Pacific Linguistics 618

Pacific Linguistics is a publisher specialising in grammars and linguistic descriptions, dictionaries and other materials on languages of the Pacific, Taiwan, the Philippines, Indonesia, East Timor, southeast and south Asia, and Australia.

Pacific Linguistics, established in 1963 through an initial grant from the Hunter Douglas Fund, is associated with the Research School of Pacific and Asian Studies at The Australian National University. The authors and editors of Pacific Linguistics publications are drawn from a wide range of institutions around the world. Publications are refereed by scholars with relevant expertise, who are usually not members of the editorial board.

East Nusantara:
typological and areal analyses

edited by
Michael C. Ewing and Marian Klamer

Pacific Linguistics
School of Culture, History and Language
College of Asia and the Pacific
The Australian National University

Published by Pacific Linguistics
School of Culture, History and Language
College of Asia and the Pacific
The Australian National University
Canberra ACT 0200
Australia

First published 2010

National Library of Australia Cataloguing-in-Publication entry:

Title: East Nusantara: typological and areal analyses / edited by Michael C. Ewing and Marian Klamer.

ISBN: 9780858836105 (pbk.)

Notes: Includes bibliographical references.

Subjects: Papuan languages.
Austronesian languages.

Other Authors/ Contributors: Ewing, Michael C.
Klamer, Margaretha Anna Flora.
Australian National University. Research School of Pacific Studies. Dept. of Linguistics.

Dewey Number: 499.22

Typeset by Julie Manley
Cover image: woven Ikat fabric from Mangili, East Sumba, depicting a cock fight.
Cover design by Julie Manley/Addcolour Digital Pty Ltd
Printed and bound by Addcolour Digital Pty Ltd, Fyshwick, Canberra

Table of contents

Taguchi, Yushin and Takako Taguchi, 1990. A phonology of Alune. In Wyn D. Laidig, ed., *Workpapers in Indonesian languages and cultures*, 8:95–127. Ambon: Summer Institute of Linguistics.

Takata, Masahiro and Yuko Takata, 1992. Kola phonology. In Donald A. Burquest and Wyn D. Laidig, eds, *Descriptive studies in languages of Maluku*, NUSA: Linguistic studies of Indonesian and Other Languages of Indonesia, 34:31–46.

Tama, I. W., Sukayana, I. N., Partami, N. L. and Z. M. Hamidsyukrie, 1996. *Fonologi bahasa Bima.* Jakarta: Pusat Pembinaan dan Pengembangan Bahasa, Departemen Pendidikan dan Kebudayaan.

Tetelepta, J., E. A. Apituley, J. Kasihuw, E. Wattimury and I. Talakua, 1985. *Struktur bahasa Kei*. Jakarta: Pusat Pembinaan dan Pengembangan Bahasa, Departemen Pendidikan dan Kebudayaan.

Verheijen, J. A. J. and Charles E. Grimes, 1995. Manggarai: Introduction and wordlist. In Daryl T. Tryon, ed., *Comparative Austronesian dictionary: An introduction to Austronesian studies, part 1: fascicle 1*, 585–92. Berlin/New York: Mouton de Gruyter.

Voorhoeve, Clemens L., 1982. The West Makian language, North Moluccas, Indonesia: A fieldwork report. In Clemens L. Voorhoeve, ed., *The Makian languages and their neighbours*, 1–74. Canberra: Pacific Linguistics.

— 1985. *Some notes on the Arandai language, South Bird's Head, Irian Jaya.* Irian 13:3–40.

Vries, Lourens de, 2004 . *A short grammar of Inanwatan, an endangered language of the Bird's Head of Papua, Indonesia.* Canberra: Pacific Linguistics.

Walker, Alan T., 1982. *A grammar of Sawu.* NUSA: Linguistic studies of Indonesian and other languages of Indonesia, 13.

Walker, Roland and J. Walker, 1990. Kowiai phonology. Jayapura: Universitas Cendrawasih and Summer Institute of Linguistics.

Watuseke, F. S., 1991. The Ternate language. In T. Dutton, ed., *Papers in Papuan linguistics, No. 1*, 223–244. Canberra: Pacific Linguistics.

Whisler, Ronald, 1992. Phonology of Sawai. In Donald A. Burquest and Wyn D. Laidig, eds, *Phonological studies in four languages of Maluku*, 7–32. Dallas: Summer Institute of Linguistics.

Williams-van Klinken, Catharina, Hajek, John and Rachel Nordlinger, 2002. *Tetun Dili: A grammar of an East Timorese Language*. Canberra: Pacific Linguistics.

Wimbish, Sandra G., 1992. Pagu phonology. In Donald A. Burquest and Wyn D. Laidig, eds, *Descriptive studies in languages of Maluku.* NUSA: Linguistic studies of Indonesian and other languages of Indonesia, 34:69–90.

3 *Notes on Waima'a intonational structure*

NIKOLAUS HIMMELMANN

1 Introduction

This chapter presents a first attempt at analysing the intonational structure of Waima'a, an endangered Austronesian language spoken in East Timor. More precisely, it deals with the variety of Waima'a spoken in the village of Caisido and parts of the neighboring town of Baucau.[1]

The analysis makes use of the autosegmental-metrical framework where intonational contours are represented as strings of high (H) or low (L) tonal targets (Ladd 1996). In accordance with their function within an intonation unit (IU), three different types of tonal targets are distinguished within this framework (*T* here stands for *tonal target*, the cover term for H and L targets):

1. T*: accentual (or prominence-lending) tone, which occurs on lexically accented syllables and usually marks focal information (these tones are also known as (*intonational*) *pitch accents*).
2. T-: phrase accent (or edge tone), that is a major prominence which occurs at a fixed distance from the edge of an intonation unit (e.g., the first syllable or the penultimate syllable of an IU).

[1] For further information on the language and its setting, including the dialect situation, see the archive of the Waima'a documentation project at http://www.mpi.nl/DOBES/.

Many thanks to Maurício C.A. Belo, John Bowden, John Hajek and Alex V. Tilman, my main collaborators in this project. Very special thanks to Maurício, the native speaker on the documentation team, who recorded most of the elicited data forming the empirical basis of this chapter. Further information and full acknowledgements for the Waima'a project can be found on the website just mentioned.

I am very grateful to Ruben Stoel for sharing his innovative work on Javanese and Manado Malay and especially for his very helpful and productive comments on the first draft of the analysis presented here. Similarly, Bob Ladd was of great help in developing the current analysis and provided pertinent criticism on the second draft. Many thanks also to John Hajek, Michael Ewing and René Schiering for very useful comments on earlier versions of this chapter.

This work was made possible by a research professorship funded by the Volkswagen foundation and I am most grateful for this very generous support.

Michael C. Ewing and Marian Klamer, editors.
Typological and areal analyses: contributions from East Nusantara, 47–69. Pacific Linguistics, 2010

3. T%: boundary tone, a pitch excursion which occurs on the first or last syllable(s) of an IU, regardless of whether or not the syllables are lexically accented.

Perhaps the most major difference between Waima'a intonation and the much better known intonational structures in European languages[2] pertains to the fact that there appear to be no accentual tones (no T*) in Waima'a. That is, the basic structure of the Waima'a intonation unit looks as depicted in Figure 1.

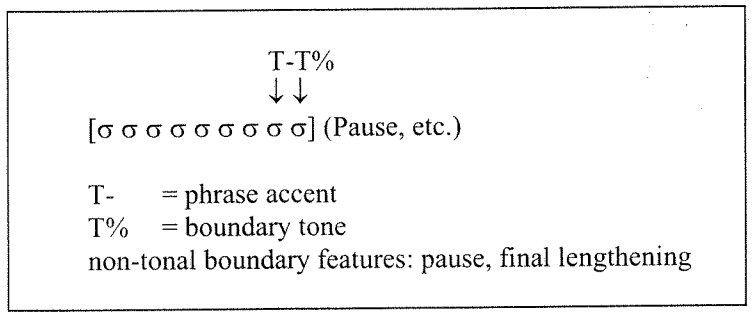

Figure 1: Basic structure of Waima'a intonation unit

A Waima'a IU thus obligatorily consists of a phrase accent on the penultimate syllable and a final boundary tone. The main part of this chapter will describe the tonal patterns that may occur in these positions (section 3) and the optional occurrence of a lower-level intonational constituent at the beginning of an IU (section 4). Section 5 briefly shows that IUs may include syntactic structures of various sizes.

