

THE INTEGRATION OF SYNTAX IN THE DETERMINATION OF PHONEMES AND ALLOPHONES IN TAGBANA LANGUAGE

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Abstract

The present article describes the phonological status of occlusive phonemes in Tagbana language. A deep analysis reveals a dichotomy : voiceless and voiced segments. An analysis of the voiced consonants with the commutation method signals that these segments are phonemes ; consequently they play a contrastive function as proposed by the commutation method. However, a deep syntactic analysis of these segments raises doubts about their contrastive function. The phonological processes related to these phonemes come rather from syntactic constraints that are realized or not in the structure of sentences, hence the point of interconnexion between Syntax and Phonology. That interconnexion admits the role played by Syntax in the determination of phonemes in Tagbana.

Key words : *Phonology – Phoneme - Consonant mutation – Voicing - Allophones.*

Résumé

Le présent article décrit le statut phonologique des occlusives du Tagbana. Une analyse approfondie relève une dichotomie : occlusives orales sourdes et occlusives orales sonores. Une analyse de ces consonnes sonores avec la méthode commutative révèle que ces segments sonores sont des phonèmes, par conséquent ont une fonction contrastive telle que proposée par la méthode commutative. Cependant une analyse syntaxique approfondie de ces segments met en doute leur fonction contrastive. Les faits phonologiques liés à ces segments proviennent plutôt de contraintes syntaxiques qui sont réalisées ou non dans la structure des phrases, d'où le point d'interconnexion entre la Syntaxe et la Phonologie. Cette interconnexion admet le rôle joué par la Syntaxe dans la détermination des phonèmes en Tagbana.

Mots clés : *Phonologie – Phonème - Mutation consonantique – Voisement - Allophones.*

Introduction

Verbal communication is composed of linguistic signals such as alphabetical letters and punctuation marks. It goes without saying that words and sentences are constructed using the alphabet. For instance the basic alphabet for written languages like English are A to Z. The elementary linguistic unit of a spoken language is called a phoneme and its acoustic realization is called a phone. Phonemes can be produced in isolation or in connected speech. This dichotomy about phonemes creates very often confusion. *“Phonemes are difficult to distinguish in normal speech...”* (Ehri 1984. P6). They can be discriminated basing on their distinctive features. Even if they have some features in common, they are not totally similar.

To contrast two phonemes, one can resort to the commutation test. This method is helpful in the awareness of phonemes in languages. But does this method work in any case and with any language ?

According to Danielle Kanga-Eba, *“the descriptive study of a language should start by a phonological study. What is more logical than the fact of knowing the phonemes of a language before hoping to lead a deep study so as to understand its structure and functioning?”*¹⁸ In this article, an emphasis will be put on the syntactic aspect of Tagbana language.

Tagbana people belong to the ethnic group of the same name (Tagbana). They occupy, between the (River) N’zi and the Bandama, respectively live in the areas of Katiola, Fronan, Niakara and Tafire. This language is spoken in the North-center

¹⁸ Our translation of the idea of Eba Kanga which goes that << L’étude descriptive d’une langue devrait, en principe, débiter par une étude phonologique. Qu’y a-t-il de plus logique que de connaître les phonèmes d’une langue avant d’espérer y mener une étude en profondeur pour comprendre sa structure et son fonctionnement ? >>

of Côte d'Ivoire. Tagbana people are one of the ethnic groups that constitute the large Senoufo Group.

Tagbana language has already been studied, phonologically speaking, by some Authors (cf. Mensah & Tchagbalé : 1983 and d'un essai de grammaire (Clamens : 1952). The phonological study of this language has revealed the existence of thirty six phonemes :

twenty one (21) consonantal phonemes: /p, t, c, k, kp, ʔ, b, d, ʃ, g, gb, f, s, h, m, n, ɲ, ɳ, l, w, j, /twelve (12) vocalic phonemes /i, ɪ, u, ʊ, e, o, ε, ɛ, ɔ, ɔ̃, a, ɔ̃ / and three (3) suprasegmental phonemes: high tone / ˊ /, the middle tone / ˊ̄ / and the low tone / ˋ / . It is important to mention that Tagbana is a tonal language ; it means that the tone plays an important role in the conceptualization of meaning.

In this work, only the occlusive phonemes except the glottal /ʔ/ will be taken into consideration. Then, the concerned segments are : /p, t, k, kp, b, d, g, gb, c and j/.

