Lingua 55 (1981) 101–121
North-Holland Publishing Company

HAUSA DIPHTHONGS

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Received April 1981

Among Hausa scholars, the analysis of the diphthongs [ai] and [au] as /ay/ and /aw/ has been accepted almost without exception.[1] This VC analysis was advocated by Greenberg (1941), in the tradition of the earlier work by Klingenheben (1927/28), and likewise adopted by Hodge (1947), Kraft and Kraft (1973), and Kraft and Kirk-Greene (1973).[2] Its 'unquestionable' correctness has been expounded by the two leading Hausaists of our day, namely F. W. Parsons of London (e.g. 1970, 1978) and Claude Gouffé of Paris. Gouffé has been particularly insistent on this point, taking every available opportunity to emphasize his position. Typical are the following comments found in recent book reviews: "Enfin, mieux vaudrait renoncer au terme de 'diphthongue'... pour désigner les groupes graphiques *ai* et *au*,

[1] In Standard Hausa orthography, however, the diphthongs are written as *ai* and *au*. The pronunciation of *au* is similar to that of the sound in English 'how'; the pronunciation of *ai* is more varied, ranging from [ai] to [əi] to [ɛi] to [ei], under conditions that are not entirely clear. Other diphthongs in Hausa are either phonetically low-level variant pronunciations of monophthongs or else extra-systematic sounds limited to ideophones, e.g. *coi* = *cwai* 'very sweet'.

[2] The current practice in pedagogical works on Hausa has been to accept the phonemic analysis of the diphthongs as /ay/ and /aw/, but to adopt the orthographic *ai* and *au* for practical purposes. A case of exactly the opposite is to be found in Zima (1973: 30), where the diphthongs are said to be true diphthongs but the *ay*, *aw* transcription is used, in line with an (unsuccessful) orthography reform attempted in Niger in the late 1960's and early 1970's. (We are indebted to Dr. Peter Skalnik for pointing out the Zima reference.)

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qui correspondent phonologiquement à /ay/ et à /aw/, c'est-à-dire à une séquence VC" (Gouffé 1974: 395); or "Les graphies *ai* et *au* de l'orthographe standard sont, ici encore, définies comme des 'diphthongues', alors qu'il y a un avantage évident à les traiter comme des séquences VC /ay/ et /aw/" (Gouffé 1977: 380).

But what are these 'evident advantages' that most Hausaists take for granted? Surprisingly, very little argument in support of the VC analysis is to be found in the Hausa literature, apart from a few unsystematic examples presented here and there. While some of the arguments presented or alluded to seem reasonable on first sight, they turn out to be far from compelling as soon as one subjects the problem to closer scrutiny. Moreover, there are many facts about Hausa not discussed by the adherents of the VC analysis that argue against the traditional treatment of the diphthongs as V plus the consonants /y/ and /w/. Contrary to the prevailing viewpoint, we contend that the Hausa diphthongs are best interpreted as true vocalic diphthongs.

The plan of this paper is as follows. In section 1, we evaluate (and refute) evidence and arguments commonly adduced in support of the /ay/ and /aw/ analysis. In section 2, we point out other phonological and morphological phenomena which favor the true diphthong analysis. In section 3, we discuss how to handle the morphophonological alternations between /i/ and /y/ and between /u/ and /w/ that result as a consequence of the true diphthong analysis. Finally, in section 4, we propose to extend the notion of true diphthong in Hausa to include VN sequences.

1.

1.1. Genitives

Hausa 'genitives' are of the form N of N, where the 'of' is indicated by a suffix *-n* or *-ɾ* attached to the first noun: *-n* (< *na*) for masculine and plural nouns, *-ɾ* < *ta*) for feminine nouns.[3] For example,[4]

[3] The non-reduced forms *na* and *ta* may (and must) be used in certain grammatical environments. In northern and western dialects, the feminine form *ta* reduces to -C′ (doubling of the following consonant) rather than to *-ɾ*. The few feminine nouns that end in a vowel other than *-aa* use *-n* as the linking particle.

[4] Transcription system: Long vowels, analytically V + length, are indicated by double letters. Hi tone is left unmarked, Lo tone is indicated by a grave accent (on the first letter only of a

(1) *dookii* 'horse' + *n* + *sarkii* 'chief' → *dookin sarkii* 'the chief's horse'
rìigaa 'gown' + *ɾ* + *sà* 'his' → *rìigaɾ-sà* 'his gown'
dumàamee 'gourds' + *n* + *tà* 'her' → *dumàaman-tà* 'her gourds'

Note that Hausa does not allow long vowels in closed syllables, so that when the suffix is added, the final vowel of the noun is automatically shortened in accordance with regular syllable overload rules. (When shortened, *e* and *o* tend to shift to *a*, in certain cases leaving a trace in the form of palatalization or labialization of the preceding consonant.) If the noun to which the genitive linker is added ends in a consonant – most C-final words being loanwords – an epenthetic *i* or *u* is inserted, e.g.

(2) *kyandìɾ* + *n* + *sà* → *kyandìɾin-sà* 'his candle'
kaamùs + *n* + *tà* → *kaamùsun-tà* 'her dictionary'
màngûl + *n* + *Bàɾno* → *màngulìn Bàɾno* 'salt of (from) Borno'

One of the common arguments given for the VC analysis is the behavior of words ending in a diphthong when used in the genitive, e.g.