The absence of accentual tones is not a unique feature of Waima'a. Instead, this is a feature which has also been reported for other languages in the area, including western varieties of Malay and Javanese (cp. Tadmor 2000, van Zanten et al. 2003, Stoel 2006, 2007). As in these other languages, the absence of accentual tones raises the question of whether Waima'a lexical items carry lexical accents (are lexically stressed), and the evidence presented in section 6 points in the direction that Waima'a in fact lacks lexical accents. Waima'a would thus appear to belong to the type of languages which have neither lexical accent nor lexical tone. To date, this type of languages has played a somewhat marginal role in the literature on prosodic typology, but there is growing evidence from languages around the world that this type is in fact not marginal at all, as briefly discussed in the final section.

Before turning to the prosodic analysis proper, however, section 2 will briefly present the rather complex Waima'a segment inventory. This is needed because various segment types cause considerable perturbations with regard to fundamental frequency, and thus are relevant to the interpretation of the data presented here.

In concluding these introductory remarks, a note on the database for this study and how the data was collected will be in order. The analysis is based primarily on two sets of elicited mini-discourses targeting sentence mood and information structure. Examples include the Waima'a equivalents of exchanges such as:

[2] See Ladd (1996), the contributions on major European languages in Hirst and Di Cristo (1998) and Jun (2005), and table 16.2 in Jun (2005a) for exemplification of typical European systems.

(1) (In the market): What are you looking for? (I am looking for) vegetables.
(2) Have you ever eaten a snake? No, I am afraid of snakes.

One set consisted of 15 items and was recorded with 14 speakers, 9 female and 5 male. The second set consisted of 16 items. To date, data for 5 speakers (that is 3 female and 2 male) have been processed for this set. This basic set was complemented by recordings of short word lists with two speakers (one male, one female), each consisting of 3-7 items presented in different orders and spellings, and approximately 150 intonation units taken from the corpus of spontaneous naturalistic speech compiled by the Waima'a documentation team.

The elicitation of the data was complicated by the fact that there is no well-established writing tradition for Waima'a. Consequently, the prompts for the mini discourses could not be presented in writing but rather had to be rehearsed in advance with the speakers who then had to *enact* the scene. All examples were first rehearsed and recorded with Waima'a team member Maurício Belo as the main speaker, with the author operating the video camera. All further rehearsing and recording was done by Maurício, who thus appears in all recordings. The author was usually not present at these further recordings, which were mostly done open air in the village. For the short word lists, reading Waima'a was rehearsed with two speakers who are fully literate in Tetum and Malay (one of them was again Maurício Belo) and all recordings were done indoors in an office setting by the author. See Himmelmann (2006) and Himmelmann and Ladd (2008) for further details on data gathering procedures.

Obviously, this basic set-up is prone to lots of interferences and noise of various kinds, and it will thus not come as a surprise that less than 50% of all recorded data were actually usable for the analysis. The corpus of utterances which were plotted (F0, waveform) and segmented into syllables for this study consists of approximately 1150 items. The program used for creating and managing this corpus was EMU (http://www.shlrc.mq.edu.au/emu), the figures included in this chapter were created with the statistical computing freeware program *R* (http://www.R-project.org.).[3]

2 Waima'a segments causing F0 perturbations

While the Waima'a vowel inventory is unremarkable and straightforward (5 vowels /i/, /e/, /a/, /o/, /u/),[4] the consonant inventory is rather large and unusual for an Austronesian language. As shown in Table 1, it includes glottalised and aspirated series for most manners of articulation in addition to the simple voiced and/or voiceless series commonly found in many Austronesian languages. Segments are given here in the practical orthography used throughout this chapter (IPA symbols are added in [ ] where they differ from the practical orthography). Segments in parentheses only occur in loans or are marginal to the system. For a fuller exposition of the phoneme inventory, including detailed commentary regarding phonetic realization, see Hajek and Himmelmann (2006). For more detail regarding glottalised segments, see also Hajek and Bowden (2002), Hajek and Stevens (2005) and Stevens and Hajek (2004).

[3] Special thanks to Emina Kurtić and Jan Strunk for creating and managing this resource. Jan Strunk prepared all the plots shown in the following figures.

[4] Phonetically long vowels arise when two like vowels occur in adjacent syllables (that is (C)V.V) as in *mee* 'red' or *khaa* 'eat'.

Table 1: Waima'a consonant inventory

		Labial	**(Post-) Alveolar**	**Velar**	**Glottal**
Stops	voiceless unaspirated	(p)	t	k	' [ʔ]
	voiceless aspirated	(ph) [p^{h}]	th [t^{h}]	kh [k^{h}]	
	voiceless ejective	p'	t'	k'	
	voiced	b	d	g	
Fricatives	plain	(f)	s		h
	glottalised		s' [s^{ʔ}]		
Nasals	plain	m	n		
	voiceless	mh [m̥]	nh [n̥]		
	glottalised	m' [m^{ʔ}]	n' [n^{ʔ}]		
Laterals	plain		l		
	voiceless		lh [l̥]		
	glottalised		l' [l^{ʔ}]		
Rhotic	plain		r [ɾ]		
	glottalised		r' [^{ʔ}ɾ]		
Approximants	plain	w [w/ɥ]	j		
	voiceless	wh [ẉ]			
	glottalised	w' [w^{ʔ}/ɥ^{ʔ}]			

Of major import for current concerns is the fact that glottalised and aspirated segments may cause considerable perturbations in fundamental frequency which may go well beyond the usual microperturbations observable for voiced and voiceless stops and fricatives (that is that voiced stops tend to lower F0, while voiceless stops tend to raise F0, etc., which are standard effects also observable in Waima'a; see Laver (1994:431–546) for detailed discussion). Thus, when inspecting the F0 extractions provided here to illustrate claims about intonational structure, it will be important to keep in mind that some of the major changes in F0 observable in the plots are not related to intonational targets, and thus are in fact hardly detectable auditorily. Instead, they are caused by a preceding glottalised or aspirated segment. Figure 2 illustrates this for the example given in (3), rendered by a female speaker.

(3) *Da. Aku thaku khaa sawa.*
NEG 1s afraid eat snake
'No! I am afraid of eating snakes'

In Figure 2 there is a clearly observable jump up in F0 after both the alveolar and the velar voiceless aspirated stops (*th* and *kh*), more than 60 Hz in the first instance, close to 80 in the second. Both these jumps are caused exclusively by the stops, and are hardly perceptible auditorily. Auditorily, pitch is low and flat after the initial rise-fall on the negative *da* (which constitutes an IU of its own). It is low and flat right up to the vowel *a* in the first syllable of the final word *sawa* where a clearly perceptible jump up to a higher

target occurs, followed by a rise in the final syllable of the unit. That is, F0 for the penultimate syllable *sa* is also somewhat misleading in that there is no perceptible fall in pitch.

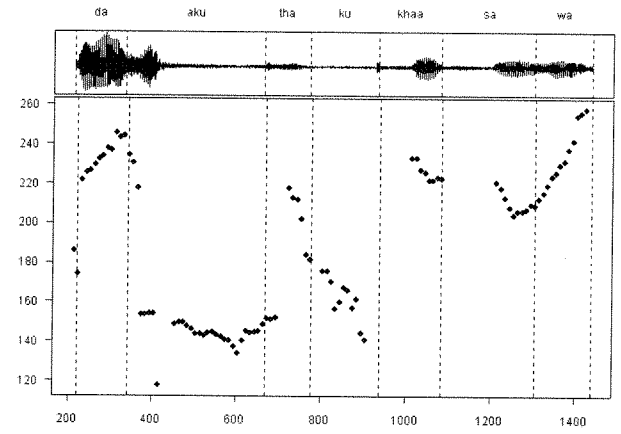

Figure 2: Waveform and F0 for example (3), female speaker ASB

Such major F0 excursions after glottalised and aspirated segments are of course well known from the literature on tonogenesis (cp. Beckman 1986:31f, Yip 2002:35-38). In this respect, it will be useful to note that in Waima'a there is considerable intra- and interspeaker variation with regard to the articulation of these segments. Figure shows another rendering of example 3 by the same speaker. Here, the initial *th* in *thaku* is rendered almost like a voiced stop and hence no upward F0 excursion occurs. Also, the jump after *kh* is much less prominent (less than 40 Hz).

