## Table of Contents

### Articles

Paul Newman and Philip J. Jaggar, *Low Tone Raising in Hausa: A Critical Assessment*  
Page 227

Page 253

Paul Newman and Philip J. Jaggar, *LTR: A Reply to Schuh*  
Page 263

Donald A. Burquest, *A Note on Hausa Plurals*  
Page 265

Thomas O. Omoregbe, *Focus and Question Formation in Edo*  
Page 279

Matt. Osayaba Aikhionbare, *Defining the Domain of Nasality in Edo*  
Page 301

Victor Edosa Omozuwa, *Speech Tempo, Consonant Deletion, and Tones in Edo Nouns*  
Page 317

Georges Hérault, *A propos de l'harmonie vocalique en ṣkpe*  
Page 339

### Advertising

Page 363

### Guidelines for contributors

inside back cover
LOW TONE RAISING IN HAUSA: A CRITICAL ASSESSMENT

Paul Newman  
Indiana University  
and  
Philip J. Jaggar  
School of Oriental and African Studies  
University of London

Low tone raising (LTR) refers to a phonological rule postulated for Hausa by Leben [1971], whereby word-final Low-Low sequences change to Low-High if the final vowel is long. In the first part of the paper, we show that counterexamples to the rule are considerably more numerous and more varied than previously thought. In the second part, we demonstrate that the morphophotemic alternations that served to justify LTR can all be explained by other, better means. We conclude that LTR does not constitute an active, synchronically functioning tone rule in Hausa.

0. Introduction*

Hausa is a simple two-tone language with Lo, indicated by a grave accent, vs. Hi, left unmarked, e.g. goorà ‘cane’ vs. gòora ‘large gourd’, makèeraa ‘blacksmiths’ vs. makeeraa ‘smithy’. The language also has a surface falling tone, marked by a circumflex accent, which can be analyzed as H + L on a single (heavy) syllable, e.g. bàkàn ‘the bow’ < bàkàa ‘bow’ + n ‘the’.

* An early version of the first part of this paper was presented at the 14th Conference on African Linguistics, University of Wisconsin, Madison, Spring 1983. The present version was completed while Newman was a fellow at the Center for Advanced Study in the Behavioral Sciences, Stanford, California, with support provided by an NSF grant no. BNS87-00864. For critical comments and suggestions on matters of fact and interpretation, not all of which we have heeded, we are grateful to Sani Sufi Ahmad, Andrew Haruna, Larry Hyman, Muhammed Munkaila, Russell Schuh, and, most especially, Abdullahi Bature.
Given two independent tones, disyllabic words, for example, should manifest four tone patterns: H-H, H-L, L-H, and L-L. It has long been known by Hausaists, however, that L-L in the language is quite uncommon, a fact generally accorded no great significance. Leben [1971], however, looked at these words in a new light and came up with some important observations and interesting proposals. To begin with, Leben noted that words with final L-L (whether two or more syllables) not only were uncommon, but also were phonotactically restricted in that they never ended in a long vowel. That is, while words such as àbù ‘thing’, àkwàài ‘box’, dàgà ‘from’, gwàdò ‘blanket’, màcé ‘woman’, tálàkà ‘commoner’, and tùkùn ‘yet’ are attested, one does not find words such as *bàkàa, *gòoràa, or *màkèerà. Leben also noted that there were morphological alternations in which tone and final vowel length covaried. For example, trisyllabic verbs belonging to the “grade 1” class end in L-L with a short final vowel before a noun direct object, but L-H with a long final vowel before a pronoun direct object:

(1) yaa kàràntà littaafi i ‘he read a book’
    yaa kàránntaa shi ‘he read it’

To account for the phonotactic gap as well as for the morphophonemic alternations, Leben [1971:202] proposed a rule of Low Tone Raising, henceforth LTR, which stated that if a word ended in a L + L sequence, the final L would raise to H if and only if the word ended in a long final vowel (henceforth lfv):

(2) Low Tone Raising (LTR)

\[
\begin{array}{c@{}c@{}c@{}c}
\text{Lo} & \text{Lo} & \# & \rightarrow & \text{Lo} & \text{Hi} & \# \\
\text{ [+long] } & \text{ [+long] }
\end{array}
\]

Leben did not explicitly discuss the status of the rule, but it was presented as a fully productive, more-or-less exceptionless phonological process rule, comparable to what today one might describe as a post-lexical rule (cf. Kiparsky [1985] and Mohanan [1986]). In other words, LTR was assumed by Leben, and has gen-

---

1Scholars prior to Leben would not have observed correlations between tone and final vowel length since an accurate conception of final vowel length in Hausa was late in developing. For example, both major Hausa dictionaries, Bargery [1934] and Abraham [1962], which in other respects are so outstanding, systematically erred in transcribing all final Lo tone vowels as short (not counting ideophones), thereby missing the important phonemic distinction. The rectification of this error is due primarily to the work of Carnochan [1951, 1952] and Gouffe [1965]. The small dictionary of Newman and Newman [1977] is the first Hausa dictionary to transcribe final vowel length correctly.

2The term “grade” refers to the morphological classification of Hausa verbs presented in Parsons [1960] and now accepted as the reference point by all Hausaists. Modifications to Parsons’ system are presented in Newman [1973, 1983].
erally been accepted since, to be a synchronically viable rule on the same level as other regular rules in the language, such as the shortening of long vowels in closed syllables or the simplification of LH on a single syllable to H. However, when a larger body of data is taken into account than was originally considered, it turns out that the synchronic status of LTR is far from certain. Our own conclusion is that LTR in Hausa does not function as a regular productive P-rule: it is at best a lexically restricted word formation rule and most probably not a synchronically viable rule at all (see McHugh [1981:17-21]).

Our discussion falls into two sections. First, we present evidence showing that exceptions to LTR are not rare, as had been thought, and that these counter-examples to LTR are too numerous and cover too wide a range of phenomena to be ignored. Then, we scrutinize the alternations that motivated LTR (and which LTR was supposed to explain) and offer alternative analyses which obviate the necessity for LTR and thus undermine much of its justification.

1. Synchronic Violations of LTR

Leben [1971:202] states, “Much checking with informants and with sources that mark a long-short distinction on final low-toned vowels ... reveals no word in Hausa which ends in two low-toned syllables, the last of which contains a long vowel.” This is apart from the reduplicated words yáayáa = káakáa ‘how?’, which were recognized as non-troublesome exceptions. If one limits oneself to common nouns and verbs out of context, the observation seems to hold. A careful inspection of a wide range of data, however, reveals there are in fact a large number of L-L Ifv words that violate LTR. We present eight groups of exceptions.

1.1. Alternative L-L imperatives. Hausa has a small set of (monotonal) H-H verbs ending in /aal/, namely biyaa ‘pay’, kiraa ‘call’, jiraa ‘wait for’, rigaa ‘precede in doing’. In the imperative, they take the normal L-H imperative tone pattern, e.g. biyaa! ‘pay!’, cf. tsáyáa! ‘stop!’ < tsáyáa ‘stop’. The L-H pattern is also the norm when the verb is followed by a noun direct object; but, as discovered by Jaggar [1982], there is for some speakers a tonal alternative. Instead of using L-H, the force of the imperative can be modified by pronouncing the verb L-L. The result is a L-L Ifv verb form that does not obey LTR, e.g.

3HL on a single syllable is realized on the surface as a falling tone. Hausa does not have corresponding rising tones because LH on a single syllable automatically simplifies to H in accordance with a rule first pointed out by Parsons [1955] and discussed more fully by Leben [1971]. In considering the presumed phonological status of LTR, one should note that Leben presented it in exactly the same terms as he presented the LH to H rule, which is indeed a synchronically exceptionless process rule.

4For a full discussion of the semantic/stylistic content of the alternative imperative form, see Jaggar [1982].
(3) **blyaa kudin!**

'pay the money!' (cf. the usual **blyaa kudin!**)

**jiraa mutumi n!**

'wait for the man!' (cf. **jiraa mutumi n!**)

**kiraa Saani!**

'call Sani!' (cf. **kiraa Saani!**)

Jaggar's (1982) study of the imperative was confined to "monoverbs" (= monosyllabic CV verbs) and the few disyllabic monotonal verbs exemplified in (3); thus the LTR violations were hardly numerous. It turns out, however—and this is something that to our knowledge has never been described before—that alternative L-L imperatives also exist, and in fact are quite common, with a range of verb grades and forms when followed by noun indirect objects, e.g.5

(4) **rabaa wa mutaanen kudin!**

'distribute the money to the people!'

(= **rabaa wa ...**; cf. the verb with an indirect object pronoun: **rabaa musu kudin!** 'distribute the money to them!', not * **rabaa musu ...**)

**karaantaa wa Saanilittaafi n!**

'read the book to Sani!'

(= **karaantaa wa ...**)

**mimmiki kaa wa baa kii miii!**

'offer the guests mints!'

(cf. **mimmiki kaa musu ...** 'offer them ...')

**kashhee wa yaraa fi tilaa!**

'put the light out for the children!'

(= **kashhee wa ...**)

**gutsuroo wa baa kii tuwoo!**

'break off some *tuwoo* for the guests!'

(= **gutsuroo wa ...**)

**jajja wa mutaanee ruwaa a riiji yaa!**

'draw water for people at the well!'

(cf. the verb followed immediately by a direct object: **jajja mutaanen ciki!** 'pull the men inside!', not * **jajja mutaanen ciki*)

---

5The = sign in the examples indicates essentially equivalent, equally grammatical forms. As described for monotonal verbs by Jaggar [1982], the L-L and L-H imperatives differ slightly in nuance with regard to the strength, politeness, etc. of the command. Since the indirect object (i.o.) marker *wa* (= *ma*) tends to attach to the preceding verb, as has been observed by a number of scholars, one might object that these L-L imperatives do not really constitute violations of LTR, i.e. **karaantaa wa 'read to ...' should be interpreted as karaantaa-wa, in which case the verb-final L-L Lv would not be word final. However, as LTR is generally applied, it is essential that there be a word break between the verb and the i.o. marker so as to account for verb tones in declarative sentences and in the better known L-H imperatives. For example, in yaa **karaantaa wa Saaniliittaafi n** 'he read the book to Sani', the final H-L-H tone of **karaantaa** is supposed to have come from H-L-L by means of LTR. The pre-i.o. verb forms thus constitute an embarrassment to LTR whichever way one decides to analyze the degree of bonding between the verb and the i.o. marker.
1.2. Plurals of augmentative adjectives. Hausa has an interesting set of descriptive adjectives referred to as “augmentative adjectival-nouns” [Parsons 1963], “profusatifs” [Mijinguini 1986], or “augmentative adjectives” [R. Newman 1988]. In one of its variants—these words exhibit several alternative patterns—the masculine singular is characterized by a suffix -eeCee and a H-L tone pattern while the feminine is formed therefrom by adding -iyaa, e.g. ‘broad’ fankameemèe (m), fankameemiyaa (f). The corresponding plural is a H-L reduplicated form with long final /aa/, e.g.

(5) fankamaa-fànkamàa pl. of fankameemèe/fankameemiyaa ‘broad’
    zabgaa-zàbgàa pl. of zabgeegèe/zabgeegiyaa ‘tall and beautiful’
    maakaa-màakàa pl. of maakeekèe/maakeekiyya ‘expansive’
    fiřdàa-fiřdàa pl. of fiřdéeđèe/fiřdéeđiyaa ‘huge (e.g. horses)’
    santalaa-sàntalàa pl. of santaleelèe/santaleeliyya ‘thin, svelte’

While these words are semantically expressive, there is nothing so totally aberrant about them that would allow one to casually disregard them as LTR exceptions. Parsons [1963:195], for example, comments that “though highly phonaesthetic, [augmentative adjectives] are quite systematic in their phonology”, by which he means that they obey normal rules and phonotactic restrictions affecting consonants and vowels. From the point of view of their morphosyntax, augmentatives behave essentially like other adjectival nouns: they may occur either before or after the noun they modify and if before, they require the use of a genitival linker; they agree in number and gender with the head noun; and they may be used without an expressed noun, e.g.

(6) wasu dawaakii fiřdàa-fiřdàa (= wasu fiřdàa-fiřdàn dawaakii) sukà fitoo
    ‘some huge horses came out’
    cf. wani dookìi fiřdéeđèe (=wani fiřdéeđèn dookìì) ya fitoo
    ‘a huge horse came out’

---

6 The verb bàa (= baa before pronoun objects) is often described as taking double direct objects. However, the imperative form bàbbàa of the reduplicated “pluractional” would support the claim that the object following the verb is really an indirect object and that the pre-noun marker wà is not syntactically absent, as has generally been thought, but rather is phonologically fused into the verb bàa. Thus, the sequence bàbbàa mutàànèn ‘give the men!’ is syntactically parallel to jàjjàa wà mutàànèn ‘pull for the men!’ (with the overt indirect object marker) and not to jàjjàa mutàànèn ‘pull the men’.

7 In translating these words Parsons [1963] uses expressions such as ‘whacking big’, ‘smashingly beautiful’, etc. to capture their emotive and stylistic power.

yaa kàllì maataa zabgaa-zàbgàa ‘he looked at the tall, beautiful women’
cf. yaa kàllì màcè zabgeegi yaa ‘he looked at the tall, beautiful woman’
naa ga wasu huulaa-bùulàa ‘I saw somefat ones’
cf. the non-augmentative naa ga wasu sàabàbbìi ‘I saw some new ones’

1.3. Ideophonic adjectives. Apart from the plural augmentatives, there are many other reduplicated adjectives with final L-L and a long final vowel, some of which are quite common. These are usually classed as ideophones, but morphosyntactically they, too, behave in a manner similar to other adjectives,8 e.g.

(7) daraa-dàràa ‘bulging’
    as in tanàa dà idòo daraa-dàràa ‘she has bulging eyes’

zaraa-zàràa ‘long and thin’
    as in tanàa dà zaraa-zàrààn ‘yan yaatsuu ‘she has long, thin fingers’

baloo-bàlòo ‘large and round’
    as in taà baa ni goorò baloo-bàlòo ‘she gave me some good (large and round) kolanuts’

ràbèe-ràbèe ‘pendulous’
    as in tanàa dà noonòò ràbèe-ràbèe ‘she has pendulous breasts’

buzuu-bùzûu ‘hairy’
    as in geemùnsà buzuu-bùzûu yake ‘his beard was disheveled’

1.4. Ideophonic adverbs. Phonologically parallel to the ideophonic adjectives but syntactically distinct from them are the reduplicated ideophonic adverbs of manner.9 This class includes not only semantically marked expressive ideophones but also words that native Hausa speakers now treat as ordinary adverbs,10 e.g.

---

8These ideophonic reduplicated adjectives differ from ordinary “adjectives” in that they do not inflect for number or gender, nor can they occur as independent nominals.

9While we have chosen our examples from regular reduplicated patterns, it should be pointed out that non-reduplicated ideophones ending in L-L and a LFV are also not uncommon, e.g. rijàà ‘suddenly’, as in yaa faaàdì rijàà ‘he suddenly fell down’; bàòodòò ‘large’, as in yanàà dà hancì ì bàòòòò ‘he has a large nose’; ràbàjà ‘spread out’, as in yaa yi ràbàjàà dà shii ‘he lay down spread out (e.g. from exhaustion)’.

10In Hausa the distinction between ideophones, which are generally regarded as extra-systemic, and adverbs of manner is not so clear-cut. Forms such as baroo-bàròò ‘clearly, unequivocally’ or jìnnaa-jìnàa ‘bloodied’ (< jìnìì ‘blood’) which would normally be classified as ideophonic on the basis of their canonical shape, appear more like normal adverbs in that (a) they are semantically more generalized and less emotive than typical ideophones and (b) they are pronounced without the marked expressive intonation normally associated with ideophones.
(8) baroo-baròo ‘clearly, unequivocally’
as in sun fàdi làabaarì i baroo-baròo ‘they told the news in unequivocal terms’
jagge-jàgèe ‘abundant’
as in naa ga àbinci jagge-jàgèe ‘I saw a mass of food’
dagajee-dàgàjèe ‘in a bad condition’
as in naa gan shì yaa tahoo dagajee-dàgàjèe ‘I saw him come in a sorry state’
dumuu-dùmùù ‘messy’
as in bàakinsà yaa yi dumuu-dùmùù da mài ‘his mouth was messy with oil’
kirì-kirì ‘in the open’
as in an kaamàa shì kirì-kirì ‘he was caught red-handed’
jinaa-jìnàa ‘bloodied’
as in sun yi jinaa-jìnàa ‘they were all bloodied’

1.5. Ideophonic action nouns. A small number of reduplicated words with
final L-L and a long final vowel are nominals that denote some kind of action or
state. These words often have corresponding “frequentative dynamic nouns”
[Parsons 1963:188n] formed with the suffix -niyàa, e.g.

(9) mun yi rabaaràbàa ‘we have quarreled and split up’
(= raba ‘to separate’)
tanàa wacaa-wàcàa (= wàcàaniyàa) da kudìntà ‘she is squandering her money’
sun yi wùkìi-wùkìi (= wùkìiniyàa) da idòo sai kà cëe bàraawòò ‘they are looking guilty/ashamed like they’re thieves’
sunàa hàyàa-hàyàa (hàyàaniyàa) ‘they are bustling about chattering’

One should emphasize that while these words are phonologically distinctive in
having a set reduplicative pattern, there is nothing lexically aberrant or peculiar
about them. They are most often used immediately following the verb yi ‘do’
(which is generally deleted in the continuative tenses), but they have other
syntactic possibilities as well, e.g.

(10) tsiyàa-tsì yàr da muka yi dà shii taa sàa yaa sàa hannuu
‘the yelling match that I had with him caused him to sign it’

mèe ya kaawoo rabaar-rábânsù? ‘what brought about their break up?’

1.6. Recent loanwords. Loanwords are a good, although not infallible, indication of the synchronic viability of phonological rules. Most loanwords in Hausa that date from an earlier period comply with the phonotactic constraints and the process rules of modern Hausa. Words that were taken into the language with H-L-L tone, for example, generally ended in a short final vowel, e.g. kaařūwà ‘prostitute’ (< Kanuri) or fuɾsùnà ‘prisoner’ (< English). More recently, however, words have started to come into the language ending in L-L and a lv, e.g.

(11) fiɾaamârèe = fiɾaamârèi ‘primary school’
    saƙândârèe = saƙândârî ‘secondary school’
    maƙistârèe = maƙistârî ‘magistrate’
    di sfânsârèe = di sfânsârî ‘dispensary’
    looŧârèe = looŧârî ‘lottery’
    àsambûlèe = àsambûlî ‘assembly (e.g. at school)’

These new loanwords that violate LTR all have a similar metrical/rhythmic shape. This is not surprising, since violations of synchronic canonical restrictions often begin with words that are alike in some respect or other. Once these words are fully established and integrated, one can expect phonologically more varied words to enter the language exhibiting the formerly unacceptable (but now possible) L-L lv pattern.

1.7. Outcome of monophthongization. It is understood that LTR only applies to long monophthongal vowels. Words with final L-L tone ending in a diphthong do not meet the conditions for the rule and thus are expected to remain unchanged, e.g. safâi ‘often’, Mîsâu (place name). But, what happens when diphthongs monophthongize, as has been an ongoing process in Hausa? If LTR were truly functional, one would expect the lexically specific cases of monophthongization to feed the tone raising rule. This is not the case. The

---

This latter sentence was considered only marginally acceptable; the first sentence in (10) was considered just fine.

A now classic study of the use of loanword information in evaluating synchronic phonological systems is Hyman [1970].

For a discussion of the phonological interpretation of Hausa diphthongs, see Newman and Salim [1981]; for an instrumental study of the “diphthongs” showing their phonetic realization as monophthongs, see Lindau-Webb [1985].
words that had L-L tone when they ended in a diphthong are still L-L even for the many speakers who now pronounce the words with a long monophthong, e.g.

(12) \textit{waat\textbar do} (< \textit{waat\textbar au}) \quad \text{‘that is to say’} \\
\textit{feel\textbar w\textbar e} (< \textit{feel\textbar wa\textbar i}) \quad \text{‘railway’} \\
\textit{ka\textbar as\textbar a\textbar r\textbar e} (< \textit{ka\textbar as\textbar a\textbar r\textbar a\textbar i}) \quad \text{‘contemptuously’}

By contrast with the above, the LH to H simplification rule, which is indeed an active rule in Hausa, is fed by dialectal and/or stylistic vowel modifications, e.g.\textsuperscript{14}

(13) \textit{t\textbar a\textbar sa\textbar i} \quad (< \textit{t\textbar a\textbar s\textbar a\textbar y\textbar ii}) \quad \text{via} *t\textbar a\textbar sa\textbar i \quad \text{‘pity’} \\
\textit{n\textbar a\textbar u} \quad (< \textit{n\textbar a\textbar w\textbar a\textbar a}) \quad \text{via} *n\textbar a\textbar u \quad \text{‘mine’ (NW dialects)}

1.8. Result of incorporation of the \textit{q} question morpheme. Interrogative sentences in Hausa, both wh-questions and yes/no questions, are formed, inter alia, by the addition of an overt \textit{q} morpheme [Newman & Newman 1981]. This marker consists of length accompanied for some speakers, but not all,\textsuperscript{15} by a floating Lo tone that grounds on the preceding syllable, e.g.

(14) \textit{ya\textbar af\textbar t\textbar a} \quad \text{‘he went out’} + \textit{q} \rightarrow \textit{ya\textbar af\textbar t\textbar a\textbar a} \quad \text{or} \quad \textit{ya\textbar af\textbar t\textbar a\textbar a} \quad \text{‘did he go out?’}

When the \textit{q} morpheme is added to a word ending in a short final vowel, the vowel lengthens and becomes a long vowel just like any other long vowel in the language. If the final word of the interrogative phrase ends in L-L tone, the vowel lengthening results in a sequence that meets the conditions for LTR. The rule, however, does not apply, e.g.

(15) \textit{kun s\textbar a\textbar yi g\textbar w\textbar a\textbar d\textbar o}\textbar ? \\
\textit{kan\textbar a\textbar s\textbar o\textbar n\textbar a\textbar y\textbar a\textbar b\textbar a}\textbar ? \\
\textit{an s\textbar a\textbar ki f\textbar u\textbar s\textbar u\textbar n\textbar a}\textbar ? \\
\quad \text{‘did you buy a blanket?’} \quad (< \textit{gw\textbar a\textbar d\textbar o}) \\
\quad \text{‘do you want a banana?’} \quad (< \textit{\textbar a\textbar y\textbar a\textbar b\textbar a}) \\
\quad \text{‘did they release the prisoner?’} \quad (< \textit{f\textbar u\textbar s\textbar u\textbar n\textbar a})

\textsuperscript{14}As pointed out in note 3, Leben [1971] treats LH to H simplification and LTR as rules having exactly the same status; the facts of Hausa suggest otherwise.

\textsuperscript{15}The standard grammars and sketches of Hausa all mention the final Lo tone in one manner or another, which suggests that the absence of the Lo tone, now apparently the norm in Kano city, is the result of a relatively recent innovation. Some speakers allow questions both with and without the fall, but with different connotations; many speakers have the fall with wh-questions but not with yes/no questions; and some speakers have a final rise or Hi tone rather than a fall. Question formation in Hausa (especially with regard to tone and intonation) is an area where we clearly still lack basic documentation regarding dialectal and sociolectal variation.
It might be argued that the lengthening in questions is a sentence level intonational-type process that takes place after all phonological rules have been applied and thus should not be expected to feed LTR. Note, however, that Inkelas, Leben, & Cobler [1987:328] have claimed explicitly with regard to the L tone component of the $q$ morpheme that it “is added to the lexical tier” by a purely local process. They show, for example, that the distinction between the H tone word $kai$ ‘you (m.sg.)’ and the falling tone word $káí$ ‘head’ is neutralized in questions when the final L is added, both words appearing as $káí$. An exactly parallel case of lexical neutralization holds in the case of the addition of the length component, e.g.

(16) a. $yanaa$ $šaafēe$ + $q$ → $yanaa$ $šaafēe$ = $šaafēe$  
‘it is wiped’  

b. $taa$ $ga$ $Bàako$ + $q$ → $taa$ $ga$ $Bàako$ = $Bàako$  
‘she saw Bako (proper name)’

Using the same reasoning provided by Inkelas et al. for tone, it would follow that the addition of the length must also be at the lexical level, a consequence of which is that large numbers of L-L $ltv$ words are thereby created. Thus, in terms of their own analysis of the level at which question formation takes place, LTR fails to function as it is supposed to.

---

16For reasons that are hard to fathom, Inkelas et al. ignore the simpler analysis of the tone as being part of the $q$ morpheme (they also totally ignore the fact of the lengthening) and choose to call it a “Low boundary tone”. Evidence for treating the length and, where present, the associated L tone as a distinct $q$ morpheme and not as an intonational/boundary phenomenon comes from an observation made by Hyman [in press] that in many languages, wh-questions have declarative rather than interrogative intonation. So it is in Hausa that wh-questions do not have the intonational suspension of downdrift and key raising that characterize yes/no questions and yet they do manifest final vowel lengthening and L tone. However, this difference in opinion over the source of the L tone has no effect on their analysis once the L tone is firmly attached to the preceding word.

17Hausa does not have extra-long vowels. Thus, when the length is added to a vowel that is already long, it has no effect (nor does it have any effect when it is added to a word ending in a consonant). Interestingly, in Oromo, a Cushitic language of Ethiopia, underlying vowel length distinctions are preserved when length is added in pre-pausal position since short vowels become long while long vowels become extra-long [Lloret 1989].
1.9. Implications of the numerous counterexamples for LTR. In the above we have presented eight different classes of examples (a few of which could perhaps be collapsed into larger groups) which constitute violations of LTR in Hausa as originally presented. None of the specific examples in and of themselves would necessarily require a rejection of LTR, but taken in the aggregate, these counterexamples strongly indicate that, whatever LTR is, it is not a synchronically productive phonological process rule. This is not to say that the phonotactic restriction against L-L Ifv words is without significance. The fact that the exceptions fall within clearly defined classes can be taken as evidence that the phonotactic statement is fundamentally sound. But, from a present-day synchronic perspective, Hausa has just too many L-L Ifv words deriving from a wide variety of sources and processes to continue to believe in the integrity of LTR as an active rule.

2. Putative Examples of LTR in Action

Having demonstrated that LTR is not a general, productive phonological rule, as was previously thought, we now need to provide plausible alternative analyses for the morphophonemic alternations that LTR seemed to explain so beautifully. We should make it clear at this point that we do not question the existence of LTR as a historical rule in Hausa. At an earlier period, Hausa almost certainly had basic common nouns with final L-L tone. When the final vowels underwent lengthening—originally it seems that all final vowels were short, except for low vowels in monosyllabic words (see Newman [1979a, 1986b] and Schuh [1984])—the tone of these nouns must have shifted to L-H. The few basic nouns such as åbù ‘thing’ and màcè ‘woman’ which did not lengthen remained with L-L tone. Synchronically, however, one would not want to replicate this process to generate the citation form of nouns since there is no way to know which L-H nouns came from L-L and which were already L-H even before the historical tone raising took place. The question, then, is not whether LTR ever existed in Hausa, but whether it does so at present. 18 To this end we turn to some of the key alternations discussed by Leben [1971, 1978].

2.1. Tonal polarity in direct object pronouns. Direct object pronouns in Hausa are traditionally described as having “polar tone”, i.e. a tone opposite to that of the final tone of the preceding verb, e.g.

(17) nàa kàamàa sù ‘I caught them’ vs. nàa hààrbeè sù ‘I shot them’

18 For purposes of the present paper, we are simply conceding that LTR was operative at an earlier historical period, which we do, in fact, think was so. Russell Schuh [personal communication], on the other hand, even has doubts about LTR as a historical rule.

Hausaists have long known, however, that with trisyllabic (and quadrisyllabic) grade 1 and grade 4 verbs, forms that are not in the least uncommon in Hausa, the polarity fails to appear, e.g.

(18) naa kàràntàa ta  ‘I read it’
mun kakkàammaa su  ‘we caught each of them’
taa ragařàzzaa shi  ‘she smashed it’
sun bìnci kee ta  ‘they investigated it’

Using LTR, Leben proposed an ingenious explanation for the tonal anomaly, which went as follows: (a) Trisyllabic grade 1 and grade 4 verbs are postulated lexically as having H-L-L tone and a long final vowel. (We simplify the discussion by focusing on this class; the same rules hold for longer words.) (b) Direct object pronouns, which are specified underlingly as having polar tone, are assigned a tone opposite to that of the final syllable of the verb. (c) Then LTR applies raising the final L tone of the verb to H, thereby destroying the surface polarity, e.g.

(19) *náa kàràntàa taş → *náa kàràntàa tá → náa kàràntàa tá ‘I read it’

Polarity LTR

*sún bìnci kèe táş → *sún bìnci kèe tá → sún bìnci kèe tá ‘they investigated it’

(where ş indicates polar tone and an acute accent indicates H)

The same type of analysis, in which polarity is explicitly ordered before LTR, also accounts for the H tone pronoun objects of grade 1 and grade 4 verbs in the imperative, which are presumed by Leben to have L-L imperative tone, e.g.

(20) *kàamàa suş → *kàamàa sù → kàamàa sù ‘catch them!’

Polarity LTR

*rùfèe taş → *rùfèe tá → rùfèe tá ‘close it!’

The linguistic cleverness of the analysis notwithstanding, the real explanation for the anomaly turns out to be otherwise. The simple reason why direct object pronouns of grade 1 and grade 4 verbs have H tone, thereby sometimes violating surface tone polarity, is that they are inherently H! The pronouns are invariably H, regardless of the number of syllables of the verb or the tense/aspect in which it occurs. The derivations illustrated in (19) and (20) are elegant, but unnecessary.

The realization that the direct object pronouns of grade 1 and grade 4 verbs inherently have H tone rather than polar tone immediately solves the problem of the apparent anomalies, but it of course raises the question of how to account for
the pronouns that occur in other grades. The answer here is that these other
pronouns inherently have L tone. 19 That is, rather than having a single set of
direct object pronouns with tone assigned by polarity, Hausa turns out to have
two separate object pronoun paradigms [Newman 1979b]. While it may seem
uneconomical to postulate two different pronoun sets, it is in fact quite a common
phenomenon in other West Chadic languages, where one set is usually more
closely bound to the verb stem than the other set. In these other languages, the
pronominal paradigms usually differ in vowel quality and/or length as well as
tone. Distinct direct object pronoun paradigms can be illustrated by Bole, where,
in contrast to Hausa, the use of one direct object paradigm rather than another
depends on tense/aspect, not verb class. The “strong” H tone set, which can be
compared to the grade 1 object pronouns, occurs as objects of verbs in the
perfective, while the “weak” L tone set, which is also used as possessives, occurs
as objects of verbs in the subjunctive. Full paradigms are given in (21a) and
examples in context in (21b): 20

(21) a. Bole object pronoun sets

<table>
<thead>
<tr>
<th>Object set in perfective</th>
<th>Object set in subjunctive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>naa</td>
</tr>
<tr>
<td>2m</td>
<td>kaa</td>
</tr>
<tr>
<td>2f</td>
<td>shii</td>
</tr>
<tr>
<td>3m</td>
<td>nì i</td>
</tr>
<tr>
<td>3f</td>
<td>taa</td>
</tr>
<tr>
<td>1 pl</td>
<td>muu</td>
</tr>
<tr>
<td>2 pl</td>
<td>kuu</td>
</tr>
<tr>
<td>3 pl</td>
<td>suu</td>
</tr>
</tbody>
</table>

b. Examples of Bole object pronouns

'h lòddi taa wo(o)  'I asked her’ (wo(o) is a perfective marker)
'ò ni lòddée tò     'let me ask her'
(isi) basaa naa wo 'he shot me'
kadà bèsee nò      'lest he shoot me'

19 Alternatively, one might prefer to analyze these pronouns as underlyingly toneless (cf.
Pilszczikowa [1969: esp. pp. 16-19]). For purposes of contrasting them with the inherently H
tone pronouns, we shall go ahead and treat them as L.
20 Bole data are cited as found in Newman [field notes] and Lukas [1970/71-1971/72]. Schuh
[n.d.] records slightly different tone variants for the weak object pronouns, but he too has two
clearly distinct paradigms.
In Hausa, paradigmatic leveling took place with the result that the segmental
difference between the pronouns was totally lost, leaving only the tone as the
vestigial marker of the distinct sets. One should add that the difference between
the "strong" H tone and "weak" L tone paradigmatic sets still exists in present-day
Hausa in their degree of bondedness to the verb, i.e. evidence for the existence of
two sets can be found synchronically as well as comparatively. In its standard
form, the imperative in Hausa is characterized by a L-H tone pattern, e.g. tàashi
'get up!', cf. taashi 'to get up'; dåakàtaa 'wait!', cf. daakàtaa 'to wait' (see
discussion of right-to-left tone assignment). When followed by a direct object
pronoun, grade 1 verbs manifest this L-H pattern on the verb while the pronoun
appears with its inherent H tone e.g.

