TONE ORTHOGRAPHY FOR IVORY COAST LANGUAGES

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0.   Introduction

Researchers of the Ivory Coast Institut de Linguistique Appliquée
(I.L.A.) and the Société Internationale de Linguistique (S.I.L.) have been
working for several years on a project to unify as much as possible the
orthographies of the nation's fifty some languages, many of which are just
in the process of developing a written form. This was a difficult task
given such linguistic diversity and the fact that relatively little linguis-
tic research or literacy work had been done in many of these languages
until recent years. The languages can be grouped into four major families:

Family	Languages	Population (1975)
KWA	Baoulé, Agni, Attié, etc.	2,212,000
KRU	Bété, Dida, Guéré, etc.	825,000
GUR	Sénoufo, Koulango, Lobi, etc.	800,000
MANDE: NORTHERN	Dioula, Malinké dialects	709,000
SOUTHERN	Yacouba, Gouro, etc.	624,000

Since these language families all extend into neighboring countries, some
consideration had to be given to the orthography conventions already in use
in those countries, although there has been very little progress towards
harmonization between them to date. Since orthography changes tend to be a
very emotional issue, it was perhaps fortunate that very few Ivory Coast
languages had an established orthography before national standards were
developed.

In January 1980 the research team published a document entitled "Une
Orthographe Pratique des Langues Ivoiriennes" (I.L.A., Université d'Abidjan)
which was approved by several government ministries. It sets out the basic
principles and inventory of symbols which will guide the establishment of
orthographies for all Ivory Coast languages. It does not go into any detail
for specific languages. It is concerned with standards which can be applied

with some degree of flexibility for each language. Orthography guides will eventually be prepared for each language under supervision of a joint commission of I.L.A. and S.I.L. linguists.

The basic principles which the research team followed in making their decisions on orthography conventions were the following: 1) harmonize as much as possible the writing systems within and between the four language families, 2) base the orthography for each language on a sound linguistic analysis, 3) take into account the practical problems of printing and typing and 4) choose symbols with maximum transfer value to French, the official language of Ivory Coast. Obviously, much compromise was necessary to accommodate all of these requirements. For decisions concerning the choice of consonants and vowels, the commission permitted a certain number of phonetic symbols in conformity with conventions used in neighboring countries. The most interesting innovation, however, concerns the notation of tone.

1. Symbolization of Tone

1.1 Accents

The solution adopted for Ivory Coast languages was to allow two different systems for marking tone. The more traditional method of notation using accents above the vowels was recommended for languages where the tone system is relatively simple, especially for languages with only two or three discreet tone levels. The symbols to be used are as follows:

CV́   (high tone)   (C = Consonant, V = Vowel)

CV   (mid tone or unmarked tone)

CV̀   (low tone)

CV̂   (falling tone)

CV̌   (rising tone)

The unmarked tone is generally the most frequent one. Thus, for languages

with only two level tones such as Dioula, only high tone would be marked with an accent while low tone would be unmarked: bá "river", ba "goat".

The advantages and disadvantages of this system are generally well known. In French the accents do not represent tone, but rather vowel qualities or arbitrary orthographic rules. Free accents don't exist on most typewriters and need to be added on "dead keys". Since in a number of Ivory Coast languages central vowels are written with a diacritic, tréma (¨), there are some practical printing problems if accents are used as well. This is one reason why other diacritics such as tilde (~) for nasalization were avoided. For most languages the space above vowels is kept free in order to use accents for tone.

1.2 Punctuation Marks

The second system for writing tone makes use of several punctuation marks and the equal sign written before or after syllables. This approach is recommended for languages where much tone needs to be written and the words are generally monosyllabic. Languages where central vowels are marked with tréma also find it convenient to use this system. Level tones are written before a word or syllable. Tone glides are indicated by marking the point of departure before the syllable and the final tone level of the glide after the syllable. The symbols to be used are as follows:

"CV   (highest tone)

'CV   (high tone)

CV   (mid tone or unmarked tone)

-CV   (low tone)

=CV   (lowest tone)

Some examples from the Wobé (KRU) language, which has been analyzed as having fourteen contrastive tone patterns on monosyllabic words[1], show how both level and gliding tones are written:

"si	"yam"	(very high tone)
'kpa	"bone"	(high tone)
de	"mother"	(mid tone)
-ti	"water buffalo"	(low tone)
'sɛ-	"thank you"	(high falling to low)
ko-	"rice"	(mid falling to low)
-gbu"	"house"	(low rising to very high)
be"	"pig"	(mid rising to very high)
-kle'	"field"	(low rising to high)
bli'	"cow"	(mid rising to high)

Some obvious advantages of this system are that it is easy to type and print. Field testing seems to indicate that the vertical and horizontal marks are more easily distinguished by readers than slanted accents, especially for languages where much tone is written. One disadvantage is that in French these symbols are used for punctuation. In languages where this system is already in use this does not appear to pose any major problem because apostrophe and hyphen are not needed and quotations can be marked by other means such as French guillemets (<< >>). Languages which need hyphen and apostrophe for punctuation would probably not be able to use this system for tone.

