



## Lexical vs. Grammatical Tone: Sorting out the Differences

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### Abstract

Researchers of tone are largely influenced by the properties of the language(s) on which they work. Since tone has an almost exclusively lexical function in East and Southeast Asian languages, researchers of these languages focus primarily on how languages and speakers distinguish tone on lexical morphemes. Languages such as Thai, Vietnamese and the wide range within Chinese lead one to posit a particular typology of lexical, monosyllabic tones which may interact with each other or be influenced by the syntax, but which rarely function as direct exponents of grammar. At the other extreme are languages from other parts of the world where tone is primarily grammatical. Languages such as Somali and Chimwiini treat their (sparse) tones syntagmatically, where the grammar determines where a H tone will be realized on a word or phrase, thereby encouraging many to feel they in fact represent a different typology altogether, often identified as “pitch accent”. In between these two endpoints are the majority of languages whose tones exhibit both a lexical and grammatical function. In this paper I suggest that there is in principle no difference in the range of phenomena found in lexical vs. grammatical tonology.

**Index Terms:** lexical tone, grammatical tone, morphology

### 1. Introduction

As indicated in (1), tone is largely lexical in some languages, grammatical in others, and both in still others.

	Mandarin	Chimwiini	Iau
Lexical tone	x		x
Grammatical tone		x	x

To consider such functions we need first to agree on what we consider “tone” to be—for my purposes, any instance where pitch is an exponent of a morpheme in the traditional sense. This is perhaps most clear in cases of lexical tone where tonal contrasts are on monomorphemic roots, as in (2).

- (2) a. five tone heights: Kam (Shidong) [Tai-Kadai] [1]  
 ʈa<sup>11</sup>    ʈa<sup>22</sup>    ʈa<sup>33</sup>    ʈa<sup>44</sup>    ʈa<sup>55</sup>  
 ‘thorn’   ‘eggplant’   ‘father’   ‘step over’   ‘cut down’  
 b. four heights + five contours in Itunyoso Trique [2]  
 level: ββe<sup>4</sup> ‘hair’, nne<sup>3</sup> ‘plough (n.)’, nne<sup>2</sup> ‘to tell lie’,  
       nne<sup>1</sup> ‘naked’  
 falling: li<sup>43</sup> ‘small’, nne<sup>32</sup> ‘water’, nne<sup>31</sup> ‘meat’  
 rising: yāh<sup>45</sup> ‘wax’, yah<sup>13</sup> ‘dust’

Although it does however sometimes happen that tone is marked differently on different word classes, this is still lexical tone. An example comes from Mpi [Loloish; Thailand] in which nouns and verbs are characterized by three non-

intersecting tone patterns (H = High, M = Mid and L = low tone) [3].

	Nouns		Verbs
H	sí ‘four’	MH	sí ‘to roll’
M	sī ‘a color’	LM	sī ‘to be putrid’
L	si ‘blood’	HL	sí ‘to die’

While there are historical reasons for such skewings, a three-way lexical tonal contrast clearly exists among nouns and verbs which, at least for the above examples, is not characterizable as a grammatical (e.g. derivational) process. It is in fact quite common for there to be skewing in tonal distribution by type of morpheme or word class:

(i) In Mundang [Adamawa; Chad] only grammatical morphemes give full /H, M, L/ contrasts. [4]

(ii) In Bamileke-Fe’fe’ [Grassfields Bantu; Cameroon] /H/ is grammatical vs. lexical /M, L/: *vhū* ‘ashes’ + *sāk* ‘bird’ → *vhú sāk* ‘ashes of the bird’; *lá* ‘that (near hearer)’; *sà?* ‘come’ vs. *nsá?* ‘and come’ (consecutive form). [5]

(iii) In Paic̣ [Austronesian; New Caledonia] there is a lexical contrast between /H/ and /M/ vs. five /L/ grammatical morphemes: *ò* ‘futur’, *mwàa* ‘ponctuel successif’, *bwàa* ‘en voie d’achèvement’, *mù* ‘habituel’, *é’le* (article) [6]

(iv) In Kukuya [Bantu; Congo], which contrasts five tonal melodies, /H/, /L/, /HL/, /LH/, and /LHL/, the last only occurs on verbs when a /L/ verb root is followed by the imperfective aspect /-HL/ suffix. [7]

(v) In Tataltepec Chatino [Zapotecan; Mexico] /S/, /SL/ and /HL/ mark inflectional categories on the verb (S = superhigh) and are absent as lexical tones on nouns. [8]