(3) *râi* (/rây/) 'life *raayìn-sà* 'his life'
sau (/saw/) 'foot' *saawun-sà* 'his foot'
kâi (/kây/) 'head' *kaayìn-tà* 'her head'
kyâu (/kyâw/) 'goodness, beauty' *kyaawùn-tà* 'her beauty'

The claim is that the relation between the citation form and the genitive is captured better if one postulates these words with underlying final consonants, i.e. /y/ and /w/. The problem with this solution, however, is that the forms cited are *not* typical of the genitives of diphthong-final words. There are dialects where such forms are used – one also finds *raayìi* 'life', *saawuu* 'foot', etc. as non-genitive forms – but the normal, every-day forms in standard Hausa are clearly *rânsà*, *sansà*, *kântà*, and *kyântà*. Moreover, most diphthong-final words do not have long-form genitives even as alternatives or dialect variants: the only way in which they can form genitives is by adding the suffix directly to the diphthong, which is thereupon reduced. This is true of a number of monosyllabic words, of almost all diphthong-final words of more than one syllable, and especially of words in which the diphthong is a derivational or inflectional ending, e.g.

long vowel), and Falling tone, analytically Hi + Lo, by a circumflex. The symbol *ɾ* represents a rolled or tap sound that contrasts in Hausa with a flap *r* (see Newman 1980). The glottalized consonants are indicated by the 'hooked' letters *ɓ*, *ɗ*, *ƙ* and by the digraphs *ts* (= [s'] or [ts']) and *'y*.

(4) *mân shaanuu* 'butter' (lit. 'oil of cows') < *mâi* 'oil'
ƙwan kàazaa 'chicken eggs' < *ƙwai* 'egg(s)'
kânmù, kânkù... 'ourselves, yourselves...' < *kâi* 'head'
ƙansà < *ƙai* 'pity' (used in *Allàh yà ji ƙansà* 'May God have mercy on his soul')
wàlântà 'its flash of light' < *wàlâi*
ƙoosan yaarinyàa 'the girl's fried bean cake' < *ƙoosai*
jàatan yaaròo 'a light-skinned boy' < *jàatau*
tùnkùyansà 'its fleas' < *tùnkùyau* (< *tùnkuyàa* 'to butt, gore')
gyartansù 'their calabash mender' < *gyartai* (< *gyartàa* 'to repair')
tùddansù 'their hills' < *tùddai* (pl. of *tudùu*)
kibansù 'their arrows' < *kibaụ* (pl. of *kibiyàa*)

If one postulates underlying /ay/ and /aw/, it is impossible to explain the disappearance of the presumed stem-final consonant. There is nothing in Hausa to account for this since, as is illustrated in (2), true stem-final consonants are invariably retained when flexional endings are added. By contrast, if /ai/ and /au/ are interpreted as vocalic nuclei, then the loss of the second element follows naturally from the general syllable overload rule that applies to closed syllables, i.e. if a coda is added to a syllable that contains a long nucleus, the nucleus must be reduced. One simply has to understand that 'long nuclei' include diphthongs as well as long monophthongs, e.g.

(5) *yau + n + tà → yaụntà → yantà* 'her saliva'
cf. *ɗaa + n + tà → ɗaạntà → ɗantà* 'her son'
kufai + n + sù → kufaịnsà → kufansù 'their deserted house'
cf. *gadoo + n + sù → gadoọnsù → gadonsù* [gadansù] 'their bed'
wàkiilai + n + sà → wàkiilaịnsà → wàkiilansà 'his representative'
cf. *dilàalee + n + sà → dilàaleẹnsà → dilàalensà* [dilàalansà] 'his jackals'

The alternations evidenced in (3), such as *râi/raayìnsà* 'life/his life', throw no light on the phonological problem since they are in fact examples of non-automatic, morphologically conditioned alternation going back to (presumed) historically earlier forms. Not surprisingly, they are being replaced by phonologically regular alternations based on the synchronically underlying citation forms, i.e. *râi/rânsà*. It seems clear that the genitive construction, far from supporting the VC analysis, in fact provides strong evidence in favor of the true diphthong analysis.

1.2. Plurals

Hausa plurals, with all their complexity, constitute a category of particular importance with respect to the diphthong question, as has tended to be

the case with other phonological and morphological questions.[5] Of special relevance are plural subtypes involving insertion of *àa* between C_2 and C_3 of CVCCVV nouns. It is claimed that the surfacing of /y/ and /w/ as C_2 in the plural forms proves that the diphthongs that one finds in the corresponding singulars are really VC sequences, e.g.

(6)	sg.	pl.		sg.	pl.	
'spur'	*kaimii*	*kayàamee*	cf.	*gulbii*	*gulàabee*	'stream'
'door'	*kyauree*	*kyawàaree*	cf.	*kaskoo*	*kasàakee*	'bowl'
'hide bag'	*taikii*	*tayàakaa*	cf.	*sirdii*	*siràadaa*	'saddle'

One problem with this argument is that it fails to take into account the equally normal words with diphthongs that form plurals like words with monophthongal long vowels, e.g.

(7)	sg.	pl.
'unworked farm'	*maisoo*	*maisàayee* (not **mayàashee*)
cf. 'fish'	*kiifii*	*kiifàayee*
'idiot'	*gaulaa*	*gaulàayee* (not **gawàalee*)
cf. 'hare'	*zoomoo*	*zoomàayee*
'roof frame'	*tsaikòo*	*tsaikunàa* (not **tsayàakaa*)
cf. 'room'	*ɗaakii*	*ɗaakunàa*

Another problem is that even when words with diphthongs form plurals of the internal *-àa-* types, it is not the presumed underlying /y/ or /w/ that usually shows up as C_2 but rather some other consonant, e.g.

(8)	sg.	pl.
'buffalo'	*ɓaunaa*	*ɓakàanee* (not **ɓawàanee*)
'bachelor'	*gwauroo*	*gwagwàaree* (not **gwawàaree*)
'drum'	*taushii*	*taʃàashee* (not **tawàashee*)
'arrow-shaft'	*kyauroo*	*kyamàaree* (not **kyawàaree*)

The only satisfactory means for handling these irregular, unpredictable plural forms is to assume a process of 'rule inversion' (see Schuh 1972; Vennemann 1972),[6] whereby the plural base is *morphologically* reconstituted

[5] For example, Hausa plurals have played a major role in the discussion of syllable weight (Newman 1972), rule inversion (Schuh 1972), and gemination (Leben 1977, 1980).

[6] Acceptance of rule inversion as the correct solution here does not imply our full acceptance of the extreme 'natural generativist' position that all "words are stored in the lexicon in their phonetic form" (Vennemann 1978: 403). We would agree that there probably is a universal *tendency* for surface citation forms to become underlying forms, but that languages, nevertheless, *can* tolerate and *do* make use of some degree of abstractness in synchronically underlying morphophonological representation.

