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Tone and Intonation in Chichewa and Tumbuka

Abstract: This study compares the tone and intonation systems of two closely related Bantu languages spoken in Malawi, Chichewa and Tumbuka. The lexical tone systems of the two languages are quite different from each other. Chichewa uses tone contrastively and grammatically. In Tumbuka, tone is predictable except in the ideophonic system. Only Tumbuka provides evidence for both a Phonological Phrase and an Intonation Phrase level. It is surprising, then, that the intonation systems of the two languages turn out to be quite similar. Both have penult lengthening and similar intonation patterns for statements and questions. Both use continuation rises following preverbal topics, and have final lowering at the end of declarative utterances. These similarities raise the question of whether intonation might be an areal phenomenon.

1 Introduction

Chichewa[1] and Tumbuka are both Bantu languages (N31 and N21, respectively) spoken in Malawi. As we shall see in this chapter, the two languages have quite distinct prosodic systems. Chichewa has contrastive tone, while Tumbuka has predictable tone; Chichewa has only one level of phrasing (Intonational Phrase), while Tumbuka provides evidence for two levels of phrasing (Phonological Phrase and Intonational Phrase). However, the two languages share many aspects of their intonation, notably penult lengthening and the repertoire of boundary tones used, for example, to distinguish declaratives from different question types.

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[1] Chichewa is often spelled 'Chicheŵa'. The sound represented by 'ŵ' – a voiced bilabial fricative – is not found in standard varieties of Chichewa. This is why I have not chosen to use this spelling variant. Chichewa is known as Nyanja outside of Malawi.

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Pairing a discussion of the two languages in a single chapter provides a striking demonstration that intonation patterns do not necessarily correlate with other aspects of the prosodic system.

2 Lexical tone

2.1 Chichewa: lexical tone with phrasally-conditioned tone realization

Chichewa is a major language of Malawi, and it has contrastive tone, like most Bantu languages (Kisseberth & Odden 2003). The tonal system of Chichewa is quite well studied, and only the main points are summarized here.[2] As demonstrated in some detail in Kanerva (1990) and Bresnan & Kanerva (1989), lexical (and grammatical) High tone realization is conditioned by phonological processes which take the prosodic phrase as their domain. (In section 3.2, below, I argue that the relevant level of phrasing is the Intonational Phrase.) Syntax is the main factor defining prosodic phrasing. In the analyses of Bresnan & Mchombo (1987) and Kanerva (1990), sentences have three main subconstituents – an optional subject noun phrase (NP), an obligatory verb phrase (VP), and an optional topic NP – which can be freely ordered. The VP consists of the verb and all its complements, as shown in (1a, d). According to these authors, each of the three constituents, when they co-occur, is parsed into its own prosodic phrase. As shown in (1b) and (1c), topicalized NPs are in a distinct syntactic and prosodic phrase, and can occur in either order with respect to the VP. Prosodic phrases are indicated with parentheses in the data which follows:[3]

(1)   a.   (Subj) (VP) – Kanerva (1990: 103, fig (114b))
          (mwaána)   (a-na-pézá   galú   kú-dáambo)
          1.child   1SBJ-TAM-find   1.dog   LOC-swamp
          'The child found the dog at the swamp.'

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2 See work like Bresnan & Kanerva (1989), Bresnan & Mchombo (1987), Hyman & Mtenje (1999), Kanerva (1990), Moto (1989), Mtenje (1986, 1987), Myers (1996, 1998, 1999a, b), Myers & Carleton (1996) for detailed analyses of tone in Chichewa, including some discussion of the dialectal variation in tone realization mentioned in this section.

3 The following abbreviations are used in the morpheme glosses: numbers indicate noun agreement class; OBJ = object marker; SBJ = subject marker; TAM = tense-aspect marker; PERF = perfective; LOC = locative; REL = relative; COP = copula; INF = infinitive. Acute accents indicate High tone, and parentheses indicate prosodic phrasing.

    b.   (Subj) (VP) (Top) – (Kanerva 1990: 107, fig (123b))

          (mwaána)   (a-na-ḿ-pézá   kú-dáambo)   (gaálu)

          1.child   1SBJ-TAM-1OBJ-find LOC-swamp   1.dog

          'The child found it at the swamp, the dog.'

    c.   (Top) (VP) (Subj) – (Kanerva 1990: 102, fig (110c))

          (a-leenje)   (zi-ná-wá-luuma)   (njúuchi)

          2.hunter   10SBJ-SIMPLE.PAST-2OBJ-bite 10.bee

          'The hunters, they bit them, the bees [did].'

    d.   (VP) – (Kanerva, 1990: 98, fig. (101))

          (a-na-mény-á   nyumbá ndí   mwáála)

          1SBJ-RECENT.PAST-hit 9.house with   3.rock

          'S/he hit the house with a rock.'

However, Downing & Mtenje (2011a,b) find that the subject NP is only variably followed by a prosodic phrase boundary. This variation in the phrasing of subjects is illustrated in the data below, where we see that the subject is not phrased separately in (2a), but it is in (2b):

(2) a. (Ma-kóló a-na-pátsíra   mwaná ndalámá zá   mú-longo wáake)

       6-parent 6SBJ-RECENT.PAST-give 1.child 10.money 10.of 1-sister   1.her

       'The parents gave the child money for her sister.'

    b. (M-fúumu) (i-na-pátsá   mwaná zóóváala)

       9-chief   9SBJ-RECENT.PAST-give 1.child 10.clothes

       'The chief gave the child clothes.'

As Downing & Mtenje (2011a,b) and Cheng & Downing (2009) argue, a prosodic phrase boundary following the subject correlates with topicalization.

    Kanerva (1990) and Bresnan & Kanerva (1989) demonstrate that four phonological processes motivate the prosodic phrasing indicated in (1) and (2). First, the phrase penult vowel is lengthened. Chichewa does not have contrastive vowel length, and penult lengthening is the only common vowel lengthening process in the language. While sequences of identical vowels arise across certain morpheme boundaries, all penult long vowels in the data are due to phrasal lengthening. Second, a High tone on a phrase-final vowel is retracted towards the penultimate mora. In the Nkhotakota variety (Kanerva 1990), a High tone on a phrase-final vowel is completely retracted, as shown by the phrase-final tone pattern of the word for */galú/* 'dog' in (1b). In the Ntcheu variety (Downing

& Mtenje 2011a,b), a phrase-final High tone is realized on both the penultimate and final moras: e.g., [gaálú] 'dog'. Third, within a prosodic phrase High tones double to the following syllable. However, the disyllabic window at the end of a prosodic phrase is a barrier to tone doubling. To see this, compare the tone pattern of */kálata/* 'letter' in phrase-medial (3b) vs. phrase-final (3a) position (more on the phrasing of relative clauses in section 3.2, below):

(3) Tone doubling blocked phrase finally (Downing & Mtenje 2011a)

    a. ((m-phunzitsi *a-méné* á-ná-kwiyá   kwámbíiri) a-ná-wélengera

       1-teacher   1-REL   1SBJ-TAM-be.angry very   1SBJ-TAM-read.to

       aná   á súkúlú   kálaata)

       2.child 2.of school 5.letter

       'The teacher who was very angry read the students a letter.'

    b. ((Káláta *i-méné* m-phunzitsi á-ná-weléenga) í-ma-néná   m-fúumu)

       5.letter 5-REL 1-teacher   1SBJ-TAM-read 5SBJ-TAM-criticize 9-chief

       'The letter which the teacher read criticizes the chief.'

