

NASALITY IN GBE:
A SYNCHRONIC INTERPRETATION*

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Extreme claims have been made about nasality in a number of languages that exhibit, at the phonetic level, nasal consonants and nasalized vowels. These claims can be grouped into three categories: (1) the language has both nasal consonants and nasalized vowels as autonomous/underlying phonemes; (2) the language has phonemic nasal consonants only, and nasalized vowels are pure phonetic realizations; and (3) the language has phonemic nasalized vowels only, and nasal consonants are pure phonetic realizations. The language also has, of course, phonemic non-nasal consonants and non-nasalized vowels in all three cases. The three positions have been held with regard to Ewe or Gbe, the subject matter of this paper, by Westermann [1930] and Ansre [1961], Stahlke [1971], and Capo [1977b] respectively. The aim of this paper is to attempt a critical review of these three positions, starting with the presentation of the data. Using three different theoretical approaches (Prosodic, Transformational-Generative, and Taxonomic) the paper argues that in Gbe, nasality is primarily a feature relevant to vowels. Thus, underlying nasalized vowels are recognized, and nasal consonants are treated as predictable variants of non-nasal consonants. Incidentally, syllabic nasals are analyzed as reduced forms of CV syllables.

1. Introduction

1.1. Nasalized vowels in transformational-generative phonology. Many linguists have been concerned with nasality in the phonological theory, or rather phonological theories. It is often true that their theoretical differ-

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ences, reflected in their methodologically divergent approaches, lead them to different conclusions about the status of nasality in specific languages. Thus French has been (traditionally) considered as having phonemic nasalized vowels, until Rohrer [1967] argued that these nasalized vowels should be treated as a sequence of non-nasalized vowel followed by nasal consonant, in the transformational-generative framework. Since then, it seems that all generativists tend to analyze phonemic nasalized vowels, whatever the language as a sequence /VN/. This tendency is encouraged by the search for universals and Ferguson [1963:56, 58] clearly states:

- I. "Every language has at least one Primary Nasal Consonant in its inventory."
- X. "No language has Nasal Vowels unless it has also one or more Primary Nasal Consonants."

The claim therefore is not only relevant for the transformational-generative phonology; it should be held, whatever approach is used. However, in some West African languages, e.g. Akan, Yoruba and Gban, although phonemic nasalized vowels are recognized, some authors (Schachter and Fromkin [1968] for Akan, Courtenay [1968] for Yoruba, and Le Saoût [1973] for Gban) do not take for granted the existence of a "Primary Nasal Consonant". This is also the case with Gbe for which at least three positions have been held.

1.2. Positions held for Gbe. With regard to Gbe ("Ewe"), to be presented in section 2, at least three positions are held. (1) The commonest one, taken by Westermann [1930] and Ansre [1961] for instance, is that "Ewe" has four nasal consonants, namely /m, n, ŋ, ɲ/ and some nasalized vowels. While Westermann [1930:2] claims that all vowels can be nasalized, Ansre [1961:8] remarks that all vowels occur in nasalized form except /e/ and /o/, commenting that [e] and [o] tend to become [ɛ̃] and [õ̃] when nasalized. Working in the framework of taxonomic phonology, apart from setting up phonemic nasal consonants and phonemic nasalized vowels, they nevertheless maintain that all vowels which occur after nasal consonants tend to be nasalized (see Ansre [1961:9]).

(2) The second position to date chronologically is the one taken by Stahlke [1971]. He argues that nasalized vowels in "Ewe" should be analyzed

as a sequence of oral vowel followed by nasal consonant, and he recognizes four nasal consonants, namely /m, n, ɲ, ŋ/. Working in the framework of generative phonology, he does not apparently agree that all vowels are automatically nasalized after a nasal consonant.

(3) The most recent position is argued for in Capo [1977b], that no phonemic nasal consonant exists in Wací and Gen, two dialects of Gbe; only nasalized vowels exist, and they assimilate a specific set of non-nasal voiced consonants to become nasal. Working in the framework of taxonomic phonology, Capo recognizes that the (created) nasal consonants are followed by slightly nasalized vowels. (A similar position is argued for in Rouget [1972], a fact which I became aware of while this paper was in press.)

The present paper aims at critically reviewing the three positions and arguing that the last one is the most tenable.

1.3. Methodology. Three different theoretical frameworks will be used to articulate our argument: Prosodic Analysis, Transformational-Generative Theory, and Structural Linguistics. This basic structure of the paper is defensible in that it examines how problematic data might be handled in various frameworks. In fact, by looking at the data through different theoretical perspectives, one learns more about the data itself and about the theories. One can therefore appreciate when the differences in analysis are simply due to the theoretical frameworks used, and when some aspects of the data are deliberately ignored by the investigator; and I agree with Lyons [1962:198] that "methodological differences among linguists may reflect an inherent difference in languages."

Moreover, apart from Westermann [1930] who deals with "Ewe" as a whole, Ansre's [1961] analysis is based mainly on Pecí, Stahlke's [1971] on Kpándo and Capo's [1977b] on Wací and Gen. We assume that the difference in the treatment of nasality is not related to dialectal differences, and I intend to discuss the problem in a synchronic analysis of Gbe as a whole. However, as will be said in section 2, Gbe is made up of a number of dialects. I have argued elsewhere [Capo 1979b] that dialect information is necessary to determine underlying representation of formatives in different dialects, in a synchronic analysis, especially when there is a problem of interpretation in a

particular dialect. Dealing with Gbe as a whole, I therefore rely on comparative material, without confusing synchronic statements and diachronic ones. (See Capo [1979b] for the relationship between underlying (synchronic) forms and proto-forms).

2. The Data

2.1. Gbe. Gbe is a dialect cluster spoken in the south of the Volta Region in Ghana, the south of the Republics of Togo and Bénin, and also parts of the Ogun and Lagos States in Nigeria. It is most known in linguistic literature as Ewe, although "Ewenists" content themselves with describing only one section, or some elements of that section, the one I call Vhe. In fact, basing myself on pure linguistic as well as sociolinguistic factors, I divide the dialect cluster into five sections, as follows:

- (1) Vhe section, including those dialects that have developed the bilabial fricatives /ɸ/ and /β/ from the Proto-Gbe back labial fricatives */X^w/ and */R^w/; they have also innovated the velar sonorants /ɣ/ and [ŋ] from the Proto-Gbe velar approximant */w/, and have variously merged the low front and the mid non-back vowels of Proto-Gbe into one, either /ə/, or /e/, or /ɛ/. Some of these dialects are: Awlon (Aŋɔ), Tɔwun (Tɔŋu), Awlongán, Anfóe, Gbin, Pecí ('Peki'), Fodome-ŋli, Be ('Lome'), Hó, Avéno, Avédakpá, Vo, Kpelen, Dayin (Danyi), Agu, Kpesí, Woncé (Nwatye), Adángbe and Wací. Most works dealing with "Ewe", in fact, refer only to this section, or elements of this section.
- (2) Gen section, including those dialects that have developed the voiceless bilabial stop /p/ from Proto-Gbe */X^w/; they have also merged Proto-Gbe */e/ and */ɛ/ into /e/. Gen dialects are Agóe, Glijí and Anéɔ.
- (3) Ajá section, including those dialects that palatalize /t/ and /d/ to [c] and [j] before high vowels, especially the high back ones /u/ and /ü/; they have also merged the Proto-Gbe */e/ and */ɛ/ into /e/. They are Tádó, Hwe and Dogbó.
- (4) Fon section, including those dialects that have developed the Proto-Gbe alveolar affricates */ts/ and */dz/, the Proto-Gbe alveolar "aspirates" */th/ and */dh/, and the Proto-Gbe alveolar fricatives */s/ and */z/ into alveolar fricatives /s/ and /z/. They have also retained the Proto-Gbe contrast between /e/ and /ɛ/; a typological characteristic of these dialects is that each of them has at most two nominal prefixes: a-, and e- or o-. Some of these dialects are Glexwé, Kpasɛ, Agbóme (the three being referred to as Danxome), Maxí, Gun, Wéme, Setɔ, Kotafon.

- (5) Phla-Pherá section, including those dialects that have the same history as Fon dialects, except that typologically, each of them has at least three nominal prefixes, including ɔ-, i-, ε-, apart from a-. Some of these dialects are Xwla, Xwelá, Ayizo, Gbesi, Movólo, Sáxwe, Se, Tofin, Toli, Alada.

Specific dialects for which nasality has been discussed include Gun [Rouget 1972], Glexwé [Yaï 1969], Gen (Bole-Richard [1976]; and Capo [1977b]), Wací [Capo 1977b], Kpándo [Stahlke 1971]. Other works, such as Sprigge [1967] for Adángbe, Nutsugah [1975] for Kpándo, Pecí, and Awlon, Guédou [1976] for Agbóme, can also be used. Finally, I have field notes on both described and non-described dialects of the continuum.

