

A Preliminary Analysis of East Kewa Tone

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ABSTRACT

This paper provides a preliminary analysis of the tone system in East Kewa. The domain of tone in East Kewa is the morpheme, but like other New Guinea Highlands languages tone sandhi applies such that the tone of each morpheme affects the tone of the following morpheme. Like languages elsewhere in the world, East Kewa nouns display a larger paradigm of tone choices than do its verb roots. Verb words, however, are made up of a verb root and a desinence, each with their own tone, and the combination of the two tones brings complications of its own.

1 Introduction

These notes are the beginnings of a description of tone in East Kewa (Engan family, Trans New Guinea, located in the Southern Highlands Province of Papua New Guinea). This preliminary analysis would have been more difficult, had it not been helped on its way by the account of tone in West Kewa by Karl and Joice Franklin (Franklin 1971, Franklin and Franklin 1962, 1978), but there are apparently quite complex differences of detail between the tone systems of the two dialects and no attempt is made here to say anything about these differences.¹

Mark Donohue (1997) divides New Guinea tone systems into three broad types, each rather diverse and divided from each other only by fuzzy boundaries:

1. *syllable-level tone*: the system “assign[s] a separate tone to each syllable in a word”;
2. *word-level tone*: “the domain of each tone is the word as a whole”;

¹It is a pleasure to offer this paper in honour of Karl Franklin, whom I admire both as a scholar and as a brother.

3. *pitch accent*: “there is one simply designated syllable that determines the shape of the pitch pattern on the rest of the word.”

On this categorisation East Kewa is a word tone language, although, as noted in §5, this is something of an oversimplification. In this respect it seems to be fairly typical of Papua New Guinea Highlands languages of the Trans New Guinea family (Ross 2005).

In the analysis of East Kewa tone a distinction between lexical tone (i.e., word tone) and utterance tone is necessary. Lexical tone is the tone melody which a lexical item bears in the lexicon. Utterance tone consists of the tones which occur in the utterance as a result of tone-altering rules that apply to lexical items in context. A full description of utterance tone would also include the contribution of intonation.

The preliminary and partial analysis presented below is based on elicited data from a single informant, Apoi Yaraepa of Mugumapu village, who holds a Ph.D. in linguistics and also helped to establish the tonal contrasts and to categorise the data. The recorded items were analysed with the help of the software application Praat.

Two systems are used to represent tone in this paper. Phonemic lexical tones are usually written as H (high) and L (low). M is used for phonetic mid tone in certain cases where H and L are neutralised. High tone is also written with an acute accent, low tone with no accent. In general, H, L and M are used to represent tone patterns in the abstract, and the acute accent is used orthographically. No attempt is made to represent lexical and utterance tone differently, as it is generally clear from context which is intended.

2 Non-tonal phonological basics

2.1 The phonological word

A phonological word consists of a simple or compound lexical word plus any enclitics (1).

- (1) a. né=me (FREE:1SG=ERG) ‘I’
 b. sú ‘ground’ + yaa ‘sky’ < súyaa ‘earth and sky’

2.2 Interaction of prosody and vowel length

The minimal word is a monosyllable of two moras. In a curious asymmetry, there are five underlyingly monomoraic vowels /i e a o u/ and one invariably bimoraic vowel /aa/. However, when a phonological word is monosyllabic, its vowel spans two moras, and the distinction in length between /i e a o u/ and /aa/ is neutralised.

Bimoraic /aa/ is always low central, and is lower than /a/ when the latter is lengthened in a monosyllable.

A long vowel is written as a sequence of two like vowels. This allows a ‘contour’ tone, i.e., HL or LH, to be written using only the acute accent. Bimoraic /aa/ and lengthened /a/ are not distinguished orthographically, as more work is needed to check the distinction between them in individual items.

3 Tones and their manifestation

3.1 Tone and the phonological word

It is helpful to distinguish between a *tone melody*, whose domain is the phonological word, and a *tone*, whose domain is the syllable. Thus *kódo* ‘scar’ has an HL melody consisting of two tones, H on the first syllable, L on the second. In a monosyllable, both tones occur in sequence on the single phonetically lengthened vowel: *yáα* ‘bird’. In a trisyllable, on the other hand, the HL melody is spread across the three syllables. In *léмого* ‘pupil of eye’ the first syllable has H tone, the last L, whilst the middle syllable is usually M.