There is one principled set of exceptions to the generalization that High tones do not double into the disyllabic phrase-final window, namely a process of High tone plateauing. A High tone can double into the phrase-final disyllabic window if it is followed by another High tone. This is illustrated by the phrase *[ndí mwáála]* 'with a stone' in (1d), where the High tone of the preposition *ndí* doubles onto the phrase-penult vowel, forming a High tone plateau with the (retracted) final High tone of */mwalá/* 'rock'. As Kisseberth & Odden (2003) show, High tone plateauing, tone doubling and avoidance of High tones on final vowels are, in fact, common tonal processes cross-Bantu.

2.2 Tumbuka: phrasal tone or stress?

In contrast to Chichewa, there are no lexical or grammatical tonal contrasts in Tumbuka, except with some ideophones (Vail 1972).[4] Rather, the penult of every word in isolation is lengthened, and the first mora of the lengthened penult is

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4 Compared to Chichewa, Tumbuka prosody is relatively understudied. This section summarizes work developed in Downing (2006, 2008, 2010b, 2011a,b, 2012). Note that 'ŵ' in Tumbuka orthography indicates a voiced bilabial fricative [β], which contrasts with both [w] and [b].

associated with a High tone. This is shown in the following representative data (Downing 2012):

(4)   No tonal contrasts in nouns

Singular	*Gloss*	*Plural*
múu-nthu	'person'	ŵáa-nthu
m-líimi	'farmer'	ŵa-líimi
m-zíinga	'bee hive'	mi-zíinga
m-síika	'market'	mi-síika
khúuni	'tree'	ma-kúuni
báanja	'family'	ma-báanja
ci-páaso	'fruit'	vi-páaso
ci-ndíindi	'secret'	vi-ndíindi
nyáama	'meat, animal'	nyáama
mbúuzi	'goat'	mbúuzi

(5)   No tonal contrasts in verbs or verb paradigms

a.

ku-líima	'to farm'	líima!	'farm!'
ti-ku-líima	'we farm'	ti-ku-líma yáaye	'we do not farm'
ti-ka-líima	'we farmed'	ti-ka-líma yáaye	'we did not farm'
t-angu-líima	'we recently farmed'		
n-a-ŵa-limíira	'I have farmed for them'		
ŵ-a-líima	'they have farmed'		
wa-zamu-líima	's/he will farm'	wa-zamu-limilíira	's/he will weed'

b.

ku-zéenga	'to build'	zéenga!	'build!'
ti-ku-zéenga	'we build'		
nyúumba yi-ku-zengéeka	'the house is being built'		
ŵa-ka-zéenga	'they built'		
ŵa-ka-ku-zengéera	'they built for you sg.'		
ŵa-ka-mu-zengeráa-ni	'they built for you pl.'		
n-a-zéenga	'I have built'		
wa-zamu-zéenga	's/he will build'		
ŵa-zamu-zengeráana	'they will build for each other'		

Tumbuka words have the isolation pronunciation in (4) and (5), though, only when they are final in the prosodic phrase (indicated with parentheses in (6) and subsequent examples). As shown in (6), penult lengthening and a penult High tone are not found on every word. Rather, they are found, roughly, on the

word at the right edge of each lexical XP (typically, a noun phrase), unless the verb phrase is very short, as in (6c):[5]

(6) Tumbuka prosodic phrasing (Downing 2008)

    a. (ti-ku-phika síima)
       we-TAM-cook porridge
       'We are cooking porridge.' (VP)

    b. (ŵ-áana) (ŵa-ku-ŵa-vwira   ŵa-bwéezi)
       2-child   2SBJ-TAM-2OBJ-help 2-friend
       'The children are helping the friends.' (Subj) (V NP)

    c. (ti-ka-wona mu-nkhúungu) (ku-msíika)
       we-TAM-see 1-thief   LOC-market
       'We saw a thief at the market.' (V NP) (PP)

    d. (ŵ-anakáazi) (ŵa-ka-sona   vy-akuvwara vya mu-kwáati)
       2-woman   2SBJ-TAM-sew 8-clothes   8.of 1-bride
       'The women sewed clothes of the bride.' (Subj) (V NP)

    e. (m-nyamáata) (wa-ka-timba nyúumba) (na   líibwe)
       1-boy   1SBJ-TAM-hit 9.house   with 5.rock
       'The boy hit the house with a rock.' (Subj) (V NP) (PP)

To put these Tumbuka prosodic patterns into perspective, penult lengthening (especially of phrase-penult vowels), interpreted as stress, is very common cross-Bantu. (See, e.g., Doke 1954; Downing 2010a; Hyman & Monaka 2011; Philippson 1998; Zerbian, this volume.) Recall from the preceding section that penult lengthening is a cue to prosodic phrasing in Chichewa. It is also very common cross-Bantu for the High tone of a word to be attracted to the penult (see, e.g., Kisseberth & Odden 2003; Philippson 1998). And other languages of the region (roughly, northern Lake Malawi; it is not clear how widespread this is) have what have been called restricted or predictable tone systems: all words must have a High tone. (See Odden 1988, 1999; Schadeberg 1973 for discussion.) Tumbuka prosody illustrates these regional patterns.

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5 High tones are occasionally found on non-lengthened penults, as we see on the verb in example below:

ŵa-líimi) ŵa-lúta ku-múunda)
2-farmer 2-go   LOC-fields
'The farmers have gone to the fields.'

High tones occur so irregularly on non-lengthened penults that it is hard to make a generalization predicting their occurrence. We leave this as a topic for future research.

Because the phrase-penult vowel predictably bears a High tone on its first mora and is lengthened, Tumbuka is sometimes classified as a stress language, rather than a restricted tone language. (See e.g. Kisseberth & Odden 2003.) Pitch change on a lengthened vowel is a cross-linguistically common correlate of stress. However, as work like Hyman (2006, 2014) argues, stress is canonically defined as a word-level, rather than phrase-level, phenomenon. Tumbuka would, then, be a non-canonical stress language. Further, it would be very unusual for a stress language to maintain contrastive tone in a large corner of the lexicon, namely, in the ideophone vocabulary. Finally, as Gussenhoven (2006) argues, it is unusual for a stress language to have just one intonation melody associated with a stressed syllable. Instead, he argues that languages like Tumbuka, where every stressed (lengthened) syllable is realized with a High tone, are not stress languages with phrasal stress, but rather pivot tone languages with phrasal tone, and the phrasal High tone is distinct from an intonational tone. This is the view we adopt in annotating the pitch tracks in the next sections.

