A PHONOLOGY OF IKHIN, AN EDOID LANGUAGE IN SOUTH – SOUTH NIGERIA

BY

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ABSTRACT

Ikhin, a north-central Edoid language, is one of the minority languages used in Edo State, South-South Nigeria. It has similar linguistic features with Edo (Bini). However, the only linguistic study on this language mainly dwells on the phonetics of the language. This study, therefore, investigated the phonology of Ikhin with a view to determining the typology of its tone system. It also examined the phonological processes of Ikhin, such as glide formation, vowel elision and insertion, vowel assimilation, nasalization, stability and downstep.

The methodology adopted in the study was both descriptive and analytical. The theoretical framework was Goldsmith's Autosegmental theory. Data were obtained from seven purposely selected native speakers in Ikhin town and one from Ibadan, using the 1000 wordlist of the Summer Institute of Linguistics and the Ibadan wordlist of 400 basic items. Additional data were collected from traditional stories, conversations, descriptive statements and isolated, unelicited utterances. The data were analysed using the Speech Filing System of the computerized speech laboratory. Autosegmental theory was also used in analyzing and presenting the data.

The typology of Ikhin tone system was 'two tones plus a downstep', that is, the lowering of the pitch level of the second high tone in a high [H], low [L], high [H] tone sequence. Two of the strategies of discouraging vowel cluster in Ikhin were vowel elision and glide formation because the syllable structure of the language prohibits cluster of vowels within word or across word boundary. The language also avoids cluster of consonants by inserting a vowel between two consonants. This occurs more in loan words. At morpheme boundary, a vowel may exercise influence on the articulation of the other vowel in such a way that the assimilated vowel segment becomes more alike. Vestigial evidence of concord, which is normally the hallmark of a noun class system, was discovered in modifiers such as demonstrative and possessive pronouns. The stability of phenomena, such as tone and nasalization, and which was the foundation for autosegmental phonology, was also identified in Ikhin. The analysis of Ikhin tone system as containing two tones and a downstep confirmed that it was a terraced level tone system and also confirmed that the two tones, (high [H] and low [L]) were distinctive, while the phenomenon 'dowstep' was not phonemic.

The postulation of a grammatical tone, such as a floating high tone, as a general feature of Edoid languages did not work in noun-numeral attributive construction in Ikhin. Therefore, the application of the term 'tap' to laterals and nasals in the Edoid languages was supported. This discovery will contribute to the proposed writing system and the issue of accuracy in the design of orthographies for Edoid languages.

Key words: North central Edoid language, Ikhin, Tone language, Syllable structure, Phonological processes.

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CERTIFICATION

I certify that this work was carried out by

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DEDICATION

TO GOD BE THE GLORY

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CHAPTER ONE
THE IKHIN PEOPLE AND THEIR LANGUAGE

1.0 INTRODUCTION

The speakers number approximately 30,000 (according to Mr. M.F. Omueti my informant) and live in the North Western part of Owan East Local Government area in Edo State, adjoining the boundary with Akoko, Idoani and Ifon in Ondo State. There are very few resident members of other tribal groups such as Urue, Arokho, Uzeba, Otuo, Ake, Ikaho, Igwe etc and there appears to be a very high degree of linguistic homogeneity.

The name 'Ikhin' is applied to both the tribal group and its language by the people themselves. See figure 1.

1.1 METHOD OF DATA COLLECTION

The analysis presented in this thesis is based on the quantity of tape-recorded text material (Traditional stories, conversations, descriptions and collection of words). With very few exceptions, all the examples quoted in this thesis are from this corpus of text. In a few cases, however, examples are taken from isolated unelicited utterances (not tape recorded).

The collection of data took place in Ibadan and Ikhin. My informant at Ibadan is Mr. Festus Phime, a photographer who lived in Ikhin for twenty years before coming to Ibadan. He speaks Ikhin at home with his family. I have more informants at Ikhin, prominent among whom is Mr. M.F. Omueti. He is 62 years old and has spent the last 30 years in Ikhin. He holds a B.Sc Geography/History from the University of Ibadan and retired as a School Principal at Ikhin. He is at present, permanently residing in Ikhin. This method has assisted in unveiling speech variation among the various speakers in the community.

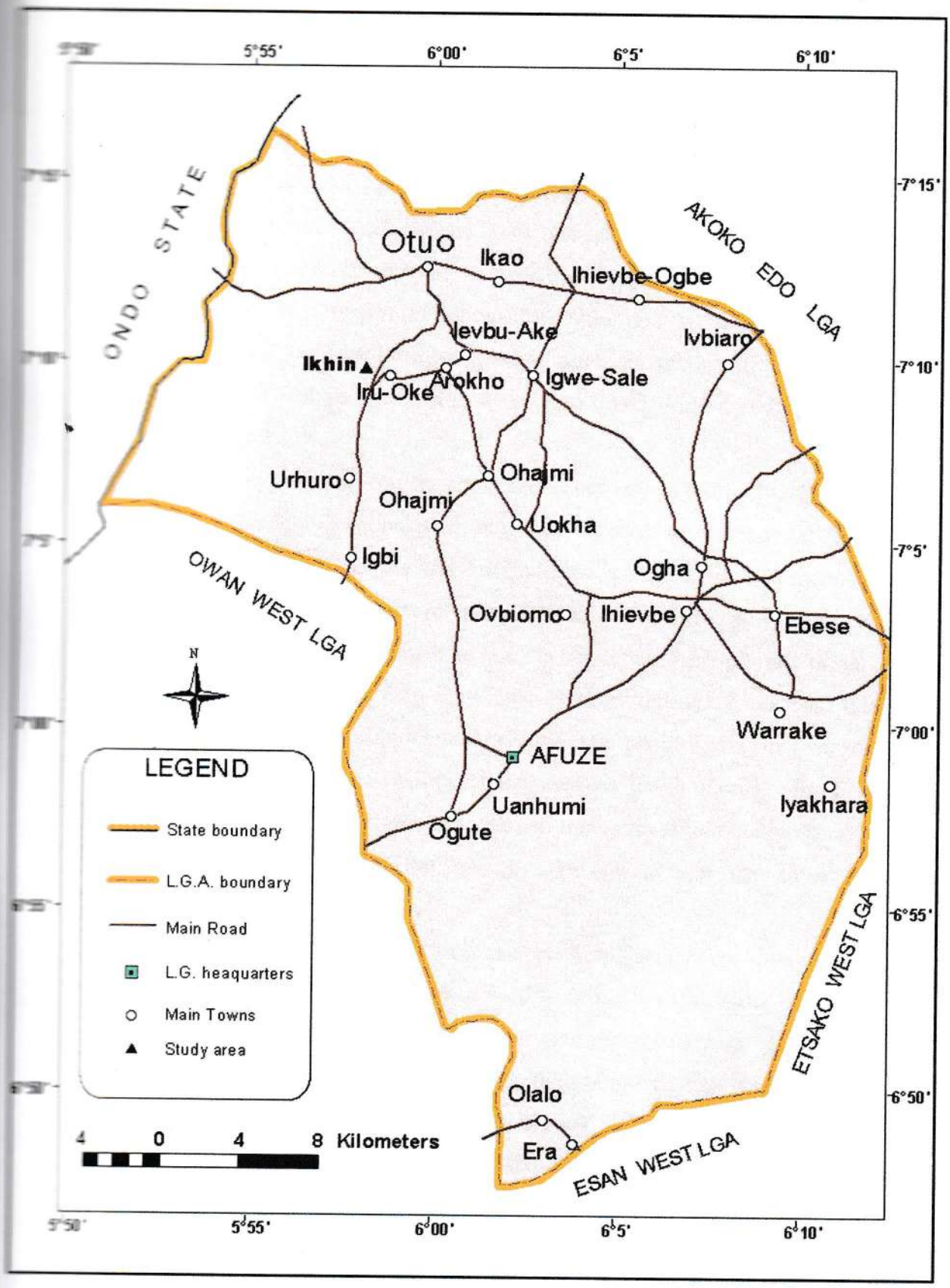


Fig. 1: Map of Owan East Local Government Area showing Study Area (**Ikhin**)

1.2 ORIGIN OF THE PEOPLE OF IKHIN

The name of the founder of Ikhin is Ekpenga. He was one of the three sons of the Oba of Benin who left Benin City as a result of disagreement with their father, King Ewuare of Benin who ruled from about 1440-1475. The other two brothers were Ekonkaran and Iguan. They packed their belongings and headed West Ward from Benin. They had no specific destination in mind. The disagreement arose as a result of their opposition to their father's practice of enslavement as a source of labour for building his palace and also his insistence on the use of palm oil instead of water for mixing the mortar. The three brothers, Ekpenga, Ekonkaran and Iguan finally settled at Ifon which is now in Ondo State.

They sojourned at Ifon for about half a century. During this period, the three had increased in population but they refused to imbibe the Yoruba Culture. Therefore, the people asked them to leave. Ekonkaran and Iguan were the first to leave Ifon. Ekpenga remained. As he continued to stay, Ifon people became more worried and began to ask "what type of people are these ?". Ekpenga usually replied in Bini thus "Edo-Mikhin" that is, "I am from Edo". Therefore, in discussions and conversations, the people of Ifon instead of saying "Edo-mikhin people" would refer to them as "Ikhin people". From such interplay, Ekpenga and his household earned the name "Ikhin" before they left eventually to settle at UHOMOERUE. This was how the name Ikhin originated.

Uhomoerue is a flat land located near the present Erue. It was a good place for settlement as it had a plain land to build houses, water and fertile land on which to plant crops. The people were mostly farmers. Ikhin people settled here. They began farming and soon their population increased.

Following the rapid growth in population, their leader, chief Okogume was motivated to introduce an administrative mechanism of dividing the people into three segments which he named OARE, UKPE and UMASI. These segments are now referred to as quarters. Each quarter continued to expand in

population through nuclear families to extended families, splitting into kindred units as we have them today.

When slave trade was originally stopped, pockets of the trade lingered on in the obscured areas in the Bini kingdom. Ikhin people were constantly attacked by the people from Owo, Ipele, Idoani and Ikara through kidnapping. The rate of loss of men, women, children and other materials was so high that Ikhin people migrated to UGBOVBETE.

UGBOVBETE denotes montanious vegetation. It is one of the series of Fold Mountains in Edo North and parts of Ondo State. The Eastern part of the mountain overlooking the present Ikhin town was the settlement site. In line with the administrative set up, Umasi, Oare and Ukpe had to settle at different locations not far from one another.

The first Oba installed to be the administrative head of the people was Chief Eyhien from Umasi. He was succeeded by Chief Oaikhena from Ukpe. Intertribal wars, slavery and their attendant vices of the time struck the town Ogedengbe of Ilesha led a formidable army from his town to Ikhin. It was an unslaught that would have razed the town into oblivion. Ikhin's army, led by Ogaso from Umasi launched their offensive attack that threw the invaders into panic. The intruders seeing the war tactics of their opponents fled.

In the process, Ogedengbe's magical hat was seized and dumped into River Osse at a point called Oghurugbo.

The men and materials lost made Ogedengbe not to attempt a reappraisal till he died few months later at Ilesha. Despite the fact Ikhin defeated Ogedengbe's army, there was an imminent fear that they might send a reconnaissance mission. So, Ikhin decided to change location. They moved to UGBORA, a location close to the present Okpe town. Ikhin soon fell prey to their neighbouring towns Okpe jaja as a result of which they had to leave for UGBO IGBAN, a location in the present Ondo state side of Osse river. Here, there was also constant attack from the people of Idoani, Ipele and Ondo. This made the people to return to Ugbovbete under the leadership of Oba Igbafe and later Esezeobo.

During the time of Esezeobo, there was peace and prosperity for quite a longtime. Uroe and Ohami people came to seek protection from Ikhin and they were made to settle some distances away from Ikhin town. Only Arokho and Iru-Oke were known to be relatively stable in their settlements.

Some Europeans visited Ikhin at Ugbovbete about three consecutive times. On their second and third visits, they fell down many times on the rugged, Hilly and Winding road. Thus the Europeans advised Ikhin people to come down from their mountain settlement to the present location, a level plain land. Consequently, Umasi and Ukpe heeded the advice of the Europeans. They came down to the present site between 1890 and 1900. But Oare people remained at Ugbovbete until 1903", Omueti (1997:4) when they were forced to move down to the present site by the Europeans.

1.3 THE NON-INDIGENES OF IKHIN

Ikhin people have vast agricultural lands that extend to River Osse and the forest reserve of Ifon, Ipele and Idoani area of Ondo state. Their movements from place to place for security from invaders up till 1900 afforded the people the right of occupancy of these places.

About 1940, some Igbira wage-earning migrants headed by one Mallam Balogun sojourned in Ikhin. As Ikhin indigenes became involved in cocoa cultivation, the need to employ wage labour continued to increase.

In the fifties and sixties when the cocoa marketing board announced favourable price per bag, all the indigenous farmers abandoned grassland holding for the cultivation of cocoa farms in the forest region. Correspondingly, the wage earning migrants became self employed migrant' tenant farmers. Thus intensive cultivation of cash and food crops started to receive a boom.

Today, the various ethnic wage-earners and self employed migrant tenant farmers in Ikhim include the Igbiras from Kogi State, the most populous; the Ososos, the Otuos, the Yorubas, the Idoani's /Idoguns, the Kwales, the Ibos, the Unemes, the Okas / Ifiras, the Hausas, the Tarjus from Benue.

These groups have in no small way stimulated economic development in terms of the production of food crops.

In the words of Mr. M.F. Omueti, there has been an assertion that Ikhin is the greatest producer of cocoa in Edo State and the food basket of Owan East and Owan West.

The resultant impact is the increase in the population that has now created accommodation problems in Ikhin town.

Today, Ikhin is the second most populous town after Otuo in constituency II of Owan East Local Government area of Edo State.

See Fig. 2.

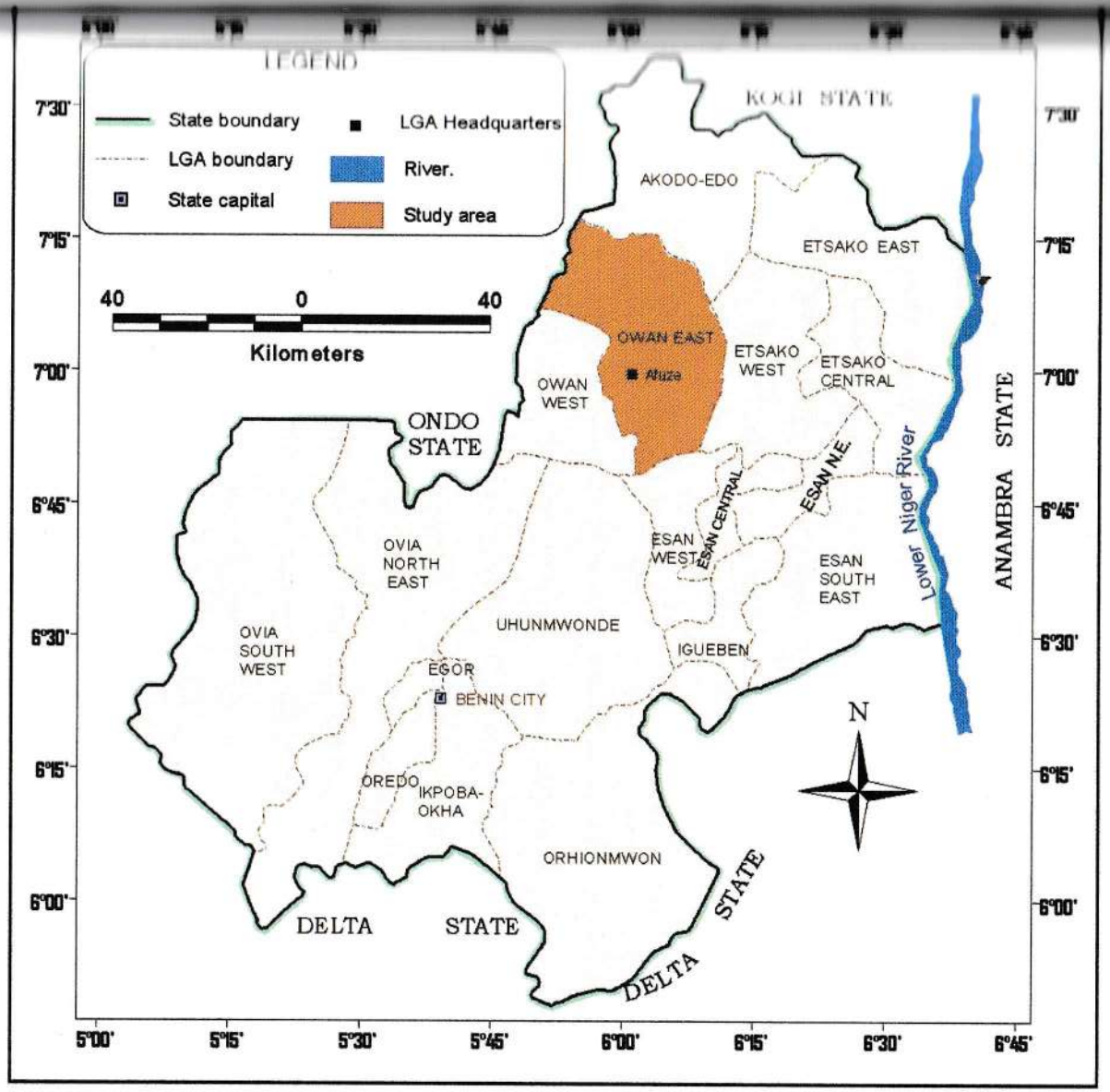


Fig. 2: Map of Edo State showing Owan East Local Government Area

1.4 PREVIOUS STUDIES ON IKHIN

Literature on Ikhin language is rare. Folarin (1982) is a Master's project and is the only extant linguistic study on this language. Apart from the very useful auditory and instrumental study of the sounds of this language and the identification of two basic tones high /H/ and low /L/, little is said about the various tonal and segmental processes in the language. Folarin's work does not identify the voiced alveolar lateral tap /ɺ /, the voiced alveolar nasal tap /ɳ/ and tone alternation. However, it identifies palatalisation and low tone raising which do not exist. Her examples show that what she calls palatalisation are cases in which a glide is formed from [i] between a consonant and an unidentical vowel. See section 4.4 for a discussion on glide formation.

Omueti, (1997) presents a detailed history on the origin of the people of Ikhin and their present location. It does not offer anything on the linguistic study of the language.

1.5 FAMILY TREE

One of the aims of a comparative study of a group of languages is a reconstruction of the Family tree. A classification of languages based on this principle is called a genetic classification. The term genetic is important because it assumes a 'genetic' relationship, a relationship that goes beyond burrowing, absorption or typology: it is one of common origin. (Elugbe, 1979).

If we assume that the Edoid languages have a common origin, we imply that at some point in the distant past all these languages were one- possibly with varieties. A comparative study of these languages, leading to a reconstruction of the sound system, the lexicon and the morphology, etc of the assumed parent language enables us to reconstruct 'a family tree' or a 'genealogical table' of the group. The Family tree is a convenient way of showing at a glance the relationship between languages and language groups (Elugbe 1979). It displays, in terms of branching or splitting' the way in which the daughter languages are derived from the parent language. Innovations in

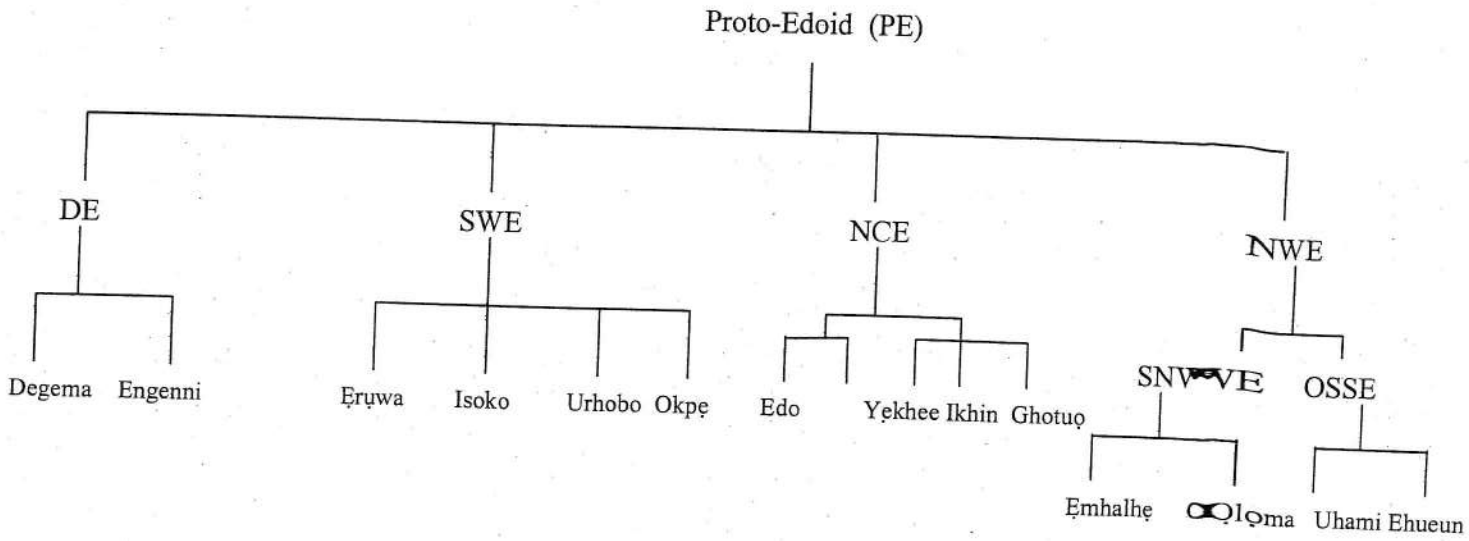
sound, lexical and syntactic change help us in determining the internal relationships within a group. As an instrument of pre-history, this method is one of the most reliable.

Ikhin and Otuo are Edoid languages spoken in the same Owan East Local Government, but Ikhin is yet to be included in the original Edoid family tree called 'Proto-Edoid' (Elugbe,1973).

If the family tree principle assumes that all the Edoid languages of today were once one and the same language then, there is a common period of pre-history. The Edoid family tree therefore, has to be reconstructed to include Ikhin.

THE FAMILY TREE

Fig. 3: The Edoid Family tree



1.6 CLASSIFICATION OF EDOID LANGUAGES

Westernman and Bryan (1952) and Greenberg (1963) claim that Edoid languages belong to the 'Kwa' branch of Niger-Congo family of languages, with the former emphasizing that they belong to the Eastern sub-branch of the 'Kwa' branch of Niger-Congo phylum.

Greenberg (1963a) split Kwa into eight groups, while Bennet and Sterk (1977) reduced Greenberg's Kwa by promoting Ijoid and Kru and by reassigning some of his groups to Benue-Congo, (a name introduced by Greenberg (1963a). Greenberg subsequently divided the family into branches namely, Platoid, Jukunoid, Cross-River and Bantoid. It was Bennett and Sterk (1977) who added the Eastern branches of Greenberg's Kwa, which were later grouped together as 'West Benue-Congo' by Blench (1989), with Greenberg's original Benue-Congo renamed as 'East Benue-Congo'. The West Benue-Congo corresponds to the former Eastern Kwa earlier mentioned.

1.6.1 Edoid Languages as a Sub-branch of West Benue-Congo Family

Recent classification identifies Edoid languages as a sub-branch of West Benue-Congo family which is a group of languages spoken over the greater part of the Western, Central and East Central part of Southern Nigeria. The Easternmost branch is Idomoid which extends to the Northern part of Cross River State. There are five branches in this sub family. They are Yoruboid – Akokoid, Akedoid, Ọkọ, Central – Niger and Igboid.

However, there is still a lot of uncertainties regarding the internal classification of West Benue-Congo especially in terms of the placement of Ọkọ (the language of Ogori) and the small languages of Akoko area of Ondo state. (Elugbe 2009).

1.7 CLASSIFICATION OF IKHIN LANGUAGE

Ikhin belongs to the North Central Edoid group of languages. Following recent classification, Edoid languages belong to the 'YEAI' branch of West Benue-Congo family of languages (Blench 1989). Ikhin is classified as an Esimi language because it displays similar grammatical features with other Esimi languages in terms of functioning noun class system (prefixes) verbal extensions, pronouns, and sentence order etc. As in most Edoid languages. Ikhin, phonologically allows only CV and V syllable types (i.e. all syllables are open and no consonant clusters).

1.8 OBJECTIVES

The aim of this work is to present a phonological analysis of a language which hitherto had not been studied systematically in the kind of depth we are presenting here. It sets out to give an objective insight into the phonology of Ikhin and to contribute to scholarship. It is expected that it will aid the development of literacy-related materials such as an orthography, a primer, a grammar and a dictionary.

CHAPTER TWO

PHONEMIC STATEMENT OF THE SEGMENTS.

2.0 INTRODUCTION

The work is in two folds. We need to know *which sounds are used and* how they are organized into a system. It is the structural organization of these sounds into a system that is central to the functioning of language and the study of it that is called 'phonemics' or 'phonology'.

However, we cannot make sense of that study until we have studied the sounds themselves, it is the study of the sounds themselves that is called phonetics. Thus, two levels of phonological representation are recognized-the level of pronunciation or what has traditionally been referred to as the 'phonetic level' and the level of contrast or opposition, 'the phonemic'(Schane, 1973). A phonetic study tells how the sounds of a language are made and what their acoustic properties are. A phonological study tells how these sounds are used to convey meaning (Hyman, 1975).

In this chapter, we will present a short phonemic statement of Ikhin: consonants, vowels, tones and syllable structure. This will be helpful to the readers when we present the framework of the autosegmental theory in chapter 3.

PHONETIC CONSONANT CHART

Place / Manner	BILABIAL	LABIO-DENTAL	ALVEOLAR	PALATO-ALVEOLAR	PALATAL	VELAR	LABIAL-VELAR	GLOTTAL
NASAL	m		n ɳ		ɲ		ŋʷ	
PLOSIVE	p b		t d			k g	kp gb	
AFFRICATE			ts	tʃ dʒ				
TRILL/ROLL			r					
TAP			ɾ					
FRICATIVE		f v	s z	ʃ ʒ				
APPROXIMANT CENTRAL	ɸ		ɹ		j	x ɣ	w	h
LATERAL			l ɭ					
NASALISED			ɹ̃ ɾ̃			x̃ ɣ̃		h̃

Fig. 4: The phonetic chart of Ikhin contains 38 consonants.

2.1 STOPS

Plosives and affricates are the various forms of stop. Thus according to [illegible] (1990), stops are consonant sounds produced by a total obstruction of the vocal tract followed by a sudden release (for plosives) or gradual release (for affricates).

2.1.1 Plosives

In Ikhin, plosives are articulated at bilabial, alveolar, velar and labial-velar places of articulation.

Examples:

2.1.1.1 Bilabial

/p/ has one allophone

[p] a voiceless bilabial plosive as in

i) /ɔ̀pɛ̀pɛ̀/ → [ɔ̀pɛ̀pɛ̀] 'measles'

ii) /ɔ̀pià/ → [ɔ̀pjà] 'matchet'

The above are the only two occurrences of / p/ in the language.

/b/ has one allophone

[b], a voiced bilabial plosive

i) /àbù/ → [àbù] 'mat'

ii) /bà/ → [bà] 'plait'

iii) /bíhì/ → [bíhì] 'black'

2.1.1.2 Alveolar

/t/ has three allophones

[tʃ], a voiceless palato-alveolar affricate when it occurs before a close vowel (palatal glide) which is in turn followed by a non-identical vowel:

i) /tíà̃/ → [t j â] → [tʃâ] ' to walk'

ii) /tíɛ̀/ → [tʃ ɛ̂] → [tʃ ɛ̂] 'to refuse'

[ts], a voiceless alveolar affricate which is in free variation with [tʃ] as shown below

iii) /tsi/ → [tʃì] ' to push'

[t], a voiceless alveolar plosive when it occurs elsewhere:

iv) /itɛ̀/ → [ítɛ̀] - 'leprosy'

v) /étò/→[étò] - 'hair'

[d] has two allophones

[dʒ], a voiced palato alveolar affricate when it occurs before a close vowel (palatal glide) which is in turn followed by a non-identical vowel.

i) /dìɛ̀/ → [djɛ̀] → [dʒɛ̀] 'to laugh'

ii) /mùdìà/ → [mùdʒìà] → [mùdʒà] 'stand up'

[d], a voiced alveolar plosive when it occurs elsewhere:

iii) /ìdàmɔ̀/ → [ìdàmɔ̀] 'chest'

iv) /ódí/ → [ódí] 'wall'

The happenings in [tʃ] and [dʒ] just mentioned above are as a result of a glide formation, a phonological process that will be discussed later.

2.1.1.3 Velar

[k] has one allophone

i) [k], a voiceless velar plosive

ii) /kɔ̀/ → [kɔ̀] 'plant'

iii) /kà/ → [kà] 'dry'

[g] has one allophone

i) [g], a voiced velar plosive

ii) /gɛ̀/ → [gɛ̀] 'to tie (rope)

iii)a /ágágá/→ [ágágá] 'buttock'

2.1.4 Labial –Velar

/kp/ has one allophone

i) [kp], a voiceless labial-velar plosive

a) /ɛkpà/ →[ɛ̀kpà] 'skin'

b) /ókpèkù/ →[ókpèkù] 'spear' (war)

ii) /gb/ has one allophone

[gb], a voiced labial- velar plosive

a) /gbè/ → [gbè] 'kill'

b) /igbè/ → [ìgbè] 'ten'

However /kp / and /gb / contrast as shown below:

iii) a. ègbè - 'body'

b. ékpè - 'vagina'

iv) a. úgbò - 'forest'

b. úkpò - 'cloth'

v) a. ɔ̀gbɔ̰̀ - 'thirsty'

b. ɔ̀kpɔ̰̀ - 'light'

vi) a. ùgbɔ̰̀ - 'thorn'

b. ìkpɔ̰̀ - 'bemi-seed'

2.2 NASALS

The aggressive pulmonic or glottalic air-stream escapes either through the nose or the lips. The roof of the mouth has two parts: soft and hard. The hard palate is fixed and immovable while the soft palate moves up and down. The soft palate (also called 'velum') controls the outlet through the nose, thus when it is lowered, the way through the nose is opened, however, when it is raised it constricts with the back wall of the pharynx and the outlet through the nose is shut off.

It must be pointed out that if the velum is raised, the only escape for an air-stream is through the mouth; but if it is lowered, it can escape by both mouth and nose.

2.2.1 Nasal Consonants

In Ikhin, nasal consonants occur at bilabial, alveolar, palatal Labio-velar and glottal places of articulation.

2.2.1.1 Bilabial

a. /m/ is [m] voiced bilabial nasal

i) /ígèmì/ - [ígèmì] 'charcoal'

ii) /àmɛ̀/ - [amɛ̀] 'water'

iii) /mà/ - [mà̰] 'mould'

2.2.1.2 Alveolar

b. /n/ is[n]

a. [n], a voiced alveolar nasal

i) /ìnì/ → [ìn̄ì] 'elephant'

ii) /ɛ́ranúgbò/ → [ɛ́rã̰nṵ̃gbò] 'buffalo'

b. /n/ is [ɳ]

[ɳ] an alveolar tap nasal and is in free variation with a nasalised alveolar tap as in the following examples:

i) [òhɛ̀ɳɛ̀] ~ [ohɛ̀ɾ̃ɛ̀] 'tongue'

ii) [ɳɛ̀] ~ [ɾ̃ɛ̀] 'to know'

iii) [ɳɔ̃] ~ [ɾ̃ɔ̃] 'to think'

2.3 FRICATIVES

Fricatives are sounds produced with a close approximation of the articulators, resulting in turbulence in the out flowing air-stream. They are characterized by randomly distributed energy peaks (noise) over the sound spectrogram. (Egbokhare, 1990).

