Focus and Tone*

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Tone is a distinctive feature of the lexemes in tone languages. The information-structural category focus is usually marked by syntactic and morphological means in these languages, but sometimes also by intonation strategies. In intonation languages, focus is marked by pitch movements, which are also perceived as tone. The present article discusses prosodic focus marking in these two language types.

Keywords: Tone (language), intonation (language), focus, pitch accent, prosodic phrasing

1 Introduction

This article aims at a definition of *focal tone*, i.e., tone that signals the information-structural category of focus. It analyses focal tone from two typological perspectives. First, it examines focus marking by pitch accents in intonation languages. Second, it looks at the relation between focal and lexical tones in tone languages. Due to possible conflicts between these tones, tone languages make much less use of focal tone than intonation languages do when it comes to the realization of focus. Instead, tone languages either resort to morphological or syntactic focus strategies, or employ other prosodic strategies to mark a focused constituent.

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2 General Properties of Tone

Tone is a phonological category that distinguishes words or utterances. It refers to pitch differences perceived as variations of the fundamental frequency (f_0). Since pitch varies considerably in spoken language, depending on the sex, age, body height or emotional state of the speaker, it is not the absolute pitch value that determines the phonological category of tone, but its relative value within a word or phrasal contour. A language that uses tone to differentiate word meanings is called a *tone language*.

We distinguish two types of tones: *Level tones* are characterized by a constant pitch. Tone languages have at least two contrasting level tones, a high (H) and a low (L) tone. In addition, many tone languages have a mid tone (M), and may even possess more distinctive level tones. *Contour tones* consist of a combination of two level tones. Rising tones combine an L and an H tone (LH), and falling tones combine an H and an L tone (HL). Evidence for contour tones as tonal combinations comes from Hausa, a Chadic tone language with a fairly simple phonemic tone system (H, L and HL). In Hausa, each vowel is associated with a tone. (1) shows that contour tones are derived by tonal processes under various circumstances. (i) Some Hausa words have optional vowel elision (VE), deleting the segment, but not the associated tone. What results is a *floating tone* that reassociates with the preceding tone-bearing unit (TBU), a vowel carrying a high tone, to form a falling tone (1a). (ii) Underlying floating tones as parts of suffixes combine with preceding tones in word formation processes, e.g. in the formation of verbal nouns (1b), or definite noun phrases (1c); cf. Newman (2000:604):[1]

[1] Concerning the notation of tones, I follow the Africanist tradition and mark a high tone with an acute accent on the TBU (á), a low tone with a grave accent (à). Falling and rising contour tones are annotated as *â* and *ǎ*, respectively, where the resulting tone mark is understood iconically.

(1) a. mùtúmìi → mùtúm ` (VE) → mùtûm (HL) ‘man’
b. dáawóo + `wáa → dáawóòwáa ‘(the) return’
c. hùulá + `ř → hùulâř ‘(the) cap’

Tone languages use tone to differentiate lexical (2a) and grammatical (2b) meanings, as illustrated again with minimal pairs from Hausa (examples in (2b) are from Newman 2000:600):

(2) a. tsáaràa – tsáaráa ‘to arrange, to organize – an equal, age-mate’
kúukàa – kúukáa ‘baobab tree – crying’
gàagáràa – gáagàráa ‘be impossible for, – cut with blunt instrument’

b. màatáa – máatáa ‘wife – wives’ *plural*
dáfàa – dàfáa ‘to cook – cook!’ *imperative*
sháa – sháà ‘to drink – drinking’ *verbal noun*
táa – táà ‘she (completive) – she (potential)’ *aspect*

In (2a), the tones form part of the lexical information. Since the lexical items are segmentally identical, the lexical meaning of these minimal pairs is differentiated only at the tonal level. In (2b), tone has an inflectional function. It indicates different grammatical forms of one lexeme, such as singular vs. plural, infinitive vs. imperative, infinitive vs. verbal noun, or completive vs. potential aspect. I have not come across a minimal triple in Hausa, but minimal n-tuples exist in many tone languages; see, e.g., Yip (2002).