(in effect recovering a historically earlier form), i.e. *ɓaunaa* ⇒ **ɓakn-* → *ɓakàanee*.[7] It is evident in such cases that the plural is not built directly on the synchronically underlying singular form. What has not been recognized is that the same phenomenon of rule inversion is also applicable to, and is the explanation for, the examples given above in (6), where a consonantal glide /y/ or /w/ appears in the plural form. The derivation *kyauree* ⇒ **kyawr-* → *kyawàaree* requires morphological recovery of the /w/ by rule inversion just as much as do the examples involving the recovery of /k/, /f/, etc. The need for rule inversion in the case of plural forms containing consonantal /y/ and /w/ is particularly clear in those examples where the singular noun now occurs with a monophthongal long vowel, e.g.

(9)	sg.	reconstituted base	pl.	alt. pl.
'stone'	*duutsèe*	**duwts-*	*duwàatsuu*	*duutsunàa*
cf. 'heart'	*zuuciyaa*	**zukt-*	*zukàataa*	*zuuciyooyii*
cf. 'raised-hut'	*ruudùu*	–	*rûddaa* =	*ruudunàa*
'tooth-gap'	*giibii*	**giyɓ-*	*giyaaɓuu*	*gibbaa*
'side'	*kwiibii*	**kuyɓ-*	*kuyàaɓaa*	*kwiibunàa*
'horse'	*dookii*	**dawk-*	*dawaakii*	*dookunàa*

Other plural patterns are equally troublesome for the VC analysis. Singular nouns of the form CVCVV with Hi-Hi tone regularly take plurals of the form CVC_2éaC_2ee. Singulars with a final diphthong behave exactly like singulars with a final monophthong and not like CVCVC nouns,[8] e.g.

(10)	sg.	pl.	gen. of sg.
'spoon'	*cibii*	*cibàabee*	*cibin*
'cornstalk'	*karaa*	*karàaree*	*karan*
'bangle'	*karau*	*karàaree*	*karan*
'anklet'	*kacau*	*kacàacee*	*kacan*

[7] Many of the words in (8) have alternative plurals of the type associated with nouns with a long vowel in the first syllable, e.g. *ɓakàanee* = *ɓaunàayee*, *gwagwàaree* = *gwauràayee*, etc. Schuh (1972) used the existence of the pl. form *ɓaunàayee* as proof that the synchronically underlying form of the singular could not be **ɓaknaa*. He failed to see that by his own arguments, the underlying form could not be **ɓawnaa*, as he supposed, but rather had to be *ɓaunaa*, as claimed here.

[8] There are so few C-final nouns in Hausa that it is difficult to generalize about the rules of their plural formation. What one can say is that none of the examples that occur show any evidence of the root-final consonant being lost in the process, e.g. *?oofis*, pl. *?oofisooshii* 'office'; *kyandir*, pl. *kyandiroorii* 'candle'; *taawùl*, pl. *taawuloolii* or *tàawùlai* 'towel'.

There is one more important point that needs to be made about diphthongs in relation to plurals. Parsons (1962: 263) has made the general observation that the 'causative' suffix *-s/-ɾ* is "*the only termination in the whole flexional morphology of the language containing an unequivocally consonantal final sound*" (1962: 263, italics his). His 'unequivocally consonantal' was a hedge necessitated by his interpretation of *ai* and *au* as /a/ plus /y/ and /w/ respectively. But once the diphthongs are correctly recognized to be vocalics, the statement acquires greater cogency. This is especially striking in plurals, where there are myriads of formations, involving suffixes, infixes, reduplication, etc., but all characterized by having a final vowel, whether it be a monophthong or a diphthong. Compare, for example, the following 'ablauted' plurals:

(11)		sg.	pl.	gen. of pl.
	'chick'	*tsàakoo*	*tsàakii*	*tsàakin*
	'husband'	*mijìi*	*mazaa*	*mazan*
	'finger'	*yaatsàa*	*yaatsuu*	*yaatsun*
	'monkey'	*birìi*	*birai*	*biran*
	'arrow'	*kibiyàa*	*kibau*	*kiban*

1.3. Etymology.

Another argument sometimes alluded to in favor of the VC analysis is that etymologically the semivowel is identifiable as such, either on internal or on comparative grounds.[9] Even if one granted that a synchronic analysis should mirror historical reality – and this is a dubious requirement – the examples cited are hardly clearcut and convincing, e.g.

(12)	'life'	*râi* (/rây/) < *raayii* (dial.)
	'foot'	*sau* (/saw/) < *saawuu* (dial.)
	'goodness'	*kyâu* (/kyâw/) < *kyaawùu* (dial.)
	'mercy'	*tàusai* (/tàwsay/) (dial.) < *tàusàyii*
	'stench'	*ɗwai* (/ɗway/) (dial.) < *ɗòoyii*

While it is probably true that the shorter forms are historically derived from the longer forms, it is not necessarily true that these are apocopated forms in which the final diphthong preserves an etymological stem con-

[9] In the case of reduplicated forms, whether synchronic or diachronic, the diphthong usually does represent an earlier VyV or WwW where the root-final vowel has been lost, e.g. *daidayaa* 'type of millepede', *dàudawaa* 'locust bean cake' (see Gouffé 1975). Explanation for these words will be found in section 3.

sonant. It is just as likely (and probably more correct) that the shorter forms resulted not from the loss of the final vowel but rather from the loss of the intervocalic semivowel, i.e. **raayìi* > **raaii* > *râi*; and *tàusàyii* > **tàusàii* > *tàusai*. Note here the preservation of the tone of the original final vowel.[10] By contrast, when a final vowel in Hausa is clearly dropped, its tone is also lost, e.g. *tùkùna* = *tùkùn* 'yet'; *dukà* = *duk* 'all' (not **dûk*).