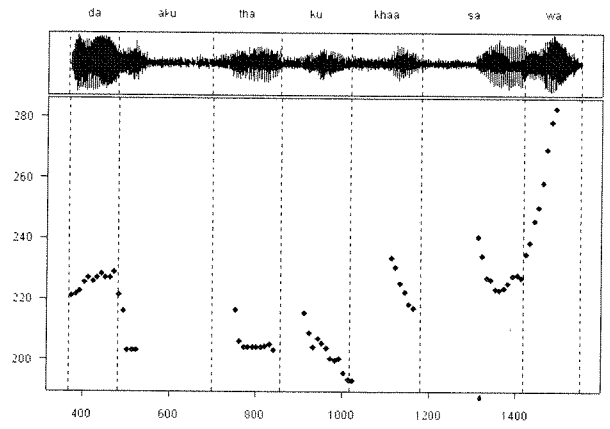

Figure 3: Waveform and F0 for example (3), alternative rendering by female speaker ASB

Figure 4 shows the same example rendered by a male speaker. Here the jumps in F0 after the aspirated initial consonants are rather moderate and much more like the minor jumps found after plain voiceless stops. (This speaker also uses a different intonation

pattern for this utterance, ending on a final fall rather than a rise, but this is not of import for the matters under consideration here.)

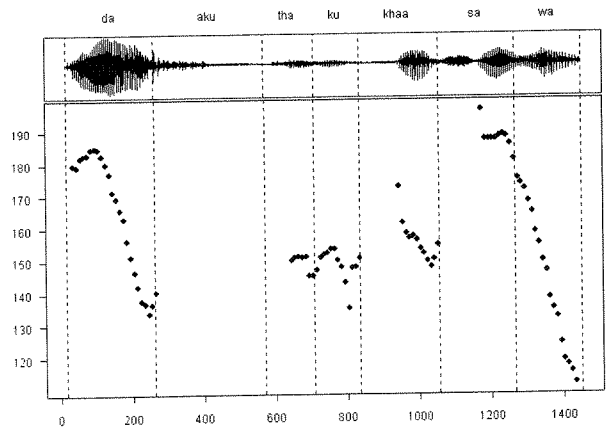

Figure 4: Waveform and F0 for example (3), male speaker MB

3 Tonal patterns at the right edge of an IU

3.1 The major, unmarked pattern: H-L%

The most common intonation pattern in the database begins mid-level in the speaker's current register, continues level along the middle range, rises on the penultimate syllable and ends on a final fall to the bottom of the current range. In terms of the autosegmental framework used here, this pattern can be analyzed as consisting of an unmarked or default initial boundary tone, followed by a H(igh) phrase accent on the penultimate syllable and a final L(ow) boundary tone, in short: H-L%. Figure 5 illustrates this contour on the basis of example (4). Note in particular that F0 is almost flat up to the penultimate syllable, where a clear rise occurs, reaching its peak towards the end of the syllable. The following fall is articulated with very strongly and quite abruptly decreased loudness, a widespread, but by no means universal feature in the database.

(4) *ne de kara haru lumu*
3s NEG like shirt reen
's/he doesn't like the blue shirt'

Before continuing the discussion of intonation contours, it will be useful briefly to take note of another major characteristic of Waima'a connected speech seen in Figure 5, that is a pervasive tendency to reduce syllables. In the current example (and also in the next one), the final vowel in *haru* 'shirt' is omitted. Syllable reduction, however, is not restricted to final syllables but may, in principle, occur in any syllable and may pertain to complete syllables rather than just to the nucleus, as further illustrated in section 6 below.

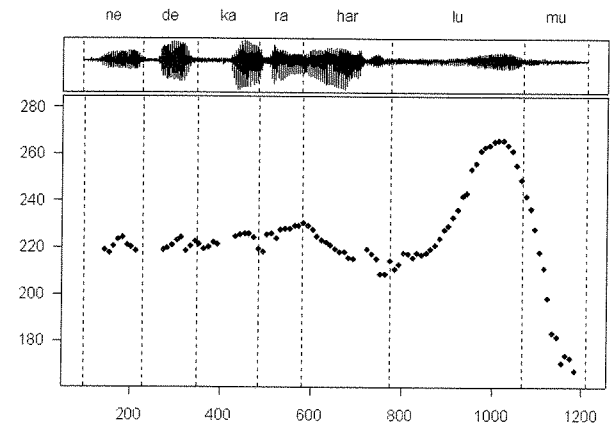

Figure 5: Waveform and F0 for example (4), female speaker SB

Returning to the discussion of tonal patterns at the right edge of an Waima'a IU, if the final word in an intonation unit ends on two identical vowels which are phonetically realised as a single long vowel (that is (C)V.V -> [(C)V:]), then phrase accent and boundary tone both occur on this phonetically long vowel, as illustrated by example (5).[5]

(5) *ne kara hile haru mee*
3s like again shirt red
's/he likes the red shirt'

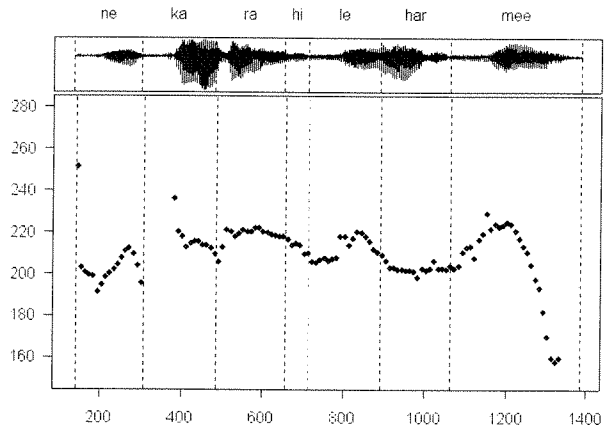

Figure 6: Waveform and F0 for example (5)5), female speaker SB

As seen in the preceding two examples (Figure 5 and Figure 6), the rise characterizing the phrase accent usually starts at the beginning of the penultimate syllable, if its onset is

[5] No syllable boundary is indicated in waveform and F0 in words involving a phonetically long vowel. Alternatively, one could analyze the contrast involved here in terms of an opposition between monomoraic and bimoraic syllables, making the mora rather then the syllable the tone-bearing unit in Waima'a. At this point it is unclear whether the analysis of phonetically long vowels as bimoraic or disyllabic provides for an overall simpler statement of Waima'a phonology (see Hajek and Himmelmann 2006 for further discussion).

voiced. If the onset of the penultimate syllable is voiceless, then there is no rise, but rather a jump to the high target, followed by the fall of the final boundary tone, which may already begin in the penultimate syllable. Compare example (6) and also example (3) and Figure 4 above.

(6) *karita soke mata lo kii la basara*
car crash dead ASP person LOC market
'(Oh, you haven't heard yet:) A car killed someone in the market!'

