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**VOWEL COALESCENCE ACROSS WORD BOUNDARIES  
IN CHUMBURUNG**

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Linguists have treated vowel coalescence in West African languages in different ways and three of these are examined in this paper. One approach views the product of coalescence as a 'third' vowel- different from either of the two coalescing vowels. A second approach views the product of coalescence as a 'strong' vowel, where the vowel realised is the stronger of the coalescing vowels. Finally, a third approach views the product of coalescence as one or other of the two vowels involved, which may have assimilated certain features prior to the deletion of the other.

It is this last approach which is applied to coalescence in Chumburung. Evidence presented suggests that the processes of assimilation and deletion are independent of each other.

Il y a plusieurs façons dont les linguistes ont analysé la coalescence des voyelles dans les langues de l'Afrique de l'Ouest. Dans cet article, trois d'entre ces façons sont examinées. Une de ces points de vue considère le résultat de la coalescence vocalique comme étant une troisième voyelle, différente de celles dont elle est issue. Un deuxième point de vue consiste à dire que le résultat de la coalescence vocalique est une voyelle 'forte', la plus forte des deux qui se sont assimilées.

Finalemment, le troisième point de vue consiste à dire que le résultat de la coalescence est l'une ou l'autre des voyelles en question. Cette voyelle aura assimilé certains traits avant l'élimination de l'autre.

C'est ce dernier point de vue que nous avons adopté pour traiter de la coalescence en Chumburung. Les faits présentés tendent à montrer que les processus d'assimilation et d'élision sont indépendants l'un de l'autre.

**0. INTRODUCTION**

Whenever syntactic and morphological constraints in Chumburung<sup>1</sup> allow syllabic nuclei to be placed in juxtaposition across a word boundary, syllabic union takes place.<sup>2</sup> In these contexts three phenomena are observed: (a) resyllabification of syllabic nasals, (b) tone fusion, and (c) vowel coalescence.

Linguists have treated coalescence in West African languages in different ways and three of these are examined in this paper.<sup>3</sup> Although not all analyses of coalescence are necessarily best analysed in the model below, the data presented is seen as lending

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itself rather well to a generative phonological analysis, and it is concluded that coalescence involves independent processes of assimilation and deletion.

### 1. THREE ANALYSES

Of the possible analyses of vowel coalescence, three are examined below in relation to the Chumburung data. These are as follows:

(a) Third vowel: the resultant vowel is considered to be a product of the coalescing vowels and different from them.

(b) Strong vowel: the resultant vowel is considered to be the stronger of the vowels involved to the exclusion of the other.

(c) Assimilated vowel: the resultant vowel is considered to be one or other of the vowels involved which may have undergone processes of assimilation prior to the deletion of the other.

#### 1.1 THIRD VOWEL

In his analysis of vowel coalescence in Igede, Bergman (1971) considers the resultant vowel to be a third vowel. He describes this vowel as having the same "tense or lax quality as the first vowel, but the same tongue position...as the following initial vowel" (p.16). He notes a situation of "complete coalescence" where the second vowel is either high, or central (low) and where the resultant vowel is the appropriately tensed or lax counterpart of this vowel. This is contrasted with "partial coalescence" where the second vowel is mid. In the case of mid vowels, the lax counterpart of a tense vowel is slightly lower in height than the tense vowel. As a result of partial coalescence, the resultant vowel assumes the tense/lax quality of the first vowel and the tongue position of the second vowel. This yields an allophone which, when the first vowel is tense and the second lax, is lower than a normal mid, tense vowel. When the first vowel is lax and the second tense, the resultant allophone is higher than a normal mid, lax vowel. Figure 1 illustrates the Igede data.

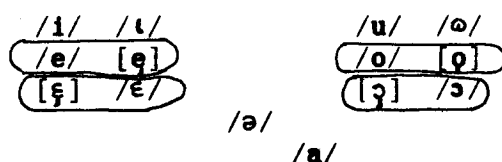


Figure 1. A phonetic presentation of Igede vowels

Were the Igede data to be analysed within the framework of generative phonology the "complete" versus "partial" coalescence distinctions could be eliminated since the product realized through partial coalescence has undergone the same process as the product realized through complete coalescence. In a generative analysis the vowel realized through coalescence is the second vowel which has assimilated the tense/lax feature of the first vowel prior to elision of the first vowel.

