

Analysis of Tone Patterns in Nambya Language of Hwange District in Matabeleland North Province, Zimbabwe

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Abstract

This article examines the tonal patterns of Nambya, a Bantu language spoken in Hwange District, western Zimbabwe, which was marginalised until its inclusion in the 2013 Zimbabwean Constitution. Tone plays a crucial role in Nambya as a primary marker distinguishing words that are otherwise segmentally identical. Like many Bantu languages, Nambya displays complex tonal structures that influence both lexical and grammatical meaning. The study explores how tonal variation is shaped by linguistic factors such as noun and verbal stems, prefixes, and phonological processes, including the Obligatory Contour Principle (OCP) and High Tone Spread (HTS). Data were gathered from ten native Nambya speakers with formal education, selected through expert and homogeneous purposive sampling. A qualitative, descriptive approach was employed, relying on field data and native speaker elicitation. The analysis was conducted within the Autosegmental Phonology framework, which explains that tone rules state that tonal and segmental elements are linked by association lines but remain distinct. Isolated words and phrases were analysed across varied linguistic environments. Findings show that Nambya has two primary tones: High (H) and Low (L), which combine to form the following patterns: HH, HL, LL and LH. Tone influences both vowel pitch and consonant articulation, with vowels and nasals serving as key tone-bearing units. Deverbal nouns and depressor consonants favour low tones, while noun classes exhibit characteristic tonal preferences. Overall, the study enhances understanding of Nambya phonology, contributing to its documentation, linguistic scholarship and long-term preservation.

Key terms: Autosegment, grammatical, lexical, tone patterns.

INTRODUCTION

This paper set out to examine the tonal system of Nambya and to establish the role of tone in differentiating lexical and grammatical meanings. Tone is essential for effective communication, as it enables both speakers and listeners to accurately interpret meaning. Tone distinguishes words that are segmentally identical, and its lexical and grammatical functions are central to conveying meaning in words and sentences (Chongowe & Hokororo, 2022). Lexical tone refers to words that are distinguished by tone (Chongowe & Hokororo, 2022). Nambya, a Bantu language spoken mainly in Zimbabwe and Botswana, possesses a complex phonological system in which tone is a crucial element. Despite this, there is still limited linguistic research on the systematic study of tonal patterns and the factors shaping them (Kadenge, 2010). This lack of research poses challenges for linguists, educators and language preservationists in developing precise orthographic and phonetic representations of the language. The operational term autosegment refers to the independent phonological units, such as a tone, nasality or vowel feature that operates on its own independent tier of representation, separate from the linear sequence of consonants and vowels. Grammatical tone explains how a piece of speech or sentence can possess a different meaning due to the application of tone.

The study's detailed tonal analysis contributes to a deeper understanding of Nambya phonology by systematically describing how tone functions to create meaning distinctions within the language. This contributes directly to the study's broader goals of documenting and revitalising Nambya, a previously marginalised language. By clarifying tonal patterns, the research provides a foundation for accurate language teaching materials, supports the development of orthographies that reflect tonal distinctions, and offers data for comparative analysis with other Bantu languages. These outcomes will enhance linguistic scholarship and promote language preservation and transmission within the Nambya-speaking community. The importance of tone is evident in examples such as /nda/, which, with a high pitch, means 'go', but with a low pitch means 'lice' (Lojenga, 2018). Ignoring tone in elicitation or

pronunciation risks distorting meaning and may result in communication breakdowns.

LITERATURE REVIEW

A range of theoretical frameworks can be applied in the analysis of tone in Bantu languages. This paper adopts Autosegmental Phonology, a branch of phonological theory. Within this framework, tones are represented on a separate level or "tier" from segments, with the two connected by association lines. Autosegmental Phonology accounts for two key properties of tone mobility and stability by treating tones as independent units (autosegments) that can be linked to segments but are not inherently part of them (Katamba, 1993). Thus, tones occupy their own tonal tier, which runs parallel to the segmental tier of consonants and vowels. In her study of tone in African languages and its significance for developing orthographies and teaching reading, Lojenga (2018) emphasises that tone is an essential element in almost all languages spoken south of the Sahara. In these languages, words are made up of consonants, vowels and tone, each playing a vital role in differentiating both word meanings and grammatical forms (Sylvester et al., 2022).

Tone patterns in these languages can be classified into high (H), low (L) and can combine to form contour tones that can be rising (LH), falling (HL) and complex patterns like rising-falling (LHL) or falling-rising (HLH). The Bantu language Venda retains all four patterns:

Example: Venda (Marlo & Odden, 2019).

(1) Word	Tone pattern	Gloss
mu-tuka	LL	'youth'
mu-rathu'	LH	'brother'
mu-se'lwa	HL	'bride'
mu-sa'dzi'	HH	'woman'

This relationship directly supports the study's focus on Nambya tone patterns by illustrating the structural principles that govern the interaction between tonal and segmental tiers. The relationship between these tiers is regulated by association lines that conform to the Well-formedness Conditions (Chongowe & Hokororo, 2022). These conditions were originally formulated to ensure a systematic and non-arbitrary mapping between tones and vowels, stipulating that all vowels must be linked to at least one tone, all tones

must be associated with at least one vowel, and no association lines may intersect. By applying these principles to Nambya, the study establishes a formal basis for analysing how tonal features are organised and realised within the language's phonological system. This contributes to a clearer understanding of Nambya's tonal structure, highlighting patterns of tone assignment and stability that are crucial for both linguistic description and language preservation efforts. This paper revealed that in Nambya, the phrase /bakalya/ can be rendered as follows:

[ba'-ka'-lya']

H H H



ba ka lya

'they ate'

H



ba ka lya

In Lingala (Zaire), most nouns display these four tone patterns on disyllabic noun roots, each preceded by a class prefix carrying a low tone.