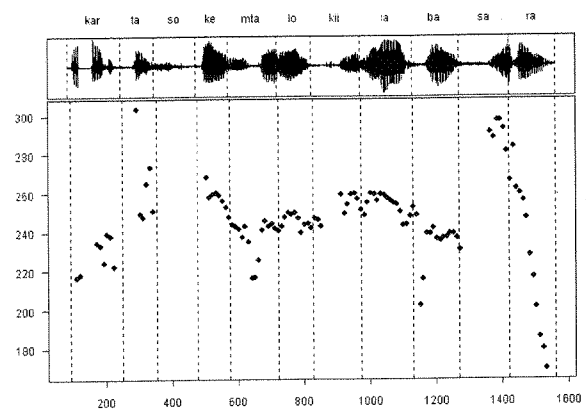

Figure 7: Waveform and F0 for example (6), female speaker ASB

Phrase-final function words appear to allow for two different realizations. Either the function word is realised as a short monosyllable, as in the short command *to'e di!* (sit ALLATIVE) 'sit down!' shown in Figure 8. Here the phrase accent occurs on the final syllable of the verb *to'e*, the allative marking *di* carrying the falling boundary tone.[6]

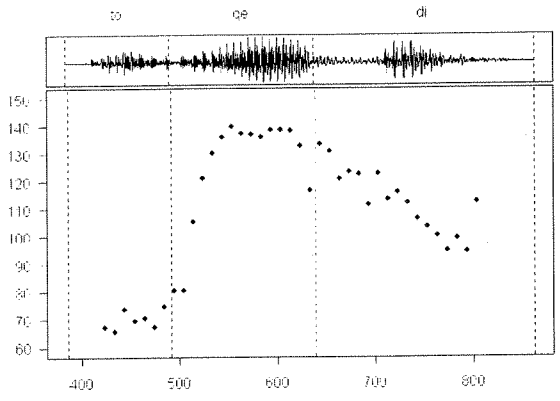

Figure 8: Waveform and F0 for *to'e di* 'sit down!', male speaker ACS[7]

[6] Allative *di* regularly occurs in some types of commands in Waima'a. It is currently still unclear whether this is best analyzed as extended multifunctionality of a high frequency function word or rather represents a case of homonymy which would then warrant an independent gloss as imperative marker.

[7] Note that glottal stop, which is represented orthographically as <'>, appears as <q> in this and some of the following figures due to limitations of the database (EMU) and plotting program (R) used.

Alternatively, the function word is realised with a (phonologically) long vowel, thus counting as disyallbic, in which case both phrase accent and boundary tone occur on the function word. This is illustrated by the second rendering of *to'e di!* in Figure 9, where both tonal targets occur on the considerably lengthened function word *di*.

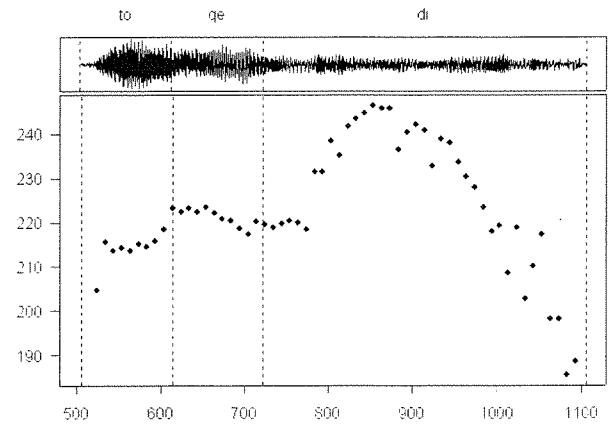

Figure 9: Waveform and F0 for *to'e di* 'sit down!', female speaker SB

At this point, it is not clear which factors determine the choice between these two options of rendering function words. Note that content words of the shape CV.V such as *khaa* 'eat', *kii* 'person' or *mee* 'red' also vary considerably in the length of the vowel, sometimes approaching the length of a short monosyllable. To date, however, no examples for an alternation similar to the one just described for function words has been observed for such content words when they occur in phrase-final position. Instead, when they occur phrase-finally, both phrase accent and boundary tone occur on them, as illustrated for *mee* in Figure 6 above.

As seen in the preceding examples, the basic pattern H-L% is used in simple declarative main clauses and in commands. In commands, the final fall is often cut somewhat short as seen in Figure 8.

3.2 Marked patterns at the right edge: H-H% and L-H%

In addition to the basic pattern discussed in the preceding section, two other patterns are well attested in the corpus. One of these is a minor variant of the basic pattern in that the H phrase accent is followed by a high boundary tone (H%) rather than a low one. This pattern occurs in wh-questions, if the wh-word occurs in final position as in example (7). (Note that here the intervocalic glottal is not realised, a widespread phenomenon in East Timorese languages.)

(7) *ka loo se'i?*
2s make what
'what are you doing?'

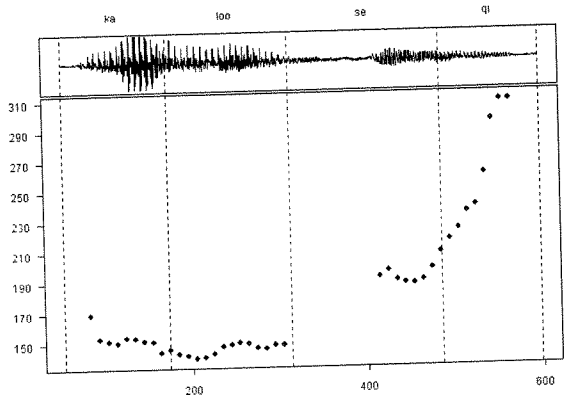

Figure 10: Waveform and F0 for example (7), male speaker MB

The most common use of H-H%, however, is as a 'continuer', signalling that the current utterance is part of a sequence which will be followed by more. Thus, it is the usual pattern found for preposed adverbial clauses (8), non-final members of lists (9) and the like.

(8) *antaun*[8] *ale'e* *anu-ata* *wuo-telu* *ke* *lheo* *la* *umo*
then child female CLF-three DEM arrive LOC house
'Then, when the three girls arrived at home, …'

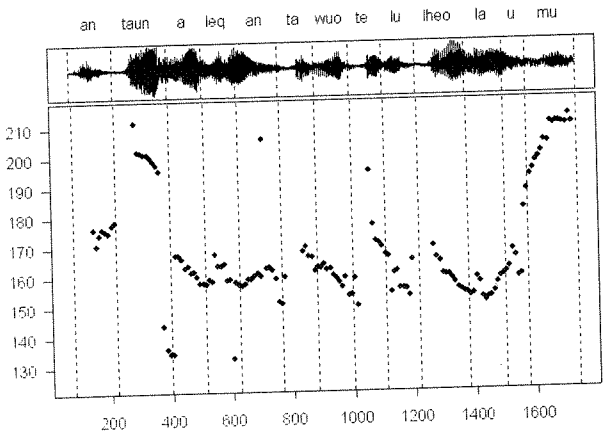

Figure 11: Waveform and F0 for example (8), male speaker JCB

(9) *do'e* *kareta::*
EXIST car
'he had a car, (a motorbike, an airplane, everything)'

[8] The initial temporal conjunction *antaun* here forms an IU by itself, as further discussed in section 5 below.

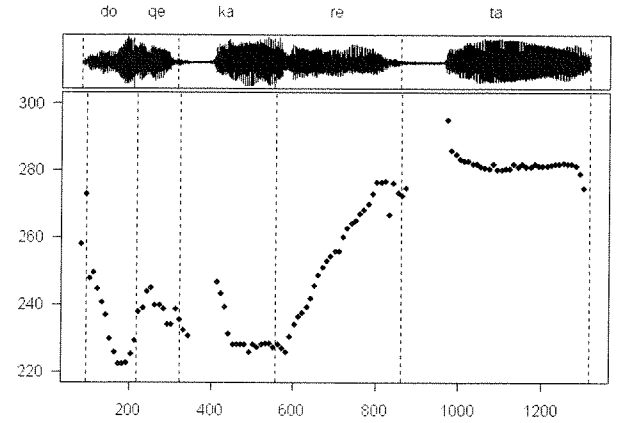

Figure 12: Waveform and F0 for example (9), female speaker OCB

While there is a general tendency for the final high boundary tone to level out flatly once the high target has been reached early in the final syllable, it should be noted that the very long flat stretch at the end of example (9) (on the final syllable of *kareta::*; the colons here indicating conversational lengthening) is due to hesitation and not part of the H-H% pattern (the speaker is searching for further items to list in order to illustrate the wealth of the king the story is about). Lengthening the unit-final syllable with a flat pitch is the major hesitation or pause-filling strategy in western Austronesian languages (cp. Streeck 1996).