Regarding the phonological representation of tone, we follow the tradition of autosegmental phonology (Leben 1973, Goldsmith 1976) and assume that tones are represented on a tier that is associated with, but otherwise independent from, the segmental tier. Tones are associated with the nucleus of the syllable, i.e., with vowels or syllabic consonants.

3 Focus and Prosody in Intonation Languages

Tone plays a fundamentally different role in *intonation languages*, which use "suprasegmental phonetic features to convey 'postlexical' or sentence-level pragmatic meanings in a linguistically structured way" (Ladd 1996:6). This section discusses the realization of focus by pitch accents, which are perceived also as tones. In intonation languages, the placement of pitch accents represents the main strategy of focus marking.

For this discussion it is important to keep apart the linguistic concepts of stress, accent, and tone, especially since they often overlap; cf. Downing (2004). Generally, *stress* is an abstract term that refers to the manifestation of relative prominence. It is assigned to the strong syllable of a prosodic foot. Thus, stress forms the basis of the rhythmic organization of a language. Its phonetic correlates include an increase in duration, loudness, or pitch.

In addition, stressed syllables may receive an *accent* on a higher prosodic level. The function of this accent is to mark a particular word within a prosodic phrase as acoustically prominent (*phrasal accent*), i.e. in a *phonological phrase* or an *intonation phrase* (for a definition of the prosodic hierarchy, see e.g. Selkirk 1984, Nespor & Vogel 1986). Phonetically, phrasal accents are the result of pitch variations, hence the term *pitch accent*. For more discussion of these concepts, see Ladd (1996) and Gussenhoven (2004). The location of a phrasal accent depends on grammatical as well as pragmatic factors. Two major grammatical factors are the distinction between heads and complements on the one hand, and adjuncts and arguments on the other. Given a pragmatically neutral clause, (internal) arguments form prosodic phrases together with their heads. In this case, the phrasal accent is assigned to the argument. Adjuncts are always phrased separately (cf. Selkirk 1984, 1995, and Uhmann 1991 for German). The pragmatic factors that influence the distribution of phrasal accents

concern the information structure: In intonation languages, phrasal pitch accents mark topical and focused constituents. (For a definition of the information structural notions of topic and focus, cf. Krifka, this volume).

Since pitch accents and lexical tones involve pitch movement, it is not always trivial to differentiate them, even more since many languages have both, accent and tone (cf. Downing 2004, and the discussion in the next section).[2]

Intonation languages use pitch accents as the principal means of focusing.[3] Most intonation languages use the H*L falling tone as a pitch accent to mark a focus, where the * following the H tone signals that the tone on the accented syllable is high.[4] Given the general interpretation of this tone as involving "a sense of finality, or completeness, definiteness, and separateness when used with declaratives" (Cruttenden 1986:100), the preference for the H*L tone as a focal pitch accent is easy to understand. Another very general feature of focus

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[2] The typological classification of languages concerning stress and accent is not consistent in the literature. Some phonologists consider *accent languages* to be a subtype of tone languages as they have lexical tones with a contrastive function only to a very limited extent (e.g., Yip 2002). Others define accent languages as identical to what I call here *intonation languages* (e.g., Hall 2000).

[3] Apart from pitch accents, the focused constituent can be marked by additional grammatical means, such as displacement. In German, for instance, the focused constituent can be fronted. Note that any fronted focused constituent has to be associated with a pitch accent.

[4] This does not imply, of course, that *all* H*L pitch accents mark a focus. Notice also that other types of pitch accents may also be used to mark focused constituents. Thus, in coordinated structures containing an ellipsis, the focus on the first conjunct is generally marked by a L*H accent that indicates the non-finality of the structure (cf. Féry & Hartmann 2005), cf. the Right Node Raising construction in (i):

		L*H		H*L		
(i)	Luise	SCHNEIdet	und Finja	FALtet	das	Papier.
	Luise	cut.3SG.PRÄS	and Finja	fold.3SG.PRÄS	the	paper