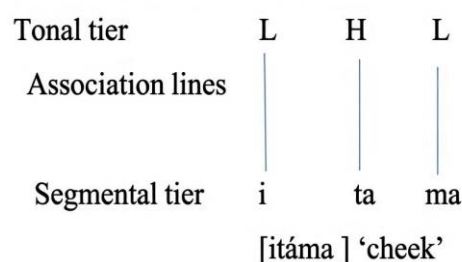
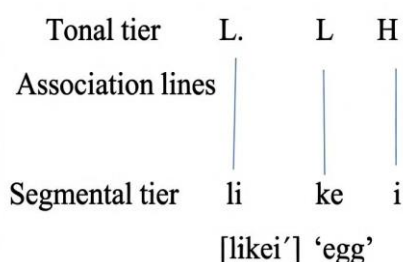


Figure 1: Rendering of the Phrase /bakalya/

Obligatory Contour Principle

Wilhelmsen (2018) and other scholars have investigated the role of the OCP in Bantu languages, observing that it frequently prevents the extension of high tones (H).

Yip (2002) demonstrated that 'ba'nga' 'knife', a disyllabic Shona word, has an underlying doubly linked H tone. In the sentence, -i'-ba'nga' 'it is a knife', Yip, following Myers (1997), explained that there is deletion of doubly linked H. The H tone deletion in the sentence was due to the H specified on the copula prefix, i, 'is', and the OCP was effective to avoid its violation.

Lojenga (2018), in the following examples from Pokomo (Kenya), demonstrates that the tone pattern is linked to the noun from left to right, beginning on the prefix. The last tone of the pattern is simply spread on the leftover syllable. Examples are from Class 3.

- | | | |
|-----------------|------|----------------|
| (2) (i) múkindú | HHH | 'type of palm' |
| (ii) mutsúzí | LHH | 'soup' |
| (iii) múkono | HL L | 'arm, hand' |
| (iv) mubano | LL L | 'smoked fish' |

Lojenga (2018) points out that although tone is seldom the sole distinguishing feature in nouns, it is significantly more important in verbs, where minimal pairs based on tone are frequently found. This is particularly noticeable in languages like Mashi (Zaire), where infinitive verb forms often vary only in tone:

- | | |
|--------|------------------------|
| kúheka | 'to not be ripe' |
| kuheka | 'to arrive at the end' |

METHODOLOGY

A homogeneous purposive sampling approach was employed, targeting native Nambya speakers who possess in-depth linguistic competence and active use of the language within their communities. This method ensured the inclusion of participants most suitable for providing reliable tonal data and authentic linguistic insights (Neuman, 2014; Nikolopoulou, 2022). Within the interpretivist paradigm and epistemological stance (Sol & Heng, 2022), ten native speakers of Nambya were selected. Data was sourced from the Nambya corpus and through elicitation, a technique in which participants provided oral or written language samples (Faitaki & Murphy, 2020).

Using Fieldworks (FLEX), a database of 100 nouns and 100 verbs was compiled, allowing for both wordlist generation and searchable corpora. The lexical items were organised into grammatical categories of nouns and verbs. Nouns were further classified by noun class, syllable profile (mono-, di-, tri-, quadri-, or polysyllabic), and morpheme type (root or stem). Verbs were

categorised in a similar manner, with stems identified as simple, compound, or complex (Snider, 2018) and their syllable structures described (e.g., CV, CV.CV, CVN). Finally, the researcher tabulated the distribution of nouns across classes according to stem shape.

(3) For example:

Table 1: Distribution of Nouns Across Classes According to Stem Shape

Word	Syllable profile	IPA	Gloss
/bala/	CV.CV	[βala]	'read'
/tya/	CCV	[tja]	'be afraid'
/kangila/	CV.NV.CV	[kangila]	'fry for'

Participants produced the target words both in isolation and within phrases or sentences. The recorded data were then analysed in AZT, which automatically displayed the Fo contour for each token. These visual representations were used to identify and annotate tonal levels, distinguishing between high, low, and contour tones. This enabled a systematic comparison of pitch variations or shifts across different lexical and phrasal contexts. Additionally, FLEX was used to organise the words into predetermined morphological and syntactic frames, ensuring consistency in the tonal analysis.

