Question prosody: an African perspective

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High-pitched question prosody is often considered as a (near-) universal: " It is almost invariably the case that high or rising pitch signals the former [a question] whereas low or falling pitch, the latter [a statement] " (Ohala, 1983 p.1). It has also been viewed as a grammaticalisation of a natural tendency in the "Frequency code": " […] the pattern is too widespread to be explained by borrowing, descent from a common linguistic source, or chance. It follows that there is something common to all human speakers, at all stages in history, which creates this phenomenon." (Ohala 1984 p.2).

The "universalist" view of high-pitched question prosody can be traced back to Bolinger's article: "Intonation across languages" (1978) in "Universals of Human Languages" (Greenberg, ed.), which remains the main reference on the typology of question prosody. In this article, Bolinger refers to two previous articles: 1) Hermann E. (1942) "Problem der Frage" published in *Philologisch-Historische Klasse*, Nr 3-4, with a database of 175 languages, 2) Ultan R. (1969) " Some General Characteristics on Interrogative Systems", *Working Papers in Language Universals* 1, with a database of 53 languages. He adds a personal contribution of 41 languages, many of them being Amerindian. According to Bolinger, Hermann "found without exception a tendency to higher pitch somewhere in the utterance" and Ultan obtained the same results: question prosody always involved high pitch, 71% of his sample languages having a rising intonation. All the languages added by Bolinger to Hermann and Ultan's databases, had question intonation with h or rise, except Papago, Itonama, Quechua for which "no h or rise [has been] reported".Currently, Hermann's and Ultan's papers, which are (almost) unavailable, are known through Bolinger's article, which reported their conclusions but did not provide the list of languages which were included.

Later on, considering related issues, various authors added other languages, such as Roermont Dutch or Chickasaw by Gussenhoven (2002), for example. But these additions are only sporadic and, to the extent of our knowledge, no article has tried to reconsider and update the data on which the "high-pitched view" is based on. In this article, we will begin this task, taking an African perspective. We will here present a preliminary data-base, including 78 African languages. We will show that many African languages do not have "high pitched question prosody" in any respect. Intonational question marking proves to be more diverse than might have been expected, at least from the perspective of better known languages. We will also propose a low pitched, "lax" African question intonation marker, at the origin of the various forms of low and lax question prosodies which are widespread in the Sudanic region.

1. Presentation of our in-progress African database

This database, which is presented in the appendix, concerns the prosody of yes/no questions without interrogative morphemes other than prosodic ones. Note that we include vocalic markers such as [open] vowel or –à in our data, because of their involvement in some types of question prosodies (see §3).

Our database is composed and organized as follows:

1.1. The current composition of the database

This is the first data-base on question prosody in African languages, and is still in progress. It currently includes 78 languages, distributed as follows according to the language family to which they belong:

NIGER-CONGO (56)
      2 Atlantic, 6 Kru, 17 Gur, 3 Mande, 7 Kwa, 2 Adamawa-Ubangi, 2 Ijoid, 24 Benue-
      Congo (7 non-Bantoid, 17 Bantoid including 14 Bantu languages)
AFROASIATIC (8)
      5 Chadic, 3 Cushitic
NILO-SAHARAN (6)
      1 Songhai, 1 Central Sudanic, 4 Eastern Sudanic
KHOISAN (1)

At this point, the database includes only languages for which we could find reliable information (more exactly, what we regard as reliable based on our experience of the field). It includes first-hand data as well as data found in published and unpublished written materials, including academic dissertations. As a consequence, while we were able to include languages from all of the main language families, some families are over-represented compared to others. Thus, the Gur family (which is part of the larger Niger-Congo phylum) has seventeen representatives in our database, while the Bantu family, which is a larger family in most respects (number of languages, number of speakers, current geographic extension) has only fourteen. As a consequence of the imbalances in the data, our database is not appropriate for statistical studies or for answering such questions as: What is the percentage of African languages with this or that type of question prosody?

1.2. Organisation of the database

In our database, languages are grouped according to families. Prosodic question markers are divided into two categories: high-pitched yes/no question markers and non high-pitched yes/no question markers, as listed below:

HIGH-PITCHED YES/NO QUESTION MARKERS
1. cancellation/reduction of downdrift, register expansion
2. raising of last H(s) (not necessarily sentence-final)
3. cancellation/reduction of final lowering
4. final High tone or rising intonation (final H%)
5. final HL melody (listed in this category as it involves a high component)

NON HIGH-PITCHED YES/NO QUESTION MARKERS
6. final Low tone or falling intonation (final L%)
7. final polar tone or M tone
8. lengthening: V (a vocalic mora) or V… (large vocalic lengthening)
9. breathy termination
10. cancellation of penultimate lengthening
11. [open] vowel

In the following section, we will present these various markers in detail. It should be kept in mind that a given question prosody generally involves more than one marker. Thus in Mooré (Gur), question prosody is characterized by falling intonation, large lengthening of the last vowel (V...), and breathy termination, while in Southern Sotho (Bantu), question prosody involves register expansion and the cancellation of penultimate lengthening. Furthermore, some languages have more than one yes/no question prosody. Thus, in Gulmancema, one type of question

prosody is characterised by falling intonation, V..., and breathy termination, and another by rising intonation, V..., and breathy termination. In the table of question markers given in the Appendix, the various exponents of a given question prosody are indicated with the same letter: *x* for the first or only prosody, *y* for a second, etc.

2. A first observation: languages without any type of high-pitched yes/no question prosody are not uncommon in our database

In our table of question markers (Appendix), markers involving high pitch in some form are listed on the left and those involving no high pitch at all are listed on the right. Languages with no high pitch component in their question prosody use one or a combination of the following markers exclusively:
- Low or L%
- polar tone
- length
- breathy termination
- [open] vowel

Examination of the table shows that many languages have no high-pitched question markers (there is no x in the left part of the table). More exactly, 36 languages of this type occur in our database: 5 Kru, 13 Gur, 2 Mande, 6 Kwa, 2 Adamawa-Ubangi, 1 Ijoid, and 7 Benue-Congo (3 non-Bantoid, 2 non-Bantu Bantoid, 2 Bantu). This data leads us towards the conclusion that there is no "near totality" of languages with high-pitched question intonations. The counter-examples to the view of high-pitched question prosodies as a (quasi) universal, prosody as a universal are massive, including a large number of the languages of an entire family (the Gur family) and they are widespread elsewhere in the Niger-Congo phylum.

3. Presentation of the question markers

The question markers in the database will be discussed in the order in which they are given in the table (Appendix), from left to right.