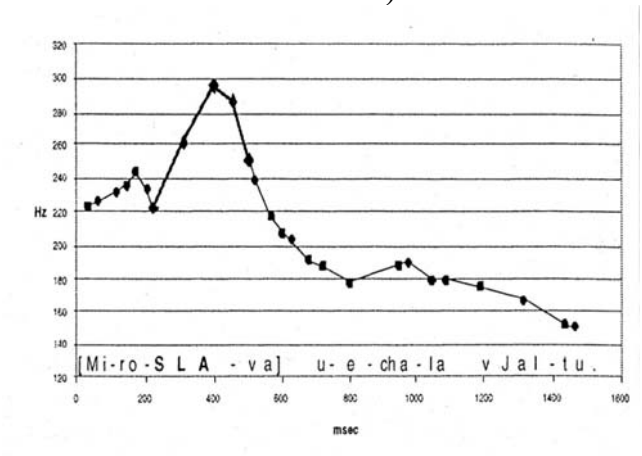
'Luise is cutting and Finja is folding the paper.'

Apart from the H*L pitch accent, Pierrehumbert and Hirschberg (1990:289) attribute an interpretation as new to the H* accent in English.

intonation is the drop in pitch after an early nuclear accent. The postfocal contour is deaccented, due to the fact that there are no more accent targets following the focus. Thus, the pitch range, which is expanded on the focus constituent, is compressed postfocally. These properties of focal intonation are illustrated in the following pitch track from Richter & Mehlhorn (2006:357). (3) is a Russian sentence with (contrastive) subject focus, and (4) is the corresponding pitch track.

(3) MIROSLAVA uechala v Jaltu.
M. left for Yalta
'It is Miroslava who left for Yalta.'

(4) Intonation contour in a sentence with contrastive subject focus (Richter & Mehlhorn 2006)



The pitch track above illustrates quite clearly the association of the most prominent syllable of the subject *sla* with the high tone and the following low trail tone. It also shows deaccentuation of the postfocal material.

The aim of the present section has been to show that intonation languages use prosodic means to indicate information structure. It was argued that the placement of an H*L pitch accent represents the main strategy to mark a focus in intonation languages. A pitch accent triggers expansion of the pitch range. After the nuclear accent, the pitch range is considerably compressed.

4 Focus and Prosody in Tone Languages

The last section illustrated one central function of pitch in intonation languages: Pitch marks the focused constituent in a clause. The present section looks at some tone languages and argues that intonation also plays a role for the purpose of marking focus.

It is expected that tone languages do not use pitch accents to the same extent as intonation languages to mark a focus constituent, since lexical tones must be retrievable through the derivation of a clause. Given that pitch accents and lexical tones are phonetically quite similar (both are produced by pitch modulations within the same pitch range), the complete obliteration of lexical tones by an intonation pattern is avoided. And indeed, tone languages seem to use intonation to a lesser extent for focus marking than intonation languages (cf. Cruttenden 1986:80). Still, some intonation effects of focus can be observed in tone languages as well. The following sections discuss f_0-expansion and prosodic phrasing. It is shown how the lexical tone contour is recovered under modification by intonation. Thus, the pragmatic meaning (from intonation) does not obscure the lexical meaning (from tone).

4.1 F_0-expansion

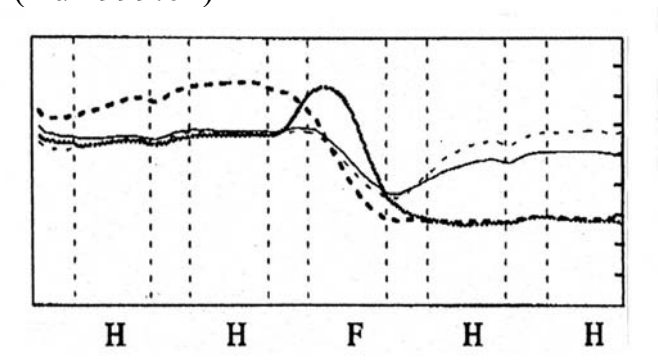
A first intonation strategy to mark a focused constituent in tone languages is the expansion of the f_0-contour. As an effect of f_0-expansion, the high points of the tones are raised, and the low points are lowered. F_0-expansion does not change the general course of intonation, but results in a more expanded shape of the intonation contour.

