UNDERSTANDING YORUBA

LIFE AND CULTURE

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32 The Sound System of Yoruba

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INTRODUCTION

In this chapter, an introductory description of the major aspects of the Yoruba sound system will be provided in as non-technical way as possible. Since the very idea of a sound system itself is technical, it is unavoidable that the chapter employs the usual technical terminologies; but we will explain the ideas behind such terms when they are employed. For the more sophisticated reader the major sources of information are cited on various aspects of the sound system in each section.

The study of the sound structure of any language involves three crucial components: the sound segments of the language, the way the segments are combined to form words and the changes that take place when the sounds are combined. The focus of this chapter is on the sound segments and the changes that take place when sounds are combined. The reader is referred to the chapter on grammar for the second component. Finally, four major phonological processes in Yoruba are discussed: vowel harmony, vowel assimilation, vowel deletion, and consonant deletion. Other processes will not be discussed because of limitation of space.

YORUBA SOUNDS

As Liberman[1] notes, "each human language develops its own rather large set of essentially arbitrary vocal signs, roughly what we normally call 'words'." These words consist of units of meaningless vocal gestures or sounds, called segments. Words in languages result from highly structured combinations of these segments, which may be likened to the letters of an

alphabet.[2] It is the subject of this section to examine the sets of sounds from which Yoruba words are built. There are three sets of sounds which make up Yoruba words: these are vowels, consonants and tones.

(a) *Vowels*

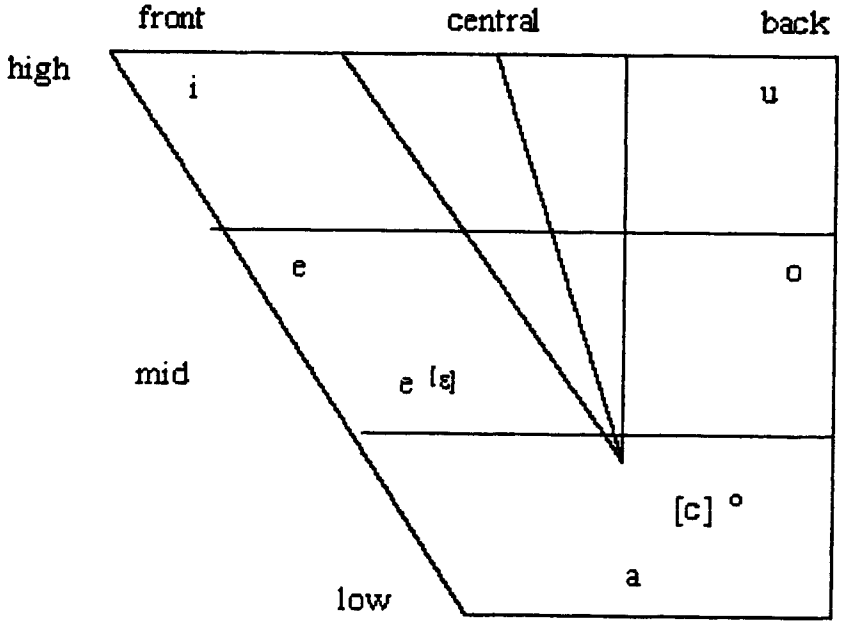
Yoruba has seven oral vowels. By oral it is meant that air escapes from the mouth (rather than from the nose) when the vowel is produced. These seven vowels are contrastive in the sense that switching one of the vowels for the other leads to a change in the meaning of the word. Technically, they are called *vowel phonemes*. The seven oral vowels are shown in the following examples. The equivalent symbols (letters) of the International Phonetic Alphabet (IPA) are put in brackets.

(1) Yoruba vowels[3]

IPA	Orthography	Example	Meaning
[a]	a	ká	(fold)
[e]	e	ké	(shout)
[ɛ]	ẹ	kẹ	(pet)
[i]	i	ki	(greet)
[o]	o	ko	(gather)
[ɔ́]	ọ	kọ	(teach)
[u]	u	kứ	(die)

These seven vowels are represented on a phonetic vowel chart as follows.[4]

Vowel Chart



The chart is to be interpreted as follows: the top-to-bottom dimension represents vowel height or openness, i.e. the higher positions on the chart correspond to a higher position of the tongue in the mouth, with [i] and [u] produced with the highest position of the tongue and [a] produced with the lowest position of the tongue. The left-to-right dimension corresponds roughly to front-to-back position of the tongue in the mouth. Finally, the three vowels [c], [o], and [u] are rounded, which means that they are produced with rounded lips, while the remaining four vowels are unrounded. These seven oral vowels correspond roughly to the following vowels of standard American English: [i] as in "Pete", [e] as in "bait", [ɛ] as in "bet", [a] as in "bott", [c] as in "bought", [o] as in "boat", and [u] as in "boot."