FINDINGS AND DISCUSSION

Tone Contrasts Patterns

Nambya, like many other Bantu languages, employs an underlying two-tone system consisting of High and Low tones. In several cases, tone is the sole element distinguishing the meaning of words. According to Gunnink (2018), the relative pitch at which a vowel is produced carries phonological significance. This is evident in tonal minimal pairs—words that are segmentally identical but differ in meaning due to tonal variation, as illustrated below:

Table 2: Tonal Minimal Pairs Illustrating Lexical Distinctions in Nambya

	Word	IPA	Gloss	IPA	Gloss
1	CV.CV	- kudʒa (LH)	'to dawn'	-kudʒa (HL)	'praise'
2	CV.CV	-tʃeka (HH)	'cut'	-tʃeka (LL)	'diarrhoea'
3	CV.CV	-βuja (HH)	'Come back'	-βuja (LL)	'good, right'
4	CV.CV	βala (HH)	'complexion'	-βala (LH)	'read'
5	CV.CV	-tʃaba (HH)	'gather firewood'	-tʃaba (LL)	'country;
6	CV.CV	-fuka (HH)	'cover with blankets'	-fuka (LL)	'of chicken brooding on eggs'
7	CV.CV	-kuβa (HH)	'become rare'	-kuβa- (LL)	'to be'
8	CV.CV	-seka (HH)	'laugh'	-seka (LL)	'ring'

The H and L tones combine to form four combinations HH, LL, LH and HL, as demonstrated by the following examples:

Table 3: Disyllabic Nouns with LL Tone Pattern

	Word	IPA	Noun class	Syllable pattern	Tone pattern	Gloss
1	u-nduki	-u ^u duki	CL1	NV.CV	LL	'sewer'
2	u-ndimi	-u ^u dimi.	CL1	NV.CV	LL	'farmer'
3	u-ndindi	-u ^u di ^u di	CL1	NV.CV	LL	'sentry'
4	u-ndanda	-u ^u da ^u da	CL1	NV.CV	LL	'slave'
5	u-ndondi	- u ^u do ^u di	CL1	NV.CV	LL	'undondi'
6	u-ndaji	-u ^u dadʒi	CL1	NV.CV	LL	'counsellor'
8	u-ndingi	- u ^u di ^u gi	CL1	NV.CV	LL	'viewer'
9	u-ndoteli	-u ^u doteli	CL1	NV.CV	LL	'fortune teller'
10	u-ndoti	-u ^u doti	CL1	NV.CV	LL	'dreamer'
11	u-ndongo	-u ^u do ^u go	CL1	NV.CV	LL	'servant'
12	u-ndowi	-u ^u dowi.	CL1	NV.CV	LL	'wizard'
13	i-guyo	-gu ^u yo	Cl5	CV.CV	LL	'grinding stone'
13	i-gombo	-i-go ^u mbo	Cl5	CV.NV	LL	'big stick'

Deverbal nouns have an effect on the tone of a noun stem. From the above words, it can be concluded that deverbal nouns that are disyllabic beginning with prenasals or depressor consonants have an effect on the vowel of the first syllable by lowering the tone. Consequently, the disyllabic word ends with L- tone. All the 11 words in the database that had deverbal nouns that are prenasalised at the stem are L-tone.

Table 4: Disyllabic Nouns with LH Tone Pattern

	Word	IPA	Noun class	Syllable pattern	Tone pattern	Gloss
1	i-gosha	i-goʃa ^u	Cl5	CV.CV	LH	'disabled person'
2	i-dete	'idete'	Cl5	CV.CV	LH	'reed'
3	i-dizwa	i-dizwa ^u	Cl5	CV.CV	LH	'hole'
4	i-zhuba	'-zuβa ^u	Cl5	CV.CV	LH	'day'
5	i-gole'	-gole ^u	Cl5	CV.CV	LH	'year, cloud'

Table 5: Disyllabic Nouns with HL Tone Pattern

	Word	IPA	Noun class	Syllable pattern	Tone pattern	Gloss
1	i-du ^u li	-du ^u li	Cl5/6	CV.CV	HL	'piece of meat'
2	i-bha ^u to	- iba ^u to	Cl5/6	CV.CV	HL	'buttock'
3	i-bha ^u nti	- iba ^u nti	Cl5/6	CV.NV	HL	'belt'
4	i-bha ^u sa	-iba ^u sa	Cl5/6	CV.CV	HL	'type of dance'
5	i-bha ^u pu	-iba ^u pu	Cl5/6	CV.CV	HL	'lung'

The presence of a depressor consonant on the initial syllable triggers lowering of the stem tone. From the above words, we can conclude that disyllabic nouns beginning with a depressor consonant influence the vowel of the first syllable by lowering the tone.

Table 6: Disyllabic Nouns with HH Tone Pattern

	Word	IPA	Noun class	Syllable pattern	Tone pattern	Gloss
1	fupa	-fu'pa'	Cl5	CV.CV	HH	'bone'
2	Chito	-tʃi'to'	Cl7	CV.CV	HH	'habour'
3	igo'mbo'	-i-go'mbo'	Cl5	CV.NV	HH	'navel'
4	i-mbi'la'	-i-mbi'la'	Cl9	NV.CV	HH	'rock rabbit'
5	i-ngu'mba'	-i-ngu'mba'	Cl9	NV.NV	HH	'house'(LHH)
6	i-sha'sha'	-i-sha'sha'	Cl9	CV.CV	HH	'door made of sticks'

The above nouns have a HH pattern. In these words, the presence of depressor consonants or non-depressors does not influence the tonal pattern.