## 1.2 STRONG VOWEL

Faraclas (1982: 70-72) proposes a syllabic strength hierarchy for dialects of Obolo such that in situations of coalescence, the stronger segment is realized and the weaker elided. However, where vowels of similar strength are involved, a "third vowel which combines some of the features of both" results. Unfortunately, he provides no rules which determine the quality of this third vowel. Also, his syllabic strength hierarchy is rather ad hoc in that it consists of a set of four rules ordered disjunctively, the last of which is based, not on any inherent quality of the syllabic segment itself, but rather on its linear position with respect to the other segment. He sums up the results of applying these rules as follows: "Except where /a/, /ɔ/, and /N/ are involved, the second of the two syllabics in contact is stronger than the preceding one".

When this approach is applied to the Chumburung data a very similar ad hoc syllabic strength hierarchy results which, though it may account for the data presented in section 2, fails to capture the generalization which can be made for the data of both sections 2 and 3.

## 1.3 ASSIMILATED VOWEL

In Ogori, when two syllabic nuclei are placed in juxtaposition, the two syllabics usually contract into one. Chumbow (1982) concludes that this contraction is not a single process but is rather a number of discrete processes which include assimilation and elision. He proposes that when two vowels are in an environment favorable to contraction, the first vowel assimilates certain features from the second vowel before it (i.e., the first vowel) is elided. His argument for the independence of these two processes rests on the grounds that the vowels of certain grammatical classes of prefixes (viz., possessive adjectives and subject pronouns) do not undergo elision after assimilating to a following vowel. If contraction were a single process it would either apply or not apply: the classes mentioned above would then be cases where it did not apply, but would then require an additional rule of assimilation which would be a proper subpart of the contraction rule (the other part being elision). This argues in favour of viewing contraction as a cover term.

The weak point in this argument lies in demonstrating that contraction actually includes assimilation in the first place since it is the elided vowel which is assumed to have previously undergone assimilation. Evidence that these vowels have in fact previously undergone assimilation comes from slow careful speech where Chumbow demonstrates that vowels which would normally be elided in faster speech are not elided, but are seen to have nevertheless undergone assimilation. A stronger case for recognizing assimilation and elision as independent processes can be made from Chumburung since in Chumburung it is the vowel which is not deleted which has undergone assimilation.



R2 Vowel harmony

V ---> [+ATR] / V (?) # \_\_\_\_  
 [+High] [+ATR]

A high vowel which is of the nonadvanced tongue root set (viz., , ) will be realized as advanced if preceded by a vowel of the advanced tongue root set.<sup>5</sup>

R3 Vowel lowering

V ---> [-High] / V (?) # \_\_\_\_  
 [-High]

The second vowel, if high, is realized as low when preceded by a low vowel.

R4 Vowel deletion

V ---> ∅ / \_\_\_\_ # V

After the rules for assimilation have been applied, the first vowel is deleted.

The following derivations illustrate the application of the four rules.

	/ab <sup>h</sup> # (fɔ/	'it is far' (1)
R1 Consonant Rounding	ab <sup>h</sup> # (fɔ	
R2 Vowel Harmony	_____	
R3 Vowel Lowering	_____	
R4 Vowel deletion	ab <sup>h</sup> # (fɔ	
	[ab <sup>h</sup> (fɔ]	

	/tɔ # (sant/	'to roast a sheep' (2)
R1 Consonant Rounding	t <sup>h</sup> ɔ # (sant	
R2 Vowel Harmony	_____	
R3 Vowel Lowering	t <sup>h</sup> ɔ # (sant	
R4 Vowel Deletion	t <sup>h</sup> # (sant	
	[t <sup>h</sup> (sant]	

	/de # ijo/	'to have yams' (3)
R1 Consonant Rounding	_____	
R2 Vowel Harmony	_____	
R3 Vowel Lowering	de # ejo	
R4 Vowel Deletion	d # ejo	
	[dejo]	

/ijo # ɿsa/ 'three yams' (4)  
 R1 Consonant Rounding ij<sup>w</sup>o # ɿsa  
 R2 Vowel Harmony ij<sup>w</sup>o # isa  
 R3 Vowel Lowering ij<sup>w</sup>o # esa  
 R4 Vowel Deletion ij<sup>w</sup> # esa  
 [ij<sup>w</sup>esa]

