

Trans: "They call it the *velvet-tailed gecko*, this one is the *velvet-tailed gecko*"



**Figure 8. Examples of focal accent**

Trans: *Maybe in a few days. Or maybe tomorrow.*

There are many examples of this kind of pattern in our corpus, with the word in focus clearly bearing the main pitch prominence, and more often than not if the word is a disyllable, the initial syllable bears the pitch accent. In the following example, *burderrh* "few days" and *dubmi* "tomorrow" are accented within the same kind of construction. The word in focus therefore does not necessarily have to be intonation phrase initial, although Dalabon does not have as much freedom as other Australian languages (e.g. Warlpiri) to move around grammatical words due to the complex form of the verbal word.

## 5. Discussion

A number of issues remain to be resolved in this analysis of Dalabon. At this stage only one intonational constituent above the prosodic word has been proposed. We have suggested elsewhere that there may be a constituent below the intonational phrase which is also tonally marked (Evans et al in press, see also Bishop for BGW) although the evidence is less compelling than for BGW. .

On a methodological note, I have tried to show in this brief survey of Dalabon that it is possible to formulate what are hopefully sensible hypotheses on the basis of existing corpora. However, it is critical to keep an open mind about competing analyses. I think it is also very important not to panic if the language one is analyzing does not appear to fit neatly into one of our pre-existing typological categories. As pointed out by Jun (2005), Beckman and Venditti (in press), one of the main problems that challenges for researchers working on less-studied languages within an AM framework, is to sort out the tune-text relationship before worrying about whether the language fits into this or that traditional typology. On a practical note, I agree with others (e.g. Gussenhoven, this workshop) that it is not really possible to understand stress if you do not actually speak the language, although it is quite obvious that this is one area where further work is required. Nevertheless, I believe it is possible to formulate sensible hypotheses based on the resources one has to hand. It is crucial to have access to speakers, or to work with analysts who are familiar with the language and who regularly interact with speakers. While it is possible to conduct certain laboratory phonology-type paradigms or to use other controlled data elicitation techniques like the use of a map task and so on, this also requires a careful appreciation of the socio-cultural context you may well find yourself in, particularly when dealing with a fragile language like Dalabon.

## **Appendix – A preliminary tonal inventory of Dalabon (Fletcher and Evans 2002)**

### **Left-edge Tones (Intonational Phrases)**

%L *low*

%H *high*

### **Pitch Accents**

H\* *high*

<sup>^</sup>H\* *expanded*

!H\* *lowered high/mid*

### **Right-edge Tones**

L% *low*      !H% *lowered high/mid*

H%/<sup>^</sup>H% *high/expanded high*

LH% *low rising*

### **Additional Notation**

**L** *low IP-internal target > early target*

**H** *high IP-internal target < late target*

Arvaniti, A.,(2001). The intonation of Wh-questions in Greek. *Studies in Greek Linguistics* 21 Thessaloniki, 57-68

Beckman, M.E, and Venditti (in press). Tone and intonation. *Handbook of Phonetic Sciences*

Beckman, M.E, Warren P, Hay, J., Speer, S., Wales, R.J., Fletcher J. 2000. Notes on Transcription conventions:Waveip 2000.

Bishop, J. (2002). *Aspects of intonation and prosody in Bininj Gun-wok: an autosegmental metrical analysis*. Unpublished PhD thesis, University of Melbourne.

Bishop, J. & Fletcher, J. (2005). Intonation in six varieties of Bininj Gun-wok. In S-A. Jun ed. *Prosodic Typology: The phonology of intonation and phrasing*, pp 331-61

- Evans, N. (2006). Who said polysynthetic languages avoid subordination? Multiple subordination strategies in Dalabon. *Australian Journal of Linguistics* 26, 31-58.
- Dixon, R.M.W. (1980). *The languages of Australia*. Cambridge:CUP
- Evans, N., Fletcher, J. & Ross, B. (in press) Big words, small phrases: mismatches between pause units and the polysynthetic word in Dalabon. *Linguistics*
- Evans, N., Merlan, F. & Tukumba, M. (2003). *A first dictionary of Dalabon*.
- Fletcher, J. & Evans, N. (2000). Downtrends in Mayali. *Australian Journal of Linguistics*, 20, 23-38
- Fletcher, J.& Evans, N. (2002). An acoustic intonational study of intonational prominence in two Australian languages. *Journal of the International Phonetic Association*, 32, 123-140.
- Grice M. et al. (2000). On the place of phrase accents in intonational typology *Phonology* 17, 143-85.
- Hayes, B. and Lahiri, I. (1991). Bengali intonational phonology. *NLLT*, 9, 47-96.
- Hellmuth, S. et al. (2007). Tonal alignment and focus in Mawng. Satellite Workshop on Intonation, ICPHS 2007.
- Jun, S-A. (2005) Prosodic Typology. In S-A. Jun ed. *Prosodic Typology: The phonology of intonation and phrasing*, pp 430-58
- Ladd, D.R (2001). Intonation. In. M. Haspelmath et al. (eds). *Language typology and language universals*. New York: de Gruyter
- Nespor, M. and Vogel, I. (1986). *Prosodic phonology*. Dordrecht: Foris
- Pentland, Christina. 2004. Stress in Warlpiri: stress domains and word-level prosody. Unpublished MPhil thesis, School of English Media Studies and Art History, The University of Queensland,
- Remijsen, A. (2002). Lexically contrastive stress and lexical tone in Ma'ya. In C. Gussenhoven and N. Warner. Eds. *Laboratory Phonology VII*. Mouton
- Sandefur, John & David Nangan:golod Jentian. 1977. A tentative description of the phonemes of the Ngalkbun language (including a small word list). In Joyce Hudson, ed., *Five Papers in Australian Phonologies*. Darwin: SIL-AAB. 57-96.
- Singer, R. (2007). *Agreement in Mawng: productive and lexicalised uses of verbal gender agreement in an Australian language*. Unpublished PhD thesis, University of Melbourne