2.2. Phonetic inventory.

2.2.1. Consonants. An overall view of the Gbe-dialect's consonants is presented in Table 1. All phonetic realizations, including dialect specific ones, are included, and they amount to 44. None of the dialects has the forty-four consonants: rather, some consonants are in systematic correspondences and could be counted as one. We thus have 34 consonants:¹

b	t	d	k	g	f	v	s	z	X	R	kp	gb	y	ɥ
ũ	m	n	l	ĩ	r	ř	ɣ	ŋ	w	ɔ-r	c-ɟ	j-ʒ		
ts-s		dz-z	n-ỹ	ŋw-w̃	X ^w -ɕ-p				R ^w -β					

¹The following clarifications need to be made here:

- (i) in those dialects exhibiting *r*, it is in free variation with *ɔ* in intervocalic position;
- (ii) in many Ajá and Vhe dialects, *ɟ* and *ʒ*, when they occur, are allophones of /s/ and /z/ before high front vowels (and high back ones too for Ajá), but in the Alada dialect spoken at Gbádáglì (Nigeria), they have phonemic status and correspond to /c/ and /j/ in Fon and Ajá dialects [Capo 1979a] (the ones entered below as members of *c-ɟ* and *j-ʒ* refer to those occurring in Alada);
- (iii) *ɥ* and *ũ*, in those dialects that exhibit them, are non-syllabic realizations of /u/ and /ũ/ before /i/ and /ĩ/, and they never occur in syllable-initial position;
- (iv) *r* and *ř* never occur in syllable-initial position, and they are treated as allophones of /l/ after non-grave consonants (see Capo [1977a] for a full discussion of Gbe coronal consonants, particularly *ɔ-n-r-l* distribution);

Table 1. Gbe-dialect consonants: phonetic inventory

		bilabial	labio-dental	laminal dent alveo- lar		apical alveol	alveo-palatal	palatal	velar	uvular	pala	labial velar	uvular
SIMPLE STOPS	vless	p		t				c	k			kp	
	vd	b		d		ɖ		j	g			gb	
	nas	m				n		ɲ	ŋ			ŋw	
AFFRI-CATES	vless				ts		tʃ						
	vd				dz		dʒ						
FRICA-TIVES	vless	ɸ	f		s		ʃ		X				X ^h
	vd	β	v		z		ʒ		R				R ^h
TAP	(vd)					r							
TRILL	oral					r							
	nas					ř							
LATER-ALS	oral					l							
	nas					ļ							
APPROX-IMANTS	oral							y	Y		ɥ	w	
	nas							ỹ			ɥ̃	w̃	

There are still some problems concerning the actual phonetic characteristics of certain segments. In particular, ɖ , n , l , ĩ , and r are described differently by Westermann [1930], Ansre [1961], Yaĩ [1969], Stahlke [1971], Guédou [1976] and Berry [1951].² I have found that they are all apical (post) alveolar, a description independently made by Guédou [1976] and confirmed by Duthie [personal communication]. The sounds X and R are described as velar by Westermann [1930] and Ansre [1961], pharyngeal by Berry [1951] and Stahlke [1971]. I have found that they are uvular, a claim independently made by Sprigge [1967] and Guédou [1976].

2.2.2. Vowels. An overall view of Gbe-dialect vowels is presented in Table 2, together with their feature specifications. It must be noted that [ɔback] → [ɑrounded]. Moreover, none of the individual dialects has the sixteen vowels phonemically; rather, although ɛ independently exists in some dialects, ɛ , ə , and e are in systematic correspondence and the three could be counted as one. Thus we have 14 vowels:

ɪ e-ə-ɛ ɛ a ɔ o u ũ õ-õ ɔ̃ ɛ̃ ɛ̃-ɛ̃ ẽ ɪ

2.2.3. Syllable structure. Gbe has the following syllable structures, at the phonetic level, and in all dialects:

(1) CV (with tone);

(v) the hyphen between two sounds indicates that those sounds are counted as one because dialect realizations of the same Common-Gbe sound, a convention introduced to avoid confusion between Common-Gbe (synchronic) and Proto-Gbe (diachronic), e.g. /X^w-ɸ-p/ in place of Common-Gbe /X^w/ from Proto-Gbe */X^w/.

² ɖ is called "retroflex" by Westermann [1930], Ansre [1961], Guédou [1976], and "retroflexed" by Stahlke [1971: 1 Table 1]. Ladefoged [1968] and Yaĩ [1969], as well as Guédou [1976] and Stahlke [1971] (despite their name for it) have observed that it is apical alveolar. The sound n is described as dental by Westermann [1930], Ansre [1961], and Stahlke [1971]; l (and ĩ) are described as dental by Westermann [1930] and Stahlke [1971], but Yaĩ [1969], followed by Guédou [1976], describes them as apical post-alveolar.

Table 2. Gbe-dialect vowels: phonetic inventory

	i	e	ə	ɛ	a	ɔ	o	u	ũ	õ	õ̃	ã	ẽ	ẽ̃	ẽ̃	ĩ
high	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+
low	-	-	-	+	+	+	-	-	-	-	+	+	+	-	-	-
front	+	+	-	+	-	-	-	-	-	-	-	-	+	-	+	+
back	-	-	-	-	-	+	+	+	+	+	+	-	-	-	-	-
nasal	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+

(2) C<V (with tone), expanded into two subtypes:

(i) < is either a liquid [l] or [r] and is analyzed as a C element;

(ii) < is a non-liquid realized as [ɣ], but authors do not agree whether it is to be interpreted as a V-element or a C-element (I treat it as a consonant, so that the C<V syllable is now to read the C₁C₂V syllable);

(3) V (with tone);

(4) N̩ (with tone).

To handle our problem of nasality, we shall deal with the commonest syllable type, CV, and eventually the C₁C₂V type. The solution we shall arrive at in this framework will influence our treatment of the syllabic nasals, i.e. the N̩ syllable type to be discussed in section 7.

2.2.4. Tones. An overall view of realized tones in Gbe dialects show four level tones and two contour tones (cf. Sprigge [1967] and Clements [1976]). They are extra-low, low, high, extra-high, rising, and falling. Phonemically, however, each dialect has two tonemes, high and low, and they correspond to themselves across dialects. This paper will refer to these basic tones only, ignoring the actually realized ones. Thus, \acute{V} and \grave{V} will represent high-toned and low-toned vowels respectively.

2.3. The problem. The problem I propose to discuss in this paper arises from some constraints in the distribution of the nasal consonants and the nasalized vowels in all Gbe dialects.

- (1) Some consonants may be followed by both oral and nasalized vowels. They are

t ts-s c-ɟ k kp f s X X^w-ɸ-p
 d dz-z j-ʒ g gb v z R R^w-β

- (2) Certain consonants may be followed by oral vowels only. They are

b ɟ-r y w l ɣ r ɥ

- (3) Certain others may be followed by nasalized vowels only. (Note that they are either nasal stops, or nasalized liquids and approximants. I refer to them as "nasal consonants"). They are

m n ɲ-ỹ ɲw-Ẃ Ì ɳ ř ũ

(It must be noted that after the nasal stops m, n, ɲ, ɳ, and ɲw, we have slightly rather than heavily nasalized vowels; whereas after the nasalized liquids and approximants, as well as the oral consonants under (1), the vowels are heavily nasalized. For this reason, it becomes sometimes necessary to show that, after the nasal stops, we indeed have nasalized vowels.)

Thus nasal consonants occur only before nasalized vowels, and nasalized vowels do not occur after certain oral consonants. Since there is clearly a phonetic relationship between the nasal consonants and those oral consonants that are not followed by nasalized vowels, I do think that this restriction is not merely accidental, but it shows a phonological peculiarity of the dialect cluster: b and m, ɟ-r and n, ɣ and ɲ-ỹ, ɥ and ɳ, w and ɲw-Ẃ, l and Ì, r and ř, ɥ and ũ are in complementary distribution. The problem here is whether despite this complementary distribution, we should recognize underlying nasal consonant phonemes, and furthermore whether we should or should not recognize in addition systematic nasalized vowels or simply treat these nasal consonants as predictable variants or oral forms and posit underlying nasal vowels. To face the problem, we shall use three different approaches, the prosodic, the transformational-generative, and the phonemic.