1. Literature review, theoretical framework and methodology.

1.1 Literature review.

In any language, one can identify a small number of regularly used sounds (vowels and consonants) called phonemes. Due to notoriously confusing nature of English spelling, it is particularly important to think of English pronunciation in terms of phonemes rather than letters of alphabet, one must be aware for example that the word 'enough' begins with the same vowel phoneme like the one at the beginning of 'inept and ends with the same consonant as 'stuff'¹⁹

¹⁹ Peter Roach, English Phonetics and Phonology. A practical course .1983. (Introduction)

According to Longman Dictionary of Language Teaching and Applied Linguistic third edition, a phoneme is a smallest unit of sound in a language which can distinguish two words. Example, in English language, the /p/ in cap and /t/ in cat represent different phonemes. The most comprehensive definition of the phoneme was first introduced by the Russian linguist L.V. Shcherba. The concise form of this definition could be : “the phoneme is a minimal abstract linguistic unit realized in speech in the form of speech sounds opposable to other phonemes of the same language to distinguish the meaning of morphemes. What are actually the characteristics of a phoneme?

1.1.1. Characteristics of a phoneme

The phonemes of a language are not totally separate entities; they have common features. Any feature that distinguishes phonemes is called a distinctive feature. A standard way is to describe vowels in terms of the features of [high], [low], [back], [round] and [tense] and consonants can be similarly described in terms of the features of [place], [manner], and [voice]. Now how does the commutation method work in phonemes discrimination?

1.1.2. Commutation method.

To contrast phonemes, one can resort to the commutation test. It consists in substituting one sound for another in a particular phonological context”.²⁰ For instance the words *pet* and *bet* differ only in the initial phonemes. Some linguists do not deeply rely on this method.

²⁰ Peter Roach(2009 P16.[English phonetics and Phonology Glossary](#) (A little Encyclopaedia of phonetics)

Consequently, Peter Roach could say: “there are serious theoretical problems with this test”²¹. That is all the more true since variation is inherent to speech. When people are involved in a trend of speech, they do not utter words separately but in *articulation*²². This way, a phoneme mutation phenomenon occurs and these mutations are considered in phonology as allophones or variants of a phoneme. Any piece of work goes through a theory and a method, the section below is about the theory and the method of research.

1.2. Theoretical framework and methodology.

1.2.1. Theoretical framework.

Undertaking a research work requires a theory or theories to frame and support one’s claims. The study of sound started long ago, in this section, a brief presentation of the evolution of the phoneme theory is done.

The theory of phoneme was first expounded by Baudouin de Courtenay (1880). In his treatise “On the Comparative Study of the Grammar of Slavonic Languages” he clearly defines the difference between a phoneme and a speech sound. He treats a phoneme as a semantically differentiating unit and a speech sound as an anthropophonic unit of speech, not connected with any meaning

Distinctive feature theory is not far from the phoneme theory. Distinctive features are smallest units of linguistic structure, from which larger units are built, sometimes seen as the attributes by which phonemes can differ. Before having a say

²¹ Op. Cit (P17)

²² In phonetics, the overlapping of adjacent articulations.

In phonology, the spreading of phonetic features to neighboring segments.

see assimilation .This definition comes from Longman Dictionary of Language Teaching and Applied Linguistics.P95

about the method, it is important to have an overview about phonemes and their production in Tagbana. This language has an alphabetical system of approximately thirty (30) phonemes seven vowels (i e ε a ɔ o u) and twenty three consonants (p b m n l t d f s r c ñ j ny k g kp gb ŋ m ŋ h ?). All the consonants phonemes can be classified (anatomically) in a table as follows:

Place Manner									
	Bilabial	Labio-dental	Dental	Alveolar	Palato-alveolar	palatal	velar	Labio-velar	glottal
Nasal	m		n	n	ñ	ny	ŋ	ŋm	
Stop	p b		t d	t d			k g	kp gb	
Fricative		f		s					h ?
Affricate					c j				
Approximant	w			r		y			
Lateral				l r					

Chart displaying the anatomy of consonants in Tagbana

In this article, the analysis will concern consonants and particularly the following occlusive phonemes : /p, t, k, kp, b, d, g, gb c and j/. As a native speaker of Tagbana, I noticed that during a speech trend, each of these phonemes is realized differently due to some specific phonetic contexts. This phoneme mutation phenomenon gets the commutation method to be misleading and leads me undertake a research to limit and

particularize the characteristics of the commutation method. What is then the method used to achieve my goal ?