Table 7: Disyllabic Nouns with HL Tone Pattern

	Syllable pattern	Tone pattern	Noun class	Word	IPA	Gloss
1	CV.CV	HH	Cl7	chipo'lo'	-tʃipo'lo'	'rail line'
2	CV.NV	HH	Cl7	chipu'nu'	-tʃipu'nu'	'non Nambya tribe'
3	CV.NV	HL	Cl7	chipu'nu	-tʃipu'nu-	'spoon'
4	CV.NV	HL	Cl7	chikwa'ma	-tʃikwa'ma	'bag'
5	CV.CV	HL	Cl7	chikwa'ta	-tʃikwa'ta	'group'
6	CV.CV	HL	Cl7	chikwa'ti	-tʃikwa'ti	'match box'
7	CV.CV	HL	Cl7	chile'lwa	-tʃile'lwa	'domestic animal'
8	CV.CV	LH	Cl9	i-huyu	i-huju'	'fig fruit'
9	CV.CV	LH	Cl9	i-bhizha	i-biʒa'	'pumpkin leaves'
10	CV.CV	LH	Cl9	i-vula	i-vula'	'water'
11	CV.CV	LH	Cl9	i-hali	i-hali'	'clay pot'
12	CV.CV	LH	Cl9	i-huku	i-huku'	'chicken'
13	CV.CV	LH	Cl9	i-zhizha	i-ʒiʒa'	'rainy season'

The noun class 7 prefix is denoted by chi- sg and zwi-. The noun prefix is underlyingly low-L, and the first syllable of the stem is H tone. The tone distribution in disyllabic nouns is realised by LHL, where the prefix is L, the stem initial is High (H), and the final syllable is Low (L). This phenomenon is predominantly exhibited in Cl 7 (chi- for singular, zwi- for plural). In this analysis, we can observe that the H tone is realised on the penultimate syllable of the stem, suggesting a systematic tonal assignment rule.

Tonal Patterns in Nouns

When the tonal patterns of nouns in Nambya are analysed, it can be realised that they follow a particular, defined pattern. There are four major tonal classes in disyllabic nouns. The 100 nouns in the dataset fall into four main tonal categories, namely

Low-Low (LL); Low-High (LH); High-High (HH), and High-Low (HL).

Each tonal pattern is associated with particular noun classes and underlying phonological structures. The data indicate that deverbal nouns containing prenasalised consonants, as well as those with depressor consonants, influence tonal realisation. Among the dataset, 11 deverbal nouns with prenasalised consonants and 7 nouns with depressor consonants exhibit a Low (L) tone on the first syllable, with 11 of them following an LL tonal pattern. In general, most deverbal nouns with prenasalised consonants and those with depressor consonants tend to have a final L tone. In contrast, nouns in Classes 9 that begin with prenasalisation typically end with a High (H) tone and lack a plural marker, consistently

exhibiting an HH tonal contour. Similarly, nouns in NC 5 (I/MA) conform to an LH tonal pattern, as illustrated in Table 5.

This suggests that prenasalised deverbal nouns and depressor consonants influence tonal realisation, likely due to historical or phonetic factors. In the analysis of the distribution of tone by Noun Class, it can be noted that certain noun classes show strong preferences for specific tonal patterns. Class 1 (deverbal nouns) with prenasalised and depressor consonants initial syllables (Human nouns) follow mostly the LL pattern. The NC5 (Objects, tools, body parts) exhibits all four tonal patterns, while NC 9 (Animals, inanimates) exhibits mostly LH or HH patterns.

This indicates that noun class morphology interacts with tone, possibly due to historical processes. There is an interesting phenomenon in the tone and morphological structure of nouns, where nouns with CV.CV structures appear in all tonal categories and NV.CV nouns, particularly those with deverbal nouns (prenasalised initial syllables), tend to follow LL or LH tone patterns. This suggests a phonological constraint where deverbal nouns /nasal-consonant sequences favour low tones.

Tonal Patterns in Verbs

The analysis of monosyllabic and disyllabic verbs in Nambya focuses on their tonal patterns and how these

interact with consonantal properties, particularly depressor and non-depressor consonants. According to Crystal (2008), an autosegment in autosegmental phonology is an independent unit represented on its own upper tier. When it is linked to the lower (segmental) tier, this process is called association. This framework is especially relevant to tone, which is treated as a separate segment distinct from consonants and vowels on the skeletal tier.

Nambya verbs /fu'ka'/'cover' and /babu'la/'scrap out' could be rendered autosegmentally as:

- (4) a. Tonal Tier H H
 Association lines | |
 Segmental tier f-u k-a [fu'ka']
- b. Tonal Tier L H L
 Association lines | | |
 Segmental tier bh-a bh-u l-a [babu'la]

In the above examples, tones (HH) and (LHL) are indicated at the tonal tier, the association lines link the tonal tier and the segmental tier, and at the segmental tier, 'fu'ka'' and 'bhabhu'la' are shown. Thus, the above two words can be marked as [fu'ka'] and [babu'la]. The transcription explains what is represented at the tonal tier.

Table 8: Monosyllabic Verbs

	Syllable pattern	Tone pattern	Word	IPA	Gloss	V1
1	CV	H	da'	da'	love	a
2	CV	H	fa'	fa'	die	a
3	CV	H	pa'	pa'	give	a
4	CV	H	ba'	βa'	be	a
5	CV	H	lya'	lja'	eat	a
6	CV	H	tya	tja'	fear	a
7	CV	H	ta'	ta'	do	a
8	CV	H	va'	va'	leave	a
9	CV	H	zha'	ʒa'	come	a
10	NV	H	ma'	ma'	stop	a
11	NV	H	nwa'	n ^w a'	drink	a
12	NV	H	nda'	ⁿ da'	go	a

It can be observed that all monosyllabic verbs gathered exhibit an underlying High (H) tone. The possible explanation of this phenomenon could be that monosyllabic verbs likely carry an inherent High tone. And since they lack additional syllables for tone spreading, the H tone remains fixed. The presence of High tone in all monosyllabic verbs suggests a fundamental tonal feature of this verb type.

