Polar question intonation in five Ghanaian languages

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Ohala 1984 and Bollinger 1978 write that polar ("yes/no") questions almost always have a final rise in pitch, e.g. "Terminals are almost universally low or falling for finality and assertion, and high or rising for the opposite, including yes-no questions…" (Bollinger 1978:471). This holds for a wide range of languages, from English and other well-known European languages to Huastec of Mexico (Larsen and Pike 1949) and Kunimaipa of Papua New Guinea (Pence 1964).

Studies in tone languages are rarer, but exist: Chengdu Chinese (Chang 1958), Chrau of Vietnam (Thomas 1966), Thai (Luksaneeyanawin 1998), and Yoruba (Fajobi 2011) all raise the final pitch of polar questions.

However, some European languages do fall in final pitch, e.g. Russian (Svetozarova 1998:268). Furthermore, Rialland in recent studies (2007, 2009) (see also Clements & Rialland 2008) has noted that African languages commonly have falling final pitch in polar questions: 36 out of 78 languages in Rialland (2007), and 66 of 119 in Rialland (2009) show this pattern. Rialland (2009) has further proposed a cluster of properties which comprises "lax question prosody." Some "lax prosody" African languages display all of these; others display a subset.

(1) a. falling pitch, specifically a Low or L%
b. final vowel lengthening
c. sentence-final low vowel /a/
d. breathy termination

These contrast with "high prosody" languages, which have some sort of High tone added, register expansion, cancelling of downstep, etc.

A previous study of Kɔnni (Cahill 2012) puts this language firmly in the lax prosody camp, showing properties (1a) and (1b). Polar questions lengthen the final vowel or nasal, and have some variety of a falling final pitch. This can be transcribed in terms of phonemic tones, as in the following case, which adds a Low tone to the final lengthened vowel:

(2) a. ù sìé gìlìnsìèlé — s/he is dancing the gilinsiele dance
b. ù sìé gìlìnsìèléè — is s/he dancing the gilinsiele dance?

However, not all patterns are that simple, as seen in the following, which must add LH and HLH autosegments, respectively, showing that final falling pitch (1a) can be accomplished in a variety of ways.

(3) a. ù ŋmìá gúúm!**bú** — s/he is rolling rope
b. ù ŋmìá gúúm!**bú!ú** — is s/he rolling rope?

(4) a. ù dàwá níí**gè** s/he has bought a cow
b. ù dàwá níí꜒**gé꜒é** has s/he bought a cow?

The current study extends this to five other Ghanaian languages, testing the lax properties in (1), but also proposes an additional characteristic, also found in Kɔnni: pitch raising even in "lax prosody" languages. The study includes the Gur languages Buli, Deg, and Safaliba, and the Kwa languages Adele and Chumburung (one male speaker per language, except two for Deg). With the limited amount of data, this study must be considered preliminary, but it is still quite suggestive.

These languages realize the lax properties as follows. All five have some sort of falling pitch (1a), and long final vowel (1b). Three of the five (Buli, Deg, Chumburung) add a sentence-final /-áà/ (1c), but Safaliba and Adele merely lengthen the underlying final vowel or nasal. Chumburung consistently has final [h] in polar questions, and Deg includes it sporadically. This can be considered "breathy termination" (1d).

Falling pitch in these languages is only sometimes created by L, as seen below.

(5) Adele simply lowers the final pitch phonetically (transcriptions approximate):

a. HL è dé fótù, è dé fótùù he is holding photo, is he holding photo?
b. LH èɛ́ kòrò èkpèɛ́, èɛ́ kòrò èkpèèè he ate dog, did he eat dog?

(6) Safaliba is quite variable, and intriguingly, with statements ending in HL, the corresponding question *raises* the final syllable from L to downstepped High (a):

a. HL ò bé ꜒dínɔ́rì, ò bé ꜒dínɔ́꜒ríí he is at door, is he at door? (adds H)
b. LL ò nyɛ́ʔ à bààsì, ò nyɛ́ʔ à bààsīī he saw dog, did he see dog? (lowers)
c. HH ò wùrí ò búríbú, ò wùrí ò búríbú꜒ú he likes his planting, does he like planting? (adds LH)

(7) Buli adds /-áà/: If a word ends with a vowel, the tone remains but vowel is deleted.

a. HH wà nyáká táná, wà nyáká tánáà he saw stones, did he see stones?
b. LL wà nyáká ŋààrùŋ, wà nyáká ŋààrùŋʷáà he saw boat, did he see boat?

(8) Deg adds /-áà/:

a. H꜒H ò ná ꜒nyú꜒hɔ́l, ò ná ꜒nyú꜒hɔ́láà he saw louse, did he see louse?
b. LH ò ná ꜒wíí, ò ná ꜒wííyáà he saw sun, did he see sun?

(9) Chumburung adds /-aaʰ/. As with Kɔnni, the final tone varies. Some data, such as (b,) are unexplained as of yet:

a. HH mǎŋú ꜒kípárí, fǎŋú ꜒kípáráàʰ I see pool, do you see pool?
b. LH mǎŋú kìté?, fǎŋú kìtí꜒yááʰ I see feather, do you see feather?