The seven oral vowels above are nasalized when they are pronounced after nasal consonants. In this situation they are pronounced as [ĩ, ê, ã, ɛ̃, c̃, õ, û]. That is, air escapes both from the mouth as well as from the nose when the word is pronounced. The mid vowels [ê, õ] are perhaps the least nasalized in this context. (—> means "becomes" or "is pronounced as")

(2)				
	/mu/	—>	[mû]	(drink)
	/mí/	—>	[mí]	(breath)
	/mc/	—>	[mc]	(know)
	/má/	—>	[má]	(don't)
	/mɛrĩ/	—>	[mɛrĩ]	(four)
	/mówó/	—>	[mówó]	(take money) (from *mu!* (to take) *owo!* (money)
	/merĩn/	—>	[merĩn]	(catch elephant) (from *mu!* (to catch) *erin* (elephant))

Yoruba also has five inherently nasal vowels [ĩ], [ɛ], [ã], [c], [ũ], whose nasalization is not caused by a (preceding) nasal consonant as was the case in the above examples. Instead these vowels may be produced after oral consonants. The following examples illustrate the inherently nasal vowels:

(3)

IPA	Orthography	Example	Meaning
[ĩ]	in	ikìn	(palm nuts for I fa divination)
[e]	en	ìyen	(that one)
[a]	an	ikan	(white ants)
[c]	on	ìbon	(gun)
[u]	un	ikun	(type of squirrel)

The position of each of these vowels on a vowel chart is roughly equivalent to that of the corresponding oral vowel in the preceding chart. They are similar in pronunciation to the following vowels in American English: [ĩ] in "mean", [ɛ] in "men", [ã] in "mom", [c] in "dawn", and [ũ] in "moon".

However, only three of these vowels [ĩ], [ɛ], and [c] are, strictly speaking, contrastive. That is, only these three effect meaningful change. The occurrence of the two other nasal vowels, [ɛ̃], [ã] , is severely restricted and predictable. [ã] is used after nonlabial consonants (see the discussion of consonants below), while [c] is used after labial consonants.[5]

(4) Words with the vowel [ã] (an) (nonlabial consonants)

itan	(thigh)
idán	(magic)
òsán	(afternoon)
isan	(muscle)
ikán	(white ants)

(5) Words with the vowel [c] (on) (labial consonants)
(an asterisk (*) implies that the form does not occur.)

ìbon	(gun)	but not	*ìban
àpon	(bachelor)	but not	*àpán
ogbón	(wisdom)	but not	*ogbán
èfon	(mosquito)	but not	*èfan
èwòn	(chain)	but not	*èwàn

These two vowels ([ã] and [c]) complement each other; that is, one vowel is used in certain contexts and the other is used in other contexts. So the vowels [ã] and [c] are actually positional or contextual variants of a single vowel. What is further interesting about the vowels is that [c] can be used in either context without any loss of meaning. That is, the vowel [ã] in (4) can be replaced with [c] without change in meaning.

(6)

iton	(thigh)
idón	(magic)
òsón	(afternoon)
ison	(muscle)

The remaining nasal vowel, [ɛ̃], is most severely restricted, occurring only in two related items:

(7)

ìyen	(that one)
yen	(that)

It is thus only marginally contrastive. Strictly speaking, Yoruba can be said to have three contrastive nasal vowels, as has been proposed by some scholars.[6] However, in the orthography all five nasal vowels (in, un, en, on and an) are used.

(b) *Consonants*

Consonant sounds are sounds produced by having a partial or complete

obstruction in the vocal tract. Yoruba has eighteen basic consonants, which are listed below in a consonant chart. They are listed as written in the orthography, with the IPA symbol indicated where both notations differ.