The distinction between lexical vs. grammatical tone is not quite the same as that between lexical vs. grammatical morphemes. *Lexical morphemes* belong to a relatively open class of “content” forms (e.g. noun and verb roots), while *grammatical morphemes* consist of a smaller class of “functional” forms (e.g. affixes, “particles”). *Lexical tone*, on the other hand, is part of the make-up of lexical morphemes, while the term *grammatical tone* is not usually invoked to characterize the linked tones which accompany segmental grammatical morphemes, e.g. the H and L tones of the subject pronouns *à* ‘I’, *í* ‘you sg.’, *ò* ‘he’, *á* ‘she’ Kalabari [Ijoid; Nigeria]. Instead the concept of grammatical tone refers to tone which is assigned by the grammar independently of the segmental morphemes to which it may ultimately link.

In the following sections I will illustrate some of the properties of grammatical tone, compare it with lexical tone, and discuss how it fits into a typology of tonal systems.

### 2. Examples of Grammatical Tone

Grammatical tone can mark inflectional categories (on nouns, verbs, etc.) as well as derivational processes, such as deriving

nouns from verbs. As seen in (4) tone can be the exclusive mark of case in Maasai [Nilotic; Kenya, Tanzania]. [9]

(4)	<i>nominative</i>	<i>accusative</i>	
class I:	èlùkùnyá	èlókúnyá	‘head’
	èncòmátá	èncómátá	‘horse’
class II:	èndèròni	èndèróni	‘rat’
	ènkòlòpà	ènkòlópà	‘centipede’
class III:	òlmérègèsh	òlmérègèsh	‘ram’
	òlósówùàn	òlósówùàn	‘buffalo’
class IV:	òmótònyí	òmótònyí	‘bird’
	òsínkírrí	òsínkírrí	‘fish’

In class I, the nominative schema is all L with one final H, while the accusative is marked by one L followed by all H. In class II there is a H on the first syllable of the stem in the nominative vs. the second syllable in the accusative. In class III the nominative has two Hs, while the accusative has only one. Finally, class IV nouns are not tonally marked for case.

In Kalabari [Ijoid; Nigeria] the different tonal patterns of transitive verbs all receive a /LH/ melody in the corresponding derived intransitive forms: [10]

(5)	a.	<i>transitive</i>			
	kán	H	‘tear, demolish’		
	kòn	L	‘judge’		
	ányá	H-H	‘spread’		
	díimà	L-L	‘change’		
	sá’kí	H- <sup>1</sup> H	‘begin’		
	kíkíma	H-H-L	‘hide, cover’		
	pákírí	H-L-H	‘answer’		
	gbóló’má	H-H- <sup>1</sup> H	‘join, mix up’		
	b.	<i>intransitive</i>			
	kàán	LH	‘tear, be demolished’		
	kón	LH	‘be judged’		
	ányá	L-H	‘be spread’		
	díimá	L-H	‘change’		
	sàkí	L-H	‘begin’		
	kíkímá	L-L-H	‘be hidden, covered’		
	pàkírí	L-L-H	‘be answered’		
	gbòlómá	L-L-H	‘be joined, mixed up’		

In both the Maasai and Kalabari examples it is clear that the tonal patterns are assigned by the grammar independent of the segmental make-up of the base noun or verb. Hence the term grammatical tone.

A grammatical tone which is the sole exponent of a morpheme is termed a *tonal morpheme* [11]. Since the tone is a morpheme, it can do anything that a morpheme can do: “tonal morphology... exhibits essentially the same range of morphological properties as in all of segmental morphology” [12, p.588]. The corresponding basic hypothesis I would like to advance here is that there is nothing that grammatical tone can do that lexical tone cannot (and vice-versa). This is because they are both exponents of morphemes, although tonal morphemes do not have any segmental content. (It is rare for a lexical morpheme to consist solely of a tone just as we would not expect a lexical root to consist solely of a segmental feature, e.g. [+nasal], [+voice].)

In fact, in contrast with the skewed Mpi examples in (3), there is a frequent parallelism between lexical tones on nouns

and grammatical tones on verbs. This is seen particularly clearly in Iau [Lakes Plain; Indonesia, Papua] [13]:

(6)	<i>Tone</i>	<i>Nouns</i>		<i>Verbs</i>	
	H	bé	‘father-in-law’	bá	‘came’
	M	bē	‘fire’	bā	‘has come’
	SH	bé’	‘snake’	bá’	‘might come’
	LM	bē	‘path’	bā	‘came to get’
	HL	bē	‘thorn’	bā	‘came to end point’
	HM	bē	‘flower’	bā	‘still not at endpoint’
	ML	bē	‘small eel’	bā	‘come (process)’
	HLM	bē	‘tree fern’	bā	‘sticking, attached to’

The same eight tone patterns contrast lexically on nouns, but mark different inflectional properties on verbs, in this case the underlyingly toneless lexical root /ba/ ‘come’.