Xu (1999) discusses effects of focusing in Mandarin Chinese, a tone language with four contrastive tones. Xu (1999) shows that focus influences the f_0-contour in Mandarin declarative clauses: The f_0-contour on the focused (in situ) constituent is expanded. Thus, the high tones are realized with a higher

pitch, and the low tones with a lower pitch. The expansion is significant on non-final focused words (see broken line and bold line in the figure in (6)). On final focused words, however, the pitch expansion is much smaller (see dotted line in (6)). Like in intonation languages, the f_0-contour of a post-focal tone is considerably suppressed. Xu examines three-word declarative clauses with minimal lexical variation, which at the same time exhibit a large number of tonal combinations. The pitch track in (6), from Xu (1999:64), illustrates the sentence in (5), an example consisting of two bisyllabic words with high level tones (H) in subject and object positions, and one monosyllabic word with a high falling tone (F), under various focus conditions. (Please note that the test sentence in (5) is a nonsense sentence that keeps tonal variation to a controllable minimum).

(5)
H H F H H
| | | | |
māomī mài māomī
kitty sells kitty
'Kitty sells kitty.'

(6) Effects of focus on an f_0 curve. Normal line: neutral focus, broken line: focus on word 1, bold line: focus on word 2, dotted line: focus on word 3 (Xu 1999:64)



The pitch track shows that the f_0-contour of the focused constituent is expanded. Comparing the curve of the neutral focus clause with the curves of the narrow foci on the first, second, and third word, it reveals that the pitch is significantly

raised on the focused words. The observation that the effect of focus is smaller on final focused words is possibly due to an interaction of focus with declination, a downtrend of the intonation contour also present in Mandarin Chinese (cf. Xu 1999:99ff).

Pitch expansion of the focus constituent is also attested in Hausa, a non-cognate tone language. Leben, Inkelas & Cobler (1989) discuss a process of *local high raising* "where a single High tone on an individual word is raised to highlight that word" (Leben, Inkelas & Cobler 1989:46). High raising occurs on focus constituents in the left periphery of the clause, i.e., subject foci and ex situ non-subject foci. Example (7) with subject focus is taken from their article; high raising is indicated by an upwards directed arrow:

(7) Máalàm ↑**Nú**hù née // yé hánà Láwàn // híirá dà Hàwwá.
Mister N. PRT 3SG.PERF prevent L. chat with H.
'It was Mister Nuhu // who prevented Lawan // from chatting with Hawwa.'

A comparison of the phonetic realizations of the subject shows that the high tone of the name *Núhù* is produced much higher if the subject is focused. Notice that, in addition to high raising, a focused constituent in the left periphery is also separated from the rest of the clause by a prosodic boundary (indicated by // in (7), cf. again Leben, Inkelas & Cobler 1989). This prosodic boundary effects a suspension of downdrift, i.e., the lowering of an H tone after an overt L tone, which typically determines the intonation structure of Hausa declarative sentences (cf. Newman 2000).[5] Note that a focused constituent does not have to

[5] It must be noted that ex situ focus in Hausa is not uniquely marked by prosodic means. In addition, there are syntactic and morphological effects of ex situ focus marking: First, non-subject ex situ focus is indicated by syntactic reordering. Second, ex situ focus is

be displaced, but can stay in its canonical *in situ* position (cf. Jaggar 2001). The prosodic focus strategies discussed for Hausa ex situ focus do not apply to the cases of in situ focus: In situ focus in Hausa is generally unmarked (cf. Hartmann & Zimmermann, in press).

4.2 Prosodic phrasing

A second strategy used by some tone languages to mark focus is the insertion of a prosodic boundary before, or in the vicinity of, the focused constituent. This is also an *intonation* strategy since the boundary is indicated tonally.