3.1. Register expansion and reduction/cancellation of downdrift (marker 1)

"Register expansion" refers to the expansion of the pitch range within which tones are realised. This expansion results mainly in the raising of H tones. It is generally also associated with reduction/cancellation of downdrift. The following Wolof examples illustrate register expansion combined with a downdrift reduction as question markers. Example 1 is a statement and example 2 is its interrogative counterpart. The texts of both examples are strictly similar.
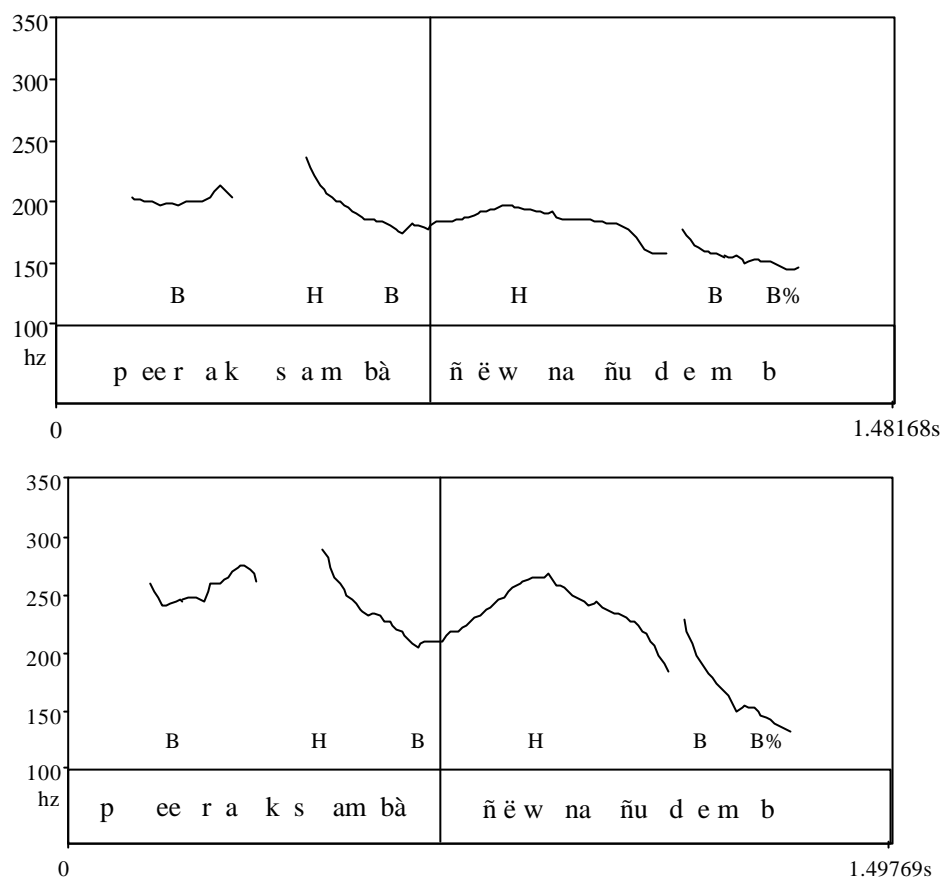
Figure 1. Pitch curves of two Wolof utterances :   *Peer ak Sambà ñëw nañu demb* "Peer and Samba came yesderday" (top), *Peer ak Sambà ñëw nañu demb* "Peer and Samba came yesderday?" (bottom)

The contours, which are determined by the High or Low phrasal tones and the final boundary tone (L%), are similar in both examples. The phrasal High tones are realised higher in the question and the phrasal Low tones are also raised, but to a smaller extent. At the same time, downdrift is reduced and almost cancelled.   (For additional examples and an analysis of the intonational system of Wolof, see Rialland and Robert 2001).

        The magnitude of register expansion and reduction of downdrift seems to vary considerably depending upon the language. Thus, we have observed from first-hand data that while Wolof has a strong reduction or even total cancellation of downdrift, at least in short sentences with one, two, or three prosodic groups, Southern Sotho reduces its downdrift in a less dramatic way: Doke and Mofokeng (1967) mention a "higher register in questions" but add that this higher register is not obligatory as it comes as a reinforcement to another question marker, the reduction of -penultimate lengthening. Published data on various other language also show such variation. In some languages, such as Turkana, downdrift seems only slightly reduced: "The initial placement of pitch with these three [question] sentences is considerably higher than with the corresponding declarative sentences. Furthermore, the downdrift in "Ó" explain is probably less strong than in corresponding non-interrogative sentences" (Dimmendaal 1983 p. 427). On the other end, there are languages in which downdrift tends to be completely cancelled: "The pitch of the voice does not decline nearly so much from the beginning to the end of the sentence. It is, in fact, nearly level throughout" (Hagman 1977 page, on Nama Hottentot). We also found

intermediate languages with various degrees of downdrift such as Hausa: "Yes-no questions are distinguished chiefly by a global strategy and a local strategy: globally, downdrift is decreased by any amount up to and including its total suspension" (Lindsey, 1985 p.105).

As can be seen in the database, register expansion and downdrift reduction are widespread means of expressing questions, occurring in 23 languages from a diversity of families: Fula (Breedvelt 1995) and Wolof (Rialland and Robert 2001) in the Atlantic family, Mende (Gordon 1971) in Mande, Konni (Watters 2000) in Gur, Ga (Kotei 1969) in Kwa, Izon in Ijoid (Williamson 1979), Efik (Cook 1985), Engenni (Thomas 1978) and Igbo (Williamson 1979), in the non-Bantoid part of Benue-Congo, Chichewa (Myers 1996),), Jita (Downing 1996), Kirundi (Meeussen 1959), Shi (Polak-Bynon 1975), Southern Sotho (Doke 1967 and personal data) and Zulu (Talgaard and Bosch 1988) in Bantu languages, Hausa (Leben 1984, 1989, Lindsey 1985), probably Tera, Angas, Sayanci (Leben 1989), and Niya (Shuh 1998) in the Chadic branch of Afro-Asiatic, Dholuo (Okombo Duncan 1997 and personal data) and Turkana (Dimmendaal, 1983) in the Eastern Sudanic branch of Nilo-Saharan, and Nama (Hagman 1977) in the Khoisan phylum.

If is it clear that register expansion and downdrift reduction are quite widespread, our database might only partially reflect its extension. Indeed, though many authors (Cox 1998, Williamson 1989, Kinda 1984, Rialland 1984, Podi 1995, Grégoire 1990, Fréchet 1989) indicate clearly that these processes do not occur in the languages that they are describing, many other authors simply do not mention them. We might expect that if register expansion and downdrift reductionhave gone unnoticed in a language, their magnitude might at best be small compared with other languages like Wolof, for example. However, the common lack of explicit information leaves us with some uncertainty on this point.

3.2. Raising of last High(s) (marker 2)

Raising of the last High tone(s) in a question is a local process. It involves either the last High tone, which is not necessarily sentence-final, or else to all the High tones of the final phrase. Raising of the last High tone(s) has been reported in Bantu languages, such as Dzamba (Bokamba 1976) and Luganda (Lindsey 1985), in Chadic languages (Hausa, Tera, Babur, Sayanci, see Leben 1989) and in Eastern Sudanic languages such as Arusa (Levergood 1987). Within the Chadic family, as shown by Leben (1984, 1989), there are variations depending upon the language. Thus in Hausa, raising of the last High(s) applies to all High tones in the final phrase, while in two related languages (Tera and Babur) it involves only the last High Tone. Outside the Niger-Congo phylum, we have found this process only in Zarma (Tersis 1980) and Nandi (Creider and Tapsusei-Creider 1989).

