

CONTRACTION AND TONE POLARIZATION IN OGORI

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In this paper, the facts of Ogori contraction lead to the observation that the term contraction may be useful as a cover term, but it is not illuminating with respect to the dynamics of the phonological processes involved in contraction since it obscures not only the number and nature of the phonological rules involved but also the rule interaction and ordering relationships that obtain between relevant rules of contraction. Also, contraction at the segmental and suprasegmental levels may involve different independent processes as in Ogori where vowel Assimilation and Elision at one level are independent of tone polarization and tone simplification at another level. Finally, a Tone Reduction Principle is proposed to predict the simplification of tonal glides and duplex tones in the domain of 'contraction' for Ogori and related Kwa languages.

Dans cette étude, les faits de la 'contraction' nous amènent à conclure que ce terme peut être employé pour décrire plusieurs procédés. Cependant, il ne nous permet pas d'avoir un aperçu sur les dynamiques des procédés phonologiques compris dans la contraction, car il obscurcit non seulement le nombre et la nature des règles phonologiques concernées mais aussi l'action réciproque et les relations d'ordre qui s'appliquent entre les règles de contraction en question. De plus, aux niveaux phonématique et prosodique, la contraction entraîne des procédés différents et indépendants les uns des autres, ce qui est le cas en ogori, où l'assimilation et l'élision des voyelles de l'un niveau sont indépendantes de la polarisation et de la simplification tonales de l'autre. Enfin, un Principe de Réduction des Tons est proposé pour prédire la simplification des tons modulés et des tons doubles dans le domaine de la 'contraction' en ce qui concerne l'ogori et les autres langues 'kwa'.

Introduction¹

The term 'contraction' has been popularized by scholars working on the Yoruba language to refer to changes affecting two contiguous segments separated by word boundary and their corresponding tonemes. Characteristically, contraction results in the shortening of words or phrases by the elision of some segment and/or

toneme in the words or phrases concerned. Consider the following examples from Awobuluyi (1978):

ra # epo	repo	buy oil
ri # ɛja	reja	see fish
ni # oja	lójà	at the market
ìdí # ɔkò	ìdíkò	motor part
ewé # okò	ewéko	weed, grass ²

Note that the first three words involve the elision of the final vowel of the first word, while the last two involve the elision of the initial vowel of the second word in the collocation, thus raising the question of predictability for the contraction process. Scholars from Ward (1952), through Bamgboṣe (1965), and Oyelaran (1972) to Awobuluyi (1978) have attempted to formulate rules to account for this process. By their own admission, none of the analyses proposed, (not even the morphologically conditioned and heavily morphologized rules of Oyelaran (1972) can claim to constitute a satisfactory account of the contraction phenomenon in all its complexity in the Yoruba language.

Vowel Assimilation, attested in Yoruba, is treated as a separate process, unrelated to contraction by Awobuluyi (1978:154) because apparently, assimilation is morphologically conditioned and restricted to noun-noun collocation as exemplified in 2.

2. ilé # ìwé	iléèwe	School (house of book)
orí # òjò	iróòjò	Ojo's head
ilé # Ayọ	iléayọ	Ayọ's house
ilé # Èbun	iléèbùn	Ebun's house
ara # òla	aroòla	Ola's body
ara # èjìde	areèjide	Ejide's body

However, the striking phonetic similarity between the domain of the contraction process in 1 and the domain of the application of the Assimilation rule in 2 raises the question as to whether a satisfactory solution to the problems of contraction cannot be found in the relationship and interaction between contraction and assimilation. This amounts to saying that 'contraction' should be viewed not as a single process but as a cover term for a number of discrete processes including elision and assimilation among others and that the burden of accounting for 'contraction' should not be borne uniquely by the type of rules formulated but also by the order in which the rules apply (including 'local ordering' if necessary). This avenue is worth exploring particularly since it is understood that in some dialects of Yoruba, assimilation is not restricted to noun-noun collocation as in standard Yoruba.