# 3 Phrasing and intonation in declarative sentences

The traditional Prosodic Hierarchy (Nespor & Vogel 1986; Selkirk 1986) provides two levels of phrasing relevant to the syntax-phonology interface: Phonological Phrase and Intonational Phrase. While there have been proposals to expand the number of levels, I follow Itô & Mester (2012, 2013) in assuming that just these two levels are sufficient to account for attested patterns of prosodic phrasing. As work like Myrberg (2013) notes, prosodic correlates distinguishing these two levels of phrasing are often hard to pin down and are subject to considerable cross-linguistic variation. However, there is wide agreement on the syntactic distinction between the two levels of phrasing: Phonological Phrases roughly align with lexical XPs, while Intonational Phrases roughly align with root clauses, which can contain more than one lexical XP.[6] I adopt this syntactic distinction

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6 Work defining and illustrating this sort of syntactically-based distinction between Phonological Phrase and Intonational Phrase includes: An (2007); D'Imperio et al. (2005); Gussenhoven (2004: 167); Kanerva (1990); Kisseberth (2010); Nespor & Vogel (1986); Prieto (2005); Selkirk (1986, 2009, 2011); Truckenbrodt (1995, 1999, 2005); Zerbian (2007). It is not the goal of this paper to argue in detail for a particular prosodic phrasing algorithm, but rather to motivate the relevant levels of phrasing for Tumbuka and Chichewa. See Cheng & Downing (2016) for detailed motivation for the phrasing analysis illustrated here, which refines the syntactic correlate of Intonational Phrases to refer to phases: *v*P and CP.

in labeling levels of phrasing in this paper. In the next two sections, I motivate the levels of phrasing in Tumbuka and Chichewa, and illustrate the intonation patterns found in Intonational Phrases in both languages.

3.1 Phonological Phrases and Intonational Phrases in Tumbuka

As shown in (6), above, vowel length and a High tone on the first mora of the penult are conditioned by the right edge of XP. The verb plus its first complement generally form a single phrase, and following complements are phrased separately. Subject NPs and Topics are phrased separately from the rest of the sentence. This phrasing pattern is consistent with the definition of the Phonological Phrase, which is conditioned by XP edges (in this case, a right XP edge). Tumbuka also provides evidence for the Intonational Phrase. The Intonational Phrase is aligned, roughly, with a right clause edge. The penult of the Intonational Phrase is extra long, compared to the penult of a clause-internal Phonological Phrase, and the High tone of the sentence-final Phonological Phrase is realized at a lower pitch than the preceding High tones. We see, though, no systematic downstepping pattern lowering the pitch of High tones before the final High tone of the Intonational Phrase. These phenomena are illustrated in the pitch track in (7), which corresponds to the sentence in (6e):

(7)
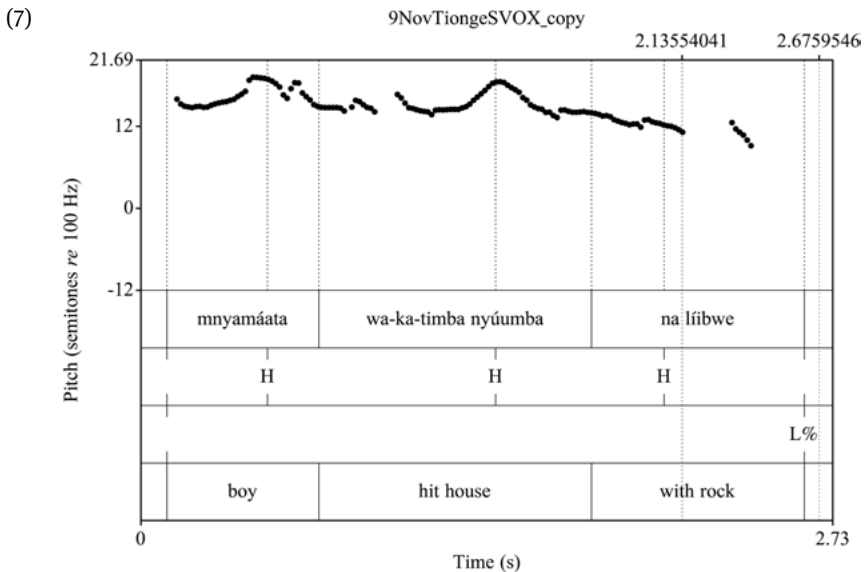
In the above example, the penult vowel durations are: 0.118 secs for *mnyamáata*; 0.120 secs for *nyúumba*; 0.162 secs for *lîibwe*. (Short vowels are roughly 0.06 secs long.) Note that the Intonational Phrase-medial penults are similar in length, whereas the penult of the word in Intonational Phrase-final position is significantly longer. This difference is representative.

Intonational Phrase boundaries are also found at the right edges of initial Topics (8), of clefts (9), and of relative clauses or other subordinate clauses (10); '}' indicates the edge of an Intonational Phrase. I propose that these sentence-internal domains are Intonational Phrases rather than Phonological Phrases, as their right edges are typically marked by a continuation rise: i.e., a H% boundary tone, realized as a (super-)High tone on the final syllable of the phrase:

(8) Topics (Downing 2011a)
  Canonical order
  a. {(ŵáana)} {(ŵa-ku-timba bóola)}
    2.child   2SBJ-TAM-kick 9-ball
    'The children are kicking a ball.'

  Sentence initial topic
  b. {(bóola)} {(ŵáana) (ŵa-ku-yi-tíimba)}
    9-ball   2.child   2SBJ-TAM-9OBJ-kick
    '[As for] the ball, the children are kicking it.'
    [Context: Had been talking about the ball.]

(9) Clefts – copula is *ni/ndi-* (Downing 2010b)
  a. Q 'It is which dog that bit the thief?'
      {(Ni ntcheŵe njíi)}   {(iyo yi-ka-luma   mu-nkhúungu)}
      COP 9.dog   9.which 9.REL 9SBJ-TAM-bite 1-thief

    A1 'It is our big dog that bit the thief.'
      {(Ni ntcheŵe y-ithu yi-kúuru)} {(iyo   yi-ka-luma   mu-nkhúungu)}
      COP 9.dog   9-our 9-big   9.REL 9sbj-tam-bite 1-thief

  OR A2 'Our big dog is the one that bit the thief.'
      {(Ntcheŵe y-ithu yi-kúuru)} {(ndi-yo yi-ka-luma   mu-nkhúungu)}
      9.dog   9-our 9-big   COP-9   9SBJ-TAM-bite 1-thief

(10) Relative clauses (underlined) (Downing 2010b and elicitation notes)[7]

    a. 'The children who are sitting in the tree are eating bananas.'

       {(ŵ-ana aŵo ŵa-khala   mu-khúuni)} ŵa-ku-lya   ma-kóombwe)}

       2-child   2.REL 2SBJ.TAM-sit LOC-5.tree   2SBJ-TAM-eat 6-banana

    b. {(n-tcheŵe iyo   m-nyamata wa-ka-yi-sáanga)}

       9-dog   9.REL 1-boy   1SBJ-TAM-9.OBJ-find

       yi-ka-zyeŵa   mu-ma-thíipa)}

       1SBJ-TAM-be.lost LOC-6-mud

       'The dog which the boy found was lost in the swamp.'

    c. {(mwanalume uyo   mwana wáakhe) m-sungwáana) wa-lwáala)}

       1.man   1.REL 1.child 1.his   1-girl   1SBJ.TAM-be.sick

       wa-ku-luta   náayo) ku   ci-patáala)}

       1SUBJ-TAM-go with.1   LOC 7-hospital

       'The man whose daughter is sick is going with her to the hospital.'