(22) kàamàa shi 'catch him!' cf. sun kàamàa shi 'they caught him'
kàrànntaa ta 'read it!' cf. naa kàrànntaa ta 'I read it'

With monoverbs and grade 2 verbs, on the other hand, the imperative tone
pattern spreads over the verb and the pronoun, the combination being treated as a
single phonological word, e.g.21

(23) jàa shi 'pull him!' cf. sun jàa shi 'they pulled him'
hàrbèe ta 'shoot her!' cf. naa hàrbèe tà 'I shot her'
sàyèe su 'buy them!' cf. mun sàyèe sù 'we bought them'
tàimàkèemu 'help us!' cf. taa tàimàkèe mò 'she helped us'

If the object pronouns in (22) and (23) were exactly the same set, as has generally
been assumed, then their behavior in imperatives should be the same, which it is
not. That is, either the L-H pattern should always apply to the verb phrase
including the pronoun, giving for example, *kàamàa-ta and sàyèe-ta, or it
should only apply to the verb, giving kàamàa ta and *sàyèe ta (or perhaps
*sàyèe tà). Note that even if one postulated the underlying tone of the imperative
to be L-L as a means of getting a polar H tone on the grade 1 object pronoun, one
would still need to assume a tighter degree of bonding between the grade 2 verb
and its pronoun object in order to prevent LTR from applying. That is, if the
pronoun direct object of grade 2 verbs were not attached, forms such as hàrbèe,

---

21In keeping with standard orthography, we shall transcribe the verbs and their pronoun objects as
separate words even though from a linguistic point of view they might better be written as single
words.
saye, taimake would all end in L-L with a word-final long vowel and thus would automatically have undergone tone raising.

As if the above comparative and structural evidence were not enough, there is also direct evidence in present-day Hausa of object pronouns with intrinsic H tone rather than the presumed polar tone. Direct objects of grade 5 verbs in Hausa (the H-H -r final "causative/efferential" grade) are usually expressed as obliques introduced by the particle da, e.g. yaa kooyar da dali bai/suu 'he taught the students/them' (< koyooy a 'learn'); sun hawar da yaarinyaa/ita a kan keek 'they put the girl/her on the bicycle' (< hau 'mount'). In such cases, the pronouns used are independent/disjunctive forms. Some grade 5 verbs also have a special variant ending in -shee that is used with a L tone object pronoun, e.g. yaa saishee ta = yaa saya daita 'he sold it' (< sayyaa 'buy'); taa fisshee shi = taa fid da shii 'she threw it out' (< fita 'go out'). What is important for the discussion here is that there is a third, less well known, possibility with grade 5 verbs, namely the use of a H tone pronoun immediately following the all H tone verb, e.g.

\[(24) \quad \text{sun hawat ta à kân këékë} \quad \text{they put her on the bicycle'}
\]
\[
yaa waatsam mu = yaa waatsa dæ muu \quad \text{he deserted us'}
\]
\[
taa kulan ni = taa kula dæ nii \quad \text{she angered me'}
\]

The object pronouns in (24) have to be regarded as intrinsically H. If one assumed that they had polar tone underlingly, there would be no way to derive their surface form since the final tone of the verb is invariably H. It should be emphasized that although this construction is not commonplace in Standard Hausa, it is documented in the major dictionaries and is fully recognized as grammatical by native Hausa speakers. These are thus unambiguous examples of direct object pronouns that synchronically are fully specified as belonging to the H tone set.

We conclude, then, that the explanation for the tonal behavior of direct object pronouns in Hausa lies in the existence of two tonally distinct paradigms rather than in a single polar tone set with striking exceptions. Since the tone of the object pronouns of grade 1 and grade 4 is consistently H, rather than polar, the appeal to LTR to handle the apparent exceptions to the presumed polarity is now of no import.

22 The final -r (historically derived from *-s) of the grade 5 verb form normally assimilates completely to the initial consonant of the following pronoun and often to other abutting consonants as well.

23 Abdullahi Bature [personal communication], who unhesitatingly accepted the examples in (24) as fully grammatical, characterized them as "village Hausa".
2.2. Verb tone alternations. Trisyllabic grade 1 verbs manifest two different tone patterns: H-L-L (with a short final vowel) before a direct object noun and H-L-H (with a long final vowel) elsewhere, e.g.24

(25) naa kařantā littaaši 
   naa kařantaa shi 
   sun raazānā Kānde 
   Kānde suka raazānaa 
   mun dāukākā shūgābanmū 
   shūgāban dā mukā dāukākaa

'I read the book’
'I read it’
'they terrified Kande’
'it was Kande they terrified’
'we honored our leader’
'the leader whom we honored’

Leben's [1971] explanation, which was incorporated by Newman [1973] in an analysis of Hausa verb forms from a diachronic perspective, was that the underlying verb tone was H-L-L and that the observed H-L-H was due to LTR. Leben assumed that the underlying vowel was long and that there was a shortening rule before noun direct objects while Newman postulated the underlying vowel to be short;25 but in either case, once the length of the final vowel was determined, the tonal alternation in pre-noun and pre-pronoun environments automatically fell into place, assuming, that is, that LTR was valid, which doesn't seem to be the case. But if one rejects LTR, how does one account for the alternations that LTR seemed to handle in such a simple and elegant fashion?

The key element in motivating the search for an alternative analysis is the recognition that the above analysis, in which LTR is central, is itself not without a serious flaw. All grade 1 verbs (as well as all secondary verb grades) form

24Grade 4 verbs have two variants. One variant behaves exactly like grade 1, the other does not. To simplify the exposition here, we shall limit our discussion to grade 1.

25The idea presented in Newman [1973] that the final vowel of the verb was underlyingly short, contrary to the received viewpoint regarding Hausa verbs, was based primarily on two observations. First was the comparative evidence from other Chadic languages that the pre-noun form of verbs often constituted the underlying form, and second was the synchronic fact that a number of verb classes in Hausa (such as -00 final grade 6 verbs) do not in fact shorten the vowel before a direct object noun while all verbs without exception have a long final vowel (i.e. undergo lengthening) before a pronoun direct object. (See Leben & Bagari [1975] for a subsequent (and generally unconvincing) attempt to resurrect the idea of an underlying long vowel with pre-noun shortening.) Further evidence of pre-pronoun lengthening as a general process in Hausa is provided by the "verboid" ungo ‘take (it)’, which, although this has seldom been noted, can take an object pronoun, in which the final vowel is lengthened, e.g. ungoo tā ‘take it (f)’, ungoo shī ‘take it (m)’, etc. Here one should also mention the fact that nouns with short final vowels undergo lengthening when possessive pronouns are attached. (This lengthening usually doesn't surface because it is overridden by a later rule that automatically shortens vowels in closed syllables!) For example, gwədō ‘blanket’, gwəddō-naa ‘my blanket’; āku ‘parrot’, ākuu-nai ‘his parrot’ [NW dialect] (= Standard Hausa ākunsā).
"weak verbal nouns" (which often translate as English present participles or gerunds) with a suffix ~waa (with L-H tone). Consider the following verb stems, as postulated by Leben, with the occurring present participial forms:

(26) *kaamàa 'catch' kaamàawaa 'catching'
    *dafàa 'cook' dafàawaa 'cooking'
    *kařàntàa 'read' kařàntàawaa (< kařàntaa + ~waa) 'reading'
    *raazànàa 'terrify' raazànàawaa (< raazànaa + ~waa) 'frightening'

Note that the final vowel of the trisyllabic verbs has a H tone preceding ~waa. Leben [1971:210] accounts for this by postulating a word boundary between the verb and ~waa, which allows him to get the occurring verb-final H tone by means of LTR, e.g. (Leben’s schematicization):

(27) kařàntàa# ~waa → kařàntaa# ~waa → kařàntaa#waa

   LTR               Tone Incorporation

The problem here is that there is absolutely no justification within Hausa for the postulated word boundary rather than the fact that Leben needs it to make his rules work. One can of course invent ad hoc boundaries, but given any normal understanding of what we mean by words, suffixes, etc. it is clear to native Hausa speakers as well as to linguists working on the language that ~waa in Hausa is a bound suffix that is lexically fused to the word to which it is attached. This being the case, given an input such as *kařàntaa~waa, the conditions for LTR are not met, the L-L not being word final, and thus the syllable /tàa/ should not raise. It should be emphasized that for tone raising to take place, LTR requires that the L-L lv sequence be word final. There are many L-L lv sequences within a word followed by a morpheme boundary, which one can illustrate clearly by citing compounds, e.g. riğàa-kafi ‘prevention’ (lit. ‘precede protective charm’), fàadàa-wuta ‘moth’ (lit. ‘fall into fire’), or dan kòomàa-baaya ‘reactionary’ (lit. ‘one who returns behind’). Thus LTR turns out to be completely irrelevant in one of the major alternations that was supposed to justify its existence. Even if LTR existed, it would be inapplicable in this case.

The most likely reason why trisyllabic verbs have a H tone before ~waa is that the final vowel is lexically H, contrary to the earlier assumptions of both Leben and Newman. Leben [1971] needed to have these verbs with a final L tone in order to get H tone direct object pronouns by a polarity rule, but this we
now know is unnecessary and incorrect. Newman [1973] postulated these verbs as ending with a final L tone and a short final vowel because comparative evidence suggested that the underlying form should be equated with the actually occurring pre-direct object noun form and because synchronic evidence indicated that there was no automatic vowel shortening rule before noun direct objects. But in this analysis the tone of commonly occurring trisyllabic stems with -\textit{waa} was also left unexplained. If, on the other hand, one takes H-L-H with a short final vowel as the underlying canonical shape for grade 1 trisyllabic verbs, then everything falls into place. Before pronoun objects, the final H tone vowel lengthens, as is fully regular before pronoun objects. No tone raising is needed. When -\textit{waa} is suffixed to a verb, it too is added to a syllable that is already H. The vowel length, which has always been ascribed to the verb, is really part of the suffix. Like the floating tone, the length attaches to the preceding vowel, but morphologically it belongs to the suffix, i.e. the suffix should really be represented as -\textit{waa}, e.g.

\begin{align*}
(28) & \quad *\text{karanta} + -\text{waa} \rightarrow \text{karantåawaa} \quad \text{‘reading’} \\
& \quad *\text{raazåna} + -\text{waa} \rightarrow \text{raazånåawaa} \quad \text{‘terrifying’} \\
& \quad \text{yaa} *\text{karanta} \text{ shi} \rightarrow \text{yaa kařåntaa shi} \quad \text{‘he read it’} \\
& \quad \text{sun} *\text{raazåna} \text{ ta} \rightarrow \text{sun raazånåna ta} \quad \text{‘they terrified her’}
\end{align*}

It follows necessarily that the H-L-L verb pattern before noun direct objects must be due to a tone change. While all the details are not certain, the tone change would seem to represent weakening of an unstressed light syllable. (It should be

---

\textsuperscript{27}This abstract underlying form never surfaces as such—either the final vowel will be lengthened or the final tone will drop. But this degree of abstractness was also true of Leben’s underlying verb form, which was postulated with a non-occurring long final vowel with final L-L tone. The suggestion that trisyllabic grade 1 verbs are underlyingly H-L-H with a short final vowel—a radical proposal that Jaggar does not support—comes out of a new model of the Hausa verbal system being developed by Newman. Elements of this system were presented at a Hausafest held at Stanford University in December, 1989.)

\textsuperscript{28}Historically the length with the L tone represents a lost vowel, i.e. the original form of the suffix was not -CV but -VCV. If the suffix is added to a grade 5 verb form ending in a consonant, e.g. \textit{kooydalwaa} ‘teaching’, or a grade 7 verb ending in -u, e.g. \textit{taaruwaa} ‘meeting’, the length cannot be attached and is dropped. (Hausa does not have long /\textit{u/} before /\textit{w/} nor long /\textit{i/} before /\textit{j/}.) If the syllable preceding the suffix is light, as in the case of u-final verbs where the /\textit{u/} does not lengthen, the tone cannot be attached and is dropped since Hausa does not allow contour tones on light syllables. An alternative explanation for the lack of a long /\textit{uu/} and falling tone in grade 7 forms such as \textit{taaruwaa} has been proposed by Gouffe [1982]. According to his analysis, \textit{taaruwaa} (and other such forms) does not contain the suffix -\textit{waa}, as has always been thought, but rather contains a verbal noun suffix -\textit{aa} (the same used with grade 3 verbs), which is connected to the grade 7 stem by means of an epenthetic glide /\textit{w/}, i.e. \textit{taaruwaa} < \textit{taaru-w-aa}. Synchronously there seems no way to choose between Gouffe’s analysis and the more traditional one; ultimately one would hope that historical/comparative data would provide a clear answer.
Low Tone Raising in Hausa

pointed out that H-L-H words with a short final vowel are extremely uncommon in Hausa.) For example,

(29) *kařànta littaafi 

sun *raazàna Kànde → sun raazànà Kànde

‘he read the book’
‘they terrified Kande’

In short, there is nothing in the Hausa verbal system that requires or justifies LTR as a synchronic rule!

2.3. Pre-genitive vowel insertion. While most Hausa words end in a vowel, the language does have a small number of consonant-final words, mostly loanwords from Arabic and English or French. In genitive constructions, where a linker, -n (masculine and plural) or -t and (feminine), is required, the linker is connected to preceding consonant-final nouns either by use of a deictic particle (di in Nigeria, ki in Niger) or by means of a postthetic vowel -ii (in a few cases -uu), e.g. kànnànzìř ‘kerosene’, kànnànzìř di-ŋ zaamànnì ‘modern-day kerosene’ (lit. ‘kerosene of modern time’); bàabùř ‘motorcycle’, bàabùři-ŋnaa = bàabùř di-ii-ŋnaa ‘my motorcycle’; lààdànnì ‘muezzin’, lààdaanì-nnì ‘our muezzin’. The matter of LTR arises in the context of consonant-final nouns with H-L tone such as teebùř ‘table’ or ooﬁ’s ‘office’. With nouns of this shape, the vowel inserted before the genitive linker has H tone as opposed to the previous examples where the tone was L, e.g. teebùři-ŋnaa ‘my table’, ooﬁshi-nsà ‘his office’, kaamùsù-ŋ laařabcìi ‘an Arabic dictionary’. Leben’s [1971:206ff; 1978:207ff] explanation is that underlingly the postthetic vowel is the same in all cases, namely toneless, its tonal specification being provided by spreading from the immediately preceding tone. According to this analysis, the H tone -ii that one sees, for example, in teebùři is a surface phenomenon that results automatically from LTR. Shortening of the postthetic -ii in closed syllables is understood to be a late rule that applies after LTR. The following illustrates the presumed derivation:

(30) teebùř# n → teebùřzi# n → teebùřzi-ŋ (e.g. teebùřziinaa) LTR

ooﬁs# n → ooﬁshi# i# n → ooﬁshi-ii-ŋ (e.g. ooﬁshinsà) LTR

Kaamùs # n → Kaamùsù # n → Kaamùsù-ŋ (e.g. kaamùsun laařabcìi) LTR

One objection that could be raised against this analysis is that it requires that one postulate a word boundary between nouns and the genitive linker, which seems counterintuitive. But, even if one were to accept this claim for the sake of discussion, the analysis doesn't work. The fact is that all vowels in Hausa are
long (either inherently long or lengthened) before the linker (cf. Schuh [1977:74]). This statement, being exceptionless, necessarily also applies to nouns that lexically end in L-L and have a short final vowel. If the analysis presented above were correct, such L-L words would meet the condition for LTR and would automatically raise the final tone in the genitive to H. This they do not do, e.g.

(31) gwàddò # n → gwàddò # n → *gwàddoo-n (cf. gwàddonaa 'my blanket')
àkwàatì # n → àkwàatì i# n → *àkwàatii-n (cf. àkwàatì n karfèe 'metal box')
fuřsùnà # n → fuřsùnàa # n → *fuřsùnaa-n (cf. fuřsùnànmù 'our prisoner')

The examples in (31) demonstrate conclusively that the derivations presented in (30) are invalid and cannot qualify as evidence in support of LTR. How then does one account for the difference in tone of the final -u in laadaanU 'muezzin’, for example, as opposed to teebùrii ‘table’? One possibility is that the -ii is not an independent suffix, but rather an optional anaptyctic attachment to these words, whose tone pattern is inherently L-H-L or H-L-(H). In support of this one should note (a) that these words can in fact be pronounced with the final vowel in isolation, e.g. làadan = làadaanì i and (b) that trisyllabic loanwords ending in /iil/ (especially Arabic loanwords) most commonly appear with L-H-L or H-L-H tone patterns. Alternatively, one could view the final -ii as an inherently H suffixal vowel, which, however, has its tone pre-empted by the final tone of the stem when it forms the third syllable of a L-H-L word, e.g.

(32) teebùri + -ii → teebùrii /teebùrii/
      H  L  H        H  L  H

laadaan + -ii → laadaan-ii /làadaanì i/
     L  H  L  H   L  H  L  H

It is not clear at this point which analysis is preferable, but both are straightforward and reasonable and fully consonant with the way Hausa normally works.

2.4. Feminines. Many masculine nouns and adjectives with a final vowel other than /a(a)/ have corresponding feminine forms with final -iyaa or -uwaa. The
suffix is L-H if the masculine has H-L tone, H-H if the masculine form is H-H, e.g.

(33)  

<table>
<thead>
<tr>
<th>Masculine</th>
<th>Feminine</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>shuudi</td>
<td>fem. shuudi'ya</td>
<td>'blue'</td>
</tr>
<tr>
<td>sheegèe</td>
<td>fem. sheegè'ya</td>
<td>'bastard'</td>
</tr>
<tr>
<td>gurgùu</td>
<td>fem. gurgùu'aa</td>
<td>'lame person'</td>
</tr>
<tr>
<td>beebee</td>
<td>fem. beebee'ya</td>
<td>'deaf mute'</td>
</tr>
<tr>
<td>doogoo</td>
<td>fem. doogoo'aa</td>
<td>'tall'</td>
</tr>
</tbody>
</table>

Leben explains the tonal alternation in the feminine forms by positing a single feminine suffix -aa which is attached to and copies the tone of the final vowel of the masculine stem. After vocalic adjustments and glide formation, the details of which do not concern us here, final L-L suffixes (the final vowel being long) are assumed to undergo LTR, thereby producing the observed L-H suffixal tone variants. (To simplify the discussion, we shall illustrate the -iyaa variant only and leave -uwaa aside.) For example,

(34)  

(35)  

<table>
<thead>
<tr>
<th>Masculine</th>
<th>Feminine</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>agóolà / agooli'ya</td>
<td></td>
<td>'step-child'</td>
</tr>
<tr>
<td>bàfaadàa / bàfaadi'ya</td>
<td></td>
<td>'councillor'</td>
</tr>
<tr>
<td>buulaalàa = buulaali'ya</td>
<td></td>
<td>'shingles'</td>
</tr>
<tr>
<td>gàuraakàa / gàuraaki'ya</td>
<td></td>
<td>'crownbird'</td>
</tr>
</tbody>
</table>

In Newman [1979a], it was demonstrated that this analysis could be extended historically to account for the form of the many "feminatives" in Hausa, i.e. nouns that are inherently feminine in form, although not deriving synchronically from masculine counterparts, e.g. tsamiyaa 'tamarind' (< *tsaame), zuuki'ya 'heart' (< *zuki). The question is whether the derivational process represented in (34), which recapitulates the historical development, is still valid synchronically. There is evidence to suggest that the form -iyaa, with the glide and a fully specified L-H tone, is becoming (or has become) morphologized into a distinct suffix (see Newman [1979a:213-214]). Consider the following masculine/feminine pairs which cannot be generated simply by adding a suffix -aa and following the derivational sequence postulated in (34):

In Newman [1979a], it was demonstrated that this analysis could be extended historically to account for the form of the many "feminatives" in Hausa, i.e. nouns that are inherently feminine in form, although not deriving synchronically from masculine counterparts, e.g. tsamiyaa 'tamarind' (< *tsaame), zuuki'ya 'heart' (< *zuki). The question is whether the derivational process represented in (34), which recapitulates the historical development, is still valid synchronically. There is evidence to suggest that the form -iyaa, with the glide and a fully specified L-H tone, is becoming (or has become) morphologized into a distinct suffix (see Newman [1979a:213-214]). Consider the following masculine/feminine pairs which cannot be generated simply by adding a suffix -aa and following the derivational sequence postulated in (34):
The feminine nouns in (35a) cannot be formed from the corresponding masculine stems by adding -aa because there is no motivation for the glide. At an earlier period in the history of Hausa, such words must have been epicene, as is still the case with common words such as sa’aa ‘age-mate (male or female)’, jii+kà ‘grandchild (male or female)’. Forms such as jàkaadìyaa or agooliyaa thus appear to be relatively recent innovations using the new feminine suffix -lyaa. Similarly, the feminine nouns in (35b) can’t be derived by adding -aa because the tone is wrong. Leben [1971:215] provides an ingenious explanation for pairs such as åbookìi / åbookìyaa by postulating an underlying L-H tone sequence on the final syllable of the masculine form on which a variety of tone rules were then assumed to operate.29 A much simpler and more direct answer is that åbookìyaa, like the other forms cited, is a historically recent creation30 making use of the now productively available -iyaa suffix. The explanation for the alternation is thus morphological/lexical not phonological.

Given the emergence of -iyaa as a distinct, phonologically fixed morpheme, it is only natural that synchronically generated feminine forms, such as those in (35), should be morphologically reanalyzed as employing this suffix. Thus, while LTR is of essential importance in our linguistic understanding of feminine formations, it is not the case that these feminine derivational and inflectional patterns can be taken as evidence to support the assertion that LTR is still a synchronically active rule.

---

29It is unfortunate that Leben illustrated his analysis with the incorrect pair beebeel/*beebìyaa ‘deaf mute’ (an error presumably repeated from Abraham’s Dictionary). The word beebyyaa in fact has all Hi tones and is a straightforward feminine formative.

30Originally the stem åbookìi (with the now frozen suffix -kìi) could only be used for ‘male friend’. ‘Female friend’ would have been expressed by a form such as åbuuyaa or by a different root entirely.
3. Conclusion

Phonotactic restrictions can almost always be rephrased in terms of phonological process rules. Based on the general restriction in Hausa against words ending in L-L with a long final vowel, Leben [1971] proposed a process rule (LTR) whereby the final vowel of words presumed to have that shape in underlying and/or intermediate structure would be raised to H. This rule was then called upon to account for various morphophonemic tonal alternations that occur in Hausa. In this paper we have shown that LTR cannot be accepted as an essentially exceptionless P-rule, as it has been presented, since there are actually large numbers of words of varying types that manifest final L-L with a long final vowel. Some of the counterexamples might be considered more significant than others, but taken as a whole they demonstrate conclusively that LTR does not function as a synchronically active, productive tone rule in Hausa.

We have also analyzed some of the morphotonological alternations discussed by Leben and have shown that better, internally consistent explanations were available without recourse to LTR. For example, we demonstrated that the differing surface tones of direct object pronouns in Hausa came directly from two distinct paradigmatic tone sets (a “strong” H tone set and a “weak” L tone set) rather than from a single set of pronouns with polar tone that required complex tonal manipulation, and that the derivation of feminine forms were derived from a tonally specified suffix -iyyaa rather than from a toneless suffix -aa plus sequences of rules that recapitulated the historical development.

As a concept that has forced us to look at tonal restrictions and alternations in a new light, LTR has played a valuable role over the past two decades in Hausa linguistic studies, both synchronic and diachronic. Nevertheless, as the facts have shown, LTR can no longer be accepted as a synchronically functioning rule in Hausa on a par with the truly operative P-rules in the language.

REFERENCES


THE REALITY OF HAUSA "LOW TONE RAISING":
A Response to Newman & Jaggar*

Russell G. Schuh
UCLA

Paul Newman and Philip Jaggar in an article in this issue of Studies in African Linguistics argue that a rule of Low Tone Raising (LTR), proposed in Leben [1971] is not a synchronic rule in Hausa. This rule, as originally formulated in Leben [1971], raises a final low tone (L) of a word if the syllable bearing the L (1) follows a L and (2) has a long vowel.

Newman & Jaggar's method of argumentation is, first, to show eight types of phonetic violations of LTR (§§1.1-8). Next (§§2.1-4), they show that four putative cases of LTR as a productive synchronic rule are problematic and/or have other, better explanations. They conclude that LTR is not "a synchronically viable rule on the same level as other regular rules in the language, such as the shortening of long vowels in closed syllables or the simplification of LH on a single syllable to H" (p. 229). While Newman & Jaggar argue only that LTR is not a "synchronically viable rule", the force of their paper, with its listing of many "counterexamples" to LTR, is to suggest that LTR has no reality at all in modern Hausa. I agree with them that LTR is not a rule; indeed, contrary to their assumption (first paragraph of §2), I would claim that it never has been a rule. The question which I wish to raise is whether there is any synchronic (and/or historical) reality to the phenomenon which originally attracted Leben's attention, viz. "Much checking with informants and with sources that mark a long-short distinction on final low-toned vowels...reveals no word in Hausa which ends in two low-toned syllables, the last of which contains a long vowel" [Leben 1971:202]. Newman & Jaggar's answer is that this "generalization" is the residue of a rule which is no longer productive, as shown by a multitude of surface violations. My answer is that this is a valid generalization about Hausa phonology, and if we are precise in our formulation of LTR, there may be no violations at all. The value of Newman & Jaggar's paper is to provide a clear and

---

* I would like to thank Will Leben and Paul Newman for comments on a draft of this reply. In particular, I credit Leben for the basic idea of English stress and vowel reduction being a possible factor in accounting for the apparently anomalous tones of borrowed words like fitama'mattee 'primary'.
explicit array of new data which will allow us to reformulate LTR more precisely and, as a consequence, to arrive at a better understanding of a number of aspects of Hausa phonology.

I will first take up Newman & Jaggar's arguments in §2 that LTR is not a productive rule in modern Hausa. The examples in §§2.1-2 involve the verbal system. Newman & Jaggar propose plausible alternative accounts to all the cases that have been cited as requiring LTR. While I do not concur in all the details of their analysis, I do agree that LTR probably does not now, nor has it ever played a role in the verbal system. (My own preference is to account for verbal tones with lexical tonal templates, using no phonological “rules”, per se.)

In §§2.3-4, Newman & Jaggar discuss two putative examples of LTR in action in the nominal system. The example in §2.4 involves feminative forms such as shuudiiyaa ‘blue (f)’ < shuudii (m) + aa. On the analysis in Leben [1971], the aa which marks feminine is toneless, copies the preceding tone, then is raised by LTR (the y seen in the feminine form is epenthetic). Newman & Jaggar argue against such forms being active examples of LTR, pointing out that in modern Hausa, this method of forming feminines is no longer productive. In modern Hausa, feminatives are formed by the addition of a suffix -iiyaa, with the full prosodic and melodic shape pre-specified. Their claims about modern Hausa feminative formation are probably correct, but these claims say nothing about whether or not LTR is a productive synchronic rule. They simply show that modern Hausa feminative formation calls on no phonological rules at all.

The most likely candidate for productive operation of LTR in modern Hausa is in §2.3. This involves the H observed on the postthetic vowel of words like teebii ‘table’ < teebiir. Leben [1971] proposed that the postthetic vowel was toneless, copied its tone from the preceding syllable, and was raised by LTR. Newman & Jaggar point out problems for this analysis and propose two plausible alternatives not using LTR to account for the tone on -ii. Even without accepting their solutions, the clear conclusion is that this one equivocal case of LTR is not sufficient to justify insisting that it is a productive phonological rule.

Before looking at Newman & Jaggar's counterexamples, consider their claim (§2) that LTR was a productive phonological rule in the past. Surely the "counterexamples" would be as problematic for such a claim as they would be for the claim that LTR functions as a rule in modern Hausa. Are we to assume that all the forms which serve as counterexamples to LTR developed after LTR ceased to be a productive rule?! This defies credibility, which suggests (1) that either Newman & Jaggar's "counterexamples" are not relevant to LTR and/or (2) that LTR has never been an active phonological process and Leben's observation has some other explanation. I believe that both (1) and (2) are right.

Let us now consider Newman & Jaggar's counterexamples. I will suggest that at most they show that Leben did not refine his generalization enough, and in some cases it is Newman & Jaggar who have disregarded generalizations.
Section 1.1 discusses verbal forms. Since I concur with Newman & Jaggar that verbal tones are not in the domain of LTR, putative violations of LTR in the verbal system could be ignored as irrelevant. However, there are a couple of points worth considering. The section contains two kinds of cases. The first involves a small class of four transitive verbs which always end in a long -aa. These verbs have H H tones in finite verbal constructions and usually have the canonical L H pattern in the imperative, but some speakers allow L L imperatives before nominal objects, e.g. *nna kira ‘I called’, kira ‘call!’, but also kira yaraa ‘call the children!’. One possible explanation of the L L prenominal forms is historical. At least some of these verbs are contracted from originally trisyllabic Grade I verbs (H L H verbs ending in -aa), e.g. kira ‘call’ < *kirayaa (cf. the still existent Grade II form kiraayaa and the Grade VI form kiraawoo ‘call hither’). The L H pattern of the contracted syllables automatically becomes H by a regular tonal rule. The L L imperative pattern seen in kirayaa yaraa ‘call the children!’ would be historically derived from a trisyllabic verb bearing the normal Grade I imperative pattern of all L and a final short vowel before noun objects, i.e. *kirayaa yaraa (cf. kàrantaa litaaaffi ‘read the book!’ < kaàntaa). The L H imperative pattern on the modern disyllabic would be an analogical reformation on the canonical L H imperative pattern for verbs other than Grade I (and IV).

There is another, purely synchronic account. Four classes of verbs are lexically monotonal. These are monosyllabic verbs, the H H final -aa verbs under discussion here, Grade VI verbs (a derived pattern bearing all high tones and final -oo meaning, roughly, “action hither”), and Grade V verbs (so-called “causatives”). For the latter three classes, a single H would be multiply associated with the syllables of the verb, e.g.

\[
\begin{align*}
\text{H} & \quad \text{H} \\
\text{shaa} \ ‘\text{drink’} & \quad \text{H} \\
\text{kira} \ ‘\text{call’} & \quad \text{tambayoo} \ ‘\text{ask (and come)’} \\
\text{H} & \quad \text{shiga} \ ‘\text{put in’}
\end{align*}
\]

For all but two classes of verbs (Grades I and IV), the imperative replaces the lexical tones of a verb by a L H template associated right to left, e.g. Grade VI tambayoo làaabaaafi ‘ask the news (and come with the information)!’ (< tambayoo). This is the pattern of the “standard” imperative kira yaraa ‘call the children!’ (< kira). However, H H final -aa verbs have a somewhat ambiguous position in the verbal system. Though they represent a unified class, it is a tiny class, and a class, moreover, which shares two features with Grade I verbs such as kaàntaa ‘read’, viz. an initial H tone and the final vowel -aa. Grade I verbs before noun objects do not have the L H imperative template, but rather a multiply associated L. I would argue that because of the resemblance to Grade I verbs, speakers who use the all L pattern with verbs like kira ‘call’ are using the L template of Grade I imperatives rather than the L H template, i.e.
The L pattern on *kiraa* would thus not be a violation of LTR because LTR applies only in the sequence L L.