Not possessing the relevant facts of Yoruba language to undertake the path proposed here, and notwithstanding what its eventual exploration might bring, I will show that a similar case of 'contraction' in Ogori can be accounted for in a straightforward way in precisely the manner suggested above.³

1.0. Elision and Assimilation in Ogori

1.1. Elision

Vowel Elision involving the deletion of the first of two contiguous vowels separated by word boundary is a highly productive phonological process in Ogori (a Kwa language of Nigeria) and indeed extends and encompasses words in diverse grammatical relationships. Consider the data in 3:

3. Noun-Adjective Collocation (Noun - Adj.)

A		B		C	
ìgìlà	'yam'	òkeke	'small'	ìgìlòkeke	'small yam'
òtélé	'pot'	òkèka	'big'	òtélókèka	'big pot'
esá	'cloth'	òrírĩ	'black'	esórírĩ	'black pot'
úbó	'house'	óbòrò	'good'	úbóbòrò	'good house'
ébí	'water'	óbòrò	'good'	ébóbòrò	'good water'
íjá	'woman'	òsúdá	'old'	íjósúdá	'old woman'

Given the nouns and adjectives in their citation forms as in 3A and 3B, the corresponding adjectival constructions in C would naturally be accounted for as a result of the deletion of the last vowel of the nouns in A. The process can aptly be captured by a vowel elision rule:

R1(a) V ———— ∅ / ———— # V (A vowel in word
final position
is deleted when
the next word
begins with a
vowel.)

R1 $\left[\begin{smallmatrix} +\text{syll} \\ -\text{cons} \end{smallmatrix} \right] \longrightarrow \emptyset / \text{ ———— } \# \left[\begin{smallmatrix} +\text{syll} \\ -\text{cons} \end{smallmatrix} \right]^4$

Consider yet another category of constructions in 4 overleaf:

4. Noun-Determiner Collocation (Noun + Deictic)

A		B		C	
òbèlè	'mat'	òbèlòne	'this mat'	òbèlònébé	'that mat'
èbàtá	'shoe'	èbàtòne	'this shoe'	èbàtònébé	'that shoe'
òdò	'rat'	òdòne	'this rat'	òdònebe	'that rat'
ójí	'rope'	ójóne	'this rope'	ójónébe	'that rope'
úwó	'dog'	úwóne	'this dog'	úwónébe	'that dog'

The underlying forms of the deictic 'this/that' above become obvious when we compare them with constructions in which the deictic modifies consonant final nouns as in 4D below:

		D	
àgàòne	'this hoe'	àgàònebe	'that hoe'
ótúmòne	'this ear'	ótúmònebe	'that farm'

Comparing the forms in D with those in B and C, the underlying representations for 'this' and 'that' can be isolated as òne and ònebe. (The justification for the underlying tone will be discussed later.) Noun phrases of the type (N + Det) are therefore derived as a result of the application of vowel elision (R1) as illustrated in B1 and C1 below:

	B1
/òbèlè # òne/	[òbèlòne]
/ójí # òne/	[ójóne]
/èbàtá # òne/	[èbàtòne]
	C1
/òbèlè # ònebe/	[òbèlònebe]
/ójí # ònebe/	[ójónébe]
/bàtá # ònebe/	[èbàtònebe]

The derivation of the numeral adverbs in 5a involves reduplication of the numeral and subsequent elision of the first of two contiguous vowels across word boundary as illustrated in 5b.

5. Numeral Adverbs (Reduplication)

a. òére	one	òéróére	one by one
èbòrè	two	èbòrèbòrè	two by two
ufómbòrè	seven	ufómbòrufómbòrè	seven by seven

b. Redupl.	òére # òére	èbòrè # èbòrè
Elision	òéróère	èbòrèbòrè
Other rules		
	[òéróère]	[èbòrèbòrè]

This and many other like processes constitute independent motivation for vowel elision.

1.2. Assimilation

There is another process in the language that appears to conflict with ELISION in that it shares the same domain of application as elision. There is a process of Vowel ASSIMILATION that is extensively attested. Consider the possessive constructions in 6 involving Possessive Adjectives - Noun Collocations and the Pronoun - Verb Constructions in 7.

6. Possessive Construction (Poss. Adj. + N)

	A igilà 'yam'	B érú 'farm'	C ówó 'mouth'
my	mììgilà	mèérú	mòówó
your (sg)	wììgilà	wèérú	wòówó
his/her	jììgilà	jèérú	jòówó
your (pl)	nììgilà	nèérú	nòówó
our	tììgilà	tèérú	tòówó
their	bììgilà	bèérú	bòówó

7. Pronoun Verb Constructions (Subj.Pro. + Tense/Aspect marker)

	múné 'run'	wá 'drink'	džó 'sell'
I am	mèémúné	màáwá	màádžó
you (sg) are	wèémúné	wàáwá	wàádžó
he/she is	èémúné	àáwá	àádžó
we are	tèémúné	tàáwá	tàádžó
you (pl) are	nèémúné	nàáwá	nàádžó
they are	bèémúné	bàáwá	bàádžó