1.2.2. Method.

As a native speaker of Tagbana, the collection of data has been done through my personal observations and this has been double checked with old native people speaking around me. First, I have listed out words which show a consonant mutation phenomenon with occlusive phonemes. Words in isolation are formed in which each of the mentioned occlusive phonemes is word initially. The same word is used in real communication (connected speech). In these circumstances, the initial phoneme in word isolation changes to become another phoneme but with no meaning change. It seems that this consonant mutation is due to the influence of the adjacent phoneme that triggers the appearance of the counterpart phoneme. The analysis of the data will say more about that mutation.

2. Data presentation, analysis and discussion.

2.1.Data presentation.

In this section, the data are presented in two groups. In the first group, words are selected on the basis of casual and rapid speech ; since they are uttered in a real communication context. The structures are numbered from 1 to 5 and each contains 4 lines maximum. In the first line, the phonemes which are concerned by the analysis (occlusive phonemes) are underlined and in bold. They also represent the phonemes which have already undergone changes due to some phonotactic constraints. The second and third lines represent respectively the literal and literary translations. As for the last line, it represents the order of the mutation (from the phoneme in word isolation to the counterpart phoneme). The second group are data used in isolation where occlusive phonemes are in initial position.

Group 1

1. *Fōḡdadonā druñan ni*

Hungriness/had/fall//world/in
Starvationhappened in the world

to→do (happen/fall)

2. *Kēnnādabākpēn kaa māḡe*

Really/ coming/ breakday/to
And when it was about to be dawn

pan→ban (come).

3. *Sā niwiga wawel di gbe*

Until/pronoun/object/look/take
Until it looks at one and select it

kpe→gbe (take/select)

4. *Nāj*ie*wida glen*

Man young/anaphorical pronoun/sit/
The young man was sitting...

klēn→glēn (sit)

5. *Mi da jiō lobil siēn*

pronoun/asp/ pick/mangoes/two
I had picked three mangoes

ciō→jiō (pick at).

Group 2 : *k/g* : *kolo* (to twist) *golo* (chicken). *P/b* : *para* (cotton) *bara* (surprising). *t/d*: *tru* (to dig) *dru* (hippopotamus). *kp/gb*: *kpo* (to kill) *gbo* (a tiny biting insect). *c/j*: *ciɔ* (to pick up) *jiɔ* (to drink).

2.2. Data analysis.

The remark is that the production of phonemes related to their contrastive function works perfectly when words are produced in isolation. In isolation we are not in a trustworthy communication activity that implies a speaker and listener using speech in a casual and rapid way as native speakers will do. Consequently, all these occlusive phonemes will play a contrastive function if they go under a minimal pair test. This is elucidated by data from group 2. But what actually happens with these phonemes when they are used in casual and rapid speech. "We do not articulate sounds in isolation, but connect them up in strings" (1994, p. 23).

By means of fast and casual speech, phonemes become more or less similar to those adjacent to them. Although, we talk about similarities of adjacent phonemes, a phoneme is not totally similar to others. It goes without saying that there is a slight difference. It is exactly on this difference that unaware people focus to assign the contrastive function of the phoneme just like in isolation context of words (commutation method). Actually things are not working this way in connected speech, above all with occlusive phonemes in Tagbana language. The coming section is that of the interpretation. It only concerns data of group 1. The different mutations observed will be interpreted showing the influenced and influential phonemes and the phonetic environment in which changes occurred.

- **Phoneme Alteration : /kp/→/gb/**

When the voiceless labio-velar stop /kp/ is in the same phonetic environment with the voiced alveolar stop /d/, it is interfered to receive the voicing feature from the phoneme /d/.

/kp/ → /gb/

+ labio-velar	+labio-velar
+ stop	+stop
- voice	+ voice

- **Phoneme Alteration /c/→/j/**

Let us analyze the voiced palatal approximant /j/ perceived in the following sentences : *Mi da ji lo bil siēn* (I had picked two mangoes). That sentence develops the idea of *getting a fruit from a tree*. If that semantic aspect is considered, one can built a free morpheme. Then, the verb which derived from *ji* is /ciɔ/. It goes without saying that *ciɔ* turned into *ji* preceded by da.

/c/ → /j/

+ palato- alveolar	+palato-alveolar
+ affricate	+affricate
- voice	+ voice

- **Phoneme Alteration : /t /→/d/**

When the voiceless alveolar stop /t/ is in the same phonetic environment with the voiced alveolar stop /d/, it is interfered to receive the voicing feature from the phoneme /d/ .