Consonant chart

			labial	alveolar	palatal	velar	labiovelar	glottal
obstruents	stops	voiceless		t		k	p [kp]	
		voiced	b	d	j [ʃ]	g	gb [gb]	
	fricatives	voiceless	f	s	s [ʃ]			
sonorants	nasals		m	n				
	approximants	lateral		l				
		central		r	y [j]		w	h

In the above chart, the segments are listed such that the columns represent place of articulation, i.e., the position in the mouth at which the closure for a sound segment occurs. The closure for Yoruba consonants occur at six places in the mouth: at the lips (labial), at the back of the upper incisors (alveolar), at the hard palate (palatal), at the soft palate (velar) and farthest at the voice box (glottal). Finally, three consonants are produced with closures occurring simultaneously at two places, labial and velar (labiovelar). The rows represent the manners of articulation, which correspond approximately to how the constriction is made in producing the sound segment. For example, [b] is produced with the two lips, hence it is (bi)labial. The two lips come completely together in articulating [b], hence it is a stop. Other constrictions include fricatives which are produced with a narrow opening and a turbulent airflow through the opening, and approximants which are produced with a relaxed constriction without turbulent airflow. Among obstruents there is a distinction between voiced consonants (with glottal vibration) and voiceless consonants (without glottal vibration). Sonorants lack this distinction; they are all voiced. However, among approximants, there is a distinction between lateral (in which air escapes from the sides of the tongue) and central (in which air passes over the center of the tongue).

Classifying the consonants according to place of articulation, the following examples show words in which the consonants occur.

(8) Yoruba consonants

IPA	Orthography	Examples			
Labial					
[b]	b	bá	(meet)	abà	(hut)
[m]	m	mò	(know)	amò	(clay)
Alveolar					
[t]	t	tà	(sell)	ata	(pepper)

[d]	d	dà	(pour)	àdá	(cutlass)
[s]	s	sò	(murmur)	asò	(murmur)
[n]	n	nà	(beat)	àna	(in-law)
[l]	l	lá	(lick)	àlá	(dream)
[r]	r	rà	(buy)	ara	(body)
Palatal					
[ʃ]	j	jà	(fight)	ajá	(dog)
[ʃ]	s	sá	(cut)	àsà	(custom)
[j]	y	yà	(draw)	aya	(wife)
Velar					
[k]	k	kà	(read)	àkà	(granary for maize)
[g]	g	gà	(spread)	àga	(chair)
Labiovelar					
[kp]	p	pa	(kill)	apá	(arm)
[gb]	gb	gba	(sweep)	àgbá	(elder)
[w]	w	wá	(search)	ìwà	(character)
Glottal					
[h]	h	ha	(scratch)	ahá	(calabash bowl)

The classification on consonant chart is basically uncontroversial. However, there are two major differences between the above classifications and those already available in the literature.[7] First {ʃ} is classified as a stop, instead of as an affricate (a segment which begins as a stop and ends as a fricative). Apart from the economy achieved from not having an entire row labeled affricate for just a single segment, Bamgbose[8] notes that there is a variation among speakers between producing a stop and producing an affricate, so either classification is appropriate. The other difference between this classification and those of earlier writers is that of [h] as an approximant, instead of as a fricative.[9]

Some Yoruba consonants have contextual or positional variants. The first of these positional variations can be described in terms of a class of consonants. All Yoruba sonorants have nasalized variants when produced before nasal vowels. The sonorant consonants are /l, r, w, y, h/, and they are pronounced respectively as [n, r, w, y, h] before nasal vowels.[10]

(9)	/l/	[n]	(feed)
	/r /	[r]	(walk)
	/w /	[w]	(lend)
	/y /	[y]	(dispense)
	/h /	[h]	(weave)

Secondly, when the nasal /n/ is syllabic, that is when it constitutes a syllable by itself (see below for the discussion of syllables), it has six variants whose points of articulation are based on the points of articulation of the following consonants. Therefore, it is a bilabial [m] before /b, m/, a labiodental [m] before /f/, an alveolar {n} before /t, d, s, n, r, l/, a palatal [n] before / ʃ , ʃ, y/, a velar [n] before the consonants /k, g, w, h/ and the vowel /o/, and a labiovelar [nm] before /kp, gb/. The following examples illustrate some of the variants. The syllabic nasal is in bold form in the following examples. The words are given in Yoruba orthographic in the rightmost column.