The Franklins suggest that West Kewa has four tone melodies, H, L, HL, and LH. The HL and LH melodies are imposed on the single syllable of a monosyllable and across the syllables of a polysyllabic phonological word. This analysis works well for East Kewa if it is restricted to root forms, but not when it is applied to verb + desinence combinations, each of which is a phonological word, since some such combinations in verb class 2 have an LHL melody.

3.2 Tone cues

The hearer identifies H and L tones from pitch movement cues. Utterance-initial tone is generally neutralised to mid tone, but in East Kewa, neutralisation of H is sometimes only at the beginning of a syllable, so that there is a distinction between *ipú* ‘3SG free pronoun’ and *ípú* ‘3DL free pronoun’.² The first syllable of *ipú* begins at mid-level but rises to H, whereas the first syllable of *ípú* does not rise.³

The initial mid-level sets a benchmark pitch. Thus when one of the adverbs *(k)abala* ‘yesterday’ or *(k)ábálá* ‘before, first’,⁴ occurs at the beginning of an utterance, the former is roughly MML, the latter MMH.

I write “roughly” in the previous paragraph for two reasons. First, a phonological word is stressed on its first syllable, with secondary stress on alternate following syllables.⁵ The tone on intervening unstressed syllables

²In West Kewa, utterance-initial syllables are mid tone (Franklin and Franklin 1978:18, 28), and there is no distinction between the pronouns, where both are *nipú* (Franklin 1971:34).

³Where items differing only in tone melody are elicited in contrasting pairs, there also seem to be instances in table 2 where initial H tone is not neutralised. However, there is one instance where elicited *ki* hand (toneless) seems to have initial H, and it may be that utterance-initial H (as opposed to MH over the first syllable) also represents neutralization.

⁴Forms with and without initial *k*- occur. The difference appears to be dialectal.

⁵There are exceptions to this generalisation, at least among verbs, but I do not have enough relevant data to sort them out.

appears to be indeterminate. Second, a variety of local phonetic factors influence syllable pitch, among them syllable-initial consonants.⁶

Once a benchmark pitch is set, the cue for pitch recognition is relative pitch. Table 1 shows approximate pitch relativities. Because these are relativities, a long straight line simply says that both syllables have the same pitch: it says nothing about absolute level.

Table 1: Pitch cues for tones

	within a word	Across a word boundary	utterance finally
HH	___ or _—	___ or _— or —_	___
HL	—	—	—
LL	___	___	—
LH	_—	_—	n/a

Certain comments and generalizations can be made about table 1:

1. A sequence of like tones has roughly the same pitch, with three exceptions:
 - a. in an HH sequence,
 - i. word-internally the second H may be higher than the first; this seems to be an instance of upstep, i.e., an additional way of signaling H;
 - ii. across a word boundary one H may be higher than the other: the higher H seems to mark focus (cf. 6);
 - b. in an utterance-final LL sequence the second L is lower than the first and functions as a boundary tone.
2. There are two degrees of fall, which are in contrast only utterance-finally, distinguishing HL from LL; but the distinction is normally redundant since the height of the first tone of the sequence has been established and the second is L regardless of the degree of fall.
3. There is no ambiguity in the system provided that the height of the first tone of the sequence has been established (e.g., within a word HH and LH may both be marked by a rise, but its function in both cases is to mark the second tone as H).
4. Utterance-final LH does not occur in my data set.

Example (2) contains a sequence of H tones across word boundaries, and *máá* ‘taro’ is higher than both the preceding and the following high-tone syllables. As indicated in the generalization (1a–ii), this is apparently because the speaker treats it as the focus item of the utterance. If this is so, then it is an instance of an intonation feature superimposed on lexical tone.

⁶For example, the Franklins comment regarding West Kewa that in an HH or LL sequence across either /p/ [ɸ] or /r/ [r] the first tone displays a slight rise–fall (Franklin and Franklin 1978:18).

- (2) kábólá mǎá áda-wa
 First taro see-3S.NRPAST
 ‘First I saw the taro.’