Given the verb forms 'múné' 'wá' and 'džó' and the (C)V morpheme for the subject pronoun, we are left with é and á as tense/aspect

marker (present progressive). The allomorphy (é/á alternation) is determined by vowel harmony.⁵

It is evident from the data in 6 and 7 that the vowels of the possessive adjectives (PA) in 6 and subject pronoun (SP) in 7 are identical to the vowels of the noun or verb they precede. This, in effect, means the vowels of the PAs and SPs are predictable from the vowels of the noun stem or verb auxiliary. An abstract underlying Vowel [V] may therefore be postulated for all PA and SP - vowels which then assimilate the vowel quality of the initial vowel of the following noun or verb as the case may be. This process may be captured by a vowel assimilation rule (R.2).

$$R2 \text{ ASSIMILATION } (V_1 \# V_2 \longrightarrow V_2 V_2)$$

$$\begin{bmatrix} +\text{syll} \\ -\text{cons} \end{bmatrix} \longrightarrow \begin{bmatrix} \alpha \text{ high} \\ \beta \text{ back} \\ \gamma \text{ low} \end{bmatrix} / \text{ --- } \# \begin{bmatrix} + \text{syll} \\ \alpha \text{ high} \\ \beta \text{ back} \\ \gamma \text{ low} \end{bmatrix}$$

Vowel Assimilation, R2, applies to underlying representations in the manner illustrated in 8A and 8B:

A	my yam	your (sg) farm	your (pl) cloth
	mV # ìgìlà	wV # érún	nV # ésa
R2	mi ìgìlà	weérún	neésa
Other rules	[mi ìgìlà]	[weérú]	[neésa]
B	I Tense run	you (sg) Tense sell	they Tense sleep
	mV # é + múné	wV # á + dǝ́ǝ	hV # é + búwé
R2	me é múné	wa á dǝ́ǝ	beébúwé
Other rules	[mèémúné]	[wàádǝ́ǝ]	[bèébúwé]

2.0. Ordering of Assimilation and Elision

R1 (ELISION) and R2 (VOWEL ASSIMILATION) have the same domain of application, the domain traditionally referred to as the domain of contraction. They both concern the behaviour of one of two adjacent vowels separated by word boundary. What is the relationship between the two rules? (Put differently, since their structural description is met at the same point in the derivation, in what order must they apply to derive the correct output?)

One solution is to allow each rule to apply to different types of grammatically determined constructions; that is, ASSIMILATION may be said to apply to possessive adjectives and subject pronouns - verb constructions while ELISION applies to other construction types including those discussed in 3,4 and 5 above. Whereas this

appears observationally correct, such a solution would undermine a number of underlying significant facts about the relationship between the two rules and furthermore would lead to incorporating grammatical information in the formal statement of phonological rules.⁶

The second solution is to order R2 (ASSIMILATION) to apply before R1 (ELISION) thereby claiming that all the vowels that get deleted undergo ASSIMILATION prior to ELISION.⁷ In this solution, ASSIMILATION therefore takes on the status of an obligatory rule while ELISION is optional. Consequently by virtue of its obligatory status, ASSIMILATION (R2) will take applicational precedence over ELISION (R1). The rule interaction proposed here is illustrated in the sample derivation in 9:

9. Sample Derivation

	òtélé # òkèka	nV # érún
R2	òtélóòkèka	nèérún
R1	òtélókèka	_____
Tone rules	òtélókèka	nèérún
	[òtélókèka]	[nèérú]
	'big pot'	'your farm'

The second solution has the advantage of dispensing with the use of grammatical information in the statement of the phonological rules. Further support for the solution also comes from observations with respect to the use of tempo in the language. Three rates of speech delivery can be distinguished in Ogori, viz: Fast, Normal, and Slow or Deliberate.

In Normal Speech, the possessive adjective and subject pronoun constructions are usually realised without ELISION as in (9) [nèérú] while the other constructions exemplified by [òtélókèka] in 9 above are realised with ELISION (Normal Tempo). In Deliberate speech *all* the constructions are realised without elision as in 10 (under Deliberate). In fast speech, all constructions undergo elision. These various rates of speech delivery are summarized in 10.