3.3. Reduction/cancellation of final lowering (marker 3)

The reduction or cancellation of final lowering in questions has the same domain as final lowering in statements. Some descriptions of final lowering and of its cancellation are very precise. Thus, Hulstaert in his detailed grammar of Mongo-Nkundu (1961: 150), states: "L'intonation énonciative, c'est à dire qui caractérise [...] une affirmation ordinaire, abaisse la dernière syllabe. En même temps, le mot entier ou le groupe de mots a déjà baissé en entier par rapport au niveau général de la phrase." [The enunciative intonation, that is the intonation which characterizes [...] an ordinary statement, lowers the last syllable. At the same time, the whole word or the whole phrase is entirely lowered with respect to the general level of the sentence.]

"L'intonation interrogative ne baisse ni sur le ton final ni sur les derniers éléments de la phrase." [The question intonation is not lower either on the final tone or on the last elements of the sentence]. Most studies mentioning cancellation of final lowering do not get into such detail, but they are quite clear about the nature of the process. For example, we find the following wording: "[question intonation] suspends the sentence final drop of pitch which accompanies the declarative" (Hayward 1984, describing Arbore) or "No phrase final lowering" (Levergood 1987: 72, on Arusa).

3.4. Final High tones and rising intonations (marker 4)

One problem that we encountered is that of differentiating between final lexical tones and final boundary tones. First, let's make clear what the differences are between these two types of tones. We may consider two examples from Gulmancema, a Gur language with three lexical tones. The first example is a statement ending with a lexical High tone on the last syllable. The second one is the interrogative counterpart of the first, which ends with a High boundary tone (H%) following the High lexical tone.
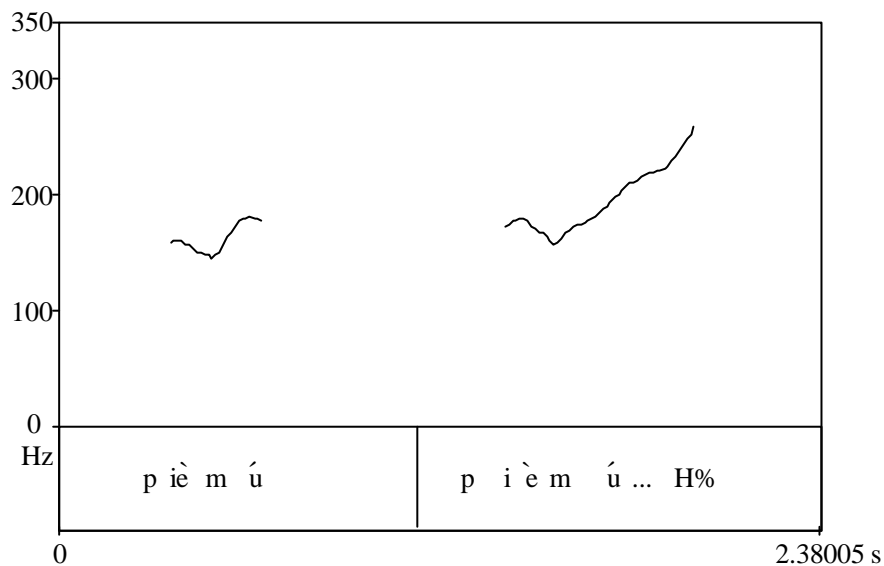
Figure 2 . Pitch curves of two Gulmancema utterances : *pièmú* "an arrow" as an answer (statement) on the left and *pièmú...H%* "an arrow ?" on the right

This High boundary tone is realised higher than the final lexical High tone, that is, above its pitch range. A simple final High tone, added at the end of the word *pièmú* with its tone bearing unit, would have been realised on about the same pitch as the lexical High on the last syllable. There is another difference between a lexical tone and a boundary tone: a lexical tone may be (floating tones) associated with a tone-bearing unit, while a boundary tone is linked to a boundary. The addition of a tone associated with a tone-bearing unit introduces a degree of lengthening determined by the nature of the tone-bearing unit (mora or syllable), while any lengthening triggered by a boundary tone is unrelated to the duration of the tone-bearing unit of the given language. Thus, in our Gulmancema examples, the lengthened vowel in the question

(Figure 2 left) is approximately three times as long as the vowel in the statement (Figure 2 right). This lengthening is greater than what we would have expected from the duration of the tone-bearing unit, which is the syllable in Gulmancema.

Based on the language data we have been able to find, it has often been difficult to decide whether a given final tone is a simple tone or a boundary tone, as most studies do not distinguish these two types of tones. We paid special attention to durational characteristics, which provide indirect cues to the nature of the tones involved, and we introduced a column for duration in our database, with V representing a lengthening of one mora and V... a greater lengthening. Thus, it can be indirectly determined whether a lexical tone or a boundary tone is involved in question marking. However, at this point, lexical tones and boundary tones could not always be separated in our database, and so are listed in the same column.

In our database, rising intonation (or final High tone) occurs in 16 languages: Fula (Breedvelt 1995) in the Atlantic family, Klao (Marchese 1983) in Kru , Gulmancema and Kulango in Gur, Mende in Mande, Yekhee (Williamson 1979) in the non-Bantoid part of Benue-Congo, and Bafut (Achuo 1989), Bajɛlɛ (Renaud 1975), Chichewa (Myers 1996), Ganda (Lindsey 1985), Saghala (com. pers.), Swahili (Maw and Kelly 1975) in the Bantoid branch of Benue-Congo, Hausa (Leben 1984, 1989), Pero (Frajzyngier 1989), Zarma (Tersis 1980), and Nandi (Creider and Tapsusei-Creider 1989) . Thus, this rising intonation is quite common in Africa, but is not evenly distributed. There are few occurrences in the Kru, Gur or Kwa families, while this type of intonation is well represented among Bantoid languages, particularly Bantu.

3.5. Final High-Low tones and High-falling intonations (marker 5)

Final HL tones (or High-falling intonations) are quite uncommon in our database, with only three occurrences: Farefare, a Gur language (Kropp-Dakubu 2003), Swahili (Maw and Kelly 1975) and Dahalo, a Cushitic language (Tosco 1991).

3.6. Final Low tones and falling intonations (marker 6)

Final Low tones are generally realized with a fall towards the bottom of the speaker's range. Thus, their ending points do not provide a criterion to differentiate them from final falling intonations, which also end at the bottom of the speaker's range. The only difference between final Low tones and final falling intonations may lie in the timing of the pitch movement, intonational movements being generally associated with greater vowel lengthening. Final Low tones are often difficult to distinguish from falling intonations in a tone language and and it was impossible to retrieve such a difference from our data. Thus, we grouped final Low tones and falling intonations into one category (marker 6), as we did previously with final High tones and rising intonations (marker 4) and HL tones and High-falling intonations (marker 5).