Fricatives are produced at bilabial, labio-dental, alveolar and palatao-alveolar places of articulation in Ikhin.

2.3.1 Labiodental

11. /f/ and /v/ contrast as shown in the following examples

i) /ɔ́fɔ́fɔ́/ 'wet'

ii) / ɔ́vɔ́vɔ́/ 'like'

iii) /fi/ 'to throw'

iv) /vì/ 'to write

2.3.2 Alveolar

/s/ has two allophones

[ʃ], a voiceless palato-alveolar fricative when it occurs before a vowel /i/ followed by another vowel:

i) /ɔ́sìé/ → [ɔ́sjě]→ [ɔ́ʃě] 'friend'

ii) /síà/ → [sjâ] → [ʃâ] 'to deny'

[s], a voiceless alveolar fricative when it occurs elsewhere.

iii) /só/ → [só] 'pierce'

iv) / ɛ̀̃sì̃/ → / ɛ̀̃sì̃/ 'horse'

/z/ has two allophones;

[ʒ], a voiced palato alveolar fricative when it occurs before /i/ followed by another vowel and [z], a voiced alveolar fricative when it occurs elsewhere

ii) /ází/ 'witch' /á/ 'their'

iii) /ázíá/ → [àzjâ] → [áʒâ] 'their witch'.

iv) /ází/ → [àzí] 'witch'

APPROXIMANTS

These are sounds produced with an open approximation of the articulators, and central passage of the air-stream. In Ikhin, there are bilabial, alveolar, palatal, velar, labial velar and glottal approximants.

Bilabial

/β/ has one allophone

14. [β], a voiced bilabial approximant

i) /áβí/ → [áβí] 'oil'

ii) /ɛ́βò/ → [ɛ́βò] 'to plant'

Alveolar

/l/ has one allophone,

15. [l], a voiced alveolar lateral approximant

i) /lɛ/ → [lɛ̀] 'go'

ii) /lɔ/ → [lɔ́] 'grind'

[l], has one allophone

[l], a voiced alveolar lateral tap

iii. /ḷè/ 'at'

iv) /ɛ́ḷò/ 'eye'

v) /ɔ̀ḷègìè/ 'chief'

There are three [r] – sounds

[r], a voiced alveolar trill

16. i) /ròlɛ̀/ → [ròlɛ̀] 'enter'

ii) /ùrù/ → [ùrù] 'tail'

[ɾ] – a voiced alveolar tap which is nasalised before a nasal vowel as in:

i) /oɾã̀/ → [oɾ̃ã̀] 'tree'

[ɻ] – a voiced alveolar central approximant which is in free variation with [l̩] a voiced alveolar lateral tap

Palatal Approximant

[j] has two allophones

[ɲ] a voiced palatal nasal when it occurs before a phonemic nasal

i) /ìjù / → [ìɲũ] 'mother'

ii) /ajṹ/ → [àɲṹ] 'wine'

iii) /éjɛ̃́/ → [éɲɛ̃́] 'breast'

iv) /éjɔ̃́/ → [éɲɔ̃́] 'bee'

[j], a voiced palatal approximant when it occurs elsewhere:

v) /ìjórò/ → [ijórò/] 'song'

vi) /ɔ̀jàlà/ → [ɔ̀jàlà] 'robe'

Velar Approximant

There are two approximants at the velar place of articulation in the language under investigation. These are /x/ and /ɣ/.

/x/ has one allophone

19. [x]; a voiceless velar approximant

i) /òxò/ → [òxò] 'day'

ii) /ɛ́xéré/ → [ɛ́xéré] 'pains'

iii) /ìxásòrò/ → [ìxásòrò] 'stick'

iv) /ùxábɔ̀/ → [ùxábɔ̀] 'okro'

/ɣ/ has one allophone

[ɣ], a voiced velar approximant

20. i) /òɣì/ → [òɣì] 'thief'

ii) /ɣáfé/ → [ɣáfé]'bird'

/x/ and [ɣ] are nasalised before a nasal vowel as in:

21. i) /úmɔ̀ɣɔ̀/ → [úmɔ̀ɣ̃ɔ̀] 'lizard'

ii) /èɣũ/ → [èɣ̃ṹ] 'death'

iii) /xɔ̀̃/ → [x̃ɔ̀̃] 'be content'

2.4.5 Labial Velar Approximant

/w/ has two allophones

[ŋʷ] a nasalized labiovelar consonant when it occurs before a nasal vowel

22. i) /úwɛ̃́/ → [úŋwɛ̃́] 'salt'

[w], a voiced velar approximant; when it occurs elsewhere

ii) /áwà/ → [áwà] 'dog'

iii) /ìdówò/ → [ìdówò]'millet'

iv) /ùwàwà/ → [ùwàwà]'cooking pot'

2.4.6 Glottal Approximant

/h/, has two allophones

/h̃/ a nasalized voiceless glottal approximant when it occurs before a nasal vowel.

23. i) /ĩ́hũ̀/ → [ĩ́ hũ̀] 'machine'

ii) /ɔ́hɛ̃́/ → [ɔ́hɛ̃́] 'needle'

iii) /ɛ́hĩ̀/ → [ɛ́hĩ̀] 'belly'

[h], a voiceless glottal approximant when it occurs elsewhere;

ix) /áhìkùɛ/ → [áhìkwɛ] 'oracle'

x) /èhà/ → [èhà] 'three'

xi) /íhùè/ → [íhẁè] 'nose'

Fig. 5.

PHONEMIC CONSONANT CHART

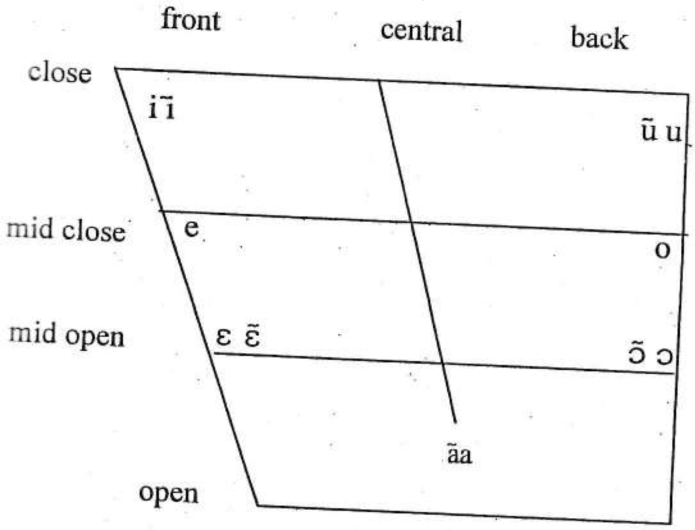
	BILABIAL	LABIO-DENTAL	ALVEOLAR	PALATAL	VELAR	LABIAL-VELAR	GLOTTAL
NASAL	m		n ɳ				
PLOSIVE	p b		t d		k g	kp gb	
FRICATIVE		f v	s z				
APPROXIMANT (CENTRAL)	β		r ɻ ɾ	j	x ɣ	w	h
LATERAL			l ɭ				

The phonemic chart of Ikhin contains three nasals, eight plosives, four fricatives and eleven approximants totaling twenty six consonants

2.5 VOWEL SYSTEM

Vowels are sounds in the production of which there is noiseless passage of the air-stream, they are specified in terms of the position of the highest point of the tongue and the position of the lips. Folarin (1982) carried out instrumental and auditory investigations on the vowels of Ikhin using wide band spectrograms. She observed that Ikhin had twelve vowels made up of seven oral vowels and five phonemic nasal vowels. Below is the auditory phonetic chart of oral and nasal vowels.

Fig. 6



Note that [ẽ] and [õ] do not occur in the above chart. Folarin (1982) claims that while other vowels are nasalized after nasal consonants, [e] and [o] are usually not nasalised in Ikhin and when they are, they are only slightly nasalised. She gave the following example:

24. ĩrĩrĩβõrã [¯¯ ¯_] root of a tree.

Ikhin employs both significant and predictable nasalization. The significantly nasalized vowels in Ikhin have their tongue height lowered than their predictable counter parts, this is also the case in most Edoid Languages that employ significant nasalization. It has been observed that the significantly nasalized vowels do not occur at the noun prefix position, this appears to be a

[illegible] restriction on the occurrence of significantly nasalized vowels. [illegible] 1973).

2.5.1 Nasal Vowels

Examples:

25. i) /àgbɔ̀̃/ 'jaw'
    ii) /lɔ́hɛ̀̃/ 'neck'
    iii) /ɔ́rà̃/ 'blood'
    iv) /áhósà̃ / 'urine'
    v) /isà̃/ 'faeces'
    vi) /ɛ̀rà̃/ 'meat'
    vii) /ɛ̀rṹ/ 'yam'
    viii) /úwɔ́wɔ̀̃/ 'axe'
    ix) /òkṹ/ 'sea'
    x) /ɛ̀xì̃/ 'egg'
    xi) /èɣ̀ì/ 'tortoise'

2.5.2 Nasalised Vowels

In Ikhin, all the seven oral vowels get nasalized after nasal consonants.

Examples:

26. i) /àmɛ̀/ → [àmɛ̀̃] 'water'
    ii) /ìnì/ → [ìn̄ì] 'elephant'
    iii) /ìgèmì/ → [ìgèm̄ì] 'charcoal'
    iv) /émùnà/ → [émṵ̄nà̃] 'dream'
    v) /ɔ̀mɔ̆ká → [ɔ̀mɔ̆ká] 'orange'
    vi) /ɔ̀kɔ̀nɔ́/ → [ɔ̀kɔ̀nɔ̃́] 'throat'

Description of Vowels

We begin vowel description from left to right or front, central and then back positions. In order to avoid repetition however, nasal vowels will not be described for what distinguishes them from their oral counterparts is the feature 'nasality'.

27. /i/: a close front, unrounded vowel. It has three allophones:

[ĩ]: a close front, unrounded nasalised vowel when it occurs after nasal segments.

a. i) /igɛmì/ → [ìgɛm̃ĩ] 'charcoal'

ii) /èmìkṹ/ → [èm̃ĩkṹ] 'iron (metal)'

[j]: a voiced palatal approximant when it occurs before a non-identical vowel

b. i) /ɔ́pìà/ → [ɔ́pjà] 'matchet'

ii) /ákìè/ → [ákjè] 'toad (frog)'

[i]: a close front, unrounded vowel when it occurs in any other environment

c. i) /òxì/ → [òxì] 'thief'

ii) /ìgbè/ → [ìgbè] 'ten'

/e/: mid-close, front, unrounded vowel

d. i) /òdègbè/ → [òdègbè] 'hawk'

ii) /vàrè/ → [vàrè] 'come'

/ɛ/: mid-open, front, unrounded vowel. It has two allophones.

[ɛ̃]: when it occurs after nasal segments

e. i) /àmɛ̀/ → [àmɛ̃̀] 'water'

ii) /òsà̰mɛ̃/ → [òsà̰mɛ̃̀] 'thirst'

iii) /ɛ̀ràmɛ̀dà/ → [ɛ̀rà̰mɛ̃̀dà] 'crocodile'

[ɛ]: when it occurs elsewhere:

f. i) /ɛ̀xɛ̀rɛ̀/ → [ɛ̀xɛ̀rɛ̀] 'penis'

ii) /èmálɛ̀/ → [èmã́lɛ̀] 'food'

/a/: open, central, unrounded vowel. It has two allophones:

[ã]: when it occurs after nasal segments

g. i) /èmálɛ̀/ → [èmã́lɛ̀] 'food'

ii) /órúmà/ → [órúmã̀] 'sheep'

[a]: when it occurs in any other environment:

h. i) /ɛ́là/ → [ɛ́là] 'low'

ii) /áwà/ → [áwà] 'dog'

/o/: mid-close, back, rounded vowel [o] e.g.

i. i) /òfè/ → [òfè] 'rat'

ii) /ɔ̀kpòsò/ → [ɔ̀kpòsò] 'woman'

/ɔ/: mid-open, back, rounded vowel. It has two allophones.

[ɔ̃]: when it occurs after nasal segments

j. i) /ɔ̀mɔ̀/ → [ɔ̀mɔ̃̀] 'child'

[ɔ]: when it occurs in any other environment

ii) /ɔ́fɔ̀fɔ̀/ → [ɔ́fɔ̀fɔ̀] 'to be wet'

iii) /ɔ̀bɔ̀/ → [ɔ̀bɔ̀] 'arm'

/u/: close, rounded vowel. It has three allophones.

[ũ]: when it occurs after nasal segments.

k. i) /émùnà/ → [émũ̀nà̃] 'dream'

ii) /rómù/ → [rómũ̀] 'to lose'

[w]: a voiced labio velar approximant when it occurs immediately before a non-identical vowel as in:

l. i) /ògùà/ → [ògwà] 'village'

ii) /ihùè/ → [ihwè] 'nose'

[u]: when it occurs in any other environment

m. i) /ówùrú/ → [ówùrù] 'cotton'

ii) /ikùkù/ → [ikùkù] 'rubbish heap'

2.5.4 Phonemic Status of the Vowels

We have been able to describe vowels in terms of their occurrence in complementary distribution or in terms of their allophonic distribution. The examples provided have also shown that the occurrence of their variants in other environments does not change the meaning of those lexical items. However, in the following examples we want to show that the occurrence of two different vowels in the same environment will result in a change in the meaning of the lexical items.

28. i) u/i /sù/ 'to pierce' /sì/ 'to draw'
ii) u/o /sù/ 'to pierce' /sò/ 'to sew'
iii) e/ɛ /dè 'to fall' /dɛ̀/ 'to buy'
iv) ɛ/a /lɛ̀/ 'to go' /là/ 'to run'
v) ɛ/ɔ /lɛ̀/ 'to go' /lɔ/ 'to grind'
vi) a/ɔ /ákà/ 'basket' /ɔ́kà/ 'maize'
vii) u/ɔ /kù/ 'to pour' /kɔ̀/ 'to plant (tubers)'
viii) i/o /fi/ 'to throw' /fò/ 'to finish'
ix) u/ɛ /zù/ 'to call' /zɛ̀/ 'to choose'

2.5.5 Vowel Sequence

The morphology of Ikhin allows nouns as well as qualifiers to begin with a vowel and end with a vowel. The stem initial vowels (prefixes) attached to these grammatical categories (nouns and qualifiers) perform grammatical functions.

Examples: Nouns

29a. Singular Plural

i. ò-rã̀ è-rã̀ 'tree/trees'
ɛ̀-wè e-wè 'goat/goats

Qualifiers (Demonstratives and articles)

Demonstratives

Singular Plural

ii. ɔ̀-nã̀ è-nã̀
this these

	Articles				
	Prefix	Stem	Noun		
iii.	ɔ-	li	oɛ	→	ɔ́lóɛ̀ (singular)
			leg		'the leg'
iv.	e-	li	oɛ	→	èléɛ̀ (plural)
			leg		'the legs'

On the other hand, grammatical categories such as verbs, adverbs and auxiliaries begin with consonants but equally end with vowels. Thus at the boundary between verb and noun direct object constructions, there is vowel sequence at the phonemic level.

Examples:

29b.	i)	gbè	+	òfè	→	gbè òfè	→ [gbòfè]
		'kill'		'rat'			'kill rat'
	ii)	dɛ̀	+	órúmɔ̀	→	dɛ̀ órúmà	→ [dórúmã̀]
		'buy'		'sheep'			'buy sheep'
	iii)	fi	+	údò	→	fi údò	→ [fudo]
		'throw'		'stone'			→ 'throw stone'

Also, in the formation of compound words, vowels are made available at the boundary as shown below:

iv)	ɔ̀mɔ̀	+	ɔ̀kpòsò	→	ɔ̀mɔ̀ ɔ̀kpòsò	→ [ɔ̀mɔ̀kpòsò]
	'child'		'female'			'girl'

v)	òkɔ̀	+	ɛ́dá	→	òkɔ̀ ɛ́dá	→ [òkɛ̌dà]
	'vehicle'		'river'			'canoe'

Besides, some lexical items also have sequence of vowels in their stems. This is however, with some restrictions as shown below:

vi) /ú-gúà/ 'bone'

vii) /ɛ̀-gùɛ̀/ 'hoe'

viii) /ɔ̀-pìà/ 'matchet'

ix) /ɛ́-kùɛ̀/ 'nail'

x) /è-kùɔ̀/ 'chin'

The restriction in the above examples is such that the first vowel in the sequence must be a close vowel, that is, either /i/ or /u/ and the following vowel must be a non-identical vowel.

Vowel sequence is at the underlying phonological representation because the syllable structure of the language does not allow identical vowel sequence at the phonetic level. When therefore, there is a sequence of vowels at the phonemic level, they have to obligatorily undergo some phonological processes to arrive at the acceptable surface structure realizations. The phonological processes involved are vowel elision and glide formation which are boundary eliminating processes.

Vowel elision and glide formation processes mentioned above are syllable structure processes. Assmilatory processes such as vowel assimilation and nasalisation will be discussed in detail at a later chapter.

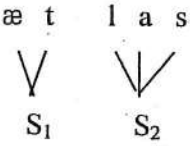
2.6 THE SYLLABLE STRUCTURE

Based on their linearity assumption in SPE (1968), Chomsky and Halle defined words as segment sequences delimited by consecutive occurrences of word boundaries, and morphemes as segment sequences delimited by consequence occurrence of formative boundaries. Thus syllable was not included in SPE's list of theoretical units.

However, Kahn (1976) revealed that syllable could be delimited without recourse to boundary markers. Williams (1976) and Goldsmith (1976) had shown that to deal with tonal facts of the Bantu languages, it was necessary to set up representations with at least two parallel sequences of segment – tones-

phonemes and that the widely accepted assumption shared by SPE that a phonological representation is a linear sequence of phonemes and boundaries was therefore untenable. Thus autosegmental conception of the phonological representation cleared the way for Kahn's treatment of the syllable. Rather than define syllable by means of special boundaries, Kahn sees it as a unit on a separate autosegmental tier. This is illustrated below with the syllabification of the English word 'Atlas'.

19.



In as much as syllable can be projected on a separate autosegmental tier, so can words and morphemes. This recognition has two consequences. On the one hand, it eliminates the need for boundaries altogether and on the other hand, it transforms the phonological representation from a sequence of phonemes and boundaries into a three dimensional object.

Besides, Kenstowicz (1994) puts it succinctly:

> Three kinds of justification have been offered for the syllable. First, the syllable is a natural domain for the statement of many phonotactic constraints. Second, phonological rules are often more simple and insightfully expressed if they explicitly refer to the syllable. Finally, several phonological processes are best interpreted as methods to ensure that the string of phonological segments is parsable into syllables.

These views are equally tenable for the analysis of the syllable structure of Edoid languages where some of the phonological rules are meant for capturing syllable structure processes.

Though a recognised and relevant phonological unit, a syllable has no precise and satisfactory definition. A syllable is that amount of utterance that you can be produce with a single breath force or chest pulse. Various scholars have considered syllable either as a phonological or phonetic unit. A syllable

of a movement from a constricted silent state to a vowel like state. (1975) also seems to have based his views on the phonotatic (sequencial) constraints of a given language subject to some universal tendencies. His interest is the structure of the syllable: the phonemes that may occur at the beginning, in the middle and at the end of the syllables.

Some sounds, in utterances, stand out as more prominent than others. The prominence or sonority of a sound is judged by its imagine "carrying power" (Cruttenden, 2001). For instance, a vowel like [a] has more 'carrying power' than a consonant like [z] which in turn has more 'carrying power' than [b]. A plosive such as [b] has no sonority at all times unless followed by a vowel. Based on this, sonority hierarchy can be set up to represent the relative sonority of various classes of sounds.

There have been arguments over some of the details of sonority hierarchy; however, according to Cruttenden, (2001) there is no dispute about the main elements. Nevertheless, he puts forward a version of the hierarchy with the most sonorous classes at the top of the scale:

Open vowels

Close vowels

Laterals.

The notion of syllable is however challenged by languages that allow long strings of consonants without any intervening vowel or sonorant. Languages of the Northwest coast of North America, including Salishan and Wakashan languages, are famous for this. For instance, consider these NUXALK (Bella Coola) words containing only obstruents:

31 a) [– X t X –] 'You spat on me'

b) [– 'k t s k – – –] 'he arrived'

c) [x-p-X—t-p—s] 'he had had in his possession a bunchberry plant

(Bagemihi 1991)

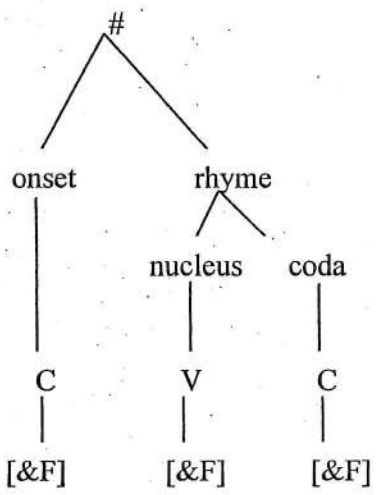
In Bagemihi's survey of previous analyses, he finds that the word [-----] would have been parsed into 0.2.3.5 or 6 syllables depending on which analysis is used. One analysis would consider all vowel and consonant segments as syllable nuclei another would consider only a small subset as nuclei candidates and another would simply deny the existence of syllables completely.

The conclusion from the foregoing is that despite the requirement that every syllable must have a nucleus (vowel or syllabic nasal or lateral), there still exist syllable-less languages. This phenomenon has also been reported in further languages.

2.4.1 Syllable Structure of Ikhin

Syllable structure refers to the combination of allowable segments and typical sound sequences. Below is a diagram of a syllable:

Fig. 7



The syllable 'nucleus' is typically a sonorant, usually a vowel sound, in the form of a monothong, diphthong, or triphthong, but sometimes sonorant consonants like [l] or [r]. The syllable 'onset' is the sound or sounds occurring before the nucleus, and the syllable coda (literally 'tail') is the sound or sounds that follow the nucleus. The term 'rhyme' covers the nucleus plus coda. In the one-syllable English word 'cat', the nucleus is a, the onset c, the coda t, and the

rhyme as. Thus syllable can be abstracted as a consonant-vowel-consonant volume, abbreviated CVC.

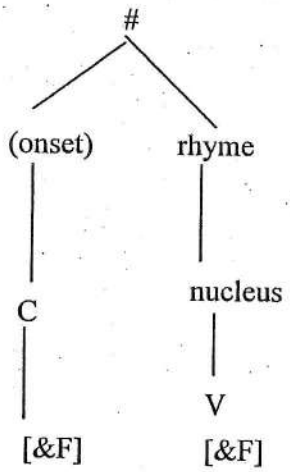
Generally, every syllable requires a nucleus. Onsets are extremely common, and some languages require all syllables to have an onset.

In a language such as English, a consonant may be analysed as acting simultaneously as the coda of one syllable and the onset of the following volume, a phenomenon known as ambisyllabicity.

Ikhin is a tone language and tone is seen as a fundamental unit that defines a syllable. Each time a tone or a sequence of tones associates to a tone bearing unit, a syllable is formed. (Njwe 2005).

At the phonemic level, Ikhin has the following structure:

Fig. 8



The above template shows that at the phonemic level, Ikhin has simple syllable structure. The onset and the rhyme are non-branching. The onset is optional because of vowel prefixes in the class of noun and their absence in the class of verbs.

Both the optional onset (consonant) and the (nucleus) vowel have their own distinctive features represented by letter 'F'.

Phonemically, Ikhin has two prominent syllable structures:

Fig. 9

(i) T
V

(ii) T
CV

Note: T stands for Tone
C stands for consonant
V stands for vowel

2.2.1 V Structure

A syllable of this type consists only of a tone bearing unit that is a vowel. The vowel may occur in isolation or before a consonant, i.e. at word initial position. The v syllable structure type may also be found in medial and final position of word.

V in isolation

Examples are:

21 i) /à/ 'their'

ii) /ɔ/ 'he'

2.2.2 (a) Word Initial Position

Nouns in Ikhin have vowels as their prefix, thus the **V** type is found at the initial position.

iii) /ètò/ 'hair'
V-CV

iv) /ùdò/ 'stone'
V-CV

v) /ùnù/ 'mouth'
V-CV

b) **Medial Position**

When words are joined together to form a compound word especially in the numerals, the V type is found between them.

vi) /xɔkpáɔ̀sùè/ 'nineteen'

CV – CV – V – CV – V

vii) /xɔ̀ìvàɔ̀sùè/ 'eighteen'

CV – V – CV – V – CV – V

c) **Word Final Position**

viii) /àɣaɛ̀/ 'knife'

V – CV – V

ix) / ɔ̀pìà/ 'matchet'

V – CV – V

2.2.1.3 **The CV Syllable Strucutre**

The CV structure appears to be the most common syllable structure, which is evident in the mono-syllabic verbs.

Examples:

33. i) /dɛ̀/ 'buy'

ii) /là/ 'run'

iii) /lɛ̀/ 'go'

iv) /dè/ 'fall'

CHAPTER THREE

THEORETICAL FRAMEWORK

3.0 INTRODUCTION

Chomsky and Halle's landmark study; Sound Pattern of English (1968) is regarded as the first systematic exposition of generative phonology. A key feature was to take seriously the notation in terms of which sounds were represented as bundles of features. A complete set of features was proposed and principles for writing phonological rules were also proposed.

However, phonological representation was still linear in the sense that it was a single line of representation.

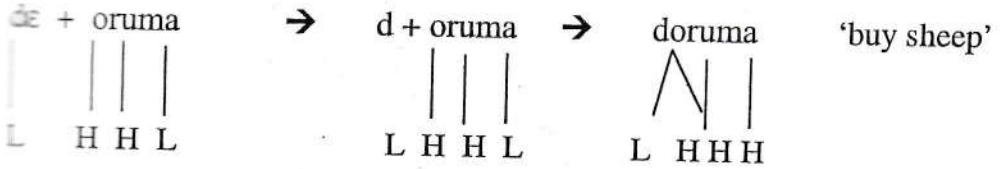
3.1 AUTOSEGMENTAL PHONOLGY

The generative phonology in which systematic alternations are derived from a common underlying form by an ordered set of rules was sucessfully applied to such well-known languages as Russian, Japanese, French, and Spanish by Chomsky and Halle's first generation of graduate students. A critical mass of detailed analyses from the generative perspective accumulated that uncovered numerous problems and research questions - many of them still unresolved.

For instance, Paul Kiparsky (1968'1971) pointed to the excessive abstractness of many analyses adhering to the generative method, raising the question of how a learner could arrive at such rules and representations in the absence of knowledge of their historical antecedents. He suggested that abstract representations are motivated by alternations and that grammars change to states in which the underlying representations can be induced by rules that state generalizations over the surface phonetic representation. Rules changing features structure in local context are ill suited to the phonology of tone, stress and length. These suprasegmentals became the object of intensive scrutiny that had profound effect on how all sounds are represented and manipulated by the rules of grammar.

The tones of Edoid languages in particular and other tonal languages of Africa in general proved more perplexing. While phonetically expressed as a vocalic feature, a tone's phonological behaviour is largely independent of segmental string.

In tonal languages, when a vowel elides the associated tone typically shifts to an adjacent syllable. Thus, John Goldsmith (1976) building on the work of Wil Williams and others made a significant breakthrough on this problem by proposing to represent tonal features on a separate level (tier) associated with but autonomous from the segmental tier. And if tones are autonomous then vowels can delete while tone persists on its own tier and maps to an adjacent syllable to ensure maximal association.



In a final note, while syllable was mentioned throughout SPE's analysis of English, the notion had no formal status in the theory. The ideas that features appear on autosegmental tiers and that an invisible hierarchical structure underlines words and phrases proved especially fruitful.

2.2 PRINCIPLES OF AUTOSEGMENTAL PHONOLOGY

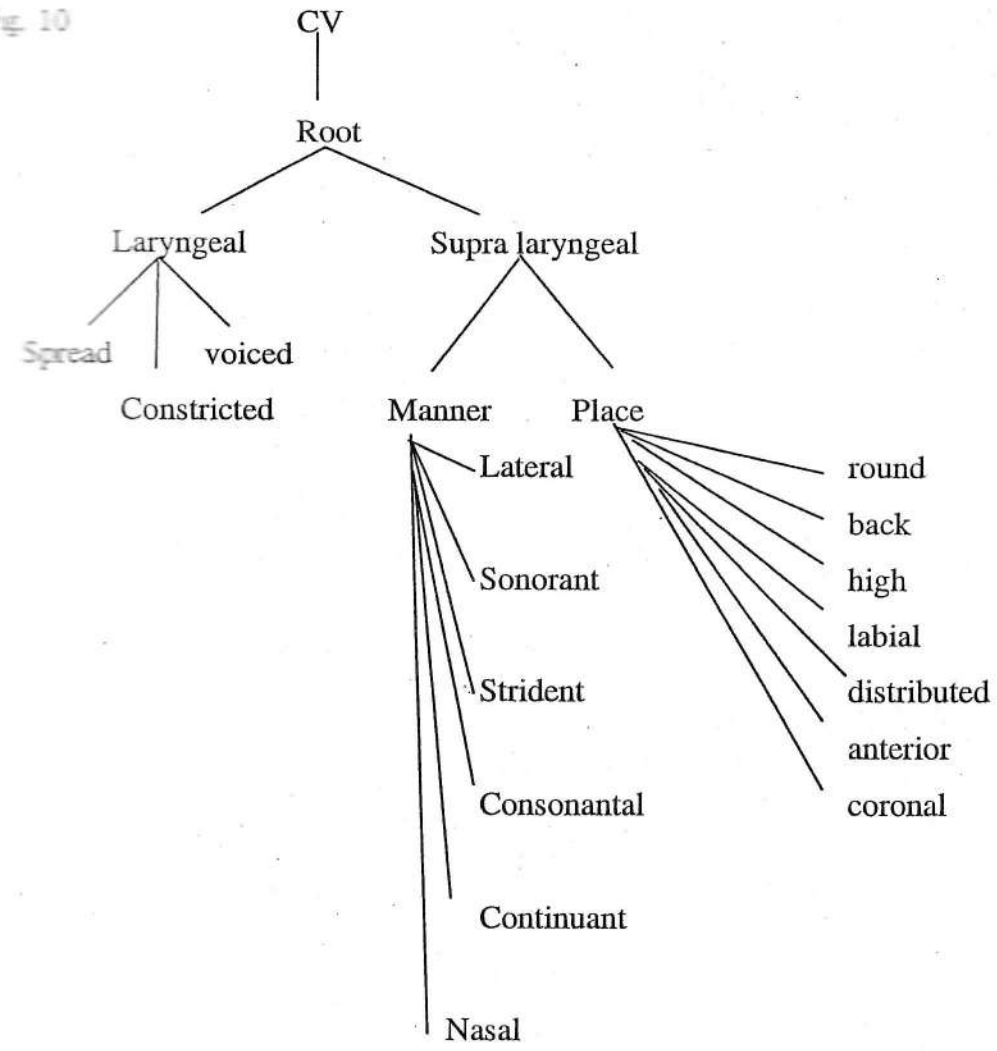
Autosegmental phonology is a non-linear approach that allows phonological processes, such as tone and vowel harmony, to be independent of and extend beyond individual consonants and vowels. As a result, the phonological processes may influence more than one vowel or consonant at a time. This theory treats phonological representations as multi-dimensional, having several tiers. Each tier is made up of linear arrangement of segments. The tiers are linked to each other by association lines that indicate how the segments on each tier are to be pronounced at the same time.