A tone language that marks focus by prosodic rephrasing is Nkhotakota Chichewa, a Bantu language (Kanerva 1990, Downing, Mtenje & Pompino-Marschall 2006). The examples in (8) show that the expression of focus affects the prosodic phrasing of the Chichewa clause: The focus constituent is located at the right edge of a phonological phrase as indicated by lengthening of the penultimate syllable and tone lowering on the phrase-final vowel (phrase boundaries are indicated by parentheses):

(8) a. What did he do? *VP focus*
(*anam**é**nyá ny**u**mb**á** ndí mwáála*)
he.hit house with rock
'He HIT THE HOUSE WITH A ROCK.'

b. What did he hit with the rock? *OBJ focus*
(anam**é**ny**á** *ny**uú**mb**a***) (ndí mwáála)
he.hit house with rock
'He hit THE HOUSE with a rock.'

c. What did he do to the house with the rock? *V focus*
(*anam**éé**ny**a***) (ny**uú**mb**a**) (ndí mwáála)

accompanied by a morphological change in the perfective and imperfective aspectual markers. Third, ex situ foci are optionally followed by a focus sensitive particle.

he.hit house with rock
'He HIT the house with a rock.'

If the VP is focused as in (8a), the whole VP forms a prosodic unit. Narrow focus on either the object (8b) or the verb (8c) effects a prosodic phrase boundary immediately after the focused constituent, evidenced by penultimate lengthening and final lowering (*nyuúmba* and *anaméenya*, respectively); see also Truckenbrodt (1995, chap 5.2).[6]

Focus marking by prosodic phrasing is also found in Tangale, a West Chadic tone language with SVO basic word order. In perfective neutral clauses, the verb and the object form a phonological phrase, which is indicated by several phonological processes, two of which are discussed below (see also Kidda 1993, Hartmann & Zimmermann, to appear). First, the verb does not appear in its citation form, but undergoes a process of final vowel elision (VE) if followed by an object in neutral clauses (Kenstowicz 1985:80). Thus, the verb /*màdgó*/ ('read.PERF') changes to /*màdg*/ and surfaces as [*màdùg*] after epenthesis of [*u*] for ease of syllabification:

(9) Áudù màd-*ùg* líttáfì. *neutral*
A. read-PERF book
'Audu read a book.'

The second process that applies within prosodic units is left line delinking (LLD; Kenstowicz 1985:82, Kidda 1993:118). LLD detaches tones that have spread to the right from their original tone-bearing unit. In (9) the high tone from the underlying verb /*màdgó*/ spreads onto the first syllable of the following

[6] Downing, Mtenje & Pompino-Marschall (2006) show that some speakers of Ntcheu Chichewa also raise the pitch register of the phonological phrase containing the focus element if the phonological phrase contains high tones.

object and is then delinked from its original tone-bearing unit (note that /*màdùg*/ is underlyingly low toned).

When the object is focused, as in (10), it is separated from the verb by a prosodic phrase boundary. The presence of this prosodic boundary effects the blocking of VE and LLD; cf. the ungrammaticality of (11).

(10) Q: Áudu mad-*gó* náŋ?
A. read-PERF what
'What did Audu read?'

A: Áudu mad-*gó* líttáfi.
A. read-PERF book
'Audu read A BOOK.'

(11) * Q: *Áudu mad-*ug* náŋ?

A: Áudu mad-*ug* líttáfi.

In the wh-question as well as in the corresponding answer in (10), neither VE nor LLD applies. The verb *màdgó* still associates with a high tone.

Focused subjects cannot stay in their canonical preverbal position but appear postverbally; compare (12):

(12) a. [$_S$ Malay [$_{VP}$ múdúd-gó]] *neutral*
M. die-PERF
'Malay died.'

b. [$_S$ t_1 múdúd-gó] nóŋ$_1$? *SUBJ-focus*
die-PERF who
'Who died?'

(12b) shows that VE and LDD are also blocked on the verb if it is followed by a focused subject in postverbal position. This could be taken as an indication that the postverbal position is the canonical focus position in Tangale. It also shows that the focused constituent must form its own prosodic phrase; see Hartmann & Zimmermann (to appear) for further discussion.