In Iau and other such languages verbs do not contrast lexical tone at all. In others verbs may have fewer underlying tonal contrasts than nouns, but the grammatical tones “fill in the blanks”. For instance, in Gokana [Ogoni; Nigeria] nouns contrast /H/, /M/ and /L/ underlyingly: *t̃* ‘ear’, *t̃* ‘house’, *t̃* ‘hoe’. Verbs on the other hand show a two-way underlying contrast, but a three-way H, M, L contrast on the surface [14]:

(7)		<i>present</i>		<i>past</i>	
	/lo/ ‘speak’	H	à ló	M	āè lō ‘s/he ...’
	/lo/ ‘weave’	M	à lō	L	āè lō ‘s/he ...’

As seen, there is a lexical contrast between ‘speak’ and ‘weave’, which is realized as /H/ vs. /M/ in the present, but as /M/ vs. /L/ in the past. As (7) shows, M tone [lō] realizes both the present tense form of ‘weave’ and the past tense form of ‘speak’. The lexical and grammatical verb tones are thus inseparable.

Grammatical functions of tone are as varied as morphology itself. In tone the issue becomes more complex and interesting in that tones tend to wander at some distance from their original sponsoring morpheme. This raises the question of what counts as a tonal morpheme—vs. a phrasal boundary tone, intonation, or something else. Chimwiini [Bantu; Somalia] shows a surface contrast between final vs. penultimate H tone, other syllables being toneless. The contrast can be observed in the following paradigm. [15]

(8)		<i>singular</i>		<i>plural</i>	
	<i>1st person</i>	n-ji:lé	‘I ate’	chi-ji:lé	‘we ate’
	<i>2nd person</i>	ji:lé	‘you ate’	ni-ji:lé	‘you ate’
	<i>3rd person</i>	jí:le	‘s/he ate’	wa-jí:le	‘they ate’

Final H is morphologically conditioned by first and second person subjects, while penultimate H is the default. In fact, final tone is always grammatically determined, other triggers being *na* ‘and’, *ka-* ‘if’, the negative imperative, and relative clauses. Noun and verb morphemes thus do not contrast tone. While the examples in (8) already show that the final H is realized one or two syllables to the right of the trigger (which has no segmental content in the case of the second and third person singular forms), the sentences in (9) show that the final H is actually assigned at the phonological phrase level:

(9)	a.	jile: namá / jile: ma-tu:ndá	‘you sg. ate meat/fruit’
	b.	jile: náma / jile: ma-tú:nda	‘s/he ate meat/fruit’

The question that arises is: What is this? (i) Morphology? (Conditioning by subject prefixes is clearly morphological.) (ii) Phonology? (The final or penultimate H is located with respect to the right edge of a phonological phrase, hence making the H semi-demarcative.) (iii) Syntax? (Syntactic configurations determine what will be a phonological phrase—see [15]). Intonation? (Not likely as intonation has not been known to mark first/second person subjects.)

The Chimwiini example raises the question of what is meant by a tone being an exponent of a morpheme (in this case inflectional features of the verb): The final H is an exponent of the subject prefix, but it surfaces on the next word in (9). Another case of H tone realized phrasally comes from Giriyama [Bantu; Kenya], which gives us a hint as to the origin of the contrast in Chimwiini. The relevant contrast is seen in (10), where a phrase-penultimate vowel is lengthened [16]:

- (10) a. All L tone (L tone is unmarked)  
 ni-na-maal-a ‘I want’  
 ni-na-mal-a ku-guul-a ‘I want to buy’  
 ni-na-mal-a ku-gul-a nguúwo ‘I want to buy clothes’
- b. H tone on penultimate mora  
 a-na-maál-a ‘s/he wants’  
 a-na-mal-a ku-guúl-a ‘s/he wants to buy’  
 a-na-mal-a ku-gul-a nguúwo ‘s/he wants to buy’  
 H