3. Interpretation within Prosodic Analysis

In the prosodic theory, we distinguish phonematic units, which occupy a specific place within the syllable, and prosodies, which often overlap on the

syllable, the morpheme, the word, or larger units. I have then, considering the data, extracted two prosodies, the domain of which is the syllable: tone and nasality. In Gbe, we can contrast a syllable with high tone with one of low tone.

tó	'father'	~	tò	'lake'	
dó	'work'	~	dò	'sickness'	(Vhe)
sí	'run away'	~	sì	'cut'	(Wací)
àzǐ	'groundnut'	~	àzǐ̃	'egg'	(Fon & Gen)

We can similarly contrast a syllable with nasality and one without nasality.

fá	'to be quiet'	~	fá̃	'to embrace'	
sè	'to hear'	~	sè̃	'to worship'	(Wací)
fò	'to find'	~	fò̃	'to wake up'	(Gen)
sù	'be enough'	~	sù̃	'to plug'	(Wací)

As a matter of notational convention, I use in this section:

+T	"with high tone"
-T	"with low tone"
+N	"with nasality"
-N	"without nasality"

If Gbe uses all the possibilities, we would write a syllable formula like this for the commonest syllable type: $\alpha^T(CV)\beta^N$.³ This formula collapses the following four statements:

³The formula $\alpha^T(CV)\beta^N$ refers to our previous choice of discussing primarily the two-segment syllable. A thorough statement should also include $\alpha^T(C_1C_2V)\beta^N$. It must be mentioned that for the one-segment syllable types, there are some constraints. The V syllable is always oral, thus $\alpha^T(V)^{-N}$ and the N syllable is by definition always nasal. We will discuss the latter specifically in section 7. Note also that, since we are now dealing with the CV syllable type, r/r̃ and q/q̃, which never occur syllable-initially, are *de facto* excluded.

$$\begin{array}{cc}
 +T_{(CV)+N} & -T_{(CV)+N} \\
 +T_{(CV)-N} & -T_{(CV)-N}
 \end{array}$$

We would then list the following phonematic units:

$$\begin{array}{l}
 C = \left\{ \begin{array}{l} t \quad ts-s \quad c-ʃ \quad k \quad kp \quad f \quad s \quad X \quad X^W-\text{ʃ}-p \\ d \quad dz-z \quad j-\text{ʒ} \quad g \quad gb \quad v \quad z \quad R \quad R^W-\beta \end{array} \right. \quad b \quad \text{d}_r \quad y \quad l \quad w \quad \gamma \\
 V = \quad i \quad e-\text{ə}-\varepsilon \quad \varepsilon \quad a \quad \text{ɔ} \quad o \quad u
 \end{array}$$

Theoretically then, if the formula $\alpha T_{(CV)} \beta N$ is fully expanded, we should obtain in Gbe $24 \times 7 \times 2 \times 2$ syllables, i.e. 672 syllables. Of course, some of the possible syllables do not actually occur, but the total number of realized syllables with two segments is significantly near this figure.

In this analysis, as can be seen from the listing of the C and the V phonematic units, there are neither underlying nasal consonants, nor underlying nasalized vowels. Yet, there are two classes of C-units:

C₁: those C-units which are phonetically approximately the same, whether the syllable is specified as [+N] or [-N]. They are:

$$\begin{array}{l}
 t \quad ts-s \quad c-ʃ \quad k \quad kp \quad f \quad s \quad X \quad X^W-\text{ʃ}-p \\
 d \quad dz-z \quad j-\text{ʒ} \quad g \quad gb \quad v \quad z \quad R \quad R^W-\beta
 \end{array}$$

C₂: those C-units that are realized [+nasal] if the syllable is specified as [+N], and as [-nasal] if the syllable is specified as [-N]. They are:

$$b \quad \text{d}_r \quad y \quad l \quad \gamma \quad w$$

In this case, we have:

- (a) "oral syllables" with initial $b \quad \text{d}_r \quad y \quad l \quad \gamma \quad w$
- (b) "nasal syllables" with initial $m \quad n \quad \tilde{y}-p \quad \tilde{l} \quad \tilde{\eta} \quad \eta w-\tilde{w}$

Thus it appears that we should write rules stating these realization restrictions, viz. "the phonematic units, voiced bilabial stop, voiced apical (post) alveolar stop, and sonorants are realized as [+nasal] in syllables specified as [+N], and [-nasal] in syllables specified as [-N]." This informal statement needs to be formalized. And to write one rule instead of at least three, it will be useful to assume that these phonematic units form a class. But which

phonetic characteristics do they share together? Some suggestions have been made to which I shall refer later (see section 6). For the time being, I submit that, from my listing of the phonematic units above, the C system uses voicing as a prominent feature. Thus C₁ units are paired in the sense that each voiced consonant has a voiceless counterpart. But C₂ units are all voiced, and none has a voiceless counterpart; they are therefore unpaired. This is the origin of the proposed set feature [paired] in Capo [1976].

It must be stressed here that it is necessary to exclude $m \ n \ p\text{-}\tilde{y} \ \tilde{r} \ \eta$ $\tilde{w}\text{-}\eta w$ as phonematic units because, with this alternative, the number of possible syllables will increase to 840, i.e. with 168 new syllables that never occur. To be more explicit, for the voiced bilabial stop for instance, we would have:

$$\begin{array}{cccc} +T_{(bV)}^{+N} & \sim & +T_{(bV)}^{-N} & \sim & -T_{(bV)}^{+N} & \sim & -T_{(bV)}^{-N} \\ +T_{(mV)}^{+N} & \sim & +T_{(mV)}^{-N} & \sim & -T_{(mV)}^{+N} & \sim & -T_{(mV)}^{-N} \end{array}$$

i.e. $/b\acute{a}/ \sim /b\acute{a}/\sim /b\grave{a}/ \sim /b\grave{a}/ \sim /m\acute{a}/ \sim /m\acute{a}/ \sim /m\grave{a}/ \sim /m\grave{a}/$, to take a concrete example. But instead of the eight possibilities, we have just four ($[b\acute{a}] \sim [b\grave{a}] \sim [m\acute{a}] \sim [m\grave{a}]$), which clearly indicate that only one C unit is to be retained for both b and m.

To sum up, with the prosodic analysis, we must assume that there are neither C phonematic units marked [+nasal], nor V phonematic units marked [+nasal]; rather, the feature nasality is a prosody that operates within the syllable. Another piece of evidence may be found in Westermann [1930], where we have alternation between a prenasalized consonant followed by an oral vowel, and an oral consonant followed by a nasalized vowel:

$$\begin{array}{lll} [àk\acute{a}g\acute{a}] & \text{or} & [àk\acute{a}\eta g\acute{a}] \quad \text{'vulture'} \\ [k\grave{a}dz\grave{e}] & \text{or} & [k\grave{a}ndz\grave{e}] \quad \text{'blood'} \\ [gb\grave{a}gb\grave{a}] & \text{or} & [gb\grave{a}\eta gb\grave{a}] \quad \text{'antelope'}$$

(See Westermann [1930:22] for more examples).

I interpret the last syllable of these words as being underlyingly $+N(ga)^{+T}$, $+N(dze)^{-T}$, and $+N(gba)^{-T}$ respectively, the tone being realized on vowels

all the time but nasality being realized as a vowel feature in the first column and as a consonant feature in the second column. Note that when nasality is to be realized as a consonant feature, the result is that we have a nasal consonant if it belongs to C_2 or a prenasalized consonant if it belongs to C_1 . Let us stress that with C_1C_2V syllable type, the C_2 is also nasalized when the syllable is marked [+N].

[mĩ́ṽ] 'lie down'
 [sřĩ́ṽ] 'learn'
 [zỹṽ] 'lean against' (Wací)

Thus, with our prosody of nasality, the phonological behaviour of the C units leads one to set up two classes: C_1 and C_2 . The set feature being open to investigation, Capo [1976] has proposed that the C_1 elements are characterized by their being [+paired] and the C_2 ones by being [-paired]. Like the C-units, the V-units are always underlyingly oral, but they are all normally realized as [+nasal] or [-nasal] according to the nasality specification of the syllable.

4. Interpretation within Generative Framework

The prosodic approach avoids the discussion of nasality as a segmental inherent feature. It may nevertheless be useful to look at this problem in non-prosodic frameworks. As stated by Robins [1957:193], "It is necessary to make it clear that in developing phonological analysis on prosodic lines, there is no suggestion that phonemic analysis is wrong, invalid or unhelpful."

This section is devoted to the discussion of our problem within the transformational-generative framework. Since this approach has been used by Stahlke [1971], his position will be discussed at length. Our problem can be rephrased in Robins' terms as follows:

"Where a feature belongs in the manner described to a syllable (for example) as a whole, this of necessity involves the phonemicist in saying that at one point in the syllable, say the consonant, the distinction (say) between nasalization and non-nasalization is phonemic or relevant, while the same feature in the vowel, being a constant concomitant of the consonantal feature, must be relegated to non-significance, non-pertinence, or 'redundancy'." [Robins 1957:193]

4.1. Critical review of Stahlke's [1971] position. Stahlke, facing the problem of assigning nasality to V or C elements in the underlying representation, stipulates with regard to the interpretation of the nasalized vowels, "We adopt the VN+ analysis and analyze the vowel system of Ewe as containing only oral vowels at the systematic phonemic level (pp. 64-65)".

4.1.1. Consonants. As far as the C elements are concerned, he recognizes four nasals, namely /m n ɲ ŋ/ without discussing their relationship with /b ɗ y ɣ/. He only discusses at some length l and ɫ̃, arguing that only l exists underlyingly. Concluding his discussion on l and ɫ̃ (pp. 18-21), he states that "there is no underlying ɫ̃ in the lexicon (p.21)" and writes the following regressive nasalization rule:

$$[+sonorant] \rightarrow [+nasal]/___[+nasal]$$

Objectively, this rule not only nasalizes l, but it should also nasalize y, ɣ, and w specified by Stahlke himself as [+sonorant] (see his Table VI p. 38). However, Stahlke does not, apparently, reach this conclusion; he does not even point out that y, ɣ, and w are in complementary distribution with n, ŋ, and ɲ respectively, or, at least, that y, ɣ, and w are not followed by nasalized vowels. In fact, considering the Kpándo data alone, it is the case that all oral sonorants are always followed by oral vowels, and all nasal (sonorants) are always followed by nasalized vowels; the rule nasalizing a sonorant before a nasalized vowel should therefore apply to all oral sonorants. The data in Kpándo, and in Gbe in general, are more complicated in that two non-sonorants, b and ɗ, are not followed by nasalized vowels and at the same time, two nasals having the same articulations as them, m and n, are not followed by oral vowels. I pretend that this case too should be dealt with by writing a rule or two deriving m and n from b and ɗ respectively. Presumably Stahlke [1971] would not agree with this analysis, by objecting that in Kpándo, he does not know of any alternation between b and m and between ɗ and n, since he states (in order to be loyal to his theoretical framework?):

"It is a basic tenet of structural phonology that if two forms are in complementary distribution and are phonetically similar, they are *ipso*

facto members of one phoneme. Fortunately or unfortunately, this claim is neither explicit nor implicit in the theory of generative phonology within which we are working. From a generative point of view, the only time a phonological rule can be considered strongly motivated is when there exists some phonological alternation which must be captured as a generalization by such a rule (cf. Kiparsky, 1968)" [Stahlke 1971:19-20].