The languages which add /-aa/ obviously end in a long vowel. The other languages which lengthen the underlying vowel can be measured, and duration of statements and questions compared. For Adele, an underlying short vowel becomes 2.6 longer in a polar question. An underlyingly long vowel becomes only 1.6 times longer. For Safaliba, an underlying short vowel is 2.1 times and a long is 1.4 times longer.

As for "breathy termination," this is rarer in these data; Chumburung consistently has final [h] in polar questions (see (9)), and Deg has it sporadically.

An additional characteristic of these languages, not found in the list in (1), is that polar questions *all* had higher pitch than statements, that is, the register raised 12-20 Hz in the initial syllables. (Deg is an outlier in this data, but still raised somewhat.) In most languages the register also expanded significantly.

(10) Summary of results for all languages:

	Register raises (Hz)	*σ for raising*	Register expands (Hz)	comments
Adele	20	*6.6*	25	both raising and expansion
Buli	13	*2.9*	8	mostly raising, some expansion
Chumburung	21	*7.2*	2	definite raising, no expansion
Deg	6	*9.7*	18	wide variation, hard to find pattern
Safaliba	12	*4.1*	8	some raising, some expansion

For all languages, the register is raised – a question is pronounced on a higher pitch than a statement. The register is expanded for most languages, not for all. Likewise, Chung & Rose (2012) have noted register raising for the otherwise lax prosody language Moro.

In summary, all the languages in this study had a falling intonation pattern, but this was not limited to the L or L% (or even M) listed by Rialland; it can vary wildly. All languages also had a long final vowel, though with three of them it appears to be an additional morpheme /-aa/. Final breathy termination was sporadic. One interesting result was the common occurrence of register raising and register expansion.

Rialland grouped register expansion with the "high prosody" group of languages. However, measurements show that expansion is common in the languages in this study, which are indubitably otherwise "lax question intonation" ones. She noted the existence of "hybrid languages," that combine some characteristics of both high and lax prosody, e.g. Bambara and Izon, and it may be that these are actually fairly common.

She limited discussion of "raising" to raising of High tones, but did not discuss them as an overall characteristic of languages. This study suggests that some type of raising may be universal, even in "lax prosody" languages, but has hitherto gone undocumented.

References

Bolinger, Dwight. 1978. “Intonation across Languages.” In Greenberg. J. H. (ed.), *Universals of Human Language 2 (Phonology)*. Stanford University Press, pp. 471- 524.

Cahill, Michael. 2012. Polar Question Intonation in Kɔnni. In *Selected Proceedings of the 42nd Annual Conference on African Linguistics*, ed. Michael R. Marlo, Nikki B. Adams, Christopher R. Green, Michelle Morrison, and Tristan M. Purvis, 90-98. Somerville, MA: Cascadilla Proceedings Project. http://www.lingref.com/cpp/acal/42/index.html, document #2761.

Chang, Nien-Chuang. 1958. Tones and intonation in the Chengtu dialect (Szechuan, China). *Phonetica* 2:59-84.

Chapallaz, Marguerite. 1964. Notes on the Intonation of Questions in Italian. In David Abercrombie, D.B. Fry, P.A.D. MacCarthy, N.C. Scott and J.L.M Trim (eds.), *In Honor of Daniel Jones.* Longman, pp. 306-312.

Chung, Younah, and Sharon Rose. 2012. Duration and Pitch in Moro Polar Questions. Paper presented at 43rd Annual Conference on African Linguistics, Tulane University.

Clements, G.N. and Annie Rialland. 2008. Africa as a phonological area. In Heine, Bernd, and Derek Nurse (eds.), *A Linguistic Geography of Africa.* Cambridge: Cambridge University Press, pp. 36-85.

Fajobi, Eunice. 2011. The nature of Yoruba intonation: a new Experimental Study. Ms. *https://www.sussex.ac.uk/webteam/gateway/file.php?name=ef-yoruba-intonation.pdf&site=1* accessed February 26, 2013.

Hirst, Daniel, and Albert Di Cristo. 1998. *Intonation Systems: A Survey of Twenty Languages.* New York: Cambridge University Press.

Larsen, Raymond S., and Eunice V. Pike. 1949. “Huasteco intonation and phonemes.” *Language* 25: 268-277.

Luksaneeyanawin, Sudaporn. 1998. Intonation in Thai. In Hirst & Di Cristo, pp. 376-394.

Ohala, John J. 1984. “An ethological perspective oncommon cross-language utilization of F0 of voice.” *Phonetica* 41: 1-16.

Pence, Alan R. 1964. “Intonation in Kunimaipa (New Guinea).” *Linguistic Circle of Canberra Publications* A3: 1-15.

Rialland, Annie. 2007. Question prosody: an African perspective. In Gussenhoven, Carlos, and Tomas Riad (eds.), *Tunes and Tones, Volume 1: Typological Studies in Word and Sentence Prosody*. Berlin: Mouton deGruyter, pp. 35-62.

Rialland, Annie. 2009. The African lax question prosody: Its realisation and geographical distribution. *Lingua* 119.6: 928-949.

Svetosarova, Natalia 1998. Intonation in Russian. In Hirst & Di Cristo, pp.261-274.

Thomas, Dorothy. 1966. "Chrau Intonation." *Mon-Khmer Studies* 2: 1-13.