The morphemes in (10a) are all toneless. As a result these sentences are all realized with default L tone. The sentences in (10b) differ only in the subject prefix. As seen, a H surfaces on the penultimate mora. As indicated, this H originates from the subject prefix /á-/ , shifting long-distance to the end of the phonological phrase. Since lexical morphemes contrast in tone in Giriyama, we can show that it is not only grammatical morphemes that send their H to phrase-penultimate mora:

- (11) a. All L tone (L tone is unmarked)  
 ku-gul-a mi-vuure ‘to buy wooden bowls’
- b. H tone on penultimate mora  
 ku-band-a mi-vuúre ‘to break wooden bowls’  
 H

In this case the H exponent of the lexical verb root /-bánd-/ ‘break’ is realized at the end of the phonological phrase. Before moving on to the next section, let us take note of the fact that this problem does not arise in non-tonal phonology: It is only tone that can have such a long-distance discrepancy between its point of origin and its surface realization.

### 3. Constructional tone

While the Chimwiini and Giriyama examples have a phrasal realization, the H tones originate from specific morpheme triggers. There are other cases where the grammatical tones originate from the syntax. I will refer to this as constructional tone (cf. [10], [17], [18]). In Barasana [Tukanoan; Colombia], the contrastive /H/ or /HL/ of possessive pronouns is copied onto the modified noun (~ indicates a nasal morpheme) [19]:

- (12)
- |                   |             |             |
|-------------------|-------------|-------------|
|                   | ‘shaman’    | ‘pet’       |
|                   | ~kúbú (H)   | ~bídi (HL)  |
| ~bádí (H) ‘our’   | ~bádí ~kúbú | ~bádí ~bídi |
| ~ídà (HL) ‘their’ | ~ídà ~kúbù  | ~ídà ~bídi  |

Outside of this case, one doesn’t expect specific possessive pronouns to impose agreement on the possessed noun.

A more complex situation is found in Kalabari [Ijoid; Nigeria]. Whenever a noun is non-initial in its noun phrase, it loses its tones and receives one of four tone “melodies” depending on the word class of the preceding modifier. This is illustrated in (13), where the /H-H/ tone of /námá/ ‘animal, meat’ has four different realizations (the downstep in *ná<sup>l</sup>má* is from a simplification of the HLH melody) [10]:

- (13) *modifier melody example*
- |             |     |                        |                  |
|-------------|-----|------------------------|------------------|
| poss. noun  | HL  | tùbò námà              | ‘child’s animal’ |
| poss. pron. | HLH | inà ná <sup>l</sup> má | ‘their animal’   |
| determiner  | LH  | tò námá                | ‘which animal?’  |
| quantifier  | L   | jà námà                | ‘some meat’      |

In fact, the above melodies map over multiword noun phrases, e.g. *féni* ‘bird’ + *námá* ‘meat’:

- (14) a. tùbò + féni + námá → tùbò fèni námà  
 L-L H-H H-H L-L H L  
 ‘the child’s bird’s meat’
- b. ì + féni + námá → ì fèni námá ‘my bird’s meat’  
 L H-H H-H L H L H

Again, what else but tone can do this?

## 4. Tonal typology

At this point let us summarize what we can extrapolate from what we have seen thus far concerning lexical vs. grammatical tone. First, languages can have one, the other, or both. Second, the presence of one vs. the other does not correspond exactly with any of the following:

- (i) The size of words: both mono- and polysyllabic languages can be restricted to lexical tone or can have grammatical tone (cf. the latter in Iau verbs and Chimwiini).
- (ii) The morphological typology: one cannot predict the type of tone system on the basis of whether a language is primarily analytic or primarily synthetic (both Chinese and Mohawk have only lexical tone).

- (iii) The degree of tonal marking: Languages with either dense or sparse tone marking can have lexical and/or grammatical tone (cf. density in Kam Shidong and Iau verbs).

The above may be unexpected to those who are used to working on lexical tone in Chinese or similar languages in the Sinosphere which are largely monosyllabic, analytic, and dense in their tone marking [20]. Although there is areal clustering, the Chinese “type” with tonal contours as the basic inventory is in fact rather unusual. This is why I frequently refer to it as “the Sinosphere vs. the world”.

The question then is whether it makes sense to typologize by tonal function. Ratliff’s typology [21] is “organized around how tonal contrasts are used” [22, p.134]:

- (15) Type A, e.g. White Hmong [China; northern SE Asia]
- lexical tone
  - minor morphological uses of tone (expressive, reduplication, compound formation...)