However, autosegmental phonology is an off shoot and a modification of generative phonology introduced by John Goldsmith in his Phd thesis in 1976. He claims that it is an attempt to supply a more adequate understanding of the phonetic side of linguistic representation. He disagrees with the classical generative phonology on the ground that it is characterised by what he describes as 'absolute slicing principle' in which a phonological representation begins by being split into neat 'slices' or segments, each nearly ordered and designed as having no ordered

sub-parts. Goldsmith (1976a) submits that autosegmental phonology is a proposal at the same logical level as SPE idea that a phonological representation is a linear sequence of atomic units or segments and also that these segments are cross-classified by distinctive features. It however, differs from SPE by proposing that a phonetic representation comprises not a single tier but several parallel tiers of phonological segments, each of which is represented on an independent tier or level and that tiers are linked. Elements of each tier are called autosegments and are sequentially ordered.

After the publication of his views, (Goldsmith1990) several modifications to the theory have been made. Recent works on the theory have adopted hierarchical organisation. Clements (1985) proposes that individual features are organised under a hierarchy of superordinate nodes which he called class nodes which are dominated by a higher level class node called root node which in turn is directly linked to the CV tier. The next tier is occupied by the laryngeal and the supralaryngeal nodes. Finally the base of the hierarchy is occupied by the terminal nodes containing individual featuers. Njwe (2005).

Fig. 10



The above tree shows varying degrees of mutual autonomy of features. With this, it is possible to maintain oral configuration while ranging laryngeal configurations or the position of the velum. Besides, higher nodes appear to be more autonomous than their lower nodes. It has been observed that some phonological processes may involve laryngeal features without any effect on supra laryngeal features. Oostendorp (2005) presents an overview of some of the basic principles of autosegmental phonology. According to him, this theory proposed that the primitive elements of phonology (features) are not grouped together in unordered bundles (Segments), but that they live their own, independent lives.

Thus, phonological structure can be seen as; a 'score' of individual instruments roughly corresponding to articulatory organs- which play together using the same beat, while tonal behaviour is a classical example of autosegmental theory in action. The lowest Level of linguistic organization. (Gussenhoven 2005) claims that segments are certainly not the ultimate primitive of this theory, there are much smaller elements - features, which together somehow make up the words of natural language. It is an important question, what the organisation looks like. A very influential view of this is autosegmental phonology,

He claims further that the organisation of speech sounds in the human mind is more or less like a musical score: every feature has its own part, which is 10 some extent independent of all other parts. Their only relation is that they are all attached to one central line, the skeleton, which keeps track of the time. The elements of the skeleton which resemble the notion of a segment in certain ways are usually depicted as 'X'.

2.3 ASSOCIATION CONVENTION

Every morpheme in Ikhin consists of two separate parts: segmental material on the one hand and completely independent of that, a tone. The underlying representations thus look as follows:

35. i) o gbe a ki 'He killed a toad'
H L H L

On the surface, every lone needs to be linked to some vowel due to the so-called Association Convention.

a. No 'floating' tones are allowed on the surface, every tone needs to be linked lo a vowel.

The association convention for tones is part of a more general set of requirements on phonological structure, inquiring every element in a phonological representation to be linked to the other parts of the phonological structure.

1. Align-tone: All tones want to be as close to the right edge of the word as possible, given other conditions of the language.

   In many tone languages of the world, the effect of ALIGN-TONE is observed: tones tend to move to the right ('spread').

2. Wellformedness condition (WFC): Every tone in the output representation should be linked to exactly one vowel, and vice versa.

Given the absolute nature of the WFC in Ikhin- it is not absolute in all languages as we will see later- the best we can do to maximally satisfy ALIGN-TONE is the following:

35. ii) ɔ gbe a ki

H L H L

ɔ gbe a ki

H L H L

Every tone is now linked as much to the right as possible.

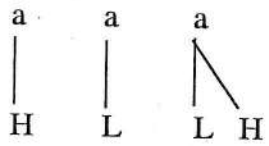
We must note also, that the WFC expressed several requirements at the same time e.g. 'no tone should be linked to more than one vowel and 'no vowel should be toneless.

Another application of the idea of autosegmentalism which has proved to be very useful, is the analysis of contour tones. For instance, Ikhin has a low tone, a high tone and contour tones (The language also has downdrft, downstep and downglide).

In principle, there are two ways of dealing with a situation such as this. We can either have a four way featural distinction (e.g. a feature 'tone' which has values high, low, rising and falling or we can describe the rising tone and falling tone as a combination of low followed by high, and a combination of high followed by low respectively).

Autosegmental analysis advises us to take the latter route, so that we can minimise the number of primitives in our theory (there are only high and low tones, and autosegmental association).

36.



Thus then, the advice that autosegmental phonology gives us turns out to be a good advice. In the first place, this representation helps us to understand what is going on with tones. Let us look at the following facts about high vowels occurring either word finally or word medial before an unidentical vowel.

37. i) /étúàgbã̀/ → [étwâgbã̂] 'bear'

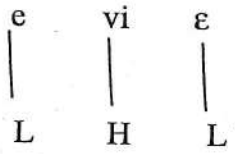
ii) /èvíɛ̀/ → [èvjɛ̂] 'morning'

iii) /íbìɣùá/ → [íbíɣwǎ] 'wing'

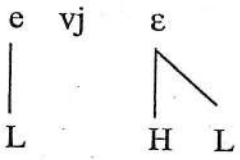
In 37 (i – iii), the vowels turn into glides with the resultant effect that the level tones turn into falling and rising tones.

Under autosegmental assumptions, it is very easy to understand this process: the falling tone is a combination of the original high and low tones while the rising tone is a combination of the original low and high tones.

38. (a) input



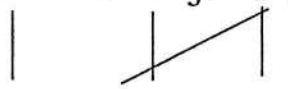
(b) output



The reason why this happens can be seen as an interaction of the impossibility of the glide to carry the tone, and the wish of the tone to be linked to some vowel. We must observe that this is always the vowel which is closest to the tone in some intuitive sense. Compare for instance the following structure:

39. (a) e twa gbã 'bear'

(b) et w a gb ã



While (39a) is possible, (39b) is an impossible structure, the reason why we do not find (39b), is because there is a very hard constraint on autosegmental representations of the following kind.

i) No line crossing: Association lines may not cross. Different from all other constraints we have seen so far, NO LINE CROSSING is hard-wired into every known grammar: languages cannot fiddle with it. The reason for this presumably has to do with the interpretation of autosegmental representations. We are dealing in this case with two tiers, one tier on which we have the tones, and another tier on which we have our X-slot- in our example, we have given these X-slots the names of the sounds they carry, by way of abbreviation.

Each of those tiers represents in some sense a timeline: if element A stands before element B on a tier, this means that the pronunciation of A precedes that of B. thus in (39b) the realisation of the high tone will always precede that of the low tone. If we think about our representations in this way, it stands to reason that association of an element X to an element Y means that the realisation of X overlaps with that of Y in time. Thus the pronunciation of low tone in (38a) will happen during the pronunciation of [e].

But given all of this, (39b) defies all logics: the second high tone precedes the first low, but is also realised during the pronunciation of an [ã] which follows the [a] with which the second high tone is associated.

We can conclude that grammar can entertain all kinds of representations including those which are not completely wellformed (because they display contour tones or floating tones); but they will never entertain possibilities which do not make any sense at all. Two of the latest models of this theory are hierarchical theory (Clements 1985) and Register theory, (Snider 1999).

In Register Tier theory, tone is treated and represented as a feature independent of the segmental features which constitute consonants and vowels. In addition to the tone features, there are register tones which are relatively high or low set of lexical tones. Thus RTT is called because, among other things, upper register tones and lower register tones occupy separate tiers from the tone tiers such as high (H) and low tone (L) in the geometrically organised phonological representation.

The difference between this theory (RTT) and other standardly assumed version of feature geometry is that Snidder (1999) incorporates register tier into the geometry of tone, in addition to the generally assumed tonal tier. However, to the extent that the model incorporates register tier into the presentation, it is somewhat similar to the model of YIP (1989). However, the two models differ in that in the Snidder's model, the register tier and tone tier are independently linked to the bearing unit, whereas in the YIP's model, the tier is dependent on the register tier.

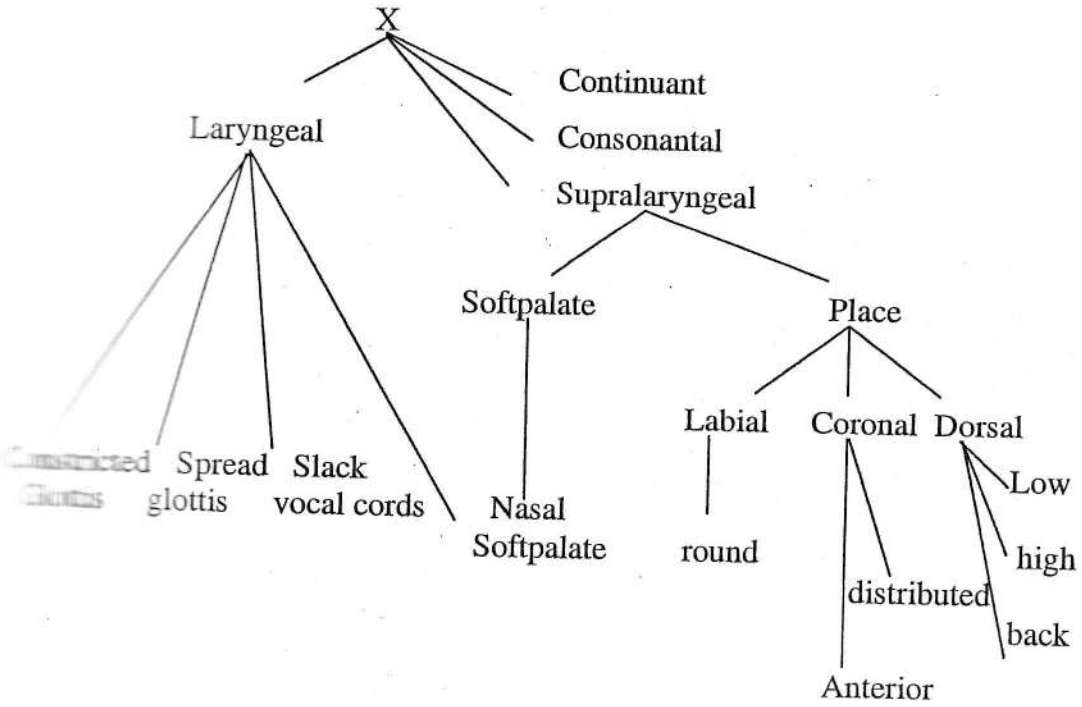
More importantly in the present work, hierarchical model will be preferred to this register Tier Theory in that RTT is essentially an application of autosegmental phonology to tonal phenomena. It appears RTT is not a general theory of phonology (like which applies to nasality, voicing vowel harmony etc) "but a theory of phonological features which integrate into the broader theories of lexical phonology, autosegmental phonology and optimality. The integration is such that it replaces the single tier representation for tone that tends to dominate the literature" Njwe (2005).

In this model, we will adopt opinions on autosegmental phonology by Clements (1985), Sagey (1986) and Pulleyblank (1988) as modified by Egbokhare (1994).

The distinctive features in the SPE matrix model which were described as having no internal organisation in the generative model are said to have internal hierarchical organisation in autosegmental phonology.

A typical feature hierarchy is as represented in figure 11 below. Ogunbiyi (1990) quotes Sagey (1986) as saying that features are grouped according to the articulator in the vocal tract they are executed by. Articulators are grouped according to their acoustic effects on formants". Find below Sagey's representation of hierarchy.

Fig. 11 Sagey 1986 (end view)



Clements' hierarchy is premised on cross linguistic generalisations with respect to phonological and phonetic processes.

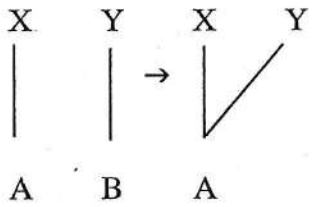
Features that pattern together in assimilation processes are grouped together. Ogunbiyi 1990). Thus according to Clements (1985).

> ... the study of the interaction among various sets of features, as observed (for example) in the study of assimilation rules provides prime evidence for the nature of simultaneous feature groupings. If we find that certain sets of features consistently behave as a unit with respect to certain types of rule of assimilation or sequencing, we have good reasons to

> suppose that they constitue a unit of phonological representation...

Multitiered view of feature representation is evident by the spreading account of assimilation. The rule of assimilation involves the spreading of an element of one tier into a new position on an adjacent tier. This is represented below:

Fig. 12 (Clements 1985:231)



Each of the three types of assimilation (Total assimilation, partial assimilation and feature assimilation) creates a linked structure as predicted by hierarchical model such that total assimilation, vowel elision or glide formation may take place when vowels occur in sequence across word boundaries. "A piece of evidence showing that assimilation creates linked structures comes from the fact that sequences of identical vowels created by total assimilation do not undergo elision; at best they may be contracted, in contrast, sequences of identical vowels are often objects of vowel elision" (Egwuikhare 1990). He provides the following examples from Emai.

i) ɔ̀ sáɣá ɔ̂i → ɔ̀ sáɣá âi

he/she rip apart it

'he/she has ripped it apart'

ii. ɔ̀ kpéɣé ɛ́ → ɔ̀ kpéɣé é

he/she shake you

'he/she has shaken you'

iii. ɔ̀ gbé éfɛ̀ → ɔ̀ gbéfɛ̀

he/she kill rats

'he/she has killed rats'

iv. ɔ́ èexà dɛ́ ɛwè → ɔ́ eèxɛ̃̀ã̀ dɛ́wè

child buy goat

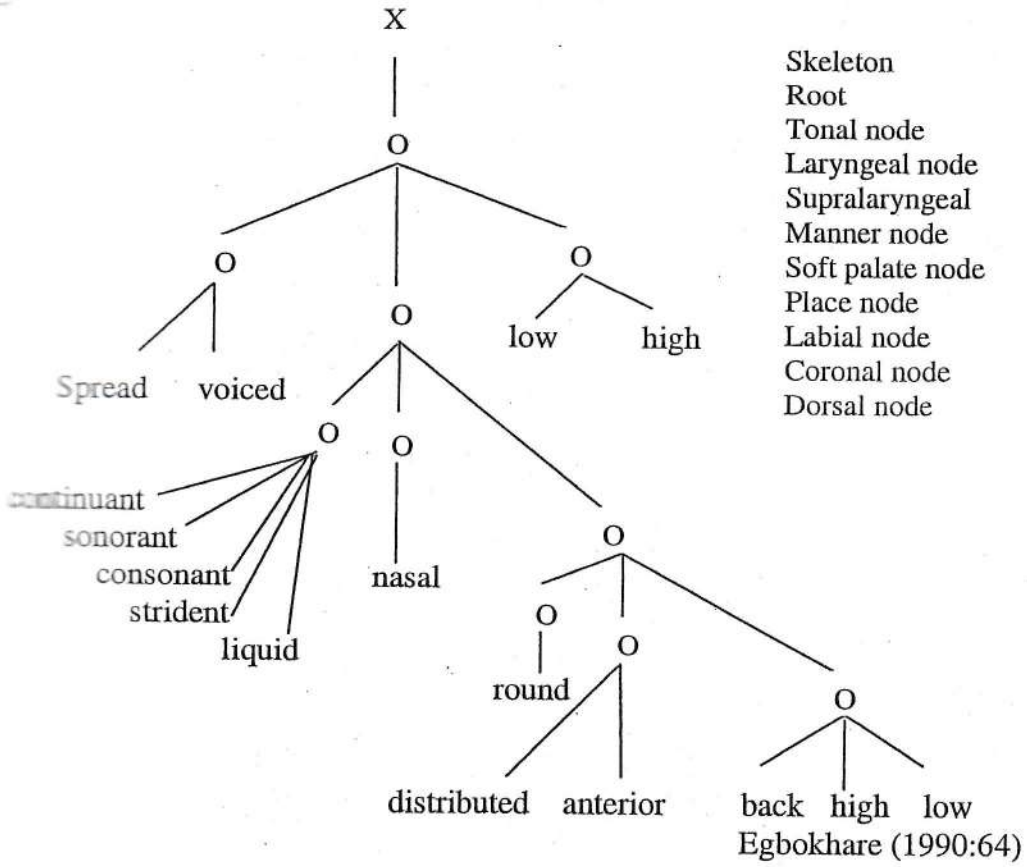
'the child has bought a goat'.

Examples (a) and (b) are for contraction while (c) and (d) which are sequences of identical vowels are for vowel elision.

He posits a universal hierarchy based on vocal tract anatomy just as a universal phonetic inventory is recognised. He claims further

> "But allowance must be made for languages to diverge in their selection of nodes as well as the functional relations of these nodes much in the same way as languages diverge in their selection of sounds from the universal inventory and the use to which such sounds are put".

The operational hierarchy is presented below:



Egbokhare (1990:64)

The hierarchy is said to be similar to that of Pulleyblank (1988) and Sagey (1986) but differs from Clements by recognising articulator nodes: labial, coronal and dorsal. It however follows Clements in postulating a manner node which dominates traditional manner features such as [sonorant], [continuant], [consonantal], [strident], [liquid],and [nasal]. On the other hand, it follows Sagey in positing a soft palate node and adopting Pulleyblank in projecting the tonal node from the skeleton rather than the laryngeal node but differ from both (Pulleylank's and Sagey's) in holding that the restriction placed on class nodes (articulator nodes) that they be monovalent- is unnecessary.

One of the advantages of this hierarchical organisation of features is the fact that it is able to characterise the phoneme as a phonological unit. Clements (1985):

> ...phonological representations are to a large extent segmentable into phonemes that behave as single units with respect to rules: indeed, this is one of the primary motivations

> for recognising the phoneme as a category of linguistic theory. Rules must have access to phoneme-size units in autosegmental theory as well. For example, they must be able to delete consonant and vowel or spread all the features of a consonant or vowel on to neighbouring position in the skeleton, as in the case of compensatory lengthening process.

Before this model, rules referring to phoneme-size units are said to have a highly marked status, in so long they have to refer to features located on two or more tiers, while within this hierarchical model, the phoneme is conceptualised in the root node. Clements and Keyser (1983) proposed extending CV representation to all languages so that a greater variety of phonological processes could be expressed in autosegmental terms. For example, the consonants and vowels can be represented as one feature matrix associated with two adjacent CV positions. With this notation, changes in quantity involve the addition or deletion of CV slots. The many demonstrates how the disparate changes of vowel shortening, consonant degemination and vowel epenthesis illustrated by the Turkish data can be normalised as by products of the organisation of segments into CVC syllables:

41.

Accusative	Nominative	Ablative	
zamaan-i	zaman	zaman-dan	'time'
hiss-i	his	his-ten	'feeling'
devr-i	devir	devir-den	'transfer'

42.

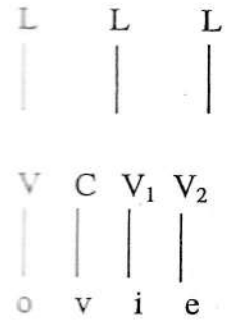
43.

The CV tier and in particular the possibility of empty skeletal positions intervening between phonetically adjacents segments has been investigated in considerable detail by researchers working under the banner of Government phonology. More generally, phonological expresions are viewed as sequences of C and V elements organised by syntactic principles.

Clement and Keyser (1983) and Pulleyblank (1983, 1986a) propose that autosegments are indirectly linked through a structural CV skeleton which is entirely of a different status from the autosegmental tiers. The CV skeleton is made up of C and V elements to which autosegments are linked and from which they are linked to bearing units. The major advantage of having a CV skeleton is that it enables a clear representation of different processes in language simultaneously "... it constitutes a separate autosegmental tier and forms the core of the representation and it is around it that vowels and consonants are articulated" Aziza (1997). One of the advantages of the CV skeleton is to afford us an opportunity to present a clear picture of a number of phonological processes in Ikhin.

Within the framework we are adopting and as observed in Urhobo by Aziza (1997) our account of glide formation will allow a change of an original V slot on the CV tier which dominates V_1 in the sequence to change to a C slot as is shown in the derivation of the word [ovjè] 'king'.

a. underlying representation

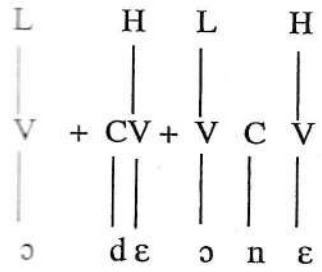


→

b. by glide formation

... to the first vowel, while V_2 refers to the second vowel.

... in her autosegmental description of floating tones, in Urhobo, she ... the following analysis:

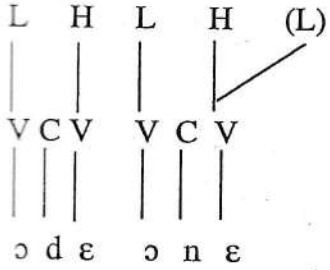


underlying representation

... question

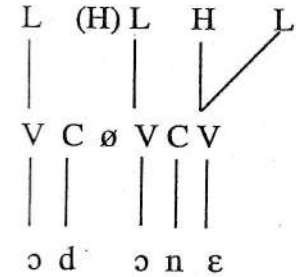
... yam tomorph

(ii)

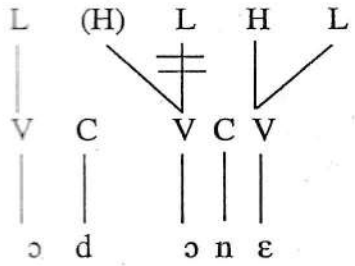


by (L) tomorph representation

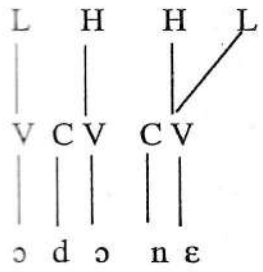
(iii)



by vowel elision

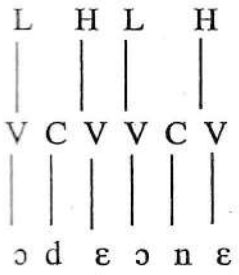
(iv) 

by (H) tone relinking and L delinking

(v) 

surface representation

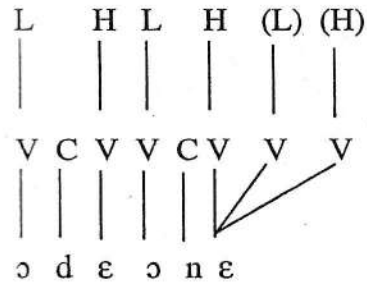
[ɔ̀dɔ́nɛ̂] 'child he/she buy yam'

(i) 

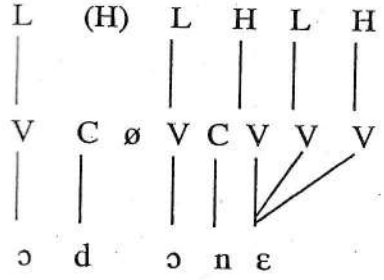
underlying represenntation

3rd person negative

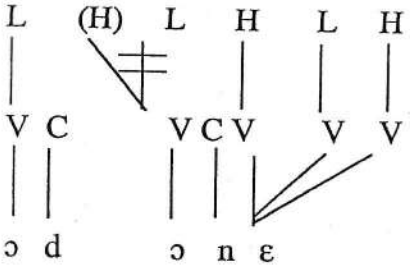
the bought yam tomorph

(ii) 

by final vowel lenghtening to bear (LH) tomorph

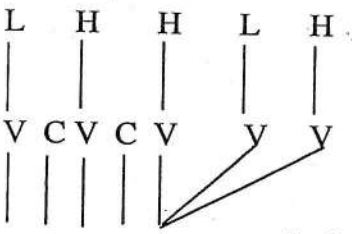
(iii) 

by vowel elision

(iv) 

by (H) tone relinking

and L delinking

(v) 

surface representation

[ɔ̀dɔ́nɛ̂ɛ̃ɛ̃ɛ̃] 'he/she did not buy yam'

[illegible] reveals that floating tones get segmentalised on tone bearers.

[illegible] glide formation processes in Ikhin, the syllabicity of the first of two vowels (in a [illegible] is lost by becoming a glide and its tone is set floating.

This floating tone then segmentalises on the following vowel already [illegible] a non-identical tone thereby creating a contour as exemplified below.

i. 

underlying representation

'pour' 'it' 'pour it'

ii. 

by glide formation, creating a floating (L)

iii. 

-low tone relinking

iv 

[kwɔ̋] 'pour it'

Clements (1985) describes floating tones which function as grammatical formatives as

CHAPTER FOUR

THE SYLLABLE STRUCTURE AND ASSIMILATORY PROCESSES

INTRODUCTION

In this language, all syllables are open, and nouns begin and end with vowels. This is why vowel processes discussed are many.

This chapter examines the syllable structure and assimilatory processes in Ikwerre. The syllable structure processes investigated include vowel elision, vowel insertion and glide formation, while the assimilatory processes investigated include Ikwerre vowel assimilation and nasalization. Having established the syllable structure types in the earlier chapter, we deem it necessary to address the maintenance of these structures in vowel elision, vowel insertion and glide formation. The syllable structures discussed are the underlying syllable structures. We can however, manifest phonetic syllable structures of type [cj] and [cw]

The [cj] type occurs when the vowel /i/, a close front unrounded vowel becomes [j], a palatal glide, between a consonant and another unidentical vowel.

Examples:

48. i) /ìiβîà/ → [ìiβjâ] 'children'

ii) /ɔ̀sìè/ → [ɔ̀ʃjè] 'friend'

iii) /àrìɔ̀/ → [àrjɔ̀] 'juju'

iv) /vìɛ̀/ → [vjɛ̀] 'weep'

The [cw] type also occurs when the vowel /u/ a close back rounded vowel changes to [w] a labial-velar glide whenever it occurs between a consonant and another unidentical vowel.

Examples:

v) / ísàgùɔ̀/ → [ísàgwɔ̀] 'groundnut'

vi) /ògùà/ → [ògwà] 'farm'

INTERPRETATION OF [CW] AND [CJ] SEQUENCES.

Although we pointed out that there are underlying CV and V syllable structures, however, some phonological processes give rise to surface structure clusters. [cw] and [cj] are phonetically complex segments, It therefore suffices to undertake some analyses of these suspicious sequences in the language. These sequences can be interpreted in either of the following ways:

1. interpreting them as a sequence of a consonant followed by an underlying vowel /i/ or /u/.

2. interpreting them as a sequence of two consonants i.e consonant cluster where the second consonant is a palatal approximant /j/ or a labial approximant /w/ e.g.

49. i) [vjɛ] /v - j - ɛ/

$C_1 C_1 V$

3. interpreting the CW/CJ as being in complementary distribution with a plain C. That is as a case of labialization and palatalisation.

4. interpreting them as part of a complex vowel i.e. the beginning of diphthongs formed with the vowel they precede e.g.

ii) [vjɛ] /v-jɛ/

C V

5. interpreting J/W as forming a single consonant phoneme with the preceding consonant. e.g.

iii) [vjɛ] /vj-ɛ/

C V

The first of the above interpretation is the most plausible, that is, deriving the CW CJ from an underlying sequence of CuV and CiV respectively. This is evident from the following examples:

iv) [mîɛ] → [mjɛ̂] 'to sleep'

v) [tìè] → [tjè] 'to abuse'

vi) [vìɛ] → [vjɛ̀] 'to weep'

The above examples support the fact that consonant and glide sequence has an alternative pronunciation at the phonetic level which has the high vowels /i, u/ in place of the glides. Therefore a glide rule would be applied to account for the CW/J sequences. This rule applies within a word or across word boundary changing /CIV/ and /CUV/ sequenes into [CJV] and [CWV] respectively. This is because the following vowel is unidentical with any of [i] or [u]. Examples illustrating this are shown below:

vii) /fí ùdò/ → [fjúdò] 'throw a stone'
'throw' 'stone'

viii) /ɔ̀pià/ → [ɔ̀pjà] 'matchet'

ix) /xí ɔ́bà/ → [xjɔ́bà] 'become king'
'make' 'king'

A glide rule applies to URs on the left side and changes them to SRs at the right side. The second option which interprets [CW] and [CJ] as a consonant cluster would lead to an untenable opinion that consonant clusters are a wide spread feature in Ikom and this would be uneconomical since only a few words in this language have this structure and only [W] and [J] occur in this position.

Also, interpreting [CW] and [CJ] as being in complementary distribution with their plain [C] is considered too abstract because it is unmotivating as it claims that they are allophones of their plain consonants.

The last two interpretations can be handled by vowel elision process in that it has the effect of eliding either v_1 or v_2 when they are in adjacent position at word boundary. Thus if the glide forms a phoneme with a preceding sound unit, then the glide will not elide leaving such a sound unit behind.

The diphthong interpretation also has to be set aside because a diphthong is said to be a utilization of two otherwise different vowels of a language. Thus if the glide forms a diphthong with a following vowel in a CW/JW sequence, vowel elision would affect the diphthong as a single syllabic unit. However, the effect of

vowel elision suggests that there are two sound units rather than a diphthong. Elision will elide the V of a CW/JV sequence leaving the glides behind.

Example:

x) tjè ɔ̀kpɔ̀sɔ̀ → tjɔ̀kpɔ̀sɔ̀

'abuse' 'woman' 'abuse woman'

As indicated earlier, the first interpretation which sees the suspicious sequence as sequences of consonants followed by vowels is acceptable.

This interpretation does not in any way affect or temper with the syllable structures of the CV and V patterns that have already been established for Ikhin. It also does not add more segments to the phonemic inventory of Ikhin vowels. The palatal and labial glides that are now interpreted as underlying vowels are formed through glide formation process as in:

xi) /àkiè/ → [àkjè] 'toad'

xii) /íβîa/ → [íβjà] 'children'

xiii) /ibiɣua/ → [ibìɣwà] 'wing'

xiv) /óxûa/ → [óxwâ] 'heavy'

Vowel Elision

Phonological changes can have drastic results in certain environments leading to complete dropping of a sound in a given context. This process is called deletion or elision. When it affects vowels, then it is vowel elision or it may have consonants as target and then we obviously deal with consonant elision. It may be an optional process if the speaker drops the sound only for articulating the phonetic sequence more easily, or it can be obligatory, if triggered by phonotactics of the respective language. The latter case can be observed in loan words which are adapted to the requirements of the language they are burrowed into or, diachronically, when the phonotactic constraints of a certain language change in time. Elision can be formalised thus **X→ø** / A-B. Where ø represents the fact that the sound is lost.

Examples:

i. Vowel elision: /junvasiti/ → /junivəsti/ 'university'

Optional /pəlis/ → /plis/ 'please'

ii. Consonant elision optional: /pəustmən/ → /pəusmən/ 'post man'

Among the common strategies for eliminating vowel hiatus is vowel elision. In some cases, it is the first vowel (v_1) that elides, while in others it is the second (v_2). Analyses of elision have simply stipulated which vowel is elided, for example by encoding this information directly in a language-specific rule. This implies that targeted position is not predictable, but simply a matter of which of two equally available options is selected by the language. A cross-linguistic study suggests, however, that this is not strictly the case, but that in some environments the choice of target is universally determined.

Vowel elision is a common phonological process in African languages in general and Edoid languages in particular. Vowel elision is found most commonly in kwa languages and that in such languages the syllable structure of verbs and nouns makes it possible for vowel sequences to occur across morpheme boundaries. (Weimers 1973). In Ikhin and in such other Edoid languages like Urhobo, Emai etc any of the vowel (V_1 or V_2) can elide at boundary depending on construction type. However, in Ngwo, a western Grass field Bantu language, spoken in the North West province of Cameroon, when two morphemes or words are juxtaposed only the V_2 elides. This V_2 is actually the noun class prefix vowel of the second word.