The other case discussed in §1.1 is that of verbs before nominal indirect objects. The standard descriptions state that Hausa verbs before indirect objects end in H with a long vowel. However, Newman & Jaggar report that for many speakers, verbs can take all L with a final long vowel before nominal indirect objects, e.g. *kârânţâa wâ Saani littaafi n!* ‘read the book to Sani!’ (cf. “standard” *kârânţaa wâ...*). They note (footnote 5) that many Hausaists have interpreted the nominal indirect object marker, wâ, as a clitic. If wâ is a clitic, then it is the final syllable of the word, and since it bears a short vowel, the all-L imperative form would not violate LTR. However, there would then be no explanation for the “standard” form with H on the final syllable of the verb stem. They conclude that “the pre-i.o. verb forms thus constitute an embarrassment to LTR whichever way one decides to analyze the degree of bonding between the verb and the i.o. marker.” I do not see the “embarrassment”. As Newman [1991] himself notes in extenso, the grammatical status of the wâ indirect object marker is in flux, some speakers treating it as a verbal clitic, others as a separate preposition. The variation in verb tone here can be interpreted as an aspect of that variation. What Newman & Jaggar do not stress is that the imperative tone variation takes place only before nominal indirect objects. It does not take place before pronominal indirect objects (*kârânţaa musù ‘read to them!’*, not *kârânţaa musû*) nor before pronoun direct objects (*kârânţaa shî ‘read it!’*, not *kârânţaa shî*), the two other environments where verbs end in long vowels, nor is the final L tone vowel of an imperative before nominal direct objects ever long (*kârânţâa littaafi n* ‘read the book!’*, not *kârânţaa littaafi n*). In all these cases, the verb is uncontroversially a separate word from its complement. It cannot be accidental that in just the environment preceding a particle known to be fluctuating in grammatical status between clitic and preposition, verbs show the fluctuating tones!

In §§1.2-5, Newman & Jaggar discuss categories which they call “(plurals of) augmentative adjectives” (*fankamaa-fânkâmâa* ‘broad’), “ideophonic adjectives” (*baloo-bâllo* ‘large and round’), “ideophonic adverbs” (*dâgaajee-dâgaâjêe* ‘in a bad condition’), and “ideophonic action nouns” (*wuķi-wûktî* ‘looking ashamed’). As the terms imply, each of these categories has syntactic properties which justify distinct lexical classifications. However, these categories are identical in one crucial respect, viz. they all have the following phonological structure:

\[
\begin{array}{c}
| H \ L \\
| | \\
\end{array} \\
\quad X - X \quad \text{where } X \text{ is a morpheme of two or more syllables}
\]
Leben [1971:note 2] already pointed out that the synonymous reduplicated interro­gatives **yàayàa?** and **kàakàa?** ‘how?’ did not conform to LTR. One could therefore stipulate for LTR that it does not apply to the second constituent of a reduplicated form. There is, however, a phonologically based account. Newman [1989:§§4.2.1-2] suggests an analysis which is identical, except for notation, to that just above. Thus, the “augmentative adjective” would have the structure

\[ H \quad L \]

\[ fànkàmàa-fànkàmàa \]

In Hausa, there are two ways that tones become associated lexically: (1) templates which provide a single tone pattern to be associated by algorithm over any number of syllables and (2) prespecification of a particular syllable with particular tones. The first type of association governs verb forms, all derived nominal forms, all productive nominal plurals (as well as most lexically restricted plurals), and some other forms. These categories have tonal templates that associate with the segmental melody regardless of the number of syllables and, for derived forms, regardless of the lexical tones of the base. For example, the “-uCa” plural has a tonal template H L associated right to left regardless of the segmental melody or the tones of the singular, e.g. **raakumàa** ‘camels’ (< singular **ràakumìi**). 

In Hausa, there are two ways that tones become associated lexically: (1) templates which provide a single tone pattern to be associated by algorithm over any number of syllables and (2) prespecification of a particular syllable with particular tones. The first type of association governs verb forms, all derived nominal forms, all productive nominal plurals (as well as most lexically restricted plurals), and some other forms. These categories have tonal templates that associate with the segmental melody regardless of the number of syllables and, for derived forms, regardless of the lexical tones of the base. For example, the “-uCa” plural has a tonal template H L associated right to left regardless of the segmental melody or the tones of the singular, e.g. **raakumàa** ‘camels’ (< singular **ràakumìi**). 

In Hausa, there are two ways that tones become associated lexically: (1) templates which provide a single tone pattern to be associated by algorithm over any number of syllables and (2) prespecification of a particular syllable with particular tones. The first type of association governs verb forms, all derived nominal forms, all productive nominal plurals (as well as most lexically restricted plurals), and some other forms. These categories have tonal templates that associate with the segmental melody regardless of the number of syllables and, for derived forms, regardless of the lexical tones of the base. For example, the “-uCa” plural has a tonal template H L associated right to left regardless of the segmental melody or the tones of the singular, e.g. **raakumàa** ‘camels’ (< singular **ràakumìi**). 

In Hausa, there are two ways that tones become associated lexically: (1) templates which provide a single tone pattern to be associated by algorithm over any number of syllables and (2) prespecification of a particular syllable with particular tones. The first type of association governs verb forms, all derived nominal forms, all productive nominal plurals (as well as most lexically restricted plurals), and some other forms. These categories have tonal templates that associate with the segmental melody regardless of the number of syllables and, for derived forms, regardless of the lexical tones of the base. For example, the “-uCa” plural has a tonal template H L associated right to left regardless of the segmental melody or the tones of the singular, e.g. **raakumàa** ‘camels’ (< singular **ràakumìi**). 

In Hausa, there are two ways that tones become associated lexically: (1) templates which provide a single tone pattern to be associated by algorithm over any number of syllables and (2) prespecification of a particular syllable with particular tones. The first type of association governs verb forms, all derived nominal forms, all productive nominal plurals (as well as most lexically restricted plurals), and some other forms. These categories have tonal templates that associate with the segmental melody regardless of the number of syllables and, for derived forms, regardless of the lexical tones of the base. For example, the “-uCa” plural has a tonal template H L associated right to left regardless of the segmental melody or the tones of the singular, e.g. **raakumàa** ‘camels’ (< singular **ràakumìi**). 

In Hausa, there are two ways that tones become associated lexically: (1) templates which provide a single tone pattern to be associated by algorithm over any number of syllables and (2) prespecification of a particular syllable with particular tones. The first type of association governs verb forms, all derived nominal forms, all productive nominal plurals (as well as most lexically restricted plurals), and some other forms. These categories have tonal templates that associate with the segmental melody regardless of the number of syllables and, for derived forms, regardless of the lexical tones of the base. For example, the “-uCa” plural has a tonal template H L associated right to left regardless of the segmental melody or the tones of the singular, e.g. **raakumàa** ‘camels’ (< singular **ràakumìi**). 

In Hausa, there are two ways that tones become associated lexically: (1) templates which provide a single tone pattern to be associated by algorithm over any number of syllables and (2) prespecification of a particular syllable with particular tones. The first type of association governs verb forms, all derived nominal forms, all productive nominal plurals (as well as most lexically restricted plurals), and some other forms. These categories have tonal templates that associate with the segmental melody regardless of the number of syllables and, for derived forms, regardless of the lexical tones of the base. For example, the “-uCa” plural has a tonal template H L associated right to left regardless of the segmental melody or the tones of the singular, e.g. **raakumàa** ‘camels’ (< singular **ràakumìi**). 

In Hausa, there are two ways that tones become associated lexically: (1) templates which provide a single tone pattern to be associated by algorithm over any number of syllables and (2) prespecification of a particular syllable with particular tones. The first type of association governs verb forms, all derived nominal forms, all productive nominal plurals (as well as most lexically restricted plurals), and some other forms. These categories have tonal templates that associate with the segmental melody regardless of the number of syllables and, for derived forms, regardless of the lexical tones of the base. For example, the “-uCa” plural has a tonal template H L associated right to left regardless of the segmental melody or the tones of the singular, e.g. **raakumàa** ‘camels’ (< singular **ràakumìi**).
by specifying that LTR applies only to singly associated tones. (If, as assumed here, the final tone of multi-tonal verbal templates are always singly associated, LTR would also take care of verbal tones. Leben [1985], however, argues for left to right association, with multiple association of the final tone.)

In §1.6 Newman & Jaggar present recent loanwords such as *fii*aamârêe ‘primary’ as counterexamples to LTR. These words do constitute an indisputable violation of LTR which cannot be accounted for by a generalization about lexical category or derivation. However, they raise issues, worthy of further investigation, related to the phonological adaptation of loanwords in Hausa. In their example (11) Newman & Jaggar give only six words that are problematic for LTR, and these are, in fact, the only six such words that I have been able to find in looking through Hausa Language Board [n.d.], supplemented with a number of borrowed items from other sources. Five of these words have a common feature, viz. the material represented by the last two syllables of the Hausa words has been reduced to a single syllable in British English, which would be the model for Hausa pronunciation, e.g. *dispensary* [dispênsri] becomes Hausa *di*sfansârêe. The sixth word, *àsambôlêe* < *assembly*, has a single syllable corresponding to two Hausa syllables in all English dialects (this is also the case with *feelôwêe* ‘railway’, cited in (12)). In other words, the penultimate vowel in these words in Hausa is epenthetic, not the vowel seen in the English orthography! In English borrowings with two final unstressed syllables where the penultimate vowel is pronounced in all varieties of English, the Hausa rendering either obeys LTR (*kamfânii* ‘company’), has H on the penultimate syllable (*reedîyô* ‘radio’), and/or has a short final vowel (*leebûrâ* ‘laborer’). The latter two cases would not meet the structural description for LTR, of course. It may thus be the case that an epenthetic vowel does not serve as part of the environment for LTR, even where it bears L.

Another feature unites the six examples in Newman & Jaggar's item (11), viz. they all end in -ee. In §1.7, Newman & Jaggar point out that another category of counterexample to LTR comprises words originally ending in diphthongs which have monophthongized (*kâasârêe* < *kâasârâi* ‘contemptuously’). They further note that diphthongs can never have counted as long vowels for the purpose of LTR. It may be that neither diphthongs nor mid-vowels, at least mid-vowels which are not in some sort of regular alternation relation with high vowels [Newman 1979], are in the domain of LTR. In short, further research is needed to tell us whether or not some more general explanation consistent with LTR can account for the borrowed items in Newman & Jaggar's (11), but this small and equivocal set of apparent violations is not sufficient grounds to discard LTR as a true generalization in modern Hausa phonology.

In §1.8, Newman & Jaggar present their final counterexample to LTR. This involves lengthening of the final vowel of the last word of a question as a concomitant of a morpheme, q, which is the sole mark of yes/no questions and
also accompanies WH questions. (The q morpheme also carries properties which affect tones; these properties differ from dialect to dialect.) Thus, the word gwàddo ‘blanket’ is pronounced with a long final vowel at the end of a question, e.g. kun sàyi gwàddo? ‘did you (pl.) buy a blanket?’, and since the vowel is now long, it should be subject to LTR were it a productive rule. This putative counterexample is a red herring. Vowel lengthening associated with q is one of the intonational properties of questions and would thus not provide input for LTR if it were a phonological rule, much less if it were a lexical condition on tone.

Newman & Jaggar specifically address this suggestion for why q lengthening should not be subject to LTR, citing an analysis by Inkelas, Leben, & Cobler [1987] that the L component of the q morpheme “is added to the lexical tier” by a purely local process, resulting in surface neutralization of underlying H and underlying falling (= H L on one syllable) to falling. Leben [personal communication] has pointed out that “lexical tier” here does not refer to the “lexical level” as this term is used in lexical phonology. Hence, Inkelas et al.’s analysis of Hausa intonation is irrelevant to the issue of whether the question intonational phenomena of Hausa can serve as input to LTR. Moreover, in footnote 15, Newman & Jaggar themselves inadvertently demonstrate that question intonation can produce output to which a well-attested phonological rule could, but does not apply. They say, “... some speakers have a final Rise ... rather than a fall” in questions [my italics], yet in example (13), they demonstrate that Rise regularly becomes H in Hausa. Surely a Rise observed as a concomitant of question intonation is not a “counterexample” to this well-documented rule of Rise simplification! In short, there is no reason to believe that the effects of the q morpheme, applied at the phrase level, should feed entirely word-internal and local phonological phenomena such as LTR.

I believe that I have shown that Newman & Jaggar have not produced convincing counterexamples to LTR. The examples from the verbal system in §1.1 are probably irrelevant, but in any case, they are not inconsistent with LTR. The four examples in §§1.2-5 all constitute a single case which does not even meet the environment for LTR. The examples from borrowing in §1.6 raise interesting questions about tonal and syllabic adaptation when words are borrowed. While definitive answers to these questions must await further research, the examples suggest that generalizations may be available which exclude these cases from or make them consistent with a reformulated version of LTR. Lengthening as part of question formation in §1.8 is an intonational phenomenon which would not create input to LTR in any formulation.

If LTR is not a productive rule, yet is not counterexemplified in the surface phonology of Hausa, what, then, is its status? In modern Hausa, it seems that LTR is best viewed as lexical constraint on prosody. This includes both the prosody of non-verbal, non-derived items, which I have argued have their tones prespecified syllable by syllable, and the prosody of templates which apply to verbs and derived forms. Newman & Jaggar have set out to support the premise
that LTR is at most a remnant of a historical process by trying to show that it is massively violated in modern Hausa. Even accepting a few (for the moment) problematic cases as true violations, LTR (perhaps better called "Low Tone Restriction" than "Low Tone Raising") expresses an extraordinarily robust generalization about Hausa phonology—much more robust, say, than the generally accepted restriction in English against fricative clusters as syllable onsets, forcing one to list exceptions such as sphere and sthenic. In short, LTR is real in modern Hausa.

Where did LTR come from? Although Newman & Jaggar discount LTR as a modern synchronic rule, they accept the idea (§2) that historically it did operate as such. I pointed out that their "counterexamples" would pose as much of a problem for LTR having been a rule in the past as for its being a synchronic rule, inasmuch as most of the cases they cite have probably existed throughout the history of Hausa, but if LTR were reformulated so as to exclude these "counterexamples" from its domain, it could well have functioned as a rule at one time, with a lexical condition on prosody as its modern legacy. There is reason to believe, however, that the modern condition expressed by LTR has a source other than a phonological rule. Hausa has two phonological properties which make it unique, as far as I know, among its Chadic relatives. One is the existence of LTR, but the more important is the fact that the overwhelming majority of items in the nominal vocabulary end in long vowels whereas nouns longer than one syllable in other Chadic languages always end in short vowels (see Newman & Jaggar, p. 237, and references cited there). There is no question that the source of final vowel lengthening in Hausa is intimately related to the source of LTR. Newman & Jaggar point out (footnote 25, pp. 245-246, and example (31)) that the final vowels of all nouns lengthen before the genitive linkers, regardless of lexical length. (Newman & Jaggar, p. 246, cite Schuh [1977:74] for this phenomenon, but Carnochan [1951] was the first to describe it.) In "Standard" Hausa, lengthening shows up only with a first person singular possessor -aa, e.g. gwàddò ‘blanket’ but gwàddò-n-aa ‘my blanket’, because this is the only possessor which begins in a vowel (all nouns and all other pronouns are C-initial). In Western Hausa, lengthening also takes place before the third masculine possessor, e.g. gwàddò nai ‘his blanket’ (cf. "Standard" Hausa gwàddò-n-sà ‘his blanket’, where the effect of lengthening is obliterated by a rule shortening long vowels in closed syllables). In Schuh [1977:74] I claimed that lengthening before genitive linkers is a reflex of a more general rule which lengthened final vowels of nouns before all cliticized determiners. Nouns with lengthened final vowels must have at one time occurred with great frequency, though today many constructions originally expressed with determiner clitics have been replaced by analytic constructions, e.g. wannàn gwàddò ‘this blanket’, or the clitics have apocopated their final vowels, creating closed syllables with concomitant vowel shortening when they are cliticized, e.g. the Previous Reference Marker -n < *nà as in
The Reality of Hausa "Low Tone Raising"

gwàdò-n ‘the blanket’. It is the reflexes of nouns with lengthened vowels that we find today as the citation forms of nouns. Evidence that lengthening before determiners is probably the source of Hausa long vowels in nouns comes from the fact that the classes of native words which typically do not have long vowels are those which would rarely, if ever, have had determiners as modifiers, e.g. adverbs, proper names, place names, etc. On the other hand, Hausa now has many common nouns with short final vowels, such as ‘blanket’ just cited. A large proportion of these words are identifiable borrowings which have probably come into the language since the time when lengthening before determiners ceased to be a common and productive surface phenomenon.

My suggestion is that determiner clitics probably conditioned not only lengthening, but also a polarizing tone shift. Tone polarization as part of the determiner system can still be seen in the particles marking equational sentences, nee (m, pl), cee (f), themselves originally determiners, though in this case it is the determiners which polarize, not the preceding syllable, e.g. farii nèe ‘it’s white’ vs. farii nèe ‘it’s a drought’. If the scenario here is on the right track, then LTR would be the effect of the combination of pre-determiner lengthening and polarization of a L syllable to H after a L. Since modern Hausa nouns with final short vowels do not show the effects of pre-determiner lengthening in their citation forms, they obviously would not show the effects of polarization either in cases where they end in a L L sequence. The fact that tone does not polarize, even in cases where lengthening applies in modern Hausa, shows that this has been lost as part of modern Hausa pre-determiner lengthening (gwàdò ‘blanket’ → gwàdòo nai ‘his blanket’, not *gwàdòo nai).

In sum, the proposal here is that LTR has never been a phonological rule. Rather, its origin is in a morphologically conditioned process which has left its mark in a (nearly) absolute condition on the lexical prosody of words. This condition remains a valid generalization about modern Hausa.

REFERENCES


1Greenberg [1978:71-72] proposes a vocalic determiner suffix which has fused with the final vowel as the source of lengthening the final vowels of nouns in Hausa. In Schuh [1984:196-197] I suggest that this vowel was *i. However, I no longer believe this is the source of lengthening. A vocalic determiner source would account for the final long vowels of nouns as opposed to other categories, but it would not explain why short vowels are lengthened before the genitive linker.
Hausa Language Board. n.d. "Alphabetical list of words imported into Hausa." Kaduna: Northern Region Ministry of Education.


Some twenty years ago Leben proposed that Hausa had a productive, essentially exceptionless P rule ("LTR") to the effect that any word final L L sequence automatically changed to L H if the final vowel of the word was long. Since that time, LTR has become accepted as a phonological rule of Hausa alongside such well-established rules as vowel shortening in closed syllables or palatalization of coronal consonants before front vowels. The aim of our paper was to demonstrate that there are in fact far too many counterexamples to the LTR rule to continue to accept it as a fully active synchronic rule in Hausa.

In his response, Schuh contends that if one were to eliminate verbs (which were at the heart of Leben's original demonstration of the significance of LTR), allow for a more sophisticated—and probably correct—approach to tonology, in which languages could contrast singly-linked vs. multiply-linked sequences of identical surface tones, and ignore all remaining exceptions as having the wrong vowel (for whatever reason) or just generally being a nuisance, then LTR could be saved after all. Of course, if one is intent on it, one can always find ways to eliminate counterexamples to some supposed linguistic rule; but this is a scientifically peculiar way to operate. It is particularly puzzling why Schuh should want to do this since, as he openly states, "I agree with [Newman & Jaggar] that LTR is not a rule" (p. 253). Schuh does, however, raise two legitimate issues.

The first question is whether our counterexamples are really all of the same status or whether they need to be grouped into different categories, which we acknowledged was a possibility. As Schuh rightly observes, some of our "exceptions" to LTR, e.g. the reduplicative forms in §§1.2-5 may indeed be inconsistent with LTR as described by Leben in its most general form, but they do not necessarily invalidate LTR as such. One could argue that what these examples require is that LTR be reformulated rather than rejected. In other words, even if
LTR were operative, it might not be expected to apply to reduplicative words such as *fankamaa-fankamàa* 'broad (pl)' or *jinâa-ji naâa* 'bloody', which have fixed segmental, syllabic, and tonal patterns.

Some of the other "exceptions", however, are true counterexamples which undermine the validity of LTR as such (pace Schuh). The LL imperatives (§1.1), the results of monophthongization (§1.7), and the loanwords (§1.6), for example, indicate in no uncertain terms that LTR does not constitute an active, functioning tone rule in modern Hausa. (It should be emphasized that loanwords such as *fî'amârêe* 'primary school' and *êelùwêe* 'railroad' are now "true" Hausa words, fully accepted by monolingual Hausa speakers.)

Schuh's second, and perhaps more interesting, question is whether LTR ever was operative in Hausa. Because our paper was concerned exclusively with the synchronic status of LTR, we purposely avoided discussing the historical question (see our footnote 18). We did, however, implicitly endorse the idea that the phonotactic restrictions observed by Leben had resulted from the operation of LTR at an earlier period. Now that we are faced directly with the question, we would assert that this does seem to be the most likely explanation for the general absence of basic, non-derived LL long final vowel words in Hausa. Schuh proposes that the LL to LH shift was due to a morphologically conditioned tone polarization rule associated with a determiner. But in that case, why wasn't there a HH to HL change parallel to the LL to LH change? From a comparative Chadic perspective, it is not unreasonable to suggest that early Hausa might have had some kind of general determiner on nouns with tone polarizing properties. The problem here is simply that Schuh presents no evidence to indicate that this in fact was the case. Under the circumstances, the simplest and most likely explanation is that the LL to LH shift affecting words with long final vowels—what we might call "historical LTR"—was strictly phonological in nature. As evidence of an ongoing drift in Hausa away from final LL sequences, it is interesting to observe that in northwest [NW] dialects, the tendency for LL to alter into LH has extended to words with short final vowels, e.g. Standard Hausa [SH] *mâce* = [NW] *màce* 'woman'; [SH] *àkwâati* = [NW] *àkwàati* 'box'; [SH] *gaadôn-kà* = [NW] *gaadôn-ka* 'your (m) inheritance'.

In sum, we see Schuh's "response" to our paper not as a real rejoinder—he accepts our essential conclusions—but rather as an additional commentary. He adds a valuable analytical perspective on the surface counterexamples we provided, and he opens up the historical question of the cause of the general phonotactic bias in modern Hausa against words ending in LL tone and a long final vowel. We think that LTR as a formerly functioning rule is the reason for the phonotactic constraint and that Schuh's alternative hypothesis is wrong, but we agree that this is not something that one can simply accept as a given. Before a final decision is reached, the historical status of the LTR rule must be subjected to the same careful scrutiny that we provided for it synchronically.
A NOTE ON HAUSA PLURALS

Donald A. Burquest
University of Texas at Arlington

In their presentation of three-dimensional phonology, Halle and Vergnaud [1980, 1981] propose that Hausa singular nouns are morphologically complex like the plural forms, composed of a stem plus a singular suffix. This paper argues that this analysis is incorrect, but that the proposal that singular nouns are morphologically complex is not necessary to demonstrate the usefulness of an autosegmental analysis. Among the arguments presented is a claim that palatalization of coronal obstruents in Hausa is a cyclic rule, but one applying only to derived words, not stems. It is further demonstrated that Hausa makes use of rules which in parallel fashion delete syllable nuclei occurring directly preceding syllable nuclei, and syllable appendices occurring directly preceding syllable appendices. Thus, the two approaches of autosegmental phonology and lexical phonology work together to account for the facts of the Hausa nominal forms in question.

Halle and Vergnaud [1980, 1981] propose an autosegmental analysis of Hausa noun plurals in which the stem and suffix are treated as being on separate tiers, following a form of representation originally proposed in McCarthy [1979] and repeated in McCarthy [1981]. Pluralization in Hausa is relatively complex, but a number of patterns are treated insightfully within their approach. Among the types of pluralization discussed are the following (as with the Halle and Vergnaud articles, there is no attempt to treat tone here):

(1) a. \[bir\]
\[
\begin{array}{c}
\text{CVC} \\
\text{VV} \\
\text{i}
\end{array}
\]

bir +ii 'monkey'

b. \[bir\]
\[
\begin{array}{c}
\text{CVC} \\
\text{VV} \\
\text{ai}
\end{array}
\]

bir +ai 'monkeys'
In (1) an apparent case of simple suffixation in the plural is seen. The other examples are more complex (and still more complex patterns are discussed in their paper), but the principle of the analysis is clear: the stem and affixes are functioning on different tiers and are mapped independently onto the appropriate CV template. In partially reduplicated plurals like (2) and (4), potential crossing of association lines (prohibited by the Well-Formedness Condition in all of its stated forms) can be avoided by this formalism, and the generalization of copying of the final stem consonant can be neatly captured. It should be noted that in certain definable contexts (Halle and Vergnaud refer to Newman [1972] for a definition of such contexts) the final consonant is not copied, but the segment y is inserted (probably by default assignment) in the vacant C slot instead, as in (3).

The analysis is an inviting one because of its simplicity. However, it is not clear that the basic singular form is in fact a construction composed of a stem plus affix. If it is not, the configuration in the singular examples in (a) above is incorrect, and as a consequence, the configuration in the plural examples in (b) is threatened as well. Three arguments bear on the question.

First, such a singular affix as the $ii$, $oo$, and $aa$ in the (a) examples has questionable status as a morpheme because it lacks the two normal characteristics of morphemes—specifiable shape and productive meaning. Note that the shape of
the final vowel of noun singular forms is quite variable, including at least the following:

(5)  

<table>
<thead>
<tr>
<th>Vowel</th>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ii</td>
<td>daajii</td>
<td>'the bush'</td>
</tr>
<tr>
<td>ee</td>
<td>karee</td>
<td>'dog'</td>
</tr>
<tr>
<td>aa</td>
<td>daawaa</td>
<td>'guinea corn'</td>
</tr>
<tr>
<td>oo</td>
<td>bangoo</td>
<td>'wall'</td>
</tr>
<tr>
<td>uu</td>
<td>hannuu</td>
<td>'arm'</td>
</tr>
<tr>
<td>ai</td>
<td>kai</td>
<td>'head'</td>
</tr>
</tbody>
</table>

It should be noted that these particular forms represent the entire inventory of long vowels in Hausa (plus one of the two diphthongs). It may be possible to state a generalization to predict the specific final vowel of noun singulars in particular cases, but such a pattern does not immediately suggest itself. To some extent there is a generalization which can be based on gender, viz., that nouns which are grammatically feminine in gender (distinguished from so-called masculine nouns by patterns of agreement and suffixation in specific constructions) commonly end in -aa. The following can be presented as examples:

(6)  

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>kafaa</td>
<td>'foot'</td>
</tr>
<tr>
<td>kyanwaa</td>
<td>'cat'</td>
</tr>
<tr>
<td>ciyaawaa</td>
<td>'grass'</td>
</tr>
</tbody>
</table>

By contrast, masculine nouns commonly end in a vowel other than -aa (with the exception of daawaa all the examples in (5) are masculine), but examples of masculine nouns ending in the pattern -aa are not hard to find:

(7)  

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>gidaa</td>
<td>'compound'</td>
</tr>
<tr>
<td>baayaa</td>
<td>'back'</td>
</tr>
<tr>
<td>gabaa</td>
<td>'front'</td>
</tr>
<tr>
<td>d'aa</td>
<td>'son'</td>
</tr>
<tr>
<td>dawaa</td>
<td>'the bush'</td>
</tr>
</tbody>
</table>

It appears to be the case, then, that the precise nature of the final vowel of the singular form of nouns is not predictable, which means that under the Halle and Vergnaud analysis each noun will need to be specified for the singular marker with which it occurs.

But even if the singular forms could be treated as constructions of stem plus suffix, this approach is not helpful as regards the plural forms, because even though there are some predictable patterns for pluralization, to a significant ex-
tent there is apparent arbitrariness. Note the variation in the singular forms of the following sets of nouns, all of which within the same set manifest the same pattern of pluralization:

\[
(8) \quad \text{Singular} \quad \text{Plural}
\]

\begin{align*}
\text{a.} & \quad \text{jaakii} & \text{jaakunaa} & \text{‘donkey’} \\
& \quad \text{harshee} & \text{harsunaa} & \text{‘tongue’} \\
& \quad \text{riigaa} & \text{riigunaa} & \text{‘gown’} \\
& \quad \text{kwando} & \text{kwandunaa} & \text{‘basket’} \\
& \quad \text{rumbuu} & \text{rumbunaa} & \text{‘granary’} \\
\text{b.} & \quad \text{fiilii} & \text{fiilaayee} & \text{‘field’} \\
& \quad \text{wuka} & \text{wukaakee} & \text{‘knife’} \\
& \quad \text{zoomoo} & \text{zoomaayee} & \text{‘hare’} \\
& \quad \text{tsuntsuu} & \text{tsuntaayee} & \text{‘bird’}
\end{align*}

Given such variation, it is clear that the plural class of the noun must either be lexically specified in at least some instances, e.g. for (a) vs (b) in (8), or determined by a set of rules which take tone and the final vowel of the singular into account. If in addition the singular class itself must be specified lexically in any case (so as to account for the specific singular suffix it occurs with as required by the Halle and Vergnaud analysis), it can be seen that there is no gain in simplicity by separating the final vowel of the singular as a suffix. Because its precise nature must still be specified in each case, unless there is strong evidence to the contrary it might just as well be left attached and treated as part of the stem itself.

The situation is not improved even if a more liberal interpretation of the morpheme concept is proposed. For example, Aronoff [1976] cites forms such as English \textit{mit} (as in \textit{remit, commit, transmit,} etc.) and proposes that the traditional definition of a morpheme as “an arbitrary constant union of sound and meaning”

\[1\text{Russ Schuh has pointed out to me that if tone and final vowel are taken into account, prediction of the plural form is possible. However, there are a number of cases in which a given noun has alternative forms, among them the following:}

\begin{align*}
\text{abookii} & \quad \text{abookai/abookanai} & \text{‘friend’} \\
\text{akuya} & \quad \text{awaakii/awaakai} & \text{‘goat’} \\
\text{alaamaa} & \quad \text{alaamuu/alaamoomii} & \text{‘sign’} \\
\text{jaakii} & \quad \text{jaakunaa/jaakai} & \text{‘donkey’}
\end{align*}

\text{Such variations make a rule accounting for plural forms difficult, but even if one is possible, such regularities as exist are dependent upon the identity of the final vowel of the singular form, and as I am arguing, there is nothing to be gained by treating the final vowel as a suffix. As I will discuss below, there is a more insightful treatment available anyway.}
(p. 15) be modified. He points out that *mit* must be considered a morpheme, because it consistently is subject to the same phonological process in words such as *remission, commission, transmission*. Thus, even though there is no constant of meaning, there is a constant of phonological patterning, and he suggests that the definition of morpheme be broadened to recognize such phenomena.

It might be suggested that the Hausa forms cited above can be viewed in this way as well, that the final vowels of the singular forms can be considered a morpheme even though they lack consistent patterning of form and meaning. Hausa nouns, however, show nothing of the sort of phonological consistency shown by English *mit*. Further, the only phonological pattern holding among the singular forms that would allow recognition of the final vowel as being varied instances of the same unit is that the "singular morpheme" proposed by Halle and Vergnaud is associated with a VV portion of the CV template, i.e. it is a long vowel. However, it seems unlikely that the major class features distinguishing C and V would serve in any language as a specific morpheme, and there is no evidence that this is the case in Hausa (for example, note the long vowels in other than final position in the examples above). In addition, there are numerous examples of singular nouns which are not VV finally, e.g. *aniini* ‘tenth of a penny’, *maage* ‘cat’, *faada* ‘palace’, *gooro* ‘kola’, *aku* ‘parrot’, and some singulars end in consonants at least in surface form, e.g. *mutum* ‘person’, *gabas* ‘east’, so not even this general characterization holds.