Citation-form utterances (both declarative and polar-interrogative) display falling pitch movement, i.e., the benchmark around which H and L vary falls, especially after the focus. This appears to represent declination, marking the final part of an intonation unit. If the utterance is broken into two parts as in (3), where there is a pause between subject + ERG and the predicate, then *póná-ámé* begins at a somewhat higher pitch than it would otherwise, representing a the start of a new intonation unit.

- (3) ímú = mí póná-ámé
 FREE:3P = ERG cut-3P.NRPAST
 ‘They cut (it).’

Pitch rises and falls between tones are generally manifested phonetically within the second of a sequence of two unlike tones. Thus on an LH sequence, the pitch rise occurs in the course of the syllable on which H occurs (or on an intervening unstressed syllable). Towards the end of an utterance, however, a HL sequence may show an anticipatory drop during the syllable on which H falls. Systemically this is perhaps attributable to intonation rather than to tone.⁷ Table 1 shows a curious asymmetry in the interaction between tone and intonation. Most of my examples have apparently declarative intonation. One would expect a final L boundary tone. This occurs in utterance-final HL and LL sequences (LL sequences displaying a fall which does not occur elsewhere), but it does *not* occur in utterance-final HH sequences. On the other hand, focus may be marked by an additional rise in HH sequences, as shown in (2), but apparently not in any sequence which includes a low tone.⁸

4 Lexical tone-melody classes

The tone-melody classes of nouns, personal pronouns and verbs are considered in the three subsections below.

⁷The Franklins make the following generalisations involving mid tone, but these follow from the description here, which does not require M tone other than utterance-initially since tones are cued by relative pitch differences:

1. a phonemic H between two L is mid, i.e., LHL < [LML].
2. a phonemic L between two H is mid, i.e., HLH < [HMH].
3. a syllable between an H and L is mid, i.e., HXL < [HML].

⁸A huge amount of work remains to be done on Kewa intonation. For example, citation forms of yes–no questions show the same tones as their declarative counterparts, but with an increased pitch range.

4.1 Tone-melody classes of nouns

Table 2 displays the nouns for which I have adequate tonal data. They are arranged vertically in five tone-melody classes numbered 0, 1, 2, 3 and 4. The table has eight columns, the fourth to the eighth showing the tone melodies manifested by each item in five different contexts. Some items show unexplained discrepancies; these may reflect incorrect analysis or glitches in elicitation.

The fourth and fifth columns of table 2 show respectively the melodies of lone citation forms and of instances occurring initially in longer utterances. The two melodies match except in the case of class 1, where the citation melody is M, the utterance-initial melody MH. This is unsurprising, since both contexts are utterance-initial, but the lone citation forms make up the whole utterance and are thus also utterance-final. Class 1 nouns have a floating H tone (see below) which docks on the final syllable if the word occurs at the end of an intonation unit.

I stated above that tone on utterance-initial syllables is neutralised to M. However, certain nouns in table 2 display HL in the fourth and/or fifth column where ML is expected. It is tempting to dismiss this as noise and to label all examples as ML, but this would not be true to the data, and it is too early in the process of analysis to be sure that the contrast is not significant. The fact that ML and HL both occur in classes 0 and 4 suggests that there is no contrast, but the consistent difference between *ki* HL ‘hand’ and *ki* ML ‘key’ in elicited sentence pairs suggests that there is. However, elicitation of *ki* ‘hand’ and *ki* ‘key’ outside of paired sentences does not obviously display this contrast, and it may result from the fact that ‘hand’ was elicited first in each pair, and the lower onset of ‘key’ reflects declination.

I have recorded citation forms, including probable minimal tonal pairs, for many more nouns than are shown in table 2, but the neutralisation of citation forms renders these partially unusable. Classes 0, 3 and 4 all have ML (or HL) as citation forms. Only classes 1 and 2 are recognisable from the citation form alone (as M and MH respectively).