Njwe (2005) claims that this process is important because it is in line with Guthrie's (1948) third criterion for Bantu languages which states:

> When a word has an independent prefix as the sign of its class, any other word which is subordinate to it has to agree with it as to class by means of dependent prefix.

provided the following examples from Ngwo:

i) à-kā + a-kɛ̄ → ē-ka-kɛ́

V-CV V-CV V-CV CV

'plates' 'large' 'large plates'

ii) flá + ibit → flabit

CCV V-CVC CCV-CVC

'Clean' 'pool' 'clean pool'

The above show that vowel elision takes place at morpheme boundary in Ngwo to prevent hiatus. Potential vowel cluster in Ikhin may be avoided by dropping one of the vowels when two morphemes or words, one of which ends in a vowel and the other which begins with a vowel are combined. This is also referred to as boundary deletion.

Our concern here is to layout basic factors that come into force in determining whether or not vowel will elide and which of the V_1 and V_2 in a sequence should disappear in any environment and to explain the phonological, morphological or syntactic reasons behind such a process. We begin by showing how vowel elision works in Ikhin and the problems arising from its analysis, also by explaining factors such as boundary, morpheme structure and vowel quality which actually determine whether or not elision should take place. An understanding of the following situations would go a long way in assisting us to appreciate the various explanations later provided as solutions to the problems of vowel elision in Ikhin.

i) $V_1 + V_2$ sequence, the v_1 is sometimes elided

òkɔ̀	+	ɛ́dá́	→	okɔ ɛda	→	òkɛ̌dá́
V_1		V_2		V_1V_2		
'motor'		'river'				canoe or boat

ii) V_2 may be elided in $V_1 + V_2$ sequence

ɛ́wè	+	ɔ̀nà	→	ɛ́wè ɔna	→	ɛ́wènã̀
V_1		V_2		V_1 V_2		
'goat'		'this'				'this goat'

iii. Sometimes, no elision of either V_1 or V_2 when occurring in sequence across morpheme boundary.

ɔmɔ̀hènì + é$hù$ + ó$dè$ → ɔmɔhe ni é$hù$ ódɛ → ɔ̀mɔ́henì é$hù$ó$dè$
V^1 V^2 V_1V_2

man die yesterday 'The man died yesterday'

iii. When high vowels /i/ and /u/ occur at V_1 position and are followed by an unidentical vowel across morpheme boundary, glide formation rather than vowel elision takes place (this situation also applies to /o/)

iv) fì + ákà → fj + ǎkà → fjǎkà
V_1 V_2 C V_2

'throw' basket 'throw a basket'

v) rò + ɔ̀kpòsò → rw + ɔkposo → rwɔ̀kpòsò
V^1 V^2 C V_2

'take' 'woman' 'marry'

vi) è$tò$ + à$gbã$ → etw + agbã → ètwà$gbã$
V^1 V^2 C V_2

'hair' 'jaw' 'bear'

iv. There are however, situation when these high vowels are deleted in this same environment

vii) o$ûrù$ + à$gbè$de → ouru + agbede → o$ûrá$$gbè$$dè$
V_1 V_2 V_1 V_2

'thread' 'needle' 'needle's thread'

v. The final vowel of a verb may be deleted in a construction and retained in another construction despite the fact that it is followed by the same vowel across word boundary.

viii) mɛ́ + dɛ̀ + ɔ̀pià → mɛ + dɛ + ɔpia → mɛ́ dɔ́pjà
V_1 V_2 V_1 V_2

I buy matchet I bought matchet

ix)	mɛ́ + dɛ̀ + ɔ̀	→	mɛ + dɛ + ɔ	→	mɛ́dɛ̀ɔ̀
	I buy it		V_1 V_2		I bought it

Besides, in a verb-noun object sequence, the final vowel of the verb sometimes stays and at other times it goes even when it is followed by the same vowel. This is more so when the main verb is preceded by the auxiliary.

"Whenever there is a seeming contradiction in the operation of two rules, it is almost certain that the language will carefully delineate the kind of area in which the one or the other can operate" (Oyebade, 1998). Some of the above situations can be examined not only phonologically but also syntactically.

Though, in Ikhin, vowel elision does not take place at boundary between syntactic categories such as auxiliary and the main verb, noun and a following verb, verb and adverb, noun and article, however, when these items occur in an adjacent relation to other lexical items e.g verb- noun, verb- numeral, verb- qualifier elision takes place.

All that we have said so far is to generalise by describing the mode of vowel elision in Ikhin. Any factor or reason that may have been advanced for being responsible for vowel elision in this language must also account for why elision takes place in certain environment but is blocked in another environment, not only that it must also account for the reason why it is V_1 that elides in one environment and V_2 in another environment.

It is at this level that explanations on phonological and syntactic factors in addition to vowel quality and morpheme structure conditions are offered. Apart from factors such as vowel quality and boundary, one other factor with respect to elision or glide formation is syllable structure of the verbs and nouns in Ikhin. Ikhin nouns are either disyllabic i.e. V(C)V or trisyllabic etc. The operation of vowel elision is blocked in disyllabic nouns as /i/, /o/ and /u/ form glides when either of them occurs as V_1 whereas vowel elision rather than glide formation takes place in trisyllabic nouns.

On the other hand, the minimal syllable structure of verbs in Ikhin is (C)V. A verb can either be monosyllabic or disyllabic, a situation that is true of most Edoid languages. Vowel elision takes place in disyllabic verbs, while monosyllabic verb having /i/, /u/, /o/ as V_1, has its V_1 turned to glide when it is followed by a stronger

The strength hierarchy presupposes that the pronoun and verb categories would lose their vowels when in near adjacency to qualifier and noun categories. having understood the foundation for the application or otherwise of vowel elision in Ikhin, we will now provide construction types where elision takes place and its effects on tones and nasality

4.2.1 V_1 Elision

4.2.1.1 Compound words

Vowel elision takes place in the formation of compound words. When two words are juxtaposed to form a compound word, the final vowel of the first word is lost or dropped, provided the following word begins with another vowel.

i) òkɔ̀ ɛ́dà → okɔ ɛda → òkɛ̌dà
V_1 V_2 V_1 V_2
'motor' 'river' 'boat (canoe)'

ii) ɔ̀mɔ̀ òkpòsò → ɔmɔ okposo → ɔ̀mòkpòsò
V_1 V_2 V_1 V_2
'child' 'female' 'female child'

4.2.1.2. Transitive verb – object

Also, V_1 elision occurs at the boundary between a transitive verb and its object.

i) gbè áwà → gbe awa → gbáwà
V_1 V_2 V_1 V_2 'kill dog'

ii) gbè òfè → gbe ofe → gbòfè
V_1 V_2 V_1 V_2
'kill' 'rat 'kill rat'

iii) dɛ̀ úkò → dɛ uko → dúkò
V_1 V_2 V_1 V_2
'buy' 'container' 'buy a container'

iv) dɛ̀ úsó → dɛ uso → dúsò
V_1 V_2 V_1 V_2
'buy' 'head' 'buy a head'

v) fã̀ ɔ̀mɔ̃́ká́ → fã ɔmɔka → fɔ̃́mɔ̃́ká́
V_1 V_2 V_1 V_2
'pluck' 'orange' 'pluck orange'

vi) dɛ̀ órúmà → dɛ oruma → dǒrúmà
V_1 V_2 V_1 V_2
'buy' 'sheep' 'buy sheep'

vii) kù àmɛ̀ → ku amɛ → kwàmɛ̀
V_1 V_2 V_1 V_2
'pour' 'water' 'pour water'

4.2.1.3. Numeral construction

V_1elision has equally been observed in the numeral constructions as shown below:

55. i) ìgbè ɔ̀kpà → igbe ɔkpa → ìgbɔ̀kpà
V_1 V_2 V_1 V_2
'ten' 'one' 'eleven'

ii) ìgbè éhà → igbe eha → ìgbèhà
V_1 V_2 V_1 V_2
'ten' 'three' 'thirteen'

4.2.1.4 Article – Noun Construction

In the noun phrase construction involving article, the word order in this language is for the article to come before the noun it modifies. In this construction, the stem vowel of the article which is V_1 at word boundary is deleted as shown below:

56. i) ɔ̀lì ɔ́bò → ɔli ɔbo → ɔ̀lɔ́bò
V_1 V_2 V_1 V_2
'the' 'doctor' 'the doctor'

ii) ɔ̀lì ɔ̀kpòsò → ɔli ɔkposo → ɔ́lɔ̀kpòsò
V_1 V_2 V_1 V_2
'the' 'woman' 'the woman'

iii) ɔ̀li ɛ̀wè → ɔli ɛwe → ɔ́lɛ̀wè
V_1 V_2 V_1 V_2
'the' 'goat' 'the goat'

iv) èlì ódì → eli odi → èlódì
V_1 V_2 V_1 V_2
'the' 'wall' 'the walls'

v) èlì òì → eli oi → èlòì
V_1 V_2 V_1 V_2
'the' 'thief' 'the thieves'

Under normal condition [i] does not delete but it deletes, here because it belongs to a modifier (article). See section 4.4 for a discussion on glide formation.

4.2.2 V_2 Elision

4.2.2.1 Noun – Demonstrative Construction

In Ikhin and perhaps in most African languages, the word-order in noun phrase is for the demonstratives to follow the nouns they qualify. In this case, the prefix vowel of this demonstrative (V_2) is dropped when it is in an adjacent position to the V_1 of a head noun e.g. the vowel of the modifier is dropped because the demonstrative is a modifier. It is a concord marker prefix not a class prefix.

57. i) à́βè + ɔ̀nà → aβe ɔ́na → áβènà
V_1 V_2 V^1 V_2
'house' 'this' 'this house'

ii) òfè + ɔni → ofe ɔ́ni → ófèn̄ĩ
V_1 V_2 V_1 V_2
'rat' 'that' 'that rat'

iii) ɛ̀wé ɔ̀nà → ɛwe ɔ́na → ɛ̀wénã̀
V_1 V_2 V_1 V_2
'goat' 'this' 'this goat'

iv) áwà ɔ̀nì → awa ɔ́ni → áwànĩ̀
V_1 V_2 V_1 V_2
'dog' 'that' 'that dog'

v) ɔ̀ɛ̀ ɔ̀nã̀ → ɔ̀ɛ̀ ɔ́nà → ɔ̀ɛ́nã̀
V_1 V_2 V_1 V_2
'leg' 'this' 'this leg'

vi) ɔ́bò ɔ̀nĩ → ɔbo ɔ́ni → ɔ́bònĩ̀
V_1 V_2 V_1 V_2
'doctor' 'that' 'that doctor'

4.2.2.2 Noun Associative Construction

In the noun-associative constructions, however, the associative marker /isɛ̀/ which intervenes between the two nominals has its two vowels (prefix and suffix) elided. In this elision process, the prefix vowel /i/ is V_2 elision while the suffix vowel is V_1 elision.

Examples:

58. i) ɛ́kpà ísɛ̀ ɔbà → ɛ́kpa ísɛ̀ ɔba → ɛ́kpásɔ̀bà
$V_1V_2V_1$ V_2 $V_1V_2V_1$ V_2
'bag' 'am' king' 'king's bag'

ii) áwà ísɛ̀ òhùà → áwà ísɛ̀ òhua → áwásɔ́hwà
$V_1V_2V_1$ V_2 $V_1V_2V_1$ V_2
'dog' 'am' 'hunter' 'hunter's dog'

iii) úsó ísɛ̀ òkpòsò → úsó isɛ̀ okposo → úsósòkpòsò
$V_1V_2V_1$ V_2 $V_1V_2V_1$ V_2
'head' 'am' 'woman' 'head of woman'

In the above examples, the associative marker /isɛ/ (V – CV) has its initial and final vowels dropped while the vowels of the nouns being fused together are retained. This is borne out of the fact that the marker is weaker in strength than the nouns and as such loses its vowels when in juxtaposition with the stronger constituents such as nouns. Though in fast speech, the whole associative marker may go.

However, this process does not occur as claimed earlier if V_1 is a close vowel i.e. /i/ and /u/ therefore, it is blocked by another process called glide formation. Also syntactic rules such as word order rule block vowel elision within primary constituents because such constituents have undergone verb movement as in the following examples:

59.

	N	Aux	V	Adv
i)	ɔmɔ́hè	è	hu̲	ó̲dɛ̀
	man		die	yesterday

The man died yesterday

ii)	ìjã̀	xé	lùmɔ̀	á̲kùɛ̀
	mother	will	travel	tomorrow

The mother will travel tommorrow

iii) áwà gbè ófè ódɛ̀
dog kill rat yesterday
The dog killed rat yesterday

The vowel elision processes discussed above affect the status of other segments such as tone and nasality. The reason for this is that all the affected vowels are tone bearing units while only a few of the affected vowels bear nasality. In autosegmental phonology, the features of the segments (vowels and consonants) and those of the tones are contained in separate tiers. The relation of tones to the vowels with which they are associated is simultaneous in time.

Though, discussion on stability of tone will be dealt with in the subsequent chapters, however, our sample derivations for autosegmental representation of vowel elision processes will also include the effects of these processes on tones. When vowels are deleted, their tones are automatically set afloat and later relinked by an association convention for tones which is a set of requirements on phonological representation to be linked to the other parts of the phonological structure.

The value of autosegmental analysis was clear in Goldsmith's (1976) analysis of tone in African languages. He argued for an autosegmental representation on the grounds that there are phonological rules that apply independently at tonal and segmental levels. He claims that there are rules that delete a segment but which can leave a tone that is associated with a segment unaffected.

Example:

60. i) òkɔ̀ édà → òkɛ̆dà
V_1 V_2
L L H L
'motor' 'river' 'boat'

Rule 1,

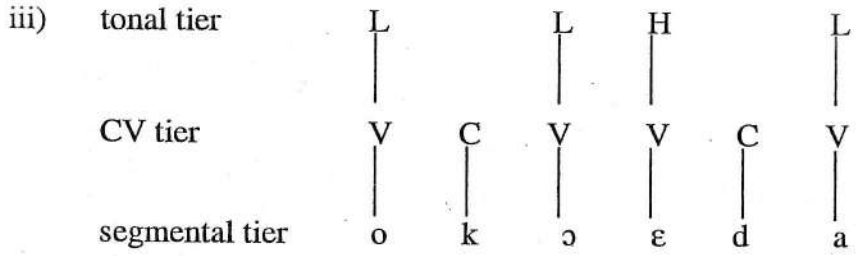
Delete V_1, but do not delete its low tone.

ii) òk` + édà

We are left with an unattached low tone (the tone which is left after the vowel [ɔ] has been deleted). We now need another rule which says that unattached tones must be attached to the nearest vowel. Consider in the light of this that the tone on the prefix vowel of the second noun [ɛ́dà] is high [H] and the unattached tone is low [L]. The combination of the two gives a low tone followed by a high tone [L then H] which is the same as rising (contour) tone.

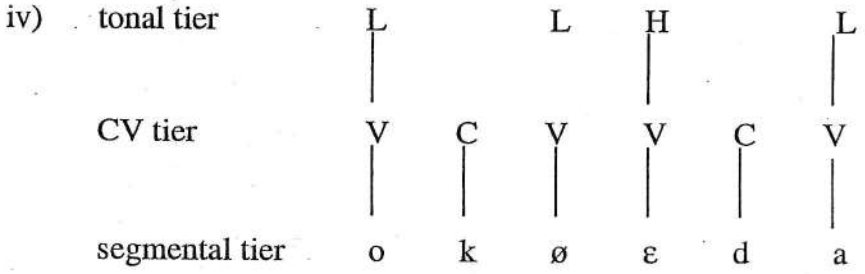
Phonologists would deal with these rule changes in an autosegmental representation in which tones and segments appear on separate levels. For example, the UR for ɔ̀kɔ̀ + ɛ́dà would be

iii)



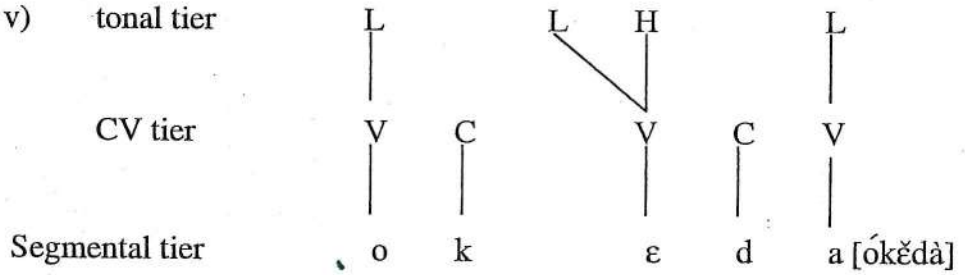
A rule applies to the segmental level to delete the final vowel of the first word when it is followed by another vowel at word boundary:

iv)



We now have a floating low tone which is attached to the nearest vowel:

v)



In other words, we have an LH (= rising) tone attached to vowel [ɛ], that is at word boundary.

Furthermore, these unattached (floating) tones result in various tonal modifications. When V_1 which bears a high tone [H] elides and V_2 which bears a low tone [L] remains, the high tone on the elided V_1 is set afloat and later relinks. This relinking of high tone [H] results in the automatic delinking (and deletion) of low tone. This is so in verb-noun object and demonstrative constructions.

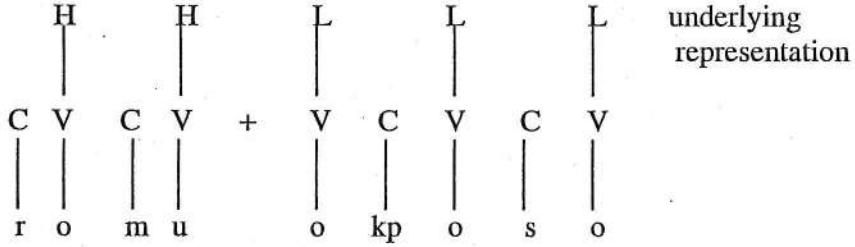
Examples

61. i) rómú + ɔ̀kpɔ̀sɔ̀ → rómókpósɔ̀
H H L L L
'marry' 'woman' 'marry wife'

ii) ɔ̀kpá + ɔ̀nà → ɔ̀ɔ̀kpánà
L H L L
'cock' 'this' 'this cock'

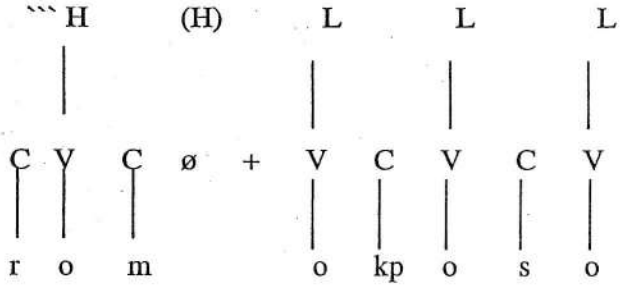
This can be illustrated with the following sample derivations:

iii)

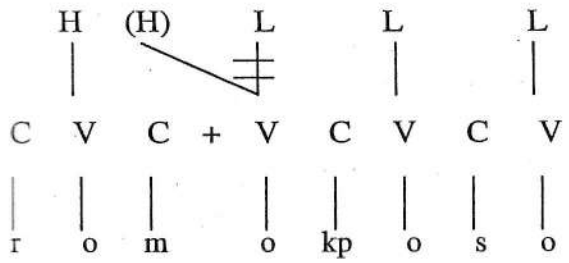


underlying representation

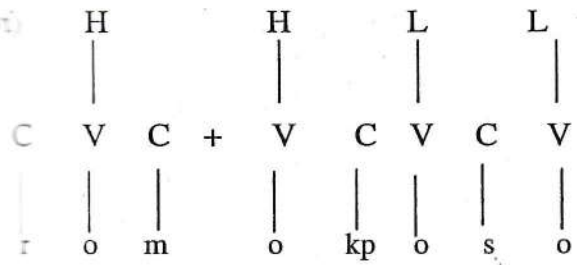
iv)



by vowel elision



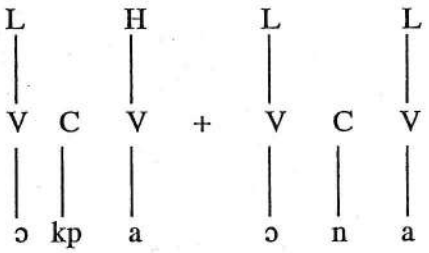
by relinking of (H) and delinking of L



surface representation (following deletion of L)

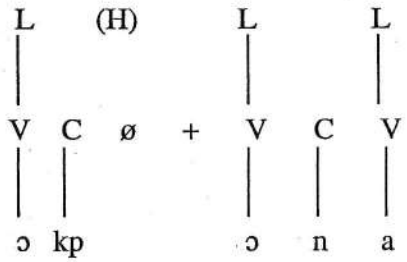
[rómókpòsò]'marry wife'

i)



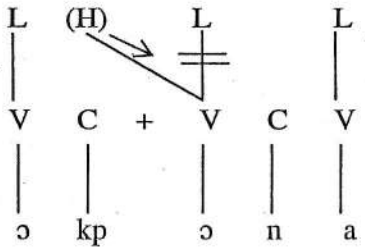
underlying representations

ii)



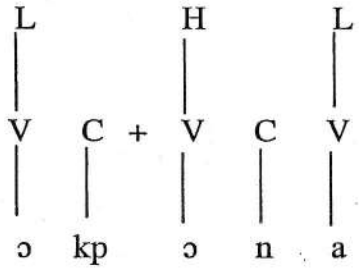
by vowel elision

iii)



by relinking of
(H) and delinking of (L)

iv)



[ɔ̀kpɔ́nã̀] 'This cock'

When at boundaries in the formation of compound words, numeral constructions – noun objects, V_1 and V_2 bear identical tones, there is vacuous relinking (that is, assimilation) thus, no tonal modification occurs.

Examples:

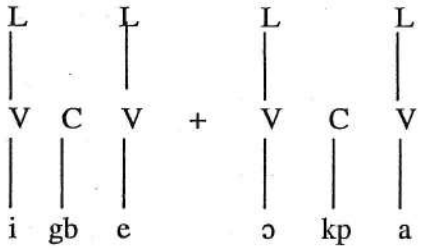
63. i) ɔ̀mɔ̀ + ɔ̀kpɔ̀sɔ̀ → ɔ̀mɔ̀kpɔ̀sɔ̀
L L L L L
'child' 'female' 'female child'

ii) ìgbè + ɔ̀kpà → ìgbɔ̀kpà
L L L L
'ten' 'one' 'eleven'

iii) gbè + ɔ̀fè → gbɔ̀fè
L L L
'kill' 'rat' 'kill rat'

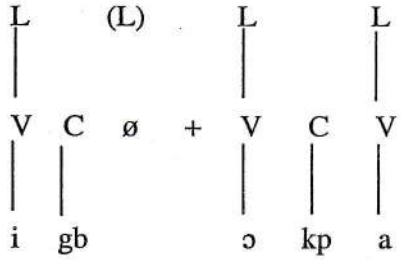
These are some sample derivations of the above:

64.i)



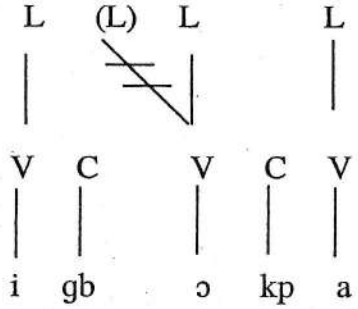
underlying representation

ii)



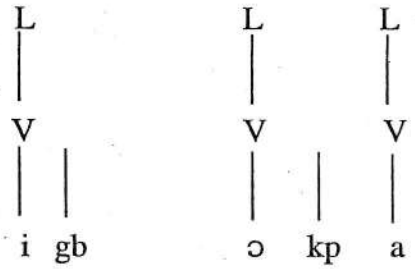
by vowel elision

iii)



by (L) vacuous relinking

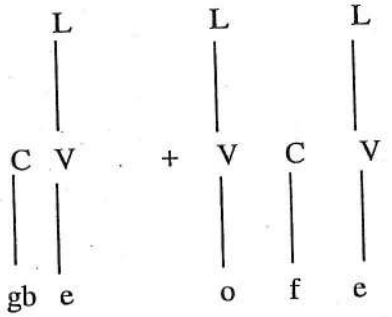
iv)



surface representation

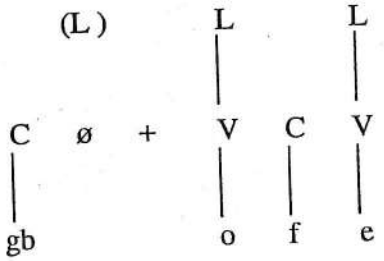
[ìgbɔ̀kpà] 'eleven'

15. i)



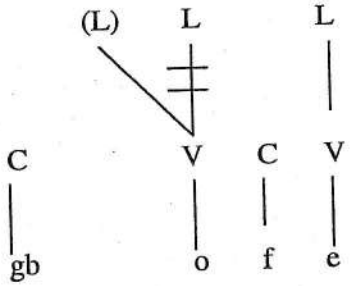
underlying representation

(ii)



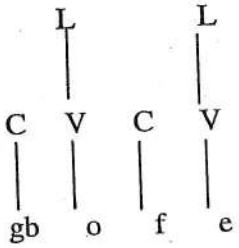
by vowel elision

iii)



by (L) vacuous delinking

(iv)



surface representation

[gbòfè] 'kill rat'

Besides, downstep high tone is created in Ikhin when a low tone vowel (V_1) preceding a high tone vowel is deleted following complete reduplication.

Example:

66. a. i) ɛ́ɣɛ̀ → ɛ́ɣɛ̀ ɛ́ɣɛ̀
'time' 'everytime'
H L H L H L

ii) óɣò → óɣò óɣò
H L H L H L
'day' 'everyday'

Below are sample derivations of the above:

i) H L H L H L by reduplication

V C V → V C V V C V

ɛ ɣ ɛ ɛ ɣ ɛ ɛ ɣ ɛ

time everytime

ii) H (L) H L by vowel elision

V C ø V C V

ɛ ɣ ɛ ɣ ɛ

iii) H (L) !H L by DS insertion

V C ø V C V

ɛ ɣ ɛ ɣ ɛ

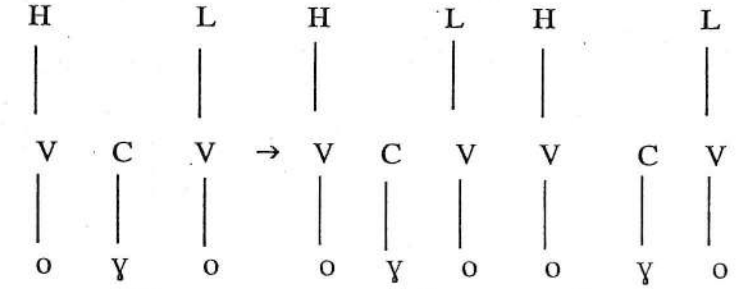
iv) H !H L by floating low tone deletion

V C V C V

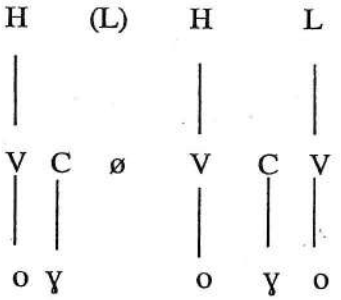
ɛ ɣ ɛ ɣ ɛ [ɛ́!ɣɛ́ɣɛ̀] 'everytime'

[ɛ́ɣ!ɛ́ɣɛ̀] everytime

i)

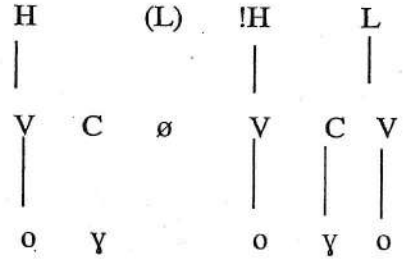


day daily or everyday



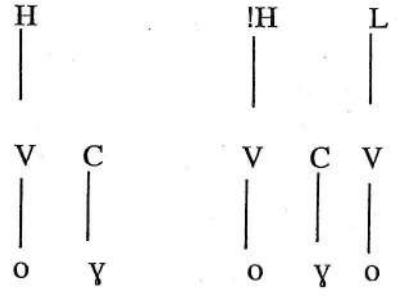
by vowel elision

iii)



by DS insertion

iv)



by floating low tone deletion

[ó!ɣóɣò] 'daily'

4.3 VOWEL INSERTION

Again, depending on the kind of sound that is inserted, we can have consonant or vowel insertion. This is a process that also takes place because in a certain environment, a phonetic sequence is either difficult to pronounce or violate the phonetic rules of the language and then a vowel is introduced to break up the unacceptable consonant clusters while a glide or a consonant can be inserted to separate sequences of vowels that would be difficult to pronounce in succession with hiatus.

Below is the formalised representation of an epenthetic process:

67. ø → **X/A-B**

Vowel insertion is found in the process of nativisation of loan words into languages where clusters are not allowed. This is the case in most Bantu languages (which do not normally allow consonant clusters), as is shown below:
as is shown below:

68. i) terekere < [træktə] 'tractor' (setswana)

ii) sukulu < [skul] 'school' (chichewa)

iii) peteroli < [petrl] 'petrol' (luganda)

iv) isikolo < [skul] 'school' (isizulu)

v) basikeli < [baisikl] 'bicycle' (nyamwezi)

Oyebade (1998) claims that vowel insertion is a very common phenomenon in the loan-word phonology of many African languages. He provides the following examples from Yoruba.

69. a) i) brɛd → búréd̀ì 'bread'

ii) sleit → síléêt̀ì 'slate'

iii) breik → búréêk̀ì 'brake'

iv) bɛlt → bɛ́lîît̀ì 'belt'

v) brʌs → búrɔ́ɔ̀sì 'brush'

b)	i)	krein	→	kérénì	→	'crane'
	ii)	freim	→	férémù	→	'frame'
	ii)	treilə	→	téréla	→	'trailer'
	iii)	frans	→	faransé	→	'france'

With the above examples, he says sometimes Yoruba breaks the cluster by the introduction of an – U-epenthetic vowel, sometimes the cluster is broken with an epenthesis. Then again, under some particular condition, the cluster is broken by a vowel identical to the vowel after the cluster (Oyebade 1998:68). As is shown in the above languages, vowel insertion in Ikhin is triggered by the asymmetry between the morpheme and the syllable structures of Ikhin and English (where the words are borrowed).

In Ikhin, nouns begin with a vowel while this morpheme structure condition is optional in English. Also, consonant cluster is not allowed in Ikhin at the monemic level while English allows sequence of at most four consonants without any intervening vowel. Thus in Ikhin, vowel insertion takes place to break up cluster of consonants for ease of pronunciation and to rectify unacceptable syllable structures represented by words loaned from English.

Prothesis, insertion at the beginning of words, is motivated strictly by morpheme structure considerations while epenthesis insertion elsewhere, is motivated by a violation of syllabic structure (Egbokhare 1990)

4.3.1 The Inserted Vowel

High vowels [i] and [u] are the inserted vowels in Ikhin as is the case in Esan and Emai.

Below are a few examples:

70.	(i)	ìtísà	'teacher'
	(ii)	ìgírêsì	'grace'
	(iii)	ìrélŭwè	'railway'
	(iv)	ìdíráívà	'driver'

(v)	ísìlétì	'slate'
(vi)	ìgàràwà	'pail'
(vii)	ítɛ̀lìfónu	'telephone'
(viii)	átì	'heart'
(ix)	ìkílásì	'class'
(x)	ìtírɛ̂ǹì	'train'
(xi)	ìfírìjì	'fridge'
(xii)	ìgírízì	'grease'
(xiii)	ìsílípà	'slippers'

71.