2. Historical Background of Writing Tone with Punctuation Marks

Since this method of writing tone is so far unique to Ivory Coast, it might be interesting to recount here how the system developed.[2] In 1972 Margrit Bolli, an S.I.L. researcher working in the Yacouba (SOUTHERN MANDE) language of western Ivory Coast, was attending a primer construction workshop in Ghana under the direction of Dr. Sarah Gudschinsky, the late International Literacy Coordinator of S.I.L.. Up to that point Yacouba had been written without any marking of tone. The result was disastrous since

there are five tonemes and tone carries a very high functional load in that language. Almost no one learned to read fluently. After examining the phonology, Dr. Gudschinsky recommended that all the tones be written. The big question was how to do it.

Accents had been ruled out because Yacouba has twelve oral vowels, some of which were represented by using accents as in French for easy transfer (é, è and ô). Several methods were tried such as marking tone with raised numbers following the syllable (a practice used in some Mexican languages) or employing unused letters of the alphabet such as c,j,q and x. These solutions were not aesthetically pleasing; they looked like a mathematician's nightmare or a language from outer space! Finally the use of punctuation marks was attempted. High tone was represented by an apostrophe, mid tone was unmarked, low tone was represented by a period and falling glides with a hyphen. This proved to be much more acceptable to Yacoubas. One man who had learned to read with great difficulty without tone marks exclaimed: "I like those little marks, they are like road signs that tell us which way to go!" Some who were literate in French thought that these marks made the page look very "un-French", but even using a lot of accents also looked strange. Many of these people were won over by the fact that without marking tone it was impossible to read Yacouba. Today there are thousands of Yacoubas who have learned to read and write their language—the system works!

Other languages with complex tone problems have also adapted the system with good results. For the past several years attempts were made to write all Ivory Coast languages with the punctuation mark system, but this was found to be not practical for a number of languages, especially those with long words. All of the KRU languages, however, have adopted punctuation marks for tone. Several KRU languages in Liberia which had been using accents (sometimes more than one accent per vowel) are experimenting with

the punctuation mark system and report good results with literacy classes. Several SOUTHERN MANDE and at least one KWA language (Attié) are using the punctuation mark system with much success.

3.   Functions of Tone

3.1   Tone Written for Native Speakers of the Language

Another important question which the commission dealt with was how much tone needs to be written. The answer to this much debated question depends in part on first resolving the matter of whom the orthography is intended to serve: native speakers of the language, non-native speakers or both. Insofar as the native speaker of the language is concerned, the commission recommended that only those tones which were indispensable for the identification of words needed to be represented. This minimal statement allows for much flexibility of interpretation and application. Each language was given the option to apply the tone symbols as best suited the specific problems of that language. Thus, in some languages every tone on every syllable needs to be represented in the orthography. Other languages may require only certain tones on certain words. There are many different kinds of tone systems in Ivory Coast and tone has different functions in each language.

Some languages such as Tyebaara Sénoufo (GUR) have a very limited number of tone patterns extending over words. Tone can be analyzed as a prosodic feature of the word. For example, all the tones of a given word may be high, low or low with a rising tone on the last syllable. Languages of this type may need only a minimum of tone marking in order to indicate the overall pattern. In Djimini Sénoufo (GUR) it appears that only the initial low tone, especially of verbs, needs to be indicated. In Dioula (NORTHERN MANDE) it is the initial high tone which is marked.

Agni (KWA) has a terraced level tone system with phonemic downstep.

There are two level tones (high and low) and two tone glides (high falling and low rising). Tone carries a low functional load since there are very few words distinguished only by tone. It has more of a grammatical function than a lexical one. In this kind of tone system there are complex rules to get from the phonemic tone to the surface phonetic tone, so it has proved more practical for native speakers of the language to write a minimum of tone. Only the symbols for high and high falling tone are used. Low tone is unmarked and low rising is perceived as vowel length so it is written as a long vowel.