Table 2: Tone-melody classes of nouns

Class	noun	gloss	citation melody	utterance-initial melody	utterance-medial melody /H ₋	utterance-medial melody /L ₋	verb-initial melody
0	aa	'man'	ML	ML	H	L	assim
	ki	'hand'	ML	HL	H	L	assim
	maa	'taro'	ML	ML	H	L	assim
	pada	'room'	ML	ML	H	L	assim
1	aa	'leg'	M	MH	HL	L	H?
	adasa	'game meat'	M	MH	HL	L	H
	ada	'house'	ML	MH	HL	L	H
	kapaa	'egg'	M	MH ^a	H(L) ^b	L	H
	mapua	'dream'	M	MH ^a	HL	L	H
	karia	'bamboo cane'	M	MH	HL	L	H
	maa	'neck'	M	MH	HL	L	H
	taga	'ashes'	M	M(H)	H(L) ^b	L	H
	rogoma	'clay'	?	MH	H(L) ^b	L(H)	H
	rapalo	'arrow'	?	MH	HL	LH	H
	papa	'kin term'	M	MH	HL	L(H)	H? ^c
	tapa	'platform'	M	MH	HL	LH	assim
	yasa	'mushroom'	ML	ML	HL	LH	assim
2	e	'garden'	MH	MH	LH	LH	assim (= H)
	kaai	'banana'	MH	MH	LH	LH	assim (= H)
	kau	'lizard'	MH	MH	LH	LH	assim (= H)
	puti	'mushroom type'	MH	MH	LH	LH	assim (= H)
	popo	'steam'	MH	MH	LH	LH	assim (= H)
	yasa	'song'	MH	MH	LH	LH	assim (= H)
3	kabu	'digging stick'	ML	ML	LH	HL	assim
4	yaa	'bird'	ML	ML	HL	HL	assim (= L)
	ki	'key'	HL	ML	HL	HL	assim (= L)
	kau	'owl'	HL	HL	HL	HL	assim (= L)
	kodo	'scar'	ML	ML	HL	HL	assim (= L)
	lemogo	'pupil of eye'	MLL		HL	HL	assim (= L)

^aUtterance-initial there is a ML fall on second syllable, but the following verb is H. The fall seems to represent an intonation unit boundary (declination), as there is a pause before the verb.

^bL is imperceptible, perhaps because it merges with following H.

^cVerb-initial H is sufficiently high to contrast with the syllables that follow it, but it is lower than final

If a word is utterance-medial, its tone melody in classes 0, 1 and 3 varies according to the final tone of the previous word. The sixth and seventh columns of table 2 show the tone melodies that occur when the word is preceded by, respectively, a high and a low tone. Where the second tone of HL or LH is parenthesised, this indicates that it is difficult to tell whether the tone is present or not.

In the elicitation frames (examples below) a noun is always followed by a verb. The eighth column shows the word-initial tone of a verb following each class of noun.⁹ Following a class 1 noun, the verb-initial tone is always high. In the other classes it assimilates to the final tone of the noun.

Table 3 summarises the tone classes displayed by the nouns listed in table 2 and discussed below. Each class, except class 0, is equated with the underlying

⁹I don't know whether the word-initial tone of a word other than a verb is affected in the same way.

tone melody indicated in the first and second columns. Class 0 is underlyingly toneless. The raised H of class 1 denotes a floating high tone.

Table 3: Summary of tone-melody classes of nouns (see table 2)

Class		citation melody	utterance- initial melody	utterance- medial melody /H_	utterance- medial melody /L_	verb- initial melody
0	toneless	ML	ML, HL	H	L	assim
1 = L ^H	low	M	MH	HL	L(H)	H
2 = LH	rising	MH	MH	LH	LH	assim (= H)
3 = H	high	ML	ML	LH	HL	assim
4 = HL	falling	ML, HL	ML, HL	HL	HL	assim (= L)

Examples of the five classes are:

- Class 0: *pada* (no tone) ‘room’
- Class 1: *yasa* (L^H) ‘mushroom’
- Class 2: *yasa* (LH) ‘song’
- Class 3: *kabu* (H) ‘digging stick’
- Class 4: *kodo* (HL) ‘scar’

The behaviour of the toneless class 0 *pada* ‘room’ is illustrated in (4). Both syllables of *pada* assume the final tone of the preceding word (and the first syllable of the following verb, *adawa* ‘I saw’, also assimilates to the final tone of *pada*).