/t/ → /d/

- alveolar	+ alveolar
+ stop	+stop
- voice	+ voice

- **Phoneme Alteration : /k/→/g/**

When the voiceless velar stop /k/ is in the same phonetic environment with the voiced alveolar stop /d/, it is interfered to receive the voicing feature from the phoneme /d/ .

/k/ → /g/

+ velar	+velar
+ stop	+stop
- voice	+ voice

- **Phoneme Alteration : /p/→/b/**

When the voiceless bilabial stop /p/ is in the same phonetic environment with the voiced alveolar stop /d/, it is interfered and received the voicing feature from the phoneme /d/.

/p/ → /b/

+ bilabial	+ bilabial
+ stop	+stop
- voice	+ voice

Considering carefully these counterparts' phonemes in each set, most of the mutations are linked to the same verb (root). When we resort to the commutation method, we would say that all these sets of phonemes are in overlapping distribution. Actually that is wrong. These occlusive phonemes in Tagbana display the weaknesses of the commutation method.

In fact, sentences which display a voiceless phoneme then a voiced one for the same verb are nothing else than syntactic precisions. To have a better insight of these modifications and grasp this phonemic and allophonic awareness, one should integrate syntax in the determination of phonemes and allophones in Tagbana.

3. Results and discussion

At the beginning of this research work, some questions were set among which the applicability of the commutation method to the Tagbana language as observed in English. The analysis of data has helped to find answers. The commutation method gets some limits. “There are syntactic rules that must be applied after that some phonological information have become accessible, there is no precise barrier between Syntax and Phonology. There exists a certain degree of osmosis between these two domains”²³

The integration of syntax plays a role of a great importance in the determination of phonemes in Tagbana language and helps to overcome the limits of the commutation method. Actually, syntax brings with spatiotemporal modifications and never alters or changes the meaning of the root word. It helps to identify environments in which variations occur and this very often happens with stops. Considering for instance, the different sets of counterparts’ phonemes used in different sentences and with the same main verb, we notice that all the verbs beginning with a voiced stop phoneme are not in opposition with their voiceless counterparts but they bring

²³ Our translation of the idea of Philip H. Miller et al (1992.P251-2) which goes that <<Il y a des règles syntaxiques qui doivent s’appliquer après que certaines informations phonologiques sont devenues accessibles, il n’y a pas de frontière nette entre la syntaxe et la phonologie. Il existe un certain degré d’osmose entre les deux domaines>>

grammatical precisions : /p/ has shifted to /b/ for information related to near future in *mi bi bā̃* (I am going to come) or to represent the negative form in *wu da fafaga* (he has not got many...).

In Tagbana, the contrastive function as proposed by the commutation method sometimes happens to be misleading above all with stop phonemes. A phoneme has a distinctive function if it helps to discriminate two lexical words. But stops are almost all integrated phonemes and very often shift from their voiceless to their voiced counterparts for precisions and parameters that are not always to show an opposition of phonemes. Among these parameters, one can consider the one of modality.

The research has revealed a set of consonant mutation concerning verbs beginning with a voiceless stop. These voiceless stop phonemes automatically become voiced stops in the phonetic context of a voiced phoneme. The aspect-modal marks *bi* and *da* express respectively unaccomplished and accomplished actions and all of them are voiced stops. The consonants *p*, *t*, *k*, *kp* and *c* respectively become *b*, *d*, *g*, *gb* and *j*.

“*Phoneme*” is used to mean sound in its contrastive sense and “*allophone*” is used for sounds which are variants of a phoneme: they usually occur in different positions in the word (i.e. in different environments; hence they cannot contrast, nor be used to make meaningful distinctions

Conclusion

The commutation method has generally been used as a referential method in the determination of phonemes in languages. The case of Tagbana language, particularly with stops has demonstrated that one should not focus only on commutation method to determine or verify the phonological status of sounds in a language. A deep analysis and scrutinization

which take into account the speech chain is important and worthy doing. In fact, the commutation method has got some limits when it happens to distinguish voiceless and voiced plosive phonemes in Tagbana. Syntax represents a complementary tool in phonology which allows and facilitates the discrimination of plosives. Actually, the voiceless stops phonemes are considered as the segments which play the contrastive function of a phoneme as mentioned by the commutation method and the voiced stops are nothing else than their allophones and they are predictable by phonetic contexts. This distinction phonemes- allophones related to occlusive phonemes puts into evidence the weaknesses of the commutation method.

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