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 Konni (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 gîlînšîlé   s/he is dancing the gîlînšîlé dance
    b. ù sìé gîlînšîléè   is s/he dancing the gîlînšîlé 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. ʊ̀ ŋmɪ̀á gúúm! bú   s/he is rolling rope
    b. ʊ̀ ŋmɪ̀á gúúm! bú!ú   is s/he is rolling rope?
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 Konni: 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 /-âà/ (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 fôtù, è dé fôtûù  he is holding photo, is he holding photo?
   b. LH  êè kôrò êkpêê, êè kôrò êkpêê  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 1'dîndôrî̀, ò bé 1'dînʒ1'rî̀  he is at door, is he at door? (adds H)
   b. LL  ò nyêʔ à bààsî̀, ò nyêʔ à bààsî̀  he saw dog, did he see dog? (lowers)
   c. HH  ò wôrî̀ ò bûrbû̀, ò wôrî̀ ò bûrbû̀!ʊ̀  he likes his planting, does he like planting? (adds LH)

(7) Buli adds /-âà/: If a word ends with a vowel, the tone remains but vowel is deleted.
   a. HH  wà nyáká tánà, wà nyáká tánàà  he saw stones, did he see stones?
   b. LL  wà nyáká ŋààrùŋ, wà nyáká ŋààrùŋ  he saw boat, did he see boat?

(8) Deg adds /-âà/:
   a. H¹H  ò ná ¹nyû1'hôl, ò ná ¹nyû1'hôlêtreà  he saw louse, did he see louse?
   b. LH  ò ná ¹wîfî́, ò ná ¹wîfî́yàà  he saw sun, did he see sun?

(9) Chumburung adds /-aa/. As with Konni, the final tone varies. Some data, such as (b), are unexplained as of yet:
   a. HH mâŋû ¹kîpârî́, fãŋû ¹kîpârâà  I see pool, do you see pool?
   b. LH mâŋû kîtêʔ, fãŋû kîtî1'yâà  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:

<table>
<thead>
<tr>
<th></th>
<th>Register raises (Hz)</th>
<th>$\sigma$ for raising</th>
<th>Register expands (Hz)</th>
<th>comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adele</td>
<td>20</td>
<td>6.6</td>
<td>25</td>
<td>both raising and expansion</td>
</tr>
<tr>
<td>Buli</td>
<td>13</td>
<td>2.9</td>
<td>8</td>
<td>mostly raising, some expansion</td>
</tr>
<tr>
<td>Chumburung</td>
<td>21</td>
<td>7.2</td>
<td>2</td>
<td>definite raising, no expansion</td>
</tr>
<tr>
<td>Deg</td>
<td>6</td>
<td>9.7</td>
<td>18</td>
<td>wide variation, hard to find pattern</td>
</tr>
<tr>
<td>Safaliba</td>
<td>12</td>
<td>4.1</td>
<td>8</td>
<td>some raising, some expansion</td>
</tr>
</tbody>
</table>

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