10. Tempo

	ójí # òne	òtélé # ókèka	nV + érún	mV # ìgìlà
Fast	ójóne	òtélókèka	nérú	mìgìlà
Normal	ójóne	òtélókèka	nèérú	mìgìlà
Deliberate	ójòòne	òtélóòkèka	nèérú	mìgìlà
	'this rope'	'big pot'	'your farm'	'my yam'

From the data in 10, note that all forms undergo assimilation in Deliberate speech. Thus, by ordering ASSIMILATION R2 before ELISION R1, we would capture the fact that in the most basic form of speech, Deliberate speech, there is evidence that assimilation does surface in all forms. Consider the sample derivations in 11. They illustrate the interaction of the two rules in the derivation of forms appropriate to the different tempo.

11.	<u>Deliberate</u>		<u>Normal</u>		<u>Fast</u>	
	ójí#òné	nV#érún	ójí#òné	nV#érún	ójí#òné	nV#érún
R2	ójóòné	neérún	ójóòné	neérún	ójóòné	neérún
R1	————	————	ójône	————	ójône	néérún
Tone rules.	ójóòné	neérún	ójône	neérún	ójône	néérún

[ójóòné] [neérún] [ójône] [neérún] [ójône] [néérún]

The evidence from Deliberate speech justifies the ordering relation established between the two rules. We are able to account for the various forms of the same word realised at the different tempo by relevant rule interaction.

To the extent that this analysis is correct, it follows that contraction in Ogori is not one phonological process but at last two segmental processes (elision and assimilation) characterised by a particular predictable rule ordering relation between them. Note that failure to recognise the discrete nature of processes involved in contraction and in particular, failure to recognise the interaction between these processes would have forced us to postulate monstrous grammatically conditioned rules (reminiscent of those of Oyelaran - 1972) to account for contraction.

3.0. Contraction and Tonal Processes

Having thus shown that the two rules (Assimilation and Elision) are well motivated and sufficient to account for 'contraction' at the segmental level, we now turn to the behaviour of corresponding tonemes.

There are two types of tonal processes observed, corresponding grosso modo to the dichotomy observed in the behaviour of corresponding vowels at the segmental level (Elision and Assimilation), except that the dichotomy in tonal processes does not involve Elision and Assimilation. The first type of tonal process is exemplified in 12 below:

12. A. $L \# L \longrightarrow (\widehat{LL}) \longrightarrow L$ B. $H \# H \longrightarrow (\widehat{HH}) \longrightarrow H$
- /òbèlè#òné/ [òbèlòné] /úbó#óbòrò/ [úbóbòrò]
- /èbàtà#òkeke/ [èbàtòkeke] /ébí#óbòrò/ [ébóbòrò]
- C. $H \# L \longrightarrow (\widehat{HL}) \longrightarrow H$ D. $M \# L \longrightarrow (\widehat{ML}) \longrightarrow L$
- /òtéilé#òkèka/ [òtéíókèka] /òdò#ònébé/ [òdònébé]
- /íjá#òsùda/ [íjósùda] /ìwè àjè/ [ìwàjè]
- E. $M \# M \longrightarrow (\widehat{MM}) \longrightarrow M$ F. $M \# H \longrightarrow (MH) \longrightarrow H$
- /ufómbóre#ufómbóre/ ufómbórufómbóre /òdò#óbòrò/ òdóbòrò
- /esa#óbòrò/ esóbòrò
- G. $L \# H \longrightarrow (LH) \longrightarrow H$
- /òbèlè#óbòrò/ òbèlóbòrò

All the forms in 12 have in common the fact that an underlying sequence of two tonemes surfaces as one toneme (after assimilation and elision processes of the segmental level have applied). A careful reconstruction of the phonological processes involved, bears justification to the phenomenon of the 'stability of tone melodies' discussed by Goldsmith (1976). In particular, it would be evident that changes affecting relevant vowels in $T_1 \# T_2$ structure at the segmental level do not automatically affect the behaviour of corresponding tonemes. Consider the construction in 12A and 12B. The surface forms are derived by assimilation and elision in the manner already discussed and exemplified in 9. Note that when elision deletes the first vowel of a representation $V_1 \# V_2$

as in 12A or $H_1 \# H_2$ as in 12B, it can be reasonably claimed that the deletion of the tone is concomitant with the deletion of the vowel. There is, indeed, no independent evidence from 12A and 12B to invalidate such an assumption. The tonal process in 12C, however, provides evidence that the assumption is untenable. In 12C for instance, the sequence $H \# L$ surfaces as H after the deletion of V_1 .