Table 9: Disyllabic Verbs with LL Tone Syllable Patterns

	Syllable pattern	Tone pattern	Word	IPA	Gloss
1	CV.CV	LL	kuya	kuɪ-a	'grind'
2	CV.CV	LL	laba	laβ-a	'read'
3	CV.CV	LL	fuka	fuk-a	'brooding of chickens'
4	CV.CV	LL	buya	βuɪa	'good, right'
5	CV.CV	LL	cheka	tʃek-a	'have diarrhoea'
6	CV.CV	LL	fema	fem-a	'breathe'

In the above data set, it can be observed that these verbs have a Low tone on both syllables (LL), and the initial consonant is not a depressor consonant /it is a raiser/unvoiced consonant. The possible explanation for this phenomenon could be that the lack of a depressor consonant allows a stable Low tone pattern, and the LL pattern suggests no tonal interaction between syllables.

Table 10: Disyllabic Verbs with LH Tone Pattern

	Syllable pattern	Tone pattern	Word	IPA	Gloss	V1	V2
1	CV.CV	LH	bhaya'	baja'	'pierce'	a	a
2	CV.CV	LH	bhisa'	bisa'	'remove'	i	a
3	CV.CV	LH	bhuza'	buza'	'ask'	u	a
4	CV.CV	LH	bhika'	bika'	'cook'	i	a
5	CV.CV	LH	bhula'	bula'	'remove'	u	a
6	CV.CV	LH	daba'	daβa'	'respond'	a	a
7	CV.CV	LH	dila'	dila'	'pour'	i	a
8	CV.CV	LH	dibha'	diba'	'dip'	i	a
9	CV.CV	LH	dula'	dula'	'expensive'	u	a
10	CV.CV	LH	duma'	duma'	'to sound'	u	a
11	CV.CV	LH	gala'	gala'	'sit, stay'	a	a
12	CV.CV	LH	gusa'	gusa'	'cut hair'	u	a
13	CV.CV	LH	guta'	guta'	'be satisfied'	u	a
14	CV.CV	LH	viya'	vija'	'skin'	i	a
15	CV.NV	LH	minya'	miɲa'	'swallow'	i	a
16	CV.NV	LH	vuma'	vuma'	'agree'	u	a
17	CV.NV	LH	vwimpa'	vʷɪmpa'	'sip'	i	a

These verbs begin with a depressor consonant. The depressor consonants identified are /b.g.d.v.j/. Analysis of the C.V. disyllabic verbs reveals that the LH pattern is found in disyllabic verbs whose initial consonant is a depressor consonant. The depressor consonant forces the initial syllable to be Low (L). The final syllable compensates by acquiring a High (H) tone. This LH alternation is fully predictable based on the presence of depressor consonants. If the word begins with a depressor consonant, the surface melody will be realised as LH. Only depressor consonants produce an LH melody, leaving the raiser/unvoiced/nondepressor consonants to produce a high tone melody (HH).

Table 11: Disyllabic Verbs with HH Tone Pattern

	Syllable pattern	Tone pattern	Word	IPA	Gloss	V1	V2
1	CV.CV	HH	fuka	fu'k-a'	'cover'	u	a
2	CV.CV	HH	cheka	tʃe'k-a'	'cut'	e	a
3	CV.CV	HH	buya	βu'i-a'	'come back'	u	a
4	CV.CV	HH	bala	βa'l-a'	'spot'	a	a
5	CV.CV	HH	chaba	tʃa'β-a'	'collect firewood'	a	a
6	CV.NV	HH	banda	ba'nd-a'	'hide, take refuge'	a	a
7	CV.NV	HH	benga	be'ng-a'	'hate'	e	a
8	CV.NV	HH	minya	mi'n-a	'be stingy'	i	a

The above verbs have both syllables carrying a High (H) tone. The initial consonant is not a depressor consonant. The possible explanation could be that since the first consonant is not a depressor, the

default High tone pattern is maintained. There is no low-tone-lowering effect that occurs. The HH tone pattern is expected when no depressor consonants are present.

Table 12: Disyllabic Verbs with HL Tone Pattern

	Syllable pattern	Tone pattern	Word	IPA	Gloss	V1	V2
1	CV.CV	HL	/tola/	to'la	'take'	u	a
2	CV.CN	HL	/kunga/	ku'ng-a	'flow'	e	a
3	CV.CN	HL	/linga/	li'nga	'look at'	u	a

It can be observed that disyllabic verbs with HL pattern indicate tone lowering on the final syllable due to possibly a historical tone reduction rule or finality effects, where a word-final syllable naturally lowers in pitch. Disyllabic verbs are realised with the following surface melodies: HL, HH, LH, and LL. Once the consonants are known, the melodies are completely predictable. Depressor consonants have L on the initial syllable of the verb stem, giving a LH melody. The pattern is predictable as:

LH-first consonant only is a depressor consonant.

LL-first consonant is not a depressor.

HL-first consonant is a non-depressor followed by a non-depressor or a nasal.

HH-first consonant is a non-depressor followed by either a non-depressor consonant or a nasal.