(4) Class 0: *pada*

a. *ábálá pádá áda = wa*
 first room see-1S.NRPAST
 ‘I saw the room first.’

b. *abala pada ada = wa*
 yesterday room see-1S.NRPAST
 ‘I saw the room yesterday.’

In class 1 (= low), the underlying L melody remains after a preceding L tone, but becomes HL after a preceding H, i.e., the first tone agrees with the final tone of the preceding word, illustrated by *ada* ‘house’ in (5). However, as indicated in the first column, the underlying melody of this class is not simply L, but apparently L^H, i.e., there is a floating H tone. This H manifests itself in the utterance-initial melody MH and in the first tone of the following verb. It also occurs sporadically on the final syllable of the noun itself.¹⁰

¹⁰It is not yet clear whether this sporadic appearance is conditioned in some way.

(5) Class 1: *ada*

a. *ábálá* **úda** *úda = wa*
 first house see-1S.NRPAST
 'I saw the house first.'

b. *abala* **ada** *úda = wa*
 yesterday house see-1S.NRPAST
 'I saw the house yesterday.'

Examples (6) and (7), respectively, show how in classes 2 (LH) and 4 (HL) the underlying contour tone remains unaffected by the preceding tone. The LH tone is apparently resistant to perturbation in East Kewa in all contexts. The first syllable of the following verb again assimilates to the final tone of the noun, as in classes 0 and 3.

(6) Class 2: *kaai*

a. *ábálá* **kaaí** *úda = wa*
 first banana see-1S.NRPAST
 'I saw the banana first.'

b. *abala* **kaaí** *úda = wa*
 yesterday banana see-1S.NRPAST
 'I saw the banana yesterday.'

(7) Class 4: *kodo*

a. *ábálá* **kódo** *ada = wa*
 first scar see-1S.NRPAST
 'I saw the scar first.'

b. *abala* **kódo** *ada = wa*
 yesterday scar see-1S.NRPAST
 'I saw the scar yesterday.'

Class 3 (apparently high) has at present only one member, *kabu* 'digging stick' (8), and is therefore suspect. It is also suspect in terms of its tonal behaviour, as its word-initial tone is the *opposite* of the preceding trigger, LH after a preceding H tone, HL after a preceding L. This would, if correct, confound any claim that synchronic tone perturbation is simple assimilation. However, the following verb has the tone predicted by the tone of *ábálá/abala*, as in class 0.

(8) Class 3: *kabu*

a. *ábálá* **kabú** *áda = wa*
 first digging.stick see-1S.NRPAST
 'I saw the mushroom first.'

- b. abala **kábu** ada = wa
 yesterday digging.stick see-1S.NRPAST
 ‘I saw the digging stick yesterday.’

I have observed above that, just as the tone of a noun may be affected by the last tone of the previous word, so the first tone of the following verb usually matches (is usually assimilated to) the last tone of the preceding word. This is indicated by ‘assim’ in tables 2 and 3. The one class where assimilation does not occur is class 1. Here, the following verb always has initial H, attributed to the floating H tone of nouns in this class (9).

(9) Class 1: rapalo

- a. ábálá **rápalo** áda = wa
 first arrow see-1S.NRPAST
 ‘I saw the arrow first.’

- b. abala **rapalo** áda = wa
 yesterday arrow see-1S.NRPAST
 ‘I saw the arrow yesterday.’

There are two unexplained cases listed under class 1 in table 2, *tapa* ‘platform’ and *yasa* ‘mushroom’. They have class 1 behaviour but cause assimilation of the following tone (i.e., they seem to reflect an underlying L melody but with no floating H). They do not appear to be elicitation errors, and may prove to reflect yet another class of noun.

4.2 Personal pronouns

As I noted in the discussion of the tonal behaviour of nouns, the tone of (at least) the first syllable of a verb is determined by the preceding word. In many of the utterances I have elicited (and not infrequently in text), the preceding word is a personal pronoun. These are listed in table 4.

Table 4: Personal pronouns

person	SINGULAR	DUAL	PLURAL
1	né	sáá	náá
2	ne	ípi	ími
3	ipú	ípú	ímú

There are two tonal minimal pairs among the pronouns: *né* 1s vs. *ne* 2s, and *ipú* 3S vs. *ípú* 3D.