(10)	[òrombó]	(orange)	òrombó
	[bómfò]	(short skirt)	bóńfò
	[pañla]	(stockfish)	pañla
	[ògòŋgò]	(ostrich)	ògòngò

(c) *Tones*

The third and final class of segments in Yoruba are tones. Yoruba has three contrastive tones-H(igh), M(id), and L(ow), which are generally realized on vowels and sometimes on nasal consonants, i.e. a word may have different lexical meaning depending on whether it is said with a high pitch or a mid pitch or a low pitch. Given the fact that there are three contrastive tones, a one syllable may have a three way pitch contrast, as the words in (11) show. In (11), the consonants and vowels are the same in the three words; the only difference is that the words have different tones.

(11)	kó (H)	(build)
	ko (M)	(sing)
	kò (L)	(reject)

Therefore tones are like consonants and vowels in Yoruba, since they distinguish the meanings of words like consonants and vowels do.[11] Disyllabic words are predicted to have nine patterns in the Yoruba language, given three contrastive tones. The following table illustrate lexical distribution of tones in words of one and two syllables.

rá H (disappear)	ra M (rub)	rà L (buy)
okó MH (hoe)	oko MM (husband)	okò ML (vehicle)
ìlú LH (town)	ilu LM (opener)	ilù LL (drum)
pákó HH (plank)	kése HM (mythological place name)	pákò HL (chewing stick)

However, there is a restriction on the distribution of the High tone. The High tone occurs in word-initial position only in (marked) consonant-initial words. Except for this minor restriction, tones occur freely in words, without apparent restrictions on word melodies.

Two of the three basic tones illustrated above (the High tone and the Low tone) have variants. The High tone (H) is pronounced as a LH (rising tone) contour after a Low tone, and a Low tone is pronounced as a HL (falling tone) contour after a High tone.

(12)	àlá (LH)	àlă (L LH)	(dream)
	rárà (HL)	rárâ (H HL)	(elegy)

(d) *Syllable structures*

As we saw in the preceding section, vocal gestures or sounds form words. But these sounds are structured in specific ways to form words. In other words, strings of sounds are not in any way arbitrary; there are specific constraints on how the sounds are combined. In this section we shall examine some the permissible sound combinations of Yoruba.

Not just any combination of the above phonological alphabet (vowels, consonants, and tones) constitutes a word in Yoruba. For example, unlike English, Yoruba disallows consonant clusters. Thus, it is impossible to have a combination like [krim] (the pronunciation of the English "cream") which has the cluster 'kr' at the beginning, or [silk] (the pronunciation of the English "silk") which has the cluster 'lk' at the end. Thus, it is crucial that we look at Yoruba syllables to discover the restrictions on segment combination.

Yoruba words result from a very simple syllable structure. The internal structure of syllables is usually described with C standing for consonants and V standing for vowels. Using these abbreviations Yoruba has only two types of syllables (- marks syllable division):

(13)	V:	àlá	(à - lá)	(dream)
	CV:	wá	(wá)	(come)

Other than pronouns which can be single vowels and so are representative of the V syllable, this syllable type is largely found as the initial vowel of nouns in the first example in (13). The V also represents nasal consonants that stand alone as syllables, such as the 'm' in *òrombó* [òrombó] (orange), and 'n' in *géndé* [gé-n-dé](a sturdy young man). Note that, like vowels, these nasal consonants are tone-bearing.

There are four logical combinations of the two syllable types found in Yoruba; all the combinations are actually attested, though not all are

independent words.

(14)				
	V-V	àánu	(à-á-nu)	(sympathy)
	V-CV	etí	(e-tí)	(ear)
	CV-V	díè	(dí-è)	(a few; some)
	CV-CV	bàtà	(bà-tà)	(shoe, footwear)

The absence of the first pattern as a simple (monomorphemic) word results from two other restrictions; namely that nouns in standard Yoruba are at least (or minimally) VCV, and all verbs begin with consonants.

MAJOR PHONOLOGICAL PROCESSES

In the second half of this chapter, we will take a look at the changes that take place when words are brought together to form phrases. Because of the limitations of space and the technicalities sometimes involved in describing these changes, we shall limit the discussion to three of the most occurring (or productive) changes called phonological processes. We will limit the discussion to nontonal processes only. These include vowel harmony, vowel assimilation, vowel deletion, and consonant deletion.