Analysis Principles

For C.V words that begin with voiceless obstruents, one finds only three contrastive pitch patterns: level, rising, and falling. Similarly, for CV words that begin with voiced obstruents or sonorants, one finds these same three patterns but realised on the lower yang-register.

Table 13: Trisyllabic Verbs with LLL Tone Pattern

	Syllable pattern	Tone pattern	Word	IPA	Gloss
1		LLL	shalula	ʃalul-a	'discriminate'
2	CV.CV.NV	LLL	sheshema	ʃeʃem-a	'nauseate'
3	CV.CV.NV	LLL	kulunga	kuluŋg-a	'stir'
4	CV.CV.NV	LLL	kulunta	kulu't-a	'drag'

Trisyllabic verbs with LLL Tone Pattern have a Low tone (L) on all three syllables. The initial consonant does not affect the tone pattern. The lack of a High tone suggests a default or neutral verb tone pattern.

No depressor consonant effect is seen because all syllables remain Low (L). Trisyllabic verbs with this pattern likely follow an unmarked tonal assignment.

These verbs might not undergo any tonal shift due to grammatical or phonological rules.

Table 14: Trisyllabic Verbs with HHL Pattern

	Syllable pattern	Tone pattern	Word	IPA	Gloss
1	CV.CV.CV	HHL	shalula	ʃaˈluˈl-a	‘discriminate’
2	CV.CV.CV	HHL	kubaja	kuˈβaˈdʒa	‘hurt’
3	CV.CV.CV	HHL	kubila	kuˈβiˈla	‘eat powdery food’
4	CV.CV.CV	HHL	kubuka	kuˈβuˈka	‘grow up’
5	CV.CV.CV	HHL	kutula	kuˈtuˈla	‘pour out’
6	CV.NV.CV	HHL	kunika	kuˈniˈka	‘lean downwards’

The above verse segments appear as infinite verbs. They are, however, not as the whole word is a root.

Unvoiced Consonants are Initial with the H Tone

In trisyllabic verbs exhibiting the HHL tone pattern, the first two syllables carry High (H) tones, while the final syllable is Low (L). This pattern is observed in both CV.CV.CV and CV.NV.CV structures. Verbs beginning with an unvoiced consonant often have an initial High tone, indicating tonal spreading across the first two syllables. Autosegmental phonology offers a framework for representing multiple surface

occurrences of a phonological feature as originating from a single underlying instance, with all surface realisations linked to a common underlying tone. The autosegmental representation of these trisyllabic verbs illustrates this phenomenon:

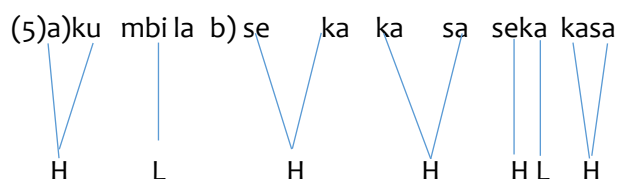


Table 15: Trisyllabic Verbs with LHL Tone Pattern

	Syllable pattern	Tone pattern	Word	IPA	Gloss
1	CV.CV.CV	LHL	bhabhula	babˈula	‘uncover a hard surface’
2	CV.CV.CV	LHL	bhabhisa	babiˈsa	‘mother to carry child’ CAUS
3	CV.CV.CV	LHL	bheuka	beuˈka	‘over turn’
4	CV.CV.CV	LHL	bhakala	bakaˈla	‘kick. Hit.
5	CV.CV.CV	LHL	bhakula	bakuˈla	‘of the heart) Palpitate.
6	CV.CV.CV	LHL	dabila	daβiˈla	‘answer, reply’

Verbs with initial depressor consonants have L tone on the initial, which is also realised on the FV-a.

Table 16: Quadrisyllabic Verbs with L.HHL Tone Pattern

	Syllable pattern	Tone pattern	Word	IPA	Gloss
1	CV.CV.NV.CV	LHHL	kulumbula	kuluᵐbula	‘be shedded off’
3	CV.CV.NV.CV	LHHL	kungulika	kuᵑgulika	‘roll’
	CV.CV.NV.CV	LHHL	kungubula	kuᵑguβula	‘clear’
4	CV.CV.NV.CV	LHHL	kulumpala	kuluᵐpala	‘be old, worn out’
5	CV.CV.NV.CV	LHHL	kulumuka	kulumuka	‘rush together’
6	CV.NV.CV.CV	LHHL	kumbuluja	kuᵐbuludʒa	‘remind’

The unvoiced initial consonant of the verb stem is toneless/L tone. From the list of verbs with three syllables, the second syllable is na nasaland; effectively, this syllable is H-toned.

Table 17: Quadrisyllabic Verbs with LHL Tone Pattern

	Syllable pattern	Tone pattern	Word	IPA	Gloss
1	CV.CV.CV.CV	LHHL	vulubata	vuluβata	'sleep drowsily'
2	CV.CV.CV.CV	LHHL	vuvulija	vuvulidʒa	'interrupt'
3	CV.CV.NV.CV	LHHL	vulumisa	vulumisa	'drive hastily'
4	CV.CV.NV.CV	LHHL	vumisisa	vumisisa	'agree' extensively
5	CV.CV.NV.CV	LHHL	zakunula	zakunula	'undo'
6	CV.NV.NV.CV	LHHL	vwinyunguka	vʷiɲuŋguka	'move as a snake'

In this analysis, it should be noted that the pattern LHHL, also rendered as LHL, is only found in quadrisyllabic verb stems in which the initial consonant is a depressor consonant, as exemplified in Table 15.