I have suggested [Capo 1979b], for my own part that (i) although complementary distribution does not necessarily imply an allophonic relationship, it is a very important basis for the formulation of a P-rule; generative phonology must attribute an *heuristic* value to complementary distribution and limitation in occurrence of certain segments; and (ii) in generative phonology, alternation, instead of being restricted to morphological alternation (inside a speech form), must be extended to mean also dialectal alternation.

4.1.2. Vowels. Having briefly touched upon the nasal consonants, I will now consider and discuss Stahlke's arguments for positing the sequence /VN/ as the underlying representation of [ṽ]. The first argument reads as follows:

"Quite regularly throughout the phonology of Ewe, nasalized vowels are restricted to morpheme-final position. That is, there can be no nasalized vowels in initial or medial syllables of single morphemes" (p.59).

This statement may be true for the idiolect of Mr. Agogo Mawuli (Stahlke's informant), which cannot cover, of course, the whole lexicon of "Ewe". It does not hold for other dialects included in the Vhe section much less for Gbe as a whole. Below are given some disyllabic mono-morphemic verbs that show nasalized vowels within the morpheme.⁴

kpɔ́tɔ́	'be paralyzed' (Gen)	
fã̀nã̀	'mix'	(XɔXɔi of Hohoe)
sú́mó	'worship'	(Wací)

⁴There are at least three types of polysyllabic verbs. If we take the disyllabic ones, we will have (i) the monomorphemic ones; (ii) the di-morphemic ones of verb + verb structure; (iii) the di-morphemic ones of verb + noun structure. In Vhe and Gen dialects, the test to identify the polymorphemic ones from the monomorphemic ones is simple. In the "progressive aspect", the monomorphemic ones accept the "progressive marker" -na/a- only at the end of the second syllable (the entire verb), whereas the polymorphemic ones accept it after the first syllable (the verb proper) and also after

Moreover, only few polysyllabic morphemes exist in Gbe (cf. Ansre's [1961] question 5 on p. 69); it means that in the large majority of Gbe morphemes, the vowel (whether oral or nasalized) occurs by necessity in morpheme-final position, which, incidentally also corresponds to morpheme-initial position. Note that we can talk of medial syllable of a single morpheme only when the morpheme is at least trisyllabic. Thus this argument is not only factually incorrect, it is also invalid and tricky.

The second argument given by Stahlke reads as follows:

"The first consideration to be raised in approaching a problem of this sort is the matter of economy...we have reason to suspect that an analysis of Ewe vowel system which posits fourteen vowels is less than optimal" (p. 60).

Although the economy argument is strong in generative phonology, its definition and interpretation vary from author to author (cf. Hyman [1975]). As a matter of fact, I think that it is more economical to add only one feature and "create" seven vowels, intrinsically in the vowel system, than to add a full consonant, which is, curiously, "unspecified for the oral cavity features involved" (p. 62). Let us take the vowel /ũ/. I will specify it as (i) below, while Stahlke will specify it as (ii):

(i)	$\left[\begin{array}{l} +\text{syllabic} \\ +\text{high} \\ (-\text{low}) \\ +\text{back} \\ +\text{rounded} \\ -\text{covered} \\ +\text{nasal} \end{array} \right]$	(ii)	$\left[\begin{array}{l} +\text{syllabic} \\ +\text{high} \\ (-\text{low}) \\ +\text{back} \\ +\text{rounded} \\ -\text{covered} \end{array} \right]$	$\left[\begin{array}{l} -\text{syllabic} \\ +\text{nasal} \end{array} \right]$
-----	--	------	---	---

Both from the point of view of the feature counting (one interpretation) and the structure (another interpretation), my analysis is more economical

the second syllable for verb + verb structure.

Wací examples:

[byó'sè]	→	[byónásè'nà]	(verb + verb: 2 morphemes)	'to ask'
[lè'ci]	→	[lènà'ci]	(verb + noun: 2 morphemes)	'to take one's bath'
[súm'ó]	→	[súm'óná]	(one morpheme)	'worship'
[gbí'dí]	→	[gbí'díná]	(one morpheme)	'to erase'

than Stahlke's; his reference to economy as being opposite to redundancy is rather strange and therefore weak. Moreover, the issue of economy should be raised for the language as a whole (I shall return to it later in 4.2.1.

Another argument given by Stahlke in support of his /VN/ analysis of [Ṽ] is the following:

"In reduplication, when the vowel of the stem is nasalized, it gets copied as an oral vowel" (p. 61).

This reduplicated form is compared with the one that comes from a three-segment stem. It has been observed in Kpándo (and in some other Vhe dialects) that the reduplicative is [C₁V], from [C₁C₂V] stem. Because of this observation, Stahlke intends to say that since the nasality of a [CṼ] stem behaves like the C₂ of a [C₁C₂V] stem, it should be treated as a consonant. He does not mention, however, that structurally, we have /C₁C₂V/ on one hand, and /C₁VC₂/ on the other hand; he does not explicitly say either that we could have /C₁C₂VC₃/, C₃ being the nasal, although he gives an example of [C₁C₂Ṽ], such as srá 'cover' on p. 61. In fact, Kpándo reduplication-rule is not general for Gbe or even for Vhe. Dialects like Wací and Gen indeed copy the nasalized vowel:

<u>Stem</u>	<u>Reduplication</u>		<u>Dialect</u>
zá	→ zázá	'use'	Wací
jǒ	→ jǒjǒ	'fall'	Wací
Rĕ	→ RĕRĕ	'bear'	Gen
zǒ	→ zǒzǒ	'walk'	Gen

Even Agbóme (in Fon section), which does not copy the stem vowel, but introduces a high vowel, has it nasalized if the stem vowel is nasalized. Agbóme reduplication-rule may be formalized as the following for CV stems:

$$\text{RED} \rightarrow \text{C} \begin{bmatrix} \text{V} \\ +\text{high} \\ \text{around} \\ \beta\text{nasal} \end{bmatrix} / \text{---C} \begin{bmatrix} \text{V} \\ \text{around} \\ \beta\text{nasal} \end{bmatrix}$$

zá	→ zǐzá	'use'
Rĕ	→ RĭRĕ	'bear'

fú → fűfű 'wake up'
 zű → zűzű 'walk'

I would therefore say that the case of Kpándo is peculiar in that the vowel of the reduplicative is always oral; this will be indicated in the reduplication rule as:

$$\text{RED} \rightarrow C_1 \left[\begin{array}{c} V \\ \text{-nasal} \end{array} \right] / \text{---}C(L)V$$

In fact, this rule has been considered as an alternative by Stahlke himself who produces it as Rule 29 on p. 61 but later on rejects it in favour of his rule 27 by stating:

"We can retain the simpler form of the reduplication rule (Rule 27, Capo) and derive the nasality of the final vowel from a morpheme-final nasal consonant" (p. 61).

Rule 27 reads: $\text{RED} \rightarrow C_1V_1 / \text{---}C_1(L)V_1$
 Rule 29 reads: $\text{RED} \rightarrow C_1 \left[\begin{array}{c} V_1 \\ \text{-nasal} \end{array} \right] / \text{---}C_1(L)V_1$

In retaining Rule 27, Stahlke adds that it should be ordered before the rule of regressive nasalization to ensure that the copied vowel will be oral. Even then, nasalized vowels could occur at the end of the reduplicative, since it is a morpheme, even though a bound morpheme. In sum, this argument based on reduplication is weak for Kpándo and invalid for Gbe as a whole.

The last argument I shall examine is the following:

"In forming participles the regular rule of reduplication applies and the suffix -á is added. If the vowel of the verb root is oral, á assimilates obligatorily in everything but tone to the preceding vowel. .. If the root vowel is nasalized, on the other hand, the assimilation is optional, and furthermore, if -á, does not assimilate, its nasalization is also optional. Thus for βě 'smell' the participle can be βěβěě, βεβεá, or βεβεá. If /ě/ is an underlying segment, there is no obvious reason why an assimilation rule should be optional with it, but obligatory with its oral counterpart" (p. 64).