In contrast to the two patterns discussed so far, the third pattern to be introduced now involves a low phrase accent. That is, the pitch stays flat up to the final syllable on which a rather steep rise occurs. This pattern is analyzed here as a L- phrase accent followed by a H% boundary tone. It is the usual pattern for polar questions as in (10), among other functions.

(10) *Kii* *dai* *mai* *lo?*
person foreign come ASP
'has the foreigner arrived yet?'

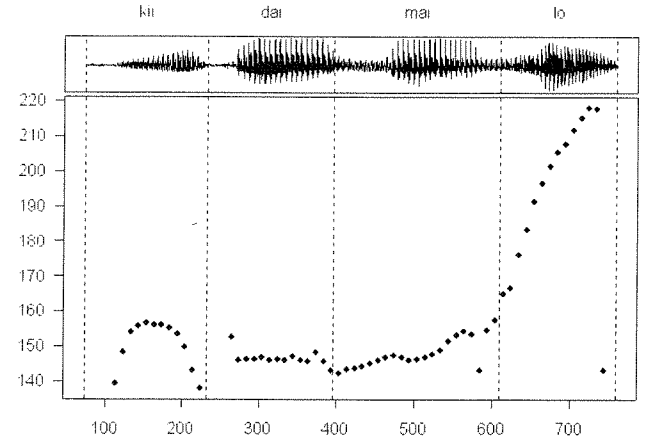

Figure 13: Waveform and F0 for example (10), male speaker JAJ

If the final two syllables consist of a vowel cluster ((C)V.V), pitch stays low in the first part of the cluster and only rises towards the end, as seen in (11). Compare Figure 14 with Figure 6 where there is a clear pitch movement also on the first part of a vowel cluster.

(11) *lonau aisa'i de mai?*
why yesterday NEG come
'why didn't you come yesterday?'

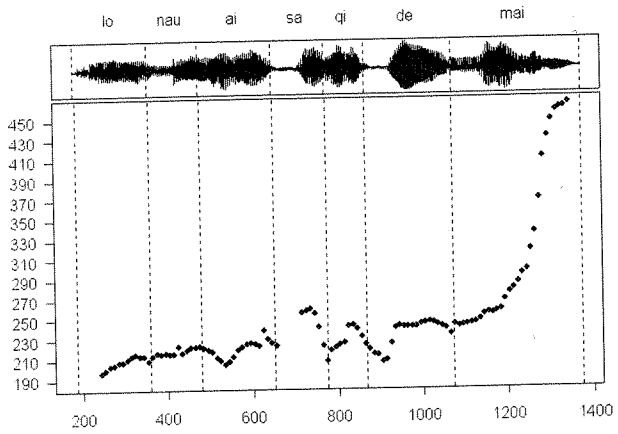

Figure 14: Waveform and F0 for example (11), female speaker JMB

As the preceding example shows, the L-H% pattern is not restricted to polar questions but may also occur with some types of information question, in particular those introduced with *lonau* 'why'. Information questions asking for the identity of participants with questions words for 'who' or 'what' usually involve another contour illustrated with (14) below.

The L-H% pattern also occurs in contexts which are widely known as 'deaccenting' contexts in the literature (e.g., Lambrecht 1994:248f, Ladd 1996:175-179), though this is not yet well understood. Thus, for example, apart from polar questions, the pattern is also attested in the corpus for utterances which contain answers to a preceding question and where, importantly, the answer largely consists of the same lexical material as the question, as in the exchange in (12).[9]

(12) *ga tabaku tasa lo?*
2s.POSS tobacco cooked ASP
'Is your tobacco ripe already?'

Da! aku de kore tabaku.
NEG 1s NEG plant tobacco
'No! I don't plant tobacco.'

[9] As seen very clearly in this example, the negation marker in Waima'a Caisido occurs in two variants *da* and *de*. *da* is used for emphatic negation and whenever the negation constitutes a speech act by itself (as when answering simply with *no!*). In other varieties of Waima'a the negative marker appears to be *da* in all environments.

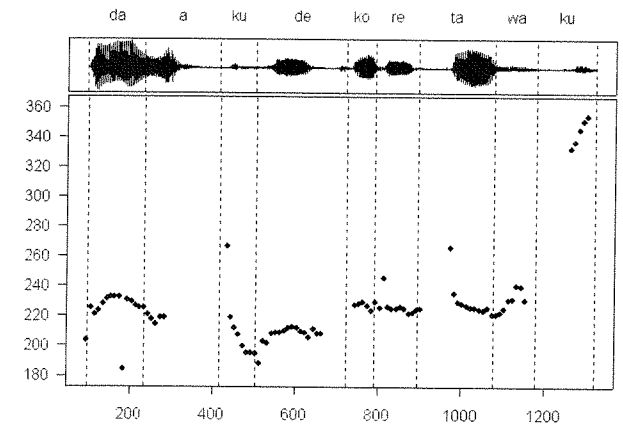

Figure 15: Waveform and F0 for answer part of example (12), female speaker ASB

Since in the preceding examples the pitch is mostly low and flat throughout the IU, it may not be immediately obvious why the pattern is analyzed as involving an initial low target (*L*-H%), rather than just as a simple high boundary tone (H%). This analysis is motivated by the fact that without this initial low target one would have to allow for the option that this pattern is realised by a continuous pitch rise throughout the IU (at least as one of a number of realizational alternatives) because the final H% would provide the only pitch target in the whole utterance. However, no pitch tracks with continuously rising pitch are attested in the database. Hence, the initial L in L-H% is required to ensure that the final rise only ever occurs on the very final syllable.

Further evidence for this analysis is provided by examples where a final L-H% follows an initial rise, as in Figure 17 below (= example (14)). In this example, pitch rises to a high target early in the IU, then falls continuously throughout, and sharply rises again only in the very last syllable. Without assuming an initial low target as part of the final pattern, this pitch track could not be explained, because then pitch would be predicted to stay high throughout the entire unit.

A more difficult point to argue is the question of whether this pattern indeed involves a phrase accent (L-) on the penultimate syllable. The alternative would be to claim that it simply involves a single final boundary tone LH% on the final syllable. Clear phonetic evidence to decide this issue is not available at this point.[10] The current analysis is based on the purely phonological consideration that it allows to preserve the generalization that all IU-final patterns in Waima'a involve the combination of a phrase accent and a boundary term. Further research may show this to be an overgeneralization.

[10] Unlike the H- phrase accents in the H-L% and H-H% patterns which clearly render the penultimate syllables prominent to the ears of a Germanic speaker, there is no such clearly perceptible prominence on the two final syllables of the L-H% pattern. This pattern rather sounds like a strong rise on a final unaccented syllable in a Germanic language. But this would appear to be exactly the kind of example where a non-native speaker analyst tends to become a victim of her or his native prosodic system. Consequently, one important piece of evidence in this regard would come from perceptual testing with native speakers.

3.3 Summary: tonal targets at the right edge

So far, the following three patterns for tonal targets at the right edge of a Waima'a IU have been described:

H-L%	declarative main clause with unmarked information structure
H-H%	wh-question with wh-word in final position; 'continuing', that is non-final unit in a sequence (as in lists and clause chains)
L-H%	polar question, exclamation, 'deaccenting' (response which repeats major lexical items from preceding utterance)

These three patterns account for a substantial number of the IUs in the corpus, but not for all of them. They all have a H target at the end of an IU, either on the penultimate or ultimate syllable or both. However, the corpus also contains a number of examples where no such H target is discernible, as in Figure 16.

(13) *aku* *soru* *kai*
1s plane wood
'I am planing wood' (answer to question 'what are you doing?')