Languages with falling question intonation patterns (or final Low tones) are quite widespread in our database, totalling 36 in all. It is noticeable that they outnumber languages with final rising intonations. They including the following: Bassa, Godie, Neyo (Marchese 1983) in the Kru family, Akaselem (Podi 1995), Dagaare (Nakuma 1998), Gulmancema (Rialland 1980), Kabiye (Lebikaza 1985), Kasem (Bonvini 1988), Konni (Watters 2000), Kusaal (England and Ladusaw 1985), Lobiri (Becuwe 1982), Mooré (Kinda 1994), Mɔyɔbɛ (Rongier 1996),

Nawdem (Nicole 1987), Ncam (Cox 1998) and Tem (Tchagbalaye 1976) in the Gur family, Gouro (Grégoire 1979) in the Mande family, Adioukrou (Marchese 1983), Akan, Asante dialect (Boakye 1972), Baule (Creissels and Kouadio 1977), Ewe (Westerman 1930), Fon (Guillet 1972) and Gun (Frechet 1989) in the Kwa family, Banda-Linda (Cloarec-Heiss 1986) and Munzombo (Boyi 1979) in the Adamawa-Ubangui family, Izon and Nembe (Williamson 1979), in the Ijoid family Degema (Williamson 1979), Gwari (Hyman and Magaji 1970), Engenni (Thomas 1978) and Isoko (Donwa-Ifude 1984) in non-Bantoid Benue-Congo languages, Ejagham (Watters 2000) in Bantoid Benue-Congo languages, Angas, Sayanci (Leben 1989) and Pero (Frajzyngier 1989) in the Chadic family, and Turkana (Dimmendaal 1983) in the Eastern Sudanic family. All these languages, belonging to various families and several phyla (Niger-Congo, Afro-Asiatic and Nilo-Saharan), are spoken in the Sudanic region of Africa, from the western part of the continent to the Ethiopian plateau in the East. Currently, this large zone (or Macro-Sudan belt) tends to be recognized as a linguistic area, sharing phonological as well as syntactic features (Güldemann, to appear, and Clements and Rialland, to appear) and the distribution of this falling intonation brings additional arguments in favor of the recognition of this area.

3.7. Polar tone or Mid tones (marker 7)

Polar tones, or Mid tones in three tone-system, are also more rarely found as question markers, and are dispersed across families. They are found in Samo (a Mande language, Platiel 1970), Ga (a Kwa language, Kotei 1969), and in the Bantu languages Holoholo (Coupez 1955) and Nyanga (Mateene 1980).

3.8. Final lengthening (marker 8)

Final lengthening is documented in 23 languages in our database, but only two languages, Nateni, a Gur language (Neukom 1995) and Wobé, a Kru language (Marchese 1983) use final lengthening as their only question marker. In a very few contexts, Tikar (Stanley 1991) also uses this marker alone.   In other languages, final lengthening, when used as a prosodic question marker, is usually associated with other markers: falling intonation as in Mooré, breathy termination as in Moba, or both as in Ncam (all Gur languages). Lengthening may add a mora, and thus a tone-bearing unit, to the last syllable, but it may have even greater durational effects. Falling or rising intonations lengthen the final vowel, and the breathy termination marker draws it out even more (see 3.6). In sum, lengthening can be used as a self-sufficient feature, but is more often used in conjunction with other markers.

3.9. Breathy termination (marker 9)

Breathy termination has been studied in Moba, a four-tone Gur language of Togo, by Rialland (1984). Here we summarize our earlier results.   Let us first consider two examples, a statement and its interrogative counterpart sharing the same lexical word:
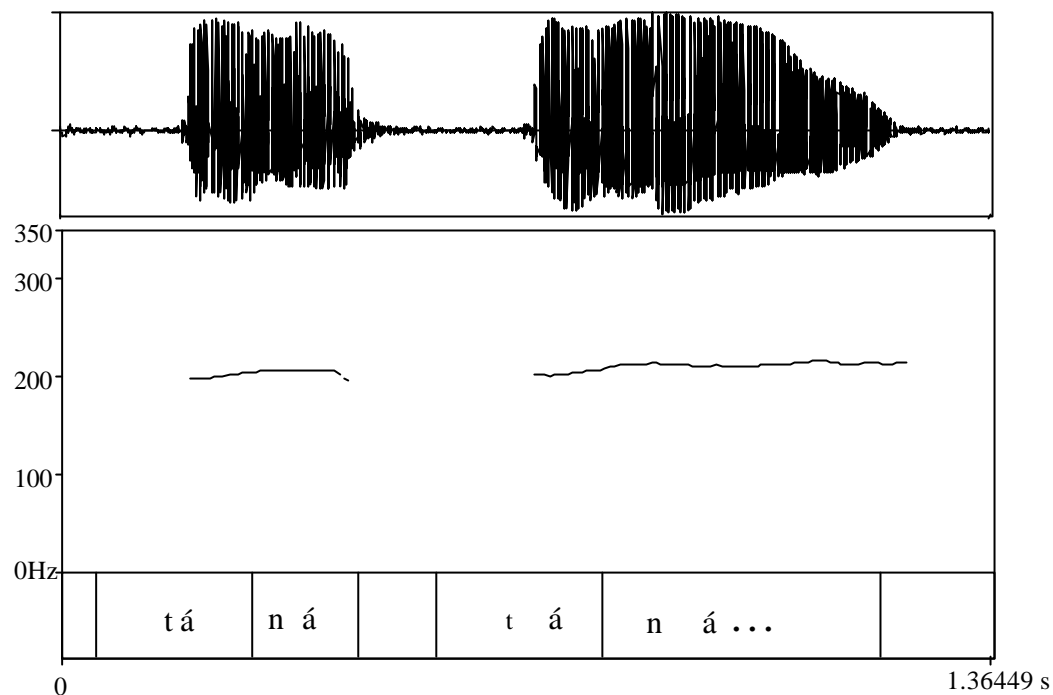
Figure 3. Waveforms and pitch curves of *táná* "stones" (statement) and *táná* ... "stones?"
(question) by a Moba speaker

Statement and question differ in the duration of the last vowel (short *a* versus extra-long *a*) as
well as in the termination of the vowel (abrupt versus smooth termination, with a progressive
decrease in intensity as shown by the waveforms). The realisation of the last High tone is
prolonged in the question, the same pitch level being maintained up to the end of the utterance.
Airflow tracings and laryngograms of the same examples published in Rialland (1984) show that
the statement (*táná*) ends abruptly with a glottal stop, while the question (*táná...*) fades away with
a progressive opening of the glottis associated with an increase in airflow .