The H% at the right edge of a sentence-initial topic is illustrated by the pitch track on the right in (11b). The two pitch tracks in (11b) show two successive repetitions of the sentence in (11a). As we can see, the subject *amáama* 'woman' is pronounced as a neutral Phonological Phrase in the first repetition, but as a Topic Intonational Phrase, with an H%, in the second repetition. Note that the final Phonological Phrase in the sentence is lowered in pitch in both repetitions:

(11) a. (a-máama) (a-ku-pula   ngóoma)

       2-woman   2SBJ-TAM-pound 9.maize

       'A woman is pounding maize.'

    b.

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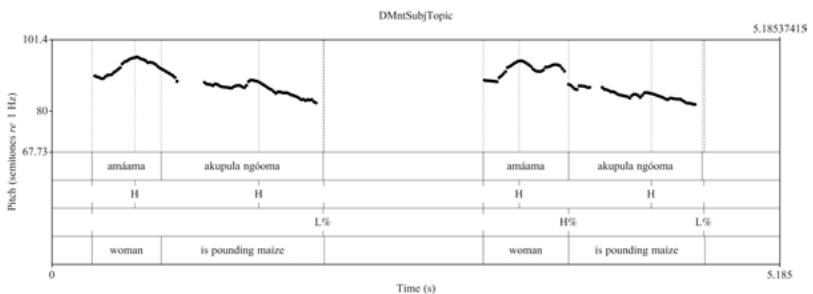
7 Note in (10) that we do not always find the expected Phonological Phrase break following the subject of a relative clause. See Downing (2010b) for more detailed discussion and analysis of the phrasing of relative clauses in Tumbuka.

A continuation rise at the right edge of a relative clause is illustrated in (12) for the sentence given in (10c). Notice in (12) that the entire relative clause preceding the H% boundary tone is realized at a raised pitch register, and the final High tone within the relative clause has a raised pitch. The final Phonological Phrase in the sentence is, as usual, noticeably lowered in pitch.

(12)
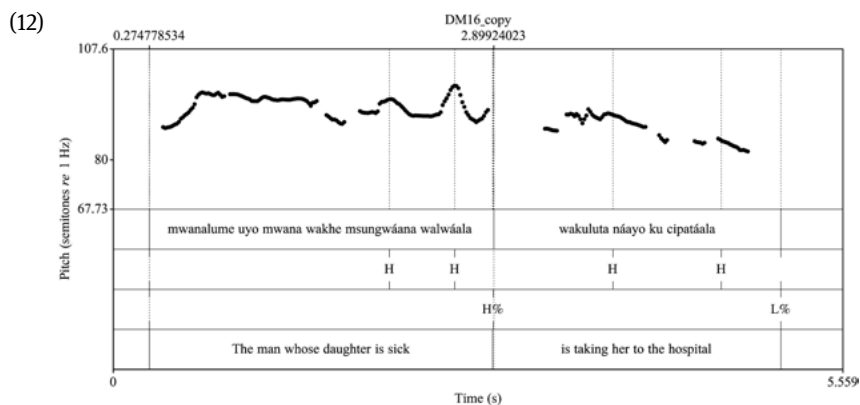
To sum up, Tumbuka prosody provides evidence for both Phononological Phrases and Intonational Phrases. The correlates of the Phonological Phrase are phrase penult lengthening and a High tone on the first mora of the lengthened penult. The correlates of the Intonational Phrase are additional phrase penult lengthening (especially sentence-finally) and boundary tones sentence-finally, as well as at the right edges of Topics, clefts and subordinate clauses. The distinction between Phonological Phrases and Intonational Phrases is nicely illustrated by the pitch track in (12), above. Each penult High tone cues a Phonological Phrase (indicated with parentheses, while the boundary tones cue the Intonational Phrases (indicated with curly brackets):

(13) {{(Mwanalume uyo mwana wakhe msungwáana)
      (wa-lwáala)H% } (wakuluta náayo) (ku cipatáala) L%}
      {{(The man whose daughter)
      (is sick)}(is taking her) (to the hospital) }

One does not find systematic downstepping within the Intonational Phrase. However, raised register in initial Topics and lowering of the final Phonological Phrase leads to a downward trending register within the Intonational Phrase. The fact that an entire phrase can have raised pitch shows that intonation can affect the pitch of more than just a syllable at a phrase boundary. The domain

of influence of the boundary tones and other intonational tones in Tumbuka is a topic requiring further study.

3.2 Intonational Phrases in Chichewa

Kanerva's (1990) prosodic analysis of Chichewa also argues for two levels of phrasing in that language: the Phonological Phrase is the domain of penult lengthening and tone processes, as described in section 2.1, above. The Intonational Phrase is the domain of culminative penult lengthening – similar to what we find in Tumbuka – and downstep (= catathesis in Kanerva's terms). Kanerva, as was typical of his time, does not provide phonetic details of these correlates of the Intonational Phrase, but subsequent work confirms his observations. Myers' (1996, 1999a) careful phonetic study provides an analysis of downstep in Chichewa sentences. Downing & Pompino-Marschall's (2013) phonetic analysis demonstrates that the penult vowel of an Intonational Phrase-final word is significantly longer than sentence-internal lengthened penults.

More problematic is the claim that there are two levels of phrasing in Chichewa. If this were so, then we would expect sentences with similar syntactic structure in Chichewa and Tumbuka to be phrased similarly. However, we have seen that this is not the case. Subject noun phrases are always parsed into a prosodic phrase in Tumbuka. However, as shown by the data in (2), subjects only form separate prosodic phrases in Chichewa when they are topicalized. In Tumbuka, if a verb is followed by two complements, only the first one phrases with the verb. The second one phrases separately. However, as shown in Chichewa, both postverbal complements phrase with the verb: compare the Chichewa phrasing in (1d) with the phrasing of the equivalent Tumbuka sentence in (6e). This is the essential problem to be accounted for in any analysis of Chichewa prosodic phrasing: the Phonological Phrase which includes the VP is bigger than we expect because there is no phrase break following the first complement of the verb. The prosodic algorithm must therefore optimize a Phonological Phrase break setting off subject and topic noun phrases, yet it must not optimize a Phonological Phrase break following noun phrases internal to the verb phrase. Truckenbrodt's (1995, 1999) well-known WRAP constraint is a mechanism for achieving this. WRAP penalizes breaking the verb phrase into more than one Phonological Phrase.

Downing & Mtenje (2011a, b) show, however, that WRAP predicts the incorrect phrasing when the first complement of a verb is modified by a relative clause. The verb plus the modified first complement plus a following complement should be WRAP-ed into a single Phonological Phrase. What we find instead is a prosodic phrase break following the relative clause.

(14) Phrasing of relative clauses violates WRAP; relative clause is underlined
(Downing & Mtenje 2011b)
a. ((Ma-kóló a-na-pátsíra   mwaná a-méné
   6.parent 6SBJ-TAM-give 1.child 1-REL

   á-ná-wa-chezéera) ndalámá zá   mú-longo wáake)
   1SBJ-TAM-6OBJ-visit 10.money 10.of 1-sister 1.her
   'The parents gave [the child who visited them] money for her sister.'

cf.

b. (Ma-kóló a-na-pátsíra   mwaná ndalámá zá   mú-longo wáake)
   6-parent 6SBJ-PST1-give 1.child 10.money 10.of 1-sister   1.her
   'The parents gave the child money for her sister.'

c. (Ti-ku-gáníza kutí m-nyamatá á-pézá   galú
   we-TAM-think that 1-boy   1SBJ.TAM-find 1.dog

   a-méné á-ná-mu-sowéetsa) ku dáambo)
   1-REL 1SBJ-TAM-1OBJ-lose LOC 5.swamp
   'We think the boy will find [the dog which he lost] at the swamp.'

cf.

d. (Subj) (VP) Kanerva (1990: 103, fig (114b))
   (Mwaána) (a-na-pézá   galú kú dáambo])
   1.child   1SBJ-PST1-find 1.dog LOC 5.swamp
   'The child found the dog at the swamp.'