Again, the statement on participle formation is not universal in Gbe, even in Vhe section. But even though we consider only Kpándo, what we can say is that (i) if "nasalization does not normally move forward across morpheme boundary in Ewe" [Stahlke 1971:64], it is not surprising that -á could re-

clearly excludes such non-sonorants as *b* and *d*. In fact, Stahlke's rule (32) reads

$$[+\text{sonorant}] \rightarrow [+\text{nasal}] / ___ [+\text{nasal}]$$

My own, assuming that the feature [paired] is accepted, will read

$$[-\text{paired}] \rightarrow [+\text{nasal}] / ___ [+\text{nasal}]$$

This (consonant) regressive nasalization rule should simply apply before the reduplication in Kpando so that the initial consonant of the reduplicative is nasal (except the lateral). Thus, instead of having three classes of consonants,

- those that can be followed by V and VN,
- those that can be followed by V only, and
- those that can be followed by VN only,

our grammar will be simplified if, at the underlying representation, all consonants can be followed by both V and VN, a situation for which we need no statement. A phonological rule will state that /*b d-r y l y w*/ get nasalized into [*m n n-ỹ ã ŋ n^w-w̃*] before /VN/. Although there is no clear intra-dialect morphological alternation that proves the existence of the process, there are dialectal variations that help to arrive at this conclusion in a synchronic analysis:

súmó	(Wací)	súbó	(XóXoi)	'worship'
àní	(Awlon)	àyí	(Fon)	'earth'
níní	(XóXoi)	dídí	(Wací)	'to slip'
ńó	(Gen)	wó	(Agbóme & Glexwé)	'to detect'
dà	(Gen)	dà	(Awlon)	'snake'
gbò	(Gen)	gbò	(Wací)	'to breathe'

The point of my argument is that, synchronically, we can no longer use the /VN/ analysis for [Ṽ], since there is no N, i.e. systematic phonemic nasal consonant in the language. This situation, therefore, obliges us to posit underlying nasalized vowels.

The third point is that there is no need to have a superfluous syllable

structure /C₁VC₂/ where:

- (i) the final C is restricted to nasals;
- (ii) the final C occurs only when there is an initial C (there is no VC syllable although V syllables exist);
- (iii) the final C occurs only after specific initial C's;
- (iv) the final C is always deleted in the phonetic realization.⁵

Here again, the grammar is simplified, in that the statement of the syllable type and the statements about its structural constraints do not appear any longer.

4.2.2. Two supplementary cases. I will now present two supplementary cases for the existence of underlying nasalized vowels as a set different from underlying oral vowels in their phonological behaviour. These are drawn from vowel assimilation patterns shown in Gen on one hand and in Dogbó, Hwe, and Tádó on the other.

(1) *Data from Gen.* Bole-Richard [1976], discussing consonant nasalization, after taking for granted the existence of phonemic nasalized vowels (pp. 33-44) points out an interesting case of vowel assimilation. He correctly ob-

⁵Stahlke [1971:66] is in disagreement with me, for the last statement. He writes indeed:

"It is not the case that final nasal consonants do not occur in Ewe. Westermann [1943] cites the following forms as evidence:

kpàm	'violently'	tàn	'completely'
kpèm	'banging'	kón	'sweet'

In addition to these we have also found the forms kéŋ 'completely; sóŋ 'completely' and àprīm 'cannon'."

It seems to me that Stahlke disregards an important characteristic of these nasals in that they are tone-bearing, although he later indirectly resorts to it when he writes (p. 67) that "since nasals are sonorants and will bear the same tone as the syllabic nucleus, it is not surprising that VN and VW sequences will behave similarly with respect to length." In fact, although in most of his examples the tone of the nasal is the same as the one of the preceding vowel, it is the case that in Awlon and other coastal dialects, 'sweet' is kón (with two tones, hence two syllables), that clearly alternates with kónù. These examples are thus dismissed as having final consonant; they should be dealt with in relation to syllabic nasals. It is interesting (and also amazing) to note that Stahlke [1971] is not interested in "syllabic nasals in Ewe". My section 7 is devoted to it.

serves that oral vowels and nasalized vowels undergo different types of assimilation when they are followed by /o/. Thus, for the low central vowels:

- (i) /a/ + /o/ → [ao]
 e.g. /é+sà+ò/ → [èsàò] 'he sold you'
 /é+blá+ò/ → [ébláò] 'he tied you'
- (ii) /ã/ + /o/ → [õ] or [ãõ]
 e.g. /é+kã+o/ → [ékõ] or [ékãõ] 'it's your concern'
 /é+zã+o/ → [ézõ] or [ézãõ] 'he used you'

Thus, phonologically, nasality is a class feature in the underlying vowel system of Gen. Bole-Richard also correctly points out that after nasal consonants, the nasality of the vowels is so weak that it could be treated, theoretically, as the effect of the nasal consonant on an oral vowel; looking, however, at the phonological behaviour of such almost non-nasalized vowels, he rightly indicates that their assimilation rules are the same as the ones of the heavily nasalized ones. Thus

- (iii) é+ná+ò → [énõ] or [énãõ] 'he gave you'
 é+nã+ò → [énõ] or [énãõ] 'he gave you'
 é+má+ò → [émõ] or [émãõ] 'you are used to it'
 é+mã+ò → [émõ] or [émãõ] 'you are used to it'

These examples show that, even though a vowel after a nasal consonant may seem oral, it is basically nasalized. It is then the case that two sets of vowels, nasalized and non-nasalized, exist, but nasal consonants are always followed by nasalized vowels; this constraint is a clue of the questionable status of these consonants in the underlying representation.

(2) *Data from Dogbó, Hwe, and Tádó.* In these dialects, the vowel assimilation rules involving the verb stem followed by the third person singular object pronoun for instance, apply differently when the vowel of the stem is oral and when it is nasalized.

(a) For the oral set of vowels, when these vowels are followed by /ì/ (the underlying representation of the pronoun), the assimilation rules are:

(i) stem-vowel closing:

$$\begin{bmatrix} V \\ -\text{low} \\ -\text{nas} \end{bmatrix} \rightarrow [+high]/__ + \begin{bmatrix} V \\ +\text{high} \\ -\text{back} \end{bmatrix}$$

(ii) suffixed-vowel lowering:

$$\begin{bmatrix} V \\ +\text{high} \\ -\text{back} \end{bmatrix} \rightarrow [+low]/ \begin{bmatrix} V \\ +\text{low} \\ -\text{nas} \end{bmatrix} + __$$

The results of these P-rules are the following:

/i + i/ → [ii]; /e + i/ → [ii]; /a + i/ → [εε]

/u + i/ → [ui]; /o + i/ → [ui]; /ɔ + i/ → [ɔε]

/qì + ì/ → [qìì] 'bury him'

/qù + ì/ → [qùì] 'eat it'

/sè + ì/ → [sìì] 'hear it'

/kò + ì/ → [kùì] 'laugh at him'

/qà + ì/ → [qèè] 'cook it'

/só + ì/ → [sóè] 'take it'

(b) For the nasalized set of vowels, when these vowels are followed by /ì/ , the assimilation rules are the following:

(iii) Stem-vowel closing:

$$\begin{bmatrix} V \\ +\text{nas} \end{bmatrix} \rightarrow [+high]/__ + \begin{bmatrix} V \\ +\text{high} \\ -\text{back} \end{bmatrix}$$

(iv) suffixed-vowel nasalization:

$$V \rightarrow [+nasal]/[+nasal] + __$$

The results of these P-rules are the following:

/ĩ + i/ → [ĩĩ]; /ɛ̃ + i/ → [ĩĩ]; /ã + i/ → [ĩĩ]

/ũ + i/ → [ũĩ]; /ɔ̃ + i/ → [ũĩ]

/zĩ + ì/ → [zĩĩ] 'push him'

/zũ + ì/ → [zũĩ] 'insult him'

/sè̃ + ì/ → [sĩĩ] 'worship him'

/f[́]s + ì/ → [fú[́]ɪ̃] 'wake him up'

/z[́]á + ì/ → [z[́]fɪ̃] 'use it'

What is worth noticing is that before /ì/

/a/ → [ɛ]; but /ã/ → [ɪ̃]

e.g. /q[́]à + ì/ → [q[́]èè̃] 'cook it'

/z[́]á + ì/ → [z[́]fɪ̃] 'use it'

/ɔ/ → [ɔ]; but /õ/ → [ũ]

e.g. /s[́]ó + ì/ → [s[́]óè̃] 'take it'

/f[́]s + ì/ → [fú[́]ɪ̃] 'wake him up'

Thus, on phonological grounds, the nasalized set and the oral set are clearly two distinct classes. Now, when the syllable initial consonant is a so-called nasal consonant and the following vowel is only slightly nasalized (I will not therefore mark it as nasalized in the examples below), it is the case that all vowels become high before /ì/ , i.e. they behave like heavily nasalized vowels:

ná + ì → [n[́]fɪ̃], not *[n[́]éè̃] 'give him'

ná + ì → [n[́]fɪ̃], 'give him'

m[́]ó + ì → [m[́]úɪ̃], not *[m[́]óè̃] 'force him to drink'

m[́]ó + ì → [m[́]úɪ̃], 'force him to drink'

This phonological pattern leads one to the interpretation of the vowels following the so-called nasal consonants as underlying nasalized vowels, and to the questioning of the status of the nasal consonants.