/ipurutu # ɿsa/ 'three kapok pods' (5)  
 R1 Consonant Rounding ipurut<sup>w</sup>u # ɿsa  
 R2 Vowel Harmony ipurut<sup>w</sup>u # isa  
 R3 Vowel Lowering ipurut<sup>w</sup> # isa  
 R4 Vowel Deletion ipurut<sup>w</sup>isa  
 [ipurut<sup>w</sup>isa]

/de # ɔɲart/ 'to have a man' (6)  
 R1 Consonant Rounding \_\_\_\_\_  
 R2 Vowel Harmony \_\_\_\_\_  
 R3 Vowel Lowering \_\_\_\_\_  
 R4 Vowel Deletion d # ɔɲart  
 [dɔɲart]

/ite kede # ɿsa/ 'three sieves' (7)  
 R1 Consonant Rounding \_\_\_\_\_  
 R2 Vowel Harmony iteɲkede # isa  
 R3 Vowel Lowering iteɲkede # esa  
 R4 Vowel Deletion iteɲked # esa  
 [iteɲkedesa]

### 3. VOWEL ASSIMILATION

#### 3.1 VOWELS SEPARATED BY GLOTTAL STOP

There are a large number of words whose final vowels in isolation and in prepause position are phonetically shorter in length than "normal" vowels and end abruptly with a fairly clear glottal stop. In other environments, however, they are of normal length, with no glottal stop. But, after assimilatory rules have been applied to a following vowel, vowels followed by glottal stop do not undergo vowel deletion. Instead the following rules apply:

##### R5 Glottal Deletion

? ----> ø / V \_\_\_\_\_ # (V) C

A glottal stop is deleted when followed by other segments.

##### R6 Semivowel Epenthesis

ø ----> [ -Syllabic ] / V \_\_\_\_\_ ? # V  
 [ -Consonantal ] [ <Back ]  
 [ <Back ]

A semivowel<sup>7</sup> (viz., y or w) is epenthesized between two adjacent vowels within the same breath group.

R7 Vowel Raising  
 V ---> [+High] / \_\_\_\_\_ [ -Syllabic ] # V  
 [ -Consonantal ]

A vowel assimilates in height to an epenthesis following semivowel.<sup>8</sup> The following derivations demonstrate the application of rules 1-7.

/akɔbɛʔ # asa/ 'three relatives' (8)

R1 Consonant Rounding \_\_\_\_\_  
 R2 Vowel Harmony \_\_\_\_\_  
 R3 Vowel Lowering \_\_\_\_\_  
 R4 Vowel Deletion \_\_\_\_\_  
 R5 Glottal Deletion akɔbɛ # asa  
 R6 Semivowel Epenthesis akɔbɛy # asa  
 R7 Vowel Raising akɔbɪy # asa  
 [akɔbɪyasa]

/ibodobodoʔ # ɪsa/ 'three loaves' (9)

R1 Consonant Rounding \_\_\_\_\_  
 R2 Vowel Harmony ibodobodoʔ # isa  
 R3 Vowel Lowering ibodobodoʔ # esa  
 R4 Vowel Deletion \_\_\_\_\_  
 R5 Glottal Deletion ibodobodo # esa  
 R6 Semivowel Epenthesis ibodobodow # esa  
 R7 Vowel Raising ibodoboduw # esa  
 [ibodoboduwesa]

/ijandeʔ # isiye/ 'six onions' (10)

R1 Consonant Rounding \_\_\_\_\_  
 R2 Vowel Harmony \_\_\_\_\_  
 R3 Vowel Lowering ijandeʔ # esiye  
 R4 Vowel Deletion \_\_\_\_\_  
 R5 Glottal Deletion ijande # esiye  
 R6 Semivowel Epenthesis ijandey # esiye  
 R7 Vowel Raising ijandiy # esiye  
 [ijandiyesiye]

/dɔʔ # ɪsɪ/ 'to hoe soil' (11)

R1 Consonant Rounding \_\_\_\_\_  
 R2 Vowel Harmony \_\_\_\_\_  
 R3 Vowel Lowering dɔʔ # ɛsɪ  
 R4 Vowel Deletion \_\_\_\_\_  
 R5 Glottal Deletion dɔ # ɛsɪ  
 R6 Semivowel Epenthesis dɔw # ɛsɪ  
 R7 Vowel Raising dɔw # ɛsɪ  
 [dɔwɛsɪ]

	/adaka? # asa/	'three boxes'	(12)
R1 Consonant Rounding	_____		
R2 Vowel Harmony	_____		
R3 Vowel Lowering	_____		
R4 Vowel Deletion	_____		
R5 Glottal Deletion	adaka # asa		
R6 Semivowel Epenthesis	adakay # asa		
R7 Vowel Raising	adaky # asa		
	[adakyasa]		

These examples show that the processes of assimilation are distinct from deletion.