In any case, there is an argument that shows specifically that Hausa singular nouns are indivisible, which forms the second part of the evidence against the Halle and Vergnaud analysis. Note first of all that there is a process of palatalization in Hausa such that coronal obstruents are manifested as alveopalatals when occurring before front vowels. Thus the coronals *s, t, d*, and *z* become *ʃ* (orthographically *sh*), *ç* (orthographically *c*), *j* (orthographically *j*), and *ʒ*, respectively. Note the following examples:

(9) *yaa isa*

    *yaa ishe ne*  ‘it is enough’
    *yaa saataa*  ‘he stole (it)’
    *yaa saacee shi*  ‘he stole it’
    *yaa saaci tuuluu*  ‘he stole the water pot’

    *yaa gudu*  ‘he ran away’
    *aguje*  ‘on the run’

    *yaa aagazaa*  ‘he helped (someone)’
    *yaa aagajee shi*  ‘he helped him’
    *yaa aagaji mutum*  ‘he helped the man’
However, where borrowed vocabulary is concerned, the process frequently fails to apply within stems. Note the following examples:

(10)  
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>tiitii</td>
<td>'street'</td>
<td></td>
</tr>
<tr>
<td>tiimaa</td>
<td>'beat'</td>
<td></td>
</tr>
<tr>
<td>siisii</td>
<td>'five-kobo coin'</td>
<td></td>
</tr>
<tr>
<td>siiboo</td>
<td>'theft'</td>
<td></td>
</tr>
<tr>
<td>ziinafii</td>
<td>'gold'</td>
<td></td>
</tr>
<tr>
<td>ziiyarta</td>
<td>'to visit'</td>
<td></td>
</tr>
<tr>
<td>diihoo</td>
<td>'dampness'</td>
<td></td>
</tr>
<tr>
<td>diidamii</td>
<td>'leather apron'</td>
<td></td>
</tr>
</tbody>
</table>

What is of particular importance here is that in certain morphological contexts in which the result is a new, morphologically complex sequence of a coronal obstruent and a front vowel, the palatalization rule applies even to these borrowed forms (the examples in (9) above show the rule applying in derived forms in native vocabulary). For example, note the following:

(11)  
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>tiitii</td>
<td>tiitoocii</td>
<td>'street/streets'</td>
</tr>
<tr>
<td>tikititi</td>
<td>tikitoocii</td>
<td>'ticket'</td>
</tr>
</tbody>
</table>

Plurals such as those in (11) are built on a pattern of partial reduplication which repeats the final consonant of the stem between the added vowels oo and ii; the following are further examples:

(12)  
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>hanyaa</td>
<td>hanyooyii</td>
<td>'road/roads'</td>
</tr>
<tr>
<td>teebur</td>
<td>teebuoořii</td>
<td>'table/tables'</td>
</tr>
<tr>
<td>tambayaa</td>
<td>tambayooyii</td>
<td>'question/questions'</td>
</tr>
</tbody>
</table>

What is of interest about the words in (11) is the fact that neither t is palatalized in the singular form, and the first t is not palatalized in the plural form, although the reduplicated t is palatalized to an alveopalatal c in the plural form where it occurs before the same ii vowel (there is of course some light phonetic palatalization of all instances of t occurring before ii, but it is not sufficient to produce the alveopalatal articulation characteristic of plural forms such as these). Thus, in spite of the fact that the environment is one of a high front vowel in each case, only in the plural form, between the suffixed vowels oo and ii, does the rule palatalizing coronals to alveopalatals apply.

A possible explanation for the forms in (11) is available in Lexical Phonology [Mohanan 1982, Pulleyblank 1984, Halle and Mohanan 1985]. As shown in (12),
Hausa has a rule forming plurals of a certain class by partial reduplication. Further, there is a rule of palatalization of coronal obstruents to change them into alveopalatals before front vowels (the forms in the right-hand column in (11) are among those illustrating the effects of this process). However, this palatalization process applies only in derived environments, not within stems (the forms in (10) show that it does not apply within stems, and the plural form *tiitoocii* in (11) serves as an example of its application in a derived form). Thus, if the singular *tiiti* is interpreted as being an indivisible stem, the lack of palatalization of the second *t* is accounted for in a manner parallel to that of the first *t*—it is not in a derived form occurring before a front vowel. By contrast, the plural form can be understood as providing a new instance of a sequence of *t+ii* and thus as a derived form falling under the domain of the rule. Note that under the Halle and Vergnaud proposal there is no distinction between the singular and plural forms as regards their morphological structure, both being derived forms composed of a sequence of stem plus suffix, and thus the differing facts of palatalization in words like *tiiti/tiitoocii* cannot be explained with reference to this principle within their analysis.

It appears to be the case, then, that treatment of the final vowel in Hausa singular nouns as a separate morpheme has no justification and effects no economy.

Further, there is some evidence, though not common, which demonstrates that in fact the final vowel of the singular noun is not replaced by a plural suffix, as if the singular form were indeed a sequence of stem plus suffix, but that the plural suffix is added to the complete singular form itself (of course, in surface form the final vowel of the stem is in fact “replaced”, but this is a result of a rule of vowel deletion, to be discussed below, not the result of morphological replacement). Note the following plural variants:

(13) bangoo  bangaa yee  ‘wall’
     bangʷaayee

kangoo  kangaayee  ‘empty thing’
     kangʷaayee

kahoo  kahoonii  ‘horn’
     kahʷannii

In these variant cases the nature of the final vowel of the singular form still shows its effects in the plural by labializing the final stem consonant. This is unexpected if the final vowel is a separate singular morpheme which is replaced in the plural by the plural morpheme, as the analysis of Halle and Vergnaud claims; rather, it is what would be expected if the plural suffix were simply added to a stem which already carried a round vowel, which in these instances is the full
singular form itself. In particular, note that the variant forms can be easily accounted for in terms of a different ordering of the general rules of labialization (before round vowels) and vowel deletion (before following vowels):

\[(14)\]
\[
\begin{align*}
\text{bangoo} + \text{ayee} & \quad \text{bangoo} + \text{aayee} \\
\text{Lab} & \quad \text{bangwoo} + \text{aayee} \quad \text{V-Del} & \quad \text{bang} + \text{aayee} \\
\text{V-Del} & \quad \text{bang}^\wedge + \text{aayee} \quad \text{Lab} & \quad ---
\end{align*}
\]

That is, if Vowel Deletion applies first, it bleeds away the form from possible application of the Labialization rule; if Labialization applies first, however, the rounded variant will appear, even though the following vowel in the surface form is not round.

Note that under the Halle and Vergnaud account the variant forms cannot be derived. Rather, under their approach the lexical form is not \text{bangoo} but \text{bang-}, and the \text{oo} which under this analysis is the singular marker attached by a morphological rule will not, of course, appear in the derivation of plural forms, leaving no possible source for the labialized variants. The only immediately apparent alternative is to treat the final stop of the stem in such cases as being already labialized in the lexicon in dialects using the rounded variants: \text{bang}^\wedge. Such an analysis, however, would fail to recognize the fact that labialized consonants in Hausa (non-contrastive before round vowels and thus not written) are regularly the result of the influence of a following round vowel (e.g. the singular \text{bangoo} is phonetically \text{bang\text{\text{\text{i}}}o}; cf. also \text{goonaa} \text{[g\text{\text{\text{i}}}o\text{\text{\text{n{a}}}}]} ‘farm’, \text{koo} \text{[k\text{\text{\text{i}}}o]} ‘or’). Given the fact that there is an \text{oo} in the singular forms in all of the words which manifest the variant labialized plural forms in (13), there is no reason to posit a lexical labialized stop, and in fact to do so would be misleading as to the source of the labialization.

Fortunately, it is not necessary to propose that Hausa singular nouns are formed by suffixation to demonstrate the usefulness of the notion of autosegmental tiers. Later in their 1981 paper Halle and Vergnaud discuss Luganda, using data (and basic analysis) from an unpublished paper by Clements. In this analysis syllables are analyzed hierarchically as being composed of onset (initial consonant) plus rime (everything else), with the rime having an internal structure of nucleus and optional appendix (coda). Typical syllable structure can thus be represented as follows:
Given such an analysis it is demonstrated that Luganda has two rules of particular interest for the topic of this paper: (1) non-branching rimes (those with no appendix) become branching when they follow directly another rime; (2) in a sequence of consecutive rimes, all but the last is deleted. A sample derivation proceeds as follows:

\[
\begin{array}{c}
zi + a + ni \\
\rightarrow CV \ V \ CV \\
OR \ R \ OR
\end{array}
\]

In the last stage, because the \(i\) has no association with any segment on the CV tier, it receives no phonetic expression. The result is the same as if the vowel were directly deleted by a rule:

\[
(17) \ zaani \quad \text{‘whose’}
\]

A related pattern is that in which some long high vowels become glides in stated contexts rather than being deleted:

\[
li + ato \quad lyato \quad \text{(no meaning given)}
\]

If such an analysis is proposed for Hausa plurals rather than treating the final vowel in the singular as a morpheme in its own right, a comparable pattern can be seen:
There is apparently no lengthening of rimes as in Luganda, but the deletion of all but the last of consecutive rimes appears to be the same. The precise nature of the suffixal consonant can be predicated to be either a copy of the final consonant of the stem or \( y \) in the same way the variation is treated by Halle and Vergnaud. The two-dimensional nature of the display here prevents drawing the association line for the final consonant of the stem to the \( C \) slot of the suffix, but this is an artifact of the formalism, not an inadequacy of the approach (see Pulleyblank [1984] for a suggestion that intersecting planes are a better representation of the tiers).

Under such an analysis the form of the plural must be stated lexically to the extent that it is not predictable, but there is no need to state a separate singular morpheme; the final vowel of the singular stem is simply its final stem vowel and therefore part of its lexical form. Further, as shown above, the dialect manifesting labialization in the plural forms in (13) can be accounted for by ordering application of the productive labialization rule in Hausa before the rule deleting the second rime in sequence. That is, the singular \( \text{bangoo} \) is always phonetically \( [\text{bang}\text{\^\text{o}}] \) because of the round vowel; the plural varies between \( [g] \) and \( [g\text{\^\text{w}}] \) dependent upon whether or not the round vowel is present at the time the labialization rule applies. In addition, the rime-deletion rule required by this proposal makes explicit the valid claim for Hausa that vowel sequences do not occur.

Note, however, that such a treatment forces a revision of the Halle and Vergnaud analysis in another way. Rather than treating \( ai \) and \( au \) in Hausa as simple vowel sequences as they have done, e.g. (1b), it is necessary to recognize that long vowels and these phonetic vowel combinations are in fact rimes compa-
rable in structure. (This is not a new idea; it is alluded to at least as early as Leben [1977]). Rather than phonological sequences, such complex vocalic patterns are in fact units, so that a more suitable analysis of them is as follows:

(20) \( \text{biri} \) \( \text{birii} \)

\[
\begin{array}{c}
\text{CVCV} \\
\text{OROR}
\end{array}
\]

\( \text{birii} \) \( \text{monkey} \)

\[
\begin{array}{c}
\text{CVC} \\
\text{VV}
\end{array}
\]

\( \text{biri} + \text{ai} \) \( \text{birai} \)

\[
\begin{array}{c}
\text{ORO} \\
\text{R}
\end{array}
\]

\( \text{birai} \) \( \text{monkeys} \)

This is in fact the correct analysis; these are diphthongs, not sequences of vowels, and they manifest single rimes. Note that both long vowels and diphthongs in Hausa are subject to a totally general rule of shortening in closed syllables:

(21) \( \text{gidaa} \) \( \text{gidan mutum} \)

\[
\begin{array}{c}
\text{CVC} \\
\text{R}
\end{array}
\]

\( \text{gidaa} \) \( \text{compound} \)

\[
\begin{array}{c}
\text{VV}
\end{array}
\]

\( \text{gidan mutum} \) \( \text{the compound of the man} \)

\[
\begin{array}{c}
\text{ORO}
\end{array}
\]

\( \text{kai} \) \( \text{head} \)

\[
\begin{array}{c}
\text{R}
\end{array}
\]

\( \text{kan mutum} \) \( \text{the head of the man} \)

Thus an analysis that treats both long vowels and diphthongs in the same way (as manifesting single segments but corresponding to two positions in the CV tier) has justification. In fact, the rule to insert \( \text{y} \) in those plural forms which do not copy the stem consonant can be interpreted as a strategy to prevent the rimes characterizing the plural vowels from coming together and thus causing one to be deleted. Because of its consonantal weakness and transitional nature, the glide \( \text{y} \) is exactly the sort of segment we would expect to find in such contexts, especially before a front vowel. Further, the fact that in closed syllables both long vowels and diphthongs are comparably shortened shows that Hausa permits rimes with only a single appendix, which may be either length, the offglide of a diphthong, or a consonant. Thus there is a parallel between the deletion of a rime which directly precedes another rime and the deletion of an appendix which directly precedes another appendix:
There are, however, some forms which threaten this analysis, which must be considered. First, note that there is at least one case in which the singular stem ends in oo, but unlike the forms in (13), the plural shows no dialectal variation, occurring only in a labialized form:

\[(23) \text{angoo} \quad \text{angwaayee} \quad \text{‘bridegroom/bridegrooms’}\]

For this form, unlike the parallel bango/bangaayee/bangwaayee case, either the underlying representation contains a labialized consonant (unusual, given its predictable nature preceding a round vowel) or else (for this word and others like it) for all dialects the labialization applies before the round vowel is deleted. Thus at least two different sorts of patterns are found, even though the forms in question are parallel.

Further, note that the pattern of optional labialization is not paralleled by the palatalization cases. That is, where by a parallel argument we might expect the palatalized obstruents to occur by a variation in rule ordering, they do not:

\[(24) \text{fagee} \quad \text{fagaagee/\*fagyaagee} \quad \text{‘field/fields’}\]

It is not clear why the two processes, parallel in many languages, are not parallel in Hausa. The explanation may be simply one of ordering, such that palatalization consistently follows vowel deletion and does not precede it, even in the dialect in question where labialization precedes vowel deletion. While this is perhaps less than ideal, there is no clear alternative analysis for the labialized variant above, so it has no direct bearing on the argument here.

Finally, note the following singular/plural pairs:

\[(25) \text{akushii} \quad \text{akusaa} \quad \text{‘black wooden bowl for food’}\]

\[\text{almakashii} \quad \text{almakasai} \quad \text{‘scissors’}\]

Here the singular forms end in ii, and the stem shows palatalization, as expected in native vocabulary. But the plural, having a vowel other than ii, shows
lack of palatalization. This could be taken as evidence that the stem in fact is consonant-final, and the final vowel of the singular form has a coronal obstruent, which becomes alveopalatal because (in this instance) a new occurrence of $s + \text{ii}$ is produced. Further, note the following, which shows dialectal variation also in the plural:

(26) \textit{ajii} \quad \textit{ajujuwaa/azuuzuwaa} \quad \text{‘grade, class’}

This form is troublesome because in the plural palatalization need not occur, there being no front vowel following. The variation can be explained on the same grounds as the \textit{bangoo} case, but the difficulty here is that to use a parallel argument would necessitate positing a coronal obstruent which becomes alveopalatal, thus providing evidence for the Halle and Vergnaud claim that the singular form is a sequence of stem+affix. Further, Russ Schuh has pointed out to me parallel forms like the following:

(27) \textit{soojaa} \quad \textit{soojoojii/soodoojii} \quad \text{‘soldier/soldiers’}

\textit{canjii} \quad \textit{canzaa} \quad \text{‘changing/to change’}

In both of these instances the borrowed form has an alveopalatal obstruent, but at least a variant with a coronal obstruent when the \textit{ii} conditioning environment is not present.

The solution may simply be that the palatalization rule in fact works both ways, to palatalize coronals before front vowels and to insure (in at least some dialects) that non-palatalized coronals occur before non-front vowels (I owe this suggestion to Bob Mugele). Such a rule can be formulated as follows:

(28) $\begin{cases} \text{-son} \\ \text{+cor} \end{cases} \rightarrow [\text{ohigh}] / \quad \begin{cases} \text{+syll} \\ \text{ohback} \end{cases}$

If this rule is still considered to be a rule applying only to derived words, not to lexical stems, it can be expected to apply in all these cases mentioned here, but without contradicting the fact that in native vocabulary there are minimal contrasts between coronal and alveopalatal obstruents before non-front vowels. To the extent that \textit{soojoojii} is a counterexample, it could be interpreted as analogically motivated, in that most such forms contain the same consonant in both positions in the plural (note the example in (26) and others in (12)).
REFERENCES


FOCUS AND QUESTION FORMATION IN EDO*

Thomas O. Qmruyi
University of Benin

The purpose of this study is to investigate the relations that hold between sentence constituents in focus constructions and the derivation of questions which involve focussing. We observe that word-order change plays a fundamental part in focussing as the elements in focus are moved to a sentence-initial position. As a result, these elements which are spoken about, questioned, or negated are made explicit. We examine the syntactic operations which occur when subject nouns, direct and indirect object nouns, genitival constructions, beneficiaries, locations, instruments and manner are focalized. Finally, we examine the derivational processes for polar and non-polar questions and the role focussing plays in eliciting appropriate responses from the hearers.

1. Introduction

Focussing is a widespread phenomenon in Edo.¹ It involves a reordering of some sentence constituents with a view to bringing them into prominence, hence such sentences are labelled emphatic sentences. In stress-timed languages such as English, an emphatic stress on constituents of a sentence usually brings such constituents into focus, but in syllable-timed and tone languages, emphatic stresses

---

* I would like to thank Professor J.S. Gruber and Mr. Matt Aikhionbare for their valuable comments on the ideas put forward in this paper. I am greatly indebted to Professor Russell G. Schuh who revealed to me several errors in an earlier draft. None of these people are responsible for any error that may still exist. This paper builds on an earlier work, Qmruyi [in press]. The syntactic processes for the formation of focus constructions and how they relate to question formation were not fully investigated in that paper because of the limitation of space.

¹Edo (also called Bini) is the main language of the ancient Kingdom of Benin in Nigeria. It is classified by Elugbe [1979] as a member of the Edoid group of languages within the Kwa subgroup of Niger-Congo languages. The data for this study have come largely from our native speaker competence in the language. We, however, consulted many informants whenever we had reasons to distrust our intuition.
and tone do not appear to be productive devices for focalization because every syllable corresponds to a unit of stress and tone.

Passivization, which serves as a device for bringing some nouns into prominence in some languages, does not occur in Edo, but the prevalence of focussing compensates for the nonoccurrence of this device. Focussing also functions as a means of introducing new arguments or information into a discourse and also for correcting false information. As Welmers [1973:43] rightly observes, it is in topicalized or focus constructions that the full forms of Edo verbs are realized. The final vowels and suffixes of verbs are not elided in object-focus constructions in which the verbs occur sentence-finally. And finally, we observe that elements about which a questioner seeks information are clearly identified in question-types which involve focussing. This is particularly helpful to the hearer in the choice of appropriate responses to questions.

First, we shall examine the syntactic processes for the formation of focus constructions and their semantic interpretations in Edo. We shall then proceed to examine how focus constructions, question formation, relativization, and so on, commonly operate together.

2. Focus in Declarative Sentences

Edo focus constructions are synonymous with English cleft sentences [Schachter 1973]. According to Quirk et al [1972:951] a cleft sentence is

"...a special construction which gives both thematic and focal prominence to a particular element of the clause in the cleft sentence, so called because it divides a single clause into two separate sections, each with its own verb."

Edo is basically an SVO language, and it is from this structure that focus constructions are derived. The element in focus occurs sentence-initially, and it is followed by a focus marker which consists of a third person singular pronoun ẹ or ọ and the copula ré. Other syntactic processes, which we shall examine shortly, occur depending on the element that is focalized.

2.1. Subject focus. Subject nouns occur sentence-initially in non-focus constructions as follows:\[1\]

---

\[1\] All examples are cited in the Edo orthography proposed by Amayo and Elugbe [1983]. The oral vowels i, e, ọ, a, o, and u correspond approximately to /i/, /e/, /a/, /o/, /a/ and /u/ respectively. Nasalized vowels are marked by a following nasal consonant as follows: in = /IN/, en = /EN/, an = /AN/, on = /ON/ and un = /UN/. When a nasal consonant precedes a nasalized vowel, it is unmarked by n. Digraphs are used as follows: vb = /V/, mw = /M/, rr = /RR/, rh = /R/, kp = /KP/, kp = /KP/, kh = /K/, gh = /G/, and gb = /Gb/.
A leftward movement of the subject noun occurs when it is brought into focus and it is optionally followed by the focus marker ṑ re or ṕ re ‘it be’. Finally, the third person singular pronoun ṕ ‘he/she/it’ fills the gap from which the subject noun has been moved. Following these processes, (1) will be realized as (2) below:

(2) Osaró (̕ re) ṕ bó ḍwá
Osaro it be PRO build house

‘it is Osaro who built a house’

When the focus marker is deleted as is often the case in rapid speech, it is the occurrence of the third person singular pronoun, which we call PRO below, that indicates that the subject noun is focalized. This pronoun is always ṕ regardless of the number, gender, and person of the subject noun in focus.

The occurrence of a slot filling third person pronoun in a subject focus sentence has also been attested in Yoruba. According to Bamgboṣe [1967:37], “when the subject is moved to the initial position of the clause, a third person pronoun must be substituted for it.” It is, however, an invariable pronoun in the case of Edo subject focus constructions. As a result, the following are grammatical focus constructions even though the pronouns in focus do not share the same person and number features as the PRO.

(3) a. íran (̕ re) ṕ bó ḍwá
they it be PRO build house

‘it is they that built a house’

b. wè (̕ re) ṕ dé íkèkè
you(sg) it be PRO buy bicycle

‘it is you that bought a bicycle’

Amayo [1975] calls this third person singular pronoun which occurs in subject focus sentences a “subject concord marker”. He argues further that subject concord markers (SCM) and auxiliary markers (AM) are inherent parts of Edo verbal constructions (VC). Among others, he illustrates with the following sentence (= (23) in Amayo [1975]) in which the focus marker is deleted:

(4) írá ṕ ghá ṕ ōrè
they SCM AM come

‘it is they who would have come’

Amayo may have come to this conclusion because what appears to be SCM’s have been attested in some Edoid languages. However, their syntactic behaviour in
these languages is different from the Edo case. Consider the following non-focus constructions in Yékhee (Etsako):³

(5) a. *Ogèlè ṣe dè Ṽkpọ*
    *Ogele PRO buy cloth*
    ‘Ogele bought a piece of cloth’

   b. *Ogèlè yyyyMMdd ẹ dè Ṽkpọ*
    *Ogele and Adamu PRO buy clothes*
    ‘Ogele and Adamu bought pieces of cloth’

The pronouns ṣe in (5a) and ẹ in (5b) agree in number with the subject nouns. When these nouns are brought into focus, the result is as follows:

(6) a. *Ogèlè lì ṣe dè Ṽkpọ*
    *Ogele it-be PRO buy cloth*
    ‘it is Ogele who bought a piece of cloth’

   b. *Ogèlè yyyyMMdd lì ẹ dè Ṽkpọ*
    *Ogele and Adamu it-be PRO buy clothes*
    ‘it is Ogele and Adamu who bought pieces of cloth’

Sentence (5a) is a non-focus construction which is similar to Edo focus constructions when the focus marker *ẹ rẹ* ‘it be’ is deleted. The pronoun (PRO) does not occur in Edo non-focus constructions. Therefore, its occurrence must be attributed to subject focus. As it does not often manifest any concord and agreement with the antecedent noun, we feel that it is a misnomer to call it a subject concord marker. Subject concord marking is commonly associated with noun class languages and Edo does not belong to this category.

Following Awoyale [1985], we shall call this third person pronoun a “pro-copy”. He observes in the Yoruba case that when a subject noun “is shifted to the front...a pro-copy is left in its place”. This is an adequate description of the syntactic process in Edo. However, it should be noted that the pro-copy may not possess the features of the antecedent noun in terms of number and person. Gender does not play any role in Edo pronominalization processes.

2.2. Object and genitive focus. Whenever a direct object of a monomorphic transitive verb is focalized, it occurs at a sentence-initial position, and then it is op-

³I am grateful to Mrs. Grace Masagbor for the data on Yékhee (Etsako).
tionally followed by the focus marker. Unlike the subject focus case discussed above, no pro-copy fills the place from which the direct object is moved. For example, (1) will be realized as follows:

(7) òwà (è ré) Òsàrò bòrè
   house it be Osaro build+Past

   ‘it is a house Osaro built’

The simple past suffix -rè and its phonologically conditioned variants (see Qmørui [1986a]) do not occur when a verb is directly followed by an object noun. The noun òwà ‘house’ in (7) now assumes the grammatical status of a subject noun. This new grammatical function is aptly demonstrated when an object pronoun is focalized; it obligatorily changes to its subject pronoun counterpart. Consider the changes that occur in the following non-focus and focus constructions:

(8) a. Òsàgié tiè rùè
    Osagie call you (sg.)

    ‘Osagie called you’

b. wè (è ré) Òsàgié tièrè
    you(sg) it be Osagie call+Past

The object pronoun rùè in (8a) obligatorily becomes wè in (8b) as it is now a subject pronoun. Since it is the noun or pronoun in focus that the speaker is actually talking about, it assumes the role of a subject noun or pronoun. The transitivity of the verb, however, gives clues that it is a direct object that “is transposed to the beginning of the sentence and the verb appears in sentence-final position” [Welmers 1973:43].

When direct and indirect object nouns of ditransitive verbs are brought into focus, a resumptive pronoun érè ‘him/her/it’ fills the gap created by the movement of these nouns. For example:

(9) a. íràn mà Òsàgié ègiè
    they make Osagie king

    ‘they made Osagie a king’

b. Òsàgié (è ré) íràn mà érè ègiè
    Osagie it be they make PRO king

    ‘it is Osagie they made a king’

---

4A full description of Edo subject and object pronouns occurs in Qmørui [1986b]. Object pronouns are also used in genitival constructions.

5See Safir [1986] for a discussion of how resumptive pronouns are bound in sentence structures.
c. ṇegiè (è ré) ìràn má Osàgiè ërè ‘it is a king they made Osagie’
   king it be they make Osagie PRO

The focalized nouns are coindexed with the resumptive pronoun ërè. A similar
pronoun occurs in genitival constructions. A possessed noun usually occurs be­
fore the possessor and the two can be moved together to a sentence-initial posi­
tion. However, if the possessed noun or the possessor alone is focalized the pro­
noun ërè or its variant ërè must occur in the second part of the clause. For ex­
ample:

(10) a. ìràn guòghò ikèkè Osàrò
    they destroy bicycle Osaro
    ‘they destroyed Osaro's bicycle’

b. ikèkè Osàrò (è ré) ìràn guòghòrè
    bicycle Osaro it be they destroy+Past
    ‘it is Osaro's bicycle that they destroyed’

c. Osàrò (è ré) ìràn guòghò ikèkè ërè
    Osaro it be they destroy bicycle PRO
    ‘it is Osaro whose bicycle they destroyed’

d. ikèkè (è ré) ìràn guòghò Osàrò ërè
    bicycle it be they destroy Osaro PRO
    ‘it is a bicycle belonging to Osaro that they destroyed’

The word ërè which occurs in (10c) and (10d) functions as a possessive pronoun. Object pronouns also perform this function in Edo.

2.3. Focus on objects of prepositions. Some syntactic changes occur when
a noun preceded by a preposition is focalized. Consider the predicate of the fol­
lowing non-focus sentence:

(11) Ozò khuërè vbè ëzè
    Ozo bathe+Past in river
    ‘Ozo had a bath in the river’

Because ëzè ‘river’ is not directly dominated by the verb, it is possible for the
simple past suffix -rè to occur. Therefore, ëzè is the object of the locative
preposition vbè ‘in’. Of course, it is also possible for a direct object of a verb to be followed by a prepositional phrase as follows:

(12) íràn rî ëvbârè vbè úwù òwà
    they eat food in inside house
    ‘they ate food inside the house’

When stationary or specific locations such as vbè ëzê in (11) and vbè úwù òwà in (12) are focalized, the preposition vbè is deleted and a locative marker (LOC) nà obligatorily precedes the verb. The occurrence of the simple past suffix is then blocked. Thus, (11) and (12) will be realized as (13a) and (13b) respectively.

(13) a. ëzê (è re) Òzo nà khuè
    river it be Ozo LOC bathe
    ‘it is in the river that Ozo had a bath’

    b. úwù òwà (è re) íràn nà rî ëvbârè
    inside house it be they LOC eat food
    ‘it is inside the house that they ate food’

However, if the location is not specific vbè and nà can co-occur. For example:

(14) a. Ìyàyi de ëwù vbè ódè
    Iyayi buy shirt on way
    ‘Iyayi bought a shirt on the way’

    b. vbè ódè (è re) Ìyàyi nà de ëwù
    on way it be Iyayi LOC buy shirt
    ‘it is on the way that Iyayi bought a shirt’

In another sense, vbè marks the time of an event and when the event is brought into focus a sequence marker (SQM) nà occurs in the second clause. For example:

(15) a. Òzo de vbè ò khuè
    Ozo fall while he bathe
    ‘Ozo fell while bathing’
b. *vbè o khuè (ɛ rè) Ozó ná dé*  
while he bathe it be Ozo SQM fall  
‘it was while bathing that Ozo fell’

In other locative focus constructions, *yè* becomes *yi* when its object is focalized and the preposition occurs sentence-finally.

(16) a. *Ozó tóta yè ágá*  
Ozo sit on chair  
‘Ozo sat on a chair’

b. *ágá (ɛ rè) Ozó tóta yi*  
chair it be Ozo sit on  
‘it is a chair Ozo sat on’

Similarly, the preposition *nè* becomes *nà* when a beneficiary is brought into focus and the preposition occurs sentence-finally.

(17) a. *Osàgiè bó òwá nè Osàrò*  
Osagie build house for Osaro  
‘Osagie built a house for Osaro’

b. *Osàrò (ɛ rè) Osàgiè bó òwá nà*  
Osaro it be Osagie build house for  
‘it is Osaro who Osagie built a house for’

However, focus on instrument and manner follows similar processes of direct objects of monotransitive verbs described above. No pro-copy or resumptive pronoun occurs after focalization. For example:

(18) a. *írán yá ísàn hèn kiè èkhù*  
they use key open door  
‘they used a key to open the door’

b. *ísàn hèn (ɛ rè) írán yá kiè èkhù*  
key it be they use open door  
‘it is a key they used in opening the door’
(19) a. Œdë yá òhù gbé òmọ nií
Ode use anger beat child that
‘Ode beat that child in anger’

b. òhù (ê ré) Œdë yá gbé òmọ nií
anger it be Ode use beat child that
‘it is in anger that Ode beat that child’

(20) a. Òzó khian zàizàì
Ozo walk briskly
‘Ozo walks briskly’

b. zàizàì (ê ré) Òzó khian
briskly it be Ozo walk
‘it is in a brisk manner that Ozo walks’

2.4. Verb focus. Verbs cannot be focalized directly like subject and object nouns. In order to focalize an action or state expressed by a verb, a nominal must first be derived from it. The derived nominal is moved to the front and the verb occurs in the second part of the sentence.

All Edo nouns begin and end with vowels while verbs begin with consonants and end with vowels. Two methods are employed in the derivation of nominals from verbs. The first method is by the prefixation of oral vowels to verb stems. There are no phonological rules for the choice of vowel prefixes. For example:

(21) khian ‘to walk’
        òkhian ‘walk’

gié ‘to laugh’
        ògié ‘laughter’

tuè ‘to greet’
        òtuè ‘greeting’

hiò ‘to urinate’
        àhiò ‘urine’

fô ‘to perspire’
        òfô ‘perspiration’

khuè ‘to bathe’
        àkuè ‘bath’

mwèmwè ‘to be mad’
        èmwèmwè ‘madness’

The second method involves the affixation of the discontinuous morpheme ù-mwè to a verb stem. For example:

(22) fô ‘to end’
        ùfômwè ‘ending’

gbè ‘to beat’
        ùgbèmwè ‘beating’

gò ‘to shout’
        ùgómwè ‘shouting’
The (b) sentences below are focus constructions which are derived from the (a) sentences.

(23) a. Òzò tuè mwè
   Ozo greet me
   ‘Ozo greeted me’

b. òtuè (è ré) Òzò tuè mwè
   greeting it be Ozo greet me
   ‘it is greeting that Ozo greeted me’

(24) a. ìran gá Óànòbuà
   they serve God
   ‘they serve God’

b. ùgàmwè (è ré) ìran gá Ósànòbuà
   serving it be they serve God
   ‘it is serving that they serve God’

We observe, however, that not all verbs can be brought into focus through a nominalization process. For example, the verbs mwè ‘have’ and ré ‘be’ cannot be nominalized. As we shall discover later, there are other problems when we attempt to focalize and question a verb.

2.5. Negative focus construction. In all the affirmative focus constructions we have examined so far, we observed that the occurrence of the focus marker èré or ô ré is optional. In negative focus constructions its occurrence is obligatory. The negative particle ô is cliticized to the pronoun è; the variant ô never occurs with the negative particle. The element in focus which is also now negated occurs after the copula ré and this places it within the scope of negation. For example, a negation of (2) which we repeat here as (25a) will result in (25b).

(25) a. Òsàrò (è ré) ô bó òwà
   Osaro it be PRO build house
   ‘it is Osaro who built a house’
b. ẹ́í re Osàrọ ọ bọ ówá
   it-NEG be Osaro PRO build house
   ‘it is not Osaro who built a house’

A negation of the object focus sentence in (7) which we repeat here as (26a) will result in (26b).

(26) a. ówá (ẹ́ re) Osàrọ bọ́rè
   house it be Osaro build+Past
   ‘it is a house Osaro built’

b. ẹ́í re ówá Osàrọ bọ́rè
   it-NEG be house Osaro build+Past
   ‘it is not a house Osaro built’

All elements that can be focalized can also be negated through this process.