Kanerva (1990) and Downing & Mtenje (2011a,b) show that all embedded com-
plement clauses, including *think/say* clauses, phrase with what precedes in
Chichewa. A break comes only at the end of the most deeply embedded clause:

(15) Embedded and recursive clauses (underlined) (Downing & Mtenje 2011a,b)
a. (Mu-nthu a-méné á-ná-bweréká   búkhú
   1-man   1-REL 1SBJ-TAM-borrow 5.book

   li-méné ndí-ná-gulá ku Liloongwe) w-a-pita   ku Mzúuzu)
   5-REL   I-TAM-buy   LOC Lilongwe 1S BJ-TAM-leave LOC Mzuzu
   'The man who borrowed the book which I bought in Lilongwe has moved
   to Mzuzu.'

b. (Mu-nthu a-méné á-ná-néná   kutí m-balá
   1-man   1-REL 1SBJ-TAM1-say that 9-thief

   i-ná-bá   ndaláama) a-ná-thaawa)
   9SBJ-TAM-steal   10.money 2SBJ-TAM-run.away
   'The man who said that the thief stole some money ran away.'

    c. (Mu-nthu a-na-néná   kutí m-balá <u>i-méné</u>

        1-man   1SBJ-TAM-say that 9-thief 9-REL

    <u>í-ná-bá</u>   ndaláama) i-na-tháawa)

    9SBJ-TAM-steal 10.money   9SBJ-TAM-run.away

    'The man said that the thief who stole the money ran away.'

This range of data shows that prosodic phrases can be quite large in Chichewa, as they regularly right-align with clauses (phases), rather than XPs (e.g., noun phrases).

    I propose, then, that Chichewa prosodic phrases are best characterized as Intonational Phrases, rather than Phonological Phrases. By definition, this is the level of prosodic phrasing that aligns with the syntactic clause (or the phase). Furthermore, boundary tones often coincide with the right edge of the prosodic phrase, as is expected for Intonational Phrases but not for Phonological Phrases. For example, similar to Tumbuka, we find a continuation rise at the right edge of a relative clause. Note in (16) that the words which end each of the Intonational Phrases – *kusáamba* 'swim' and *mtsíinje* 'river' – have the same tone pattern: a HL on the lengthened penult syllable. But the final vowel of *kusáamba* rises in pitch, while the final vowel of *mtsíinje* falls in pitch. Notice, too, that High tones undergo downdrift, with the final High-toned string considerably lowered in pitch, typically barely rising above the level of a preceding Low tone:

(16)
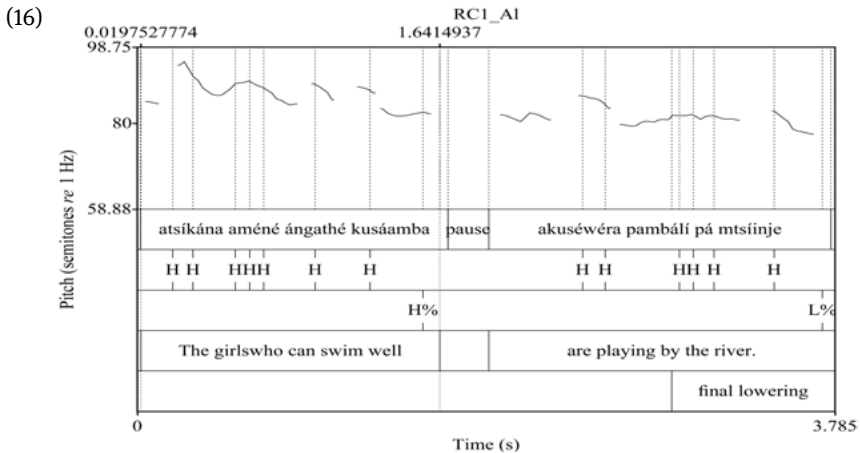
Also similar to Tumbuka, we find a continuation rise following an initial Topic (in this case, a topicalized subject):

(17)
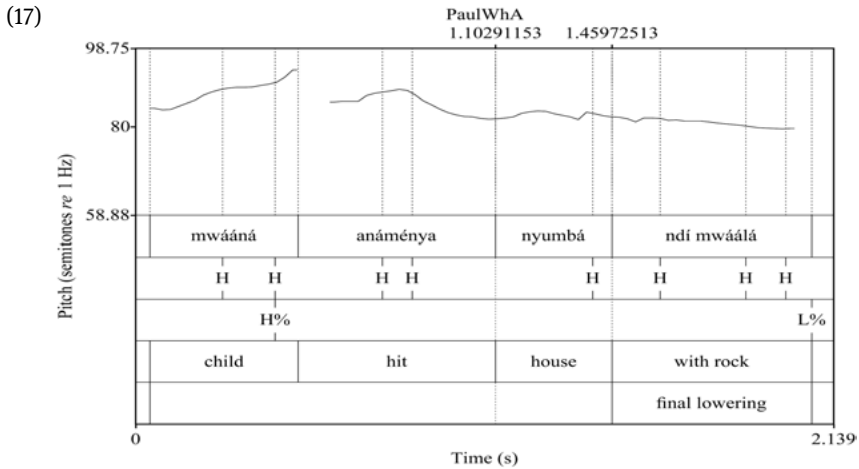
To sum up, we find no strong evidence for a distinction between Intonational Phrase and Phonological Phrase in Chichewa. Prosodic phrasing only seems to motivate an Intonational Phrase level, as phrasing targets clause edges and right edges of initial Topics. (See Connell and Rialland & Aborobongui, this volume, and Zerbian (2006) for discussion of other languages lacking a distinction between Intonational Phrase and Phonological Phrase.) How then, can we define the domain for downstep and culminative penult lengthening, the correlates of Kanerva's (1990) Intonational Phrase? Following work like Itô & Mester (2012, 2013) and Selkirk (2009, 2011), I propose that recursive levels of phrasing can help us avoid multiplying phrase level distinctions in the Prosodic Hierarchy. Adopting this view, Chichewa has recursive Intonational Phrasing and distinguishes a minimal and maximal Intonational Phrase. The maximal Intonational Phrase corresponds to Kanerva's Intonational Phrase, while the minimal Intonational Phrase corresponds to his Phonological Phrase.

4 Intonation of questions and answers

In this section I survey the intonation of both yes-no questions and wh-questions and their answers. Since questions and answers are common contexts for eliciting focus, I briefly take up the (lack) of focus intonation in the final section.

4.1 Yes-no (choice) questions and answers

In both Chichewa and Tumbuka, yes-no questions have the same word order as declaratives. They often begin with a question-signaling word: *kodí* in Chichewa and *kasi* in Tumbuka. These points are illustrated in the examples below:

(18) a. Chichewa yes/no question

(Koodí) (pali a-lakatuli améne á-ná-takása   chidwí   mwá íiwe)
Q   LOC-be 2-poet 2.REL 2SBJ-TAM-speed.up 7.motivation in   you
'Are there poets who speeded up your motivation?'

b. Tumbuka yes/no question

(Káasi), (ni dokotala péera) (uyo wa-ku-vwira mu-sambíizi) (ku-sukúulúu)
Q   COP 1.doctor only (1.REL 1SBJ-TAM-help 1-teacher   LOC-school
'Does only the doctor help the teacher at the school?'