(a) *Vowel Harmony*

While there are generally no restrictions on the occurrence of consonants in any of the word classes, Yoruba has restrictions on the occurrence of vowel sequences in words. This restriction is known as *vowel harmony*, which means that vowels are divided up into two (or more) classes such that words are made up of vowels drawn from only one class or the other. This division usually involves the vowels [i, e, o, u] on the one hand, the vowels [a, e, o] on the other. The distinction between the two sets of vowels is that the first class (i, e, o, u) involves drawing forward the root of the tongue so that the throat (the pharynx) is expanded, while in the second set (a, e, o) the root of the tongue is pulled back such that the throat is narrower. The first set is thus named Advanced Tongue Root (ATR), while the second is named non-ATR.[12]

In simple (monomorphemic) words in Yoruba, the last vowel of the word determines the rest of the vowels in the word. If the last vowel is a non-ATR vowel (a, e, o), then all the preceding vowels are non-ATR as well. Only mid vowels (e, o, e, o) are fully involved in the harmony. The high vowels (i, u) do not participate in the harmony at all; that is, the high vowels can occur with any vowel. Concentrating on non-high vowels, therefore, the following are the permissible and the nonpermissible sequences:

Permissible sequences

Any sequences of mid vowels in which all the vowels are either non-ATR (e, o) or ATR (e, o) are allowed.

(15) non-ATR mid vowels only

o ... o	ojó	(day)	e ... e	esè	(leg/foot)
e ... o	ejó	(case)	o ... e	òsè	(week)

(16) ATR mid vowels only

o ... o	òjò	(rain)	e ... e	ètè	(lips)
e ... o	ejò	(snake)	o ... e	olè	(thief)

A sequence in which the vowel [a] precedes a mid vowel, ATR or non-ATR, is also allowed.

(17) Sequences of [a] preceding any mid vowel

a ... o	àjo	([pool] contribution)	a ... e	asé	(seive)
a ... o	àjò	(journey)	a ... e	ajé	(commerce)

Finally, a sequence in which the vowel [a] is preceded [a] or by a non-ATR mid vowel (e, o), is allowed.

(18) Sequences of [a] or non-ATR mid vowels preceding [a].

a ... a	ajá	(dog)
o ... a	ojà	(market)
e ... a	eja	(fish)

Nonpermissible sequences

Any sequence in which ATR (e, o) and non-ATR (e5, o5) mid vowels are mixed is disallowed.

(19) disallowed sequences of mixed ATR and non-ATR mid vowels

*o ... o
*e ... o
*e ... e
*o ... e

Also disallowed is a sequence in which an ATR mid vowel precedes the vowel [a].

(20) disallowed sequences of [a] preceded by ATR mid vowels

*e ... a
*o ... a

In summary, any sequence of mid vowels in which the final vowel is non-ATR and the preceding vowel is ATR (or vice versa) is forbidden. Therefore, there are no words with the sequences in (19). The low vowel [a]

may precede an ATR vowel, as in the examples in (17), but the vowel [a] may not be preceded by an ATR mid vowel, hence the sequences in (20) are forbidden. What all of the above restrictions imply is that in Yoruba, a non-ATR vowel (mid or low) makes a preceding vowel become non-ATR as well (except when the vowel is high).

(b) *Vowel Assimilation*

By vowel assimilation is meant a situation in which a vowel becomes completely or partially like another vowel. The process of vowel harmony discussed in the preceding section is, therefore, by definition a form of vowel assimilation, since a vowel becomes like the final vowel by becoming non-ATR. But unlike vowel harmony, the vowel assimilation discussed here is one which takes place when two vowels are situated side by side; that is, the two vowels are next to each other without any consonant coming between them. Note that in the case of vowel harmony discussed above, the vowels are separated by consonants.