3. Relationship Between Focus and Question Formation

In this article, we shall restrict ourselves to the so-called yes/no and WH-questions. Following Emena, we shall call yes/no questions polar questions and WH-questions non-polar questions. It is the way these questions are asked that determines felicitous responses. We shall argue that focussing obligatorily occurs in non-polar questions, so natural responses must also be in the form of focus constructions. We shall first examine polar questions in which focussing is optional.

3.1. Polar questions. Our data suggest that there are three principal methods of forming polar questions in Edo. A natural response to them must commence with ẹ́ẹ́n ‘yes’ or ẹ́ó ‘no’ and these may be followed by the appropriate information required by the questioner.

Focus in a polar question is only a stylistic device for bringing a constituent being questioned into prominence. However, if the questioner decides to bring any constituent into focus, the hearer must reply in a focus construction.

3.1.1. Raised pitch. Statements can be changed to questions when the pitch, especially on the final syllable, is raised. Such questions also usually commence with a high tone which is traceable to the emphatic particle té. It occurs sentence-initially and Agheysi [1986] translates it as ‘it is the case that …’ but in a question formation it can be translated ‘is it the case that …?’ In our literal translation we shall simply call it EMPH (emphasizer). The pitch differences between a
statement and a question, which coincides with the tonal level, can be represented as follows:

(27) a. \[\text{[ __ _ _ _ ___ _ _ ]} \]
    \[\text{\begin{tabular}{l} \text{tē} \text{ Ōsāsērē} \text{khuē} \\ EMPH Osasere bathe \end{tabular}} \]
    'it is the case that Osasere is bathing'

    b. \[\text{[ _ __ _ _ _ ___ _ _ ]} \]
    \[\text{\begin{tabular}{l} \text{tē} \text{ Ōsāsērē} \text{khuē?} \\ EMPH Osasere bathe \end{tabular}} \]
    'is it the case that Osasere is bathing?'

If the emphasizer is deleted, the following pitch changes can occur:

(28) a. \[\text{[__ _ _ _ ___ _ _ ]} \]
    \[\text{\begin{tabular}{l} \text{uwa} \text{ rrīē} \text{úgbó} \\ you(pl) go farm \end{tabular}} \]
    'you are going to the farm'

    b. \[\text{[ _ _ _ _ _ ___ ]} \]
    \[\text{\begin{tabular}{l} \text{uwa} \text{ rrīē} \text{úgbó?} \\ you(pl) go farm \end{tabular}} \]
    'are you going to the farm?'

We can begin the translation of (28b) with 'is it the case that ...?'. This is because \text{uwa} 'you(pl)' normally bears two low tones but if \text{tē} is deleted sentence-initially, the floating high tone left behind displaces the initial low tone in \text{uwa}.

As a sentence emphasizer, \text{tē} can only occur in the basic SVO sentence-pattern. If any element is already in focus \text{tē} cannot occur. For example, the following sentence which is derived from (28a) is ungrammatical:

(29) \text{*tē uwa (ē ré) ō rrīē úgbó}
    \[\text{\begin{tabular}{l} EMPH you(pl) it be PRO go farm \end{tabular}} \]
    'it is the case that it is you going to the farm'

The ungrammaticality of (29) is due to the fact that it is illogical or self-contradictory to emphasize a sentence constituent by focussing it and at the same time
emphasize the whole sentence. However, if a sentence is negated, the focus marker and the negator can co-occur with té. When this happens, it is the whole sentence that is in focus. No movement occurs so neither a procopy nor a resumeptive pronoun replaces any element. For example:

(30) ëí ré té ùwà rrié úgbô?
    it-NEG be EMPH you(pl) go farm
    ‘is it not the case that you are going to the farm?’

Finally, we observe that statements turned into questions by a raised pitch are commonly accompanied by some paralinguistic features which make it clearer to the hearer that some information is sought from him.

3.1.2. Formation with yi. Again, a statement can be turned into a question by placing the tag yi at the end of it. It has no meaning of its own; it only functions as a question marker so we shall gloss it as Q in the following example:

(31) ìran tié ëbè yi?
    they read book Q
    ‘are they reading a book?’

An emphatic sentence which begins with té can also be changed into a question when yi is placed at the end of it. For example:

(32) té ìzó lé ëvbàré yi?
    EMPH Ozo cook food Q
    ‘is it the case that Ozo is cooking?’

The question particle yi can occur in all focus constructions. For example, the object noun is focussed and questioned in the following sentence:

(33) ëbè (ë ré) ìran tié yi?
    book it be they read Q
    ‘is it a book that they are reading?’

As earlier observed (see 29), té cannot occur in this sentence structure. An appropriate response must also bring the object noun into focus. For example, an affirmative response will be as follows:

(34) ëén, ëbè (ë ré) ìran tié
    yes book it be they read
    ‘yes, it is a book that they are reading’

The following response will be inappropriate:
(35) ẹẹn, ịrụ n i̯e èbè
yes they read book

The information provided in (35) is about what the subject noun is doing but the information sought in (33) is about èbè ‘book’. The unacceptability of (35) arises from the fact that Edo does not permit the placement of emphatic stresses on elements with a view to bringing them into focus.

3.1.3. Alternative question formation. Alternative questions are formed by conjoining two or more sentences by the alternative conjunction rà ‘or’. One sentence contains an assertion and the other negates it or contains a different assertion.

(36) Ịvié kụọ rà ọ vié?
Ivie play or-Q she cry

In (36) the conjunction rà is glossed as ‘or-Q’ because it performs a dual role of conjoining two sentences and question marking. However, the second sentence is commonly deleted and in such cases the question ends with rà. It then functions as a tag and it is in this form that we can rightly call this question-type a polar question. The tag functions as the only question marker (Q) in the following example:

(37) Ụyị ghá kpè ọkpá n rà?
Uyi AM wash plate Q

Although yi and rà are both tag question formatives, they elicit slightly different responses. Respondents are only expected to agree or disagree with the assertion contained in the formation with yi but in the case of questions formed with rà, apart from agreeing or disagreeing with the assertion of the questioner, the respondent can make an alternative assertion. If focussing occurs the respondent is further required to respond in a focus construction. For example, if the subject noun of (37) is in focus it will become:

(38) Ụyị (ị rẹ) ọ ghá kpè ọkpá n rà?
Uyi it be PRO AM wash plate Q

‘is it Uyi that should wash the plate?’

An appropriate negative reply will be as follows:
(39) ëó, ë́ ré Ýyí ọ ghá kpè ìkpán
    no it-NEG be Ýyí PRO AM wash plate
    ‘no, it is not Ýyí that should wash the plate’

Focussing, as we have seen so far in polar questions, is an optional device for bringing some constituents into prominence. It determines the natural response of hearers. However, focussing is obligatory in the non-polar questions we shall now examine.

3.2. Non-Polar questions. There are about six methods of forming non-polar questions in Edo. The division is based on the types of question words that occur in them. However, as we shall discover shortly, some of these methods are only alternative ways of asking for the same information. The question particle yi (see 3.1.2. above) optionally occurs sentence-finally in all non-polar questions and in such cases, interrogation is doubly marked. We shall, however, ignore this particle here because it adds nothing to the semantic interpretation of such questions.

3.2.1. dè + NP + S formation. All Edo noun phrases including independent pronouns can be questioned by preposing the question particle dè to them, and then the information sought about the noun phrases is contained in relative clauses that follow them. Dè translates as ‘what’, ‘which’, ‘who’, ‘when’, ‘where’, and so on, depending on the context of use and the noun phrase that follows it. For example:

(40) a. dè èhé...?  ‘where?’
      what place

b. dè èghè...?  ‘when?’
      what time

c. dè èmwi...?  ‘what (thing)?’
      what thing

d. dè òmwá...?  ‘who (sg.)?’
      what person

e. dè èmwá...?  ‘who (pl.)?’
      what persons

Relative clauses which obligatorily follow dè and the noun phrase are formed in the same manner focus constructions are formed. Schachter [1973] observes
that there are striking similarities between focus constructions and relativization in a number of unrelated languages.

In the formation of Edo relative clauses, noun phrases are moved leftward and they are followed by the relativizer (REL) ne which introduces the clauses. If a subject noun is moved, a pro-copy obligatorily fills the extraction site but if an object noun is moved no pro-copy occurs. For example, from the simple declarative sentence in (41a) below, the relative clauses in (41b) and (41c) can be derived.

(41) a. Osaze bó dwá
    Osaze build house

    'Osaze built a house'

    b. Osaze ne ó bó dwá...
    Osaze REL PRO build house

    'Osaze who built a house ...'

    c. dwá ne Osaze bórè...
    house REL Osaze build+Past

    'a house which Osaze built...'

Of course, (41b) and (41c) do not make complete sense; in fact, they are complex noun phrases. When de is preposed to them, they are transformed into meaningful questions as follows:

(42) a. de Osaze nè ó bó dwá?
    which Osaze REL PRO build house

    'which Osaze built a house?'

    b. de dwá nè Osaze bórè?
    which house REL Osaze build+Past

    'which house did Osaze build?'

A natural response to these questions must be in focus constructions. For example, (43a) and (43b) below are appropriate responses to (42a) and (42b) respectively.

(43) a. Osaze nè qsè mwé (è ré) ó bó dwá
    Osaze REL friend my it be PRO build house

    'it is Osaze who is my friend that built a house'
3.2.2. REGISTER + S formation. Plural human nouns are questioned by the use of ávbáó ‘who (pl.)’ or ávbá as the young generation of Edo speakers often say. There are syntactic correlations between the use of ávbé as a pluralizer and ávbáó as an interrogative pronoun.6

We call it an interrogative pronoun because unlike dè which is preposed to the noun questioned, ávbáó or ávbá is a pronominal replacive for the persons questioned. It is an alternative way of saying dè èmwa ‘what persons’ or ‘who (pl.)’ which occurs in (40e) above.

Focussing is overt when ávbáó or ávbá is used in questioning. In fact, the focus marker ë ré or ò ré can optionally occur after this interrogative pronoun. For example:

(44) a. ávbáó (ë ré) Ø kpdó?  ‘who is sweeping?’
    who (pl.) it be PRO sweep

b. ávbá (ë ré) Ø Ozó tiè? ‘who is Ozo calling?’
    who (pl.) it be Ozo call

The pro-copy occurs in (44a) because a subject noun is questioned, but it does not occur in (44b) because an object noun is questioned.

3.2.3. vbé + S formation. A variety of questions can be formed by the use of vbé which translates as ‘what’, ‘where’, ‘why’ and so on, depending on the context of use. It is used for asking questions about events, activities, conditions, reasons, locations, and so on.

An aspectual marker a usually occurs in this question-type and it is the tone this marker bears that determines the aspect. A high tone marks the progressive and habitual aspects while a low tone marks the past. It occurs after the subject noun of the sentence that follows vbé. However, when q ‘he/she/it’ occurs as the subject pronoun, this aspectual marker assimilates to q. For example,

(45) a. vbé ô á ré?  ‘what are you eating?’
    what you(sg) ASM eat

---

6 For a detailed discussion of the use of ávbé as a pluralizer, see Òmòrùyí [1986c]. We have now realized that what we call a pro-copy in this paper cannot be derived from the focus marker ò ré ‘it be’ as we suggested in that paper.
b. vbè Osàrò à ré?
    what Osaro ASM eat
    ‘what did Osaro eat?’

c. vbè ó ó ré?
    what he ASM eat
    ‘what is he eating?’

d. vbè ó ó ré?
    what he ASM eat
    ‘what did he eat?’

Adjectival or quality verbs are usually questioned by the following sentence:

(46) vbè ó ó ye héè?7
    how it ASM be Q
    ‘how is it like?’

Focussing appears to have occurred in this question-type because vbè is an interrogative pronoun which replaces something or someone about which information is sought by the questioner. This thing or someone is brought into focus in a sentence-initial position. A more appropriate response to (45a), for example, will be (47a) below, while (47b) will be inappropriate even though it is grammatical.

(47) a. iyán (è ré) i ré
    yam it be I eat
    ‘it is yam that I am eating’

b. i ñô i iyán
    I eat yam
    ‘I am eating yam’

Note that the verb ñô ‘eat’ is realized as ré ‘eat’ when it is not followed by a direct object.

3.2.4. ghà + S formation. The interrogative pronoun ghà ‘who’ questions singular and plural human nouns. It therefore combines the questioning roles of òmwa and ëmwa in (40d) and (40e) respectively, and also ávbàó which is discussed in 3.2.2. above. This means that whenever a questioner employs ghà ‘who’, he is either requesting information about one person or more than one person, or he is not sure about the number of persons. For example:

(48) ghà ó tòtà yè ágà?
    who PRO sit on chair
    ‘who sat on the chair?’

7The particle héè is a question marker which accompanies vbè when it denotes ‘how’.
Focus and Question Formation in Edo

We observe again that focussing is overt in this question type. The pro-copy ñ occurs in (48) because a subject noun is focussed and questioned. It does not occur when an object noun is questioned as in the following example:

(49) ghà Ódúwà támà? ‘who did Oduwa tell?’
    who Oduwa tell

3.2.5. ínù + S formation. The word ínù ‘how many/much’ questions the quantity of nouns. It can be used with reference to both count and non-count nouns. For example:

(50) a. ínù èghè ...? ‘how much time ...?’
    b. ínù òkpòn ...? ‘how many clothes ...?’
    c. ínù àmè ...? ‘how much water ...?’
    d. ínù òwà ...? ‘how many houses ...?’

In sentence structures, ínù co-occurs with the noun it questions so it is not an interrogative pronoun. However, unlike dè, ínù can be uttered in isolation if there is a previous mention of the noun being questioned or it is present in the context of speech. Nouns questioned by ínù are always in focus as in the following examples:

(51) a. ínù ikèkè (è ré) ò rré èvba
    how-many bicycles it be PRO be there
    ‘how many bicycles are there?’

    b. ínù íghò (è ré) Osàgié rhíe mè?
    how-much money it be Osagie give me
    ‘how much money did Osagie give me?’

3.2.6. Formation with vbòò. The question particle vbòò immediately follows elements about which information is sought by the questioner. This question-type is, however, usually two ways ambiguous, especially when vbòò is preceded by a noun phrase. The questioner may seek information about the location or the state or well-being of the noun phrase. It becomes a “how-question” in the latter interpretation. For example:

...

(52) a. *ívbí rué vboô?*  
    ‘where/how are your children?’
    children your where/how

b. *né èbé vboô?*  
    ‘where/how is the book?’
    ART book where/how

In fact, (52a) commonly occurs in Edo greetings and the following responses are both appropriate:

(53) a. *irân rré òwá*  
    ‘they are at home’
    they be house

b. *ègbé rhàán iràn*  
    ‘they are well’
    body well them

If the questioner specifically wishes to know the location and exclude information about the well-being of the questioned noun phrase, the *dè + NP + S* formation is adopted as follows:

(54) *dè èhé nè ívbí rué yé?*  
    ‘where are your children?’
    what place REL children your be

Only (53a), for example, will be an appropriate response to (54). It is in this question-type that the interrogative adverb of ‘where’ as in English is unambiguously expressed in Edo. Focussing can only be said to have occurred in (52) because the element about which information is sought occurs sentence-initially.

4. Conclusion

Focussing plays a significant role in determining the information a speaker wants to give or elicit from the hearer. This is achieved in Edo by bringing some sentence constituents into prominence. Other syntactic changes which occur have been examined.

Through focus constructions, Edo speakers are able to form different questions in such a manner that the specific information they wish to elicit from the hearer closely follows the constituent in focus. The derivational processes of these questions and their semantic interpretations have been carefully examined.
REFERENCES


DEFINING THE DOMAIN OF NASALITY IN EDO

Matt. Osayaba Aikhionbare
University of Benin

In Aikhionbare [1986], it is demonstrated that nasality spread in Edo is most evident in alternations between verb stems and their suffixes. In other words, nasality spreads beyond the segment (across morpheme boundaries). This paper seeks to establish whether or not nasality spreads beyond the verb stem and its suffixes onto an object NP. Having defined the domain of nasality spread, evidence for the autosegmental status of nasality in Edo is advanced. Finally, a brief autosegmental analysis of the facts of nasality in the language is attempted in line with evidence from Guarani [Lunt 1973], Gokana [Hyman 1982], Ogberia [Chumbow 1986], and Igbo [Ihionu 1986].

0. Introduction

Evidence from Guarani [Lunt 1973], Gokana [Hyman 1982], Ogberia [Chumbow 1986], and Igbo [Ihionu 1986] show that nasality in some languages is better viewed as a suprasegmental rather than a segmental feature. This means that for these languages, nasality is a feature of units larger than the segment. In such languages, nasality could be accounted for within the autosegmental framework as outlined in Goldsmith [1976], Kiparsky [1982], and Pulleyblank [1983].

Examining data from Edo, we shall first attempt to establish the fact that nasality spreads beyond the segment. Then we shall determine the domain of this spread. In section 1, an analysis of the facts of nasality in Edo is attempted. In section 2, we advance a definition of the domain of nasality spread in Edo. A brief autosegmental phonology perspective to the facts of Edo nasality is then

---

1We refer to the language all through this paper as Edo. Reference is to the same language that has been characterized as Edo (Bini) in the literature. To the extent that the word Bini is non-existent in contemporary usage, and to the extent that native speakers of the language refer to themselves as speakers of Edo, we prefer to refer to the language by the same label.
presented. Finally, we examine the implications of the manifestation of nasality for the phonology of Edo.

1. Nasality in Edo

As demonstrated in Aikhionbare [1986], nasality spread in Edo is most evident in alternations between verb stems and their suffixes. The verb system of Edo manifests only two suffixes, a simple past tense suffix\(^2\) and a plural/reiterative\(^3\) suffix, each of which has different phonologically conditioned reflexes. The data below illustrate this.

(1) a. \(de^4\) ‘to buy’
   b. \(\dot{\jmath} \ d\dot{e}-r\dot{e}\)
      3 sg. buy+PAST ‘he/she (3 sg.) bought’
   c. \(\dot{\jmath} \ d\dot{e}-l\dot{e} \ \dot{e}b\dot{e}\)
      3 sg. buy+PL book ‘he/she bought books’

(2) a. \(gb\dot{e}\) ‘to write’
   b. \(\dot{\jmath} \ gb\dot{e}-\ddot{r}\dot{e}\)
      3 sg. write+PAST ‘he/she wrote’
   c. \(\dot{\jmath} \ gb\dot{e}-n\dot{e} \ \dot{e}b\dot{e}\)
      3 sg. write+PL book/letter ‘he/she wrote books/letters’

(3) a. \(gb\dot{e}\) ‘to kill’

\(^2\)Aikhionbare [1987] argues that /re/ serves the dual function of depicting intransitivity as well as serving as the simple past tense marker. The symbol /r/ is used to represent the lateral approximant /ɻ/. In the speech of most younger generation speakers of the language, the sound is virtually non-existent.

\(^3\)In Aikhionbare [1987] we also argue for /lo/ as the plural/reiterative suffix. In most of our examples, the suffix evidently indicates plurality on the object NP. In 6(c), 11(c) and 12(c) however, it marks reiterated or repeated action. Hence we prefer to refer to it as a plural/reiterative morpheme.

\(^4\)Edo verbs are conceived of as being underlyingly toneless. Unlike nouns which have lexical tone, verbs only acquire tone in grammatical contexts. We have therefore decided to leave our verb stems toneless. The language also displays the phenomenon of downstep, where high tones preceded by low tones get reduced in height or “downstepped”. Our examples do not reflect this fact since tone is not crucial to the subject of this paper.
b. ò gbè- rè 3 sg. kill+PAST ‘he/she killed’

c. ò gbè- lè èwè 3 sg. kill+PL goat ‘he/she killed goats’

(4) a. tà ‘to spread’

b. ò tà- rè 3 sg. spread+PAST ‘he/she spread’

c. ò tà- nò ukpò 3 sg. spread+PL cloth ‘he/she spread clothes’

(5) a. ì ‘to shoot’

b. ò ì- rì 3 sg. shoot+PAST ‘he/she shot’

c. ò ì- 1ò áhiámpè 3 sg. shoot+PL bird ‘he/she shot birds’

(6) a. ì ‘to fly’

b. ò ì- ì 3 sg. fly+PAST ‘he/she flew’

c. ìrá ì- nò kpàá they fly+PL go ‘they flew away’

(7) a. bòùù ‘to break’

b. ò bòù- òdà 3 sg. break+PAST ‘he/she broke’

c. ò bò- nò àbó- èrá 3 sg. break+PL branch-tree ‘he/she broke tree branches’
(8) a. \( \textit{b\text{\`{o}}} \)  
   ‘to build’

   b. \( \textit{\text{\`{e}} b\text{\`{o}-r\text{\`{e}}} \)  
   3 sg. build+PAST
   ‘he/she built’

   c. \( \textit{\text{\`{e}} b\text{\`{o}-l\text{\`{o}}} \text{\`{d}w\text{\`{a}}} \)  
   3 sg. build+PL house
   ‘he built houses’

(9) a. \( \textit{d\text{\`{o}}} \)  
   ‘to snap’

   b. \( \textit{\text{\`{e}} d\text{\`{o}-r\text{\`{e}}} \)  
   3 sg. snap+PAST
   ‘he/she snapped’

   c. \( \textit{\text{\`{e}} d\text{\`{o}-n\text{\`{o}}} \text{\`{i}f\text{\`{i}}} \)  
   3 sg. snap+PL trap
   ‘he/she snapped traps’

(10) a. \( \textit{sa} \)  
   ‘to sting’

   b. \( \textit{\text{\`{e}} s\text{\`{a}-r\text{\`{e}}} \)  
   3 sg. sting+PAST
   ‘he/she stung’

   c. \( \textit{\text{\`{e}} s\text{\`{a}-l\text{\`{o}}} \text{\`{i}m\text{\`{a}}} \)  
   3 sg. sting+PL us
   ‘he/she stung us’

(11) a. \( \textit{so} \)  
   ‘to shout’

   b. \( \textit{\text{\`{e}} s\text{\`{o}-r\text{\`{o}}} \)  
   3 sg. shout+PAST
   ‘he/she shouted’

   c. \( \textit{i\text{\`{o}j\text{\`{e}k\text{\`{a}}} s\text{\`{o}-l\text{\`{o}}} \)  
   children shout+PL
   ‘children shout/are shouting’

(12) a. \( \textit{tu} \)  
   ‘to cry’

   b. \( \textit{\text{\`{e}} t\text{\`u}-r\text{\`{o}}} \)  
   3 sg. cry+PAST
   ‘he/she cried’

   c. \( \textit{i\text{\`{o}j\text{\`{e}k\text{\`{a}}} t\text{\`u}-l\text{\`{o}}} \)  
   children cry+PL
   ‘children cry/are crying’
The data above show the verb stem displaying inflections to mark the simple past and plurality. In Aikhionbare [1987], it is argued that the basic forms of the suffixes are /-re/ and /-lo/ respectively. The choice of /-re/ and /-lo/ as being the basic forms was predicated on the principles of frequency of occurrence and predictability of the other reflexes from either of them.

1.1. The /-re/ suffix. The /re/ suffix has the following reflexes.

(13) re when preceded by vowels /e, /ɛ, /ɔ, /a/

(14) re when preceded by vowels /ɛ, /â, /o/

(15) ri when preceded by vowel /i/

(16) ri when preceded by vowel /i/

(17) ru when preceded by vowel /u/

(18) ru when preceded by vowel /o/

(19) ro when preceded by vowel /o/.

Taking /re/ as our basic morpheme, we need rules to explain the alternations in (14) through (19). Before attempting an analysis, we shall first characterize the vowels of Edo using distinctive features.

![Figure 1: the vowels of Edo](image)

Examining the alternations involving oral vowels, a rule that would derive /ri/, /ru/, and /ro/ from our basic suffix /re/ needs to be posited. A look at Figure 1 shows that all three vowels, along with /e/ itself, are the [-low] oral vowels in Edo. Our rule could be formulated thus:
PR1: \[
\begin{bmatrix}
+\text{syll} \\
-\text{high} \\
-\text{low}
\end{bmatrix}
\rightarrow
\begin{bmatrix}
+\text{syll} \\
-\text{low} \\
\alpha F
\end{bmatrix}
+ \ast \text{Past Suffix}
\]

PR1 claims that /e/ copies the features of a preceding [-low] vowel across morpheme boundary. This is illustrated below:

(20) /fi + re/ → firi 'shot'
(21) /he + re/ → herè 'refused'
(22) /wu + re/ → wùrò 'died'
(23) /so + re/ → sòrò 'cried'

Since our condition for the application of PR1 is not met by /e/, /ɔ/ and /a/, which are all [+low], they do not trigger off any alternations.

(24) /de + re/ → dèrè 'bought'
(25) /bɔ + re/ → bɔrè 'built'
(26) /ka + re/ → kårè 'counted'

In examining the nasal vowel alternations, it should first be noted that /e/ and /ɔ/ have no nasal counterparts in Edo. /ʎ/ and /á/ are therefore our only [-low] nasal vowels and in line with the behaviour of the [-low] oral vowels, (16) and (18) can be accounted for by PR1. Nasality also spreads to the lateral approximant /r/.

The other three nasal vowels—/ɛ/, /ɔ/, and /a/—all surface with ðɛ (see (2b), (4b), and (9b). Recall that their oral counterparts occur with /re/ and recall that neither /e/ nor /o/ have a nasal counterpart. It means that we require a phonetic rule which stipulates that when /e/o or /o/ are [+nas], they come out as [ɛ] and [ɔ] respectively. An alternative to a rule will be a morpheme structure condition (MSC) to the same effect. We would prefer an MSC because it makes a significant claim about the sound system of the language. We could then posit our MSC thus:
MSC1: If
\[
\begin{array}{c}
[+\text{syll}] \\
-\text{low}
\end{array}
\begin{array}{c}
-\text{high}
\end{array}
\begin{array}{c}
[+\text{nas}]
\end{array}
\]
\[\rightarrow\]
Then \([+\text{low}]\)

We also need to posit a general rule of nasal assimilation across morpheme boundary which would necessarily be ordered byfore MSC1.

PR2: \([+\text{son}]\rightarrow [+\text{nas}] / [+\text{syll}] +_{+\text{nas}}\)

Our two phonological rules, in conjunction with MSC1, adequately account for all the alternations we have.

1.2. The /\text{lo}/ suffix. As evident from (1c) through (12c), the /\text{lo}/ plural reiterative suffix has the reflexes outlined in (27) below:

(27) a. \(\text{lo}\) when preceded by any of /i/, /u/, /o/

b. \(\text{la}\) when preceded by any of /a/, /a/

c. \(\text{le}\) when preceded by any of /e/

d. \(\text{le}\) when preceded by any of /ε/

e. \(\text{nr}\) when preceded by any of /I/, /ʊ/, /ʊ/, /ʌ/

f. \(\text{ne}\) when preceded by any of /ε/

The /l/ → [n] alternation of (27e) and (27f) can be taken care of by our PR2 of nasal assimilation. /l/ never occurs in nasal environments.

To account for (27b), (27c), and (27d), i.e. /\text{lo}/ → [lɔ], [le], and /le/ respectively, we could formulate a rule thus:
PR3: 
\[
\begin{bmatrix}
+\text{syll} \\
-\text{high} \\
-\text{low} \\
+\text{back}
\end{bmatrix}
\rightarrow
\begin{bmatrix}
\text{LOW} \\
<-\text{round}>
\end{bmatrix} \\
\begin{bmatrix}
\text{LOW} \\
<-\text{back}>
\end{bmatrix}
\]

\[+\text{high} \]

\[+\text{low} \]

\[+\text{Plural/reiterative suffix}\]

\[
\begin{bmatrix}
\text{e} \\
\text{o} \\
\text{e} \\
\text{a} \\
\end{bmatrix}
\rightarrow
\begin{bmatrix}
\text{e} \\
\text{o} \\
\text{e} \\
\text{c} \\
\end{bmatrix}
\]

PR3 thus accounts for all the oral vowel alternations. Note that vowels /i/, /u/, and /o/ (to which PR3 applies vacuously) do not trigger off any alternations:

(28) /ti + lo/ \rightarrow fi \text{l}o \quad \text{‘to shoot’}

(29) /wu + lo/ \rightarrow wu \text{l}o \quad \text{‘to die’}

(30) /so + lo/ \rightarrow so \text{l}o \quad \text{‘to cry’}

Our nasal vowel alternations can be accounted for by a lowering rule or our MSC1 and our nasal assimilation rule, PR2. Observe that each of /i/ and /o/, whose oral counterparts occur with vowel /o/, occur with vowel /5/. Also, recall that Edo has no nasal counterparts for /o/ and /e/. MSC1 above accounts for */5/ surfacing as /5/. This is illustrated in the sample derivation below.

(31) /ti+lo/ /fi+lo/ /bo+lo/ /wu+lo/

PR2: /tin\delta/ - /bun\delta/ -

MSC1: tin5 - bun5 -

OUTPUT: [tin\delta] [bun\delta]

Following are some further derivations illustrating the interaction of PR2, PR3, and MSC1:

(32) /ta+lo/ /d55+lo/ /gb\varepsilon+lo/ /sa+lo/ /gbe+lo/ /d+lo/ /bo+lo/

PR2: tan\delta d55n\delta gb\varepsilon n\delta - - - -

PR3: tan5 d55n5 gb\varepsilon n5 salo gbele - -

MSC1: - - - - - - -

OUTPUT: [tan\delta] [d55n\delta] [gb\varepsilon n\delta] [salo] [gbele] [tan5] [bun5]
1.3. Summary. With three rules and two morpheme structure conditions, we are able to account for all the alternations displayed by the two verbal suffixes in Edo within a linear phonology framework, as in Chomsky and Halle [1968].

2. Domain of Nasality

Our data so far show nasality spreading beyond a segment unto an entire morpheme. Thus we have the following examples:

(33) /gbé+re/ → gbéřè 'wrote'
(34) /gbé+lo/ → gbènè 'to write' (PL)
(35) /tā+re/ → tīří 'flew'
(36) /tā+lo/ → tīnš 'to fly' (PL)

There are instances where both morphemes co-occur. Some examples are given below:

(37) /gbé+lo+re/ → gbènèřè
    write+PL+PAST

(38) /mīè+lo+re/ → mīènèřè
    squeeze+PL+PAST

As opposed to

(39) /gbe+lo+re/ → gbèlèřè
    kill+PL+PAST

(40) /dè+lo+re/ → dèlèřè
    buy+PL+PAST

Since Edo nasal vowels never occur word or morpheme initially, one can say that nasality spreads from left to right since it is the nasality of the vowel(s) of the verb stem which cause(s) nasality on the suffixes. So far, we can define the domain of nasality spread in Edo as a phonological word, viz. a verb stem and its dependent suffixes. Does nasality spread beyond our phonological word onto, say, an object NP? We shall examine this using the examples below:
(41) ə dɔs i fi
3 sg. snap trap
‘he snapped a trap’

(42) ə gbené èbé
3 sg. write+PL book
‘he wrote books’

(43) ə gbené emè hyá ye ɔtò
3 sg. write+PL word all on ground
‘he wrote all the words down’

(44) ə sá èré
3 sg. fetch it
‘he fetched it’

(45) ə sàá èré
3 sg. jump it
‘he jumped it’

(46) ə sàá ógbà
3 sg. jump fence
‘he jumped (over) the fence’

(47) ə tɔ ɔré
3 sg. roast it
‘he roasted it’

In (41), (43), and (46), it is apparent that nasality does not spread onto an object NP. If it did, we would have expected (42) for example to come out as *[ə gbené be] (that is, assuming that the obstruent may block nasality spread) or *[ə gbené be]. In (45) and (47) however, nasality spreads beyond our phonological word as defined above to an object pronoun. We therefore need to redefine the phonological word. But before that, it will be insightful to examine the behaviour of other object pronouns vis-a-vis nasality.
Looking at our examples above, it is obvious that usually nasality does not spread onto an object pronoun. In (48), when $V_1$ gets elided it appears as if $V_2$ acquires the nasality of $V_1$. This is only further proof of the auto segmental status of nasality in Edo. According to Omozuwa [1987] and in personal communication, the nasal feature is not a feature of $V_2$. Instead, it exists on its own tier, even though it does not get lost with the elision of $V_1$.