As Downing (2011b) shows, we find a special intonation prosody for yes-no question in both languages, namely, an obligatory rise-fall over the final two syllables of the Intonational Phrase. This is illustrated in the pitch tracks on the next page. Note that downstep is suspended in Chichewa yes-no questions:

(19) Yes-no question intonation in Chichewa
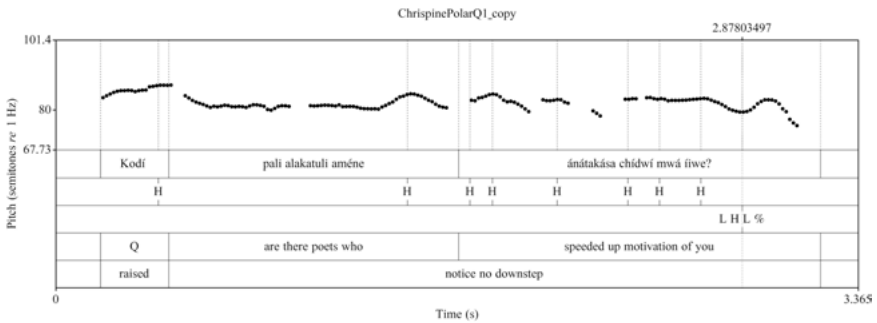
(20) Yes-no question intonation in Tumbuka
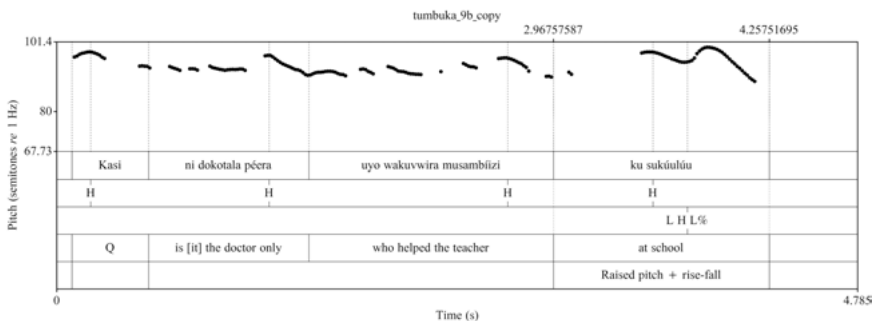
To put these intonation patterns in a wider perspective, a rise-fall melody over the last two syllables of a yes/no question is described for other E. Bantu languages, like Swahili (Ashton 1947). An overall raise in pitch has also been described for yes/no questions in other Bantu languages, like Jita (Downing 1996), as well as N. Sotho (Zerbian 2006) and several other languages discussed in this volume. In fact, cross-linguistically raised pitch is described as common in yes/no questions (Cruttenden 1997; Gussenhoven 2004).

In choice questions, the question prosody is realized only on the first choice in both languages. The rise-fall melody is sometimes truncated in alternate questions in Chichewa, as illustrated in the pitch track on the next page. The second choice undergoes pitch lowering:

(21) a. Chichewa choice question
    (Mu-ku-fúná   khóofíí) (kapéná thíiyi)
    you.pl-TAM-want coffee   or   tea
    'Do you want coffee or tea?'

b. Tumbuka choice question[8]
    (M-nyamáta wa-ka-sanga n-cheŵe ya-ku-zyéeŵáa)
    1-boy   1SBJ-TAM-find 9-dog   9.of-INF-be lost
    (panyákhe m-buzi ya-ku-zyéeŵa) (mu-ma-thíipha)
    or   9-goat 9.of-INF-be lost LOC-6-swamp
    'Did the boy find a lost dog or a lost goat in the swamp?'

c. Pitch track for Chichewa choice question in (a)
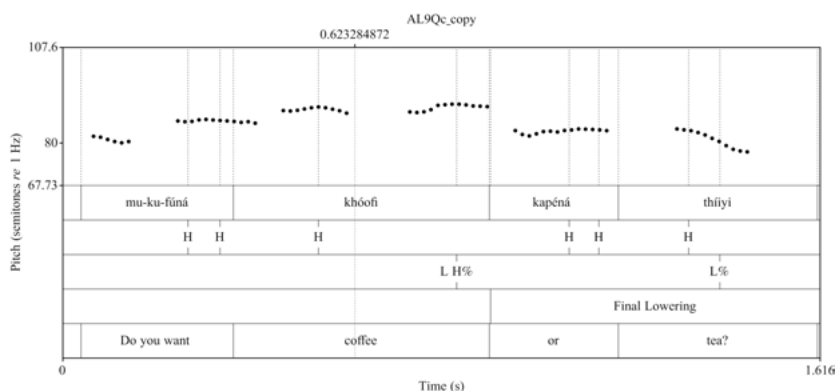
8 Strikingly, the phrase break and position of penult lengthening in this choice question does not highlight the words in focus (e.g. the word for 'dog' and the word for 'goat'). Instead, the Phonological Phrase aligns, as usual, with the right edge of XP. See Downing (2008) and Downing & Pompino-Marschall (2013) for detailed discussion of the problems these data pose for theories of focus prosody.

The question arises, for Chichewa, of how the yes-no question intonation melody interacts with lexical tone in the last two syllables. As shown in the examples below, the full rise-fall melody is only realized if the last two syllables of the word are low-toned. If a High tone is found within that two-syllable window, the melody is simplified. This is illustrated the examples below:

(22) Comparison of Intonational Phrase final tone patterns, Affirmative vs. Yes/No Q
(Downing 2013)

    Affirmative   *Yes/No Q*

a. ... tébuulo   'table'   ... tébuúlóo?
   'No, FATHER has made a <u>table</u>.' Answering,
   'Have the CHILDREN made a <u>table</u>?'

b. ... mpaando 'chair'   ... mpaándóo?

c. ... aáná   'children' ... áánáa?

d. ... b<u>ú</u>uku   'book'   ... búukúu?