A personal pronoun subject is followed by the ‘ergative’ enclitic =*me* if the verb is transitive. The enclitic becomes =*mi* if the final vowel of the pronoun is /i/ or /u/, i.e., after *ipú*, *ípi*, *ípú*, *ími* or *ímú*. The enclitic is

lexically toneless and acquires the tone of the last syllable of the pronoun. Because the first, and sometimes also the second, syllable of an utterance-initial pronoun is neutralised to mid tone, it is sometimes only the tone of the ergative clitic which disambiguates the members of a tonal minimal pair. That is, *né=me* (1S=ERG) is manifested as *nemé*, and *ne=me* (2S=ERG) as *neme*.

There is a further complication with regard to *ípi* (2D) and *ími* (2P) to which I return in §4.3.

4.3 Tone-melody classes of verbs

Unlike nouns, verb words in East Kewa usually consist of a root and a desinence. This raises a question. Does a verb word have a single tone melody? Or do verb root and desinence have separate melodies which combine to form a compound melody across the verb word? The compound-melody alternative provides a simpler analysis, and I assume it in the description below, returning to a discussion of the two alternatives in §4.4, where melody classes of verbs are compared with those of nouns.

The analysis in this section is based on elicited paradigms with the near past and present progressive desinences shown in table 5. Two sets of desinences are shown for each tense. The second set in each case is used with verbs with a mono- or disyllabic root ending in /aa/. Note that trisyllabic roots in /aa/ like *pogolaa* ‘jump’ take the default desinences. Syllables marked with a grave accent are always L and never perturbed to H.

Table 5: Verbal desinences

person and number	NEAR PAST		PRESENT PROGRESSIVE	
	default	after -aa	default	after -aa
1S	-wa	-ripu	-lo	-to
2S	-e	-ripi	-le	-te
3S	-a	-ripa	-la	-ta
1D	-apa	-pa	-lepà	-tepà
2/3D	-ape	-pe	-lepè	-tepè
1P	-ama	-rima	-lemà	-temà
2/3P	-ame	-rimi	-lemè	-temè

Verb roots are set out in tone melody classes in table 6 in a format similar to that used for nouns in table 2. The three classes correspond in their tonal behaviour to noun melody classes 0, 1 and 2, except for the fact that verb root class 1 is simply L: it shows no sign of a floating H tone. Classes 0b, 1b and 2b are verb roots ending in /-aa/ which take the special desinence sets shown in table 5. The first six columns of table 6 correspond

with columns in table 2, with the important difference that the hyphen in the middle of the tone melodies in the fifth and sixth columns marks the boundary between root and desinence. Parentheses in the tone melodies of the desinences take account of the fact, seen in table 5, that some desinences have one syllable, others two. The melodies of disyllabic desinences include the parenthesised tones; the melodies of monosyllabic desinences exclude them.

Table 6: Tone-melody classes of verb roots and desinences

Class	verb	gloss	citation melody	utterance-medial melody/H ₁	utterance-medial melody /L ₁	FREE:2D/P
0a	pona	‘cut’	HL	HH-HH	LL-L(L)	L
	na	‘eat’	M	H-H(L)	L-L(L)	L
	epa	‘come’	HL	HH-H	LL-L	?
	la	‘speak’	HL	H-H	L-L	?
	tya	‘hit’	HL	H-H	L-L	?
0b	waraa	‘touch’	ML	HH-HL	LL-LL	L
1a	ada	‘see’	M	HL-L(L)	LL-L(L)	L
	ruma	‘climb up’	M	HL-L(L)	LL-L(L)	L
	kala	‘give’	M	HL-L	LL-L	?
	pea	‘do’	M	HL-L	LL-L	?
	ria	‘carry’	M	HL-L	LL-L	?
	koda	‘enter’	HL	HL-L	LL-L	?
1b	aa	‘stand’	M	HL-LL	L-LL	?
	pogolaa	‘jump’	M	HLL-LL	LLL-LL	H
	rumaa	‘share out’	ML	HL-L(L)	LL-L(L)	H
2a	ru ^h ba	‘throw out’	ML	LH-(H)L	LH-(H)L	L
	re ^h ra	‘cry’	LH	LL-H	LH-H	?
2b	ro ^h gaa	‘tie’	M	LH-LL	LH-HL	?