If (48) and (56) are compared, we observe that with the elision of the final vowel of the verb stem in (56) we have a nasal vowel in collocation with an oral, the initial vowel of the object pronoun. Example (57) below gives further evidence that even though nasality remains when a final nasal vowel is deleted, it does not necessarily become a feature of the following oral vowel across morpheme or word boundary.
Recall that vowels \(/e/\) and \(/o/\) do not have nasal counterparts in Edo and they do not get nasalized. In (57), the elision of the final vowel of the verb stem leaves us with \(/e/\) which is not a nasality bearing unit. However, nasality is still perceived. Since nasality cannot reside on \(/e/\), it follows that it exists on a separate tier and it is not necessarily a feature of the following vowel segment.

An examination of (48) through (56) shows that apart from the third person singular object pronoun, all other object pronouns in the language have their initial segments as close vowels: \(/i/\) or \(/u/\). There is the general tendency for open vowels to be more susceptible to nasality than close vowels. Evidence from Edo lends credence to this fact. The third person singular object pronoun in either of its variants has an initial open vowel, i.e. \([\text{ërɛ}]\) or \([\text{êrɛ}]\). It is therefore not surprising that nasality would spread to the third person singular but not to other object pronouns.

In other words, we are making the claim that with the third person singular object pronoun, we have a case of cliticization. That is, the object pronoun gets cliticized to the verb and forms part of the phonological word as the domain of nasality spread in Edo. This would necessitate a redefinition of the domain of nasality spread in Edo as the verb stem and its dependent suffixes and clitics.

3. An Autosegmental Perspective

3.1. Mapping nasalization. Evidence has been given to show that nasality in Edo is not a feature of the segment but one that exists on a tier distinct from the segmental tier. It is a feature of units larger than the segment. Having defined the domain for nasality spread in Edo, we need to determine those segments which can occur with the feature [+nas]. Hyman [1982] refers to such segments as nasality bearing units (NBU's).

The NBU's in Edo would include all the oral vowels (*\(/e/\) and *\(/o/\) becoming \([\text{ê}]\) and \([\text{ê}]\) respectively by MSC1), the liquid, the glides, and the lateral approximant. These we shall represent with the feature [+son].

Each verb stem will be specified for absence or presence of nasality. Those stems which have the feature will have a single [+nas] specification which our mapping rule MR1 below will spread to all NBU's within our defined domain of application.
Defining the Domain of Nasality in Edo

MR1:  

\[ +N \]

\[ (\text{NBU})^{n} \] ... \[ +NBU \]

(where \([-NBU]\) specifies all the non-nasality bearing units)

What our mapping rule says is that in a stem which has a single \([+N]\) specification, nasality will spread to all the NBU's (marked \([+son]\)) within our defined domain of application. Such a stem may have a \([-NBU]\) (that is, non-nasality bearing unit) as its initial segment. The schema (58) below illustrates this.

(58)  

\[ +N \]

\[ /gb\hat{e}\hat{e}\hat{e}/ \]

write + PL + PAST

By MSC1: \((\varepsilon \rightarrow \varepsilon)\) \hspace{1cm} \[gb\hat{e}\hat{e}\hat{e}\]

Following the association convention [Goldsmith 1976] mapping starts from “left” and goes “rightwards”. In (59) below, our \([+N]\) feature spreads across morpheme and word boundaries.

(59)  

\[ +N \]

\[ /\text{ĩřđ} / \]

\[ /sa + lo + cre \] ... \[ /\text{ĩřđ săn5 řč} \]

they jump + PL it ‘they scaled it (repeatedly)’

By MSC1: \[\text{ĩřđ săn5 řč}\]

An advantage of the auto segmental approach is that we are able to dispense with iterative rule application.

3.2. Problems. However, a number of pertinent issues have been glossed over. One is the question of the status of nasal consonants. Our analysis assumes that
[n] is the realization of /l/ in nasal environments. This seems fairly straightforward. But there are occurrences of /n/, though few, which one would be hard put to explain as realizations of /l/. Examples (60) and (61) below illustrate this point.

(60) nẹnẹ ọ kpì a
    Def. man

    ‘the particular man…’

(61) ọ kpì a nẹ ọ re...
    man REL copy PRO come

‘the man who came…’

/n/ in nene and ne (relative clause marker) cannot possible be explained as being underlyingly /l/. /e/ is one of the two vowels which do not have nasal counterparts. We therefore should expect underlying /lele/ and /le/ to surface as *[lele] and *[le] respectively. Since this is not the case, it follows that Edo has phonemic /n/, even though its occurrence is limited to only a few items. This calls to question Amayo's [1976] recognition of /m/ as the only phonemic nasal consonant in Edo.

Secondly, our explanation for nasality spread onto the third person singular object pronoun to the exclusion of all other pronouns seems ad hoc. But then, it remains the only plausible explanation we can advance to account for the facts of nasality spread within the VP in Edo.

4. Conclusion

Nasality in Edo is evidently a supra-segmental feature whose domain is the verb stem and its dependent suffixes and clitics. The manifestation of nasality spread in the language bears out the fact that open vowels are more amenable to nasal assimilation than close vowels. This claim is supported by evidence from other Edo data in Omozuwa [1987].

We question the designation of /m/ as the only phonemic nasal consonant in Edo by Amayo [1976]. Evidence shows that /n/, though less frequent than /m/, is also phonemic.

A number of details have been left out in this study. What we have done is attempt a definition of the domain of nasality spread in Edo.
REFERENCES


SPEECH TEMPO, CONSONANT DELETION, 
AND TONES IN EDO NOUNS

Victor Edosa Omozuwa
University of Benin, Nigeria

Speech tempo, vowel contraction/elision, and consonant deletion are common phonetic features of the Edo language spoken in Oredo, Orhionmwon, and Ovia Local Government Areas of Bendel State, Nigeria. Vowel contraction/elision in rapid speech usually occurs in word boundaries in larger constructions and often results in tonal modifications of such utterances. This paper focuses on speech tempo as it affects consonant deletion in Edo nouns. Two speech tempos, slow and rapid, will be used in explaining the presence or absence of consonant deletion in the language. Consonant deletion in rapid speech occurs exclusively in nouns. The tonal melody, the number of syllables, and the meanings of such nouns are not affected by consonant deletion. Consonant deletion in Edo nouns follows a regular pattern depending on the articulatory properties of the consonants in a given sequence.

0. Introduction

Speech tempo, vowel elision, and consonant deletion are common phonetic features of the Edo language spoken as a mother tongue in Oredo, Orhionmwo, and Ovia Local Government Areas of Bendel State, Nigeria. It is pertinent to note that these three LGA's (coterminous with the Benin Division of the former Mid-Western State of Nigeria [Agheyisi 1982:v], now Bendel State, constituted the core of what used to be the ancient Benin Kingdom/Empire. The Edo spoken in these three LGA's is "a core member of a larger group of genetically related languages and dialect clusters usually referred to as the Edoid group of languages ..." [Agheyisi 1982:vi]. This group of genetically related languages is

---

1This paper is a revised version of a paper presented at the 8th Conference of the Linguistic Association of Nigeria, Port Harcourt, August, 1987.
what some writers refer to as the "Edo speaking peoples [Melzian 1937:vii, Wescott 1965:182].

The Edo language under discussion is the same language Wescott referred to as Bini, and it is generally homogeneous [Agheyisi 1982:vi], characterized by the absence of dialectal variations due to the highly centralized nature of the sociopolitical structure of the ancient Benin Kingdom [Melzian 1937:vii, Omozuwa 1987:16]. However, noticeable peculiarities do exist in the speech of the inhabitants of some of the peripheral communities [Agheyisi 1982:vi].

Vowel elision in rapid speech in Edo usually occurs at word boundaries in larger constructions and often results in tonal modifications of such utterances. Consonant deletion in rapid speech, on the other hand, occurs exclusively in nouns. This paper, which is one of the reports of experimental study of the Edo language, focuses on speech tempo as it relates to consonant deletion and tones in Edo nouns. We shall limit our discussion to a descriptive explanation of the observed phenomenon. It is also our view that two tempos, slow and rapid, are adequate from a pragmatic point of view for explaining the presence or absence of consonant deletion in Edo nouns. Thus all cases where a consonant is not deleted are regarded as the slow speech tempo, whereas rapid speech tempo is used to refer to all cases where there has been consonant deletion.

We will argue in the present study that consonant deletion in rapid speech in Edo does not result perceptually in a modification or alteration of the basic tonal melody, a reduction of the number of syllables, nor a change in the meanings of such nouns in which a consonant has been deleted, as Wescott's analysis of the phenomenon tends to suggest [Wescott 1962, 1965].

Finally, consonant deletion in disyllabic or polysyllabic nouns follows a regular pattern depending on the nature of the consonant(s) in a given sequence, i.e. whether or not the consonant is "weak" or "strong" or whether the deleted consonant is identical or not to the consonant in the following syllable.

We will first give a brief summary of Wescott's [1965] claims regarding speech tempo effects in Edo, with a view to highlighting areas of agreement and disagreement.

1. Speech Tempo, Consonant Deletion, and Tone

1.1. Wescott's [1965] claims. In this brief summary of Wescott's [1965] article, we shall limit our comments to claims relating to "segmental" phonemes, tones, consonant deletion (which was not given prominence in Wescott's analysis), and speech tempo.

Wescott [1965:182] gives a schematic representation of the seven oral vowel phonemes and "24 consonant phonemes" of Edo (Bini). According to him (p. 183), the language "has a co-vocalic phoneme of nasalization, represented by a syllable closing -rn". However, Omozuwa [1987:70, 161] points out that Edo has
twelve vowel phonemes, seven oral and five nasal, and twenty-five consonant phonemes, the labiodental nasal phoneme /ny/ being absent in Wescott’s analysis.

Wescott was perfectly right when he said that “one of the phonotactic rules of Bini is that in unaccelerated speech, e and o are never nasalized.” However, it is difficult to defend the claim that “… in accelerated speech, e, for example, may become nasalized when the disjunction in the sequence an’e is lost, yielding en” [Wescott 1965:183]. The example given here is certainly not a good one, at least from a native speaker’s point of view. As pointed out in Omozuwa [1987:63], the phonemes /e/ and /o/ are never nasalized, no matter the speech tempo at which they are realized. The fact is that in larger constructions and in rapid speech with its concomitant vowel deletion and tonal modification processes, whenever /e/ or /o/ are responsible for the elision of a nasal bearing element at word boundary, the nasal bearing element is elided while the nasality lingers on in the surface realization. It is pointed out in Omozuwa [in preparation] that the nasality in such cases is co-articulated with the segment immediately preceding the deleted segment since /e/ and /o/ in such cases maintain, perceptually, their oral qualities, a fact that lends weight to an autosegmental treatment of nasalization, especially in the context described above.

We also disagree with Wescott when he says that “… at certain restricted speech tempos … some new segmentals appear …. They are gyh, gwh, zh, sh, j and c,” a fact which runs contrary to the phonetic fact of speech tempo and consonant deletion in Edo, and indeed in languages manifesting the same phenomenon (cf. Abimbola & Oyelaran [1975] for the case of Yoruba) as we shall explain below.

It is also pertinent to remark that some of the “phonemically unitary segmentals” such as YW, Z, J, D3, TF claimed by Westcott to appear at “restricted speech tempos” do not form part of the phonemic inventory of Edo (no matter the tempo).

On tones, Wescott [1965:183] claimed that “Bini also has six phonemic tones, named and marked as follows (illustrated with the vowel a):

<table>
<thead>
<tr>
<th>Tone</th>
<th>Mark</th>
<th>Mark</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 top</td>
<td>1</td>
<td>4 low</td>
<td>4</td>
</tr>
<tr>
<td>2 high</td>
<td>2</td>
<td>5 flat</td>
<td>5</td>
</tr>
<tr>
<td>3 mid</td>
<td>3</td>
<td>6 bottom</td>
<td>6</td>
</tr>
</tbody>
</table>

Wescott [1965] identified at least seven temporal variations in his “tentative” exploration of speech tempo in Edo. It is the opinion of the present writer that Wescott appeared to be “meticulous” to the point of distorting the phonetic facts of the language. For instance, it is not true that “consonant doubling of the type seen in [eggo] ‘bell’, is also a strictly temporal phenomenon: in ceremonious
speech, it can only be pronounced \[\text{[\text{\textit{epogo}}]}\] and in slurred speech \[\text{[\text{\textit{ego}}]}\] [Wescott 1965:185]. The word \[\text{[\text{\textit{ego}}]}\] is meaningless in Edo as evidenced by the negative response to such stimulus by a group of Edo native speakers (studying linguistics) in a listening test. Similarly, Wescott's [1965:185] analysis of the different forms of the word “\text{ihinrin} ‘nine’ induced by consecutive tempo changes” is misleading in the sense that the forms in his ceremonious \[\text{[\text{\textit{ihinbhinlin}}]}\] and slurred \[\text{[\text{\textit{ihin}}]}\] speech tempos are two different lexical items in Edo, viz. the name of an Edo village (the correct tonal melody of the word being 1 4 4 1 following Wescott's notation) and ‘catarrh’, respectively. A careful examination of some of the items of Wescott's TABLE 4: TEMPORAL TONEME CHANGES reveals similar cases of forms with different meaning or no meaning at all. Such forms are presented in the table below (following Wescott's presentation):

<table>
<thead>
<tr>
<th>Number</th>
<th>Syllabic tonality</th>
<th>Word at tempo 1</th>
<th>Translation</th>
<th>Same word at tempo 4</th>
<th>Same word at tempo 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>TLF</td>
<td>1 4 14 oghodua</td>
<td>‘the Almighty’</td>
<td>1 4 14 o’odua</td>
<td>1 2 odwa ?</td>
</tr>
<tr>
<td>4</td>
<td>TLR</td>
<td>1 4 4 1 igiorlua</td>
<td>‘water-yam’</td>
<td>1 4 1 igio’a</td>
<td>1 2 ija ?</td>
</tr>
<tr>
<td>6</td>
<td>TFL</td>
<td>1 14 4 ubgaarlo</td>
<td>‘eyebrow’</td>
<td>1 1 5 ugba’o</td>
<td>1 1 uba ?</td>
</tr>
<tr>
<td>7</td>
<td>TFF</td>
<td>1 14 14 ikhinbhiin</td>
<td>Newbouldia laevis (a tree)</td>
<td>1 1 24 ikhibhiin</td>
<td>1 1 1 ikhin ?</td>
</tr>
<tr>
<td>9</td>
<td>TRT</td>
<td>1 4 1 uhukpa</td>
<td>‘suddenness’</td>
<td>1 2 1 uhukpa</td>
<td>1 2 ukpa ?</td>
</tr>
<tr>
<td>10</td>
<td>TRL</td>
<td>1 4 1 uhuki</td>
<td>‘evil effect’</td>
<td>1 2 4 uhuki’</td>
<td>1 4 uk ?</td>
</tr>
<tr>
<td>12</td>
<td>TRR</td>
<td>1 4 1 ateete</td>
<td>‘grasshopper’</td>
<td>1 2 2 ateete</td>
<td>1 2 ate ?</td>
</tr>
<tr>
<td>16</td>
<td>LLR</td>
<td>4 4 4 1 omuheen</td>
<td>‘a beginning’</td>
<td>4 4 4 1 omuheen</td>
<td>4 1 omwen ?</td>
</tr>
<tr>
<td>18</td>
<td>LFL</td>
<td>4 14 4 esosi</td>
<td>‘church’</td>
<td>4 1 5 esosi</td>
<td>1 5 esi ?</td>
</tr>
<tr>
<td>20</td>
<td>LFR</td>
<td>4 14 4 1 ekpookpo</td>
<td>‘bullet’</td>
<td>4 1 3 ekpokpo</td>
<td>4 1 ekpo ?</td>
</tr>
</tbody>
</table>

In a footnote on page 188, Wescott states that “? means that this particular pronunciation was unknown to at least one informant.” This statement tends to confirm our claim that consonant deletion at a rapid speech tempo does not lead to a distortion of the form, meaning, and tonal melody of such words. We will quickly make a few remarks concerning some of the items in the above table. First, we do not agree with Wescott that there is any form of consonant deletion
and syllable reduction in items 3, 7, and 18, as we shall explain in the present analysis. Secondly, the tonal melodies for each of these words as specified by the author are certainly not correct. With regard to the forms of all the items in the above table in the column “Same word at tempo 7”, these are either meaningless or belong to different lexical formatives (with some tonal modifications in some cases). The forms of items 3, 4, 6, 7, 12, and 16 “at tempo 7”, for instance, have no linguistic meaning in the language. On the other hand, the forms of items 9, 10, 18, and 20 are different lexical formatives (but with different tonal melodies) meaning ‘lamp’, ‘moon’, ‘pig’, and ‘masquerade’, respectively. The correct tonal melodies of items 9, 10, 18, and 20 are as follows (using Wescott’s notation):

1.2. The present analysis: deletion of lax consonants in intervocalic position in Edo nouns. In the present study we will attempt to give a more systematic analysis of consonant deletion in Edo with a view to highlighting some of the phonetic motivations of the phenomenon in specific contexts.

Lax consonants are “often rather weak”, especially in intervocalic position [Ward 1952:§255 ff & 275]. They are therefore easily elided in many languages (cf. Ward [1952], Wescott [1965], Fresco [1970], Jeje [1972], Abimbola & Oyelaran [1975]). In Edo, [j] and [h] are such lax consonants usually deleted in rapid speech in intervocalic position. Of these two consonants, [j] is particularly weak in the sense that it is deleted in rapid speech wherever it occurs in an Edo noun in cooccurrence with other consonants or when it constitutes the only consonantal segments in a polysyllabic noun. We note here that all Edo nouns begin with and end in a vowel.

1.2.1. [j] deletion in nouns of more than one syllable. The Edo alveolar voiced frictionless approximant is usually deleted in rapid speech in disyllabic and polysyllabic nouns (without modification of the tonal melody) as can be seen from the following examples:

The symbol [j] is used in the present study to represent the Edo voiced alveolar frictionless approximant (glide) during whose production the front of the tongue makes a single upward and downward movement (in slow speech) and may or may not strike the alveolar ridge. The symbol [č] has always been used in published materials by linguists who have worked on Edo, e.g. Melzian [1937], Agheyisi [1982], Omozuwa [1987], and Amayo & Elugbe [1983], however, proposed [č] or [j].
<table>
<thead>
<tr>
<th>Orthography</th>
<th>Gloss</th>
<th>Slow Speech</th>
<th>Rapid Speech</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) ̀arò</td>
<td>‘eye’</td>
<td>[̀aɾo]</td>
<td>[aɾo]</td>
</tr>
<tr>
<td>(2) ̀rô</td>
<td>‘thought’</td>
<td>[iɾo]</td>
<td>[i o]</td>
</tr>
<tr>
<td>(3) òrù</td>
<td>‘thread’</td>
<td>[oɾù]</td>
<td>[où]</td>
</tr>
<tr>
<td>(4) òrè</td>
<td>‘mat’</td>
<td>[oɾè]</td>
<td>[oè]</td>
</tr>
<tr>
<td>(5) òrè</td>
<td>‘outside’</td>
<td>[oɾè]</td>
<td>[oè]</td>
</tr>
<tr>
<td>(6) èrô</td>
<td>name of an Edo chief</td>
<td>[ẹɾo]</td>
<td>[ẹò]</td>
</tr>
<tr>
<td>(7) ̀rì</td>
<td>‘200’</td>
<td>[rì]</td>
<td>[rì]</td>
</tr>
<tr>
<td>(8) ̀ràn</td>
<td>‘they’</td>
<td>[iɾà]</td>
<td>[i à]</td>
</tr>
<tr>
<td>(9) èvbàrè</td>
<td>‘food’</td>
<td>[ẹβàɾẹ]</td>
<td>[ẹβàɾẹ]</td>
</tr>
<tr>
<td>(10) òròkà</td>
<td>‘ring’</td>
<td>[oɾɔkà]</td>
<td>[oɾɔkà]</td>
</tr>
<tr>
<td>(11) èrókhi ̀n</td>
<td>‘chameleon’</td>
<td>[ẹrɔkhi]</td>
<td>[ẹrɔkhi]</td>
</tr>
<tr>
<td>(12) úgbàl̀rò</td>
<td>‘eyelashes’</td>
<td>[úgbàl̀ɾò]</td>
<td>[úgbàl̀ɾò]</td>
</tr>
<tr>
<td>(13) íkòrò</td>
<td>type of brass armlet</td>
<td>[íkòɾò]</td>
<td>[íkòɾò]</td>
</tr>
<tr>
<td>(14) úrùvbà</td>
<td>a disease of the spleen</td>
<td>[úɾùvba]</td>
<td>[úɾùvba]</td>
</tr>
<tr>
<td>(15) òkàrò</td>
<td>‘first’</td>
<td>[òkàɾò]</td>
<td>[òkàɾò]</td>
</tr>
<tr>
<td>(16) òrókè</td>
<td>‘horse-tail whisk’</td>
<td>[òrókè]</td>
<td>[òrókè]</td>
</tr>
<tr>
<td>(17) íkòròbà</td>
<td>‘pail’</td>
<td>[íkòròbà]</td>
<td>[íkòròbà]</td>
</tr>
<tr>
<td>(18) òrùkhò ̀q</td>
<td>‘sin’</td>
<td>[òrùkhòq]</td>
<td>[òrùkhòq]</td>
</tr>
<tr>
<td>(19) ùkpàrámwè</td>
<td>‘coated tongue’</td>
<td>[ùkpàrámwè]</td>
<td>[ùkpàrámwè]</td>
</tr>
<tr>
<td>(20) ̀ròrì nmwì</td>
<td>‘funeral service’</td>
<td>[iɾòɾì nmì]</td>
<td>[i oɾì nmì]</td>
</tr>
<tr>
<td>(21) úrò̀l’mè</td>
<td>‘gutter’</td>
<td>[úɾò̀l’mè]</td>
<td>[úɾò̀l’mè]</td>
</tr>
<tr>
<td>(22) òròghòdò</td>
<td>name of an Eka village</td>
<td>[òròghòdò]</td>
<td>[òròghòdò]</td>
</tr>
<tr>
<td>(23) ùkò̀ròbò̀dò</td>
<td>variety of wild fowl</td>
<td>[ùkò̀ròbò̀dò]</td>
<td>[ùkò̀ròbò̀dò]</td>
</tr>
<tr>
<td>(24) ìrànòmwi’ràn</td>
<td>species of water plant</td>
<td>[iɾànòmwi’ràn]</td>
<td>[iɾànòmwi’ràn]</td>
</tr>
<tr>
<td>(25) ìrògbètìn</td>
<td>a name</td>
<td>[iɾògbètìn]</td>
<td>[iɾògbètìn]</td>
</tr>
</tbody>
</table>

Following Abimbola & Oyelaran [1975:49], the following [j] deletion rule specifies the contexts in which [j] deletion applies:

R1 \[j \rightarrow \emptyset / [(VC)_0 V \_\_ V (CV(CV))_0]_{\text{Formative}}\]
1.2.2. [h] deletion in nouns of more than one syllable. Like [j], the Edo glottal fricative [h] (intervocalic breathy voice) is usually deleted in rapid speech as can be seen from the following nouns.

(26) ẹhá  'three'  [ẹhá]  [ẹá]
(27) ẹhó  'neck'  [ẹhó]  [ẹó]
(28) i hín  'catarrh'  [i hí]  [îf]
(29) i hàn  'wrong side'  [i hà]  [i à]
(30) i hà  'divination'  [i hà]  [i à]
(31) ühë  'vagina'  [ùhé]  [ùé]
(32) ühè  'Ife'  [ùhe]  [ùe]
(33) ühi  an Edo village  [ùhi]  [ùí]
(34) ühí  'law'  [ùhi]  [ùí]
(35) üháé'só  'swallow'  [ùháé'só]  [ùáé'só]
(36) ühó'ghè  'lie'  [ùhó'γè]  [ùó'γè]
(37) ühùkpa  'once'  [ùhúk'pa]  [ùúk'pa]
(38) ühúkì  'evil spirit'  [ùhúkì]  [ùúkì]
(39) üvbí'chá  'bride'  [ùβjí'chá]  [ùβjí'á]
(40) ümùhën  'a beginning'  [ùmùhé]  [ùmùé]
(41) ügbì hàn  'blind side'  [ùgbì hà]  [ùgbì à]
(42) übáhìágbön  a name  [ùbáhjágbö]  [ùbájágbö]

The following rule specifies the contexts in which [h] deletes in Edo:

R2  [h]  →  Ø / [(VC)₀ VCV___(C)₀ V (CV)₀]_Formative

The parenthesized (C) following the environment bar is illustrated in (42).
R2 is blocked if [h] and [j] are present in the same formative of three or more syllables (whether or not in contiguous syllables). In such cases [j] is usually deleted since it is weaker than [h], as can be seen in the following examples:

(43) i hòrì  'nothing'  [i hòrì]  [i hòrì]
(44) ühó'ro  'pawpaw'  [ùhó'ro]  [ùhó'ro]
(45) i hìnì  'nine'  [i hìnì]  [i hìnì]
(46) ühìónron  'small snails'  [ùhìónròn]  [ùhìónròn]
1.2.3. \([m], [\text{\texteta}], 3\) and \([n]\) deletion. These nasal consonants, which equally are lax consonants, are sometimes deleted in trisyllabic and polysyllabic nouns but never in disyllabic nouns.

In cases where these consonants are deleted in trisyllabic and polysyllabic nouns, they have to constitute the lax consonants in the sequence. They usually do not occur in \(C_1\) position except in cases where \(C_1\) and \(C_2\) are identical, in which case \(C_1\) is deleted (cf. §1.2.4) and the surrounding vowels are usually identical, as can be seen from the following examples:

3\(^{\text{a}}\)The symbol \([\text{\texteta}]\) (orthographic \(mw\)) represents a labio-dental frictionless nasal approximant produced with the approximation of the lower lip and the upper teeth and a lowering of the velum.
But consider the following examples in which the vowels surrounding the nasal consonant are not identical: 4

(73) ụkọ́n’mwẹ̀ ‘act of being stupid’ [ụkọ́n’mẹ̀] [ụkọ́n’mẹ̀]
(74) ụkhiọ́nmwẹ̀ ‘half’ [ụkhiọ́nmẹ̀] [ụkhiọ́nmẹ̀]
(75) ọgbànmwẹ̀ ‘jaw’ [ọgbànmẹ̀] [ọgbànmẹ̀]
(76) ụlọ́mwà ‘restriction order’ [ụlọ́mẹ̀] [ụlọ́mẹ̀]
(77) ụvian’mwẹ̀ ‘act of complaining’ [ụvian’mẹ̀] [ụvian’mẹ̀]
(78) ụvbé’lmwẹ̀ ‘(act of) being scarce’ [ụvbé’lmẹ̀] [ụvbé’lmẹ̀]
(79) ụtú’lmwẹ̀ ‘act of crying’ [ụtú’lmẹ̀] [ụtú’lmẹ̀]
(80) ị mị’nà ‘dream’ [ị mị’nà] [ị mị’nà]
(81) ụfú’lmwẹ̀ ‘act of being gentle’ [ụfú’lmẹ̀] [ụfú’lmẹ̀]
(82) èmàbà a type of drum [èmàbà] [èmàbà]
(83) èmàltòn ‘iron’ [èmàltòn] [èmàltòn]
(84) ènọfè a name [ènọfè] [ènọfè]
(85) ènàbùlèlè a name [ènàbùlèlè] [ènàbùlèlè]
(86) ènàghì’sè a name [ènàghì’sè] [ènàghì’sè]

In all the cases considered so far, the resultant hiatus is realized with a minor disjuncture which, together with the tonal melody, are the perceptual cues for syllable division in words in which there has been consonant deletion. It should also be noted that in all the examples above, consonant deletion is not conditioned by the vocalic context, i.e. sequences of all Edo vowels can occur in any of the vowel slots as specified above.

It is interesting to note too that where there are minimally contrastive forms of words from which [h] and [j] have been deleted, the context in which such words are used removes any form of ambiguity. Consider the following examples: the form [ẹs] could be the elided form of [ẹhẹ] ‘neck’ or [ẹj] (name of an Edo

---

4Examples 73, 77, 78, 79, and 81 are all verb based nouns.
In rapid speech, and depending on context, the utterance \( [ο\tilde{β}_1\,ο\tilde{δ}] \rightarrow [ο\tilde{β}_2\tilde{β}_2\tilde{δ}] \) could be interpreted as follows:

\[
[ο\tilde{β}_1\,ο\tilde{δ}] \rightarrow [ο\tilde{β}_2\tilde{β}_2\tilde{δ}]
\]

(a) child Ero
(b) small voice, neck

(cf. also the elided forms of (7), (33)). However, cases of such minimally contrastive forms resulting from consonant deletion are not very common.

1.2.4. Consonant deletion in “reduplicative formatives”\(^5\) in Edo. In an Edo sequence \( V_1C_1V_2C_2V_3(C_3V_4) \), where \( C_1 = C_2 \neq C_3 \) and \( V_2 = V_3 \), or where \( C_2 = C_3 \neq C_1 \) and \( V_3 = V_4 \), the first of the identical consonants is usually deleted:

\begin{align*}
(87) & \quad 6b6b6 \quad \text{‘flower’} & \quad [6b6b6] & \quad [66b6] \\
(88) & \quad \tilde{e}v\tilde{b}v\tilde{b}a6 \quad \text{‘father’} & \quad [\tilde{e}\beta\tilde{b}\tilde{b}a] & \quad [\tilde{e}\tilde{a}\beta\tilde{a}] \\
(89) & \quad \tilde{a}\tilde{t}\tilde{t}\tilde{e} \quad \text{‘straw tray’} & \quad [\tilde{a}\tilde{t}\tilde{t}\tilde{e}] & \quad [\tilde{a}\tilde{t}\tilde{t}\tilde{e}] \\
(90) & \quad \tilde{a}\tilde{t}\tilde{t}\tilde{e} \quad \text{‘grasshopper’} & \quad [\tilde{a}\tilde{t}\tilde{t}\tilde{e}] & \quad [\tilde{a}\tilde{t}\tilde{t}\tilde{e}] \\
(91) & \quad \tilde{o}\tilde{s}\tilde{i}\tilde{i} \quad \text{‘gun’} & \quad [\tilde{o}\tilde{s}\tilde{i}\tilde{i}] & \quad [\tilde{o}\tilde{s}\tilde{i}\tilde{i}] \\
(92) & \quad \tilde{e}\tilde{g}\tilde{g}\tilde{o} \quad \text{‘bell, gong’} & \quad [\tilde{e}\tilde{g}\tilde{g}\tilde{o}] & \quad [\tilde{e}\tilde{g}\tilde{g}\tilde{o}] \\
(93) & \quad \tilde{u}\tilde{k}\tilde{o}\tilde{k}\tilde{o} \quad \text{‘pipe’} & \quad [\tilde{u}\tilde{k}\tilde{o}\tilde{k}\tilde{o}] & \quad [\tilde{u}\tilde{k}\tilde{o}\tilde{k}\tilde{o}] \\
(94) & \quad \tilde{a}\tilde{k}\tilde{p}\tilde{a}\tilde{k}\tilde{p} \quad \text{‘spider’} & \quad [\tilde{a}\tilde{k}\tilde{p}\tilde{a}\tilde{k}\tilde{p}] & \quad [\tilde{a}\tilde{a}1\tilde{k}\tilde{p}\tilde{a}] \\
(95) & \quad \tilde{u}\tilde{k}\tilde{p}\tilde{o}\tilde{k}\tilde{p}\tilde{o} \quad \text{‘stick’} & \quad [\tilde{u}\tilde{k}\tilde{p}\tilde{o}\tilde{k}\tilde{p}\tilde{o}] & \quad [\tilde{u}\tilde{k}\tilde{p}\tilde{o}\tilde{k}\tilde{p}\tilde{o}] \\
(96) & \quad \tilde{u}\tilde{k}\tilde{p}\tilde{o}\tilde{k}\tilde{p}\tilde{o} \quad \text{‘worries’} & \quad [\tilde{u}\tilde{k}\tilde{p}\tilde{o}\tilde{k}\tilde{p}\tilde{o}] & \quad [\tilde{u}\tilde{k}\tilde{p}\tilde{o}\tilde{k}\tilde{p}\tilde{o}] \\
(97) & \quad \tilde{i}\tilde{g}\tilde{h}\tilde{o}\tilde{g}\tilde{h}\tilde{o} \quad \text{‘smoke’} & \quad [\tilde{i}\tilde{g}\tilde{o}\tilde{y}\tilde{o}] & \quad [\tilde{i}\tilde{y}\tilde{o}\tilde{y}] \\
(98) & \quad \tilde{o}\tilde{g}\tilde{h}\tilde{o}\tilde{g}\tilde{h}\tilde{o} \quad \text{‘joy’} & \quad [\tilde{o}\tilde{g}\tilde{y}\tilde{o}\tilde{y}] & \quad [\tilde{o}\tilde{y}\tilde{o}\tilde{y}] \\
(99) & \quad \tilde{o}\tilde{k}\tilde{h}\tilde{o}\tilde{k}\tilde{h}\tilde{o} \quad \text{‘hen’} & \quad [\tilde{\tilde{o}}\tilde{x}\tilde{x}\tilde{o}] & \quad [\tilde{\tilde{o}}\tilde{x}\tilde{x}\tilde{o}] \\
(100) & \quad \tilde{u}\tilde{t}\tilde{t} \quad \text{‘low hill’} & \quad [\tilde{u}\tilde{t}\tilde{t}] & \quad [\tilde{u}\tilde{t}\tilde{t}] \\
(101) & \quad \tilde{i}\tilde{h}\tilde{h}\tilde{i}\tilde{h} \quad \text{a type of beans} & \quad [\tilde{i}\tilde{h}\tilde{h}\tilde{h}\tilde{h}] & \quad [\tilde{i}\tilde{h}\tilde{h}\tilde{h}] \\
(102) & \quad \tilde{i}\tilde{h}\tilde{h}\tilde{h}\tilde{i}\tilde{h}\tilde{h} \quad \text{‘great grandchild’} & \quad [\tilde{i}\tilde{h}\tilde{h}\tilde{h}\tilde{h}\tilde{h}] & \quad [\tilde{i}\tilde{h}\tilde{h}\tilde{h}] \\
(103) & \quad \tilde{i}\tilde{r}\tilde{h}\tilde{o}\tilde{r}\tilde{h} \quad \text{‘chaff’} & \quad [\tilde{i}\tilde{r}\tilde{r}\tilde{r}] & \quad [\tilde{i}\tilde{r}\tilde{r}] \\
\end{align*}

\(^5\)The term “reduplicative formative” is used here in a purely descriptive sense and refers to “formatives with a sequence of two identical non-syllabic segments” [Abimbola & Oyelaran [1975:45], each followed by single identical vowels, as distinct from Yoruba as described by Abimbola & Oyelaran [op. cit.], where the vowels need not be identical. Examples such as \( [\tilde{i}\tilde{k}\tilde{o}\tilde{k} \tilde{a}] \) (a village name) and \( [\tilde{i}\tilde{t}\tilde{o}\tilde{l}\tilde{a}] \) ‘the act of sitting’ are very rare in Edo.