The following waveform and pitch curve of a word ending with a Low tone confirm that
the last vowel in the question bears a prolongation of the realisation of the last High tone of the
word *táná* and not some type of High intonational boundary tone. These examples correspond to
realizations of the word *bînà* "beans" as a statement (left) and a question (right).
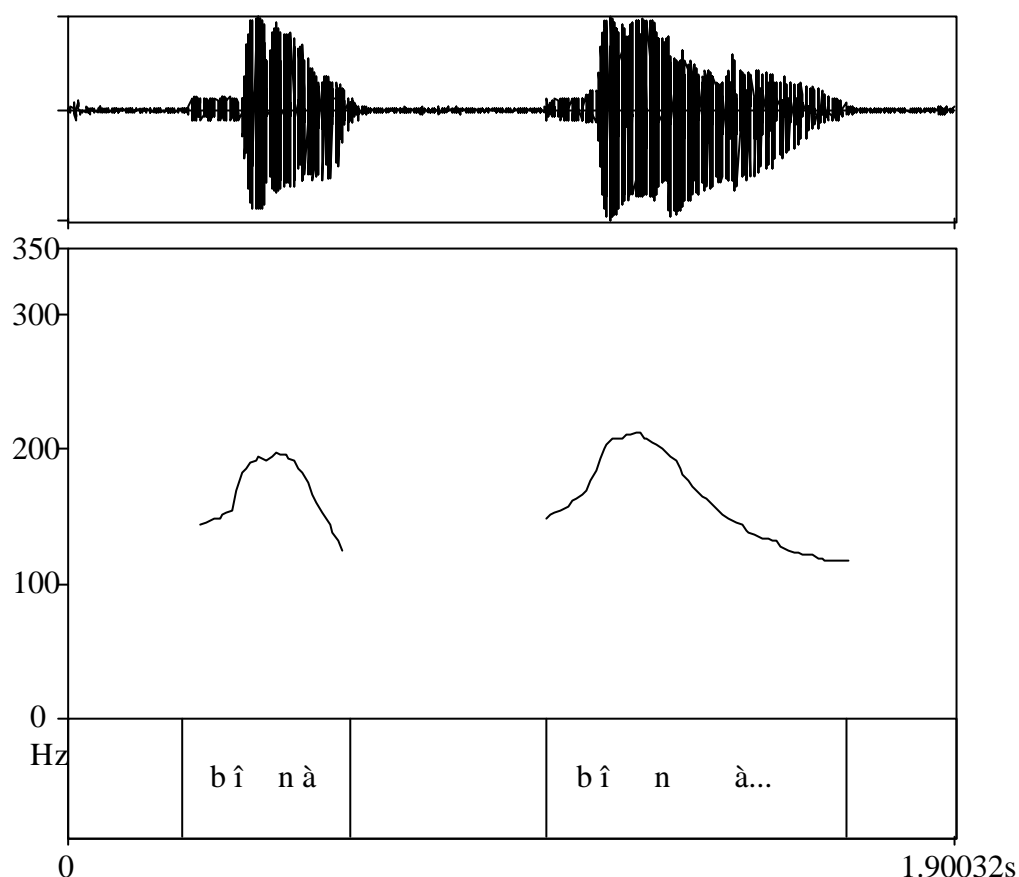
Figure 4. Waveforms and pitch curves of *bînà* "beans" (statement) and of *bînà* ... "beans?" (question) by a Moba speaker

It can be observed that the Low tone is realised falling in both the statement and the question. In African languages, utterance-final Low tones are most commonly realised as falling, which is exemplified here in the statement. In questions, the realisation of this final falling Low tone is simply stretched out. Other examples with various tone patterns also show the prolongation of the tonal realisation (see Rialland 1984). This type of intonation is not specific to yes/no question but occurs at the end of all questions, including Wh-questions.

Thus, we can summarise the characteristics of question prosody in Moba as follows: 1) there is no tone or boundary tone, either High or Low, instead the realisation of the last tone is stretched over the last vowel, 2) this last vowel is greatly lengthened, and 3) the utterance ends with a breathy termination. This type of prosody requires a final vowel for its realization, which triggers various segmental processes (see Rialland 1984, for an overview).

Breathy termination occurs in other Gur languages, but in combination with other markers. Thus, in Ncam, a Gur language belonging to the Gurma group as does Moba, it is associated with a falling intonation pattern and, in some contexts, with a vowel *-a* (Podi 1995 and Rialland, personal data). Let us consider the realisation of one Ncam example:
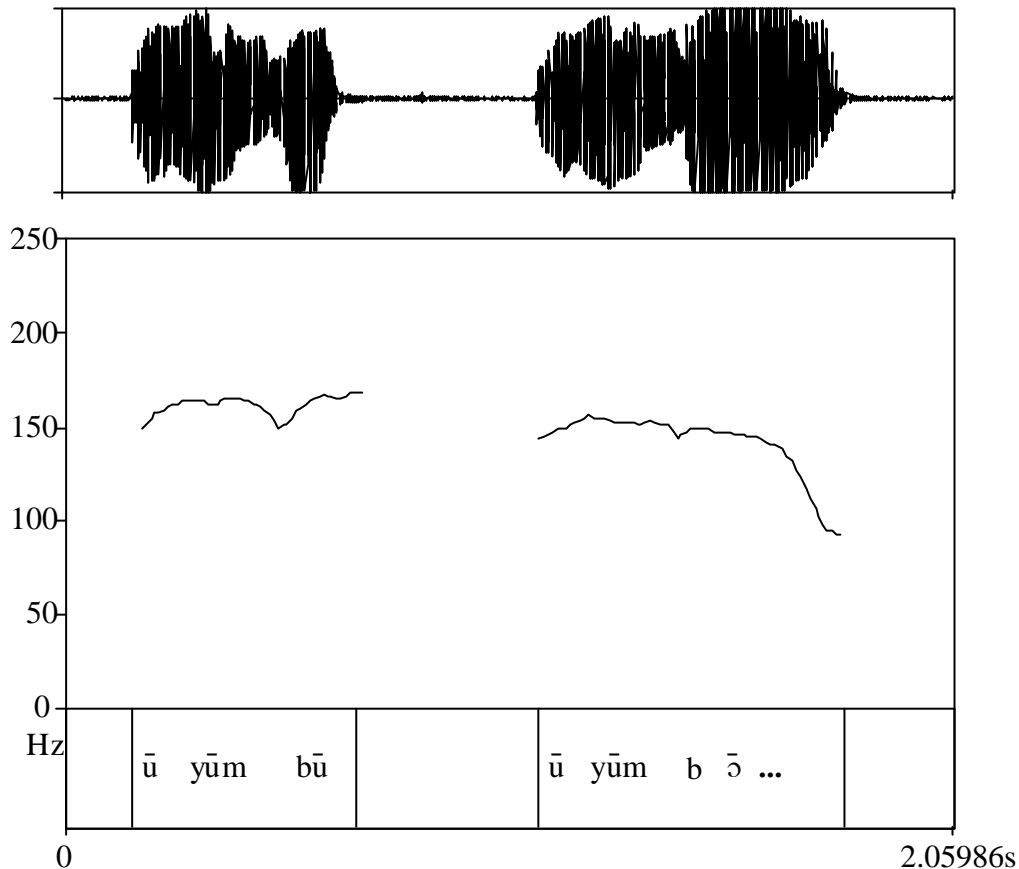
Figure 5.. Waveforms and pitch curves of *ūyūmbū* "a slave" (statement) and of *ūyūmbɔ̄* ... "a slave?" (question) by a Ncam speaker

In the statement, the word *û yûmbû* "the slave", with three mid tones, is realised flat. In the question, the last vowel is lengthened, ending with a breathy termination (as shown by the intensity decrease on the waveform) and becoming more open (ɔ replaces u). The opening of the vowel into ɔ results from the contraction of the word-final *u* with the question marker *a*. (Note that the question marker appears as *a* after a word ending with a consonant.) The same combination of markers occurs in Akaselem, which is closely related to Ncam. In Gulmancema, which also belongs to the Gurma group, breathy termination can be combined with either falling or rising intonation (cf. figure 2), but there is no vowel marker. In Mooré, breathy termination is associated with falling intonation, as shown by Kinda's (1984) waveforms and melodic curves; as in Gulmancema, there is no vowel marker.

In our database, most of the data concerning "breathy termination" comes from our own studies and involve Gur languages, mainly from the Gurma group. We have found only one

mention of a variety of breathy termination outside the Gur languages and in just one language: Hausa (Lindsey 1985). However, it is difficult to believe that this breathy termination is restricted to Gur languages. We think that breathy termination may have gone unnoticed in other languages, and that further studies may unearth it in a wider variety of languages.