4.3. Conclusion. In this section, I have tried to show that a linguist working in the framework of generative phonology must be embarrassed with Common-Gbe data (cf. section 2.3). From the point of view of economy, he cannot posit both nasal consonants and nasalized vowels, since he will be forced to state **some** strange MSC's. To take a decision, he will resort to dialect information: all dialects show that, with certain consonants, we can oppose nasalized vowels to oral vowels; Kpándo on one hand, Gen on another, Dogbó, Hwe, and Tádó on still another, show that phonologically nasalized and oral vowels constitute two different sets. It becomes more economical, and

even compelling, to derive the syllable-initial nasal consonants from underlying oral voiced consonants by a regressive nasalization, the vowel of the syllable being a nasalized one. At this stage, it becomes contradictory to try to derive synchronically the nasality of the vowel itself from a following nasal consonant restricted to the morpheme-final position and unspecified for the oral cavity features involved; in any case, it would be too costly. On these grounds I have discussed fully Stahlke's position and said that it is not defensible, either because the argument is factually incorrect or because a piece of information is neglected, or because the reference is not made explicit (case of economy for instance), or still because there is internal contradiction in the argumentation (case of the participles, for example). My own position is that, analyzed within the framework of generative phonology, Gbe has synchronically underlying nasalized vowels (and oral vowels), but no underlying nasal consonant. All nasal consonants are derived by a regressive nasal assimilation from the oral voiced consonants /b d̥ y l ɣ w/ , which I suggest are [-paired].

5. Interpretation within Taxonomic Phonemic Analysis

The conclusion arrived at in the last section (4) is equivalent to the one I have arrived at using traditional phonemic theory [Capo 1977b]. This is not surprising, since "a systematic phonemic representation will be equivalent to a taxonomic phonemic one, unless there is good reason to deviate from the latter" [Schane 1973:97]. However, as noted above, Westermann [1930] and Ansre [1961] have different conclusions altogether, viz. Gbe has both nasal consonants (m n ɲ ŋ) and nasalized vowels, a position they do not attempt to justify; it is then simply by pointing out the nature of the data that we also point out the weaknesses of the analysis. Two later versions, systematically argued for, have been presented by Yaï [1969] and Bole-Richard [1976] for Fon and Gen respectively.

5.1. On Yaï's analysis. Based on Fon dialects, Yaï's analysis takes for granted the existence of phonemic nasalized vowels and is based on the complementary distribution between b and m , d̥ and n , y and ɲ , and w and Ẃ .⁶ Discussing these consonants, he interestingly arrives at the

⁶Fon dialects do not exhibit ɣ and ŋ ; ĩ has apparently not been

following phonemes:

/m/ and /n/ for [m-b] and [n-d] respectively

/y/ and /w/ for [y-p] and [w-ṽ] respectively

Apparently, this analysis is not consistent because one would expect that the same series be posited as the phonemic forms, viz, either /b d y w/ or /m n p ṽ/. Without any hesitation, Yaï implicitly states that y-p and w-ṽ are represented as orals in their phonemic forms because they are all sonorants, and it is common for oral sonorants to develop nasal allophones in the environment of nasalized vowels. In that he is right. Concerning the stops, he avoids positing the orals, because

- (i) "Nasalized stop" is not a phrase common in linguistic literature (this reason is not made explicit in the dissertation).
- (ii) Fon consonant system is symmetric since each voiceless obstruent has its voiced counterpart (this is explicit); the positing of /b/ (without voiceless counterpart) and /d/ (also without voiceless counterpart) will destroy this symmetry (this is implied in the dissertation).

Unfortunately, Yaï does not discuss at length the implications of his analysis, some of which are that (i) some oral consonants (in fact all sonorants) develop a nasal/nasalized allophone when they occur before nasalized vowels; (ii) some nasal consonants (in fact all) develop an oral allophone when they occur before oral vowels. In fact, it is as if Yaï is after natural class, since now all sonorants have two realizations: those that are basically oral develop nasal/nasalized allophones and those that are basically nasal develop oral allophones. It was then because /b d | y w/ could not fit into a natural class that he did not consistently posit them. For my own part, because in structural phonology it is nasality which is treated as abnormal and in the view of the fact that phonemic nasalized vowels are recognized, I will say that in Fon b-m, d-n, y-p, w-ṽ, l-ĩ are all represented as voiced oral in their phonemic forms.

noticed by Yaï [1969], although it is regularly attested before nasalized vowels.

(ii) On the second statement by Bole-Richard, I will simply object that tonal realization is sensitive to the consonant actually occurring, not to the underlying one. This reason is therefore weak.

5.3. Conclusion. I maintain, therefore, that within structural linguistics one has to acknowledge the existence of phonemic nasalized and oral vowels in Gbe; moreover, the phonemic inventory of consonants must not include any nasal, be it *m* or *n*. This analysis implies that /b d̥-r l y ɣ w/ which have the peculiarity of being marked [+nasal] before nasalized vowels need to be labelled together, as /l y ɣ w/ can be readily referred to as oral sonorants. Since this is the implicit reason that leads both Ya'f [1969] and Bole-Richard [1976] to divide this class into two, with different treatments, I will now discuss their being a natural class.

6. Do b d̥-r l y w (and r ɣ) constitute a natural class?

6.1 Phonetic features. There is a general tendency, both in Generative Phonology and in Taxonomic Phonology, to define a natural class in terms of phonetic features. However, with regard to the actual descriptions of b d̥-r l y ɣ w, none of the features proposed by Chomsky and Halle [1968], Jakobson, Fant and Halle [1952], Ladefoged [1971, 1975], Williamson [1975] is helpful. It will thus be denied that these segments form a natural class, since the classical definition of natural class reads, "Two or more segments are said to constitute a natural class if fewer features are required to specify the class than to specify any one member of the class" (Hyman [1975: 139], referring to Halle [1962:281-382]).

In such a situation, one alternative is to consider that the consonants are represented as nasals in their phonemic form. Of course, /m n ɲ-ỹ ɿ ŋ ẽ-ŋʷ/ are members of a natural class specified as [-syllabic, +nasal]. In adopting this solution, however, we should distinguish two classes of consonants (after two classes of vowels): the orals and the nasals. Thereafter, a rule should be written indicating that nasal consonants are denasalized when followed by oral vowels, which would be stated

$$\begin{bmatrix} \text{[-syllabic]} \\ \text{[+nasal]} \end{bmatrix} \rightarrow \text{[-nasal]}/\text{---} \begin{bmatrix} \text{[+syllabic]} \\ \text{[-nasal]} \end{bmatrix}$$

Despite Oyelaran's [1970] protest that there is no reason why sounds produced in the nasal cavity "are treated as abnormal, marked, or even subsidiary with respect to those produced in the oral cavity", we are still left with the general feeling that, as far as nasality is concerned, it is its presence which is considered as a mark rather than its absence. This means that between an "oralizing" rule and a "nasalizing" one, the majority of linguists will prefer the nasalizing one. But again, this is not convincing. The real challenge is that, if the denasalization of *m* gives *b*, it should be expected that *n*, *ɲ*, and *ŋ* for instance yield *ɗ*, *j*, and *g* respectively. Actually, however, in Gbe, *ɲ* and *ŋ* are not in complementary distribution with *j* and *g* which indeed occur, but with *ɣ* and *ɣ̃*; we should then need another rule to state this in the grammar.

We may consider again the alternative of our consonants being represented as orals in their phonemic form. We face again the problem of finding a common label for *b* *ɗ-r* *ɣ* *l* *ɣ̃* *w*. It must be noted that the difficulty arises in connection with *b* and *ɗ-r*, all others being approximants or sonorants. Two similar suggestions have been made to me, but I have not found any synchronic justification to adopt them. They are as follows:

(1) *b* *ɗ-r* *ɣ* *l* *ɣ̃* and *w* may be lenis. This suggestion comes from Dr. Dakubu [personal communication], who bases herself on historical evidence drawn from Stewart [1973] and on her own comparative work [Dakubu 1977]. In these works, it is claimed that Common Potou had a lenis/non-lenis opposition for three voiced and three voiceless stop articulations of which Dakubu discusses only the voiced labial and alveolar ones.

Dakubu [1977] notes that Common Potou lenis 'b generally develops to *b* and *m* in Gbe, but fortis *b* develops to *gb* (the latter is only a tentative statement because based on only two Potou items).⁷

⁷Dakubu [1977:432] also observes that Common Potou lenis 'b also corresponds to Modern Potou *v* :

	'small'	'black'
Common-Potou	*'bi	*'bē
Gbe	-ví	vivi-tí

(In fact, *vivi-tí* is peculiar to Wací and means 'darkness, night': Dakubu.)