\(^6\)This could also be pronounced \([\tilde{e}\tilde{b}\tilde{a}\tilde{b}a]\) in slow speech and \([\tilde{e}\tilde{b}\tilde{a}\tilde{b}a]\) in rapid speech.
In their account of consonant deletion in “reduplicative formatives” in Yoruba, Abimbola & Oyelaran ([1975:46] proposed the following rule to account for the data below:

P3 Reduplicative formative consonant deletion

\[
\begin{array}{c}
[-\text{syl}] \rightarrow \emptyset / \\
\text{1} \\
\end{array}
\begin{array}{c}
\text{[+syl] N} \\
\text{[-high]} \\
\end{array}
\begin{array}{c}
\text{[+syl]} \\
\text{[+high]} \\
\end{array}
\begin{array}{c}
\text{[+syl]} \\
\text{[+high]} \\
\end{array}
\begin{array}{c}
\text{1} \\
\text{2} \\
\end{array}
\text{\left[ \begin{array}{c}
\text{[+syl]} \\
\text{[+high]} \\
\end{array} \right]} \\
\text{\left[ \begin{array}{c}
\text{[+syl]} \\
\text{[+high]} \\
\end{array} \right]} \\
\text{\left[ \begin{array}{c}
\text{[+syl]} \\
\text{[+high]} \\
\end{array} \right]} \\
\text{\left[ \begin{array}{c}
\text{[+syl]} \\
\text{[+high]} \\
\end{array} \right]}
\end{array}
\]

Condition: 1 = 2

According to them, this rule deletes the first consonant “when the formative is a noun, and the two consonants are identical. The initial vowel is non-high, and, when the second is not high, the last two vowels must be identical” [Abimbola & Oyelaran 1975:46]. This rule does not seem to fit the Edo material since in the first place there is no restriction as to what vowel can occur in V₁. Seconding, in Edo for C₁ to be deleted, C₁ has to be identical to C₂ and V₂ identical to V₃ in the case of trisyllabic nouns. Thus, the following consonant deletion rule is pro-
posed to account for the fact that the vowels surrounding the second consonant C₂ or C₃ (in the case of formatives with more than three syllables—cf. 105) must be identical for C₁ to be deleted in the former and C₂ in the latter.⁸ In a linear rule, this is stated as

\[
\text{R3} \quad \ldots \ V \ C_i \ V_j \ C_i \ V_j \ldots \rightarrow \ldots \ V \ V_j \ C_i \ V_j \ldots
\]

where "..." contains no word boundaries and V_j may or may not vary only with respect to tonal features.

The Edo data presented in §1.2.4 seem to provide further support for phonological models in which vowels and consonants are represented on separate tiers [Halle & Vergnaud 1980, 1982; McCarthy 1981; Pulleyblank 1983]. We will assume, as suggested by McCarthy [1981] that "the consonantal and vocalic patterns are to be considered as autosegmental levels and that the CV skeleta ... be given the theoretical status of the basic autosegmental tier ..." [Van der Hulst & Smith 1982:25]. Another basic assumption, following Halle & Vergnaud [1982:68-69], is that consonant deletion in reduplicative formatives in Edo involves copying the whole word melody from left to right or vice versa and that segments that are left over, i.e. not associated, (in rapid speech) do not receive any phonetic realization "and forever remain in a phonetic limbo condemned never to see the bright light of phonetic reality" [Halle & Vergnaud 1982:69]. R3 is more or less a formalisation of this phenomenon. Consequently, vocalic elements are to be associated with the V-tier while the consonantal elements are to be associated with the C-tier in the CV skeleta. Furthermore, the tonal tier will be linked directly to the CV skeleta in the present study (to make for a neater representation using broken lines) since according to Pulleyblank [1983:37], the special nature of the skeletal tier is that "autosegmental tiers can only link slots in the skeletal tier", thus allowing "tiers to radiate out from a central skeletal tier ...". Using the examples of trisyllabic reduplicative formatives in Edo in (87-89) respectively, this can be illustrated as shown below:⁹

---

⁸We are highly grateful to R.G. Schuh for his useful suggestion regarding the formulation of this rule.

⁹As stated in Melzian [1937], Amayo [1976], and experimental evidence contained in Omozuwa [1987], a Low tone immediately following a High tone is realized as a Falling tone, i.e. a /H.L/ sequence is realized as a [H.HL] sequence. This language specific rule is required in order to obtain the correct phonetic realization in the mapping convention.
The mapping conventions adopted in the present study are open to further research.

1.2.5. Absence of consonant deletion. In an Edo trisyllabic or polysyllabic noun there is absence of consonant deletion in rapid speech in the contexts given under §§1.2.5.1-3 below.

1.2.5.1. The consonants in the sequence have different points of articulation but the same mode of production irrespective of the nature of $V_2$ and $V_3$.

(107) ọgbádá  ‘flowing gown’  [ọgbádá]  [ọgbádá]
(108) ọbádàn  ‘Ficus vogellii’  [ọbádàn]  [ọbádàn]
(109) ọgọ’bọ  ‘left hand’  [ọgọ’bọ]  [ọgọ’bọ]
(110) ẹdógún  a name  [ẹdógún]  [ẹdógún]
1.2.5.2. The consonants in the sequence have different points and modes of articulation irrespective of the nature of V₂ and V₃.

1.2.5.3. The consonants in the sequence have the same point of articulation but different modes of production, even in cases where V₂ and V₃ are identical, i.e. the consonants in the sequence differ in at least one feature.
2. Experimental Investigation

A preliminary electroglottographic study of consonant deletion in Edo nouns was undertaken with a view to verifying our claims that there is neither an alteration of the tonal melody nor a reduction of the number of syllables in nouns where there has been consonant deletion as the preliminary analysis by Wescott [1962, 1965] seems to suggest. It is therefore not intended to be a detailed acoustic analysis of the phenomenon. The acoustic results are presented to provide an easy means of comparing tokens at both the slow and rapid speech-temps. Thus, the recorded items in the present paper, i.e. one repetition of nine Edo nouns at both the slow and rapid speech tempos by one Edo speaker, will serve as a basis for such verification. Consequently, the relative pitches of contiguous syllables at the slow speech tempo will be compared with corresponding syllables at the rapid speech tempo with a view to determining whether or not there has been syllable reduction and/or a change in the direction of pitch contour which, incidentally, should lead to a change in meaning of such tokens, or whether or not there is a substantial difference in duration between tokens uttered in slow speech and the same tokens uttered in rapid speech.

2.1. Procedure. A corpus of nine Edo trisyllabic nouns (see Tables 1 and 2 below) translated into English was presented to a female speaker of Edo. The corpus was present in English in order to avoid any possible influence or difficulty the informant might have in reading the Edo orthography, especially with tone markings.

Two electrodes mounted on an elastic band and placed one on each side of the informant's larynx were connected to a melody analyser which was in turn coupled to an oscillograph (oscillomink). A microphone placed a few centimeters in front of the informant was equally connected to the oscillograph (see Figure 1 below for experimental set up). The informant was asked to pronounce each of the nine tokens in Edo, first in slow speech, then in rapid speech. The phonogram and the tonal contour for each token were thus obtained graphically at two different speech tempos.

2.2. Results and discussion. Statistical results of the oscillographic tracings are shown in Tables 1 and 2. In interpreting the acoustic tracings for each token pronounced in slow and rapid speech, the following parameters were taken into consideration: the fundamental frequency value \( F_o \) at the beginning and end of each syllable, the total duration of each word, and the reduction of the number

---

10This experimental investigation was carried out in the Phonetics Laboratory of the Université de Franche-Comté, Besançon, France. Many thanks to Professor E. Lhote for her useful comments and suggestions.
Table 1. Speech tempo and tonal realizations

<table>
<thead>
<tr>
<th>WORDS</th>
<th>SLOW SPEECH</th>
<th>RAPID SPEECH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Syllable 1</td>
<td>Syllable 2</td>
</tr>
<tr>
<td></td>
<td>$F_0^i$</td>
<td>$F_0^f$</td>
</tr>
<tr>
<td>1. [égo̞gô]</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>2. [úkôkô]</td>
<td>31</td>
<td>27</td>
</tr>
<tr>
<td>3. [úkpôkô]</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>4. [ikêkê]</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>5. [ékêkê]</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>6. [i hêfê]</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>7. [únhêkô]</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>8. [uhuki]</td>
<td>29</td>
<td>28</td>
</tr>
<tr>
<td>9. [ôhô'ye]</td>
<td>34</td>
<td>35</td>
</tr>
</tbody>
</table>

(F0 values expressed in quarters of a tone below reference frequency of 600 HZ)

Table 2. Speech tempo and word duration

<table>
<thead>
<tr>
<th>SLOW SPEECH</th>
<th>RAPID SPEECH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Words</td>
<td>Duration</td>
</tr>
<tr>
<td>1. [égo̞gô]</td>
<td>530 ms</td>
</tr>
<tr>
<td>2. [úkôkô]</td>
<td>530 ms</td>
</tr>
<tr>
<td>3. [úkpôkô]</td>
<td>520 ms</td>
</tr>
<tr>
<td>4. [ikêkê]</td>
<td>610 ms</td>
</tr>
<tr>
<td>5. [ékêkê]</td>
<td>440 ms</td>
</tr>
<tr>
<td>6. [i hêfê]</td>
<td>570 ms</td>
</tr>
<tr>
<td>7. [únhêkô]</td>
<td>620 ms</td>
</tr>
<tr>
<td>8. [uhuki]</td>
<td>560 ms</td>
</tr>
<tr>
<td>9. [ôhô'ye]</td>
<td>470 ms</td>
</tr>
</tbody>
</table>

Figure 1. Experimental Set-up for Electroglottographic Method
Figure 2. Speech Tempo and Tonal Realisations

Scale: Vertical axis, 1 mm represents 3/4 of a tone.
Horizontal axis, 1 mm represents 20 milliseconds.
of consonant spaces. The latter provides a very easy basis for identifying words in which there has been consonant deletion.

On the acoustic tracings, fundamental frequency (F₀) values are presented logarithmically on a musical scale in quarters of a tone below a predetermined reference frequency of 600 HZ (cf. Table 1) while duration is presented in milliseconds (ms) (cf. Table 2). Thus, 1mm on the vertical axis represents 3/4 of a tone below the reference frequency, while 1mm on the horizontal axis represents 20ms. For example, the initial F₀ value (F₀initial) of the [ɛ] of [ɛgọgọ] is 31 quarters of a tone below 600 HZ. The F₀ value at the end point of the same syllabic element is equally 31 quarters of a tone below the reference frequency.

Results of this experiment show that the tonal melodies of words are not affected by speech tempo and consonant deletion even though variations in terms of absolute pitch values might be observed in words produced in slow and in rapid speech. Let us consider, for instance, the word [ɛgọgọ] 'bell'. In slow speech, each syllabic peak of the word carries a High tone realized on the same pitch level characteristic of a sequence of High tones in Edo: 31 quarters of a tone from the beginning to the end of each of the first two syllabic peaks, 32 quarters of a tone at the beginning and 31 at the end of the third syllabic peak. Moreover, the micromelody for the voiced consonant [g] of the last two syllables of the word is easily identifiable, showing that no consonant has been deleted. In rapid speech, F₀ initial value of the High tone of the first syllabic peak of the word is 34 quarters of a tone while the end point of the F₀ realization is 32 quarters of a tone below the reference frequency (the positive value of F₀ variation when F₀ variation on a syllabic peak is nil is the perceptual cue for identifying a High tone in Edo). The High tone on the second and third syllabic peak is realized on the same pitch level, 32 quarters of a tone from the beginning to the end of the F₀ realization.

However, the reduction in the number of the micromelody for the voiced consonants from two to one clearly indicates the absence of the first consonant in the V₁C₁V₂C₂V₃ word at the rapid speech tempo.

The results of this study further reveal that words tend to have longer duration (cf. Table 2) in slow speech than in rapid speech (with the exception of [ ámbọ́ ámbọ́] and [úhúkí] where a Low tone follows a High tone in word final position). This is to be expected, especially in cases for which consonant deletion is not compensated in terms of duration, by the minor disjuncture of the resultant hiatus.

---

¹¹The difference in absolute pitch between the repetition of this word at two speech tempos is not linguistically significant since the same relative pitch range is maintained between contiguous syllables. It is for this reason that Edo listeners perceived the same word, [ɛgọgọ] in this case, irrespective of the difference in speech rate and the individual speaker.
3. Conclusion.

Results of this study suggest that speech tempo and the nature of the consonants in a given sequence are the primary conditions for consonant deletion in Edo nouns. Experimental results confirm our hypothesis that the tonal melody of individual Edo nouns is not affected by speech tempo and consonant deletion.

In places where there has been consonant deletion, there is usually a minor disjunction between contiguous syllables. This forms the perceptual basis for syllable division in such nouns. Acoustically, consonant deletion is easily identifiable by the reduction in the number of consonant spaces in words pronounced in rapid speech. The process of consonant deletion in Edo nouns neither results in a reduction in the number of syllables or such nouns nor in a meaning difference, contrary to Wescott's [1965] claim.

REFERENCES


Omozuwa, V.E. In preparation. “Vowel contraction and nasalization in Edo: an autosegmental explanation.”


A PROPOS DE L'HARMONIE VOCALIQUE*
EN əkpe

G. Hérault
Université de Paris VII

Inspirée par l'article de Pulleyblank [1986] paru dans Studies in African Linguistics, l'étude présentée ici tente d'intégrer les faits d'harmonie ATR dans une conception où les événements phonologiques résultent de l'interaction d'un nombre limité de principes universels et de choix paramétriques individuellement déterminés pour chaque langue. Dans cette perspective, on montrera que des faits tels que l'absence, pour a, de partenaire à la fois ouvert et [+ATR], ou la formation ou non de diphtongues légères lors de l'adjonction de suffixes vocaliques deviennent prévisibles si on les intègre dans une théorie qui tienne compte du "charme" des segments concernés et des gouvernements caractéristiques du plan structurel qui les régit. L'enjeu n'est pas négligeable: il s'agit, à terme, d'expliquer sans recourir à des "règles".


D. Pulleyblank [1986] propose une analyse de l'harmonie ATR de l'əkpe en se donnant notamment pour but d'expliquer pourquoi le partenaire [+ATR] de a n'est pas une voyelle basse et pourquoi ce partenaire émerge parfois comme [-ATR] dans des contextes [+ATR]. Son étude vise à démontrer qu'une théorie de la sous-spéciﬁcation, incluant des règles d'assignation syllabique et des règles de redondance, permet de prévoir ces faits.

Reposant presque exclusivement sur les données de Pulleyblank, la présente étude les intègre dans une théorie phonologique différente, celle dite du charme et du gouvernement, qui manipule des éléments sans avoir directement accès aux

* Editor's note: This paper was written in 1988 and submitted to Studies in African Linguistics in January 1989.
traits phonétiques. Ecartant toute comparaison tâtilonne entre les deux approches et toute critique systématique, je souhaite plutôt faire ressortir que la compréhension des faits d'harmonie vocalique en ṣkpe—et ailleurs—ne nécessite aucune batterie de "règles" mais découle naturellement d'un nombre restreint de principes théoriques à combiner avec les paramètres propres à la langue.

Dans ce cadre, je serai par ailleurs conduit à énoncer un certain nombre de propositions et notamment que

- Les éléments vo, I° et U° se distribuent du moins marqué au plus marqué dans cet ordre et que I° est susceptible de suppléer à vo lorsque celui-ci s'avère paramétriquement incapable de fonctionner comme tête d'une expression.
- Au sein des représentations phonologiques, les structure syllabiques constituent un niveau hiérarchiquement supérieur et les processus dont les conditions en dépendent sont mis en œuvre prioritairement.

1. Les faits d'harmonie vocalique en ṣkpe

L' нескpe illustre un type tout à fait standard d'harmonie ATR (Advanced Tongue Root, avancée de la racine de la langue): les bases lexicales imposent aux affixes dont elles se munissent de se conformer à leur spécification [+ATR] ou [-ATR]. Les données utilisées par D. Pulleyblank concernent le verbe:

\[
\begin{align*}
da & \quad \text{'boire'} & \quad \text{à-}d\text{á-}r\text{i} & \quad \text{‘nous (incl.) avons bu’} \\
ti & \quad \text{'pousser'} & \quad \text{è-}t\text{i-}r\text{i} & \quad \text{‘nous (incl.) avons poussé’}
\end{align*}
\]

Le pronom préfixé ‘nous (incl.)’ à- devient è- devant une base [+ATR], et de même le suffixe -rî devient -rî après une base [+ATR]. Cinq alternances vocaliques sont illustrées dans les exemples ci-dessous\(^1\), tous repris de Pulleyblank [1986]:

(1) \(i - i - o - u:\) Il s'agit de la voyelle du suffixe du passé où une harmonie d'arrondissement se combine avec une harmonie ATR:

\[
\begin{align*}
ti-rî & \quad \text{tirer + passé} & \quad \text{zé-rî} & \quad \text{courir + passé} \\
sé-rî & \quad \text{tomber + passé} & \quad \text{dá-rî} & \quad \text{boire + passé} \\
sô-rî & \quad \text{dérober + passé} & \quad \text{wô-rî} & \quad \text{se baigner + passé} \\
rû-rû & \quad \text{faire + passé} & \quad \text{sô-rô} & \quad \text{chanter + passé}
\end{align*}
\]

---

\(^1\)Pulleyblank prend soin d'indiquer que sa notation est juste en-deçà de la réalisation phonétique où les oppositions \(u/e\) et \(o/o\) sont neutralisées au profit de \(e\) et de \(o\) respectivement.
(2) **ε ~ e**: Cette alternance se manifeste avec le préfixe de l'infinitif:

<table>
<thead>
<tr>
<th>Ti</th>
<th>'pousse!'</th>
<th>È-tjó</th>
<th>'pousser'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sé</td>
<td>'tombe!'</td>
<td>È-se</td>
<td>'tomber'</td>
</tr>
<tr>
<td>Só</td>
<td>'dérobe!'</td>
<td>È-só</td>
<td>'dérober'</td>
</tr>
<tr>
<td>Ru</td>
<td>'fais!'</td>
<td>È-rwó</td>
<td>'faire'</td>
</tr>
<tr>
<td>Ri</td>
<td>'mange!'</td>
<td>È-ri</td>
<td>'manger'</td>
</tr>
<tr>
<td>Dé</td>
<td>'achète!'</td>
<td>È-dé</td>
<td>'acheter'</td>
</tr>
<tr>
<td>Ló</td>
<td>'mouds!'</td>
<td>È-ló</td>
<td>'moudre'</td>
</tr>
<tr>
<td>Só</td>
<td>'chante!'</td>
<td>È-swó</td>
<td>'chanter'</td>
</tr>
<tr>
<td>Dá</td>
<td>'bois!'</td>
<td>È-dá</td>
<td>'boire'</td>
</tr>
<tr>
<td>Dá</td>
<td>'vole!'</td>
<td>È-dá</td>
<td>'voler'</td>
</tr>
</tbody>
</table>

(3) **a ~ e**: Cette alternance caractérise le pronom préfixé 'nous (incl.)':

- À-dá-rí 'nous (incl.) avons bu'
- È-tí-rí 'nous (incl.) avons poussé'

(4) **ɔ ~ o ~ zéro**: Telles sont les trois formes sous lesquelles apparaît un suffixe d'infinitif dans les exemples (2) ci-dessus.

(5) **a ~ ε**: Alternance inattendue puisque ε est la variante de a, suffixe du progressif, en contexte [+ATR]:

- Só 'chante!'   ā-́swá 'nous (incl.) chantons'
- Ru 'fais!'     ē-́rwé 'nous (incl.) faisons'

2. **La théorie du charme et du gouvernement**

Elle conçoit que si tant est que les systèmes phonologiques reposent sur la combinaison de traits phonétiques binaires, celle-ci opère par le truchement d'un certain nombre d'éléments dans lesquels ils sont regroupés comme au sein de molécules distinctes dont les traits seraient comparables à des atomes. Ainsi, par exemple, à partir des éléments

\[ I^0 \quad U^0 \]

\[ A^+ \]

2Sont brièvement et partiellement résumées ici les propositions de Kaye, Lowenstamm et Vergnaud—désormais KLV—[1985] et (à paraître), auxquelles on se reportera pour plus de détails.
(qui représentent les voyelles hautes antérieures et postérieures ainsi que la voyelle basse a), on dérive les voyelles moyennes antérieures en fusionnant I\(^o\) et A\(^+\), les voyelles moyennes postérieures en fusionnant U\(^o\) et A\(^+\), etc.

Les éléments utilisables dans la constitution des systèmes vocaliques sont au nombre de six et chacun d'eux est caractérisé par un trait dominant (son trait chaud). Certains sont pourvus d'un charme positif représentant la maximisation d'un des résonateurs supra-glottiques:

- A\(^+\) (maximalisation de la cavité buccale); trait chaud: [-HAUT]
- N\(^+\) l'élément nasal (maximalisation de la cavité nasale); trait chaud: [+NASAL]
- I\(^+\) l'élément ATR (maximalisation de la cavité pharyngale); trait chaud: [+ATR]

Les autres, qui n'ont pas cette propriété, sont dits sans charme, ou de charme neutre:

- P trait chaud: [-POSTERIEUR]
- U\(^o\) trait chaud: [+ARRONDI]
- v\(^o\) la voyelle "froide"; c'est le seul élément qui ne possède aucun trait chaud.

Lors de la fusion de deux (ou plusieurs) éléments, l'un d'entre eux reste dominant par rapport à l'autre, ce dernier ne contribuant que son trait chaud. Ainsi e ou e résulte de la fusion de I\(^o\) et de A\(^+\) avec I\(^+\) pour tête. Si au contraire c'est A\(^+\) qui domine, le résultat sera æ:

\[
\begin{align*}
\text{I}^o & = \varepsilon \text{ ou } e \\
\text{A}^+ & = \varepsilon
\end{align*}
\]

(représentations partielles; la tête est soulignée)

Les segments ainsi analysés sont associés à des positions qui se suivent les unes les autres sur un axe linéaire et dont la séquence est organisée par une structure syllabique.

La théorie de la syllabe qui est incluse dans celle du charme et du gouvernement ne reconnaît que trois types de constituants syllabiques [KLV à paraître]: l'attaque A, la rime R et le noyau N, la rime étant la projection du noyau. Chaque constituant ne domine au maximum que deux positions:
Enfin, les positions ainsi structurées au plan syllabique manifestent des relations de gouvernement qui se reflètent dans la nature des segments susceptibles de s'associer à elles. Ainsi, au sein d'un constituant syllabique, la position de gauche gouverne celle de droite tandis qu'entre positions adjacentes appartenant à des constituants différents, le gouvernement s'exerce en sens inverse.

3. Le système vocalique de l'okpe

La phonologie repose donc sur un nombre réduit de principes qui relèvent de cette partie de la grammaire universelle, mais ceux-ci laissent des choix à la disposition de chaque langue individuelle: les options prises par chacune d'elles constituent autant de paramètres propres qui servent à l'individualiser. Ainsi au niveau des systèmes vocaliques, les langues privilégient telles combinaisons d'éléments plutôt que telles autres, fonctionnant avec 3, 7, 10 voyelles, etc., plutôt qu'avec 5, 8, 9, etc.. Certaines imposeront un charme positif à toutes leurs voyelles (systèmes i, e, a, o, u), d'autres non.

S'agissant de l'okpe, le système est formé de 9 voyelles orales ainsi représentée:

```
<table>
<thead>
<tr>
<th>i</th>
<th>e</th>
<th>a</th>
<th>o</th>
<th>i</th>
<th>e</th>
<th>o</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>I°</td>
<td>I°</td>
<td>V°</td>
<td>U°</td>
<td>U°</td>
<td>I°</td>
<td>I°</td>
<td>U°</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V°</td>
<td>A°</td>
<td>A°</td>
<td>V°</td>
<td>V°</td>
<td>A°</td>
<td>A°</td>
<td>V°</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V°</td>
<td>V°</td>
<td>V°</td>
<td>V°</td>
<td>V°</td>
<td>I+</td>
<td>I+</td>
<td>I+</td>
</tr>
</tbody>
</table>
```

L'élément I+ entre dans la composition de i, e, o, u, les quatre voyelles [+ATR] mais non dans celle des autres. La voyelle froide (systématiquement postulée en l'absence d'autre opérateur) ne fonctionne jamais comme tête (soulignée) d'une expression vocalique on okpe: ceci traduit l'absence de voyelle centrale dans la langue.

4. L'harmonie dominante ATR: les voyelles non basses

Reprenons ici certains des exemples (1) et (2):

(1) a. zé-rí 'tirer’ + passé  wó-rí ‘se baigner’ + passé
b. sè-rí ‘tomber’ + passé  só-rí ‘dérober’ + passé
(2) a. è-dé ‘acheter’ è-1s ‘moudre’
   b. è-sé ‘tomber’ è-só ‘dérober’

En (1), le suffixe du passé -rt ne se transforme en -ri que si la voyelle de la base verbale est elle-même [+ATR]. Sans avoir à postuler de neutralisation de l’opposition /i/ dans la forme sous-jacente du suffixe ni de sous-spécification de la voyelle / (sous-spécification que réduira la règle [ ] → [-ATR] dans Pulleyblank [1986:132]) il suffit de noter que la voyelle radicale gouverne la voyelle suffixale et que cette domination s’exerce par la propagation de l’élément I dont le suffixe est dépourvu. Si le radical ne contient pas lui-même d’élément ATR, rien ne se passe (1a):

```
   z   e  +  r  i
   N   N
|   |
\ x x x x \\
|   |
[z]  I*  [r]  I*
|   |
A+   V*
|   |
V*   V*
```

Mais en (1b) la voyelle suffixale subit la propagation de l’élément I+ du radical:

```
   s   e  +  r  i
   →   s   e   r   i
   N   N   N   N
|   |
\ x x x x \\
|   |
[s]  I*  [r]  I*
|   |
[s]  I*  [r]  I*
|   |
A+   V*
|   |
I+-----V*
```

De la même manière en (2), le préfixe è- de l’infinitif s’harmonise avec la voyelle radicale qui le gouverne en lui imposant, le cas échéant, son élément ATR:
L'okpe se caractérise donc par une harmonie ATR dominante (cf. Kaye [1982]) qui dénote le gouvernement des voyelles radicales sur les voyelles suffixales dans le cadre du mot verbal. On observera que c'est un type de gouvernement qui ne concerne que les noyaux des syllabes, et donc des positions nucléaires qui, si elles ne sont pas adjacentes sur l'axe des successions réalisées, le sont au niveau de la projection des noyaux (cf. §8.3):

5. L'harmonie directionnelle d'arrondissement

En (1c) le suffixe du passé devient -ra ou -ru:

(1) c. sə-ra ‘chanter’ + passé rú-rú ‘faire’ + passé

Une voyelle radicale haute et arrondie exerce donc son gouvernement non seulement en transmettant au suffixe l'élément I+ dont elle est éventuellement pourvue, mais également son élément U°. Ce dernier est le seul à se propager dans sə-ra, où il déloge l'élément I°:

Dans le cas de la propagation de I+ analysée §4 ci-dessus, l'élément ATR ne délogeait pas l'élément qu'il trouvait sur le lieu de sa propagation puisqu'il
s'agissait de la voyelle froide, élément neutre, opérateur d'identité (cf. KLV [1985]). Mais ici U° se propage sur I°. La fusion des deux éléments est tout à fait licite dans la phonologie universelle postulée puisque c'est elle qui génère [y], la voyelle haute antérieure arrondie. Mais c'est un des paramètres de l'ɔkpe que de ne pas comporter cette voyelle dans son système et donc de ne pas admettre cette fusion: c'est ce dont rend compte la représentation de I° et de U° sur une même ligne.

L'exemple (1c) ru-ru quant à lui illustre la propagation des deux éléments I° et U° radical:

\[
\begin{array}{c}
r \quad u + r \quad u \quad \rightarrow \quad r \quad u \quad r \quad u \\
N \quad N \\
x \quad x \\
\downarrow \quad \downarrow \\
U. \quad I. \\
\end{array}
\]

Cette harmonie d'arrondissement ne semble pas dominante mais directionnelle: elle s'exerce de gauche à droite sur le suffixe -rt du passé mais n'est attestée sur aucun des préfixes du corpus de Pulleyblank (au nombre desquels toutefois il n'y a pas d'exemple de i-). On observe avec certitude en revanche qu'elle n'est déclenchée que par les verbes à voyelle haute arrondie, donc uniquement lorsque l'élément U° n'est pas combiné avec A+ (so+rt, wo+rt ne donnent pas *so-ru ni *wo-rta). Ceci est à nouveau un des paramètres propres à l'ɔkpe; en akan (fante) par exemple [Welmers 1973:36] le morphème du futur arrondit sa voyelle aussi bien avec un verbe en o que a ou u:

\[
\begin{align*}
\delta-bé-si & \quad {\text{il achètera'}} \\
\delta-bé-si & \quad {\text{il construira'}} \\
\delta-bó-kò & \quad {\text{il ira'}} \\
\delta-bó-pò & \quad {\text{il aboiera'}}
\end{align*}
\]


Dans des exemples (3) repris ici (de même qu'en (5) où il s'agit du même morphème):

(3) à-dá-rti \quad {\text{nous (incl.) avons bu'}}
ê-tí-rti \quad {\text{nous (incl.) avons poussé'}}
on observe que le pronom préfixé a- se conforme au gouvernement exercé par la voyelle du verbe et que sa variante [+ATR] est e-, coïncidant donc avec la variante [+ATR] de e. Pourquoi cette neutralisation? Pourquoi le partenaire [+ATR] de a, voyelle basse, n'est-il pas une voyelle basse? Pourquoi, étant non-bas, ce partenaire est-il antérieur (e) plutôt que postérieur (o)?