The etymological argument, however, normally centers on syllable final obstruents that historically weakened to *w* in accordance with what is now referred to as 'Klingenheben's law' (Klingenheben 1927/28; Westermann 1934; Schuh 1972, 1974, n.d.), i.e. **K* > *w*/_____\$ (where **K* = *k*, *g*, *ƙ*); and **P* > *w*/_____\$ (where **P* = *p*/*f*, *b*, *ɓ*),[11] the former change affecting all dialects, the latter change being limited to 'Standard Hausa', e.g. (provisionally using /w/ for transcription purposes):

(13) 'poverty' *talawcii* (< **talakcii*) cf. *talàkà* 'poor person'
'heart' *zuwciyaa* (< **zuktiyaa*) cf. *zukàataa* 'pl.'
'left side' *hawni* (< **hagni*) = *hagun*
'blind woman' *màkawniyaa* (< **màkafniyaa*) cf. *màkaafòo* 'blind man'
'rubbish heap' *juwjii* (< and = *jibjii*) cf. *jibàajee* 'pl.'

(Cf. also the examples in (8).)

As generally presented, the changes illustrated above represent simple lenition, in which a strong consonant (*k*, *p*, etc.) is replaced by a weaker consonant (*w*). Since the historical changes are well documented, the resultant forms would seem to support the VC analysis. However, one can turn the matter around. If one starts with the idea that the Hausa diphthongs are true vocalic diphthongs, then it suddenly becomes clear that the historical change has been formulated incorrectly. Uncritical acceptance of the semivowel hypothesis has diverted scholars' attention away from the true processual mechanism underlying Klingenheben's law, namely, the tendency towards open syllabicity (see, for example, Martinet 1952; Malmberg 1965; Pulgram 1970). The changes, which should be indicated **K* and **P* > *u*..., involved not just *segmental* lenition, but also a major adjustment in the *syllabic* structure. The former CVC syllable was replaced, not by another CVC syllable with a weaker C_2, but by a

[10] The simplification of a rising tone to Hi is completely automatic and regular (Parsons 1955: 385n).

[11] The consonant written *f* in standard orthography structurally fills the voiceless bilabial plosive slot. Its 'normal' pronunciation is [p] or [ɸ] except when followed by a (long) back vowel, whereupon it is pronounced as [h] (see Salim 1980).

CVV syllable containing a long nucleus. In some cases, e.g. **zuktìyaa* > *zuucìyaa* or **jibjii* > **jiujii* > *juujii*, the result was a long vowel (monophthong);[12] in others, e.g. **baknaa* > *baunaa* or **màkafnìyaa* > *màkaunìyaa*, the result was a diphthong; but in either event, the former coda had disappeared and the syllable was now open. There is no reason either on the basis of Hausa diachronic phonology or on general linguistic grounds to postulate an intermediate stage **zuwcìyaa* or **bawnaa* containing an initial CVW closed syllable.[13]

2.

In refuting the major arguments commonly given (or presumed) in favor of the VC analysis, we demonstrated why /ai/ and /au/ should be considered true vocalic diphthongs. There are, in addition, numerous other phenomena in Hausa in which the phonological behavior of diphthongs patterns with that of long monophthongal vowels and not with that of VC sequences. We shall cite just a few scattered examples, each to be described very briefly.

2.1.

Nouns indicating a person of a particular origin, ethnicity, or occupation are formed in the singular by a prefix *bà-*, which is usually accompanied by a suffixal vowel, in most cases *-èe*, less often *-ii*. The corresponding plurals are formed from the lexical base (not from the form containing the prefix) by a suffix *-aawaa* (plus LLH or H* tone pattern). In vowel-final words the lexical final vowel is replaced by the suffix; consonant-final nouns simply add the suffix to the full base form. Words ending in a

[12] The diphthong */iu/, which would have resulted from the vocalization of syllable-final consonants preceded by /i/, was presumably monophthongized almost immediately to /uu/ by a 'sudden-death' rule (see Cowan 1976). The palatalization of the preceding consonant that had been conditioned by the front vowel was preserved. Monophthongization of */ui/ > /ii/ – the /ui/ going back to a much earlier change of **r* > */y* – was presumably also immediate, e.g. **kurbi* > **kuibi* > *kwiibii* 'side of body'.

[13] CVC syllables where C_2 was really etymologically a /v/ did exist at one time in Hausa, although probably not very commonly. Two good examples are **dawki* 'horse' (cf. pl. *dawaakii*), where the synchronic form is now *dookii*, and **awki(yaa)* 'goat' (cf. pl. *ʔawaakii*), which is now found as *ʔàkuyàa* = *ʔàkwiyàa*.

diphthong pattern with monophthongal V-final words and not with C-final words, e.g.

(14) *bàkabèe* pl. *kabaawaa* 'Kebbi person' < *kabi* 'Kebbi'
bàmasàṛii pl. *masaṛaawaa* 'Egyptian' < *masàṛ* 'Egypt'
bàtuuṛèe pl. *tuuṛaawaa* 'European' < *tuuṛai* 'Europe'
(not **bàtuuṛàyii*, pl. **tuuṛayaawaa* < **tuuṛay*)

2.2.

Hausa has a few adverbial expressions in which the normal lexical final vowel is replaced by *-à(a)*. The formation also applies to words with an underlying diphthong, e.g.

(15) *jikà dà jikà* 'very close together' < *jikii* 'body'
daidai wà daidàa 'exactly' < *daidai* 'correct'

2.3.

So-called 'intensive' (= 'pluractional') verbs,[14] i.e. verbs indicating multiple action or action on multiple objects, are mostly formed in one of two ways (cf. Frajzyngier 1965). The most common formation is to prefix C_1VC' to the verb stem (where C' indicates a doubling of the following consonant), e.g. *ci*, plu. *cicci* 'eat'; *hau*, plu. *hahhau* 'mount'; *sàataa*, plu. *sàssaatàa* 'steal'; *jeefàa*, plu. *jajjèefaa* 'throw' (with automatic shortening and quality shift of /ee/ → /e/ → /a/). The other means, which is only possible if the C_2 of the stem is a sonorant,[15] is to prefix C_1VC_2 to the stem, e.g. *waarèe*, plu. *warwàaree* 'separate'; *tunàa*, plu. *tuntùnaa* 'remember'. Now, consider the following examples:

(16) *ʔaunàa* plu. *ʔanʔaùnaa* 'weigh'
taunàa plu. *tantàunaa* 'chew' cf. *toonàa* plu. *tantòonaa* 'dig up'

[14] Instead of the misleading term 'intensive', which is normally used in the Hausa linguistic literature, the first author has proposed the neologism 'pluractional' verbs. In the first place, 'pluractional' is semantically a more accurate label for this verb form; cf. Gouffé (1975: 306): "Les thèmes verbaux dits 'intensifs' expriment en réalité la pluralité du procès." Second, 'pluractional' has the advantage of relating the Hausa forms more clearly to similar verb forms in other Chadic and Afroasiatic languages (cf. Frajzyngier 1979).