Vowel assimilation in Yoruba is most commonly observed when two nouns are next to each other. Most nouns in Yoruba begin with vowels, and all Yoruba words end in vowels. Therefore, when two nouns occur side by side, a situation is created in which the last vowel of the first noun and the first vowel of the second noun stand next to each other. Given this structure, one of the things that can take place is that one of the vowels become completely like the other. The following examples illustrate the change: [13]

(21)	ìwé	ilè	ìwéelé
	(paper/book)	(house)	(tax receipt)
	arán	oko	aróoko
	(person)	(farm/bush)	(person from the countryside or "bush man")

Vowel assimilation also occurs when two vowels are next to each other within a word as a result of the fact that the consonant separating the vowels has been deleted (see the section on consonant deletion). The conditions are exactly the same as in the first case. If the second vowel of the sequence is a high vowel then the high vowel assimilates to the preceding vowel completely.

(22)	egúngún	eégún	(masquerade)
	òtító	òótó	(truth)
	òrùka	òòka	(ring)
	òrìsa	òòsa	(god)
	oríkì	oókì	(praise name)

However, if the first vowel in the sequence is a high vowel /i/ or /u/, then there is no assimilation (the vowel sequence remains the same).

(23)	adîre/ adîye	adîe	(chicken)
	àdúra	àdúa	(prayer)

The negative marker [ò] always assimilates to the preceding vowel (or nasal consonant), regardless of what that vowel is.

(24)	n ò lo	n n lo	(I did not go)
	mi ò lo	mi ì lo	(I did not go)
	a ò lo	a a lo	(We did not go)
	won ò lo	won òn lo	(They did not go)

(c) *Vowel Deletion*

Another major phonological process in Yoruba is vowel deletion. By vowel deletion is meant that a vowel which will normally be pronounced in slow speech or when a word is said in isolation (pronounced alone) is not pronounced in fluent speech. Again the most common situation in which this happens is when two words occur next to each other, one of which ends in a vowel and the other of which begins in a vowel, making the context identical to that of vowel assimilation discussed in the preceding section. There are several constructions in which this situation may arise; however the two most prominent constructions are when two nouns are placed side by side (i.e. noun + noun) or when a noun occurs after a verb (i.e. verb + object). It is only these two that will be illustrated here.[14]

Noun + Noun

We will assume here for simplicity that vowel deletion in noun + noun constructions takes place when forming (noncompositional) compound nouns, and vowel assimilation takes place in corresponding phrases. Generally, the second of two vowels in a sequence is deleted in noun + noun constructions,[15] as the following examples show.

(25)	ojú	òde	ojúde
	(eye/face)	(outside)	(verandah)
	aya	oba	ayaba
	(wife)	(king)	(queen)
	ewé	oko	ewéko
	(leaf)	(farm)	(leaf)
	ìdí	okò	ìdíkò
	(base/bottom)	(car/vehicle)	(motor park)
	omo	obìnrin	omobìnrin
	(child)	(female)	(girl)
	eyin	ojú	eyinjú

(egg) (face/eye) (eyeball)

There are, however, very few exceptions to second vowel deletion. Generally the first vowel may be deleted when it is a high vowel, as in the following examples.

(26)	orí	òkè	orókè
	(top/head)	(hill)	(mountain top)
	orí	omi	orómi
	(top/head)	(water)	(water top)
	ojú	orun	ojórun
	(face/eye)	(sleep)	(during sleep (slumber))
	ìlú	ètò	ìletò
	(town)	(organization)	(name of a town)

Verb + Noun

In verb + noun object constructions, it is difficult to predict which vowel will delete, but one of them must. We will assume, for the purposes of this chapter, that in the compositional cases, the first vowel deletes, as in (27).[16] In non-compositional cases, the second vowel deletes as in (28). However, the high vowel /i/ is often deleted whether it is the first or second vowel, as in (29) and (30). In some cases the tone of the deleted vowel remains, and may appear alone or in a glide on one of the remaining vowels; in other cases the tone of the deleted vowel also seems to disappear. The output of tone sequences in the following examples is straightforward to calculate if we disregard the mid tone.[17]

(27) Compositional first vowel deletion

(a)	wá (H) +	ékó (LH)	wékó (H L H)
	(look (for))	(education)	(look for education)
(b)	wá (H) +	owó (MH)	wówó (H H)
	(look (for))	(money)	(look for money)
(c)	wá (H) +	okò (M L)	wókò (H L)
	(look (for))	(vehicle)	(look for a vehicle)

(28) Noncompositional second vowel deletion

(a)	kà (L)	ìwé (LH)	kàwé (LH)
	(read/count)	(book)	(be educated)
(b)	je (M)	owó (MH)	jewó (MH)
	(eat)	(money)	(to owe)
(c)	da (H)	ojú (MH)	dájú (HH)
	(cease)	(eye/face)	(be callous)