(i)	ìbúrɛ́dì	'bread'
(ii)	ísíkû	'school'
(iii)	ìbúlṹ	'blue'
(iv)	ìbɔ̂lù	'ball'
(v)	ìʃɔ̂bù	'shop'
(vi)	ìbúlɔ́kù	'block'
(vii)	ìpólù	'pole'
(viii)	ífɔ́kù	'fork'
(ix)	ìkómù	'comb'
(x)	ìkúkù	'cook'
(xi)	itùrɔ́kì	'truck'
(xii)	ìtúrɔ́zà	'trousers'
(xiii)	ífúláwà	'flowers'

The above examples show that [u] is inserted if the vowel of the final syllable of the stem word is back and rounded otherwise [i] is inserted. This process is not limited to Edoid languages alone, it has also been observed in Yoruba (Pulleyblank 1988).

4.4 GLIDE FORMATION

Glide formation is a phonological process that allows a segment to undergo a major class change by changing its major class features. It can occur within as well as across morpheme boundaries: e.g.

Examples:

72a. i. ɔ́pià → ɔ́pjà 'matchet'/ 'cutlass'

ii. áxí àmɛ̀ → áxjâmɛ̀ 'waterpot'

'pot' 'water'

Glide formation and vowel elision complement each other. Glide formation in Ikhin applies within or across morpheme boundaries provided the following conditions are met:

(a) V_1 must be preceded by a consonant. That is, the close vowel (front and back) occurs between a consonant and a non-identical vowel, as in the frames C-V, CV-.

(b) In the vowel sequence, V_1 must be a close vowel (/i/ or /u/) and V_2 a non-identical vowel, provided the word that bears the V_1 has the minimal structure of its lexical category.

Examples:

iii.	fi	èɣò	→	fjèɣò
	'throw'	'money'		'throw money'
iv.	xì	ɔ́bà	→	xjɔ́bà
	'make'	'king'		'become king'

Examples below illustrate the conditions above.

4.4.1 Glide formation across morpheme boundaries

72b.	i)	áxí	àmɛ̀	→	áxjâmɛ̀
		'pot'	'water'		water pot
	ii)	ètò	àgbã̀	→	étwàgbã̀
		'hair'	'jaw'		beard
	iii)	òrú	àmɛ̀	→	òrwâmɛ̀
		'season'	'water'		raining season
	iv)	xì	ɔ́bà	→	xjɔ́ba
		'make'	'king'		become king
	v)	vù	àxí	→	vwáxí
		'cover'	'pot'		cover pot
	vi)	rì	ètò	→	rjètò
		'cut'	'hair'		barb hair
	vii)	mu	amɛ	→	mwámɛ́
		'carry'	'bag'		carry water

viii) fí ɛ̀ɣò → fjɛ̀ɣò

'throw' 'money' 'throw money'

Despite the fact that in (b) above /o/ forms a glide, it still must be raised to /u/ before undergoing the process because the production of glides begins with a close tongue position. What we have discussed here would not happen if the first element is a modifier, usually an article. See section 4.2.1.4.

This glide formation process across morpheme boundaries provides the basis for same process within morphemes as shown below:

4.4.2 Glide Formation within Morpheme Boundaries

73 i) /èkùɔ̃̀/ → [èkwɔ̃̀] 'chin'

ii) /ɛ́kùɛ́/ → [ɛ́kwɛ̌] 'nail' (finger or toe)

iii) /ɔ̀dìɔ̃̀ / → [ɔ̀djɔ̃̀] 'elder'

iv) /úgúà/ → [úgwá] 'bone'

v) /ìgúà/ → [ìgwà] 'knee'

vi) /ísagùɔ̀/ → [ìságwɔ̀] 'groundnut'

vii) /ɛ̀gùɛ̀/ → [ɛ̀gwɛ̀] 'hoe'

viii) /ɔ̀pìà/ → [ɔ̀pjà] 'matchet'

ix) /ògùà/ → [ògwà] 'village'

x) /ɛ̀xàí/ → [ɛ̀xàj] 'fore head'

xi) /míɛ̀/ → [mjɛ́] 'lie down'

In all of the examples above, it has only been monosyllabic and disyllabic verb and noun structures respectively that have been conditioning glide formation. This implies that disyllabic verbs and trisyllablic nouns do not conditon glide formation as shown below:

74.

	Input			output
i)	rómú 'lose'	òkpòso 'woman'	→	rómópòso 'lose wife'
ii)	ìkùkù 'rubbish heap'	èrɯ̃̀ 'yam'	→	ìkùkèrɯ̃̀ 'yam peeling'

	'rubbish heap'	'yam'		'yam peeling'
iii)	óxùrù	ágbèdè	→	óxùrágbèdè
	'thread'	'needle'		'needle's thread'

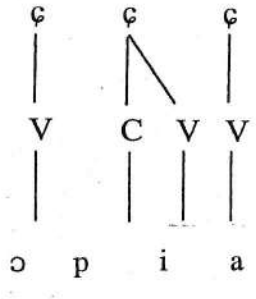
In the above examples, elision of V_1 rather than glide formation occurs. Also, glide formation does not apply in Noun + qualifier and noun + Associative marker sequences, rather elision of V_2 occurs because the concord prefixes of the qualifier and the associative marker which are V_2 at boundary are redundant. Examples illustrating this process are shown below:

75.	i)	ódí	ɔ̀nà	→	ódínà
		'wall'	'this'		'this wall'
	ii)	íkpã̀mì	ènì	→	íkpã̀mì̀ni
		'seed'	'those		'those seeds'
	iii)	ákì	ɔ̀nì	→	ákìní
		'market'	'that'		'that market'
	iv)	ákà	ísì ɔ̀bà	→	ákásɔ̀bà
		basket	'cm' king		'king's basket'
	v)	áwà	ísì òxwà	→	áwá sòxwà
		'dog'	cm hunter		'hunter's dog

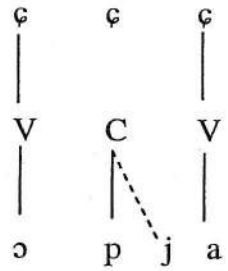
Our account of glide formation can be formalised thus:

Example:

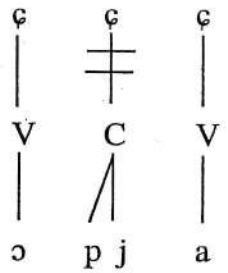
76a. i)



underlying form

ii) 

glide formation

iii) 

-resyllabification and delinking of syllable node

iv) 

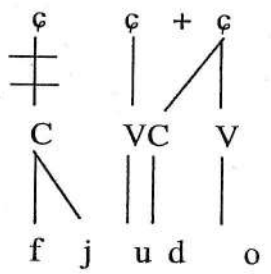
phonetic form [ɔ̀pjà] 'matchet'

76b. i) 

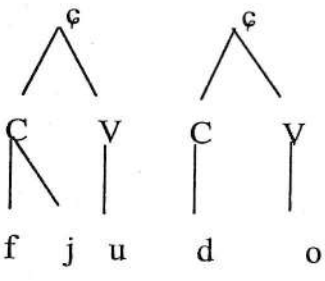
underlying form

ii) 

glide formation

iii) 

resyllabification and delinking of syllable node

iv) 

phonetic form [fjùdò] 'throw stone'

4.5 Assimilatory Processes

A phonological phenomenon is described as conditioned if it occurs whenever a certain definable condition is obtained. The idea is not that the condition necessarily causes the phenomenon but they occur together in such a way that one can be predicted from the other. In other words, when morphemes are combined to form words, the segments of neighbouring morphemes become juxtaposed and sometimes undergo change. Other changes include those that occur at word intial, word final, intervocalic positions e.t.c. these changes that take place on segments are called phonological processes which are of two types; assimilatory and non-assimilatory processes.

4.5.1 Assimilation

The non-assimilatory processes are referred to as syllable structure processes, while the assimilatory processes are called euphomic processes because they make pronunciation easier or pleasing to the ear. (Oyebade 1998). Assimilatory processes are the most natural types of phonological processes. Assimilation takes place when segments take on features from neighbouring segments.

Examples:

77a. sì + ɔ́ → sjɔ → ʃɔ̌

'pull' 'it' 'pull it'

In the above example, after assimilating the palatal feature, the palatal glide is deleted.

4.5.2 Vowel Assimilation

Vowel assimilation takes place in Ikhin when two vowels are placed side by side at morpheme or word boundary so that one of the vowels takes on features from the other. It refers to the influence exercised by one vowel on the articulation of the other, in such a way that the assimilated vowel segment becomes more alike.

This vowel assimilatory process is a complete type because a vowel assimilates all the features of the adjacent vowel. In Ikhin, a vowel becomes more like a following vowel, thus making the assimilation regressive as in the following numeral reduplication examples:

4.5.2.1 Numeral reduplication

78. i) /ɔ̀kpà/ # /ɔ̀kpà/ → [ɔ̀kpɔ́ɔ̀kpà] a → ɔ / -# ɔ
'one' 'one' 'one by one'

ii) èvà # èvà → [èvèèvà] a → e / - #e
'two' 'two' 'two by two'

iii) /èhà/ # èhà → [éhèéhà] a → e / #e
'three' 'three' 'three by three'

iv) /ìgbè/ # ìgbè → [ìgbììgbè] e → i/ # i
'ten' 'ten' 'ten by ten'

v) ùkpè # ùkpè → [ùkpùùkpè] e → u / #u
'year' 'year' 'yearly'

4.5.2.2 Verb- numeral construction

vi) /dɛ̀/ # / ígbè/ → [dìígbè]
'buy' 'ten' 'buy ten'

vii) /dɛ̀/ # /ènɛ̃̀/ → [dèénɛ̃̀]
'buy' 'four' 'buy four'

viii) /dɛ̀/ # /ɛ́là/ → [dɛ̀ɛ́là]
'buy' 'cow' 'buy a cow'

ix) /dɛ̀/ # /ákà/ → [dà̀áka]
'buy' 'basket' 'buy a basket'

x) /fì/ # /ákà/ → [fjà̀ákà]
'throw' 'basket' 'throw a basket'

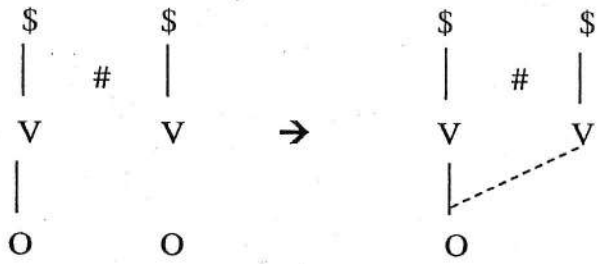
xi) /fì/ # /úkò/ → [fù̀úko]
'throw' 'container' 'throw a container'

xii) /fì/ # /ígbè/ → [fìígbe]
'throw' 'ten' 'throw ten'

Notes: # stands for morpheme boundary.

Vowel assimilation can be formalised with the following derivation:

Fig. 14 a) Input



The above shows that total assimilation turns two segments into one.

4.6 NASALISATION

The typical Edoid language is rich in nasals. In some of these languages it is usually the case that these are seen as allophones of non-nasal phonemes (Elugbe 1986). This implies that such nasal sounds (apart from nasal consonants) are derived from their respective oral counter parts when they occur in the environment of nasalisation.As earlier postulated that Ikhin has twelve vowels made up of seven oral vowels and five phonemic nasal vowels, we are now faced with the analysis of consonant and vowel nasalisation.

4.6.1 Consonant Nasalisation

The phonemic nasal vowels in Ikhin are /ĩ/,/ɛ̃/, /ã/, /ũ/ and /ɔ̃/. When consonants occur in their environment they become nasalised. Specifically, these consonants are nasalised when they occur before the nasal vowels as in the following examples:

79. i) /òrã̀/ → [oɾ̃ã̀] 'tree'

ii) /ɛ̀wɛ̃̀/ → [ɛ̀ŋwɛ̃] 'ashes'

Within our adopted framework, nasality occurs on an autosegmental tier.

A lexical item is either marked positive for nasality or it is without underlying nasal specification. Nasality is linked to a segment only through association in a phonological representation, thus making it autonomous, that is, independent of the segment bearing it.

In autosegmental phonology, nasality either spreads on neighbouring segments or remains stable even in the absence of the segment to which it is linked when the segment elides or undergoes certain phonological processes. In accounting for nasality in this way, Nasality Bearing Unit (NBU) has been proposed. Thus NBU in the underlying representation can be said to be the final vowel segment in the stem. This indicates that the autosegment is mapped on to only a V slot on the CV tier. The slot will then be on a nasal vowel in the underlying representation. In this proposal, all the nasalised segments within a stem are derived from the spreading of the nasal autosegment. Spreading here is from right to left.

Examples:

iii) /àjũ̀/ → [àɲũ̀] 'wine'

iv) /òkũ̀/ → [òk̃ũ] 'sea'

v) /ɔ́rã̀/ → [ɔ́ɾ̃ã̀] 'blood'

vi) /ɛ̀rã̀/ → [ɛ̀ɾ̃ã̀] 'meat'

vii) /ùrũ̀/ → [ùɾ̃ũ̀] 'tail'

Most consonants in Ikhin are nasalized or slightly nasalized when they occur before significant nasal vowels. Consonants such as bilabial approximants, glottal

approximants and alveolar taps are also nasalised before nasal vowels, as shown below:

viii) /úɣúãβã/ → [úŋwãβã] 'axe'

ix) /íɾ̃ɾ̃íβorã/ → [íɾ̃ɾ̃íβorã] 'root of tree'

x) /íhĩ/ → [íhĩ]

The above attest to the claim that Ikhin has nasalised consonants. A nasalised consonant refers to a consonant which though normally oral in a language, was being articulated in a nasal manner because of some adjacent nasal sound..

A sample derivation of the above examples is presented below:

80. i) Nasality tier — N — underlying form

CV tier — V C V

Segmental tier — a j u

ii) Nasality tier — N — nasality (leftward) spreading

CV tier — V C V

Segmental — a ɲ u

iii) Nasality tier — N — surface form

CV tier — V C V

Segmental — a ɲ u [ãɲũ] 'wine'

4.6.2 Vowel nasalisation

The seven oral and five nasal vowels in Ikhin are shown in the following tables.

Fig. 15

(i) Oral vowels

i		u
e		o
ɛ		ɔ
	a	

Fig. 16

(ii) Nasal vowels

ĩ		ũ
ɛ̃		ɔ̃
	ã	

In table (ii) above there are no half close nasal vowel phonemes (i.e. */ẽ / and */õ/). Each of the vowels in the two tables is a phoneme in Ikhin. It has been observed that most Edoid languages with seven vowel system used to have a ten vowel system (postulated for proto Edoid) which is now reduced to seven vowel system (Elugbe 1989).

He states that the ten vowels of proto-Edoid fall into two harmony sets as shown in the following table:

Fig. 17

(iii) Expanded Pharynx (+Exp) non-expanded Pharynx [-Exp]

i	u	ɪ	u
e	o	ɛ	ɔ
ə		a	

He points out that only Degema, a Delta Edoid language is known to have contrasts involving all ten vowels as most of them (Edoid language) have reduced the original ten vowels in either of the following ways:

(a) In the nine-vowel system, there is no /ə/

(b) In the eight vowel system, there are no /ə/ and /ɪ/

(c) In the seven-vowel system, there are no /ə/, /ɪ/ and /ʊ/.

Ikhin subscribes to (c) because there are no /ə/, /ɪ/ and /ʊ/.

The language displays a number of nasal sounds at the phonetic level. Each of the seven oral vowels in Ikhin may be phonetically nasalised if it occurs after nasal consonants [m] or [n]. Spreading here is from left to right. The NBU is a C.

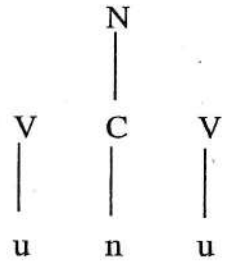
Examples:

81.	i)	/ɔ̀mɔ́hè/	→	[ɔ̀mɔ̃́hè]	'man'
	ii)	/ùnù/	→	[ùnũ̀]	'mouth'
	iii)	/àmɛ̀/	→	[àmɛ̃̀]	'water'
	iv)	/èmhì/	→	[èmhĩ̀]	'thing'

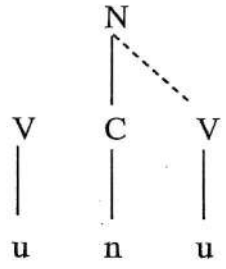
As is the case in the consonant nasalisation, a way of accounting for this process in our framework is to propose once again, that the NBU is either a voiced alveolar nasal consonant /n/ or a voiced bilabial nasal consonant /m/ within a stem. This is mapped on to a slot on the CV tier and the slot is either [n], [n̩] or [m]. Spreading is from left to right.

The derivation is presented below:

82. i) Nasality tier — underlying form



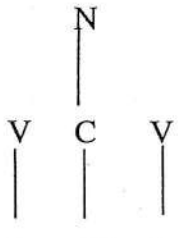
ii) -naslity (rightward) spreading



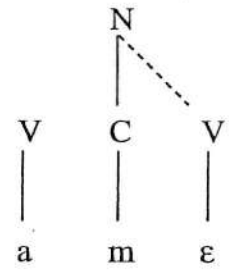
iii) surace form

[ún$\tilde{u}$] 'mouth'

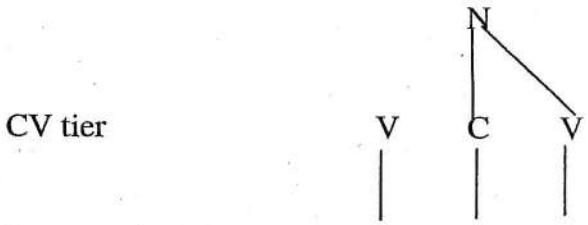
83. i) Nasality — underlying form



ii) nasality (rightward spreading)



iii) -surface form



The above show that oral vowels are nasalised after nasal consonants such as [n] and [m]. Also at morpheme boundary, spreading mode is from left to right.when a nasal vowel of monosyllabic verbs elides, nasality relinks to the adjacent vowel across morpheme boundary. This is a demonstration of the stability of nasality in autosegmental framework.

Examples:

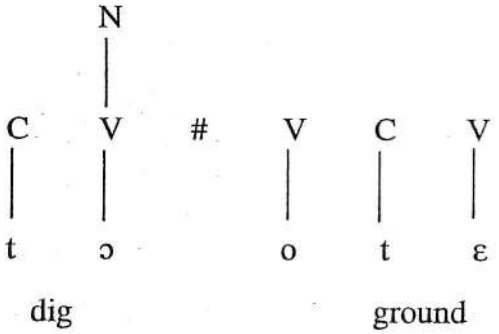
84. a i) jã̀ + èrũ̀ → ɲẽrũ̀
cook yam cook yam

ii) tɔ̃̀ + òtɛ̀ → tɔ̃̀tɛ̀
dig ground 'dig ground'

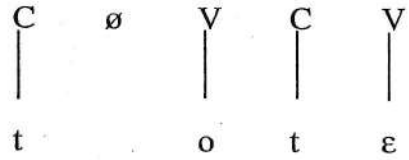
iii) tʃɛ̃̀ òkpòsò → tʃɔ̃̀kpòsò
'refuse' 'woman' 'refuse woman'

The above is derived below

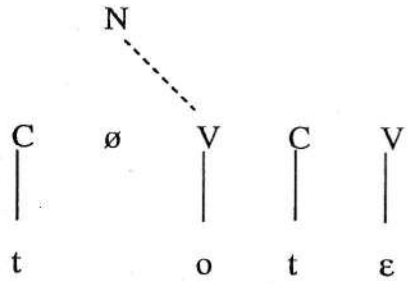
b i)



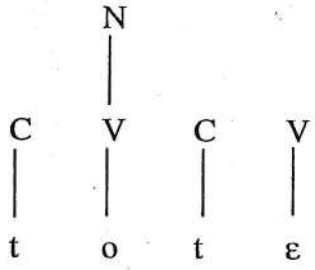
ii) N — by vowel elision



iii) N — nasality (right ward)



iv) N — surface form



[tõtɛ̀] 'dig ground'

CHAPTER FIVE

PHONOLOGY AND MORPHOLOGY

5.0 INTRODUCTION

In this chapter, we want to discuss morphological alternations and their implications for phonology.

Normally, a sentence is made up of phrases, phrases are made up of words, while words are made up of morphemes. Morphology is a sub-discipline of linguistics that studies word structure. While morphemes are generally accepted as being the smallest units of syntax, it is clear that in most (if not all) languages, words can be related to other words by rules. For examples, speakers of English recognize that the words dog, dogs and dog – catcher are closely related English speakers recognize these relations by virtue of the unconscious linguistic knowledge they have of the rules of word formation processes in English. Therefore, these speakers intuit that dog is dogs just as cat is cats. Similarly, dog is to dog-catcher as dish is to dishwasher.

The rules comprehended by the speaker in each case reflect specific patterns (or regularities) in the way words are formed from smaller units and how these smaller units interact in speech. In this way, morphology is the branch of linguistics that studies such patterns (as dog plus plural is dogs, box plus plural is boxes, cat plus plural is cats, case plus plural is cases and also to form like cook, cooking, cooked, flug, flugging, flugged, want, wanting, wanted) of word formation across and within languages, and attempts to explicate formal rules reflective of the knowledge of the speakers of those languages.

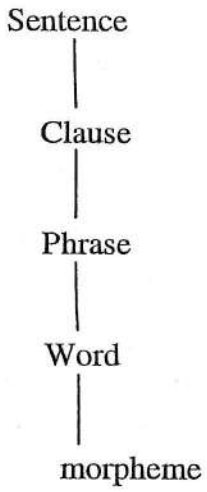
Granted that some elementary concepts (such as morphemes, morphs, allomorphs, affixes etc.) in morphology can be understood quite adequately without any real reference to the other aspects of linguistics, it is however, rare to grasp the full implications of contemporary research in morphology without a requisite knowledge in phonology and syntax.

Egbokhare (1990:74) refers to morphology as a lower-level syntax "because both syntax and morphology involve syntagmatic relations of some kind". Syntax has as its frame of reference the sentence as a unit of relationship involving words.

Morphology on the other hand has as its frame of reference the word as a unit of organization involving morphemes.

The grammatical description of any language can be schematized as below:

Fig.18



Such grammatical description is always in ascending order, that is, from morphemes, words etc. Morphemes are themselves short sequences of phonemes, thus it is important to begin from a phonological description (phonemes) to a morphological description (morphemes / words).

Words and their internal structure will be given attention in this chapter, thus the following categories in Ikhin are recognized; nouns, verbs and its complements, modifiers. Morphology is concerned with the internal structure of words, and how words can be formed. It is usual to recognize three different word formation processes.

1) Inflectional processes, by means of which a word is derived from another word form, acquiring certain grammatical features but maintaining the same part of speech or category (e.g. walk, walks)

2) Derivational processes in which a word of a different category is derived from another word or word stem by the application of some process (e.g. grammar => grammatical, grammatical => grammaticality).

Compounding, in which independent words come together in some way to form a new unit (buttonhole).

Examples of derivational affixes can be found in the derivation of nouns and gerundive nominals from verbs.

Fig. 19

Affix	CHANGE	EXAMPLES	GLOSS
e-	verb to noun	vùjɛ̀/ évùjɛ̀	Open/Opening
e-	verb to noun	kɛ́/ ékɛ̀	Divide/Division
e-	verb to noun	jà̀ / èjà̀	Drink/Drinking
o-	verb to noun	jɛ̀ / òjɛ̀	Laugh/laughing

5.1 Noun structure

In Edoid languages "most roots (verb or noun) are monosyllabic, consisting in CV". (Westernmann and Bryan 1952). The prevalence of second syllables in stems and the use of noun prefixes and concord prefixes lend a complexity of morphology to the Edoid languages of a kind not frequently associated with 'Kwa' languages. (Elugbe 1976). In all branches of the Niger-Kordofanian language family, with the exception of mande, it is typical that a noun in its simplest form can be analysed as consisting of the stem and an affix. (Welmers 1973)

Egbokhare (1990) claims that "in a number of West African languages, such affixes are prefixes which distinguish number". Thus Ikhin also has affixes which are noun prefixes.

5.2 Number

In Ikhin, majority of the nouns are inflected for number by means of prefix vowel alternation. Thus, the difference between the singular and plural forms is marked by a difference in the prefixes the nouns take.

For example:

85(a)	i)	ò-bò	'native doctor'	è-bò	'native doctors'
	ii)	ù-gbà̀	'thorn'	i-gbà̀	'thorns'

A look at the singular-plural pairs shows that the following pairs exist:

85(b) u/i
o/i
ɛ/i
a/i
o/e
ɔ/e
ɛ/e

On the basis of the above, we can say that the plural morphemes are /i/ and /e/ and that others are singular morphemes.

These patterns do not reveal a purely phonologically determined number system. For example, we have ɛ/i, o/i and then ɛ/e, o/e. there is, therefore, no way of phonologically explaining this class pairing. It is not possible to say that non-low vowel attracts [i] and low vowel attracts [e]. It must be assumed, therefore, that this is an evidence of a richer noun classification system of an earlier stage in the history of the language. Nonetheless, it seems obvious that we can say there were two alternants of the plural morphemes [i] and [e] which may be reflexes of an earlier i/e.

We know, of course, that proto-Edoid [*e] became [e] in all environments in North Central Edoid (Elugbe 1989). Other North Central Edoid languages include Edo (Bini), Esan, Yekhee (Etsako), Emai and Ghotuo. Typical singular – plural pairings are exemplified in the examples below.

		SINGULAR	PLURAL
85(c)	i)	o-rà 'tree'	è-rã̀ 'trees'
	ii)	ò-bò 'native doctor'	è-bò 'native doctors'
	iii)	ù-gbã̀ 'thorn'	i-gbã̀ 'thorns'
	iv)	ɛ̀-wè 'goat'	è-wè 'goats'
	v)	ò-kɔ̀ 'mortar'	è-kɔ́ 'mortars'
	vi)	ò-kpòsò 'female'	ì-kpòsò 'females'
	vii)	ɔ̀-mɔ̃̀hè 'boy'	ì-mɔ̃̀hè 'boy'

However, there are also nouns which are not inflected for number but in constant forms. These have the same vowel prefix in their singular and plural forms:

viii) ú-só 'head'
ix) à-kɔ̃̀ 'teeth'
x) ì-bùbù 'dust'
xi) ì-kè 'back'
xii) ɛ̀-ò 'eye'

Thus, each noun class set up here includes the singular and plural prefix pair of each noun. Vowel harmony is not a prominent feature in Ikhin. However, vestiges of harmony are observed in the patterning of vowels in nouns and in the way vowels alternate in prefixes during plural formation as shown in the following paired classes.

5.2.1 Singular/Plural classes

CLASS 1: u- / i-

86. Parts of the body

a) i) ̀- kò 'stomach (intestine)'

ii) ̀- gwà 'knee'

Man made objects:

b) i) ̀- kpò 'cloth'

ii) ́- ɣòɣò 'door way'

iii) ̀- íkhũ̀ 'medicine'

Animals and animal parts:

c) i) ̀- kɔ̀ 'he-goat'

ii) ̀- ɣù 'vulture'

Plants and parts of plants:

d) i) ̀- ságùɔ̀ 'groundnut'

ii) ́- kpá 'seed'

Insects

e) ̀- sù 'Mosquito'

Natural Phenomenon

f) ̀- kì 'Moon'

CLASS 2: a- /i-

Plants and parts of plants

i) ̀- sìè 'Pepper'

ii) ̀- tábà 'Tobacco'

Parts of body:

h) ̀- tìkpóhò 'Buttocks'

Man made objects:

i) ̀- ɣàì 'Knife'

CLASS 3: ɛ- /i-

Man made object:

j) ̀- kpà 'bag'

Abstract:

k) – yɛ̀ɛ̀ 'lie'

CLASS 4: ɔ –/ e–

People:

l) i) ̀- mɔ́hè 'Man'

ii) ̀- rùa 'In-law'

iii) ̀- sè 'Friend'

iv) ̀- rè 'Guest'

Part of plants:

m) i) ̀- gɛ̀dɛ̀ 'plantain'

ii) ̀- mɔ̀ká 'Orange'

Man made objects:

n) i) ́- pìà 'Machet'

ii) ̀- xɔ̀rɔ̀ 'Mud'

CLASS 5: o- / i

People :

o) i) ̀- kpòsò 'Female'

ii) ̀- ɣ̀i 'Thief'

Man made objects:

p) - dí 'Wall of house'

CLASS 6: ɛ- /e

Animals:

q) i) ̀- la 'Cow'

ii) ́- ʃɛ̀ 'Snake'

Natural Phenomenon:

r) ̀- dà 'River'

Man made objects:

s) ́- gùɛ̀ 'hoe'

CLASS 7: o- /e-

Man made objects:

t) i) - gùà 'farm implement'

ii) ̀- hìsà 'broom'

Animal and animal parts:

u) i) - fè 'rat'

ii) ̀- xùà 'horn'

Plant:

v) i) ̀- rā̀ 'tree'

ii) ̀- bè 'leaf'

5.2.2 Single class

The single classes are each identified by single unpaired prefixes. They contain mass, abstract and some countable nouns which are pluralised through the addition of number.

87. a. i) /úsó/ + /evà/

'head' 'two'

ii) /úsóevà/ 'two heads'

Those nouns that refer to parts of the body, parts of the plants, animals, man made objects are countable, while mass nouns, abstract nouns, the nouns which refer to the natural phenomena group are uncountable. Some of these fall within the group called 'others'.

CLASS 8: u-

Parts of body:

b. i) ˋ- sóˊ 'head'

ii) ˋ- nù 'mouth'

CLASS 9: i-

Parts of body:

c) i) ˋ- gwè 'nose'

ii) ˋ- xɛ̀rɛ̀ 'penis'

Man made objects:

d) ˋ̃ bàtà 'shoe'

OTHERS:

e) i) ˋ- tã̀ 'story'

ii) ˋ- ɣ̀i 'guinea corn'

iii) ˋ- rà 'father'

iv) ˋ- kpɛ̀kpɛ́yɛ̀ 'duck'

v) ˋ- sɔ̀ 'feaces'

CLASS 10: o-

Natural Phenomena:

f. i) ˋ- kũ̀ 'sea'

ii) ˋ- óɣò 'day'

Abstract:

g. - sà 'hunger'

Parts of body:

h. ˋ- bɔ̀ 'arm'

CLASS 11: e-

Man made objects:

i. i) ˋ- gùà 'village'

ii) ˊˋ ɣòɣò 'road'

Others:

j. i) ˊˋ rà 'name'

ii) ˋ- gbè 'body'

CLASS 12: a-

Parts of body:

k. i) ˋ- gbã̀ 'jaw'

CLASS 13: ee-

Others:

l. i) - nɛ̀ 'four'

CLASS 14: ɔ -

Seasons:

m. i) ˋ- rùámɛ̀ 'rainy season'

ii) - wòvɔ 'dry season' vɔ̃

CLASS 15: oi-

Others:

n. ˋ- hi 'fear'

5.3 COMPOUND NOUNS

A good number of these polysyllabic (trisyllabic) nouns are derived. Each of these nouns whether derived or not has initial vowel which is historically a class marker.