### 3.2 VOWELS SEPARATED BY CONSONANTS

Not only does vowel assimilation occur when vowels are separated by a glottal stop but also when vowels are separated by consonants. The processes are the same as those described in section 2; however, the environments are of course more general. Vowel harmony rule R2 may therefore be rewritten as R2'.<sup>5</sup>

#### R2' Vowel Harmony

$$V \text{ ---} \rightarrow \begin{matrix} [+ATR] \\ [+High] \end{matrix} / \left\{ \begin{array}{l} V \quad (C) \# (C) (w) \text{ ---} \\ [+ATR] \\ \text{---} \quad (C) \# (C) (w) \quad V \\ \text{---} \quad \quad \quad \quad \quad [+ATR] \end{array} \right\}$$

	/kofi # kɪbaŋ/	'Kofi's paddle'	(13)
R2' Vowel Harmony	kofi # kibaŋ		
	[kofi kibaŋ]		

	/afiya # ʧikpɔʔ/	'Afiya's sponge'	(14)
R2' Vowel Harmony	afiya # ʧikpɔʔ		
	[afiyaʧikpɔʔ]		

Vowel Lowering rule 3 may likewise be rewritten as R3'. Note that lowering is blocked by an intervening high consonant (palatals and (w)).

#### R3' Vowel Lowering

$$V \text{ ---} \rightarrow [-High] / \begin{matrix} V \quad (C) \# \quad (C) \text{ ---} \\ [-High] \quad \quad \quad [-High] \end{matrix}$$

	/ʧaŋ # dɔŋ/	'guinea fowl's enemy'	(15)
R2' Vowel Harmony	ʧaŋ # dɔŋ		
R3' Vowel Lowering	[ʧaŋ dɔŋ]		



	/l̥caŋ # isa/	'three guinea fowls'	(16)
R2' Vowel Harmony			
R3' Vowel Lowering	l̥caŋ # ɛsa		
	[l̥caŋ ɛsa]		
	/kabuno # dɔŋ/	'clan's enemy'	(17)
R2' Vowel Harmony			
R3' Vowel Lowering	kabuno # duŋ		
	kabuno # doŋ		
	[kabuno doŋ]		
	/afiya # čikpɔʔ/	'Afiya's sponge'	(18)
R2' Vowel Harmony			
R3' Vowel Lowering	afiya # čikpɔʔ		
	[afiya čikpɔʔ]		

In addition there is a rule of vowel backing, the effects of which, in cases of vowel coalescence, are not realized on the surface due to subsequent vowel deletion. Whenever a front vowel precedes a back vowel, **w** or **Cw** across a boundary, the front vowel is realized as a back round vowel. Intervening consonants do not affect the process with the following exception: the process is blocked by intervening palatal consonants.

### R3a Vowel Backing

$$V \text{ ---> } [+Back] / \text{ --- } (C) \# \text{ --- } (C) \left\{ \begin{array}{l} V \\ [-Palatal] \end{array} \right\} \left\{ \begin{array}{l} [+Back] \\ w \end{array} \right\}$$

	/kofi # kɔtɪ/	'Kofi's monkey'	(19)
R2' Vowel Harmony			
R3' Vowel Lowering			
R3a Vowel Backing	kofu # kɔtɪ		
	[kofu kɔtɪ]		
	/ani # kuri/	'our fowl house'	(20)
R2' Vowel Harmony			
R3' Vowel Lowering	ani # kuri		
R3a Vowel Backing	anu # kuri		
	[anu kuri]		
	/mɪ # ɔčɪʔ/	'my wife'	(21)
R2' Vowel Harmony			
R3' Vowel Lowering			
R3a Vowel Backing	mɔ # ɔčɪʔ		
R4 Vowel Deletion	m # ɔčɪʔ		
	[mɔčɪʔ]		

/kofi # jono/ 'Kofi's dog' (22)

R2' Vowel Harmony  
R3' Vowel Lowering  
R3a Vowel Backing

[kofi jono]

It is readily apparent that the rules of assimilation which vowels of coalescence undergo is only a restricted subset of a more general set of assimilatory rules operating in the language. This supports the analysis that the vowel realized through coalescence in Chumburung is not a "third" vowel or the "stronger/strongest" of the vowels involved, but rather the second or following vowel which may have undergone processes of assimilation prior to deletion of the "first" or preceding vowel.