3.10. Cancellation of penultimate lengthening (marker 10)

The cancellation of penultimate lengthening in questions presupposes the existence of penultimate lengthening in statements. It suppresses a positive marker of statements.
As an illustration, let us consider a Zulu example (Talgaard and Bosch 1988):

     ukali:le   'he/she cried'
     ukalile   'did he/she cry?'

It is often, but not always, associated with pitch expansion, which is a positive marker of questions.   This type of marker has been found only in some Bantu languages spoken in the South of Africa; in our database they are represented by Zulu and Southern Sotho (Doke C. M. and S. M. Mofokeng 1967 and pers. data).

3.11. [open] vowels (marker 11)

We have included *open vowels*, especially [a], among question markers due to the fact that in our database they are usually associated with a Low tone or falling intonation. .The adjunction of an open vowel as a unique question marker is found in Vata (a Kru language, Vogler 1987) and in Tikar (a non-Bantu bantoid Benue-Congo language, Stanley 1991), where it harmonises in place of articulation with the last vowel of the word. Thus in Tikar, for example, we find [º] after a word ending in one of the vowels [i e º] and [a] after a word ending in [u o a] (Stanley 1991). The geographic distribution of this vocalic question marker, generally associated with a Low tone or a falling intonation, is particularly vast.   Within the Niger-Congo phylum we find it in Neyo, Odie (Marchese 1983), and Vata (Vogler 1987) of the Kru family, in Akaselem (Podi 1995) and Ncam (Cox 1998) of the Gur family, in the Gbe languages: Fon (Guillet (1972), Gun (Fréchet 1989 and Ewe (Westerman 1930) of the Kwa family, in Engenni (Thomas 1978) in the non-Bantoid part of the Benue-Congo family, in Banda-Linda (Cloarec-Heiss 1986) of the Adamawa-Ubangi family, and in Ejagham (Watters 2000) and Tikar (Stanley 1991) in the non-Bantoid part of Benue-Congo. No Bantu language in our database is reported to have this marker, though two (Shi and Southern Sotho) have CV question markers in which the vowel is *a*. Outside Niger-Congo languages we find it in Pero (Frajzyngier 1989), Angas, Sayanci (Leben 1989 of the Chadic branch of the Afro-Asiatic phylum and in Turkana (Dimmendaal 1983), an Eastern Sudanic language of the Nilo-Saharan phylum. As the low tone or the falling intonation, this marker is spread across the sub-Saharan (or Sudanic belt).

4. [open] vowels, falling intonation and breathy termination: toward a "lax" prosody

Interestingly, the open vowel question marker often appears in combination or alternation with falling intonation (or a final Low tone) and sometimes with the breathy termination marker. Such variant realizations can be observed within a single language and between dialects of closely related languages.

Thus, we mentioned previously that *-à* occurs in Akaselem and Ncam (see 3.11), but is absent in other languages of the Gurma group, such as Moba and Gulmancema, discussed above.

Outside the Gurma group, Mooré uses a pattern of question marking similar to that of Ncam (vowel lengthening, breathy termination, falling intonation), but without the -*à* marker.

In Kru languages, one also finds a number of variant patterns involving open vowels, vowel lengthening, and Low tones. For example, one finds languages with final -*à* (Néyo, Godié), languages with an underspecified [+open] vowel (Vata), languages with only vowel lengthening (Wobé), and languages with a final lengthened vowel and Low tone (Bassa). We have so far found no mention of the breathy termination marker in Kru languages. (See Marchese 1983, Vogler 1987.)

In the Gbe languages (Kwa) spoken from Ghana to Benin, the -*à* marker is particularly frequent. Though this is usually the sole marker of yes/no questions, in the Porto-Novo dialect of Gun yes/no questions may be marked by Low tone alone (Fréchet 1989).

In the Adamawa-Ubangi group, Banda-Linda has final –*à*, but Munzombo a simple Low tone on a lengthened vowel. In Edoid languages (non-Bantoid Benue-Congo), there is a similar variation between Low-toned -*à*, or -*è* in expressions of doubt (Engenni, Thomas 1978) vs. Low tone alone (Isoko, Degema). Of the two non-Bantu Bantoid languages of our database, Tikar has an open vowel and Ejagham has Low-toned -*à*.

In Chadic languages, Hausa employs an optional Low tone in addition to its usual vowel lengthening and breathy termination, while Sayanci and Angas have final Low-toned -*aà*.

One comes to wonder, then, whether the frequency of open vowels, Low tones or falling intonations, and lengthening, which often occur in combination, cannot be explained by a single historical origin such as a Low-toned -*a*, perhaps accompanied by breathy termination. This cluster of properties combines a group of "lax" features: vowel opening, the relaxation of the vocal cords inducing pitch lowering, and glottal opening. One might be tempted to speak of a "lax prosody" opposed to a "tense prosody", the latter being characterised by rising intonation, vocal cord tension and glottal adduction.

5. Conclusion

Question prosodies without any high-pitched correlates are not just exceptions. Based on a preliminary database containing 78 languages, we have showed that they are widespread in Africa. Among Niger-Congo languages, where they are most prevalent, they occur in almost all Gur languages, in many Kwa, Mande, Kru languages, and in some Benue-Congo languages. In geographic terms they are concentrated in the Sudanic belt that stretches laterally across Africa from the Atlantic to the Ethiopian-Eritrean Highlands. Markers without any type of high-pitched correlates are diverse, including falling intonation (or final Low tones), lengthening, breathy termination, open vowels, polar tones, and cancellation of penultimate lengthening. Certain of these (falling intonations or Low tones, lengthening, breathy termination, open vowels) co-occur in various combinations in many languages and language families (mainly Kru, Gur, Mande, Kwa, Adamawa-Ubangi, non-Bantu Benue Congo, and Chadic). We have proposed that they are various facets of a "lax prosody" which might have a single historical origin.

At this point, further research and more data are needed to determine the full extent of the "lax" prosody and of question prosodies without high-pitched component.

References

Abraham R. C.   1967   *The Principles of Ibo.* (Occasional Publications 4.) Ibadan: Institute of African Studies, University of Ibadan

Achuo, Ambe H.   1989   *The Structure of Bafut*. Ph. D. dissertation, Georgetown University, Washington.

Becuwe, Jean 1982   *Eléments de phonologie et grammaire du lobiri (parler de Bouna - Côte d'Ivoire)*. Thèse, Université de la Sorbonne-Nouvelle, Paris.

Bianco A.   1978   *Phonologie du Kulango de Bondoukou*. Maîtrise, Université d'Abidjan.

Boakye, Paul 1982   *Syntaxe de l'achanti. Du phonème à la phrase segmentée*. Bern : Peter Lang.

Bokamba, Eyamba G.   1976   *Question formation in some bantu languages*. Ph.D. dissertation, Indiana University.

Bolinger, Dwight   1978   Intonation accross languages. In: Greenberg (ed.), *Universals of Human Language*, 371-425. Stanford: Stanford University Press.

Bonvini, Emilio   1988   *Prédication et énonciation en kàsîm.* (Collection Sciences du langage) Paris: CNRS.

Boyi, Jean   1979   *Description phonologique du Munzombo*. Thèse, Université Marien Nouagbi, Brazzaville.

Breedveld, Anneke   1995   *Form and Meaning in Fulfulde: a Morphological Study of Maasinankoore*. Leiden: University of Leiden.