The contrast transcribed in (22a) is illustrated by the pitch tracks in (23):

(23) ... tébuúlóo?
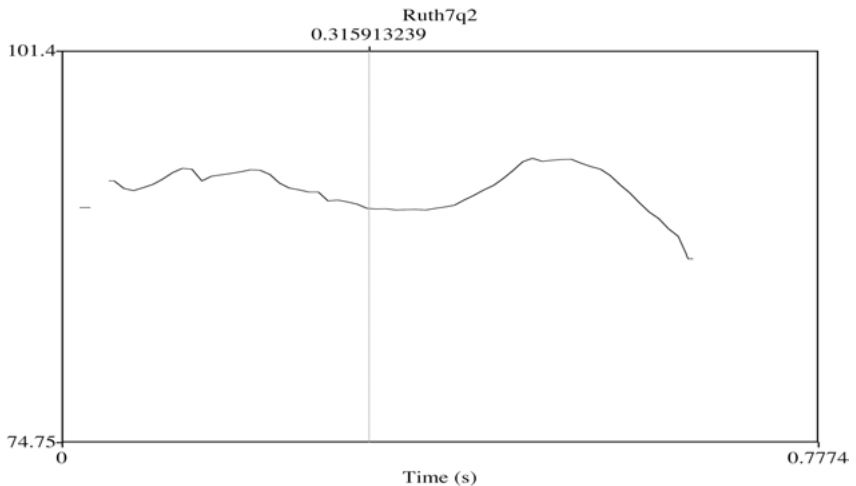
... tébuulo.
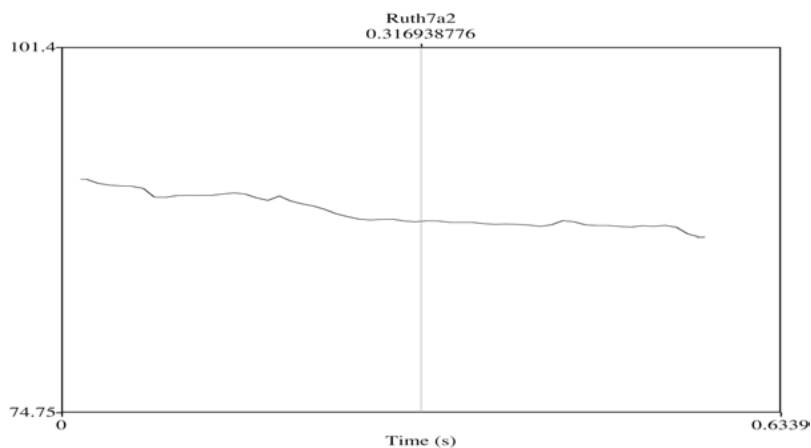
The answers to yes-no questions would, in normal conversation, usually be simple one-word answers. If complete sentence answers are elicited, they have the same intonation as normal declaratives.

4.2 WH-questions (content questions) and answers

In Wh-questions, in contrast, we find no obligatory question melody in either language, though the overall pitch is raised somewhat compared to statements.[9] This is illustrated in the pitch track in (24c) on the next page for Chichewa:

(24) Wh-questions in Tumbuka and Chichewa
   a. Tumbuka Wh-question/answer pair; ')' indicates Phonological Phrase

   Q (U-ka-mu-gulira   njáani)   (mango ya ŵíisi) (ku-gorosáari)
      you-TAM-1OBJ-buy.for 1.who   9.mango 9.of unripe LOC-grocery
      'Who did you buy the green mangoes for at the shop?'

   A (N-kha-mu-gulira   mu-nyáane) (mango ya ŵíisi) (ku-gorosáari)
      I-TAM-1OBJ-buy for   1-my friend 9.mango 9.of unripe LOC-grocery
      'I bought green mangoes for my friend at the shop.'

---

9 Other languages discussed in this volume also demonstrate no special intonation for constituent-questions. See Myers (1996) for further discussion of Chichewa question intonation, and see Downing 2011b for discussion of the position of Wh-words in both Chichewa and Tumbuka.

b. Chichewa Wh-question/answer pair; '{' indicates Intonational Phrase

Q {mwaáná a-ná-ménya chiyáani} ndí mw-áálá}
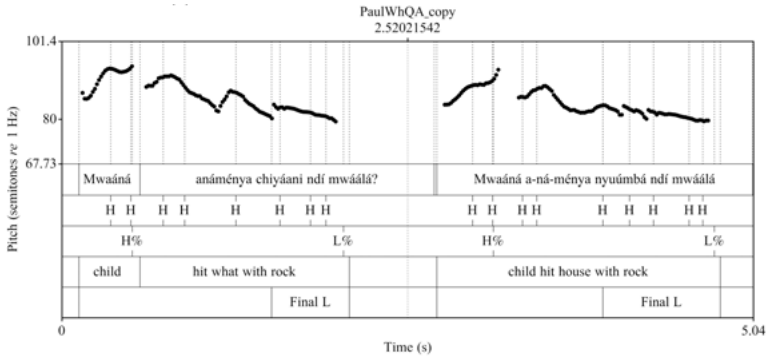   1.child   1SBJ-TAM-hit what   with rock
   'What did s/he hit with the rock?'

A {mwaáná {a-ná-ménya nyumbá ndí mw-áálá}}
   1.child   1SBJ-TAM-hit house   with rock
   'S/he hit the house with the rock.'

c. Pitch track for (b)

As we can see, we find downstep and final lowering in both wh-questions and in their answers. Non-subject wh-question words are not fronted and do not necessarily have special prosody in either Chichewa or Tumbuka. (Though there is some tendency to put a phrase break after a wh-word in Chichewa. See Downing & Mtenje 2011b for discussion.) In Tumbuka, there is, though, an optional raised (↑) register melody on a wh-question word when it appears in sentence-final (Intonational Phrase-final) position, and the final syllable of the wh-question word is also raised (though not quite as High as the penult syllable). This is illustrated in (25):

(25) a. {(Mu-ku-ŵa-vwira   ŵa-zimáayi) (ku-phika ↑ víí!cíí)}
    you.pl-TAM-2OBJ-help 2-woman   INF-cook   8.what
    'What are you helping the women to cook?'

b. Pitch track for (a):
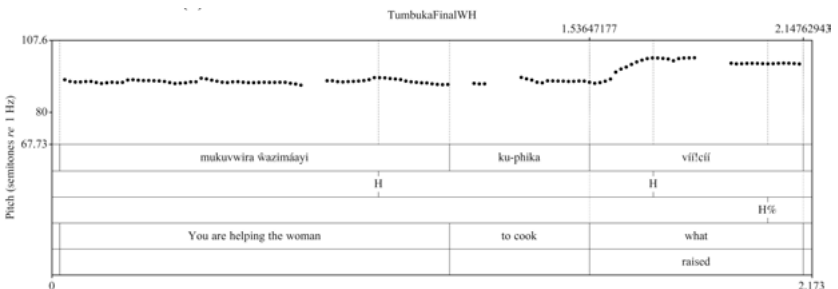
4.3 Focus and emphasis

Neither Tumbuka nor Chichewa has focus prosody, as Downing & Pompino-Marschall (2013) and Downing (2012) have argued in some detail. However, both have what Downing & Pompino-Marschall term 'emphasis' prosody. The register of a word or phrase can be raised to highlight that word. We can see one example of this in (25b), above, where the Tumbuka wh-question word has been emphasized by raising its pitch.

Downing et al. (2004) document emphasis prosody on phrases in focus for one variety of Chichewa, as shown in the data in (26). (The upward arrows in the data indicate register raising on the preceding Phonological Phrase, '‖' indicates optional measurable pause.)

(26) Focus and phrasing in one variety of Chichewa (Downing et al. 2004)
    a. /A-ná-meny-a   nyumbá ndí   mw-alá/
         2SBJ-TAM-hit-FV 9.house with 3-rock
         'S/he hit the house with a rock.'

    b. (A-ná-mény-a nyumbá ndí mw-áálá).   (broad VP focus)

    c. Q (A-ná-ménya nyuúmbá) (ndí mw-áálá) (kapéná ndí ndoodo)?
           'Did s/he hit the house with a rock or with a stick?

        A (A-ná-mény-a nyuúmbá) (ndí mw-áálá) ↑.   (Oblique PP focus)

    d. Q (A-ná-ménya chiyáani) (ndí mw-áálá)?
           'What did s/he hit with the rock?'