The column headed ‘FREE:2D/P’ in table 6 makes reference to a feature for which I have no explanation. In table 4 above, the second person dual and plural free pronouns are shown as *ipi* and *imi* respectively. Because their second tone is L, this provides the contextual tone for the following word, which in (10a) is the class 1a verb *ruma* ‘climb’. Preceding certain verbs of class 1b, however, the tone melody of these pronouns shifts from HL to H, and they become *ipí* and *ímí*, inducing the tone pattern expected after a contextual H. This is illustrated in (10b), where the class 1b verb is *rúmaa* ‘share out’.

- (10) a. *ipi* = mi *ruma* = ape
 FREE:2D = ERG climb-2D.NRPAST
 ‘You two climbed (it).’

- b. ípí = mí rúmaa = pe
 FREE:2D = ERG shared-2D.NRPAST
 ‘You two shared (it).’

Table 7 is a summary of the tone classes displayed by the verbs listed in table 6.¹¹ There are several features in table 7 of which I am not yet able to give a coherent account. This is partly because I have not yet collected enough paradigms, partly because some have gaps because crucial disyllabic desinences have not been collected. The gaps are indicated by ‘?’ in table 6. This is important in the cases of class 0, which is apparently divided into two subclasses by the tonal behaviour of its desinences, and of class 2, where no pattern can yet be recognised in the tonal behaviour of desinences.

Table 7: Summary of tone-melody classes of verb roots and desinences (cf. table 6)

Class		citation melody	utterance-medial melody /H_	utterance-medial melody /L_	FREE: 2D/P
0a	toneless	HL	(H)H-HH, (H)H-H(L)	(L)L-L(L)	L, ?
0b			HH-HL	LL-LL	L
1a = L	low	M	HL-L(L)	LL-L(L)	L, ?
1b			HL-L(L)	LL-L(L)	H, ?
2a = LH	rising	LH	LH-(H)L	LH-(H)L	L, ?
2b			LH-LL	LH-HL	?

Table 7 also shows the default behaviour of desinences. Their first or only syllable is assimilated to the tone of the final root syllable, and their second syllable, if any, is low. This default behaviour resembles that of a class 1 (low) noun. However, there are two kinds of deviation from default behaviour.

Firstly, as noted in table 6, among the paradigms collected thus far just one class 0 verb, *pona* ‘cut’, assimilates both syllables of its desinences, except those with fixed L, to H if the root-final syllable is H. Contrast (11a), with an -HH desinence, with (11b), where the final desinence is one the tone of which always remains low (table 5).

- (11) a. ímú = mí póná-ámé
 FREE:3P = ERG cut-3P.NRPAST
 ‘They cut (it).’

¹¹Class 0 is the Franklins’ underlying H, Class 1 is their underlying L, Class 2 their underlying LH.

- b. ímú = mí póná-léme
 FREE:3P = ERG cut-3P.PRES
 ‘They are cutting (it).’

Note, however, that in other class 0 verbs for which relevant data have been collected a disyllabic desinence ends in a L tone as expected (see 13a).¹²

The second deviation from default (low) behaviour is that certain class 2 verbs do not assimilate the first or only syllable of a singular desinence to H when we might expect them to. Usually, the first syllable of a desinence has the same tone as the final syllable of the root, as in (12a), where *ná* ‘eat’ is a class 0 verb, but the class 2 verbs *ruba* ‘throw out’ and *rogaá* ‘tie’ take a desinence with L tone despite root-final H, as in (12b). The patterning here is not yet clear.

- (12) a. né = mé ná = wá
 FREE:IS = ERG eat-1S.NRPAST
 ‘I ate (it).’

- b. né = mé rubá = wa
 FREE:IS = ERG throw.out-1S.NRPAST
 ‘I threw (it) out.’