Wobé and Yacouba, which have already been mentioned, are at the other extreme where lexical tone is very crucial. Both of these languages have a discreet level tone system with four or five level tones plus a good number of tone glides.[3] These languages tend to be generally monosyllabic in word structure. The use of punctuation marks for tone tends to make words longer in print, but this is no disadvantage if all the words are short to begin with. It would be very difficult to write all of the tone glides in these languages with accents. With the punctuation mark system all tones are written with just three little marks.

Toura (SOUTHERN MANDE) has four level tones. Lexical tone is very important but so is grammatical tone. A number of tonal clitics are used to indicate verb aspects and certain higher discourse features. The solution which has proved useful for this language is to write lexical tone with accents and the tonal clitics with punctuation marks. Here are some examples:

 à bhá "his friend"

 à bhá' nu "his friend has come" (high tone suffix on noun)

 à bhá- nu "his friend should come" (low tone suffix on noun)

Since the tonal clitic is perceived as lengthening of the vowel, it might be possible to add a dummy vowel to carry the suffix tone. This was not done because Toura words can have sequences of two or three identical

vowels without the suffix. The use of the punctuation mark keeps the already complex word shape more constant.

In Bété (KRU), which has only three tones, it was useful to mark tone with punctuation marks because of the high frequency of central vowels marked by tréma. In some words a tone is written before the final syllable and indicates not only the following tone but also corresponds to a morpheme break. Otherwise it is only the first syllable of a word which is marked in this language.

Tones should be marked in as systematic a fashion as possible in order to facilitate both reading and writing of the language. The more arbitrary the tone rules become, the more difficult it will be to teach literacy. The best solution for a given language requires extensive testing to see which tones are most essential to promote fluency in reading and writing. If readers must constantly reread material to get the meaning, it probably indicates that tone is not adequately marked.

3.2 Tone Written for Non-native Speakers of the Language

Although no explicit mention is made of this issue in the orthography standards document, members of the commission have carefully considered language specific solutions. It was, of course, one of the goals of the commission to harmonize the orthography symbols and their application between all the national languages in order to permit easy transfer from one language to another. This was pretty well achieved for the symbolization of consonants and vowels but not for tone. Since tone systems in Ivory Coast vary greatly between languages and even between dialects of certain languages, the commission felt that more flexibility was required not only in dealing with how to symbolize tone but also in how much tone to write. Their primary concern was for the great majority of Ivorians who are still illiterate and need to learn to read in their own language before worrying

about how they are going to transfer their literacy skills to other
national languages and French. Usually, literate people have little
difficulty adapting to different orthographies.

In a country where fifty languages are spoken it is important for
the development of national unity that citizens have opportunity to learn
other national languages. The I.L.A. has already developed basic language
learning courses in several major national languages. Manuals for these
audio-visual courses provide for teaching tone in different ways according
to the nature of the tone system. In Dioula and Bété the normal tone
orthography is used for the most part since phonetic and phonemic tone
are basically the same. Even though all of the tones are not explicitly
marked, the overall tone pattern can be quickly learned from the initial
and occasional final tones which are marked. In Baoulé, however, the tones
on words learned in isolation are different from those in context. Since
the nature of the tone is a terraced level system with downstep, the
phonetic and phonemic tone is not identical. A **low** tone at the beginning
of a sentence is often realized higher than a high tone near the end of the
sentence. The solution adopted for noting tone as a pedagogical help has
been to write a sort of musical scale with notes above the key sentences
to be learned. This is in contrast to the normal tone orthography for
native speakers which only marks occasional high tone on certain grammatical
constructions. It would be very awkward to write all language materials
with this musical notation. An alternative method for language learners
would be to note every change of tone direction using accents.[4] This would
not represent phonetic tone, but it would serve as a guide to rises and
falls in the overall intonation pattern. When this system is used with
native speakers of the language, it appears to be more of a hindrance than
a help. It would appear to be wise to allow some flexibility for writing
tone for non-native speakers of the language. In some languages one system

can serve both native and non-native speakers. In other languages this may not be possible, so special pedagogical materials would be needed.

4. Teaching of Tone

Experimental adult literacy classes are being held in a number of Ivory Coast languages. One of the keys to success in teaching tone, especially for discreet level tone systems, has been the use of a reference system. A common word is chosen to represent each tone pattern. In Yacouba, for example, high tone is associated with the word for "moon" which is pronounced on high tone, mid tone is associated with the word for "father" which is a good example of a word with mid tone, etc. Exercises are necessary to help people identify tones and develop automatic tone recognition. Often these exercises are carried out as a game. The teacher says a short sentence, picks out a word with a known tone, writes the word on a blackboard without noting the tone and then asks the student to compare it with the set of reference words until it is correctly identified. The student is supposed to say whether it is a "moon" tone or a "father" tone, etc. Often students are encouraged to whistle the tone to help them in comparing the pitch. There is no need to use technical terms for the various tone patterns. It is better to use an indigenous term or none at all. When there are several reference words, it has sometimes proved necessary to start with the highest tone in order to establish the normal pitch levels of words.