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If the elision of a vowel were concomitant with the deletion of its accompanying tone, one would expect the relevant structure in

12C to surface as L i.e. V_1 would be deleted with its accompanying V_2

tone (H): instead the high tone of V_1 survives deletion and surfaces on V_2 . The apparent discrepancy has a straightforward explanation if it is assumed that on the deletion of V_1 by elision, the well-formedness condition requiring that every toneme be associated with at least one segment (Goldsmith, 1976) reassigns the high tone of V_1 to V_2 creating a tonal glide HL on V_2 and that this falling tone is subsequently simplified to a high tone by a general process of tone simplification applying to all tonal glides (or duplex tones) in this environment.⁸

Support for this position comes again from Deliberate Speech, where the tonal glides do surface as such. Recall that in deliberate speech the sequence of two vowels $V_1 \# V_2$ are realised with ASSIMILATION $V_2 \# V_2$ and no ELISION. In such situations, (as illustrated in 9), the sequence of two identical vowels is perceived phonetically as a long vowel (with tonal glide or duplex tone as the case may be). Thus, tonal glides (which in this context are transitional tones and so do not surface in Normal Speech), do surface in Deliberate Speech, thus providing evidence for the reality of tonal glides and support for an analysis that reflects these glides.

In order to avoid confusion with the rather well defined concept of Tone Simplification in the literature (Hyman, 1975, Hyman and Schuh, 1974), I shall call the process of creating tonal glides or duplex tones and the ultimate simplification of these to single tonemes, TONE REDUCTION.

From the tonal processes observed in 12, the direction of Tone Reduction in Ogori can be predicted as in 14.

14. Tone Reduction Principle

A tonal glide or duplex tone reduces to one of the tonemes of which it is composed in the hierarchical order $H > L > M$. This means that:

- (1) A tonal glide or duplex tone composed of H and either L or M (in whatever order) reduces to H.
- (2) A tonal glide or duplex tone composed of L and either L or M (in whatever order) reduces to L (L being the next toneme on the hierarchy after H).
- (3) A tonal glide or duplex tone reduces to M if and only if it does not contain either H or L. (In other words, only MM sequences can reduce to M.)

Given the principle governing reduction of tonal glides in Ogori we can predict the logically possible tone processes in 12H for Ogori (processes which are not attested in our data, perhaps, due to the limitations of our corpus).

$$\begin{array}{rclclcl} 12H & L & \# & M & \longrightarrow & \widehat{LM} & \longrightarrow & L \\ & H & \# & M & \longrightarrow & \widehat{HM} & \longrightarrow & H \end{array}$$

The process of creation and subsequent reduction of tonal glides and duplex tones differs from corresponding processes at the segmental level in that the tonemes undergo neither ASSIMILATION nor ELISION as their corresponding segments. This supports a suprasegmental analysis of tone to capture the fact that tone is immune to the assimilation and elision processes at the segmental level. Before examining how the tone phenomena discussed can be insightfully handled within the auto-segmental theory (Goldsmith, 1976), let us examine the behaviour of tone within the second type of constructions: constructions of the type, poss adj # N and subject pron # aux.

All the relevant forms in this type of $V_1 \# V_2$ constructions have in common the property that the tone of V_1 can be predicted from the tone of V_2 not as a straightforward copying process, but as a case of polarization. Consider the data in 6 and 7 derived by assimilation and elision. A close observation of the paradigms in 6 and 7 shows that when the initial vowel V_2 of the noun or verb carries a high tone, the vowel V_1 of the preceding Adjective or possessive pronoun is invariably a low tone and when V_2 is a low tone V_1 is a midtone.

There are four possible ways of accounting for the behaviour of tone in these paradigms. Three of these involve assuming that the adjective or pronoun has one of the three Ogori tones as its underlying tone (low, mid, high).