#### 4. CONCLUSION

I have tried to demonstrate that the rules for assimilation of vowels across word boundaries are constant in Chumburung, whether the first vowel undergoes deletion or not. This is seen as strong evidence for recognizing the processes of assimilation and deletion as independent of each other.

The success of this approach in yielding a solution for the Chumburung and Ogori data suggests that it might provide a preferable alternative for other language analyses as well. For example, this approach enables the analyst to eliminate the "complete" versus "partial" coalescence distinction posited to account for the Igede data because the allophone realized through partial coalescence can be seen to have undergone the same process as that realized through complete coalescence. Although Faraclas doesn't provide enough data to reformulate his analysis, the similarity of his data to the Chumburung data suggests that this approach could prove more intuitively satisfying for Obolo as well.

#### NOTES

<sup>1</sup>Chumburung belongs to the Guang subgroup of Volta-Comoe languages which form part of the Kwa family. The Banda dialect under investigation is spoken in the southeastern part of Ghana's Northern Region.

<sup>2</sup>Throughout this paper, all references to word boundaries refer to phonological word boundaries -- the phonological word being defined as the vowel harmony span. Syllabic union also occurs across morpheme boundaries within phonological words, but the rules governing this are not identical with the rules governing syllabic union across word boundaries.

<sup>3</sup>I wish to express appreciation to various colleagues of mine who share a part of this paper. Much of the data upon which this work is based was elicited together with Keir Hansford. I am especially grateful to Tony Naden for his criticism of various drafts of this paper and to Don Burquest, Paul Dancy, and Andy Ring for their criticism at one stage. Any remaining mistakes are of course my own responsibility.

<sup>4</sup>For a more complete description of CHVH see Stewart and van Leynseele (1979).

<sup>5</sup>Inasmuch as the merits of an autosegmental representation of vowel harmony are not in focus, I have chosen a segmental representation of this rule, though it is recognized that vowel harmony operates on the word level in Chumburung.

<sup>6</sup>In an early and tentative phonological analysis of Chumburung, Price (1975) referred to vowels followed by glottal stop as "VV" (p. 10). Since they did not participate in vowel fusion as such, he analyzed them as having historically undergone fusion with another vowel (p. 6). In Snider (in preparation), historical and comparative evidence is presented which suggests that the glottal stop "marks" words which have historically undergone apocope.

<sup>7</sup>Semivowel features may be specified as follows:

	y	w
Consonantal	-	-
Syllabic	-	-
High	+	+
Back	-	+

<sup>8</sup>Price (1975) recognized only Ca<sup>7</sup> as being realized C<sub>l</sub> before another vowel. The fact that all nonhigh vowels are raised in this environment may have gone unnoticed due to the greater similarity of front vowels to i/ɪ and back vowels to u/ɔ.

<sup>9</sup>Although not discussed in this paper, there is a further rule whereby a nasal consonant assimilates the point of articulation of a following consonant.

#### REFERENCES

- Bergman, Richard. 1971. Vowel sandhi and word division in Igede. *Journal of West African Languages* 8.1:13-25.
- Chumbow, Beban Sammy. 1982. Contraction and tone polarization in Ogori. *Journal of West African Languages* 12.1:89-103.
- Faraclas, Nicholas. 1982. Elision and other morpheme boundary phenomena in the western dialects of Obolo. *Journal of West African Languages* 12.2:69-82.
- Pike, Kenneth L. 1967. Tongue root position in practical phonetics. *Phonetica* 17.129-40.
- Price, Norman. 1975. Collected field reports on the phonology of Nchimburu. *Collected Language Notes*, 14. Legon: Institute of African Studies, University of Ghana.
- Snider, Keith L. In preparation. The historical source of   in Chumburung.
- Stewart, John M. 1967. Tongue root position in Akan vowel harmony. *Phonetica* 16.185-204.
- Stewart, John M. and Hélène van Leynseele. 1979. Underlying cross-height vowel harmony in Nem. *Journal of African Languages and Linguistics* 1:31-54.