Tone frames have been helpful for teaching tone in several languages. In one language the tone on nouns is discovered by substituting the noun in a frame such as "I saw ___ yesterday." This frame has a preceding low tone and a following mid tone. If the substitution item is not the same as either of these, it is identified as high tone in this three level tone system. This method may be useful for languages where words in isolation are realized differently in context.

For languages where only grammatical tone is marked, tone rules for specific constructions need to be drilled until they become automatic.

This is best done in the context of natural sentences or other appropriate discourse units. In Agni, for example, the tone pattern on a given sentence is read first by the teacher and then repeated by the students. The grammatical construction under consideration is then written directly below the sentence and read in isolation in order to focus on the tone pattern to be learned. Two or three sentences with the same grammatical pattern and tone are compared in this way and students are asked to seek other examples of the same pattern. This kind of exercise helps students group words and read longer intonational patterns fluently.

5. Conclusion

The question of how to write tone and how much tone to write have been much debated in Africa. It appears that these questions are often left unanswered because not enough research has been done to understand the tone system of the language in question. In Ivory Coast some creative research and experimentation has been done to solve tone orthography problems for several different language families with quite divergent tone systems. In addition to the widespread practice of writing tone with accents, a new system using vertical and horizontal symbols derived from punctuation marks has been tested and found to be very practical for certain languages.

Although it was at first hoped that one system for marking tone would work for all the languages in the country, it was eventually decided that two systems were needed in order to best serve the cause of promoting literacy in national languages. Given the urgency of the struggle against illiteracy in Ivory Coast and other African countries, this decision to promote orthography standards which are generally uniform but above all practical instead of ones which are rigidly uniform but not entirely

practical is quite understandable. Much more research and experimentation
is needed in these areas of devising tone orthographies and teaching people
to read and write them fluently. More exchange of information in this
matter will no doubt help in the promotion of literacy in Africa where
tone plays such an important part in many languages.

NOTES

1. Bearth, T. and C. Link, 1978 Les tons du wobé: étude fonctionnelle.
Annales de l'Université d'Abidjan, Série H, 11, pp. 21-57.

2. For a full account see Bolli, Margrit, 1978 Writing tone with punctu-
ation marks. Notes on Literacy 28, Summer Institute of Linguistics: Dallas,
pp. 16-18.

3. Flik, Eva, 1977, Tone glides and registers in five dan dialects.
Linguistics 201, Mouton, pp. 5-59.

4. This was proposed as a pedagogical help for the related Twi language of
Ghana by Christaller, J.G., 1875, A Grammar of the Asante and Fante Language
Called Tschi (Twi). Basel, republished 1964 by Gregg Press Inc.; Ridgewood,
New Jersey.

APPENDIX

Here are some sample paragraphs of text written with the punctuation
mark system for tone notation:

Wobé

-Tɛɛ" 'ɛ -kae 'kpa -gboe", -wɛe ɔɔ 'bɛ -kae dee 'de 'ma -gbei" 'de.
Ɔ ke ɔɔ' -gbe' a -si' -ta "en o -gbei" jeejee, 'ka ɔ se 'on 'da
kpɛ du'e. 'Soh "ɛn -gba -gbaejɔ du' 'bo ɔɔ' -jei". -Tɛɛ" se 'on
'je, ɔɔ' -gbe' mɛ -je 'on.

Bété

Ɔ 'pä-ä mö laklĭ-a -gɔja 'nyu 'möo ɔ yia ka 'a 'yua wäzeh ɔ naa:
— A yeh bhä-ä -ka -mö 'toha nĭmĭ·maa 'zeha -a 'kɔ-ɔ 'wu 'bhlie
yi-i, na -bubu laklĭa ɔ neh ɔ yreh 'mö?

Yacouba

Do 'kun =plɛ 'kun 'yan zë -gaɔ -dhë. -Gaɔ zü =wöng' 'ka 'söü- zo
gon ⊷Gbɛi, -a -dhɛ -kë =dɛɛ pë- 'zee- tii =Göö tii 'gluë- -kë bɔ
n 'ga Blii dhö -vu -kpa -yɛ =nɛ klɔ.