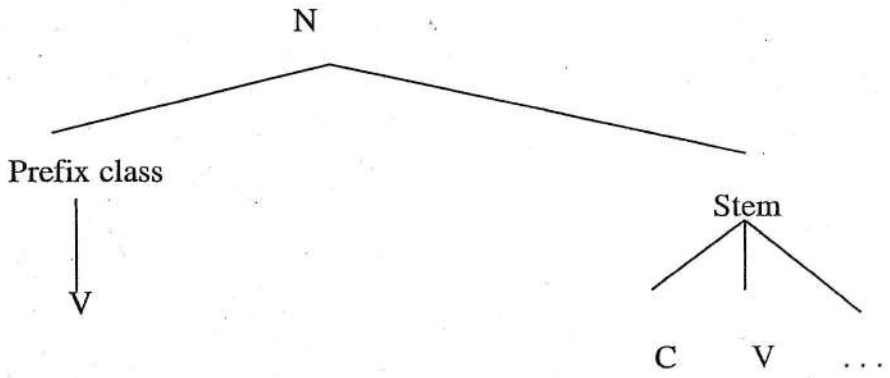
88. i) /étùàgbã̀/ < é + tù + à-gbã̀
'bear' np + hair + jaw

ii) /ókɔ̀ɛ̀dà/ < ó + kɔ̀ + ɛ̀-dà
'canoe' np + motor + river

iii) /òsàmɛ̀/ < ò + sà + à-mɛ̀
'thirst' np + hunger + water

iv) /ɛ̀rã̀mɛ̀dà/ < ɛ̀ + rã̀ + àmɛ̀ + ɛ̀-dà
'crocodile' np + animal + water +river

Based on the above, noun structure may be represented with the following diagram: Fig.20



5.4 AGENTIVE NOUNS

A noun in Ikhin (most nouns are formed from verb stems) is usually of v – c v structure (the hyphen separates the prefix from the stem). Polysyllabic nouns are of the structure v – c v c v. While verbs have initial consonants, nouns on the other hand, have initial vowels. A few of these nouns are derived from the verbs by prefixing vowels to the verb stems.

Examples:

	VERB	prefix	+ stem	+concord	prefix + verb	AGENTIVE–Nominal
89.	i) dɛ̀ 'buy'	ɔ-	li	ɔ	-dɛ̀	ɔ́lɔ̀dɛ̀ 'buyer'
	ii) kíɛ̀ 'sell'	ɔ-	li	ɔ	-kíɛ̀	ɔ́lɔ́kjɛ̂ 'sellers'
	iii) gbè 'kill'	ɔ-	li	ɔ	-gbe	ɔ́lɔ̀gbè 'killer'
	iv) zɔ̀ 'build'	ɔ-	li	ɔ	-zɔ̀	ɔ́lɔ̀zɔ̀ 'builder'
	v) xà 'teach'	ɔ-	li	ɔ	-xà	ɔ́lɔxà 'teacher'

The above involve the deletion of the vowel of the agentive stem.

5.5 PERSONAL PRONOUNS

In traditional grammar, a pronoun is seen as functioning as a substitute for a noun in discourse. According to Egbokhare, (1990), an adequate description of the pronominal system of a language entails a specification of the forms which are realized in various environments and where necessary a specification of their relationship. The pronoun in Ikhin is a nominal which can be inflected both for person and number.

The following is the paradigm of the subject pronominal:

			Singular	Plural
90.	i.	Ist person	mɛ́mɛ́ 'I'	mámá 'we'
	ii.	2nd person	wɛ́wɛ́ 'you'	wáwá 'you'
	iii.	3rd person	ɔ́rɛ́ 'he/she/it	éré 'they'

The above paradigm reveals that the subject pronominals are inflected both for person and number.

Examples:

iv.	mìmɛ rɛ́ ɔ̀kpòso	I have a wife
v.	wɛ̀ rɛ́ ɔ̀kpòsò	You have a wife
vi.	ɔ̀rɛ rɛ́ ɔ̀kpòsò	He has a wife
vii.	mà rɛ̀ íkpòsò	We have wives

viii. wà rɛ́ íkpòsò — You(plural) have wives

ix. èrè rɛ́ íkpòsò — They have wives

On the other hand, the pronominals have the following paradigm when functioning as object.

		Singular		Plural	
x.	Ist person	mímɛ́	'me'	mímá	'us/our'
xi.	2nd person	wɛ́wɛ́	'you'	wáwá	'you/your'
xii.	3rd person	ɔ̀sɔ̀	'him/his	è!è	'them/their'

Examples:

Objects

xiii. ɔ́ fì mɛ̀ èmì — He beat me

xiv. ɔ́ fì wɛ — He beat you

xv. mí fì ɔ̀sɔ̀ — I beat him

xvi. ɔ́ fí èmì — He beat us

xvii. òbè nî isé érɔ̀ — The book is their own

On the contrary, the above show that the morphological shape of the second person remains constant in both the subject and the object positions. This is an exception which is not unusual as the same is found in English language where the second person pronoun 'you' has the same morphological shape in every environment it occurs.

5.6 NUMERALS

Numerals are made up of prefixes and stems. The numeral forms from one to ten are simple forms while those from twelve upwards are compounds of one kind or the other:

Examples:

91. i) /ɔ̀kpà/ 'one'
ii) /èvà/ 'two'
iii) /èhà/ 'three'
iv) /ènɛ̀/ 'four'
v) /íkhè/ 'five'
vi) /éhà/ 'six'
v) /ɪ̀khirà/ 'seven'
vi) /inɛ̀nɛ̀/ 'eight'
vii) /itʃírí/ 'nine'
x) /ɪ̀gbè/ 'ten'

The numeral forms from twelve to fifteen (12-15) are formed by the addition of the Ikhin word for ten /igbè/ to the simple form for one through five which are listed above thus making them derived compound forms.

Examples:

92. i) /ɪ̀gbè/ + /èvà/ ìgbéévá → [ìgbéva]
'two' 'twelve'
ii) /ɪ̀gbè/ + /éhà/ ígbééhà → [ìgběhà]
'three' 'thirteen'
iii) /ɪ̀gbè/ /énɛ̀/ ìgbéénɛ̀ → [ìgbénɛ̀]
'four' 'fourteen'
iv) /ɪ̀gbè/ + /ɪ̀khɛ̀/ ígbéìkhè → [ìgbíkhè]
'five' 'fifteen'

However, numeral forms from sixteen to nineteen (16-19) are exceptions to this derivational process, as shown below:

v) kɔ̀íhínhɔ́sùe 'sixteen'

vi) kɔ̀íháhsùè 'seventeen'

vii) kɔ̀íváhɔ̀sùè 'eighteen'

viii) kɔ̀kpáhɔ́sùe 'nineteen'

Note that the form for eleven is not described because it also does not have similar relationship with others. For instance, the form for eleven is /ígbéùɔ́/. If we say that /igbè/ means 'ten', then to what numeral form or number do we want to assign /u/ ?.

This also constitutes an exception. The numeral form for twenty is /ègbɔ̀/ while the numeral forms for forty, sixty, eighty etc. are formed by multiplication, which involves suffixing the basic numerals to the form for twenty.

ix) /ègbɔ̀/ + /èvà/ → ègbɔ̀và → [ègbèvà]
twenty two 'forty'

x) /ègbɔ̀/ + /éhà/ → ègbɔ́éhà → [ègběhà]
twenty three 'sixty'

xi) /ègbɔ̀/ + /énɛ̃́/ → ègbɔ̀énɛ̃́ → [ègbénɛ̃́]
twenty four eighty

5.7 THE DETERMINERS

Noun phrases consist of a head noun and various sorts of modifiers. The modifiers that will be primarily discussed here are the determiners, a class of modifiers that includes the articles 'ɔ̀-li', demonstratives 'ɔ̀-nī', ɔ-na, è-nà, è-nì and possessive 'mɛ̀', 'mà' etc

In Ikhin, the semantic distinction between definite and indefinite articles is not marked overtly in any obvious way as it is in English by contrasting 'a' and 'the' rather both are presented as /ɔ-li/ in Ikhin.

5.7.1 Article:

Examples: Singular

		prefix	stem			noun
93.	i)	ɔ	li	òɛ̀ 'leg'	→	ɔ̀loɛ̂ 'the leg'
	ii)	ɔ	li	ɔ́bò 'doctor'	→	ɔ́lɔ́bò 'the doctor'
	iii)	ɔ	li	ɔ̀kpòsò 'woman'	→	ɔ̀lɔ́kpòsò 'the woman'
	iv)	ɔ	li	ɛ̀wè 'goat'	→	ɔ́lɛ̀wè 'the goat'

Plural

	prefix	stem	Noun		
v)	e	li	òɛ 'leg'	→	èleɛ̂ 'the legs'
vi)	e	li	ɔ́bo 'doctor'	→	élébò 'the doctors'
vii)	e	li	ɔ̀kpòsò 'woman'	→	èlékpòsò 'the women'
viii)	e	li	ɛ̀wè 'goat'	→	élɛ̀wè 'the goats'

5.7.2 Demonstrative

The demonstratives are modifiers that can be used in pointing things out such as 'this' /ɔna/ and that /ɔni/, and as a result of their meaning, demonstratives are always definite and they are post modifiers, occuring after the headnouns. In using these demonstatives, Ikhin distinguishes between near /ɔ̀nà/ 'this' and far /ɔ̀nĩ̀/ 'that'. This can be looked at from the point of view of the speaker and the hearer.

Example: Singular

		Noun	Prefix	Stem		
94.	i)	ɔ̀ɛ	ɔ-	nã̀	→	ɔ̀ɛ́nã́
		'leg'				'this leg'
	ii)	ɔ̀ɛ̀	ɔ-	nĩ̀	→	ɔ̀ɛ́nĩ́
		'leg'				'that leg'

Plural

	iii)	àɛ̀	e-	nã̀	→	àɛ́nã́
		'legs'				'these leg'
	iv)	àɛ̀	e-	nĩ̀	→	àɛ́nĩ́
		'legs'				'those legs'

other examples are:

v)	ɔ̀bónã̀	'this doctor'
vi)	èbónã̀	'these doctors'
vii)	ɔ̀bónĩ̀	'that doctor'
viii)	èbónĩ̀	'those doctors'
ix)	ákánĩ̀	'that basket'
x)	ákánã̀	'this basket'
xi)	ódínĩ̀	'that wall'
xii)	ódínã̀	'this wall'

However, the demonstrative morphemes /ɔ̀-nà/ or /ɔ̀-nì/ can stand alone when it does not serve as a modifier to any noun. Compare for instance, the following pairs of sentences:

95. 1a. mi ́dé áβɛ̀ ɔnì (nominalised)

I buy + past house that

I bought that house

b. mí dé ̀ɔnì (non- nominalised)

I buy + past that

I bought that

2a. mi ́dé áβè ɔnà (nominalised)

I buy + past house this

I bought this house

b. mí dé ̀ɔnà (non- nominalised)

I buy + past this

I bought this

As said earlier, the demonstrative is not monomorphemic, it consists of the prefix ɔ̀-/ and the stem /-nà/. /ɔ-/ is a singular prefix which becomes /e-/ in the plural so that when we have the plural demonstrative, plurality is marked in the prefix, thus the prefix serves as a concord marker. Examples:

96. a.) mi ́dɛ áβè ènì 'I bought those houses'

b) mí dé ̀ènì 'I bought those ones'

2. a) mi ́dɛ áβè ènà 'I bought these houses'

b) mí dé ̀ènà 'I bought these ones'

5.7.3 Possessive

97. 1. a) ɔ̀bɔ̀ mɛ̀ → ɔ̀bɔ̀mɛ̀

hand my my hand

b) àbɔ̀ mɛ̀ → àbɔ̀mɛ̀
hands my my hands

2. a) òbɔ̀ wɛ̀ → àbɔ̀wɛ̀
hand your your hand

b) àbɔ̀ wɛ̀ → àbɔ̀wɛ̀
hands your hands

3. a) òbɔ̀ ɔ̀sɔ̀ → òbɔ́sɔ̀
hand his his hand

b) àbɔ̀ ɔ̀sɔ̀ → àbɔ̀sɔ̀
hands his his hands

In the paradigm for the articles, the stem vowel is deleted at word boundary while in the demostratives the prefix vowel of the demonstrative is deleted. Also in the possessive, the prefix vowel is deleted as shown in the third person plural and singular possessives. It must be noted, however, that deletion does not apply to other forms of possessive because they are monosyllabic with cv syllable structure whereas the third person possessive has V-CV structure like other forms of determiners. See section 4.2 for a discussion on vowel elision.

5.8 REDUPLICATION

Reduplication is a morphological process which has the effect of copying a root, syllable or segment and attaching it to the original. Most often, a reduplicated element is added at the beginning of a form, but it may also be added at the end or less commonly somewhere in the middle.

Two views of reduplication have been identified, the first of which sees reduplication as a process of 'binary fission' while the second view sees it as an affixation process. Linguists who are of the first view describe reduplication as a process of repetition and more importantly a transformational process. (Lieber 1981).

However, phonologists who hold the second view include Marantz (1982) who defines reduplication:

> "as a process relating a base form of morpheme or stem to a derived form that may be analysed as being constructed from the base via affixation of phonemic material which is necessarily identical in whole or in part to the phonemic content of the base form".

Describing reduplication as a process of repetition or 'fission' does not see morphological processes as essentially meaning based processes which involve the combination of two or more morphemes in different functional relations. Based on this, the second view will be adopted in our description of reduplication, because it will enable us to express the appropriate generalization about reduplication as a morphological process.

Reduplication is by its nature a phenomenon involving phonological identity between the 'reduplicant' and the 'base' to which it adjoins. Segmental and prosodic identity of the reduplicant and the base is obvious in the case of total reduplication which may involve copying of a complete word. Other form of reduplication process copies only part of the segment of the base. This is known as partial reduplication.

In Ikhin, reduplication can be partial or complete. In Ikhin, the emphatic form of the personal pronouns can be derived from their simple forms by repeating the entire stem. This is an instance of a complete or total reduplication.

		Pronoun		Complete (emphatic)
98.	i. 1st person singular	mɛ̃́	'I'	mɛ̃́mɛ̃́
	ii. 1st person plural	má	'We'	mã́mã́
	iii. 2nd person singular	wɛ́	'You'	wɛ́wɛ́
	iv. 2nd person plural	wá	'You'	wáwá

Also, adverbs of time are derived from nouns through the complete reduplication process in Ikhin:

99.		Noun	Adverb
	i.	ásɔ̃	á!sɔ́sɔ̃
		'night'	'everynight'
	ii.	óɣò	ó!ɣóɣò
		'day'	'everyday'
	iii.	éɣé	é!ɣéɣé
		'time'	'everytime'

Other forms of complete reduplication in Ikhin include the following numeral formations.

100.	i.	/ɔ̀kpà/	'one'	/ɔ̀kpáɔ̀kpá/	→	[ɔ̀kpɔ̂kpà]
						'one by one'
	ii.	/èvà/	'two'	/èvaèvà/	→	[èvêvà]
						'two by two'
	iii.	/èhà/	'three'	/éhàéhà/	→	[èhêhà]
						'three by three'

The following are also some of the examples of partial reduplication in Ikhin.

101.	òwótà	òwówòtà
	'afternoon'	'every afternoon'

Other forms of partial reduplication are found in monosyllabic verbs. Here the consonant is reduplicated and vowel [i] is inserted between the reduplicated consonant and the verb stem as shown in the formation of the following gerundive nominals:

102.	i.	/kù/	'pour'	/kìkù/	'always pouring'
	ii.	/bà/	'plait'	/bìbà/	'always plaiting'
	iii.	/sò/	'sew'	/sìsò/	'always sewing'

5.9 SUPPLETION

In our earlier discussion of morphology, morphological rules are described as *analogies between* word-forms: dog is dogs as cat is to cats, and as dish is to dishes. The difference is always the plural form –s affixed to the second word, signalling the key distinction between singular and plural entities. One of the largest sources of complexity in morphology is that, this one to one correspondence between meaning and form scarcely applies to every case in any language. In English, there are word form pairs like ox/oxen, goose/geese and sheep/sheep, the difference in their plurality is said to be irregular. These cases where the same distinction is effected by alternative changes to the form of a word are called allomorphy. There are several kinds of allomorphy: one is pure allomorphy, where the allomorphs are just arbitrary. Other, more extreme cases of allomorphy are called SUPPLETION, where two forms related by a morphological rule cannot be explained as being related on a phonological basis: for example, the past tense of go is went, which is a suppletive form.

Thus the use of alternate lexical items to represent the same component of meaning in different grammatical circumstances is called 'SUPPLETION'.

The choice among alternative lexical items to manifest a certain component of meaning is determined entirely by grammatical considerations:

Examples:

103.

Singular	Plural
/ɔ̀mɔ̀/	/iβià/
'Child'	'Children'

The above shows that, the morpheme /ɔ̀mɔ̀/ 'child' is used in the singular number but the phonologically unrelated form /íβìà/ 'children' is used in the plural number.

Whereas /ènà/ 'these' represents a simple modification of the demonstrative pronoun /ɔ̀nà/ 'this', /íβíà/ 'children' can just as well be regarded as a lexical item, separate from /ɔ̀mɔ̀/ 'child', that is used in place of /ɔ̀mɔ̀/ 'child' in the plural number. The above examples indicate that suppletion involves morphological irregularity. The alternation in the above examples (/ɔ̀mɔ̀/ and /íβíà/) is found in no

other pairs of nouns and it follows from no general principles of Ikhin phonology or morphology.

5.10 COMPOUNDING

Languages often use their own internal resources to create new words, without appealing to other languages. One very frequent technique is compounding: combining two existing words into a new word. Compounding represents an interface between morphology and syntax per excellence (Harrison, 2007). There is a semantic difference between compounding and associative construction. In compound nouns, there is a composite meaning e.g ò kɛ̀dà 'canoe' derived from:

104. /ò kɔ̀/ /ɛ̀dà/

' motor' 'river' 'canoe'

The above derivation results in a different meaning from the different words involved. This is not the case with associative constructuion.

Compounding is a process of word formation that involves combining complete word-forms into a single compound form; dog-catcher, is a compound, because both dog and catcher are complete word-forms in their own right before the compounding process was applied and are subsequently treated as one form. The process whereby two or more morphemes are combined to produce a single word is known as COMPOUNDING. In other words, compounds are lexical units formed by juxtaposing more that one stem. Besides, compounds are capable of taking on special senses that cannot be predicted from the meanings of the morphemes they contain in the rules that derive them.

In Ikhin, the process of compounding may be illustrated in two ways.
Where neither of the two juxtaposed nouns is dependent on the other.

Examples:

		Component roots			Compound
105.	i.	/ɔ̀mɔ̀/	/ɔ̀mɔ̀hè/	→	[ɔ̀mɔ́mɔ́hè]
		N_1	N_2		
		'child'	'male'		'son'

ii. /ɔ̀mɔ̀/ /òkpòsò/ → [ɔ̀mókpósó]
N_1 N_2 'daughter'
'child' 'female'

iii. /òkɔ̀/ /ɛ̀dà/ → [ɔ̀kɛ̀dà]
N_1 N_2
'motor' 'river' 'canoe'

It must be noted however, that the above process also invariably involves vowel elision. The other process of compounding is where one of the two adjacent or juxtaposed nouns is possessed by the other.

Examples:

106. i. Component roots Compound

/áxí/ /àmɛ̀/ → [áxjàmɛ̀]
'pot' 'water' 'waterpot'
N_1 N_2

In the above example of a compound noun formed from two nouns, the second is possessed by the first. Thus, the second serves as a kind of modifier to the first. This process also involves glide formation.

Furthermore, another example is a compound noun derived from two nouns in which the first is possessed by the second. i.e. the first serves as a kind of modifier to the second.

Component roots Compound

ii. /ɛ̀rã̀/ /úgbò/ → [ɛ̀rṹgbò]
'meat' 'bush' 'bushmeat'
N_1 N_2

The above examples show that N_1 with N_2 can be expressed by a compound noun of the form N_1 N_2 through vowel elision process.

CHAPTER SIX

IKHIN TONE SYSTEM

6.0 INTRODUCTION

In order to explain the concept of tone languages, it is necessary to lay down the foundation for understanding a few terms which are related to the concept. Since tone languages are languages which use variant pitches, pitch is the first term that should be discussed. All languages which have sounds have pitch differences. In tone languages, those pitch differences are used either to differentiate between word meanings or to convey grammatical distinctions.

Physically changing the pitch of a sound can occur in two ways. The first is the stretching and tensing of the vocal folds: the tenser they are, the higher the pitch. The second is changing the pressure below the vocal cords, the subglottal pressure: the more pressure, the higher the pitch. (Catford 1988).

The pitch of an utterance depends on the rate of vibration of the vocal cords, the higher the rate of vibration, the higher the resulting pitch becomes. Katamba (1989). The more taut the vocal cords, the faster they vibrate and the higher the pitch of the perceived sound. In every tone language, pitch plays a relevant role on every syllable at the surface level. Pike was about the first person to give a really clear definition of a tone language. He developed a systematic technique for analysing tone systems. He defined a tone language as a language having lexically significant, contrastive but relative pitch on each syllable (Pike 1948). Significant because it distinguishes utterances, lexical, because it distinguishes meaning of words. For pitch to be lexically significant, it has to be contrastive. This implies that pitches will be tonemes contrasting with other tonemes.

By saying that pich is relative, he meant that it is not the absolute pitch level that is important but its relationship with neighbouring tones. Welmers criticises this on the ground that in a tone language, some syllables may be toneless while some tones may not occur on syllable nuclei, a situation that will later be referred to as the occurrence of floating tones. It should be noted however, that Pike's definition regarding the occurrence of tone on every syllable is a reference to a surface phenomenon since no syllable in a tone language can be pronounced without a tone.

In the following examples, the different aspects of this definition will be demonstrated.

Individual tones used in speech are represented by a series of symbols. These symbols are used when representing the way in which an individual word is pronounced. They are a sort of notation which is recognised by phonetic experts around the world.

Fig 21

Common Tone	features
high	[v́]
mid	[v̄]
low	[v̀]
rising	[v̌]
falling	[v̂]

In Asian tone languages, more varieties of contour tones are usually in evidence than in African languages. Ikhin is an African language with basically level tones and so this work will not go into the study of contour tone systems.

Tone plays different functions in tonal languages and it does not necessarily play all the functions in all languages e.g intonational, lexical and grammatical functions. By using a different tone for one word, the meaning of that word can be dramatically changed. For example, in Yoruba, the three letter words "awo" can have many meanings depending on the tones used in its production.

107.	Word	meaning
i)	awó	guinea fowl
ii)	àwo	dish
iii)	awo	secret cult
iv)	awò	glasses

In Ikhin, we are concerned with lexical and grammatical functions as shown below:

108.	Word	Meaning	
i)	étò	'burial'	[HL]

ii)	èto̩	'hair'	[LL]
iii)	ákì	'toad'	[HL]
iv)	àkì	'market'	[LL]
v)	òsà	'hunger'	[LL]
vi)	ósà	'thirsty'	[HL]

As we see above, the segments are the same within each language and the different meanings are carried by the different tone patterns on the disyllabic words. In some tone languages, it is possible for segmentally identical utterances to differ grammatically purely on the basis of tone.

For instance, in Ikhin a declarative sentence differs from an interrogative sentence on the basis of tone as shown below:

109. i) Declarative: ù vòrò lù jé ékó

' you want to go to Lagos'

ii) Interrogative: ú vòrò lù jé èkó

'do you want to go to Lagos?'

In addition, it is possible for a tone language to have morphemes which are purely tonal (Tomorphs) which are variously referred to as grammatical tones.

In Ikhin for example, the progressive aspect is represented by a preverbal morpheme 're'. This morpheme carries a high tone which in the underlying representation is floating and occuring at the end of the subject noun phrase.

Examples:

110. i. ɔ̀ + / + kɔ̃ [ɔ̀ɔ́kɔ̃]

ø (H) ø LHL

he present tomorph read

he reads / is reading

ii. ɔ̀ + / + tù + mɔ́tò [ɔ̀ɔ́tù mɔ́tò]

L (H) L H L LH L HL

He present tomorph drive car

he drives/is driving car

6.1 DECLINATION

This is a term widely known, and used to refer to a gradual modification of the phonetic backdrop against which the phonologically specified local F_o targets are scaled – a tilting of the graph paper, (Pierre humbert 1980:63).

Declination refers to the global tendency of the pitch (or more appropriately Fo Curve) of an utterance to decline progressively with time.

Examples: Edo (Bini)

111. i) ɔ̀ghɛ́dɛ̀ [¯ _ _] 'plantain'

ii) ɔ̀zùkpògjèvà [¯ - - _] 'second-in-command'

The above examplify the pitch lowering from one low tone to an immediately following low tone. Other terms that are equally in use are final lowering, downstep and downdrift.

6.1.1 Final Lowering

A more abrupt lowering confined to phrase and utterance ends must be distinguished from declination-which is a gradual lowering throughout a phrase or utterance. Final lowering has been noted in many African languages. For instance, Welmers (1973) 'even where overall terracing is not present… a perceptible lowering of final position appears to be exceedingly common in discrete level systems. Also, among the practical tips for field workers in Pike (1948) – presumably based more on Mesoamerican than in African tone systems, "pitches may be lowered non-phonemically at the ends of phrases" Pike (1948). However, in languages without lexical tone, final lowering is more difficult to identify, though recent work based on quantitative models of F_o suggests that it is present. For instance, Liberman & Pierre Humbert (1984) suggest that much of what has previously been ascribed to declination in English is actually the result of final lowering. They model final lowering as a substantial progressive lowering of overall pitch range during the last 250ms or so of an utterance.

previously been ascribed to declination in English is actually the result of final lowering. They model final lowering as a substantial progressive lowering of overall pitch range during the last 250ms or so of an utterance.

See section 6.4 for a discussion on downdrift and downstep.

Examples

112.	i.	ígbàlàkà	/¯ _ _ _/	[¯ ¯ - ˩]	→	'ladder'
	ii.	ìgbégbè	/_ ¯ _/	[_ ¯ ˩]	→	'velvet'
	iii.	údò	/¯ _/	[¯ ˩]	→	'stone'
	iv.	àkàkà	/_ _ _/	[_ _ ˩]	→	'grasshopper'
	v.	ɔ̀gbɛ̀lɛ̀	/_ _ _/	[- _ ˩]	→	'belt'

6.2 TONE TYPOLOGY

Two yardsticks have been used in separating tone languages into two types. The first yardstick is based on the phonetic characteristics of tone and the second is based on the functions of tone in different languages. Pike's classification of tone languages is based on the phonetic nature of tone. He notes that there are two types of tone languages. The first type consists of languages with mostly level tones and the second type are languages with mostly gliding or contour tones. The distinction between contour and registered tone languages is not absolute. Most systems display some of the qualities of each of the two types.

Languages with level tones are called REGISTER TONE LANGAUGES while languages with gliding or contour tones are referred to as CONTOUR TONE LANGUAGES. The level toneme is one in which within the limit of perception, the level of the syllable does not rise or fall during its production. In other words, the tone or pitch level is varied. A gliding or contour tone on the other hand, is one during the production of the syllable in which it occurs there is a perceptible rise or fall or some combination of rise and fall. Examples of Register tone languages include Yoruba and Nupe while languages with contour tones are mostly Asian languages e.g. Chinese, Cantonese, Mandarin, Vietnamese etc.

Furthermore, Welmers goes ahead to sub-classify Register tone languages into discrete level and terraced level tone systems. In a discrete level tone system, each toneme is restricted to a relatively narrowed range of absolute pitch. High, Low, Mid, could maintain their absolute pitch level through out the phrase. In a three tone system of this type, the last high tone will be as high as the first high tone in the phrase. A good illustration can be found in Yoruba e.g.

113. a. ó wù mǐ kpúkpɔ̀ 'I like it very much'

[¯ _----' - - _]

Inspite of the fact that the low tone spreads from its low position to the following high to give a rising tone on [mǐ] the distance between high and low remains constant throughout the phrase. By contrast, in a terraced level system,the high tone goes down when downdrift occurs with the same number of steps that the low goes down throughout the phrase, thereby maintaining their relative distance from each other.

In a terraced level tone system however, like tones are realized on successively lower levels. This means a high tone may not be realized on the same pitch level all the time. Sometimes, a high tone may fall to the level of a mid after a low tone. In this case, a high tone is said to be downstepped.

6.2.1 The Typology of the Tone System of Ikhin

Ikhin is a terraced level tone system with two basic tones, high and low as none of the lexical items within the data has a mid. Perceptual analysis suggests that there are two tones; High and Low but sometimes the low tone sounds like aYoruba mid particularly in isolation. However, in a construction where an apparent mid relates to other tones they are clearly seen as low. The fact that an apparently low tone of Ikhin is sometimes perceived as a mid tone particularly in isolation demands a more objective analysis of the tonality of Ikhin.

At a point during perception, one is confused as to whether or not certain tones are low or mid. This has led this investigator into an acoustic analysis of the

tones. Due to the high level of variability in speech, each of the relevant speech sounds (tones) is represented statistically by the mean and variance around and by which they are respectively distributed. In this instrumental analysis, the difference in frequency between the high and the low tones seems to be smaller than the difference between the high and the low of a three tone language like Yoruba – Examples: Yoruba

113. b. i. ó ti kɔ̀ HML [¯ - _]

he has refused

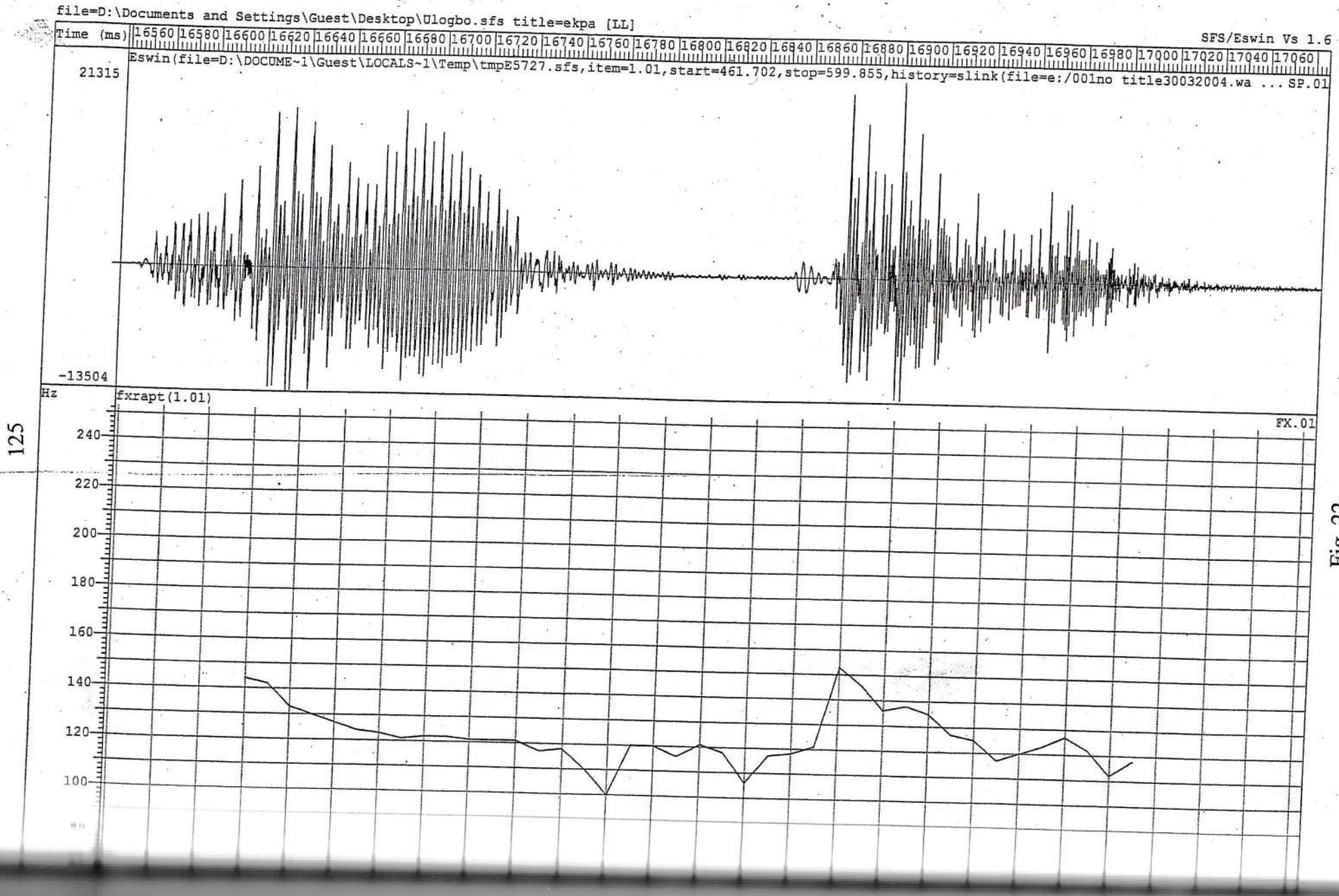
ii. ó kɔ̀ HL [¯_]

he refused

However, in construction, when a high tone precedes a low tone the difference between the high and the low seems to be higher, thus making the low to be perceived almost like a Yoruba mid. In figure 22, /ɛ̀kpà/ 'skin' the tone of the first syllable was realized as 115 H_Z; while that of the Second syllable was realised as 123 HZ, showing a difference of 7.85 HZ. However, in construction, the first syllable was realized as 125.8 HZ while the tone on the second syllable was realized as 107.3 HZ.