Assuming underlying low tone, the grammar will require a rule like 15a to account for the alternations.

$$15a \quad L \longrightarrow M / \text{---} \# L \quad (\text{Dissimilation - underlying low})$$

Assuming mid tone will require 15b.

$$15b \quad M \longrightarrow L / \text{---} \# H \quad (\text{Dissimilation - underlying mid})$$

Assuming a high tone will require two rules

$$\left[\begin{array}{l} H \longrightarrow M / \text{---} \# L \\ H \longrightarrow L / \text{---} \# H \end{array} \right] \quad \begin{array}{l} \text{Assimilation (lowering)} \\ \text{Dissimilation} \end{array}$$

- (2) Deliberate speech provides evidence for a transitional tonal glide and
- (3) by the same token, provides evidence for an autosegmental analysis of tone to capture the stability of tone melody evidenced by tonal glides.
- (4) Polarization, to the extent that it is well motivated here, constitutes another evidence for an autosegmental analysis of tone in Ogori, in that whereas the relevant segments undergo assimilation, the corresponding tonemes undergo polarization thereby establishing the independence of the two levels.
- (5) Furthermore, even within the standard generative phonology analysis, the phenomenon of contraction is adequately captured by the four rules interacting in the manner illustrated in 16a.
- (6) Finally, the tone reduction principle claims that tonal glides and duplex tones, if and when they do undergo simplification appear to conform to a certain principle characterised by a hierarchy among the tonemes, such that certain pitch levels in the tonal complex take precedence over others (H > L > M).

Subsequent readings of work on related languages show that this principle will account for the facts of all Kwa languages for which we had relevant data (Yoruba, Beni, Emevor, Nembe, Etsako, Uvwie and Igbo).

It may appear from Goldsmith (1976 and 1979) that Igbo could be considered an exception since $\bar{L}H$ simplifies to D (Drop tone) rather than H as predicted by the tone reduction principle. However, as pointed out by Macawley (1979), Drop is actually a down-stepped High and functions as such in the phonology of Igbo. Thus, the simplification of $\bar{L}H$ to D is ultimately a simplification of $\bar{L}H$ to H and as such, conforms to the tone reduction principle 14. It has also been subsequently observed that the principle can account for tone reduction in Mbembe and Lókè, languages of the Benue - cross sub-family and may therefore be more universal than envisaged here.

FOOTNOTES

¹ An earlier version of this paper was presented in the colloquium series of the Indiana University (Department of Linguistics) in September 1980 and at the Department of Linguistics and Nigerian Languages Seminar, University of Ibadan in March 1981. I am grateful to John Goldsmith, Emmanuel Adegbiya and others for comments on the paper.

² Actually, the term 'contraction' in Yoruba scholarship also applies to word internal elision, particularly consonant elision (Abimbola and Oyelaran, 1975; Awobuluyi, 1978) as exemplified below:

àárò	—	àwúrọ́	morning
ààtà	—	àtìtàn	refuse dump
eégún	—	egúngún	masquerader
oówo	—	oríwo	a boil
èèmò	—	èmímò	something unusual

³ I have since learnt from Ayọ Bamgboṣe (personal communication) that this line of investigation (which solves the contraction problem for Ogori as shown in this paper) will still not account for contraction in Yoruba.

⁴ The feature 'consonantal' is necessary to prevent the elision of syllabic nasals which in Ogori and related languages function like vowels in many respects; they bear tone and constitute the nucleus of syllables (just like vowels).

⁵ Ogori operates a partial vowel harmony system with two harmonic sets featuring three neutral vowels in each set as illustrated below:

Phonetic Vowel Chart				Harmonic sets			
i	ĩ	u	ũ	A		B	
e	ẽ	o	õ	í	u	ĩ	u
ɛ	ẽ	ɔ	õ	e	o	ɛ	ɔ
a ǣ				a		a	

The progressive aspect marker is *é* for words of basically A set and *á* for words of basically B set. For an introductory discussion of vowel harmony, see Amoran (1979) and for the verb morphology, see Popoola (1980) and Ayangoke (1981). For an in depth treatment of Ogori vowel harmony, see Chumbow (1981) and Chumbow (1982).

⁶ Not that this is not permissible *in extremis* but that it is certainly costly and a simpler, more natural and plausible alternative should be preferred.

⁷ According to A. Amayo and B. Elugbe (personal communication) in some languages, there is phonetic evidence that the rule of vowel Elision should best be viewed as a vowel shortening rule. It should be obvious that whether Assimilation is the input to Elision or Vowel Shortening does not affect the facts of the rule interaction proposed here as both rules (Elision and Shortening) have the same effect in the system. From the same source it is learnt that Ian Maddieson had made a similar suggestion about the interaction of Assimilation and Elision in the process of contraction.

⁸ I use the term duplex tone to refer to the well known situation where two identical tonemes converge on one segment.

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