[15] Curiously, the rule has to be stated such that C_2 *is* a sonorant or it *may become* a sonorant, as in the case of alveolar obstruents which weaken to *r* in syllable-final position, e.g. *fita*, plu. *fiffita* or *firfita* 'go out'.

One can see clearly that the /n/ behaves as the C_2 whether the preceding vowel is a monophthong or a diphthong. If one treated the diphthong as /aw/, so that the /n/ would then be C_3, the pluractional forms would be totally anomalous.[16] With the diphthongs treated as long vocalic nuclei, the pluractionals pose no problem.

2.4.

Many Hausa words with /ai/ and /au/ have alternative pronunciations – dialectal, sociolectal, or ideolectal – with /ee/ and /oo/, e.g.

(17) 'umbrella' *laimàa* = *leemàa*
'despise' *rainàa* = *reenàa*
'bean cake' *koosai* = *koosee*
'everything' *koomai* = *koomee*
'loaf' *laumàa* = *loomàa*
'cross-question' *zàulayàa* = *zòolayàa*
'in-other-words' *wàatàu* = *wàatòo*

In most cases exhibiting such an alternation, the diphthong is the older form; in a few, e.g. *koomai* < *koomee* < *koomii*, the monophthong is definitely older; in others, e.g. *rainàa/reenàa*, the direction of the change is not entirely clear (cf. Parsons 1970: 277n).[17] Be that as it may, the close relationship that holds in Hausa between /ai/ and /ee/ and between /au/ and /oo/ is much easier to capture if one thinks of the diphthongs as long vocalic nuclei rather than as sequences of the vowel /a/ + the consonants /y/ and /w/.[18] Synchronically there would even be advantages in escaping from the constraints of history and orthography and analyzing the diphthongs *ai* and *au* as /EE/ and /OO/, i.e. as long mid vowels with the feature [– Steady State], which would be opposed minimally to the corresponding monophthongal mid vowels /ee/ and /oo/, which would have the feature [+ Steady

[16] In the case of *tantàunaa*, one could argue that the nasal in the first syllable goes back (by rule inversion) to a historically earlier form **tamnàa*. This argument would not, however, explain *?an?àunaa*, where /au/ comes from */aw/, cf. the verbal noun *?awòo* 'weighing'.

[17] Originally Hausa did not have /ee/ and /oo/ in word-medial position, most of the examples coming from /ii/ and /uu/ by a conditioned lowering rule (Newman 1979). The subsequent diphthongization of some of these vowels has resulted in cases of vowels diachronically passing one another, i.e. **ai* > *ee* vs. **ii* > *ee* > *ai*.

[18] The relationship between /ai/ and /e/ and between /au/ and /o/ has been described by Foley (1977: 145) in terms of bond strength, i.e. the "degree of intensity of the binding together of elements".

State]. While there are various reasons why one might not want to go so far, the possibility of such an analysis serves to emphasize the fact that diphthongization in Hausa is essentially a process of vowel modification and not a process of vowel plus consonantal glide addition.

2.5.

Some thirty years ago, Carnochan (1952) observed that monosyllabic verbs that normally have a long final vowel are pronounced shortened and with a final glottal closure when occurring before pause. This unusual feature has been verified instrumentally in a recent study by R. Newman and van Heuven (1981), who also confirmed Carnochan's observation that the glottal stop was added to diphthongs as well as to monophthongs, e.g.

(18) 'he drank' *yaa shăa?* 'he carried' *yaa kăi?*
'let's go' *mù jĕe?* 'let's mount' *mù hău?*
'she'll want' *tâa sŏo?* 'she'll move away' *tâa kău?*
cf. 'she won't want' *bà tâa soo ba?*
cf. 'she won't move away' *bà tâa kau ba?*

3.

The evidence presented above suggests strongly that *ai* and *au* in Hausa should be treated as true vocalic diphthongs and not as sequences of /a/ plus /y/ and /w/. A consequence of this analysis, however, is the creation of apparently real phonological alternations between /i/ and /y/ and between /u/ and /w/ that have to be taken into account, e.g.

(19)

'buy'	*sàyi*	'sell'	*sai-dà*
'orphan'	*màraayàa*	'fem. orphan'	*màrainìyaa*
'sorcerer'	*maayèe*	'sorcery'	*mâitaa*
'stop'	*tsayàa*	'stop (plu.)'	*tsaitsàyaa*
'dancing'	*rawaa*	'shake'	*rau-dà*
'thief'	*bàraawòo*	'fem. thief'	*bàrauniyaa*
'slave'	*baawàa*	'slavery'	*bàutaa*
'mounting'	*hawaa*	'mount'	*hau*

In contrast to the VC analysis, where the semivowel would remain unchanged and no alternation would be involved (e.g. /baawàa/, /bàwtaa/), the diphthong analysis adopted here would seem to require rules changing *y/w* to *i/u* in

certain circumstances and *i/u* to *y/w* in others – obviously an uneconomical solution. But the mistake here is thinking that one needs process rules changing one *phoneme* into another when all that is really required is to adjust the feature specification of phonetic high vowels and glides in accordance with underlying (and persistent) Sequence Structure Conditions (SqSC's).[19] The point is that in Hausa the vowels [i] and [u] do not contrast with the glides [y] and [w]. Rather, they are distinguished simply by the feature [Vocalic],[20] whose specification is totally redundant in relation to the syllabic structure, i.e. [–Vocalic] in syllable-initial position, [+Vocalic] elsewhere. For example, using = to indicate syllable boundary, the specification of /i/ vs. /y/ in the following is completely automatic:

(20) 'house' *=gi =daa* [+Voc] 'boy' *=yaa =ròo* = [–Voc]
'go' *=tà =fì* = [+Voc] 'one' *=ɗa =ya* = [–Voc]
'spleen' *=sai =ƒàa* = [+Voc] 'break' *=kar =yàa* = [–Voc]

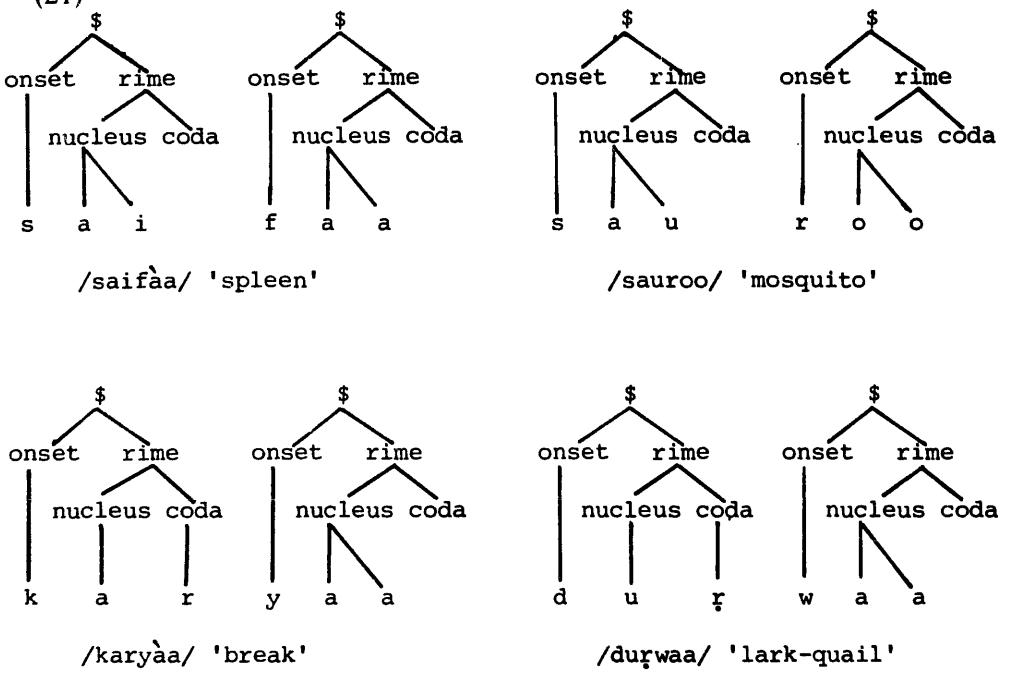
Since glides do not function as consonantal codas in Hausa,[21] an *i/y* or *u/w* occurring in syllable-final position will automatically be assigned the feature [+Vocalic] and become attached to the syllabic nucleus (thereupon forming a diphthong). This can be displayed diagrammatically as follows:

[19] The specific model we have in mind is that of Schachter and Fromkin (1968), which in turn goes back to ideas found in Stanley (1967). The possibility of applying this approach to the Hausa diphthong problem was suggested in part by a reading of Vogel (1977). We are also grateful to John Stewart for discussions concerning this model and related matters.

[20] Vowels are [–Consonantal, +Vocalic]; the glides /y/ and /w/ are [–Consonantal, –Vocalic]. We prefer to retain the feature [Vocalic] rather than replace it by [Syllabic], as has been advocated (Chomsky and Halle 1968: 303, 354). The feature [Vocalic] would still be understood to refer to the functional categories vowel and consonant as opposed to the feature [Consonantal], which would refer to contoid and vocoid – using Pike's terms (1943: 78) – but the feature [Syllabic] would be left available to mark the peak of a complex vocalic nucleus, for example, or to specify syllabic phenomena independent of the segmental level.

[21] Geminates such as in *gàyyaa* (not **gài = yaa*) 'communal work' or *zàwwaatì* 'calico cloth' constitute an exception to the rule, but the behavior of geminates in Hausa requires special treatment anyway (see, e.g. Leben 1980).

(21)



The apparent alternations that one finds in (19), for example, can thus be handled simply by reimposing the SqSC *after* the resyllabification rules that accompany derivational and inflectional affixation, e.g.

(22) $=sa\ =yi\ =\ +\ =da\ =$ (via vowel loss and resyllabification) $\rightarrow$
$=say\ =da\ =$ (via [Voc] SqSC) $\rightarrow$ $=sai\ =dà\ =$ 'sell'
$=hau\ =\ +\ aa\ =$ (via resyllabification) $\rightarrow$
$=ha\ =waa\ =$ (via [Voc] SqSC) $\rightarrow$ $=ha\ =waa\ =$ 'mounting'

Note that lower level phonological rules apply after the (re-)specification of the [Voc] feature, e.g. *mâitaa* 'sorcery' may be pronounced *mêetaa* (cf. section 2.4), even though derived from *maayèe*; similarly, *kau* 'move aside' adds glottal closure before pause (cf. section 2.5) even though derived from and equal to *kàwa*.

Since the common alternation such as one finds in (19) can be handled as easily and naturally by Sequence Structure Conditions as by postulating underlying /ay/ and /aw/, and since, as has been shown, the VC analysis is defective in so many other respects, we conclude that /ai/ and /au/ in Hausa constitute true diphthongs, which function in the syllable as long vocalic nuclei just like the long monophthongal vowels.

4.

The discussion so far has concerned the phonological interpretation of diphthongal elements whose existence, at least at the lowest surface level, has never been at issue. In this section we push further and propose the existence of phonological entities never previously suggested for Hausa, namely nasal diphthongs.[22]

4.1.

Hausa nouns with Hi-Hi tone and a heavy first syllable exhibit two different (but related) plural patterns: one where the first syllable is CVV and another where the first syllable is CVC. If the first syllable ends in a nasal consonant, however, the plural patterns with that of CVV- words and not CVC- words, e.g.