(29) High Vowel deletion in first vowel position

(a) jí (H) + òbe (L M) jóbe (H L M)

	(steal)	(knife)	(steal a knife)
(b)	bi (H) +	omo (M M)	bimo (HM)
	(give birth)	(child)	(give birth (to a baby))

(30) High Vowel deletion in second vowel position

(a)	mú (H) +	ìwé(LH)	múwé (H L H)
	(take)	(book)	(take a book)
(b)	fé (H) +	ìwo (L M)	féwo (H L M)
	(want)	(horn)	(want a horn)
(c)	wá (H) +	ìmò (L L)	wámò (H L)
	(look (for))	(knowledge)	(look for knowledge)

(d) *Consonant Deletion*

Just as vowels may be deleted, Yoruba consonants may also be deleted in fluent speech. There are various contexts in which consonants may be deleted, but only the three most common and most predictable contexts will be discussed here. The first context is one in which a consonant is identical to one in the next syllable. In this context, the first of such consonants is deleted, and the vowels are assimilated as discussed earlier.[18]

(31)	egúngún	eégún	(masquerade)
	òtító	òótó	(truth)
	esinsin	eesin	(fly)
	òlèlè	òòlè	(steamed bean cake)

The second context involves the glides /y/ and /w/. /w/ and /y/ may be deleted between two vowels 'when followed by vowels that share their respective point of articulation.'[19] This means that the glide /w/ is deleted before back vowels /u, o, c/, and the glide /w/ is deleted before the front vowels /i, e, E/. This process is exemplified in (32) and (33).

(32)	w-deletion		
	àwùjo	àùjo	(assembly of persons)
	perewu	pereu/peewu	(doggedly)
	dáwódù	dáódù	(first son)
	jòwó	jòó	(please)

(33)	y-deletion		
	ìwòyí	ìwòí	(at this time)
	láyé	láé	(forever)
	adiye	adie	(chicken)

The third context of consonant deletion is the deletion of /r/. /r/ deletion may take place under two conditions: (a) when /r/ occurs between two identical vowels, or (b) when /r/ is preceded or followed by a high vowel.[20]

(34) Occurrence between identical vowels

gbègìrì	gbègìì (bean-flour soup)
wèrèpè	wèèpè (nettle)
èrèké	èèké (cheek)
wárápá	wáápá (epilepsy)
orógùn	oógùn (wooden stick for stirring food)

(35) Occurrence before or after high vowels.

a)	ìkirè	ìkiè (name of a Yoruba town)
	òrìsà	òòsà (god)
	oríkì	oókì (praise name)
b)	Yorùbá	Yoòbá (Yoruba language/tribe)
	òrùka	òòka (ring)
	dárúko	dááko (to name)

CONCLUSION

In this chapter, we have provided an introduction to Yoruba sound structure. Because of limitation of space, we have not provided sufficient detail on any of the topics covered, and we have not discussed tone at all. Since Yoruba sound structure is so well studied, it is our hope that these pages will serve as a stimulant to the reader to take a look at the references cited in this chapter for more details.

NOTES

1. Mark Liberman, 'The Sound Structure of Mawu Words: A Case Study in the Cognitive Science of Speech,' In *An Invitation to Cognitive Science*, Volume 1. Gleitman, L.R. and M. Liberman (eds.) (Cambridge: MIT Press, 1995), 56.
2. Liberman, op. cit., p. 57.
3. In transcribing the examples I will use the standard Yoruba orthography. Where the orthography differs from the International Phonetic Alphabet (IPA), I will note such a difference.
4. A. Bamgbose, 'Yoruba,' in *Twelve Nigerian Languages*, E. Dunstan (ed.), (New York: Africana Publishing Corporation, 1969)
5. See A. Bamgbose, *A Grammar of Yoruba* (London: Cambridge University Press, 1966), and O.O. Oyelaran, 'Theoretical Implications of the Sources of the Syllabic Nasal in Yoruba,' *Research in Yoruba Language and Literature 1*, (1991): 7-19.
6. See Pulleyblank, D., "Vocalic Underspecification in Yoruba," *Linguistic Inquiry* 19, (1988): 233-270, for example.
7. A. Bamgbose, 'Yoruba,' in *Twelve Nigerian Languages*, E. Dunstan (ed.), (New York: Africana Publishing Corporation, 1969).
8. A. Bamgbose, *Grammar of Yoruba* (London: Cambridge University Press, 1966),

7; and Bamgbose, op. cit., 163.