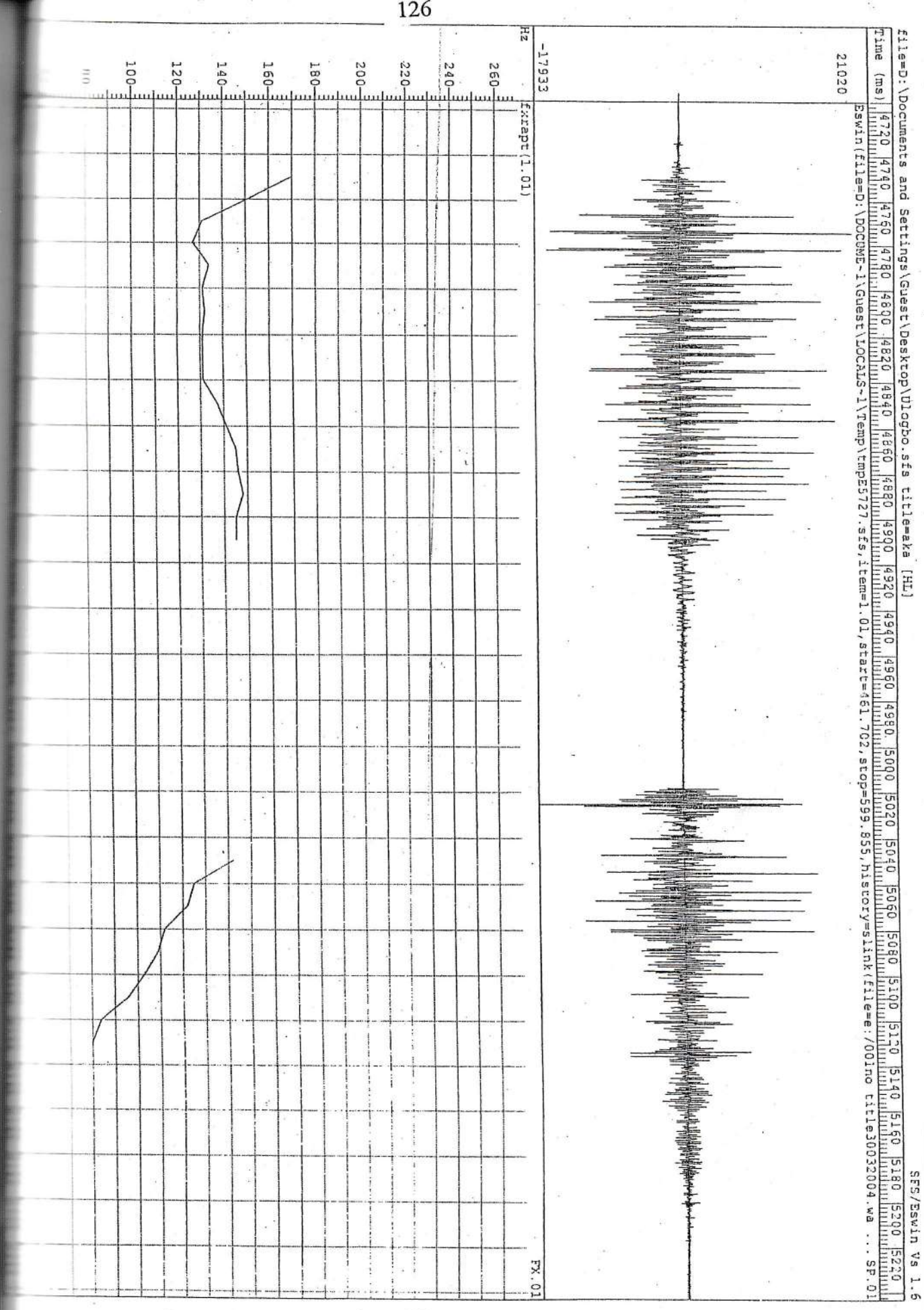
Frequency discrimination dictates that at low frequencies, tones, 8 or 9 Hz apart, can be distinguished; however, at high frequencies, tones must differ by hundreds of hertz... Critical bands are approximately I00 HZ wide from 20 to 400 HZ", a region within which F_o values normally fall. If we can realize what we perceived as low at a higher frequency than what was sometimes perceived as a mid, it can then be concluded that they are both lows as they are both realized within the same range of 115 HZ to 126 HZ, a mere difference of 11 HZ.

A cursory look at the acoustic analysis for /áka̰/ 'basket' and /ɛ̀kpà/ 'skin' revealed that the perceived mid tone in isolation for /ɛkpa/ 'skin' was realized as 145 Hz while the low tone in /ákà/ was equally realized as 145 HZ. The same analysis goes for /ìbàtà/ 'shoe' and /ùlògbò/ 'door'.


file=D:\Documents and Settings\Guest\Desktop\Ulogbo.sfs title=ekpa [LL]
Time (ms)
16560 16580 16600 16620 16640 16660 16680 16700 16720 16740 16760 16780 16800 16820 16840 16860 16880 16900 16920 16940 16960 16980 17000 17020 17040 17060
SFS/Eswin Vs 1.6
Eswin(file=D:\DOCUME~1\Guest\LOCALS~1\Temp\tmpE5727.sfs,item=1.01,start=461.702,stop=599.855,history=slink(file=e:/001no title30032004.wa ... SP.01
21315
-13504
Hz
fxrapt(1.01)
FX.01
240
220
200
180
160
140
120
100

125

Fig. 22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Time (ms)
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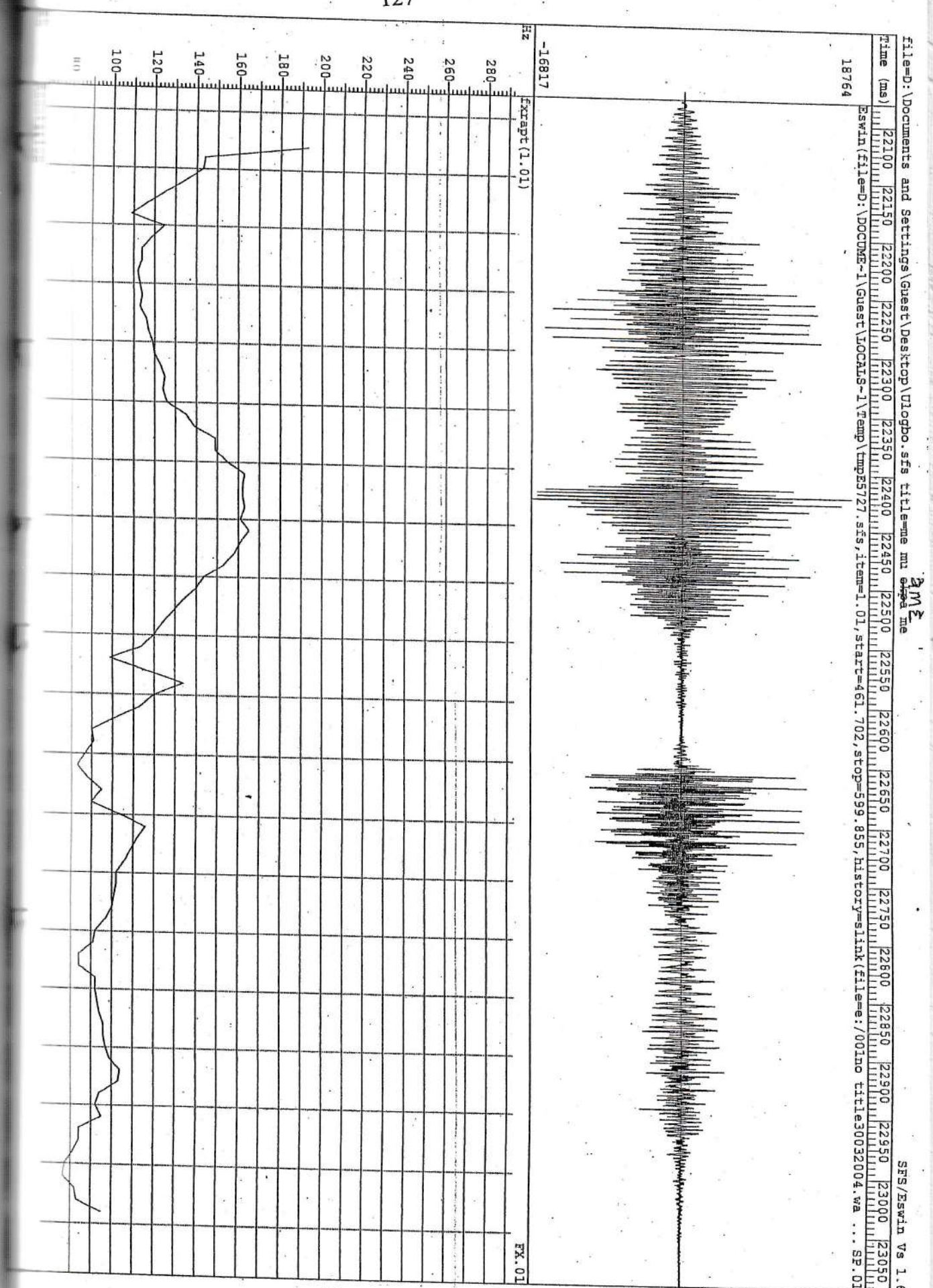
FX.01

Fig. 23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18764
-16817
Hz
fxrapt(1.01)
280 260 240 220 200 180 160 140 120 100
FX.01

Fig. 24

All these examples are a clear evidence of the fact that Ikhin has two basic tones, High and Low. The language exploits these two basic tones to make lexical and syntactic contrasts.

In this regard, find below minimal pairs of words which are distinguished only by tonal contrast.

115.

i)	ákì	'toad'	[HL]
ii)	àkì	'market'	[LL]
iii)	ɔ̀kpà	'one'	[LL]
iv)	ɔ́kpà	'cock'	[HL]
v)	ɛ́dà	'high'	[HL]
vi)	ɛ̀dà	'river'	[LL]

6.2.1.1 Systematic Phonetic Tones

Ikhin displays high, low, downstep and downdrift characteristics at the systematic phonetic level. These tones are respectively represented by the following symbols:

Fig. 25

[¯]	–	High tone
[_]	–	Low tone
[! ¯]	-	Downstep high
[¯ – _]	–	Downdrift
[– – ˩]	-	Downglide
[ˇ]	–	Rising tone
[ˆ]	–	Falling tone

6.2.1.2 The High Tone

Phonetically, the high tone is realized as a high in word initial position or after another high tone:

116. i) ɛ́kɛ̃̀ / ¯_ / → [¯ ˩] 'stomach'

ii) ɛ́khi / ¯_ / → [¯ ˩] 'Belly'

iii) ɛ́ŋ¯ìè / ¯¯_ / → [¯ ¯ ˩] 'Breast'

iv) ákà / ¯_ / → [¯ ˩] 'Basket'

v) égbà / ¯_ / → [¯ ˩] 'Fat'

vi) éhɔ̀rɔ̀ / ¯__ / → [¯ ¯ ˩] 'Swallow'

vii) úsó / ¯¯/ → [¯ ¯] 'head'

viii) ɛ́là / ¯_ / → [¯ ˩] 'cow'

ix) ódí / ¯¯/ → [¯¯] ' wall'

A high tone is lowered after a low tone, a term that includes declination, final lowering, downstep and downdrift. These are discussed in the section following. Examples of high tones lowered by the preceding low tones are:

x) òsā́ /_¯ / → [_ -] 'Thirst'

xi) àsìn̄́ /__¯ / → [__ -] 'cricket'

xii) ɔ́mɔ̀ká /¯_¯/ → [¯_ -] 'orange'

xiii) ìkòkó /__¯ / → [__ -] 'cocoa'

6.2. 1.3 The Low Tone

The low tone is phonetically realized as a low tone in word initial position or as the non-final tone in a tone sequence. The low tone ends with a downglide in final position. This final position may be at the end of a word or at the end of a tone phrase.

117. i) ákà /¯_ / → [¯ ,] 'basket'

ii) étùàgbɔ̃̀ /¯___ / → [¯__ _,] 'bear'

iii) ìdã̀mà /___/ → [__ ,] 'heart'

iv) ɔ́kà /¯_ / → [¯ ,] 'maize'

v) ílàlò /¯_ / → [¯_,] 'beans'

vi) ɔ́gɛ̀dɛ̀ /¯__/ → [¯_,] 'plantain'

vii) éhàwɔ̀rã̀ /¯___/ → [¯__,] 'back of tree'

viii) íkpã̀mì /¯__/ → [¯_,] 'seed'

ix) íbɔ̀bɔ̀dì /¯___/ → [¯_ _,] 'cassava'

Apart from downgliding of a low tone in a final position, another phonetic realization of low tone is the pitch lowering from one low tone to an immediately following low tone. Thus a sequence of low tones without an intervening high tone also drifts downward as exemplied below:

118. mɛ́ mú àmɛ̀ mɛ̀ /¯¯___/ → [¯¯-˩]
'I carried my water'

With the example above, we will see that in a sequence of two low tones preceded by a high tone, the second low tone is lower that the first low because of the influence of the preceeding high.

In addition, given a contiguous sequence of two low tones which is immediately preceded by a contrastive high tone, each low is realized on different pitch level. This analysis is ably supported by the attached instrumental evidence on:

119. i) ákà /¯-/ → [¯˩] 'basket'

ii) mɛ́mú àmɛ̀ mɛ̀ /¯¯___/→ [¯¯-˩]
'I carried my water'

6.2.1.4 Rising and Falling Tones

When syllable structure processes (e.g. vowel elision and glide formation) desyllabify the first of two adjacent vowels bearing non-identical tones, contour tones may be formed. (Egbokhare, 1990). A contour tone is one in which at least one unit toneme must be described in terms of two distinct components: the direction of pitch change, and also the position of the entire glide within the pitch range of the environment. (Welmers, 1973).

Examples :

120.	i.	eβîɛ	[eβjê]	'morning'
	ii.	tɛgàlekùa	[tɛgàlekwã]	'dish'
	iii.	igbeènɛ	[igbênɛ̃]	'fourteen'

6.3 Tone Stability

Stability is the survival of tones after deletion of segments on which they are grounded. Tone exhibits stability in this language. Deletion of a tone bearing unit does not necessarily involve the deletion of the tone, infact, it usually does not. Any process that involves the removal of a tone bearing unit must relate to stability and relate to the creation of contour tones.

Examples:

121 (a)

i	/ekùe/ →	[ɛkwɛ̃]	'nail'
ii	/ògúà/ →	[ògwâ]	'village'
iii	/ìgúà/ →	[ìgwâ]	'knee'

(b)

i	/èto/	/agbã/ →	ètwăgbã
	hair	jaw	beard
ii	/axi/	/àmɛ/ →	axjâmɛ
	pot	water	waterpot

(c)

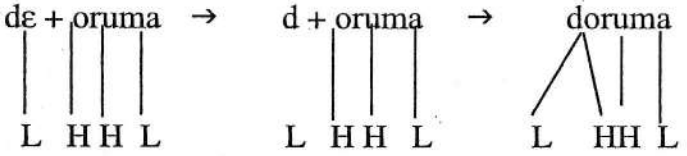
i	/kù/	/aka/ →	kwăkà
	'pour'	'basket'	'pour basket'
ii	/fã/	/ɔka/ →	fɔ̃kà
	'pluck'	'corn'	'pluck corn'

The autonomy granted to tone and Nasality is one of the fundamental aspects of autosegmental phonology. This autonomy in turn leads us to expect that rules whose effect is to delete a segment located on one autosegmental tier will not affect an autosegment with which it was formerly associated. This effect is known as a stability effect- a resistance to deletion- even when the vowel it was associated with is deleted phonologically.

We now represent tonal features on a separate level (tier) associated with and autonomous from the segmental tier. And if tones are autonomous then vowels can delete while tone persists on its own tier and maps to an adjacent syllable to ensure maximal association.

Example:

122. dɛ + oruma → d + oruma → doruma



buy sheep 'buy sheep'

6.4 Downstep and Downdrift

It is no longer new in African Linguistics that, in many languages, downdrift occurs in tone sequences involving alternating high (H) and low (L) tones. This was initially assumed to be a predictable matter of phonetic realization. In such languages, any H preceded by L is realized at a lower pitch than an earlier H –and was commonly referred to as DOWNDRIFT. Downdrift, in this sense was distinguished from Downstep, in which one H tone is realized at a lower pitch than a preceding H tone without any apparent conditioning factor e.g. Efik, ọbóng'mosquito', ób!óng 'chief' and óbòng 'care'.

More recently, however, downdrift and downstep in these restricted senses have generally been seen as manifestations of essentially the same phenomenon. This is reflected in e.g. stewart's terms (1983) 'automatic downstep' (for surface HLH sequences) and 'non-automatic downstep' (where no conditioning factor is present in the surface tonal string). A link between 'automatic' and 'non-automatic' downstep has generally been recognized since non-automatic downstep can often be

traced diachronically or derivationally to automatic downstep, i.e. the effect of low tone that has been deleted. Whether this analysis can be extended to all cases of non-automatic downstep has been the subject of much discussion in autosegmental phonology e.g. Stewart (1983).

If a language has two level tones and one downstep or downstepped high tone, two syllable items (i.e. disyllabic items) would show five possible sequences.

123. EFIK

i)	Iyak	[¯¯]	fish	(H H)
ii)	ufɔk	[¯ _]	house	(H L)
iii)	iwa	[_ ¯]	cassava	(L H)
iv)	eso	[_ _]	pot	(L L)
v)	ɔbɔŋ	[¯ -]	chief	(H D)

In the above language, there are three contrasts after a non-low and two constrasts after a low. Thus in a language with downstep, there is no overt low tone at the surface to indicate the source of key lowering. In the above Efik examples therefore, the downstepped high contrasts with both low and high. Ikhin as a terraced level tone system has two tones and a downstep. These two tones are distinctive while the phenomenon of downstep is not phonemic.

In current mainstream analysis, a two tone plus downstep system is regarded basically as a two tone system because the feature called 'downdrift' is simply the effect of low tones on the following high tones or in some cases high tones on the following low tones as well. Edo (Bini) and Hausa provide classical well defined effect of two tones system with downdrift. Edo has downdrift that affects low and high and has a phenomenon of a disappearing low tone. By contrast, Hausa has no downstep phenomenon in the sense that lows are always there affecting lows as well as highs.

Examples:

124. **Edo (Bini)**

i)	ɔ̀gɛ̀dɛ̀	[– - _]	'plantain'
ii)	ɔ̀zùkpògyèvà	[– - _ _ _]	'second-in-command'
iii)	ɛ́dé + ènɛ́ →	ɛ́dé!nɛ́	[¯¯ –]
	'crown' 'four'	'four crowns'	
iv)	òwásɛ̀lɛ́	[– ¯_ –]	'The leg of a cricket'

In Edoid languages,the low tone which has lowered a high tone is lost in the surface structure. The loss of the conditioning low tone gives rise to many surface representations in which a high tone is immediately followed by a lowered high tone Examples:

125. **Edo (Bini)**

a.	/ɛ́dé/ +	/èné/	ɛ́dé!né	[¯¯ -]
	'crown'	'four'	four crowns	

Emai (Reduplication)

b.

i.	/ɛ́dɛ̀/	ɛ́dɛ̀ + ɛ́dɛ̀	[ɛ́!dɛ́dɛ̀]	
	'day'	'day' 'day'	'daily'	
ii.	/ɔ́dã̀/	ɔ́dã̀ + ɔ́dã̀	[ɔ́!dɔ́dã̀]	
	different		'many different'	

6.4.1 Downstep in Morphemes and Sentences

Downstep high tone is created in Ikhin morphemes when a low tone vowel preceding an high tone is deleted following complete reduplication.

126.

	Input	By reduplication	By vowel elision
i)	óɣò 'day'	óɣòóɣò	ó!ɣóɣò 'everyday'
ii)	ásɔ̃̀ 'night'	ásɔ̃̀ásɔ̃̀	á!sɔ̃̀sɔ̃̀ everynight

iii) ɛ́ɣɛ̀ ɛ́ɣɛ̀ɛ́ɣɛ̀ ɛ́!ɣɛ́ɣɛ̀
'time' everytime

In Ikhin, downstep also occurs in sentences and is as a result of vowel elision. A high tone may be downstepped when a low tone preceding the high tone across a morpheme boundary is desyllabified:

127. i) ɔ̀ jã̀ étè → ɔ́!ɲétè
She/he climb mountain she/he climbs mountain

ii) ɔ̀ dɛ̀ ɛ́là → ɔ́!dɛ́là
She/he buy a cow she/he buys a cow

iii) ɔ́ gbè ákí → ɔ́igbákì
She/he kill toad she/he kills a toad.

The low tone on each of the verbs above has lowered the following high tone in the underlying structure . This same low tone is lost in the surface structure. Various scholars have postulated floating low tone as the main cause of DS. Stewart (1965) holds that DS originates from a floating low tone preceding a higher or identical tone. Of utmost importance is also the exact place of downstep, that is, where DS is to be inserted. Clements (1979) advocates an insertion of DS. He suggests that the disappearing low tone and the DS be viewed as a sequence. Thus, DS is inserted before a low tone which may be deleted. This approach has been adopted by Stewart (1983) and Elugbe (1985). They, however, insert DS after the disappearing low tone (Egbokhare 1990). Stewart and Elugbe's proposal has been adopted in our analysis of DS insertion in Ikhin, that is, the insertion of DS after a low tone which is then deleted.

To postulate a floating low tone for downstepped high tone in Ikhin is not out of place. When languages undergo processes of vowel deletion, there are occasions when the vowel or the tone bearing segment is deleted without a deletion of the tone. The tone of such a deleted segment is then set floating and the presence is felt by the type of influence it exerts on surrounding tones. There are three stages

involved in the above phonological representations, the first of which is vowel elision. The vowel is deleted without a deletion of its tone, thus setting the tone afloat. At this stage, the tone could not be assigned to any vowel. The second stage is Ds insertion. It has been suggested and concluded that Ds should be inserted after a low tone which is ultimately deleted. These two stages lend credence to our postulation of a floating low tone before its final deletion at the third stage.

Our account of downstep in morphemes and sentences can be captured with the following representation:

128. a)

i Tone tier H L H L H L by reduplication

CV tier V C V V C V V C V

Segmental tier ɛ ɣ ɛ → ɛ ɣ ɛ ɛ ɣ ɛ

'time'

ii Tone tier H (L) H L by vowel elision

CV tier V C ø V C V

Segmental tier ɛ ɣ ɛ ɣ ɛ

iii. Tone tier H (L) !H L by DS insertion

CV tier V C ø V C V

Segmental tier ɛ ɣ ɛ ɣ ɛ

iv. Tone tier H ! H L by floating low tone deletion

CV tier V C ø V C V

Segmental tier ɛ ɣ ɛ ɣ ɛ [ɛ́!ɣɛ́ɣɛ]

b. i. Tone tier H L H L H L

CV tier V C V V C V V C V

Segmental tier o ɣ o → o ɣ o o ɣ o

'day'

ii. Tone tier H (L) H L by vowel elision

CV tier V C ø V C V

Segmental tier o ɣ o ɣ o

iii. Tone tier H (L) !H L by DS insertion

CV tier V C ø V C V

Segmental tier o ɣ o ɣ o

iv. Tone tier H !H L — by floating low tone deletion

CV tier V C ø V C V

Segmental tier o ɣ o ɣ o — [oɣ!óɣò]

c i)

Tone tier H L H L — underlying representation

CV tier v c v v c v

Segmental tier ɔ d ɛ ɛ l a

ii) Tone tier H (L) H L — by vowel elision

CV tier v c ø v c v

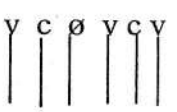
Segmental tier ɔ d ɛ ɛ l a

iii) Tone tier H (L) !H L — by DS insertion

CV tier v c ø v c v

Segmental tier ɔ d ɛ l a

iv) Tone tier H !H L — by floating low tone deletion



CV tier v c ø v c v

Segmental tier ɔ d ɛ l a [ɔ́d!ɛ́là]

d. i)

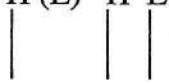
Tone tier H L H L — underlying representation

CV tier v c v v c v

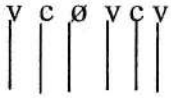
Segmental tier ɔ gb e a k i

'she/he kill toad'

ii) Tone tier H (L) H L — by vowel elision



CV tier v c ø v c v



Segmental tier ɔ gb a k i

iii) Tone tier H (L) !H L — by DS insertion

CV tier v c ø v c v

Segmental tier ɔ gb a k i

iv) Tone tier H !H L — by floating low tone deletion

CV tier v c ø v c v

Segmental tier ɔgb a k i [ɔ́gb!ák̀i]
'He kills a toad'

6.5 LEXICAL TONE PATTERNS

6.5.1 Nouns

Three tonal combinations are possible in disyllabic nouns in Ikhin. These are shown below:

HL

129. i) /ák̀i/ 'toad'

ii) /ɛ́kɛ̀/ 'stomach'

iii) /ɛ́là/ 'cow'

iv) /ɛ́sì/ 'horse'

LL

v) /ɛ̀kpà/ 'bag'

vi) /ɛ̀ò/ 'eye'

vii) /èjɔ̀/ 'ear'

viii) /ìhwè/ 'nose'

HH

ix) /ódí/ 'wall'

x) /úsó/ 'head'

xi) /ákí/ 'market'

Besides, there are six tonal patterns in trisyllabic nouns: LLL, LLH, LHL, HLH, HLL, HHL.

LLL

130. i) idàmà 'heart'

ii) ɛ̀khèrè 'penis'

iii) ùkòkò 'vagina'

LLH

iv) àsìnín 'cricket'

v) ìkòkó 'cocoa'

LHL

vi) àhósà 'urine'

vii) èmálè 'food'

viii) ètábà 'tobacco'

HLH

ix) ɔ́mɔ̀ká 'orange'

HLL

x) éhɔ̀rɔ̀ 'swallow'

xi) ɔ́gɛ̀dɛ̀ 'plantain'

xii) ílàtò 'beans'

HHL

xiii) úgûà 'bone'

xiv) ɛ́gûɛ 'hoe'

While there are trisyllabic nouns with all low tones, trisyllabic nouns having high tones on all the three syllables are yet to be attested in Ikhin within the available data.

6.5.2 Verbs

It has been reported that in most Edoid languages, monosyllabic and disyllabic verbs in isolation have low tones.

Urhobo

131. i) /kù/ 'pour'

ii) /dò/ 'throw'

iii) /rè/ 'eat'

iv) /ʃɛ̀/ 'sell'

v) /dɛ̀/ 'buy'

vi) /mù/ 'carry'

vii) /hùhù/ 'close'

viii) /lèirì/ 'break'

Emai

132. i) /gbè/ 'kill'

ii) /ù/ 'die'

iii) /tà/ 'say'

iv) /dè/ 'fall'

v) / ɣà/ 'stroll'

vi) /kòkò/ 'gather'

In Ikhin, as in Emai and Urhobo, monosyllabic and disyllabic verbs pronounced in isolation have low tones, however, tonal behaviour on verbs in construction is contextual.

133. i) /lɛ̀/ 'go'

ii) /là/ 'run'

iii) /dɛ̀/ 'buy'

iv) /whɔ̀/ 'jump'

v) /ʃà/ 'climb'

vi) /vàrè/ 'come'

vii) /rɔ̀rè/ 'enter'

viii) /dɔ̀tèrè/ 'descend'

6.5.3 Numerals

The basic numerals i.e. one to ten, have, LL(L) tonal patterns. The only exception is /éhà/ 'six' which has LH patterns

134. i) /ɔ̀kpà/ 'one'

ii) /èvà/ 'two'

iii) /èhà/ 'three'

iv) /èhìɛ̀/ 'four'

v) /ikhè/ 'five'

vi) /ikhirà/ 'seven'

vii) /itsirì/ 'nine'

viii) /ìgbè/ 'ten'

6.5.4 Demonstratives

Demonstratives in Ikhin have low tones when said in isolation but may manifest different tonal patterns in different constructions as shown below:

135. i) /ɔ̀nà/ 'This'

ii) /ènà/ 'These'

iii) /ɔ̀nì/ 'That'

iv) /ènì/ 'Those'

6.5.5 Personal Pronouns

Personal pronouns on the other hand have high tone in isolation.

			Singular		plural	
136.	i)	1st person	mɛ́mɛ́	'I'	mámá	'We'
	ii)	2nd person	wɛ́wɛ́	'you'	wáwá	'You'
	iii)	3rd person	ɔ́ré	'he /she /it'	ɛ́ré	'They'

6.6 TONE IN THE ATTRIBUTIVE CONSTRUCTIONS

The typology of the tone system of Ikhin is very well demonstrated by the behaviour of tones in the attributive constructions. The main purpose of this section is to explore the tonal behaviour in attibutive constructions in Ikhin and in doing so we provide a systematic description and explanation of instances where high and low tones alternate. We also examine instances where the conditioning tone is not physically present but its effect remains on the low tone.

In many Edoid languages, there is usually a tomorph between a noun and its qualifier or attribute. In Ikhin, when a noun has another noun as its modifier, the morpheme ' ísɛ̀ ' occurs in between them. This morpheme is called a construction marker.

Example:

137.	(i)	òɛ̀	ísɛ̀	ɔ̀bù	→	óɛ́sɔ̀bù
	(ii)	leg	cm	doctor		leg of doctor

This construction marker has a prefix high tone which performs a grammatical function. This tone has been identified in almost every Edoid language. Indeed, in Ikhin, it is not just in a noun-noun construction but also in demonstrative, possesive and relative clause constructions. In Ikhin and perphaps in most Edoid languages, the normal arrangement between a noun (N) and its modifier (M) is for a noun to preceed its modifier. Therefore, the attribute of a noun (N) is indicated by postposing a modifier (M) after a noun (N). The modifier can be any of the following:

		N + Modifier	Examples				
138.	i)	N +N:	òɛ̀	ísɛ̀	ɔ̀bù	→	óɛ́sɔ̀bù
			leg	cm	doctor		'leg of doctor'
	ii)	N + Possessive:	ìbàtà	mɛ̀		→	ìbàtàmɛ̀
			shoe	my			'my shoe'

iii) N+ demonstrative: ɔ̀mɔ̀ ɔ̀nà → ɔ̀mɔ̀nà
child this 'this child'

iv) N+ numeral àbɔ̀ èvà → àbɔ̀và
hand two 'two hands'

(v) N+relative clause ɛ̀kpà nìɔ̀gbɔ̃̀ → ɛ́kpánɔ̀gbɔ̃̀
bag cm be new 'a bag which is new'

It appears that the associative marker is a VCV with the prefix vowel on a high tone. Elugbe, (1985) claims "in proto-Edoid, an agreement marker existed between a noun and its modifier. This agreement marker carried a H which, in most Edoid languages, is the only available evidence of the marker". He went further to provide a comparative analysis of the associative marker across Edoid languages.