Clements George N. and Rialland Annie   to appear   Africa as a phonological area. In B. Heine (ed.) *Africa as a linguistic area*. Cambridge: Cambridge University Press

Cloarec-Heiss, France   1986   *Le banda-linda de Centre-Afrique*. Paris: S.E.L.A.F.

Cook T.L.   1985   *An integrated phonology of Efik*. Leiden: University of Leiden.

Coupez, André   1955   *Esquisse de la langue Holoholo*. (Annales Sciences Humaines 12) Tervuren: Musée Royal de l'Afrique Centrale.

Cox, Monica 1998   *Description grammaticale du ncam (bassar), langue gurma du Togo et du Ghana*. Thèse, Ecole Pratique des Hautes Etudes, Paris.

Creider, Chet A.and Tapsusei-Creider Jane 1989   *A Grammar of Nandi*. Hamburg: Helmut Buske Verlag.

Creissels Denis and Kouadio N'Guessan Jérémie   1977   *Description phonologique et grammaticale d'un parler baoulé*. Abidjan: I.L.A.

Dimmendaal, Gerrit J.   1983   *The Turkana Language*. Dordrecht: Foris Publications.

Doke C. M. and S. M. Mofokeng   1967   *Textbook of Southern Sotho*, Maskew Miller Longman.

Donwa-Ifude, Shirley   1984   The intonation system of Isoko. *Studies in African Linguistics* suppl. 9: 83-89.

Downing, Laura   1996   *The Tonal Phonology of Jita.* (Studies in African linguistics 5) München: Lincom Europa.

England, Nora C. and Ladusaw William A. 1985   Question formation in Kusaal. *Studies in African Linguistics* suppl. 9:105-110.

Frajzyngier, Zygmunt 1989   *A Grammar of Pero*. Berlin: Dietrich Reimer Verlag.

Fréchet, Anne-Lise   1989   *Tons et downdrift: quelques aspects prosodiques du Gungbe de Porto-Novo (Bénin)*. Mémoire de DEA, Université de la Sorbonne-Nouvelle, Paris.

Gordon Innes 1971   *A Practical Introduction to Mende*. London: School of Oriental Studies.

Grégoire, Henri-Claude   1979   *Etude de la langue Gouro (Côte d'Ivoire).* Thèse de 3ème cycle, Université de la Sorbonne-Nouvelle.

Grégoire, Henri-Claude   1990   *Tonétique et tonologie d'un groupe de langues Mandé Sud. Etude théorique et expérimentale*. Thèse d'état, Université de la Sorbonne-Nouvelle.

Guillet, Gérard   1972   *Initiation à la tonalité et à la grammaire de la langue fon*. Cotonou.

Güldemann Tom   to appear   The "Macro-Sudan belt": Towards identifying a linguistic area in northern Sub-saharan Africa. In B. Heine (ed.) *Africa as a linguistic area*. Cambridge: Cambridge University Press

Gussenhoven, Carlos 2002   Intonation and Interpretation: Phonetics and Phonology. In B. Bel and I. Marlien (eds.), *Speech Prosody 2002,* 39-46. Aix-en-Provence: Université d'Aix-en-Provence.

Hagman, Roy S.   1977   *Nama Hottentot*. (Language Science Monographs 55). Indiana University.

Hayward, Dick   1984   *The Arbore language: a first investigation, including a dictionary* . Hamburg: Helmut Buske Verlag.

Hermann, Eduard   1942   "Problem der Frage" Nachrichten von der Akademie der Wissenschaften in Göttingen. *Philologisch-Historische Klasse* 3-4.

Hulstaert Gustave   1961   *Grammaire du lɔmɔngɔ*. (Annales Sciences Humaines 39) Tervuren: Musée Royal de l'Afrique Centrale

Hyman, Larry and Magaji D. J.   1970   *Essentials of Gwari Grammar*. Ibadan: Institute of African Studies, University of Ibadan.

Kinda, Jules   1984   *Dynamique des tons et intonation en moore*. Thèse de 3ème cycle, Université de la Sorbonne-Nouvelle, Paris.

Kotei, Nii Amon   1969   *A description of modern spoken Ga with particular reference to Tone and Intonation*. Evanston: Northwestern University.

Kropp, Dakubu   2003   Interrogative structures in Farefare. *Gur Papers* 6: 57-66.

Kutsch Lojenga, Constance   1994   *Ngiti: a Central Sudanic language of Zaïre*. Köln: R. Köppe.

Lebikaza Kébié K.   1985   *Phonologie, Tonologie une Morphosyntax des Kabiye*. Inaugural dissertation. Köln: University of Köln.

Leben, William R.   1984   Intonation in Chadic languages. *Studies in African Linguistics* suppl. 9: 191-195.

Leben, William R.   1989   Intonation in Chadic: an overview. In Frajzyngier Z. (ed.), *Current Progress in Chadic Linguistics*, 200-217. Amsterdam: Benjamins.

Levergood, Barbara   1987   *Topics in Arusa phonology and Morphology*. Ph. D. dissertation. University of Texas, Austin.

Lindsey, Geoffrey A. 1985   *Intonation and interrogation: Tonal structure and the expression of a pragmatic function of English and other languages*. Ph.D. dissertation. University of California Los Angeles.

Marchese, Lynell   1983   *Atlas linguistique kru*. Abidjan: IFAN-Université d'Abidjan.

Mateene, Kahombo   1980   *Essai de grammaire générative et transformationnelle de la langue Nyanga*. Kinshasa: Presses Universitaires du Zaïre.

Maw, Joan and Kelly John   1975   *Intonation in Swahili*. London: SOAS.

Meeussen A. E.   1959   *Essai de Grammaire Rundi*. Tervuren: Musée Royal de l'Afrique Centrale.

Myers, Scott   1996   Boundary tones and the phonetic implementation of tone in Chichewa. *Studies in African Linguistics* 25-1: 29-60.

Nakuma, Constancio   1998   *Phonie et graphie tonale du dàgàaré, langue voltaïque du Ghana*. Paris: L'Harmattan.

Neukom, Lukas   1995   *Description grammaticale du nateni (Bénin): Système verbal, classification nominale, phrases complexes.* Zurich: Zurich Universität.

Nicole, Jacques   1987   *Le Nawdm et ses parlers locaux. Etude phonologique synchronique et comparative d'une langue voltaïque du Togo.* Thèse d'état, Université de Nice.

Ohala, John   1983   Cross-language use of pitch: an ethological view. *Phonetica* 40: 1-18.

Ohala, John   1984   An ethological perspective on common cross-language utilization of F0 in Voice. *Phonetica* 41: 1-16.

Okombo, Duncan Okoth   1997   *A functional grammar of Dholuo.* Köln: R. Köppe.

Platiel, Suzanne   1970   *Description du parler Samo de Toma (Haute-Volta).* Thèse, Sorbonne.

Podi, Napo   1995   *Esquisse comparative de l'Akasilimi et du basaal*, Thèse de 3$^{\text{ème}}$ cycle, Université de Grenoble 3.

Polak-Bynon L.   1975   *A Shi Grammar, Surface Structures and Generative Phonology of a Bantu Language.* (Annales Sciences Humaines 86), Tervuren: Musée Royal de l'Afrique Centrale.