- | | | | | | |
|-----|--------------|-------------|---------|---------|-----------|
| (i) | | 'be cooked' | 'arm' | 'ask' | 'respect' |
| | Common Potou | *'bɔ | *a'bɔ̃ | bisá | bù |
| | Modern Gbe | bí | àbó/àbá | byá/byó | bù |
- (Note that 'ask' and 'respect' forms are Akan forms and are supposed to have lenis 'b' in Common Potou.)
- | | | | | |
|------|--------------|-------------|--------|------------|
| (ii) | | 'excrement' | 'trap' | 'cut down' |
| | Common Potou | *'bɨ | *-'bɛ́ | *'bu |
| | Modern Gbe | -mí | -mɔ̃ | mù |
- | | | |
|-------|--------------|---------|
| (iii) | | 'grass' |
| | Common Potou | *-'bì |
| | Modern Gbe | -gbé |

[Dakubu 1977:432]

Dakubu [1977] also notes that Common Potou lenis 'd' generally develops to *q* (and *l*) in Modern Gbe.

		'eat'	'tongue'	'tooth'
	Common Potou	*'di	*á'dé	*á'dú
	Modern Gbe	qu	-qé/-qé/-qé	-quí

Dakubu's observations show conclusively, I think, that Modern Gbe *b* and *q* historically derive from lenis segments, since she and Stewart [1973] think that the lenis/non-lenis opposition is relevant in Proto-Volta-Potou, otherwise known as Western-Kwa, and including Common-Potou, central-Togo, Volta-Comoe, Ga-Dangme, and Gbe languages. My own analysis being synchronic, I cannot term *b* and *q* lenis. True, approximants are lenis. It is also true that, compared to Gbe laminal *-d*, the Gbe apical *-q* is lenis; but I do not find any articulatory basis nor any instrumental evidence to say that *b* in Modern Gbe dialects is lenis. I do think indeed that a phonetic feature should be actually perceptible. In the event of a phonetic feature being underlying, its absence must be explained by a P-rule (assimilation or dissimilation). Moreover, to allow [+lenis] to be the set feature for /*b q y l w ɣ*/, it must be proved that they are the only lenis consonants in the dialect cluster, an undertaking which will encounter a methodological problem with regard to fricatives. It is on these grounds that I am not satis-

fied with the lenis feature; it is at best a historical explanation, not a synchronic one.

(2) b d-r y l ɣ w may be *implosive*. The suggestion that *b* and *d-r* may be the implosives *ɓ* and *ɗ* has been made to me by Dr. Mensah [personal communication]. He bases himself on historical evidence drawn from Williamson [1973], who reports implosives for Proto-Ijọ and Proto-Benué-Congo, and on Hyman [1972], who claims that a nasally released implosive is phonetically impossible. Although Hyman's claim has been proved wrong by Williamson [1973], it is nonetheless agreed upon that nasal implosives are difficult (and therefore liable to simplification) and rare. Williamson herself observes that Proto-Ijọ /*ɓ*/ and /*ɗ*/ developed to *m* and *n* in North-Eastern (N.E.) Ijọ and South-Eastern (S.E.) Ijọ when later in the formative there was a nasal.

	'water'	'waves'	'pull'
Proto-Ijọ	* <i>ɓ</i> ɛndí	* <i>ɗ</i> ɔ̀ŋgò	* <i>ɗ</i> ŋnŋ
N.E. Ijọ	<i>m</i> ɛngí	-	<i>n</i> ŋnŋ
W.E. Ijọ	<i>m</i> ĩndí	ɓnŋwɔ̀	<i>n</i> ŋnŋ

[Williamson 1973:118]

If one could argue that Gbe *b* and *d* are related to Proto-Ijọ implosives *ɓ* and *ɗ*, one would have found a common phonetic feature for Gbe *b* and *d* as [+implosive] (which they alone share), and at the same time the six segments will be referred to as [+lenis], since [+implosive] implies [+lenis]. I am not satisfied with this suggestion because Gbe *b* and *d* are not now implosives. Here again, at best this would be a historical explanation but not a synchronic one, and if so, [+implosive] must not be used as a *phonetic* feature.

The present failure to find a common phonetic label for *b d-r y l ɣ w* does not convince me that these segments do not constitute a class. The search for a common phonetic feature should therefore continue. I will, however, attempt to suggest another direction for investigation.

6.2. Non-phonetic features. In an unpublished paper and also in Capo [1976], I argued for three kinds of classificatory features for segments:

(a) At the phonetic level, the linguist uses the "discriminatory features", which belong to the general phonetic category; at this stage, with an impressionistic approach, he notes all the characteristics of the sounds, regardless of the redundant features.

(b) At the phonemic level, he lops off all the redundant features, and from a functional point of view, he selects only the relevant (phonetic) features that distinguish a phoneme from others and implicitly state its similarity with others. These can be termed "distinctive features" proper.

(c) If the linguist continues the description of the language, he may notice that some phonemes behave alike. He will therefore need a label to handle them. I term the features he will deal with at this stage "set features" or "class features". I stress that since it is after the linguist has faced the similar behaviour of certain phonemes that he needs a set feature, he is not obliged to restrict his sources to phonetics, as previous authors have done (cf. Fudge [1972]). He may resort to the history of the language, to a peculiarity of the phonemic system as a whole, or even to an abstraction. This conclusion seems to be in consonance with the point of view of the glossematians, at least with its interpretation as stated by Fudge [1970:88-89]:

"Phonetic properties are not involved at all in the way phonemes are specified, or in the way they are grouped into classes... Just as phonetically determined classes may be labelled by using distinctive features, so classes determined on abstract grounds may be labelled by using non-phonetic features" [emphasis mine, H.C.C.]

Since the problem we are facing is one of class feature, I feel justified in resorting to the consonant system of Gbe and continue to use the feature [+paired], the contrast voiced/voiceless being prominent in the Gbe consonant system. Indeed, a set feature is mainly language-specific.

7. The Treatment of Syllabic Nasals

Throughout the previous sections, I have argued that, whatever the theoretical framework used, Gbe should be analyzed as having no nasal consonants. It must follow that the treatment of "syllabic nasals" as allophones of marginal nasal consonants is to be rejected. I will not, however, take for granted this first conclusion. Rather, I shall consider and discuss all the-

oretical alternatives that offer themselves. Notice first of all that the phonetic syllabic nasals seem restricted to two, $\alpha^T[m]$ and $\alpha^T[\eta]$, and occasionally $\alpha^T[n]$.

[hgbé]	'I refused'	(Fon)
[ékpóm]	'he saw me'	(Gen)
[énu sòm]	'he is hearing'	(Awlon)
[h̀kèkè]	'day'	(Wací)
[kéh]	'completely'	(Kpándo)
[kóh]	'corner'	(Avéno)

In a seminar paper at the University of Ibadan, Maddieson discusses four alternatives that I will consider.

(1) *Recognize syllabic nasals as independent phonological units.* For Maddieson himself, this solution "can be automatic only if the language has no syllable-margin nasal consonants and no nasalized vowels." Although the two conditions are not met (since Gbe, without any doubt, has nasalized vowels), Yaĩ [1969] adopts this solution for Fon. Under the heading "the syllabic nasal /N/", he says that "its phonemic identity is established by the fact that it bears a tone, unlike the other nasals." As pointed out by Maddieson, "the appeal seems to be to some principle that the set of phonemes which occurs in syllable-marginal positions must be mutually exclusive with the set of phonemes occurring in syllabic position. This is demonstrably not the best way of dealing with the facts of certain languages." It must be noted in this connection that (1) Yaĩ himself recognizes non-syllabic allophones of both /u/ and /ũ/ which therefore overlap in realization with a distinct syllable-initial phoneme /w/; this means that he could well treat his syllabic nasals as syllabic allophones of non-syllabic phonemes. Apparently Oyelaran [1970], by suggesting that "nasal consonants are continuants", will favour such an analysis, since he states that "we propose that the special circumstances under which nasals may become syllabic are language-specific." (ii) Yaĩ also observes, quite rightly, a complementary distribution of nasalized vowels and syllabic nasals within the word in Fon; on these grounds, he could well treat his syllabic nasals as allo-

phones of one or more nasalized vowels. In fact, there is free alternation between the syllabic nasals and \bar{u} , as in the phonetic realizations of the first person singular subject pronoun:

[h̄ gbé]	~	[ū gbé]	'I refused'
[m̄ b̄è]	~	[ū b̄è]	'I hide myself'
[h̄ l̄é k̄ò]	~	[ū l̄é k̄ò]	'I turned back'

(Note that the official Fon orthography has 'un' for the spelling of this pronoun.)

What I am doing here is to show that there is no compelling reason to set up an independent phonological unit for syllabic nasals in Fon, nor in Gbe in general. Let us discuss then the other alternatives implied in our criticisms of the first alternative.

(2) *Identify syllabic nasals with non-syllabic nasals.* I have said above that theoretically one could treat syllabic nasals as syllabic allophones of non-syllabic nasals. However, this analysis is only strongly motivated when there is variation between syllabic and non-syllabic forms in the same stem. Such a situation does not occur in Gbe. In this regard, Gbe is very different from Kohumono for which Cook [1969] adopts this solution by noting that

"when a nasal consonant is immediately followed either (a) by another consonant in the same word, or (b) by a word boundary, it is syllabic and has a significant tone associated with it... As the syllabic quality or lack thereof of a nasal is apparently always predictable, there is no need to analyze the syllabic nasals as phonemes separate from the ordinary non-syllabic ones... In case (a) the distinctions among the various phonemes are entirely neutralized; a pre-consonantal syllabic nasal is essentially an archiphoneme. Because this fact is predictable (i.e. no nasal other than this archiphoneme can occur in that position) there is no need to accord the archiphoneme separate phonemic status" (cited by Maddieson).