(23)

	sg.	pl.		sg.	pl.
'hare'	*zoomoo*	*zoomàayee*	'bowl'	*kaskoo*	*kasàakee*
'mystic'	*suufii*	*suufàayee*	'mortar'	*turmii*	*turàamee*
'idiot'	*gaulaa*	*gaulàayee*	'stream'	*gulbii*	*gulàabee*
'worn-out hoe'	*dumbuu*	*dumbàayee*	'whip'	*kurfoo*	*kuràafee*
'wad of paper'	*kundii*	*kundàayee*			
'crest'	*zankoo*	*zankàayee* ([zaŋkoo] [zaŋkàayee])			

If the peculiar behavior of syllable final nasals was limited to this particular plural pattern, one might treat it as an aberration. But, this is not so. With Hi-Lo nouns as well, CVVCVV singulars tend to take certain plurals and CVCCVV singulars others, and again CVNCVV words pattern with those with an initial CVV-, e.g.

(24)

	sg.	pl.		sg.	pl.
'drum'	*tuurùu*	*tuurunàa*	'saddle'	*sirdii*	*siràadaa*
'room'	*ɗaakii*	*ɗaakunàa*	'face'	*fuskàa*	*fusàakaa*
'roof frame'	*tsaikòo*	*tsaikunàa*	'pen'	*garkèe*	*garukkàa*
'basin'	*kumbòo*	*kumbunàa*	'tongue'	*harshèe*	*harussàa*
'nose'	*hancii*	*hantunàa*			
'nook'	*lungùu*	*lungunàa*			

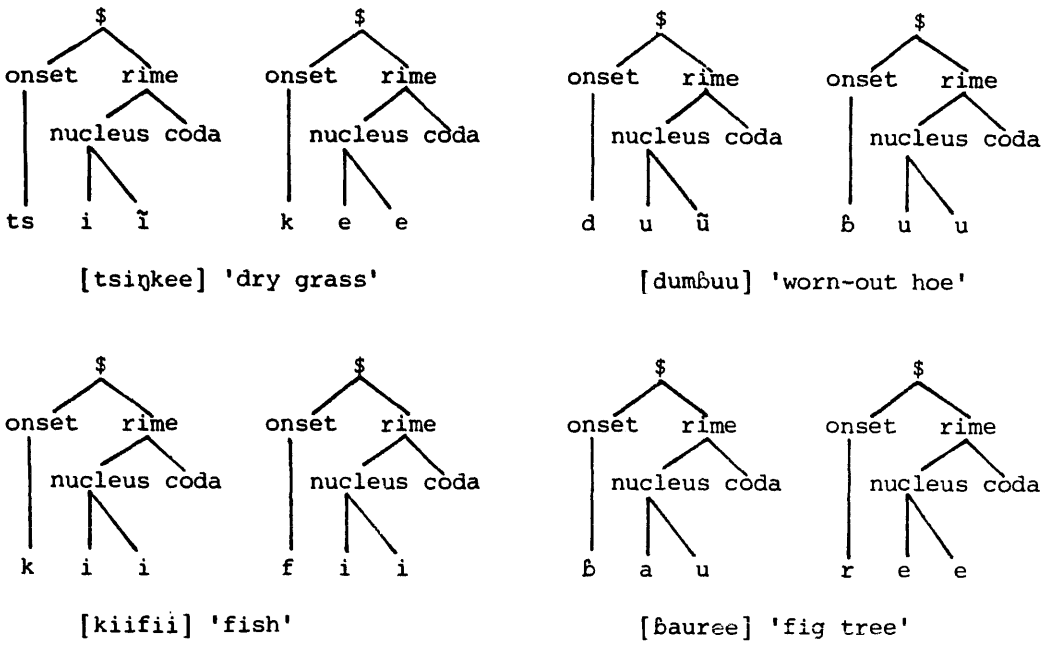
[22] The ideas in this section were first presented by the first author to the Friday Club, Department of Linguistics, University of Amsterdam (November, 1978) in a paper entitled 'Nasal diphthongs in Hausa'.

In Newman (1972) the failure of CVNCVV to behave like normal CVCCVV words was handled by the ad hoc expedient of labelling the syllable final /m/'s and /n/'s as [+Voc]. As correctly identified and criticized by Leben (1977), this was a misuse of a phonological feature as a morphological indexing device. But suppose one takes the feature seriously at the phonological level and treats the nasal as a [+Voc] nasal glide belonging to the nucleus, then in place of the vowel + consonant sequences V*m* and V*n* (plus overt morphological indexing) one has complex vocalic nuclei of the form V͡N, i.e. 'nasal diphthongs', comparable to the oral diphthongs *a͡i* and *a͡u*. Words with these nasal diphthongs, e.g. *zaNkoo*, *duNɓuu*, and *tsiNkee* 'dry grass', would thus be parallel to words such as *maisoo* 'deserted farm' or *ɓauree* 'fig tree'.

The notion of nasal diphthong was inspired by the general approach to diphthongs found in Andersen (1972). Most definitions of diphthongs refer to a qualitative change in a vowel throughout its articulation, usually referring to tongue position, with or without accompanying lip rounding or unrounding. Andersen, however, expands the concept to include any heterogeneous vowel, so that in addition to diphthongs such as *ai* and *au*, one could have diphthongs such as *aũ* or even *aã* (= /aĩ/).[23] Thus, in proposing that Hausa words such as *zankoo*, *dumɓuu*, and *tsinkee* contain a nasal diphthong, one is suggesting in effect a phonological representation of the form /zaãkoo/, /duũɓuu/, and /tsiĩkee/. In other words, such forms do not merely pattern with CVVCVV words, they *are* CVVCVV words, where the initial long vowel is a nasal diphthong composed of /a/, /u/, or /i/ plus a homorganic nasal vowel (realized on the surface as a homorganic nasal consonant). This is illustrated in the following diagram:

[23] Much earlier, Jakobson (1952: 306) already had the idea of "liquid diphthongs", i.e. a diphthong composed of a vowel plus /l/. In much the same spirit as Andersen's treatment of vocalic diphthongs is Anderson's concept of complex consonants, which exhibit "shift in feature value within the scope of a single segment" (1975: 3).