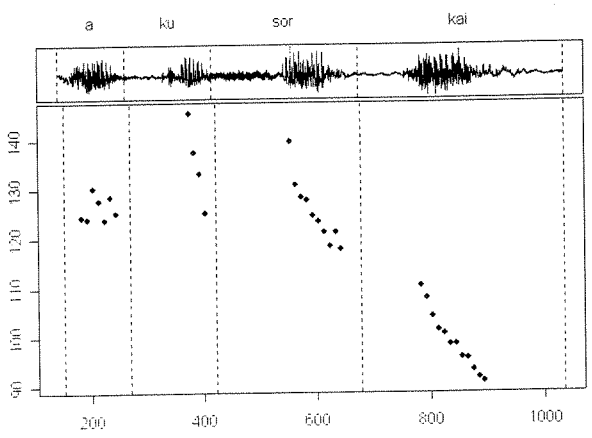

Figure 16: Waveform and F0 for example (13), male speaker DB

Here pitch appears to fall continuously throughout the IU after an initial H on the first word (this initial H is discussed in the next section). This fall could be analyzed as involving a low phrase accent (L-) followed by a low boundary tone (L%), thus resulting in a nicely symmetrical system, involving two phrase accents and two final boundary tones, which can be freely combined with each other. But apart from the fact that the rather few examples for a possible L-L% pattern found so far involve a large amount of segmentally caused perturbations, which considerably complicates the intonational analysis, it is also unclear what the functional distribution of this pattern would be.

4 Intermediate level phrases?

Most IUs in the database start somewhere in the middle range of the current register. This is analyzed here as the default option for which no special tonal target needs to be

identified. All the preceding examples, with the exception of examples (6) and (13),[11] illustrate this default option. The exceptions involve a rise on the initial word also seen in the following example:

(14) *sie* *ne* *lau* *aku?*
who FOC look.for 1s
'who is looking for me?'

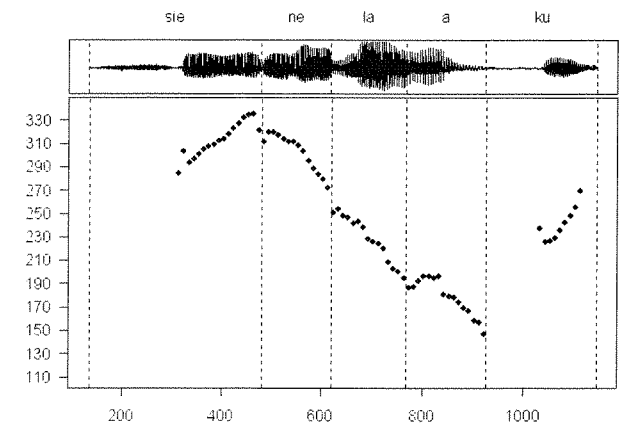

Figure 17: Waveform and F0 for example (14), female speaker S

In this example, the pitch rises on the first word and then continuously falls to the L(ow) target of the final L-H% pattern (as already discussed at the end of section 3.2). There are two possible analyses for this initial rise. One option is an initial boundary tone (%H). Alternatively, one could consider this to involve a lower-level prosodic constituent such as an accentual or intermediate-level phrase, marked by a final boundary tone of its own (H-). In his analyses of Manado Malay and Banyumas Javanese, Stoel (2005, 2006, 2007) makes considerable use of such smaller constituent units, and it appears likely that this is a more widespread phenomenon in western Austronesian languages.

Once again, however, the data set used for this preliminary report lacks the crucial data needed to decide this issue. All clear examples of major pitch excursions not occurring at the end of an IU involve the kind of initial rise seen in example (14) above, and the rise always occurs on the first word only, which always constitutes a complete syntactic constituent (for example, an NP). Hence it remains to be seen, whether the rise is strictly aligned to the initial boundary (and hence a phrase-initial boundary tone) or to the end of a phrase-initial constituent (and hence marking the end of an intermediate-level phrase).

Initial rises regularly occur when wh-words are phrase-initial (as in example (14)). Similarly, the negative imperative marker *deme'e* 'don't!' is prosodically made prominent in this way. An initial rise is also found when the first word contains new information (as in example (6)). However, it is not confined to instances where the unit-initial word arguably constitutes, or at least belongs to, the focus domain of the clause. Example (13) is an example where the initial word (*aku* 'I') is not focal, and there are quite a few examples of this type in the database (another one is in Figure 18 below). Thus, while the

[11] Note that the negation marker *da* occurring initially in some of the other examples is always realised in an IU of its own, usually with the H-L% pattern.

first-mentioned uses would support the intermediate-level phrase analysis, the overall functional distribution of the initial rising pattern also does not provide unequivocal evidence for either analysis. In the following discussion of prosodic chunking (in section 5), we will employ the intermediate-level phrase analysis primarily for reasons of ease of exposition. There is no evidence in the database for major non-final pitch excursions other than this initial rise.

5 Prosodic chunking

As in most other languages, Waima'a IUs are typically co-extensive with grammatically definable units such as clauses, noun phrases or prepositional phrases. The mapping between prosodic and grammatical units has not yet been investigated in detail, but it will be useful to note that speakers have to make choices as to how much segmental material they include in a single IU. Thus, the same speaker rendered the following example in two quite different ways:

(15) *tamba* *aisa'i* *aku* *bira*
because yesterday 1s sick
'because I was sick yesterday'

Figure 18 shows the rendering of example (15) in a single IU, with an initial intermediate level phrase ending on H- and a final H-L% (that is [[tamba H-] aisa'e aku bira H-L%]). In Figure 19, on the other hand, the example is chunked into three IUs, the first two of which end on a high boundary tone, the last one on L%:

(16) [tamba H-H%] [aisa'e H-H%] [aku bira H-L%]

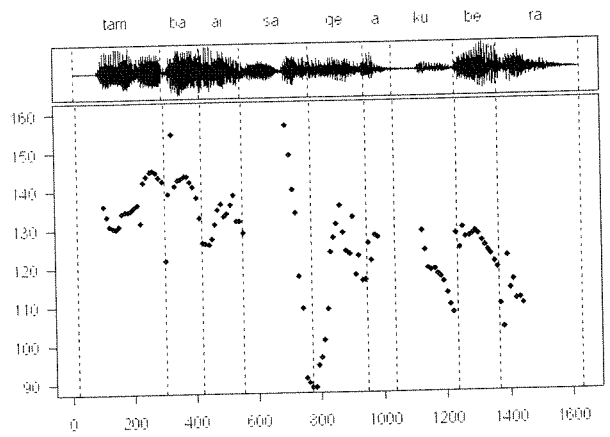

Figure 18: Waveform and F0 for example (15), single IU, male speaker ACS

In some instances, especially with regard to clause initial conjunctions, it is not always straightforward to decide whether the unit begins with an initial intermediate level phrase or whether the conjunction is presented in an IU of its own. Thus example (8) and Figure 11 above could be analyzed in two ways:

(17) a) [antaun H-H%] [ale'e anu-ata wuo-telu ke lheo la umo H-H%]
b) [[antaun H-] ale'e anu-ata wuo-telu ke lheo la umo H-H%]

In this example, the main reason for choosing analysis (a) (that is two IUs) pertains to the fact that there are quite clear indications for a new onset after *antaun*. Among other things, there is a considerable jump down in pitch after *antaun*, quite similar to the jumps seen after *tamba* and *aisa'i* in Figure 19. That is, the lack of onset phenomena, including the impossibility of a (short) pause at the boundary, distinguishes intermediate-level phrase boundaries from the kind of IU boundaries illustrated here with Figure 19.

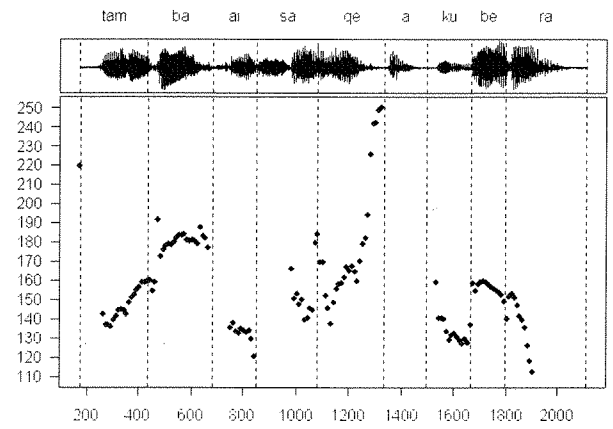

Figure 19: Waveform and F0 for example (15), 3 IUs, male speaker ACS

6 What about lexical accent?

Viewed from the perspective of Standard Average European, the most remarkable feature of the Waima'a intonational system as sketched in the preceding paragraphs is the apparent absence of accentual tones (or pitch accents), that is intonational pitch changes which are linked to a lexically accented syllable, usually represented by T* in the autosegmental-metrical analysis. This could mean that lexical accents are 'ignored' for intonational purposes, an option further discussed in the following section. Alternatively, Waima'a could lack lexical accent altogether and in this regard would be similar to languages such as French, Javanese or many varieties of Malay.[12] While it is not yet possible to provide a definitive solution to this issue here, there is some evidence which supports the latter alternative. Thus, when looking at words recorded in isolation, on first appearance it would seem that they all are regularly accented on the penultimate syllable, as seen in Figure 20 for the word *ria-kuko* 'nighttime'.