A key observation on trisyllabic and quadrisyllabic verbs is that they always end in an L tone.

Autosegmentally, this can be rendered as follows:

-tier

(6). Tonal Tier	L	H	H	L	
Association lines					
Segmental tier	z	a	k	u	n u l a [zakunula]

Nambya, as shown in (7), shows a predictable penultimate lengthening realised on different morphemes as causative and applicative suffixes are added:

- (6)
- | | |
|-----------------|------------------------|
| ku-se:k-a | 'to laugh' (se'ka') |
| ku-sek-e:s-a | 'to cause to laugh' |
| ku-sek-e:l-a | 'to laugh at' |
| ku-sek-el-e:l-a | 'to cause to laugh at' |
| sek-a | |

HTS 1Nambya verb roots are either underlyingly toneless or have an underlying H tone. (8) and (9) give some examples of toneless and H tone verbs respectively, preceded by the low tone infinitive prefix ku-

All these examples are given as they occur in an intonational phrase with penultimate vowel length.

(7) Toneless Verbs

Table 18: Toneless Verbs

Word	Gloss
-lima -LL	'cultivate'
ku-li'm-a	'to cultivate'
ku-pala'dʒ-a	'to disperse'
ku-falu'l-a	'to choose'
ku-pamhi'ja	'to add, extra'
-ku-tfi-li'ma	'to grow, plant it'

When the object prefix is followed by toneless verb stems, the H tone of the object prefix spreads twice onto the following vowels of the verb stem.

(8) Verbs with LL

Table 19: Verbs with LL

Phrasal	gloss
ku-fem-a	'to breathe
ku-kuja	'to grind'
ku-laβa	'to read'
ku-kumba	'scratch feet'
ku-βanda	'mention'
ku-βenga	'cut meat into stripes'
ku-tʃeka	'have diarrhoea'
ku-fuka-	'brooding of chicken's

(9) High Tone Verbs

Table 20: High Tone Verbs

Phrasal	gloss
ku-tj-a'	'to fear'
ku-βu'mb-a'	'to build'
ku-pu'βu'l-a	'to pierce'
ku-si'pu'l-a	'to uproot'

The lexically toneless verbs in (8) are assigned a Low tone by default. The lexical H in the verbs in (9) links to the first vowel in the verb stem. HTS1 then applies at the stem level, spreading this H tone rightwards to all the visible vowels.

(10) (a) ty-a



(b) βumb-a



The final vowel in the monosyllabic stem in (10a) and in the disyllabic stem in (10b), however, is not extrametrical because, like in a number of Bantu languages, the Nambya language also invokes a disyllabic minimum (Myers, 1987).

In cases where these H tone verbs are followed by another word within an intonational phrase, HTS3 also applies to these verbs. (10) restates these verbs from (9) above, followed by βu'-si'iku 'at night'.

(10) High Tone Verbs

Table 21: High Tone Verbs

Sentence		Gloss
ku-tj-a'	ku-ty-a' βu'-si'iku'	'to fear night'
ku-βu'mb-a'	ku-βu'mb-a' βu'-si'iku'	'to build at night'
ku-pu'βu'l-a	ku-pu'βu'l-a' βu'-si'iku'	'to pierce at night'
ku-si'pu'l-a	ku-si'pu'l-a' βu'-si'iku'	'to uproot at night'

We observe in the case of the monosyllabic and disyllabic verb stems that the stem H tone spreads by HTS3 onto the vowel of the Cl14 prefix of the following word βu-siku 'at night'. But in the case of the longer verb stems, when the word βu-siiku follows, we observe an H tone on the final vowel -a, which was not there before when these verbs occurred in isolation.

This means that after the application of HTS1 and with the addition of another word, the extrametricality is removed. This H tone then spreads by HTS3 onto the final vowel. This shows that as a postlexical rule, HTS3 can spread both within and across words.

Some common tonal processes take place in Bantu languages. Marlo and Odden (2019) state that during the analysis of tone, there are common Bantu tonal processes that take place. Marten and Kula (2009) describe that Meeussen's Rule is a dissimilation process that changes the second high tone in a series of two into a low tone. Yip (2009) states, "if two H tones become adjacent, the second one deletes, and if two L tones become adjacent, the first one changes to LH rise. Both can be seen as caused by the Obligatory Contour Principle (OCP) as stated in Leben (1973). At the melodic level of the grammar, any two adjacent tones must be distinct. The OCP captures the intuition that two adjacent TBUs with the same tone need not each be specified separately for the same tone.

(11) In Nambya, this process is exhibited as follows:

Prefix + stem

téng-és-á	→	tjá	- tɛ̀ngɛ̀sà	'it has sold'
		ká	- tɛ̀ngɛ̀sà	'it has sold' dim.
		wá	- tɛ̀ngɛ̀sà	'he/she has sold'
		βá	- tɛ̀ngɛ̀sà	'they have sold'(Cl1)
		ta'	- laβuka	'we have run'
		ba	- laβuka	'they have run'
		-lya'	- 'eat'	
		-lya'	- walya	'he/she who has eaten'
		-lya'	- wa' lya	'he has eaten'
		-ba'	- lya	'they have eaten'
		-twa'	- lya	'they have eaten'(Cl.13)
		-dʒa	- lya	'they have eaten'(Cl9)
		-zwa'	- lya	'they have eaten' (Cl.7)
		-zwa	- lya	'they that have eaten' (Cl.7)

The SM in Cl 9 and 7 have an initial depressor consonant which has an H tone, spreads to the verb root to make it an H tone.