(25)



One is accustomed in linguistics to treating nasal(ized) vowels as surface realizations of oral vowel plus nasal consonant sequences, i.e. [gã] = /gan/, etc. The reverse, as we propose for Hausa, i.e. [zaŋkoo] = /zaãkoo/, is much less common, although far from unknown. Describing a language of an entirely different family (Sindhi) from an entirely different theoretical perspective, Mitchell (1975: xviii), for example, also interprets surface nasal consonants as manifestations of underlying nasal vowels: "Nasality takes a *consonantal* form in certain contexts, notably when associated with a short vowel preceding a plosive consonant. In these circumstances, a nasal consonant is pronounced homorganically with the following plosive, *e.g.* 'ãb' [ʌmb] (mango)... 'bũɖ' [bʊɳɖ] (firewood)... 'jãg' [jʌŋg] (war)." Closer to the Hausa case is the situation in Akan (Schachter and Fromkin 1968: 64, 71–72), Baule (Stewart 1956: 356), and Cama (Stewart 1973: 12), three Western Kwa languages, where surface nasal consonants are interpreted as being nasal vowels in underlying representation, e.g. (citations from Cama), /ãtù/ = [ńtú˥] 'sand'; /ãfɔ̀/ = [m̀fɔ̃] 'nose'; /ãgɔ̀/ = [ŋ̀gɔ̃˥] 'plantations'.

Thus, while the concept of 'nasal diphthongs' may be radical for Hausa, there is good precedent elsewhere in the linguistic literature. The only question, then, is whether an analysis using this concept is justified and

useful for Hausa. The value in explaining an otherwise anomalous aspect of synchronic plural formation was described above. One can also show how the concept helps clarify diachronic processes and developments.

4.2.

The historical weakening of syllable final labials, $*P > u$, is restricted to the dialects now referred to as 'Standard Hausa'. In northern and western dialects the original obstruent is retained (cf. section 1.3), e.g. 'softness' *taushii* = and < *tafshii*. In Standard Hausa, where the general rule applies, syllable final /m/ has also changed to /u/, but only when immediately followed by /n/ or /r/, e.g.

(26) 'sit' *zaunàa* = and < *zamnàa*
'chew' *taunàa* = and < *tamnàa*
'marriage' *ʔauree* = and < *ʔamree*
'tie up' *ɗauràa* = and < *ɗamràa*

When followed by any other consonant, /m/ underwent assimilation to the position of articulation of that consonant, e.g.

(27) 'filth' *kàzàntaa* = and < *kàzàmtaa*
'cheek' *kuncìi* = and < *kumcìi*
'idol' *guŋkii* = and < *gumkìi*

Whereas the changes illustrated in (26) have commonly been included in the $*P > u$ part of Klingenheben's law, those in (27) have not. Schuh (1976: 228), however, correctly perceived that the changes were related, noting "they all clearly involve the same phenomenon, viz. syllable final nasal weakening. The phonetic realization of the weakening differs depending on the environment." Given the approach to diphthongs and nasal diphthongs developed here, the unity of the changes can be pursued further and described in a more specific way than simply by appeal to the loose (but real) concept of weakening. In both cases what was involved was the change from a [−Voc] consonant /m/ to a [+Voc] vowel, the difference simply being in the retention or loss of the [Nasal] feature, e.g.

(28) 'sit' *zamnàa* > *zaunàa*
'idol' *gumkii* > *guũkii* [guŋkii]

Thus, both the change $*m > u$ (not $*m > w$!) and the change $*m >$ hom-

organic nasal can be seen not only as manifestations of a natural weakening process but also as further examples of a general tendency in Hausa whereby consonantal codas are absorbed into the nucleus.[24] Note that as in the case of other consonants that have been subjected to Klingenheben's law, *m*'s that have become nasal vowels can also be recovered morphologically by inverse rules, e.g.

(29) 'cheek' /kuũcìi/ [kuncìi] pl. *kumàatuu* (or *kuncunàa*)
'sheep' /tuũkiyaa/ [tuŋkiyaa] pl. *tumaakii*
cf. 'arrow-shaft' *kyauroo* pl. *kyamàaree* (or *kyauràayee*)
'drum' *taushii* pl. *tafàashee*

A final note that needs to be made about nasal diphthongs is that, unlike oral diphthongs, they are limited to word-medial position. Schuh (1976) has documented a historical change at an early period whereby all word-final nasal consonants were lost. The final nasals that one now finds in Hausa, e.g. *làadân* = *làadaanìi* 'muezzin', are all recent introductions. Synchronically they have to be considered as nasal consonants that have not yet undergone the full weakening to nasal vowels, although even here the weakening trend seems evident.

5.

In a radical departure from standard descriptions, we analyze Hausa as having five diphthongs: two oral diphthongs, *ai* and *au*, and three nasal diphthongs, *aã*, *iĩ*, and *uũ* (alternatively, *ãĩ*, *ĩĩ*, and *ũĩ*; or *aN*, *iN*, and *uN*). The former are normally treated as /ay/ and /aw/; the latter have never been considered as anything but a sequence of *a*, *i*, or *u* plus the consonant /n/. At first sight, the five-diphthong analysis would seem to involve the sacrifice of simplicity in the one case and naturalness in the other. Nevertheless, as we have shown, this analysis, involving the postulation of 'nasal diphthongs' as complex nuclei, is really the most adequate for Hausa, both for explaining synchronic anomalies and for understanding the processes underlying historical phonological changes.

[24] Normally, words with original syllable-final /n/, e.g. *tanduu* 'hide container', are not described as having undergone a historical change. We would suggest that although their surface forms have not changed, they have nevertheless undergone the phonological weakening of nasal consonant to nasal vowel, i.e. */tanduu/ > /taãduu/ (cf. pl. /taãdàayee/ [tandàayee]). This was probably a historically early change which preceded the vocalization of */m/.

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