Renaud, Patrick   1975   *Description phonologique et éléments de morphologie nominale d'une langue de Pygmées du Sud-Cameroun*: les Bajǎle (Bipindi), Thèse de 3$^{\text{ème}}$ cycle, Sorbonne-Nouvelle, Paris.

Rialland Annie   1980   Marques de ponctuation et d'intégration dans l'énoncé en gurma. *Bulletin de la Société de Linguistique de Paris* 75-1: 415-32.

Rialland Annie   1984   Le fini/l'infini ou l'affirmation/l'interrogation en moba (langue voltaïque parlée au Nord-Togo). *Studies in African Linguistics* suppl. 9: 258-261.

Rialland, Annie and Robert Stéphane   2001   The Intonational System of Wolof. *Linguistics* 39-5: 893-939.

Rongier, Jean 1996   Aperçu sur le Mɔyɔbɛ. *Gur Papers* 1: 115-145

Shuh, Russell G.   1998   *A Grammar of Niya.* (Linguistics, vol. 130) Los Angeles: University of California Publications.

Stanley, Carol 1991   *Description morpho-syntaxique du Tikar (parlée au Cameroun).* SIL

Talgaard P. C. and Bosch S. E.   1988   *Handbook of Isizulu.* Pretoria: J.L. Schaik

Tchagbalaye, Zachari 1976   *Phonologie et tonologie du tem*. Thèse de 3$^{\text{ème}}$ cycle, Sorbonne-Nouvelle, Paris

Tersis, Nicole   1980   *Description grammaticale du Zarma (Niger): unités et relations*

Syntaxiques. Thèse d'état, Sorbonne-Nouvelle, Paris

Thomas, Elaine   1978   *A grammatical description of the Engenni language*. SIL Publications

Tosco, Mauro 1991   *A Grammatical Sketch of Dahalo*. Hamburg: Helmut Buske Verlag

Ultan R.   1969   Some General Characteristics on Interrogative Systems", *Working Papers in Language Universals* 1: 41-63

Vogler, Pierre 1987   *Le parler Vata* (Travaux de l'Institut d'Ethnologie 3.) Strasbourg: Université des Sciences Humaines de Strasbourg

Watters, John 2000   Syntax. In . Bernd Heine and Derek Nurse (eds.), *African languages: an Introduction*. 194-230. Cambridge University Press

Westerman, Diedrich 1930   *A study of the Ewe language.* Oxford: Oxford University Press

Williamson, Kay   1979   Sentence tone in some southern Nigerian languages *Proceedings of the Ninth International Congress of Phonetics Sciences*, 424-430. Copenhagen: University of Copenhagen

Personnal data:
        Wolof, Moba, Gulmancema, Ncam, Southern Sotho, Dholuo
Personnal communication:
        Saghala (Cédric Patin)

Appendix.

Table of YES/NO question markers in 71 African languages.

	High-pitched yes/no question markers					Non-high-pitched yes/no question markers					
	1 register expansion/ reduction of downdrift	**2** raising of last H	**3** reduction of final lowering	**4** H or H%	**5** HL	**6** L or L%	**7** polar tone or M tone	**8** final length-ening	**9** breathy termi-nation	**10** shorten-ing of penulti-mate vowel	**11** [open] vowel
NIGER-CONGO											
Atlantic											
Fula *NT*	x			x							
Wolof *NT*	x										
Kru											
Bassa *3T*						x		V			
Godié *3T*						x					-à
Klao *3T*				x				V			
Néyo *3T*						x					-à
Vata *4T*											[open] V or a
Wobé *4T*								V			
Gur											
Akaselem *3T*						x		V…	x		or -à
Dagaare *2T*						x					
Farefare *2T*				x				V			
Gulmancema *3T*			y			x		V…	x y		
Kasem *3T*						x					or - nà
Kabiye *2T*						x		V			
Konni *2T*	x					x		V			
Kulango *2T*			x								
Kusaal *3T*						x		V			
Lobiri *2T*						x		V or V…?			
Mooré *2T*						x		V…	x		
Moba *3/4T*								V…	x		
Mɔyɔbɛ *2T*						x		V			

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Nateni 3T							V or V...			
Nawdem 2/3T					x		V or V... ?			
Ncam 3T					x		V...	x		or -à
Tem 2T					x		V			
Mande										
Gouro 3T					x		V			
Mende 2T	x			x						
Samo 3T						x	V			
Kwa										
Adioukrou 2T					x					or -è
Akan (Asante) 2T					x					
Baule 2T					x					
Ga 2T	x		x			x				
Ewe 3T					x					-à
Fon 2T					x					-à
Gun 2T					x					or -à
Adamawa - Ubangi										
Banda-Linda 3T					x					-à
Munzombo 3T					x		V			
Ijoid										
Izon 2T	x				x					
Nembe 2T					final H L					
Benue-Congo non Bantoid										
Degema 2T					x					
Efik 2T	x									
Engenni 2T	x				x					-à -e doubt
Gwari 3T					x		V			
Igbo 2T	x									L pronouns
Isoko 2T					x					
Yekhee 2T				x						
Benue-Congo Bantoid (non-Bantu)										
Bafut 3T				x						

Ejagham	*2T*						x				-à
Tikar	*2T*							V or C			[open] V
Benue-Congo Bantu											
Bajåle	*2T*				x						
Chichewa	*2T*	x			x						
Dzamba	*2T*		x								
Ganda	*2T*		x		x						
Holoholo	*2T*						x				
Jita	*2T*	x									
Kirundi	*1T*	x									
Mongo-Nkundu	*2T*			x							
Nyanga	*2T*						x				
Saghala	*1T*				x						
Shi	*2T*	x									kà
S. Sotho	*2T*	x								x	
Swahili	*NT*				y	x					
Zulu	*2T*	x								x	
AFROASIATIC											
Chadic											
Angas	*3T*	x	x				x				-àa
Hausa	*2T*	x	x		x		x optional	VV, if V short	x		-àa
Pero	*2T*				y most com-mon		x				-a
Sayanci	*2T?*	x	x				x				-àa
Tera	*3T*	x?	x								
Cushitic											
Arbore	*2T*			x							
Dahalo	*2T*					x					
Niya	*2T*	x									
NILO-SAHARAN											
Songhay											
Zarma	*2T*				x						
Central Sudanic											
Ngiti	*3T*				H/ tí						tí or ná
Eastern Sudanic											

Arusa	*2 T*		x	x							
Dholuo	*2 T*	x									
Nandi	*3T*				x				VV			i after C#
Turkana	*2 T*	x					x					-à
KHOISAN												
Nama	*3 contour T*	x										

Note that in each entry, the various exponents of a given question prosody are indicated with the same letter: *x* for the first or only prosody, *y* for a second, etc. In the last column, which ~~is~~ corresponds to the [open] vowel marker, *-à* occurs many times. The Low tone symbol is redundant as it refers to the same Low tone as the one indicated in column 6. We use this redundant notation to show the frequency and broad distribution of the combination of an open vowel and a low tone, that is, of the question marker *-à*.

Abbreviations used in the table:
   Number of tones: NT = non-tonal, 1T= 1 tone (pitch-accent), 2T=2 tones, etc.
   V = lengthening of one mora, V... = greater lengthening