        A (A-ná-mény-a nyuúmbá) ↑ ‖ (ndí mw-áálá).   (Object NP focus)

    e. Q (Nyuúmba) (i-ná-táá-ní)?
           'What happened to the house?'

   A (A-ná-méeny-a) ↑ (nyuúmbá) (ndí mwáálá).   (V focus)

As Downing & Pompino-Marschall (2013) argue, the difference between focus and emphasis is that focus is an obligatory grammatical category. Emphasis (prosody) is paralinguistic: gradiently realized in a particular focus context only if the speaker so desires. In both Chichewa and Tumbuka, emphasis prosody is realized with optional prosodic phrasing, and, in addition, with pause and/or pitch span expansion setting off words under emphasis. The pitch tracks in (27) illustrate emphasis intonation for the Chichewa data in (26):
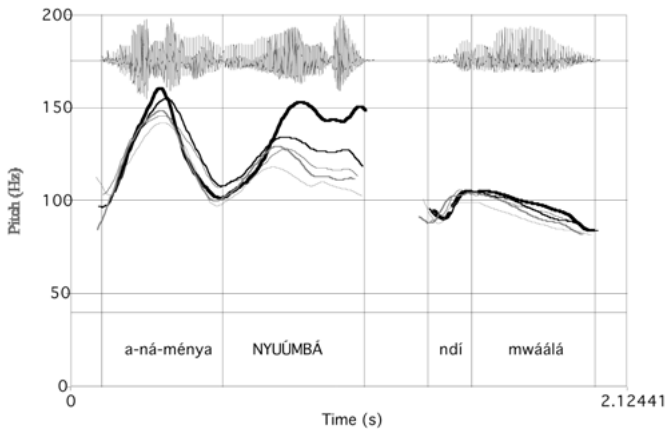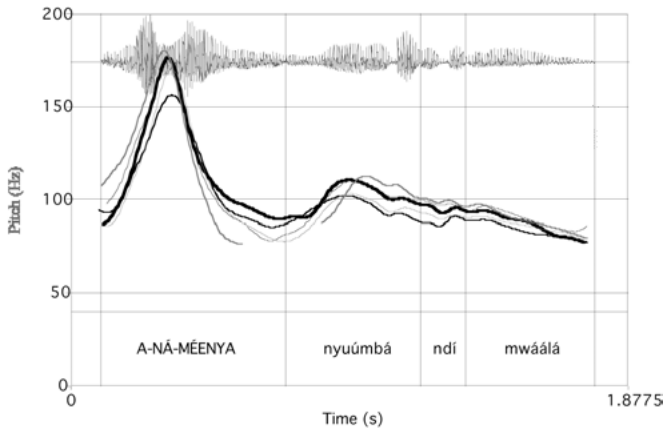
(27)

cf.
(26b)
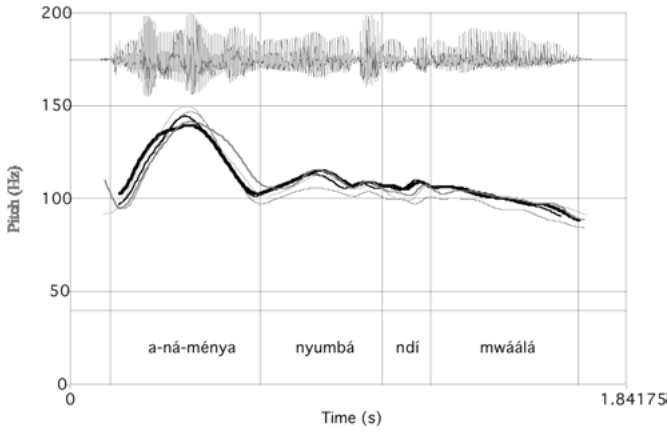
cf.
(26c)
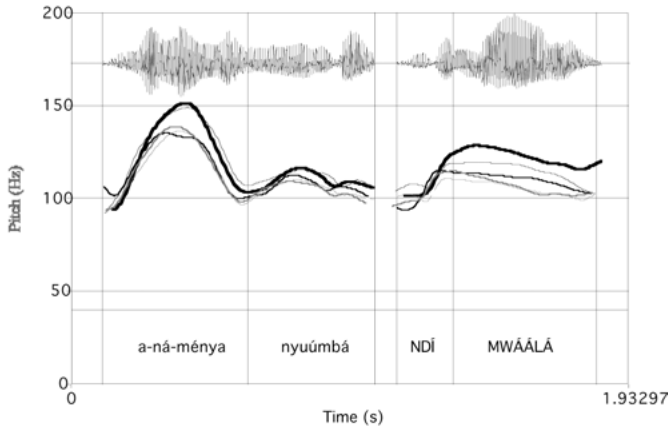
cf.
(26d)

cf.
(26e)

Downing's (2012) recent survey shows that, in fact, focus prosody is not commonly attested in African languages. In this volume, absence of focus prosody is explicitly demonstrated in Makasso et al's study of Basaa. In contrast, the chapters by Kisseberth, Kügler and Patin, this volume, show that focus (and/or emphasis) can affect prosody in some African languages, while Rialland & Aborobongui, this volume, thoughtfully distinguish the effect of focus and emphasis on Embosi prosody.

5 Interaction of tone and intonation: concluding remarks

This chapter has compared the tone and intonation of Chichewa and Tumbuka. The commonalities are striking, since the lexical prosodic systems of the two languages are quite different. This raises the question of whether phenomena like the continuation rise, register raising for emphasis, lowering of a final phrase and question prosody for yes-no questions but not wh-questions are areal phenomena. Is the similar yes-no question prosody in the two languages are more narrow areal phenomena? Further study is needed to shed light on these issues.

   To place the languages in a broader typological perspective, Hyman & Monaka (2011) has proposed that three different types of interaction of intonational and lexical tones follow from a sequential model of realization of intonational melodies: *Accommodation*: the two minimally interact, and both are realized.

Submission: intonational tones override lexical tones. *Avoidance*: intonation is minimized. (See Connell, this volume, for an example of a tone language that avoids intonation.) However, other work (e.g., Beckman 1995, Myers 1996, Pierrehumbert & Beckman 1988) proposes that an additional interaction – *Superposition* – is required to account for intonational tones that affect the pitch range or register of other tones in the representation. Intonation is not avoided or minimized in either Chichewa or Tumbuka, nor does intonation override lexical tones. This study of intonation instead has illustrated the importance of *accommodation* and *superposition*. Both languages have H% and L% boundary tones. The H% boundary tone is realized similar to a lexical (Chichewa) or phrasal (Tumbuka) High tone when it can be accommodated. Accommodation is possible when the final syllable of the Intonational Phrase is toneless. The yes-no question melodies also are accommodated: they adapt to the lexical or phrasal tones of the Intonational Phrase-final word, as shown in section 4. In contrast, the L% boundary tone is always superimposed: it has the effect, in both languages, of lowering the register of a final string. The H% can also be superimposed and have the effect of raising the nearest H tones. Register raising of a longer string is used for optional emphasis – of initial Topics, of wh-words (in Tumbuka), to highlight words in focus, and for other reasons of speaker choice. Disentangling the accommodation and superposition realizations of boundary tones must remain a topic of future research.

Acknowledgements

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