[12] See further below section 7. The status of a genuinely lexical accent in French continues to be a matter of debate (as opposed to the uncontroversial regular phrase accent). See Hayes (1995:24), Di Cristo (1998) and Gussenhoven (2004:Chapter 13) for pertinent comments and references.

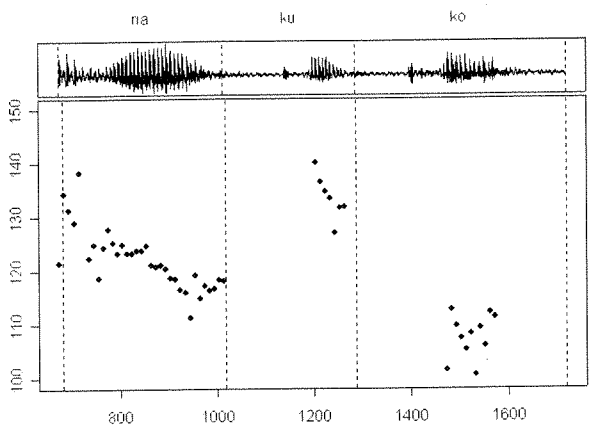

Figure 20: Waveform and F0 for *ria-kuko* 'nighttime', male speaker MB

Here the penultimate syllable *ku* is clearly made prominent acoustically as well as auditorily because of the major pitch rise which occurs on it. Note, however, that this syllable is auditorily not prominent in terms of duration.

What is more, this syllable can easily be omitted, as seen in the alternative rendering of *ria-kuko* shown in Figure 21. Cross-linguistically, various types of reduction, including complete omissability, are generally a characteristic of unaccented syllables, while accented syllables, if at all omissible, can be reduced or omitted only in very specific circumstances.[13] In Waima'a, in principle any syllable in a given item can be reduced or omitted, and while the factors governing the reduction processes are still unclear, it is clear that no syllable is exempt from these processes (that is reduction processes do not provide direct evidence for lexical accent).

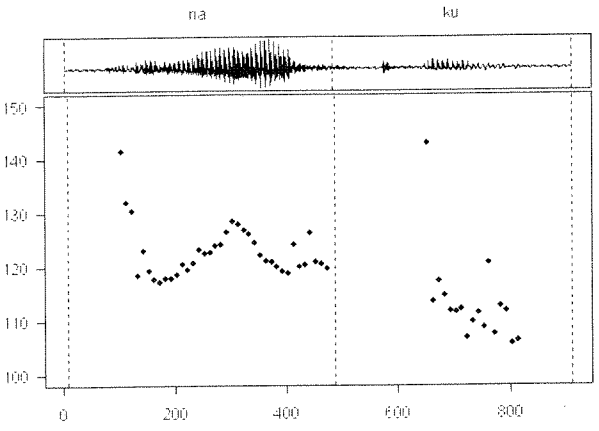

Figure 21: Waveform and F0 for *ria-kuko* 'nighttime', male speaker MB

[13] An instance of a rather narrowly delimited possibility for omitting a stressed syllable nucleus occurs in some forms of gemination found in Oceanic languages, as discussed by Blust (2001). Note that in Waima'a the complete syllable can be omitted, not just its nucleus. Furthermore, gemination is not of relevance here.

Taking these observations together, it becomes clear that the pitch rise which lends prominence to the penultimate syllable in Figure 20 is due to utterance-level intonation since words in isolation of course also have to be produced with some kind of utterance-level intonation. Hence, what Figure 20 and Figure 21 both actually show is the unmarked declarative pattern H-L% extensively exemplified in section 3.1 above.

That this is the correct interpretation is supported by a comparison of different renderings of the same word in isolation and within an IU in non-final position. Figure 22 shows the word *basara* 'market' spoken in isolation, with a clear high pitch target in the penultimate syllable *sa*. In Figure 23 the same word occurs as part of the utterance *laka to basara di* (go already market ALL) 'go to the market!'. Here, all syllables of *basara* are of almost equal pitch height, *sa* being in no way more prominent than either the preceding or the following syllable.[14] The unit-final rise-fall (H-L%) here occurs on the allative particle *di* (cp. also the discussion for Figure 8 and Figure 9 above).

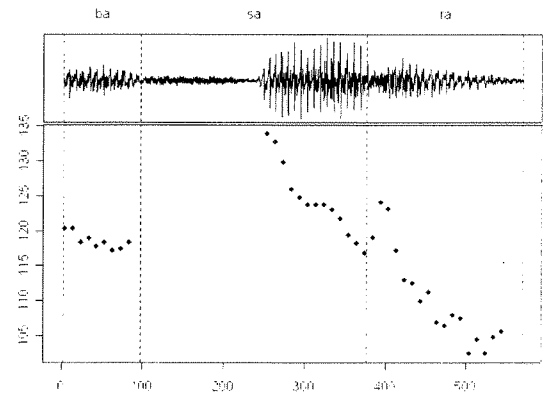

Figure 22: Waveform and F0 for *basara* 'market', male speaker MB

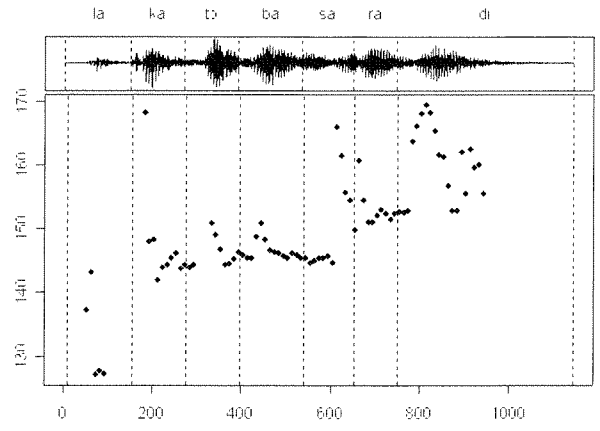

Figure 23: Waveform and F0 for *laka to basara di* 'go to the market!', male speaker MB

[14] The very minor pitch differences visible in Figure 23 are due to segmentally induced perturbations and are not perceivable auditorily.

An alternative explanation for the lack of prominence for *basara* observed in Figure 23 would be to claim that Waima'a words regularly loose their lexical accent when occurring in phrase-medial position. Such a claim, however, would only make sense if independent evidence for lexical accent in Waima'a could be found. To date, no prosodic phenomenon has come to light which would be strongly suggestive of lexical accent, but this is an issue which needs further research. Among other things, it will be necessary to have a closer look at how Waima'a accommodates the different accentual patterns occurring on Portuguese loanwords, which make up a substantial part of the Waima'a lexicon.

7 Conclusion

While still preliminary and incomplete, the analysis sketched in the preceding sections suggests that the Waima'a prosodic system is characterised by the following three core characteristics:

1. It has no lexical tone.
2. It has no lexical accent and hence also no intonational pitch accent.[15]
3. Intonation units are primarily characterised by a phrase accent on the penultimate syllable and a phrase-final boundary tone .

While the lack of lexical tone contrasts is not an unusual feature in crosslinguistic perspective, so far the claim that a language lacks both lexical tone and lexical accent has not been made very often. However, as already noted in the preceding section, it has been made a number of times for languages spoken in the western parts of Indonesia, including various varieties of Malay (van Zanten et al. 2003, Tadmor 2000, 2001, Stoel 2007) and Banyumas Javanese (Stoel 2006). Tadmor (2000, 2001) in fact speculates that the lack of lexical accent is a widespread feature of languages in western Indonesia (extending, roughly, from Sumatra to Bali and including Kalimantan), while eastern languages often have regular penultimate lexical accents. The case of Waima'a suggests that the western pattern may actually occur as far east as East Timor.