The Gbe situation is also radically different from Nupe where

"pre-consonantal nasal consonants are syllabic if word initial, non-syllabic elsewhere. ...A nasal consonant which is syllabic initially, e.g. /h̄dò/ 'a certain', will cease to be syllabic and will merely close the preceding syllable, when it forms part of a compound of which it is not the first element: e.g. /h̄dòndò/ -same meaning" (Smith [1967], cited by Maddieson).

that it is not economical in that it would be in contradiction with the canonical form of "words". For instance, there is no VV noun in Gen, but nouns such as [èh̃] 'day', [àh̃] 'thorn' would have this shape if the syllabic nasal were treated as a nasalized vowel. Indeed, these two examples show that [ŋ] functions as a stem, whereas in general, no V functions as a stem either in Gen or in any other dialect of Gbe. Again this solution does not appear motivated for Gbe.

(4) *Treat the nasality and the syllabicity as separate units.* This solution seems the most adequate for Gbe. The Gbe data allow us to treat syllabic nasals as "reduced syllables containing a nasal (consonant) and a syllabic (i.e. vowel)". For Maddieson, "the most obvious case where this might be appropriate is where an alternation can be observed between nasal + vowel and syllabic nasal", and this is precisely the case in Gbe.

(a) Inside a single dialect, we may observe alternation between a syllabic nasal and a nasal followed by a vowel. On p. 35 are examples from Fon. Some Gen examples are given below.

[é kpóm̃]	'he saw me'
[é kpóm̃ù à]	'did he see me?' (where à is an interrogation marker)
[átètè]	~ [núttètè] 'abscess'
[h̃ gé]	~ [mù gé] 'I have fallen'

Note that, basing himself on examples of this nature, Bole-Richard [1976:70-74] arrives at the same conclusion: that in Gen, syllabic nasals are phonologically CV. Some Wací examples are given below:

[kóh̃]	'corner'	[kóh̃ùá]	'the corner' (where a is the determiner)
[h̃qúf̃]	'remembering'	[é qóh̃ùò]	'he remembers you' (where ò is 'you' and the noun h̃qúf̃ is from the verb qó h̃ù by a general inversion rule)
[h̃kəkè]	'day'	[èh̃ù kè]	'it is daytime'

(b) From one dialect to another it is rare that all have the syllabic nasals in the same "words"; rather, if in one dialect we have a syllabic nasal, it is likely that in another one we have nasal consonant + vowel. For

me, as said above, this is not only an historical evidence, it is also a justification for a synchronic analysis in the dialect exhibiting the syllabic nasals.

[mǎgbé]	(Awlon)	:	:	[hǎgbé]	(Gen)	'back'
[núkǎ]	(Fon)	:	:	[hǎkǎ]	(Wací)	'front'
[núkú]	(Fon)	:	:	[hǎkú]	(Wací)	'eye'
[pǎdǎ]	(Kpándo)	:	:	[hǎdǎ]	(Gen)	'sun'
[ámǎgbà]	(Wací)	:	:	[áhǎgbà]	('Ewe')	'leaf'

From these concordant pieces of evidence, I feel it as established that the syllabic nasals in Gbe are reduced forms of plain [N \tilde{V}] syllables, where the \tilde{V} -element has been elided but the tone, being a syllable feature, is retained and shifted to the previous non-syllabic nasal, changing it to a syllabic. This is Bole-Richard's [1976] stand. In my own analysis, however, the [N \tilde{V}] is only an intermediate stage, not the underlying representation (since I do not recognize any nasal consonant), the latter being /CV/. I have pointed out above (see examples on p. 20) that we may have dialectal variation between $+N(CV)\alpha^T$ and $-N(CV)\alpha^T$. One of the logical conclusions is that we may have alternation between $-N(CV)\alpha^T$ and syllabic nasals, and this is precisely the case with the first syllable of the first two examples below and with the last syllable of the third example.

[ftí]	(Wací)	:	:	[wútú]	(Fon)	'because of'
[hǎzǎ]	(Gen)	:	:	[wùzǎ]	(Fon)	'awake'
[pǎǎ]	(Avéno)	:	:	[pǎǎ]	(Hwe)	'woman'

At this stage, it is only fair that I add that the determination of the underlying consonant is not automatic. In fact, after the nasal consonant has emerged, it may undergo other assimilation processes, one of which is that the alveolar *n* becomes velar (*ŋ*) when followed by the high back vowel, especially in Avéno.

/qú/	'thing'	→	[nú]	(most dialects	→	[ŋú]	(Avéno))
/qǎ/	'mouth'	→	[nú]	(most dialects	→	[ŋǎ]	(Avéno))

Another process may be the homorganic nasal assimilation which is very

strong (almost compulsory) when the following consonant is a velar or a labial, optional in other cases. Thus, in Wací, /bě gbé/ 'I refused' is realized as [mě gbé] or [ḡ gbé]. What I must also point out is that, although all nasalized vowels "create" the nasal consonant in the appropriate /C (C) V/, the syllabic nasal emerges when the vowel is ũ or ẽ. We have only isolated cases of ĩ and ã. Regularly in the phonology of Gbe, ə or e and their nasal counterparts are often elided when in contact with another vowel and may be properly called schwa, the function of which is tone bearing. Since any nasal consonant is potentially tone bearing, the schwa may be elided and the tone transferred to the nasal. In the case of ũ, since it assimilates first the "created" nasal to the velar ŋ, both segments have similar resonance and one of them may be elided. This is precisely what explains the free variation we sometimes have between $\alpha^T(\eta\tilde{u}) \sim \alpha^T(\eta) \sim \alpha^T(w\tilde{u}) \sim \alpha^T(\tilde{u})$.⁹

In sum, the position held in this paper is that syllabic nasals are simply phonetic realizations of the /CV/ syllable in which the vowel is a nasalized one. I derive them through the following steps:

- | | |
|--|-----------------------------|
| 1: underlying representation | $\alpha^T(C\tilde{V})$ |
| 2: regressive nasal assimilation,
if C is [-paired] | $\alpha^T(N\tilde{V})$ |
| (3: velar assimilation when V is ũ | $\alpha^T(\eta\tilde{u})$) |
| 4: vowel deletion, syllabic nasal | $\alpha^T(N)$ |
| (5: homorganicity with the consonant
of the following syllable) | |

⁹This observation, illustrated above p. 35, has also been made by Pazzi [1975:10] who writes:

"Il faut remarquer que la voyelle nasale ũ et la consonne nasale ŋ donnent pratiquement le même son. (On comprend par là pourquoi différents auteurs ont transcrit ce son de l'une ou l'autre manière.)"

Significantly near our solution, the same Pazzi adds:

"Cela peut tout aussi bien s'écrire ηu (...) et c'est la meilleure forme dans les cas où ce son constitue un radical (car tous les radicaux sont formés de consonne plus voyelle)" [Pazzi 1971:10].

Thus the four phonetic syllable types [CV], [CCV], [V] and [N̩] are now reduced to three phonological syllable types: /CV/, /C₁C₂V/, and /V/. It must once more be emphasized that [N̩] has been treated as /CV/ on alternation criteria. We may, however, observe that on distributional grounds, while in /CV/ and /C₁C₂V/ syllable types, the V elements may be underlying [+nasal] or [-nasal], and in the /V/ syllable type /V/ is always [-nasal]. Meanwhile, as shown above, these distributional criteria are not sufficient to treat [N̩] as /V/, because not all oral vowels are attested in the /V/ syllable type.

8. Concluding Remarks

This case study of nasality in Gbe is likely to show that theories are not often as radically opposed as we feel. Thus, using three different theoretical frameworks (Prosodic Analysis, Transformational-Generative Phonology, and Structural Linguistics), I have argued that Gbe should be analyzed without basic nasal consonants. Both within generative phonology and taxonomic phonology, it has been argued that nasality is only relevant in the vowel system, and therefore secondary in the consonant specification. The alternation criterion has also led us to analyze syllabic nasals as reduced forms of /CV/ syllable through [N̩V̩]. It must be concluded that data and theories are in a dialectical relationship, but instead of data being "cooked" by the theory, we should be prepared to modify our theory in order to account for all aspects of the data.

The second conclusion that may be drawn from our discussion is that, since we are far from having described all the natural languages of the world, the most established ideas should still be considered as powerful hypotheses, not transcendental truth. In the case of nasality, two of the universals proposed or stated by Ferguson [1963] have been falsified with evidence from Gbe and other languages as well. Indeed, before the present writer (although he did not know it until he presented the first version of this paper), J. Le Saoūt [1973] pointed out that many West African languages are characterized by the absence of phonemic nasal consonants and the presence of both phonemic oral and nasalized vowels. Thus Universals I and X quoted in our introduction may be considered as invalidated and have no force

as an argument in the analysis of new languages.

A third conclusion which derives from the treatment of /b d-r y l y and w/ in Gbe as belonging to one class is that the set features may not be phonetically based, since methodologically they are arrived at when the phonological study of the language is almost completed, i.e. they are language-specific.

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