6.1. L'analyse de Pulleyblank [1986]. Bien qu'il ne soit pas exactement formulé en ces termes, c'est là l'un des problèmes cruciaux qu'examine Pulleyblank. Pour lui, la voyelle a de l'okpe est, en sous-jacence, totalement non spécifiée. Elle est la seule à n'être définie par aucun trait dans un système ainsi conçu:

<table>
<thead>
<tr>
<th>i</th>
<th>e</th>
<th>a</th>
<th>c</th>
<th>o</th>
<th>o</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROND</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>HAUT</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>BAS</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>ATR</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Sa conception d'ensemble de la spécification progressive des segments, brièvement résumée, est la suivante:

(a) les voyelles des morphèmes sont données avec leur spécification minimale (tableau ci-dessus);
(b) intervention d'une procédure de syllabation des morphèmes définissant ce qui est rime et ce qui ne l'est pas;
(c) ce qui déclenche aussitôt l'association (aux rimes) d'éventuels auto-segments [+ATR] et de trois règles de redondance:

\[ [+\text{ROND}] \rightarrow [-\text{BAS}] \quad [+\text{HAUT}] \rightarrow [-\text{BAS}] \quad [+\text{ATR}] \rightarrow [-\text{BAS}] \]

Cette même procédure est ensuite répétée lors du cycle d'affixation des morphèmes, et enfin
(d) application de quatre règles "tardives" de redondance:

\[ [ ] \rightarrow [+\text{BAS}], \quad [ ] \rightarrow [-\text{ROND}], \quad [ ] \rightarrow [-\text{HAUT}], \quad [ ] \rightarrow [-\text{ATR}] \]

C'est donc seulement à cette ultime étape que la voyelle pronominale (de même que la voyelle radicale) acquerra un contenu spécifique dans à-dá-rí. Mais avec le verbe ti, dès la syllabation des affixes, le trait [+ATR] du verbe va s'imposer au pronom, déclenchant l'application de [+ATR] \rightarrow [-BAS]. Puis, les règles tardives
réussiront à transformer la matrice du pronom, vide au départ, en e pour donner é-ti-ré.

Mon but n'est pas ici de critiquer point par point chacune des règles postulées par Pulleyblank ni chacune des étapes qu'il envisage dans ses dérivation. Je ferai simplement remarquer qu'une partie de la démonstration repose sur

\[ [+\text{ATR}] \rightarrow [-\text{BAS}] \]

L'inexistence de voyelles basses [+ATR] est ainsi attribuée à une règle dont l'arbitraire paraît flagrant. Pourquoi ne pas proposer

\[ [+\text{BAS}] \rightarrow [-\text{ATR}] \]

c'est-à-dire l'inverse (tout aussi arbitraire) de la règle précédente? C'est en fait, mutatis mutandis, ce que faisait Clements [1981:140] pour l'akan en définissant la voyelle a comme opaque (associée de manière inhérente à un auto-segment [-ATR]).

La véritable question est donc en fait celle-ci: comment parvenir à encoder, à théoriser des processus dont l'universalité exclut qu'ils puissent être arbitraires mais indique au contraire qu'ils sont inhérents à la phonologie elle-même, au mode de fonctionnement des unités qu'elle manipule. Et tenter de donner une réponse satisfaisante à cette question suppose l'abandon de toute règle du type

\[ x \rightarrow y \]


6.2. L'appel au charme. Dans la théorie du charme et du gouvernement, l'inexistence de voyelles basses [+ATR] découlle directement du charme des éléments en présence et d'un principe qui énonce que des éléments de charme identique se repoussent: toute fusion leur est interdite [KLV 1985]. Ainsi, I° peut fusionner avec A° (pour donner e, e ou a); I° peut même fusionner avec U° (pour donner y): aucun des deux n'a de charme. Mais A° (ni aucune expression dont A° serait la tête, puisque le charme d'une expression est le charme de sa tête) ne peut jamais se combiner avec I°, l'élément ATR, puisqu'ils sont de charme identique. Une voyelle basse [+ATR], qui serait

\[ ^*\text{v}^- \]
\[ \Delta^+ \]
\[ I^+ \]

est donc exclue par principe.

Dès lors plusieurs stratégies sont possibles:
- ou bien, résultant en une expression mal formée, la propagation de l'élément ATR ne se fait tout bonnement pas: *a* reste *a* même en contexte [+ATR]. Exemple akan: *bisa* ‘demander’ [Clements 1981:118];

- ou bien le système comporte une 10ème voyelle, partenaire [+ATR] de *a* (schwa bas [+ATR] souvent noté Λ) mais ce partenaire est nécessairement [-bas]: la fusion de l'élément *i* à la voyelle basse oblige à l'inversion des rôles de tête et d'opérateur:

```
*ν*       ν*
|        |
Λ*      Λ*
|        |
i*      i*
```


- ou bien enfin le système ne prévoit pas de partenaire [+ATR] à l'usage exclusif de *a* et c'est un autre qui fait l'affaire comme ici en ẹkpẹ pour les raisons qu'il convient maintenant d'examiner.

6.3. 1° suppléant de *v*̄ en position dominante. Il s'agit donc de répondre à la question de savoir pourquoi, en l'absence de partenaire [+ATR] réservé à l'usage exclusif de *a* est-ce *e* et non pas *o* qui remplit cette fonction. Le problème se pose en ẹkpẹ mais aussi dans beaucoup d'autres langues caractérisées par une harmonie dominante de type ATR. En voici quelques exemples dans diverses langues kwa:

- **akan-fante** [Welmers 1973], préfixe nominal *a* – *e*:

  - "a-bôá" ‘animal’
  - "è-kùtú" ‘orange’
  - "à-dán" ‘maisons’
  - "è-kúr" ‘plaiès’

- **igbo** [Welmers 1973], préfixe verbal *a* – *e* au présent progressif:

  - "s nà à-zò" ‘il achète’
  - "s nà è-gbù" ‘il tue’

- **igbo** [Eke 1985], pronom sujet indéterminé ‘on’ *a* – *e*:

  - "à ńńńń yà s ńńńń" ‘il a été vu en brousse’
  /on/voir + accompli/lui/dans/brousse/
'il a été châtifié'
/on/battre + accompli/lui/châtiment/

- (a)kposso [Eklo 1987], nominalisant négatif ma ~ me:

\[
y_{a} : \quad lômê \ mà-ya
\]
'aller'  'le fait de ne pas aller à Lomé'

\[
w_{le} : \quad ëkômè-wlé-mè-wlé
\]
'laver'  'le fait de ne jamais faire la lessive'

- ega [Bole-Richard 1982], défini ta ~ te, démonstratif proche ma ~ me:

\[
ëlè \ tâ \quad 'l'escargot'
ënâ \ mâ \quad 'cet animal-ci'
\]

\[
edô \ tê \quad 'le boeuf'
edô \ mê \quad 'ce boeuf-ci'
\]

Même en urhobo, d'autres morphèmes subissent cette alternance. En agbon [Blanc 1985] variété mitoyenne de l'êkpe, le morphème du futur est ka ~ ke:

\[
mé-ka-da³ \quad 'je (le) boirai'
\]

\[
mî-ke-kô \quad 'je (le) coudrai'
\]

Welmers [1969] renvoie au même morphème, dans le même dialecte, mais sous la forme ca ~ ce:

\[
6-cà-hwâ \quad 'il (le) paiera'
6-cè-sé \quad 'il (l') appellera'
\]

Ne serait-ce donc que dans les langues kwa, le fonctionnement de e comme partenaire [+ATR] de a est extrêmement répandu. Comment cela est-il possible?

On a vu en §6.2 que la propagation de l'élément ATR sur a, lorsque la langue l'acceptait, obligeait à l'inversion des rôles de tête et d'opérateur entre v° et A⁺:

\[
\begin{array}{c}
v° \\
\Delta^+ \\
v° \leftarrow \ldots \ 1^+
\end{array} \rightarrow \quad \begin{array}{c}
\ast v° \\
\Delta^+ \\
1^+
\end{array} \rightarrow \quad \begin{array}{c}
v° \\
\Delta^+ \\
A^+ = \Delta
\end{array}
\]

³La notation phonétique de J.F. Blanc a intégré la neutralisation de l'opposition υ/e. Phonologiquement, on a donc ici /ml-kà-dá/.
Or cette option d'une voyelle centrale [-haut, -bas] et [+ATR] est exclue de toutes les langues citées ici: leur système ne comporte aucune voyelle centrale. Une expression ayant v° pour tête est donc inadmissible pour elles, et il est manifeste qu'elles utilisent à sa place une expression semblable mais où I° apparaît au lieu de v°. On peut donc imaginer un processus en quatre étapes:

$$
\begin{align*}
\text{v}^* & \rightarrow \text{*v}^* & \rightarrow \text{*v}^* & \rightarrow \text{I}^* \\
\Delta^+ & \rightarrow \text{A}^+ & \rightarrow \text{A}^+ & = e \\
\text{v}^* & \leftarrow \text{I}^+ & \rightarrow \text{I}^+ & \rightarrow \text{I}^+ \\
(a) & (b) & (c) & (d)
\end{align*}
$$

En (a) la voyelle a subit la propagation de l'élément ATR, ce qui aboutit en (b) à une expression universellement exclue et déclenche donc en (c) l'inversion des rôles de tête et d'opérateur. Cependant l'expression (c) n'est pas licite dans les langues sans voyelle centrale: v° ne peut fonctionner comme tête d'une expression. Il ne reste plus alors que deux candidats possibles pour remplir cette fonction, I° et U°. L'étape (d) montre que c'est I° qui est sélectionné à l'exclusion de U°.

La théorie du charme et du gouvernement postule que la voyelle froide est automatiquement présente dans tous les cas de non spécification totale. Ainsi un noyau vide est-il considéré comme automatiquement associé à v° ("Positions containing only the cold vowel are treated as empty positions by the theory" Kaye [1988]). En arabe marocain par exemple la représentation du verbe dans tan ktib ‘j'écris’ sera 4

\[
\begin{array}{c}
\text{N} \\
\text{x} \quad \text{x} \quad \text{x} \\
\text{[k]} \quad \text{v}^* \\
\end{array}
\begin{array}{c}
\text{N} \\
\text{[t]} \\
\text{v}^* \\
\end{array}
\begin{array}{c}
\text{v}^* \\
\text{[b]}
\end{array}
\]

La voyelle froide est également postulée en cas de non spécification partielle, c'est-à-dire en l'absence de tel ou tel opérateur sur la "ligne" où il fonctionne (se reporter à la distribution des v° dans la représentation des voyelles de l'okpe §3.) v° est donc interprété comme élément neutre omni-présent dans les représentations vocaliques dès lors qu'un autre élément n'apporte pas de spécification propre. Et c'est à son émergence au plan phonétique, donc à sa

4Proprement gouverné par le second, le premier noyau ne sera pas prononcé ainsi que le prévoit le principe de catégorie vide (cf. KLV [à paraître]).
prononciation qu'on réfère en général sous le nom d'épenthèse (cf. Nikiéma [1987]).

Quel rapport ceci entretient-il avec la suppléance de l° postulée plus haut? Je voudrais proposer tout d'abord que le paramètre qui identifie un système vocalique sans voyelle centrale trouve une formulation du type: “La voyelle froide ne peut assumer la fonction de tête d'une expression.”

Or l'harmonie ATR dominante est susceptible de conférer à v° une fonction dominante que de telles langues n'admettent justement pas. Il est alors minimalement fait appel à un autre élément pour remplir cette fonction. Cet autre élément est susceptible d'être fourni par une propagation en provenance du contexte (cf. les morphèmes vocaliques sans spécifications segmentales qui émergent comme copies d'une voyelle adjacente). Mais tel n'est pas le cas dans les exemples que nous avons cités. Les diverses langues d'où ils sont extraits invitent donc à inclure dans la théorie que: l° est l'élément qui est sélectionné comme suppléant de la voyelle froide pour fonctionner comme tête d'une expression lorsque cette fonction est refusée à v° et qu'aucun autre élément n'est fourni par le contexte.

Dans la mesure—à confirmer par le plus amples recherches—où U° serait moins susceptible d'être sélectionné dans ce but, on est donc amené à postuler une gradation des éléments vocaliques sans charme qui, du moins marqué au plus marqué, se distribueraient ainsi:

\[
\begin{align*}
&v^o & l^o & u^5 \\
\end{align*}
\]

On rejoindrait ainsi l'intuition selon laquelle U° semble être le plus résistant des trois, si tant est qu'il est vrai qu'il semble responsable par exemple de davantage de labio-vélarisations de consonnes que l° ne l'est de palatalisations.

6.4. Confirmation de l'hypothèse. Si l'hypothèse développée ci-dessus a quelque validité, elle suffit à expliquer que, sous l'influence d'ATR, a soit susceptible de se transformer en e et non en o. Mais trouve-t-elle des justifications indépendantes? Je crois que l'adioukrou, langue kwa sans harmonie ATR, fournit une excellente confirmation de la thèse soutenue ici.

Considérons les divers préfixes nominaux, pronom personnels sujets et marques de conjugaison des exemples ci-dessous [Hérault 1978]:

\[
\begin{align*}
1-6g & \quad \text{‘morceau’} & 1i-kp\acute{a}kp & \quad \text{‘long’} \\
\text{m-5klèb’} & \quad \text{‘bananes’} & \text{mî-\textsc{rit}fi} & \quad \text{‘sable’} \\
\end{align*}
\]

\[\text{\footnotesize 5Cette gradation serait évidemment à inclure dans l'échelle hiérarchique de complexité des segments neutres donnée dans KLV (à paraître) sous la forme:}\]

\[
\begin{align*}
\text{glides, } r & < k & < \text{nasals}
\end{align*}
\]
Il n'y aurait guère de sens à alléguer qu'une pléthore de ces prefixes [Cï] comportent un /i/ spécifié dans leur représentation phonologique et qui serait tronqué devant voyelle: pourquoi, dans la représentation phonologique des prefixes commençant par une consonne, aucun autre phonème vocalique ne serait-il attesté?

Une meilleure interprétation consiste à reconnaître qu'ils ont tous un noyau vide, vo, et que devant consonne ce noyau vide doit nécessairement être prononcé. Ni [i] ni [a] ne sont des candidats possibles pour la prononciation d'un noyau vide dans ce contexte en adioukrou: vo est minimalement supplante par 1° (qui émergera comme [i] puisque [i] n'existe pas dans le système).

Cette émergence de 1° n'est pas réservée aux prefixes puisqu'attestée également en adioukrou pour nombre de suffixes. Ainsi les variantes -r - -l - -n du pronom objet de 3ème personne au singulier sont-elles réalisées [-ir - -il - -in] après bases verbales disyllabiques elles-mêmes terminées par r, l ou n:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Meaning</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ni-bérun-ír</td>
<td>je/HAB/aimer/lui/</td>
<td>'je l'aime'</td>
</tr>
<tr>
<td>à-ál-lów</td>
<td>/vous/insulter + ACC/lui/chooses/</td>
<td>'vous l'avez insulté'</td>
</tr>
<tr>
<td>mĩ-ṇñn-in soṣ</td>
<td>/je/écrire + ACC/lui/corps/</td>
<td>'je l'ai tatoué'</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Meaning</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ṇmù</td>
<td>'trou'</td>
<td>ni-mâmù 'bon, beau'</td>
</tr>
<tr>
<td>s-ïnû</td>
<td>'solidité'</td>
<td>si-lól 'amertume'</td>
</tr>
<tr>
<td>m-bélu</td>
<td>'j'ai mis'</td>
<td>mĩ-kôk 'j'ai fait'</td>
</tr>
<tr>
<td>l-ëlu</td>
<td>'il a mis'</td>
<td>lĩ-kôk 'il a fait'</td>
</tr>
<tr>
<td>s-ëlu</td>
<td>'nous avons mis'</td>
<td>sĩ-kôk 'nous avons fait'</td>
</tr>
<tr>
<td>lĩ-bë-ëlu</td>
<td>'il met' (HAB)</td>
<td>lĩ-bĩ-kôk 'il fait' (HAB)</td>
</tr>
<tr>
<td>lĩ-kë-kôk</td>
<td>'qu'il ne mette pas'</td>
<td></td>
</tr>
<tr>
<td>lĩ-kë-kôk</td>
<td>'qu'il ne fasse pas'</td>
<td></td>
</tr>
</tbody>
</table>

7. Harmonie vocaUque et structure syllabique

Revenant maintenant à l'akpe, il s'agit d'expliquer les variations illustrées en (2), où un suffixe d'infinitif apparaît comme o ~ o (en fonction de l'harmonie dominante sur laquelle il est inutile de revenir) après voyelle haute mais possède une variante zéro après voyelle non haute. Quelques exemples sont repris ici:
Pulleyblank propose pour aboutir à ces formes un ensemble de dérivations que je résume schématiquement ici:

- syllabation du suffixe
  - comme rime d'une nouvelle syllabe après voyelle non haute,
  - comme rime de la même syllabe après voyelle haute qui se transforme en glide;
- ce qui déclenche automatiquement la propagation de [+ATR];
- ce qui déclenche automatiquement [+ATR] → [-BAS];
- désyllabation du suffixe en cas de séquence vocalique illicite (le suffixe ne se manifeste alors pas phonétiquement).

Ce scénario ne semble pas faire ressortir l'extrême généralité des processus à l'œuvre ici. Dans une théorie qui inclut par principe la préservation des structures syllabiques tout au long des dérivations (principe de projection, KLV [à paraître]) et se dispense de toute sous-spécification, les formes infinitives de l'okpe sont dérivées sans aucune machinerie complexe. Le suffixe vocalique ajoute un nouveau noyau à droite de celui du radical; dans la mesure où l'okpe n'admet pas de noyau branchant, le principe du contour obligatoire modifie cette configuration en ne laissant qu'une seule position nucléaire et deux candidats pour s'y associer: la voyelle radicale et la voyelle suffixale:6

Ce qu'il advient de cette configuration qui est très exactement celle d'une diphtongue légère est alors fonction du charme des segments y et z en présence.

---

6Pulleyblank [1986:143] rattachait y à gauche pour former une attaque branchante constituée d'une consonne et d'un glide. Cette association est exclue dans la mesure où l'absence de rime branchante en okpe implique l'absence d'attaque branchante.
En (2a) la voyelle du verbe est haute et [-ATR]. Elle admet l'adjonction du suffixal pour former une diphtongue légère:

\[ \begin{array}{c}
\text{N} \\
\text{I} \\
\text{A+} \\
\varepsilon \\
\text{er} \\
\end{array} \quad \text{et} \quad \begin{array}{c}
\text{N} \\
\text{I} \\
\text{A+} \\
\varepsilon \\
\text{es} \\
\end{array} \]

En (2b) la voyelle du verbe est haute et [+ATR]. On observe que les diphtongues vocaliques obtenues ne sont pas [io] ni [uo], pas plus que précédemment en (2a), elles n'étaient [i:u] ni [a:u]. Autrement dit, l'élément ATR permet, par sa présence ou son absence, une variation sur le second segment de la diphtongue mais non sur le premier (le fait est noté chez Pulleyblank [1986:129]).

La dissociation de I+ n'a rien de fortuit: la théorie du charme prévoyait que dans la configuration
qui définit une diphtongue légère, les deux segments sont ordonnés de telle sorte que le plus charmé figure à droite de l'autre, et donc en quelque sorte le gouverne. $I^+$, qui conférait un charme positif au segment de gauche, est donc contraint de s'en dissocier.

En (2c), qui regroupe tous les autres cas, la voyelle du verbe n'est pas haute: les diphtongues qu'on obtiendrait lorsqu'elle doit partager une même position nucléaire avec la voyelle suffixale seraient $*$[eo, eɔ, aɔ]. Aucune n'est licite en ñkpe ni ailleurs. Pourquoi?

Observons tout d'abord qu'avec èse ‘tomber', on aurait pu dériver une diphtongue légère conforme au gouvernement donné à propos de (2b) ci-dessus: $I^+$ aurait pu se dissocier de la voyelle radicale pour donner $*$[esə]. Or, sans même parler de la violation de l'harmonie ATR dans cette séquence, [eo] ne semble pas être non plus une diphtongue légère possible malgré le respect de la hiérarchie des charmes en jeu. Ceci invite donc à poser une contrainte supplémentaire régissant la formation d'une diphtongue légère: celle-ci est non seulement exclue avec un premier segment de charme positif ($*$[aɔ]) mais également avec un premier segment qui contient un élément de charme positif ($*$[eo, eɔ, eoi]).

De ce fait, l'association de la voyelle suffixale -ɔ à la même position nucléaire que la voyelle radicale échoue si cette dernière contient l'élément A+; elle reste non associée, donc inaudible, aussi bien dans èlis que dans èse ou èda. Et il ne s'agit pas d'une stipulation propre à l'ñkpe mais bien de la définition même des diphtongues légères. Dans une terminologie plus ancienne, celles-ci étaient dites "ouvantes" (par opposition aux diphtongues lourdes dites "fermantes"). La théorie du charme et du gouvernement formalise cette intuition en définissant une diphtongue légère comme séquence de deux segments associés à une même position nucléaire et dans laquelle $A^+$ est exclu du premier segment.

8. $\varepsilon$ variante de $a$ en contexte [+ATR]

Il reste donc en dernier lieu à comprendre comment $a$ sélectionne une variante $\varepsilon$ en contexte [+ATR]. Pulleyblank n'en donne qu'un seul exemple:

\[
\begin{align*}
(5) & & a^\prime \text{ swá} & \text{‘nous (incl.) chantons’} & (< s\omega) \\
& & é^\prime \text{ rwè} & \text{‘nous (incl.) faisons’} & (< ru)
\end{align*}
\]
8.1. L'analyse de Pulleyblank. L'analyse qu'il en propose suit la conception déjà exposée dans les sections précédentes; elle ne pose pas de problème pour dériver *ä' swá. La dérivation de *ä' rwé cependant repose crucialement sur la prétendue impossibilité de rattacher le suffixe à la même syllabe que le radical en raison de la "séquence inacceptable de voyelles adjacentes" (p. 149) que cela formerait. L'argument avait déjà été utilisé (et correctement) à propos par exemple de *èdèé dont l'impossibilité servait à expliquer èdè 'acheter'. Mais ici il l'est tout à fait abusivement puisqu'une séquence nucléaire comportant une voyelle haute en première position, ici ue, est tout à fait licite, en *kpe (le fait a été expressément noté p. 143) comme ailleurs.

Le scénario imaginé par Pulleyblank (pour expliquer que la voyelle du suffixe refuse à un certain stade de sa dérivation le trait [+ATR] qu'elle avait accepté à un stade antérieur) apparaît donc comme non recevable puisque fondé sur une considération erronée concernant la syllabation.

8.2 Présence d'un domaine intermédiaire de gouvernement. Dans le cadre de la théorie du charme et du gouvernement, dériver *ä'swá n'offre aucune difficulté non plus, mais *ä'rwe revanche pose problème. En suivant le processus exposé en §7 à propos des infinitifs, on aboutit à *

\[ \begin{array}{cccc}
N & N & N & N \\
\downarrow & \downarrow & \downarrow & \downarrow \\
x + x & x + x & x & x \\
\downarrow & \downarrow & \downarrow & \downarrow \\
\nu^* & [r] & U^* & \nu^* \\
\downarrow & \downarrow & \downarrow & \downarrow \\
\Delta^+ & \nu^* & \Delta^+ & A^+ \\
\downarrow & \downarrow & \downarrow & \downarrow \\
I^+ & I^+ & I^+ & I^+
\end{array} \]

forme dans laquelle I+ est indûment relié à la voyelle finale. Tout se passe en effet comme si la voyelle suffixale avait subit l'harmonie dominante puis cessé de tolérer son association à l'élément ATR, n'en conservant pour trace que sa fermeture et son antériorisation. La question est donc de savoir pourquoi I+ ne peut-il maintenir son emprise sur la voyelle finale: pourquoi ne peut-il plus la gouverner?

C'est en termes de gouvernement que l'on peut en effet proposer une réponse à cette question. Il n'est certainement pas fortuit d'observer que c'est dans la conjugaison du présent progressif que a prend cette variante e inattendue, et que cette conjugaison est marquée par un downstep, c'est-à-dire un ton bas flottant. Ce bas flottant n'appartient ni au lexème verbal ni au pronom. Cette construction met donc en jeu quatre morphèmes: le pronom sujet, un préfixe tonal, le lexème
verbal et un suffixe a, selon un schéma extrêmement fréquent dans les langues africaines (cf. Welmers [1973:312]).

On peut donc poser que ces constructions comportent quatre noyaux syllabiques qui sont dans une relation de gouvernement telle que celui du radical verbal domine tous les autres, ce que manifeste l'harmonie ATR:

(a) \[ N_1 \quad N_2 \quad N_3 \quad N_4 \ ]

Cependant, dès qu'on descend un peu plus dans la hiérarchie de la représentation phonologique de la construction, on s'aperçoit que deux de ces noyaux sont dans une configuration telle \( N_3 \quad N_4 \) qu'elle déclenche l'application du principe de contour obligatoire:

(b) \[ N_1 \quad N_2 \quad N_4 \ ]

Et l'on s'aperçoit également que l'un d'entre eux, \( N_2 \), ne dominant ni position ni matériau segmental, est de ce fait identifié comme catégorie vide. Il est donc régis par le principe du même nom, ce qui implique [KLV à paraître] qu'il soit proprement gouverné: il y a donc identification d'un domaine de gouvernement propre de \( N_2 \) par \( N_4 \):

(c) \[ N_1 \quad [ \quad N_2 \quad N_4 \quad ] \ ]

Dès lors, le gouvernement que manifestait l'élément ATR par son association à toutes les syllabes cesse de pouvoir s'exercer en raison de l'identification de cet îlot récalcitrant. Les associations de \( I^+ \) ne peuvent être maintenues à l'intérieur de ce domaine de gouvernement et il n'en reste donc qu'une seule:

(d) \[ N_1 \quad [ \quad N_2 \quad N_4 \quad ] \ ]

\[ I^+ \]

On aboutit ainsi à \( êr\wε \) selon un processus qui présuppose la pérennité des structures syllabiques (principe de projection, [KLV à paraître]) à travers toutes les étapes de la dérivation phonologique: seul le principe du contour obligatoire a le pouvoir d'effacer un constituant, ici un noyau.
8.3. La hiérarchie des représentations phonologiques. Le fil conducteur du raisonnement précédent est donc que le suffixe -a a été sujet à la propagation de I\(^+\) mais que celui-ci a dû ensuite s'en dissocier. Dans un autre cadre, ce scénario est peu différent de celui de Pulleyblank (cf. §8.1.) mais ses diverses étapes pourraient donner l'impression qu'il s'agit d'une reconstruction diachronique. Il n'en est évidemment rien: c'est la hiérarchie des représentations phonologiques qui est en cause, telle que l'illustre le fonctionnement d'une harmonie dominante. La question est en effet celle-ci: qu'est-ce qui déclenche la propagation de l'élément ATR dont un radical est pourvu? Ce ne peut être l'identification d'un élément v\(^o\) comme voisin immédiat, ni celle d'une position x adjacente: cette position pourrait être celle d'une consonne (et cette consonne pourrait même comporter un élément v\(^o\)), segment par définition en dehors du domaine de l'harmonie vocalique. La propagation de I\(^+\) ne se joue pas à ce niveau. Elle est fonction de l'identification d'un autre noyau à la droite ou à la gauche de celui qui gouverne.

Cependant, séparés le plus souvent les uns des autres par des attaques, les constituants nucléaires ne sont généralement pas mutuellement visibles. Un domaine de gouvernement qui, comme celui de l'harmonie ATR, porte sur une séquence de noyaux ne peut par conséquent être défini au niveau des constituants nucléaires eux-mêmes: il l'est à celui de leur projection maximale. Dans le schéma (a) donné en §8.2., la séquence \(N_1 N_2 N_3 N_4\) est donc à proprement parler celle des projections des noyaux du domaine. Dès qu'elle est identifiée, I\(^+\) opère. Et il est simplement postulé qu'un processus qui concerne ce niveau hiérarchiquement supérieur dans la représentation a priorité sur les autres.

En ce sens, l'identification de l'adjacence stricte de deux positions nucléaires—et c'est elle qui fait intervenir le principe de contour obligatoire—implique que l'on soit "descendu" dans la hiérarchie jusqu'au squelette. Et il en va de même pour l'identification des catégories vides puisque celle-ci dépend de l'inexistence de matériel segmental et/ou de position dominé par N.

En parfait accord avec le principe de projection qui maintient leur intégrité tout au long des dérivations, il est donc proposé ici que les structures syllabiques d'une représentation phonologique constituent un niveau hiérarchiquement supérieur aux autres. Et s'il demeure constant que les processus phonologiques s'appliquent aussitôt que sont remplies les conditions qui les déclenchent [Kaye 1988], j'ajouterai que les conditionnements dépendant d'un niveau supérieur dans la hiérarchie ont préséance sur ceux qui dépendent d'un niveau inférieur.

Alors est ouverte la possibilité logique d'interpréter certains faits phonologiques comme traces du ou des gouvernements à l'oeuvre. Ainsi dans \(e^\text{trw}e\) ‘nous faisons’, le e final apporte-t-il une double information:

- je suis sous l'emprise de l'élément ATR du radical (puisque je ne suis pas resté a)
- mais je n'ai pu tolérer sa propagation (sans quoi je serais e) car je suis circonscrit dans un domaine de gouvernement propre.
REFERENCES


Wolof is the major language of Senegal and Gambia. *Ay Baati Wolof* is the first Wolof-English dictionary and one of only two modern full-scale dictionaries of Wolof. It has a 154 page Wolof-English dictionary and a 94 page English-Wolof index. The Wolof-English entries contain grammatical information, examples, and frequent cross-referencing to related entries. It is based on the Dakar dialect and includes many recent innovations in Wolof as used in Dakar.

You may order copies from

Department of Linguistics  
UCLA  
Los Angeles, CA 90024-1543  
USA

Please send me

_____ copies of *Ay Baati Wolof* @ $9.00/copy (postpaid)  

Add $3.00/copy for overseas air mail  

TOTAL enclosed

Make checks payable to The Regents of the University of California
BOOK SALE!

BEATRICE AND WILLIAM E. WELMERS

IGBO: A LEARNER'S DICTIONARY

and

IGBO: A LEARNER'S MANUAL

The Welmers and Welmers Igbo books, originally published in 1968, were written as pedagogical texts for learners of Igbo, but they serve as general reference books on "Central Igbo" as well. The dictionary has both Igbo-English and English-Igbo sections. Entries in the Igbo section are alphabetized by initial root consonant rather than by prefix. The learner's manual has extensive information on syntax and in particular, on tonal alternations, which play a central part in the syntax.

The books are now being offered at the very special price of $3.00 each. The two Igbo books can be purchased as a set at the greater bargain of $5.00 for the two. Also now available for $15.00 is a set of eight cassette tapes to accompany the manual.

Use the order blank below or a facsimile. Prepayment in US dollars is required. Send orders to

African Books
Department of Linguistics
UCLA
Los Angeles, CA 90024-1543
USA

Please send me

____ copies of *Igbo: A Learner's Dictionary* @ $3.00 each

____ copies of *Igbo: A Learner's Manual* @ $3.00 each

____ sets of the two Igbo books @ $5.00 per set

____ sets of cassette tapes for the Learner's Manual @ $15.00 per set

Book rate postage (surface): $2.00 for each book or cassette set ordered

Overseas air mail postage: $8.00 for each book or cassette set ordered

TOTAL ENCLOSED

NAME: ________________________________

ADDRESS: ________________________________

____________________________

(Make checks payable to Russell G. Schuh)
"This volume considers data from some forty African languages on the East and West sides of the continent in an effort to answer the question, ‘How do languages of different word order typologies tell a story?’ The evidence suggests that the ordering of constituents on the clause level, i.e. subject, verb, and object/complement, often determines differences in the mechanics of story telling."

You may order copies from

Subscription Manager
James S. Coleman African Studies Center
University of California
Los Angeles, CA 90024-1310

Enclosed is

___ copies @ $5.00 for current individual subscriber to Studies in African Linguistics $_____
___ copies @ $8.00 for current institutional subscriber to Studies in African Linguistics $_____
___ copies @ $12.00 for individual non-subscriber to Studies in African Linguistics $_____
___ copies @ $15.00 for institutional non-subscriber to Studies in African Linguistics $_____
$5.00 for overseas Air Mail for each copy ordered

TOTAL enclosed $_____

Make checks payable to The Regents of the University of California