In her survey of prosodic systems, Jun (2005a:444) lists French, Bengali and Korean as languages lacking lexical accents as well as lexical tone, which shows that this phenomenon is not confined to Indonesia and East Timor. However, at this point at least, it is not clear that these three languages have much else in common with regard to their prosodic systems. Similarly, there are many obvious differences between these systems and the Waima'a system. The domain for phrase accents in French, for example, is much smaller than in Waima'a, often only containing a single word or even just a part of it. Consequently, phrase accents in French are of much higher frequency in spontaneous speech than the Waima'a ones. Korean, on the other hand, has a much more complex system of both initial and final boundary tones delimiting accentual phrases which also are units of considerably smaller size than the Waima'a IU. While it is much too early to tell, this raises the suspicion that lack of lexical accent and tone are possibly not very important typological parameters, but instead define a rather heterogeneous class of languages which happen to lack these features.

[15] The implication of course only holds if (intonational) pitch accent is defined as a change in pitch aligned with a lexically stressed syllable. Gussenhoven (2004:Chapter 13) analyses French as a language without lexical accent ('an intonation-only language', 2004:253), but with variable 'pitch accents'.

Instead, it may be more interesting and promising to compare the Waima'a system with other languages where apart from a limited number of boundary tones, at most one major pitch change occurs in units of a similar size as IUs in Waima'a. The Papuan language Kuot (Lindström 2002, Lindström and Remijsen 2005) and the West African language Wolof (Rialland and Robert 2001) have been described in this way. For both languages, it is claimed that at least some lexical items have lexical accents, the primary phonetic exponent of which is duration, but that this accent is 'ignored' by intonation, as Lindström and Remijsen put it in the title of their joint paper on Kuot. That is, unlike in Standard Average European, this lexical accent does not interact with intonation. Most importantly, it does not attract the pitch changes characterizing different intonational contours. Instead and as in Waima'a, Kuot and Wolof intonation patterns only involve pitch changes which are definable with regard to the boundaries of an IU, the major events generally occurring on the unit-final syllable or syllables. Consequently, at least at first glance and without any deeper probing, the structure of intonation units is quite similar across the three languages. Most importantly, the contours of the most frequent and unmarked type in each language are essentially flat, with major pitch changes being confined to the last one or two syllables.

Similarly, and returning to the Indonesian archipelago, it would seem obvious that Manado Malay (as analysed in Stoel 2005 and 2007) on the one hand, and Banyumas Javanese and Waima'a on the other have much more in common with each other than any of them with prototypical European lexical-accent languages such as English, German or Dutch, despite the fact that Manado Malay is said to have lexical accents. The common feature again pertains to the fact that accentual pitch excursions in Manado Malay may occur at most once per IU so that – oversimplifying a bit and ignoring marked intonational patterns – one could hypothesise that a single major pitch excursion per intonation unit constitutes one of the core features of the intonation systems of a larger number of languages in the area. It remains to be seen whether the further segmentation of intonation units into lower level accentual or intermediate-level phrases, as proposed by Stoel for Manado Malay as well as Banyumas Javanese, constitutes another characteristic areal feature (for Waima'a, see the preliminary remarks in section 4 above). If so, the typical size and frequency with which IUs are segmented into such smaller units would constitute the major parameter for variation across the area.

References

Beckman, Mary E., 1986. *Stress and non-stress accent*. Dordrecht: Foris.

Blust, Robert A., 2001. Some remarks on stress, syncope, and gemination in Mussau. *Oceanic Linguistics*, 40:143–150.

Di Cristo, Albert, 1998. Intonation in French. In Hirst and Di Cristo, eds, 195–218.

Gussenhoven, Carlos, 2004. *The phonology of tone*. Cambridge: Cambridge University Press.

Hajek, John and John Bowden, 2002. A phonological oddity in the Austronesian area: ejectives in Waimoa. *Oceanic Linguistics*, 41:222–224.

Hajek, John and Nikolaus P. Himmelmann, 2006. Notes on Waima'a phonology and orthography. Waima'a DoBeS archive, <http://www.mpi.nl/DOBES/>.

Hajek, John and Mary Stevens, 2005. On the acoustic characterization of ejective stops in Waimaa, *INTERSPEECH-2005*, 2889–2892.

Hayes, Bruce, 1995. *Metrical stress theory*. Chicago: The University of Chicago Press.

Himmelmann, Nikolaus P., 2006. Prosody in language documentation. In Jost Gippert, Nikolaus P. Himmelmann and Ulrike Mosel, eds, *Essentials of language documentation*, 163–181. Berlin: Mouton de Gruyter.

Himmelmann, Nikolaus P. and Robert D. Ladd, 2008. Prosodic description: an introduction for fieldworkers. *Language Documentation and Conservation*, 2:244–274.

Hirst, Daniel and Albert Di Cristo, eds, 1998. *Intonation Systems*. Cambridge: Cambridge University Press.

Jun, Sun-Ah, 2005a. Prosodic typology. In Sun-Ah Jun, ed., 430–458.

Jun, Sun-Ah, ed., 2005. *Prosodic Typology: The phonology of intonation and phrasing*. Oxford: Oxford University Press.

Ladd, D. Robert, 1996. *Intonational phonology*. Cambridge: Cambridge University Press.

Lambrecht, Knud, 1994. *Information structure and sentence form: topic, focus, and the mental representations of discourse referents*. Cambridge: Cambridge University Press.

Laver, John, 1994. *Principles of phonetics*. Cambridge: Cambridge University Press.

Lindström, Eva, 2002. Topics in the grammar of Kuot, a non-Austronesian language of New Ireland, Papua New Guinea. Stockholm: Stockholm University (available online at http://www.ling.su.se/STAFF/evali/thesis/Kuot-PhD.html). PhD dissertation.

Lindström, Eva and Bert Remijsen, 2005. Aspects of the prosody of Kuot, a language where intonation ignores stress. *Linguistics*, 43:839–870.

Rialland, Annie and Stéphane Robert, 2001. The intonational system of Wolof. *Linguistics*, 39:893–939.

Stevens, Mary and John Hajek, 2004. A preliminary investigation of some acoustic characteristics of ejectives in Waima'a: VOT and closure duration, *Proceedings of the Tenth Australian International Conference on Speech Science and Technology*, Sydney, 277–282. Available online at http://www.assta.org.

Stoel, Ruben B., 2005. *Focus in Manado Malay*. Leiden: CNWS Publications.

—2006. The intonation of Banyumas Javanese, *Proceedings Speech Prosody 2006*, 827–830. Dresden: TUD Press.

—2007. The intonation of Manado Malay. In Vincent J. van Heuven and Ellen van Zanten, eds, *Prosody in Indonesian Languages*, 117–150. Utrecht: LOT.

Streeck, Jürgen, 1996. A little Ilokano grammar as it appears in interaction. *Journal of Pragmatics*, 26:189–213.

Tadmor, Uri, 2000. Rekonstruksi Aksen Kata Bahasa Melayu (The Reconstruction of Word Accent in Malay). In Bambang Kaswanti Purwo and Yassir Nasanius, eds, *PELBBA 13 (Pertemuan Linguistik (Pusat Kajian) Bahasa dan Budaya Atma Jaya Ketiga Belas)*, 153–167. Jakarta: Unika Atma Jaya.

—2001. Phonological Convergence in the Malay Archipelago. Paper presented at the Annual Meeting of the Deutsche Gesellschaft für Sprachwissenschaft (DGfS) in Leipzig.

Yip, Moira, 2002. *Tone*. Cambridge: Cambridge University Press.

Zanten, Ellen van, Robert W.N. Goedemans and Jos J. Pacilly, 2003. The status of word stress in Indonesian. In Jeroen M. van de Weijer, Vincent J. van Heuven and Harry G. van der Hulst, eds, *The Phonological Spectrum II: Suprasegmental Structure*, 151–175. Amsterdam: Benjamins.