4.4 Comparing the tone-melody classes of nouns and verbs

I have assumed in §4.3 that verb root and desinence have separate melodies which combine to form a compound melody across the verb word, avoiding the alternative possibility that a verb word has a single tone melody. The description shows that with certain exceptions desinences have their own melody corresponding roughly to that of class 1 (L) nouns. However, the non-singular present progressive desinences in table 5 display a final L which defies perturbation. This pattern has no parallel in the tonal behaviours of nouns, but it appears to represent a desinence-specific tone melody.

If the available tone melodies of East Kewa are treated as a system, then there are also systemic grounds for analysing verb roots as having separate tone melodies. The tone-melody classes of nouns in table 3 and of verb roots in table 7 are numbered in the same way in order to facilitate comparison, and table 8 displays the two sets side by side. There are no verb classes 3 and 4, i.e., no classes corresponding to the high and falling classes of nouns. The missing classes correspond to the two noun classes which have a HL melody when the final syllable of the previous word is L. As a consequence all verbs have initial L when the preceding word ends in L.¹³

¹²The Franklins (1978: 35–37) treat the latter as a separate verb class (underlying HL), but its tonal assimilation is not parallel to that of nouns in HL.

¹³This apparent fact may be somehow related to the tonal behaviour of FREE:2D/P pronouns when they co-occur with (some?) Class 1b verbs (§4.3), but how they may be related is not clear.

Table 8: Comparison of tone-melody classes of nouns and verb roots

Class	underlying tone?	Utterance-medial melodies:			
		Noun classes		Verb classes	
		/H_	/L_	/H_	/L_
0	toneless	H	L	(H)H-HH, (H)H-H(L)	(L)L-L(L)
1	L	HL	L	HL-L(L)	LL-L(L)
2	LH	LH	LH	LH-(H)L	LH-(H)L
3	H	H	HL	—	—
4	HL	HL	HL	—	—

Although the parallel between noun and verb root classes is thus incomplete, it is more convincing that the parallel between noun melodies and whole verb words. This is because verb words of class 2 have an LHL tone melody, and three-tone melodies have not been found among nouns.¹⁴ Further, verb words with an HL melody display different mappings of tone to syllable. In class 0 we find HHL and HHH, as in *wáráá-rípa* in (13a), but in class 1 HLL and HLLL, as in *rúma-leme* in (13b).

- (13) a. *ipú = mí wáráá-rípa*
 FREE:3S = ERG touch-3S.NRPAST
 ‘S/he touched (it).’
- b. *ímú = mí rúma-leme*
 FREE:3P = ERG climb-3P.PRES
 ‘They are climbing (it).’

If these are both manifestations of a single HL melody, then a diacritic feature must be introduced into the analysis to account for the different mappings of the melody onto sequences of four syllables. If roots and desinences are understood each to have their own melody, this complication does not arise.

5 Conclusions

Perhaps the most obvious conclusion to be drawn about East Kewa tone is that there is much more to be learned. Phonologists will probably find my account unnecessarily conservative. This is partly a reflection of the paucity of my data and of a desire not to extrapolate to analytic decisions that might not apply to a larger data set, and partly a reflection of the fact that I am not a phonologist.

¹⁴There are also HLH examples in the Franklins’ materials.

Certain things seem clear, however. The domain of tone in East Kewa is not the word, but the morpheme. This is also true of other Trans New Guinea languages of the Highlands of Papua New Guinea, although there are substantial differences of detail between the tone system of, say, Fore and the tone system of East Kewa (Ross 2005). East Kewa (and other Highlands languages too) displays a quantitative difference between the paradigm of tones available to nouns and the paradigm available to verb roots. The paradigm of verb-root tones is smaller than the paradigm of noun tones, and this seems to reflect a tendency across those of the world's languages in which the tonal domain is the morpheme and in which the verb displays greater affixation than the noun (Larry Hyman, pers. comm., 6 November 2004). This tendency is also manifested in Niger-Congo languages and in Tokyo Japanese,¹⁵ and reflects the larger tendency for verbs to have larger paradigms than nouns (Rhodes 1987).

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¹⁵Tokyo Japanese is usually classified as a pitch-accent language (rather than a tone language), but, as Hyman (2006) argues, pitch accent languages do not form a coherent category. Tokyo Japanese can readily be analysed as a tone language in which the tonal domain is the morpheme, albeit with a tonal organisation quite different from that of Kewa.