9. See A. Akinlabi, "Supraglottal deletion in Yoruba glides," *Proceedings of the West Coast Conference on Formal Linguistics* 10, (1991)13-26, for evidence that [h] is an approximant in Yoruba.
10. See O.O. Oyelaran, *Yoruba Phonology* (Ph. D. Dissertation, Stanford University, Stanford, 1971), and Pulleyblank, op. cit., for more details.
11. For more details on Yoruba tone, see A. Akinlabi, *Tonal Underspecification and Yoruba Tone* (Ph.D Thesis, University of Ibadan, 1985) and D., Pulleyblank, *Tone in Lexical Phonology* (Reidel, Dordrecht, 1986).
12. The details of the Yoruba vowel harmony have been discussed in such works as E. M. Fresco, *Topics in Yoruba Dialect Phonology* (Studies in African Linguistics. Supplement 1, (1970), O.O. Oyelaran, "Yoruba Vowel Co-occurrence Restrictions," *Studies in African Linguistics* 4, (1973): 155-182, Archangeli, D. and D. Pulleyblank, 'Yoruba Vowel Harmony," *Linguistic Inquiry*, 20 (1989):2 173-218., and others.
13. See O.O. Oyelaran, *Yoruba Phonology*, (Ph. D. Dissertation, Stanford University, Stanford, 1971), A.Y. Folarin, *Lexical Phonology of Yoruba Nouns and Verbs* (Ph.D. Dissertation, University of Kansas, Lawrence, 1987), D., Pulleyblank, "Vocalic Underspecification in Yoruba," *Linguistic Inquiry* 19, (1988): 233-270, Owolabi D.K.O., *Ijinle Itupale Ede Yoruba (1). Fonetiiki ati Fonoloji.* (Ibadan: Onibonoje Press & Book Industries, 1989), A., Bamgbose, *Fonoloji ati Girama Yoruba* (Ibadan: Ibadan University Press, 1990) for further details.
14. For details on vowel deletion, the interested reader is referred to the long literature on this subject, including Ida Ward, *An Introduction to the Yoruba Language* (Cambridge: W. Heffer and Sons Ltd., 1952), A. Bamgbose, "Assimilation and contraction in Yoruba," *Journal of West African Languages*, XI.I (1965): 21-27, Bamgbose, op. cit., Oyelaran, op. cit., Oyelaran, O.O., "Yoruba Vowel Co-occurrence Restrictions," *Studies in African Linguistics* 4, (1973): 155-182; O. Awobuluyi, *Essentials of Yoruba Grammar* (Ibadan: Oxford University Press, 1978), A. Akinlabi, and F. Oyebade, "Lexical and Postlexical Rule Application: Vowel Deletion in Yoruba," *Journal of West African Languages* 17, (1987) 23-42, D. Pulleyblank, "Vocalic Underspecification in Yoruba," *Linguistic Inquiry* 19, (1988): 233-270, Owolabi, op. cit., and others.
15. Akinlabi and Oyebade, op. cit.
16. Akinlabi and Oyebade, op. cit., Pulleyblank, op. cit.
17. A. Akinlabi, *Tonal Underspecification and Yoruba Tone* (Ph.D Thesis, University of Ibadan,1985), D. Pulleyblank, *Tone in Lexical Phonology* (Dordrecht: Reidel, 1986).
18. For details on consonant deletion, see R. C. Abraham, *Dictionary of Modern Yoruba* (London: Hodder and Stoughton, 1958), Oyelaran, O.O., *Yoruba Phonology* (Ph. D. Dissertation, Stanford University, Stanford, 1971), Abimbola, W. and O.O. Oyelaran, "Consonant Elision in Yoruba," African Language Studies, XVI (1975) 37-60, A. Akinlabi, "Underspecification and the Phonology of Yoruba /r/," *Linguistic Inquiry*, 24:1, (1993): 139-160.
19. Oyelaran , op. cit., 114.
20. Akinlabi , op. cit.