Yip, following Myers (1997), explains that the doubly linked H is deleted. She suggests that the H tone deletion in the sentence is due to the H specified on the copula prefix, i, 'is', (infinitive -ku-)and that the elision of the doubly linked H tone is triggered by the OCP to avoid its violation.

(12) Word	prefix -ku-
se'βa'	ku'se'ba'
'toast'	'to toast'
-ka'ng-a'	ku'ka'nga'

'fry'	'to fry'
-ku'm-a'	ku'ku'ma'
'praise'	'to praise'
-βu'j-a'	ku'βu'ja'
'come back'	'to come back'
-mi'n-a'	ku'mi'na'
'be stingy'	'be stingy'

H- Spreading/Shifting

H tone is very mobile in Bantu languages, meaning it frequently spreads or shifts. This movement can be unbounded within a constituent or bounded. In this latter case, it is limited to a distance of one or two syllables (or moras) and can operate either to the left or right.

Nambya example: H. [a'-to'-lyà] 'he/she does not eat'.

Meeussen's Rule is a dissimilation process that changes the second high tone in a series of two into a low tone. For example, in Nambya:

Prefix + stem

(13) 'la'bu'ka	'run'
wa'-la'βùkà	'he/she has run'
'ka'-la'βùkà	'it (diminutive) has run' 'it' animal) has run'
'tja'-la'βùkà	'it (augmentative) has run'
'lja'-la'βùkà	'it (augmentative)has run'

Lexical and Grammatical Tone

Lexical Tone

Rasmussen (2018) defines lexical tone as the tone that is assigned to a word part, which is used to distinguish one word or part of a word from another, in the same way as consonants and vowels. Results from the study indicate that in Nambya, this is realised in the following lexicals:

(14) (i) 'da' H	'da (L)
'go'	'lice'
(ii)seka' (LH)	seka (LL)
'laugh'	'ring'
(iii)ku'βa' (HH)	kuβa (LL)
'be finished'	'to be'

Tone languages use variations of pitch at the syllable level to distinguish lexical meanings of different words (Yip, 2002). In a large majority of African languages, tone, the relative pitch on which syllables are spoken, can both differentiate different words (lexical tone)

(Franich et al., 2024) and communicate grammatical function (grammatical tone) (Josh & Eldeberi, 2023).

For example:

/bana/ [bána] with a high tone on both syllables could mean 'children'

/bana/ [bàna] with a low tone might mean something different: 'quantity of four.' This property makes the tonal system vital for distinguishing meaning in communication.

Grammatical Tone

Lojenga (2018) observes that in many Bantu languages, tone is not only used to differentiate

meaning in nouns and verbs (lexical tone) but also plays a key grammatical role, although the segments are the same, only tone differs. The distinction between lexical and grammatical tone does not imply the existence of two separate tonal systems; rather, it emphasises the multiple functions tone performs within the language. In these instances, clearly reflecting tonal distinctions in writing is especially important as grammatical tone signals specific pitch variations that convey differences. A high tone on a verb stem might signal a different tense from a low tone on the same verb stem.

Grammatical Tone

Table 22: Grammatical Tone

Word	IPA	Gloss
ya:pinda	-ja:pi ^ˈ nda	'that which he has passed'
yapinda	japi ^ˈ nda	'it has passed'
toboka	toβo ^ˈ ka	'trample'
toboka	to ^ˈ βo ^ˈ ka	'we thank'
tooboka	to:βoka	'we will thank'FUT.

In data, the words *toβóka* 'you stample' and *tóβóka* 'we thank' show how tone can change meaning. Both words have the same segments. In the first word, only the penultimate syllable /βo/ carries a High tone, while in the second, both the subject prefix /to/ and first syllable /βo/ are marked with a High tone. The form *toβoka* is an imperative meaning "trample," but when both the prefix and /βo/ are high-toned, the word shifts from the imperative to the indicative mood, meaning 'we thank.'

CONCLUSION AND RECOMMENDATIONS

Conclusion: Tone analysis in this study was done using the autosegmental phonology theory. Nambya is a two-tone language: High and Low tone that combine to make HH; HL; LL; LH patterns, which are crucial for distinguishing meanings between otherwise similar words. Tone is contrastive in the language, affecting both verbs and nouns. Deverbal nouns influence tonal

realisation, with a tendency toward low-toned stems. Different noun classes prefer specific tonal patterns, possibly due to morphological constraints. Disyllabic nouns exhibit structured tonal distributions, reflecting underlying phonological rules.

Recommendations: Future research should continue documenting Nambya tonal patterns, including tone alternations in connected speech, to preserve and understand its phonology. Findings should inform educational materials, literacy programs, and language revitalisation policies. Comparative studies with neighbouring Bantu languages can illuminate typological and historical insights. Integrating computational tools for pitch analysis and speech processing is recommended to facilitate large-scale documentation and support language learning. It is hoped that this study will put Nambya at a comparable level with other Bantu languages.

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