5 Conclusion

The intention of the present article has been to clarify the notion of tone and pitch accent as indicators of focus. The article took two perspectives. First, it looked at accentual realizations of focus in intonation languages, where focus is obligatorily marked by pitch accents. Second, it investigated two intonation strategies of focusing in tone languages, f_0-expansion, often going hand in hand with postfocal f_0 compression, and prosodic phrasing. It is interesting to note, though, that intonation focus strategies are scarce in tone languages. Rather, tone languages prefer to resort to morphological and/or syntactic strategies of focus marking. This result meets our expectation that intonational pitch accents and lexical tone are not easily compatible. I hope that the present article will contribute to disentangle the complex interaction of focus and tone in different language types.

References

Cruttenden, A. (1986) *Intonation*. Cambridge: Cambridge University Press.

Downing, L. (2004) What African Languages Tell Us about Accent Typology. *ZAS Papers in Linguistics* 37: 101–136.

Downing, L., A. Mtenje and B. Pompino-Marschall (2006) *Prosodic Cues to Focus in Chichewa*. Ms. ZAS, Humboldt University Berlin, University of Malawi.

Féry, C. and K. Hartmann (2005) Focus and Prosodic Structures of German Gapping and Right Node Raising. In *The Linguistic Review* 22:67–114.

Goldsmith, J. (1976) *Autosegmental Phonology*. Ph.D. dissertation, MIT.

Gussenhoven, C. (2004) *The Phonology of Tone and Intonation*. Cambridge: Cambridge University Press.

Hall, T. (2000) *Phonologie*. Berlin: de Gruyter.

Hartmann, K. and M. Zimmermann (in press). In Place — Out of Place? Focus in Hausa. In K. Schwabe and S. Winkler (eds.) *On Information Structure, Meaning and Form.* Amsterdam: John Benjamins.

Hartmann, K. and M. Zimmermann (to appear) Focusing in Chadic — The Case of Tangale Revisited. *Studia Linguistica.*

Jaggar, P. (2001) *Hausa*. Amsterdam: John Benjamins.

Kanerva, J. (1990) *Focus and Phrasing in Chichewa Phonology*. New York: Garland.

Kenstowicz, M. (1985) The Phonology and Syntax of WH-expressions in Tangale. *Studies in the Linguistic Sciences* 15: 79–91.

Kidda, M. E. (1993) *Tangale Phonology. A Descriptive Analysis*. Berlin: Reimer.

Ladd, R. D. (1996) *Intonational Phonology*. Cambridge: Cambridge University Press.

Leben, W. R. (1973) *Suprasegmental Phonology*. Ph.D. dissertation, MIT.

Leben, W. R., S. Inkelas and M. Cobler (1989) Phrases and Phrase Tones in Hausa. In: P. Newman and R. Botne (eds.) *Current Approaches to African Linguistics*. Dordrecht: Foris. 45–61.

Nespor, M. & I. Vogel (1986) *Prosodic Phonology*. Dordrecht: Foris.

Newman, P. (2000) *Hausa*. New Haven & London: Yale University Press.

Pierrehumbert, J. and J. Hirschberg (1990) The Meaning of Intonational Contours in the Interpretation of Discourse. In: P. Cohen, J. Morgan and M. Pollack (eds.) *Intentions in Communication*. Cambridge, MA: MIT Press. 271–311.

Richter, N. and G. Mehlhorn (2006) Focus on Contrast and Emphasis: Evidence from Prosody. In V. Molnár and S. Winkler (eds.) *The Architecture of Focus*. Berlin: Mouton de Gruyter. 347–371.

Selkirk, L. (1984) *Phonology and Syntax: The Relation between Sound and Structure*. Cambridge, MA: MIT Press.

Selkirk, L. (1995) Sentence Prosody: Intonation, Stress, and Phrasing. In J. Goldsmith (ed.) *Handbook of Phonological Theory*. Oxford: Blackwell. 550–569.

Truckenbrodt, H. (1995) *Phonological Phrases: Their Relation to Syntax, Focus, and Prominence*. Ph.D. dissertation, MIT.

Uhmann, S. (1991) *Fokusphonologie*. Tübingen: Niemeyer.

Xu, Y. (1999) Effects of Tone and Focus on the Formation and Alignment of F_0 Contours. *Journal of Phonetics* 27: 55–105.

Yip, M. (2002) *Tone.* Cambridge: Cambridge University Press.

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