Type B, e.g. Kanuri [Nilo-Saharan; Nigeria, Chad Cameroon]

- a. lexical tone
- b. major morphological use of tone (all type A functions + derivation, inflection...)

Any such typology of course idealizes over what is for sure a continuum, some languages clearly falling in between “major” and “minor” morphological uses of tone. The same can be said for my own preferred typology, which recognizes two extremes in terms of how “active” the tones are:

(16) Type A, *Lethargic*: tones are stable, domesticated (they stay home), isolated, uninteresting (they are so well behaved you wouldn’t even know they were “autosegmental”)

Type B, *Restless*: tones change, wander all over the place, wreak havoc on neighbors (they’re so extroverted it may require considerable analysis to determine their underlying sponsors)

An example of type A is Tangkhul Naga [Tibeto-Burman; NE India], which has no tonal morphology or tonal alternations; the three contrastive tones /H/, /M/ and /L/ on lexical morphemes which just stay on their own syllables and do not interact: *páay* ‘defecate’, *pāay* ‘be cheap, able’, *pàay* ‘jump’. This non-interaction is largely attributable to the fact that toneless grammatical morphemes intervene between the lexical roots whose tones thus rarely meet when words are concatenated. This includes a certain number of toneless lexicalized prefixes, as seen on the following nouns and verbs [personal notes]:

(17)	Ø-H		Ø-M	
	aa-kúy	‘head’	aa-kōr	‘cover’ (n.)
	ma-khá	‘cough’ (n.)	ma-cō	‘spit’
	ka-shúy	‘be startled’	ka-sāay	‘be accustomed’
	ŋa-níj	‘stand’	ŋa-rēw	‘play’
	Ø-L			
	aa-khòj	‘neck’		
	ma-nù	‘laugh’		
	ka-tsàa	‘be ill’		
	ŋa-nìr	‘wrinkle’		

We have already seen several examples of “restless” type B, e.g. Giryama, Kalabari. Adopting Corbett’s notion [23], we can however accept that it is more “canonical” for an exponent of a morpheme to be realized on that morpheme—and that includes tone, however “badly behaved” it rather uniquely sometimes is.

What such typologies attempt to capture is that tone systems can vary quite dramatically, with tone having different functions and marking different things in different languages. While assigning tone systems to unique types is tricky, a more general question we can ask is whether there is any reason to think that Language might be predisposed to lexical vs. grammatical tone. It does not appear to be the case that one is more “natural” than the other. Rather, the prevalence of lexical vs. grammatical tone likely depends on diachrony in at least two ways:

(i) Assuming that the most common process of tonogenesis is from the transphonologization of other laryngeal features (breathiness, creakiness, voicing), lexical morphemes are not only more numerous, but often support

more laryngeal contrasts than grammatical morphemes. It thus should not be surprising if lexical morphemes develop more tonal contrasts, perhaps exclusively, as in Ratliff’s Type A languages. (However, for an unusual case of tonogenesis apparently arising from the loss of a grammatical morpheme, see [24].) These are young tone languages.

(ii) Assuming that grammatical morphemes generally derive from the process of “grammaticalization” with lexical morphemes developing into grammatical ones, one does not expect to find tonal morphology in a language that has little segmental morphology: “If a tone language makes significant use of segmental morphology (either affixal or ablaut), it will make grammatical use of tone” [22, p.143]. This implicational observation can be subsumed under Spencer’s more general claim: “There is an overall tendency cross-linguistically for morphology to be expressed by affixes rather than changes in the form of the root (root allomorphy) or changes in stress, tone and so on. In general, if a language makes use of, say, ablaut to signal a morphological property, then it will also make use of affixation” [25, p.115]. This too is a direct result of the fact that such non-segmental processes derive historically from more canonical affixal morphology. In short, Ratliff’s Type B languages are mature tone languages.

Interpreting tonal systems in terms of their “youth” assumes that tonal contrasts mostly, if not exclusively arise from the transphonologization of other laryngeal properties—and not, say, from word stress or phrasal intonation. I believe this to be the case. In §1 I defined tone as an exponent of a morpheme, hence standing in paradigmatic contrast with the exponents of other morphemes. However, as seen in the above discussion of Chimwiini, Giryama, and Kalabari above, tone can be quite syntagmatic. While a morpheme in one word can assign tone to another word, neither stress nor any other phonological property can do this. Such syntagmaticity occurs towards the endpoint of the following natural history of tonogenesis and tonooxodus:

(18) laryngeal > paradigmatic tone > syntagmatic tone > loss

As seen, although tone starts out paradigmatically, there is an unmistakable tendency for paradigmatic tonal contrasts to become increasingly syntagmatic, ultimately self-destructive. This we must assume is due to the ease with which speakers can detect pitch patterns over considerable distance. Language learners appear to be better at producing, perceiving and exploiting tonal melodies than any other syntagmatic property of speech. This is why intonation is first and foremost expressed through pitch modulations. A related question therefore is to ask how much of the nature of tone systems is structurally “tonal” vs. due to the nature of F0 or pitch in general. I will leave aside the question of whether Hs and Ls are better suited for distinguishing morphemes vs. the various functions of intonation. Many tone languages have intonation, marked either by F0 or by other means [26], [27]. Several researchers have claimed that all languages have intonation (see e.g. [28], [29], [30]). The question I would like to raise in the final section is why all languages don’t have tone in the sense defined above?

## 5. Conclusions

In the preceding discussion I have tried to show that lexical and grammatical tone (qua exponents of morphemes) exhibit

the same range of contrasts, hence are not significantly different from each other. As we saw in the Kalabari example in (5), grammatical tone can override lexical tone, but there are also cases where specific lexical tones block the assignment of a grammatical tone. This can occur even at the phonological phrase level, as in Kinande [Bantu; Democratic Republic of Congo], where a lexical L-final word blocks the assignment of a final H% boundary tone [31]. This H% also fails to occur at the end of an imperative clause. Structural H and L pitches can be present and thus potentially interact at all levels of language: lexicon, phonology, grammar, pragmatics. The question I would like to end with is: Why don't all languages exploit pitch for the purpose of distinguishing morphemes? For several reasons, a minimal /H/ vs. /L/ contrast would seem to be a good candidate for universality:

(i) Tone presents few, if any articulatory difficulties vs. consonants, which all languages do exploit for distinguishing morphemes.

(ii) Tone is acoustically (hence perceptually?) simple, F0, vs. consonants and vowels, universally exploited despite the relatively minor acoustic distinctions they sometimes produce.

(iii) Tone is acquired early—one might even want to claim that we are prewired for it. In fact, if all languages did exploit tone for distinguishing morphemes, this would seem like a natural, if not automatic claim to make.

There are of course caveats to the above three points:

(i) It is well known that some tones are more complex than others, producing the complexity scale: LHL, HLH >> LH >> HL >> H, L [32]. The articulatory difficulty of contour tones increases if they are surrounded by unlike tone heights requiring rapid ups and downs, hence L-HL-H, H-LH-H >> H-HL-L, L-LH-H, the latter however being less perceptually distinct [33].

(ii) F0 is acoustically simple, but may cooccur with non-modal phonation (breathiness, creakiness) and be counteracted by the intrinsic effects of consonants, especially obstruents.

(iii) Early acquisition generally refers to the production of tones on words in isolation. In languages with complex tonal morphology, e.g. Sesotho [Bantu; Lesotho, South Africa], acquisition occurs in stages: "The acquisition of tone on nouns and subject agreement markers has taken place by the age of 2, much in the way that lexical tone is acquired in languages like Mandarin and Thai. In contrast, grammatical tone melodies on verbs, where there is much more tone sandhi, is beginning to be acquired around the age of 2;6-3 as more of the tense/aspect/mood morphology is also acquired." [34, p.220]

The best explanation for the non-universality of tone seems to be the competition from other functions of pitch in language, especially intonation. We hypothesized in (18) that even when present, paradigmatic tone tends to become increasingly syntagmatic, ultimately phrasal, as in Chimwiini and Giryama. There is no counterbalancing tendency for syntagmatic tone to become paradigmatic. Even in cases where bisyllabic H-L or L-H words drop their second vowel, resulting in monosyllabic HL and LH words, this does not produce an increase in the paradigmatic contrasts of words, rather of syllables. As in the case of initial tonogenesis, increase in paradigmatic contrasts typically comes from bifurcations due to the interaction of consonant types and tone and occasionally other phonetic factors [35]. As in the case of tonal stability whereby H-L, H-L > HL, LH, what started out as paradigmatic remains paradigmatic. Given the strong drive

towards syntagmaticity, we might turn the question on its head and ask how it is that so many languages tolerate paradigmatic morpheme-distinguishing tones. In this context the only idea I can offer is that the most syntagmatic tonal property of all, intonation, can only effect a limited number of sparse contrasts (most instances exploiting only combinations of H and L). As we have seen above, this leaves a lot of space open for lexical and grammatical tone.

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