139. i) Oloma (NWE)
ghé-hu ghɔ́-sùè → ghéhúghɔ́swè
'cap' cm hunter 'cap of hunter'

ii) Urhobo (SWE)
ò bɔ̀ + rɛ́ + ɔ̀bò → óbɔ́rɔ̀bò
hand cm doctor 'hand of doctor'

According to him, an associative or genitive agreement marker still exists segmentally in Oloma and it carries a high tone. Urhobo has a marker rɛ́ which also carries a high tone.

6.6.1 Alternation between high and low tones in the attributive construction

In Ikhin all low tones on N_1 alternate with high tones if there is no intervening high tone. The construction marker /ísɛ̀/ has its initial and final vowels dropped while the vowels of the nouns being fused together are retained.

The following paradigms exemplify the tonal behaviour in N_1 + N_2 construction:

6.6.1.1 N + CM + N

LL + LL

140a. i) èxuà ísɛ̀ òkpè → éxwã́sokpè
'cheek' cm palmfruit 'cheek of palmfruit harvest'
harvester

ii) èto ísɛ̀ òkpè → étósòkpè
hair cm palmfruit 'hair of palmfruit harvester'
harvester

LL + HL

iii) ɛ̀kpà ísɛ́ égbè → ɛ́kpá!ségbè
'skin' cm 'body' 'skin of body'

iv) ɛ̀kpà ísɛ́ ɛ́kɛ̃̀ → ɛ́kpá!sɛ́kɛ̀
'skin' cm 'stomach' 'skin of stomach'

v) òɛ̀ ísɛ̀ ɛ́là → óɛ́!sɛ́là
'leg' cm cow 'leg of cow'

	LL	+	HH			
vi)	ètò	ísὲ	úsó	→	étó!súsó	
	hair	cm	head		'hair of head'	
vii)	ὲkpà	ísὲ	úsó	→	ɛkpá!súsó	
	skin	cm	head		'skin of head'	
	HL	+	LL			
viii)	ɛ́là	ísὲ	ɔ̀bò	→	ɛ́lásɔ̀bò	
	cow	cm	doctor		'cow of doctor'	
ix)	ɛ́là	ísὲ	òkpè	→	ɛ́lásòkpè	
	cow	cm	palmwine harvester		'cow of palmwine harvester'	
x)	úgbò	ísὲ	ὲβò	→	úgbósὲβò	
	bush	cm	town		'bush of town'	
xi)	ódì	ísὲ	ὲβò	→	ódísὲβò	
	wall	cm	town		'wall of town'	
xii)	úkò	ísὲ	àmὲ	→	úkósàmὲ	
	container	cm	water		'container of water'	
	HL	+	HL			
xiii)	úgbò	ísὲ	ɛ́là	→	úgbó!sɛ́là	
	bush	cm	cow		'bush of cow'	

xiv) ákà ísɛ́ ɛ́là → ákà!sɛ́là
basket cm cow 'basket of cow'

HL + HH
xv) ɔ́kpà ísɛ́ úsó → ɔ́kpa!súsó
cock cm head 'cock of head' (of the family)

xvi) ɛ́là ísɛ́ úsó → ɛ́là!súsò
cow cm head 'cow of head' (of family)

6.6.1.2 N + ´ + Dem

Contrary to what was observed in the noun plus noun construction discussed above where the conditoning high tone was visible and segmentally grounded, the demonstrative, possessive and relative clause constructions have no overt high tone but a tomorph that conditions the alternation as shown in the following paradigms:

LL + ´ + LL

140b. i) LL: òɛ̀: òɛ̀´ ɔ̀nã̀ → óɛ́nà
Leg this 'this leg'

ii) àɛ̀: àɛ̀´ ènã̀ → áɛ́nã̀
legs these 'these legs'

iii) ɔ̀bɔ̀: ɔ̀bɔ̀´ ɔ̀nĩ̀ → ɔ́bɔ́nĩ̀
doctor that 'that doctor'

iv) èbɔ̀: èbɔ̀: ´ènĩ̀ ébɔ́nĩ̀
doctors these 'these doctors'

HL + ´ + LL

v) HL: ákà: ákà ´ ɔ̀nã̀ → ákánã̀

basket this 'this basket'

vi) ákà: ákà ´ ènã̀ → ákénã̀

basket these 'these baskets'

vii) ódì: ódì ´ ɔ̀nã̀ → ódínã̀

wall this 'this wall'

6.6.1.3 N + ´ + Poss

140c. LL + ´ + LL

i) LL: ɔ̀bɔ̀: ɔ̀bɔ̀ ´ sɔ̀ → ɔ́bɔ́sɔ̀

hand his 'his hand'

ii) àbɔ̀: àbɔ̀ ísɛ̀ è!è → ábɔ́sè!è

hand their 'their hand'

HL + ´ + LL

iii) HL: ákà: ákà ´ sɔ̀ → ákásɔ̀

basket his/her 'his/her basket'

iv) ákà: ákà ísè è!è → ákáse!è

basket their 'their basket'

6.6.1.4 N + ` + NUM

In the noun plus numeral construction however, the low tones on the noun do not alternate as in the various constructions discussed earlier but remain low at the surface level. We can postulate therefore that the Noun plus numeral construction has a low tone as its own tomorph.

Examples:

LL + ` + LL

141 i) àbɔ̀ ` èvà → àbɔ̀và
hand two 'two hands'

ii) ùsò ` èvà → ùsòvà
head two 'two heads'

iii) òɛ̀ ` èhà → òɛ̀hà
leg three 'three legs'

6.6.1.5 N + ´ + REL MARKER

A clause is a group of words with its own subject and predicate provided it is included in a sentence. The main function of a relative clause is to modify or provide more information about its head noun in the main clause. In Ikhin, the marker of a relative clause 'nì' is with a low tone. This relative marker precedes the clause and is itself immediately preceeded by the head noun.

Examples:

LL + ´ + L

142 i) ɛ̀wɛ̀ ´ nì mɛ́ dɛ̀ ɔ́ hu → ɛ́wɛ́ nì mɛ́ dɛ̀ ɔ́ hù
goat cm I buy die 'the goat which I bought died'

ii) èrũ̀ ´nì mɛ́ kɔ̀ ɔ̀zɛ → érṹ nì mɛ́ kɔ̀ zɛ
yam cm I plant grow 'the yam which I planted has grown'

LHL + ´ + L

iii) ɔ̀mɔ́hè´ nì vàrè ódɛ̀ ɔ́ hù → ɔ̀mɔ́hé nì váré ódɛ̀ ɔ́ hù

man cm come die yesterday 'the man that came yesterday is dead'

LLL + ´ + L

iv) ɔ̀kpɔ̀sɔ̀´ nì mɛ́ gbè kùàrè→ ɔ́kpɔ́sɔ́ nì mɛ́ gbé kwàrè

woman cm I beat leave 'the woman that I beat left'

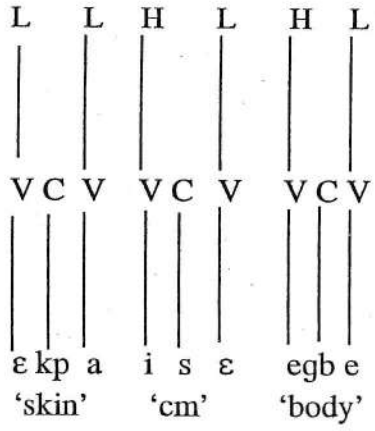
LLLL + ´ + L

v) ɔ̀mɔ̀kpɔ̀sɔ̀´ nì dɛ́ ɛ̀wè mɛ́ ɔ́sè → ɔ́mɔ́kpɔ́sɔ́ nì dɛ́wè mɔ́ sè

girl cm buy goat my friend 'my girl friend bought a goat'

The above examples constitute a further illustration of alternation between lows and highs in Ikhin. An autosegmental derivation of this alternation is presented below:

143. i) Tone tier



- underlying representation

ii) Tone tier — H L H L — by prefix tone spread

CV tier — V C V V C V

Segmental tier — ɛ kpa i s e e gb e

iii) Tone tier — H (H) (L) L L -by deletion of vowels of cm

CV tier — V ø C ø V C V

Segmental tier — ɛ kpa s e gb e

iv) Tone tier — H H L — by spreading

CV tier — V C V C V C V

Segmental tier — ɛ kp a s e gb e [ɛ́kpa!ségbè:] "skin of body"

Tone alternation is a grammatical phenomenon. To account for the alternation between high and low tones in Ikhin, a floating high tone has to be posited. I am hereby postulating /ísɛ̀/ a construction marker with a prefix high tone

even when it is not visible. At morpheme boundary between the noun and *ísɛ̀*, the vowel bearing the high tone is deleted but the high tone still remains to perform its grammatical function by ensuring that the preceding low tone alternates with the following high tone.

Postulating either a floating high tone or the prefix high tone of the construction marker (*ísɛ̀*) as a tomorph in this sense is not out of place because both are from the same source only that a floating high tone is not there segmentally but it is there tonally. The happenings in Ikhin and other Edoid languages with respect to this phenomenon imply that even in Proto-Edoid, there is a tonal morpheme (tomorph).

It seems to us a general feature of Edoid languages. Elimelech (1976) and Amayo (1976) account for similar changes in Etsako (Yekhee) and Edo (Bini) respectively by postulating floating tones (in the phonological representation) for each noun phrase type identified. Such floating tones were sometimes derived historically as remnants of a deleted construction in Edo (Amayo, 1976), Egbokhare (1990).

6.7 TONE AND VERB STEM

As in other Edoid languages, Ikhin verb stems do not have tonal representation in the lexicon. The context in which a verb occurs determines what tone it takes. Verb stems therefore acquire tonal representation at the grammatical level. The fact that we cannot elicit any minimal tonal contrasts on verb stems independently of their grammatical contexts provides no basis for representing tone on verb stems in the lexicon.

Examples:

144. i) dɛ 'buy'

past tense	interrogative (past)	future tense	interrogative (future)
ɔ́!dɛ́	ɔ́ dɛ̀?	ɔ́ dɛ̂	ɔ́ dɛ́?
'he bought'	'did he buy'?	'he will buy'	'will he buy'?

ii) ku 'pour'

past tense	interrogative (past)	future tense	interrogative (future)
ɔ́! kú	ɔ́ kù ?	ɔ́ kû	ɔ́ kú ?
'he poured'	'did he pour'?	'he will pour'	'will he pour'?

iii) fã̀ 'pluck'

past tense	interrogative (past)	future tense	interrogative (future)
ɔ́! fã́	ɔ́ fà ?	ɔ́ fẫ	ɔ́ fã́ ?
'he plucked'	'did he pluck'?	'he will pluck'	'will he pluck'?

iv) fi 'throw'

past tense	interrogative (past)	future tense	interrogative (future)
v) ɔ́!fí	ɔ́ fì ?	ɔ́ fî	ɔ́ fí ?
'he throw'	'did he theow'?	'he will throw'	'will he throw'?

The above paradigm applies to all monosyllabic verbs in this language.

The present tense construction on the other hand is indicated by a floating high tone called 'tomorph'. The present tense construction in this language is used to show habitual as well as present continuous action.

In order for this tomorph to be realised, the final vowel of the subject noun phrase is slightly lenghtened to accommodate it such that if the subject noun phrase already ends on a high tone, it is easy to perceive the lengthening of both the high tone and final vowel. However, if the subject noun phrase ends in a low tone, the present tense tomorph is segmentalised on the lengthened portion of the final vowel. Consequently, the first part of the vowel bears a low tone while the lengthened portion bears a high tone.

Examples:

145a i) ɔ + ´ dɛ + áwà → ɔɔ dɛ awa → [ɔ̀ɔ́dáwà]

ø + (H) ø H L LH H L

he present tomorph — he buys/he is buying dog

ii) ɔ + ´ tu + mɔ́tò → ɔɔ tu mɔto → [ɔ̀ɔ́tùmɔ́tò]

ø (H) ø HL LH LH L

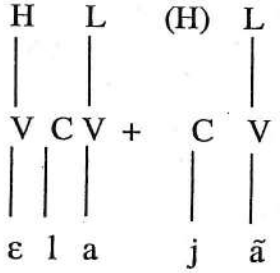
he present tomorph drive car — he drives/ he is driving car

iii) ɛ́là + ´ jã + àmɛ̀ → ɛlaa jã amɛ → [ɛ́làáɲàmɛ̀]

HL (H) ø L L H LH L L

low present tomorph drink water — cow drinks/drinking water

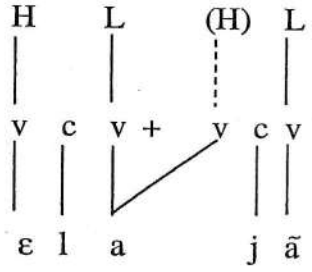
b. i) Sample derivations are illustrated below:

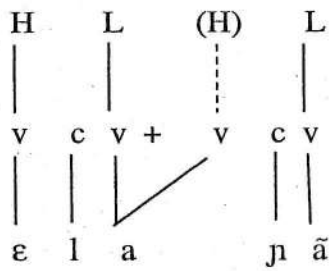


underlying representation

cow present tomorph drink

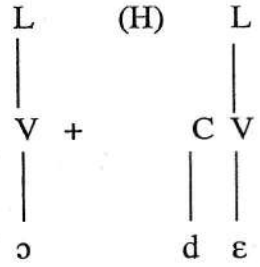
ii) by segmentalisation of present tomorph and lengthening of the final vowel of subject NP



iii) 

phonetic representation

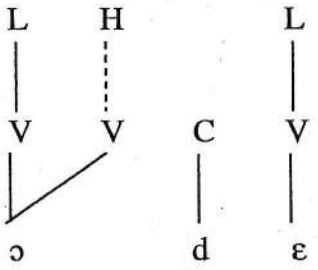
'cow drinks/ is drinking'

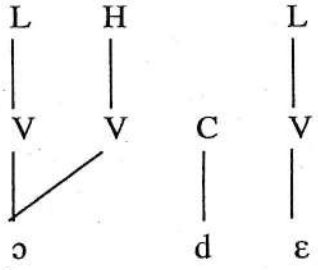
c i) 

underlying representation

he present tomorph buy

ii by segmentalisation of present tomorph and lengthening of final vowel of the subject pronoun.



iii. 

phonetic representation

[ɔ̀ɔ́dɛ̀] 'he reads/is reading'

6.8 TONE IN THE NEGATIVE CONSTRUCTION

Negativity is marked in Ikhin by a high tone on the negative morpheme /i/

Examples:

146a	i)	ɔ̀ dɛ́ ákà	→	ɔ́dákà	→	'he bought a basket'
	ii)	ɔ̀í dɛ́ ákà	→	ɔ̀ídákà̃	→	'he did not buy a basket'
	b. i)	ɔ̀ dɛ́ ɛ́wè	→	ɔ̀dɛ́wè	→	'he bought a goat'
	ii)	ɔ̀í dɛ́ ɛ́wè	→	ɔ̀ídɛ́wè	→	'he did not buy a goat'
	c. i)	ɔ̀ dɛ́ úsó	→	ɔ̀dúsó	→	'he bought a head'
	ii)	ɔ̀í dɛ́ úsó	→	ɔ̀ídúsó	→	'he did not buy a head'

The presence of an high tone supports the postulation of the high tomorph in so many constructions in this language.

CHAPTER SEVEN

7.0 CONCLUSION

In this concluding chapter, I summarise the results of the research. This thesis has focused on three areas of the grammatical description of Ikhin: Syllable Structure and Assimilatory Processes, Morphological Processes and Tone System of Ikhin. In doing this, an autosegmental theory was adopted.

7.1 FINDINGS

I have proposed that Ikhin is a typical African language with some similar grammatical features of Edoid origin. It has thirty-eight phonetic consonants. I have established that only twenty-six of these consonants are phonemic. Extending this further, it was established that two of the major strategies of eliminating vowel sequence (cluster) in Ikhin are vowel elision and glide formation because the syllable structure of the language discourages cluster of vowels within word or across word boundaries. This language avoids cluster of consonants in loan words.

In my account of how nouns and pronominals are inflected for number and person, I established that the plural morphemes are /i/ and /e/ and that others are singular morphemes. Vestigial evidence of concord which is normally the hallmark of a noun class system was confirmed in modifiers, such as demonstrative and possessive pronouns. Regarding pluralisation, I demonstrated that plural marking is optional in Ikhin but that when nouns are marked for plural, there are three different ways in which this is carried out. First is through a contextually determined plurality. These are cases where there is no overt plural marking: as such a noun can be interpreted as singular or plural e.g. [ú-só] 'head', [à-kɔ̃] 'tooth'. The second strategy is a lexically determined plurality. These are cases where nouns take quantifiers and numerals. The third strategy is a morphologically determined plurality by means of a prefix vowel alternation e.g. [ò-rã̀] 'tree', [è- rã̀] trees [ɛ̀-wè] 'goat' [è-wè] 'goats', [u-gbà] 'thorn', [ì-gbã̀] 'thorns'.

I established that Ikhin is a two tone and downstep system. The two tones, high [H] and low [L] are distinctive while the phenomenon 'downstep' is not phonemic. A floating high tone 'tomorph' was discovered in Ikhin. This 'tomorph' performs grammmatical function. As in many other Edoid languages, this floating high tone 'tomorph' conditions the alternation between high and low tones in Ikhin by spreading leftward to the preceding low tone. The present tense construction is also indicated by this tomorph. It was equally established that the marker of a negative construction was this tonal morpheme.

It was however, established that this high tone 'tomorph' was not found in noun-numeral attributive construction.

REFERENCES

Adeniyi, H. 2007. "A Morphology of Edo". Ph.D Thesis, University of Ibadan, Ibadan.

Akinlabi A & Oyebade F. 1987. Lexical and Post Lexical Rule Application Vowel deletion in Yoruba. *Journal of West African Languages*. XVII: 2, 23 – 42.

Amayo, A. 1976. "A generative phonology of Edo (bini)" Ph. D. Thesis, Department of Linguistics and African Languages, University of Ibadan.

Armstrong R. 1968. Yala (Ikom): A Terraced Level Language with Three Tones: *Journal of West African Languages*. 5(1): 49 – 58

Aziza, R. 1997. "Urhobo Tone System". Unpublished Ph.D Thesis, University of Ibadan.

Bagemihl, B. 1991. Syllable structure in Bellacoola. *Linguistic Inquiry* 22: 589 – 646.

Bakare, C. 1975. Discrimination and Identification of Yoruba Tones: Perception Experiments and Acoustic Analysis: Language in Nigeria (eds) by Kolawole Owolabi.

Bamgbose, A. 1989. When rules fail: The Pragmatics of vowel elision in Yoruba: Annual Conference of the Linguistic Society of Nigeria, University of Jos.

Bennett, P. and Sterk, J. 1977. 'South Central Niger-Congo' Studies in *African linguistics* 8: 247 – 730.

Blench, R. 1989. New Benue – Congo. A Definition and Proposed Internal Classification. *Arbeits Papiere*. 17: 115 – 147.

_____1989. Nupoid in Bendol Samuel (ed). *The Niger-Congo Languages*. New York: University of America, pg. 305 – 322.

Catford, J. 1988. *A Practical Introduction to Phonetics*. Clarendon Press: Oxford.

Chomsky, N. and Halle, M. 1968. *The Sound Patterns of English*. New York: Harper and Row.

Clement, G. 1979. The description of Terraced level tone Languages. *Language* 55.

Clement, G. & Kayer, S (1983). *CV Phonology*. Cambridge: MIT Press.

Clement , G. & Goldsmith, J. 1984. *Autosegmental Studies in Bantu tone*. Dordredit Fortis publication.

Clement, G. N. 1985a "The Hierarchical Representation of Tone", in G.N. Clements (ed.) *Havard Studies in Phonology*, vol. 11, pp. 50 – 108.

Donwa, S. 1982. "The Sound System of Isoko". Ph.D Thesis, University of Ibadan.

Egbokhare, F. 1985. "Vowel Elision in Emai", Unpublished M.A. Dissertation, University of Ibadan.

_____1990. "A Phonology of Emai". Unpublished Ph.D Thesis, University of Ibadan.

Elugbe, B. 1973. "A Comparative Edo Phonology". Ph.D Thesis University of Ibadan.

_____ 1976. Noun Class Vestiges in Degema. *Africa and Ubersee Lix* (3): 24 – 33.

_____ 1977. Some implications of low tone raising in South Western Edoid. *Studies in African Linguistics, Supplement* 7: 53 – 62.

_____ 1978. On the wider application of the term 'tap'. *Journal of Phonetics* 6: 133 – 9.

_____ 1979. Some tentative historical inferences from comparative Edoid Studies. *Kiabara, Journal of the Humanities*, University of Port Harcourt, Nigeria 11: 82 – 102.

_____ 1983. Noun Prefixes in Proto-Edoid. In I.R. Dihoff (ed): Current Approaches to African Linguistics Publications in *African Languages and Linguistics* Vol. 1: 59 – 83. Dodrecht: Foris Publications.

_____ 1985. The tone system of Ghotuo. Cambridge papers in *Phonetics and Experimental Linguistics* 4: 1 – 21.

_____ 1989. Edoid. In J. T. Bendor – Samuel (ed.) *The Niger – Congo Languages*, 291 – 304. New York: University Press of America.

_____ 2009. Comparative Akedoid and West-Benue Congo. A Talk presented at the Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany, on November 23, 2009.

Elimelech, B. 1976a A Tonal Grammar of Etsako, Los Angeles California: UCLA Working Papers in Phonetics, 35.

Folarin, Y. 1982. "Aspects of the Phonetics and Phonology of Ikhin". Unpublished M.A. Dissertation, University of Ibadan.

Folely. J. 1977. *Foundations of Theoretical Phonology*. Cambridge, England: CUP,

Gleason, H. 1955. An Introduction to Descriptive Linguistics New York: Holt Rinehart and Winston.

Goldsmith, J.1976a. "Autosegmental Phonology", Ph.D Dissertation, Massachusetts Institute of Technology, Cambridge.

_____1976b. "An Overview of Autosegmental Phonology" *Linguistic Analysis*, Vol. 2, No. 1, pp. 23 - 68.

_____1979. "The Aims of Autosegmental Phonology", in Dinsen (ed.) *Current Approaches to Phonological Theory*. LLI.P., pp 202 - 223.

_____1990. *Autosegmental and Metrical Phonology*. Oxford: Basil Black well.

_____1993. 'Harmonic Phonology'. In Goldsmith, J. (ed) *The last Phonological rule*. Chicago: University of Chicago Press, 21-60.

_____1995. *A Handbook of Phonological Theory*. Cambridge: Black well.

Greenberg, J. 1955. *Studies in African Linguistic Classification*. New Haven. Compass Publishing Company,

_____1963.. *The Languages of Africa*, Mouton and Co., Hague.

Guthrie, M. 1948 *"The Classification of the Bantu Languages."* London: Dawsons of Pall Mall for the IAI.

_____1971. *Comparative Bantu*. Fambourough Gregg International Publisher, England. Vol. 4.

Hyman L. 1975. Phonology: Theory and Analysis. New York: Holt, Rinehart and Winston.

Kahn. D. 1976. *Syllable based generalizations in English Phonology*. New York: Garland Publishing Company.

Katamba, F.1989, *An introduction to Phonology*. London: Longman Group UK Limited.

Kenstowicz, M. 1994, *Phonology in Generative Grammar*. Oxford, UK Blackwell.

Kiparsky, P. 1968. *"How abstract is Phonology?"* Bloomington. Indiana: Indiana University Linguistics Club.

Kiparsky, P. 1971. 'Historical Linguistics. In Dingwall, W.A. Survey of Linguistic Science College: University of Maryland Linguistics Program. 576 – 642.

Kiparsky, P. 1985. 'Some Consequences of Lexical Phonology'. *Phonology Year*

Leben, W. 1973, The Role of Tone in Segmental Phonology. In L. Hyman (ed) Consonant *Types and Tone.* Southern California. *Occasional papers in Linguistic* No 1: 117- 149.

Liberman, M. 1974. 'On Conditioning the rule of Subject-Aux-Inversion. Papers from the fifth Annual meeting. North-eagtere Linguistic Society, pp. 11 - 91.

Marantz, A. 1982. Re reduplication. L113, 485 - 545.

_____ 1988. Clitics, Morphological Merger and the Mapping to Phonological Structure. In Hammond and Noam (eds).

Mc Carthy, J. & Prince, A 1986/1996. Prosodic Morphology Report no Rucc-TR-32. New Brunswick, NJ: Rutgers University Center for Cognitive Science.

Njwe, A. 2005 "Tone Analysis of Ngwo in Cameroon". Unpublished Ph.D. Thesis, University of Ibadan,

Oladimeji, O. 1990. Syntax and Semantics of Agbede Verb Phrase. Unpublished M.A. Dissertation, University of Ibadan.

Ostendorp, M, 2005. Autosegmental Phonology: An overview of some of the basic principles of Autosegmental Phonology http://en.wikipcdia org./wiki: 21:4:05

Oyebade, F. 1998. *A Course in Phonology.* Ijebu-ode Sebiotimo Publication.

Pierre Humbert, J, 1980. The Phonetics and Phonology English Intonation. Massachusetts Institute of Technology. Ph.D Dissertation, Cambridge.

Pike, K. 1948. *Tone Languages.* Ann Arbor: University of Michigan Press.

Pulleyblank, D. 1983. *Tones in Lexical Phonology.* Ph.D Thesis, M.I.T. Massachusetts.

Pulleyblank, D. 1986a. *Tone in Lexical Phonology.* Dordrecht: Reidel.

Pulleyblank, D. 1988. Vocalic Underspecification in Yoruba in *Linguistic Inquiry* Vol. 19, No 2, 333-270,

Sagay, E. 1 996. The representation of features and relations in non-linear phonology. Ph.D Thesis, Massachussetts, MIT. Viii + 196pp.

.Schane, S. 1973. *Generative Phonology.* Prentice-Hall, Inc. Englewood Cliffs, Jersey.

Selkirk, E. 1980. Prosodic domains in Phonology: Sanskrit revisited Aronoff. M & Kean, M-L (eds.) Juncture. Saratoga, Ca: Anma Libri 107 - 290.

Snider, K. 1999. *The Geometry and Features of Tone*. SIL, Inc. USA.

Spencer, A. 1991. *Morphological Theory*: Cambridge University Press.

Stewart, J. 1981. Key Loweing (Downstep/Downglide) in D Schang. *Journal of African Languages and Linguistics* vol 3 No 2: 113 – 138.

Tesar, B. and Smolensky, P. 1998. Learnability in Optimality Theory. *Linguistic Inquiry* 29, 229 – 268.

Urua, E. 1990. Aspects of Ibibio Phonology and Morphology Ph. D Thesis, University of Ibadan.

Webb, V. 1999. "Multilingualism in democratic South Africa: the Overestimation of language policy". In International Journal of Educational Development.

Welmers, W. 1973. *African Language Structures*. Los Angeles: University of California Press.

Westernmann, D. and Bryan, M. 1952. *Languages of West Africa. Handbook of African Languages, part 11*. London: Oxford University Press.

Williamson, K. 1970a. The Treatment of Downstep. University of Ibadan. *Research notes* 3 (2,3) 22 – 29.

_____1970b. Downstep/Downdrift . In Lan Maddieson (ed) Tone in *Generative Phonology* 23 – 33.

_____1971. Downdrift/Downstep. *Research Notes* (Ib). 3 (2 and 3) 23 – 39. University of Ibadan.

Yip, M. 1989. "Contour Tones". *Phonology* 6(1): 149 – 174.

_____ 2002. *Tone*. Cambridge University Press. United Kingdom

APPENDIX

ONE THOUSAND ENGLISH WORD LIST COMPILED BY SUMMER INSTITUTE OF LINGUISTICS AND TRANSLATED TO IKHIN

A – NUMBERS

1.	One	ɔ̀kpà
2.	Two	èvà
3.	Three	èhà
4.	Four	èhɛ̀
5.	Five	ìkhè
6.	Six	èhã̀
7.	Seven	ìkhìrà
8.	Eight	ìnɛ̀nɛ̃̀
9.	Nine	ìtʃ̀ìñ̀
10.	Ten	ìgbè
11.	Eleven	ígbéùɔ̀
12.	Twelve	ígbévà
13.	Thirteen	ìgbéhà
14.	Fourteen	ígbênɛ̃̀
15.	Fifteen	ìgbéhɛ̂
16.	Sixteen	khɔ̀ìniɔ̀sùè
17.	Seventeen	khɔ̀ihaèsùè
18.	Eighteen	khɔ̀ívásùè
19.	Nineteen	khɔ̀kpàsùè
20.	Twenty	ùwhè/ègbɔ̀
21.	Twenty-one	ùwhébíɔ̀kpà
22.	Twenty-two	úwhébíèvà
23.	Thirty	ɔ̀gbɔ̀
24.	Forty	ègbèvà

25.	Fifty	ègbèvèhìgbè
26.	Sixty	ègbèɬà
27.	Seventy	ègbèhèhìgbè
28.	Eighty	ègbénɛ̀
29.	Ninety	ègbèŋɛ́hìgbè
30.	(One)hundred	ègbìkhè
31.	Two hundred	ègbìrúɛbìvà
32.	Four hundred	ègbìhèvɛ́bènɛ̀

B –Family

33.	Marriage	ɔ̀kpɔ̀
34.	Father	ìrà
35.	Mother	ijā
36.	Aunt	óńwiɔ̀ɛ̀lɔ̀diɔ̃̀
37.	Uncle	ɉɔ̃̀pásábà
38.	Father's brother	ɉɔ̃̀kpásábàmī̀
39.	Father's sister	adégbésábàmī̀
40.	Mother's brother	ɉɔ̃̀kpásáhɔ̀mɛ̀
41.	Mother's sister	ɉɔ̃̀kpásáhɔ̀mɛ̀
42.	Elder sibling	amíɔ̃́kpàigbemā̃
43.	Younger sibling	àmɔdigbemɔ̃
44.	Brother	jɔ̃́kpà
45.	Sister	adégbéméme
46.	Elder brother	jɔ̃́kpà
47.	Younger brother	jɔ̃̀kpamíleke
48.	Elder sister	adégbémɛ̀
49.	Younger sister	àdegbemɛlike

50.	Twin	iwèvà
51.	Son	ɔmɔ́hè
52.	Granddaughter	ɔmaimɛ́lɔ̀kò
53.	Grandmother	iɲɔ̄málɔ̀dʒɔ̀
54.	Grandfather	iràmɔ̄lɔ̀dʒɔ̀
55.	Husband	ɔ̀dɔ̀
56.	Wife	ɔ̀hami
57.	His second wife	ɔ̀hawɔ́lòsèvà
58.	Son-in-law	òrṹà
59.	Senior	ɔdíɔ̄

C. Body/Corps

60.	Face	ɛhɔ
61.	Skull	ɔguasɔ
62.	Brain	ɛwā
63.	Head	uso
64.	Forehead	ɛha
65.	Hair(head)	èlò
66.	Grey hair	èdɛ̀
67.	Nose	ígùè
68.	Ear	èhɔ̀
69.	Eye	ɛhɔ
70.	Eye-brow	igogomɛ́ò
71.	Eye-lash	ímɛ̌hò
72.	Check	ikuā
73.	Beard	èɪuágbò
74.	Chin	èkuá

75.	Jaw	àŋgbɔ̀
76.	Mouth	ùnù
77.	Lip	úkwakwùnù
78.	Saliva	esɛ
79.	Spittle	
80.	Tongue	òhɛ̀rɛ̄
81.	Voice	uroro
82.	Tooth	àkɔ̄
83.	Neck	ɔ́hɛ̄
84.	Nape	ɛhɛ̄
85.	Throat	ɔ́kɔ̀nɔ̄
86.	Chest	ídamà
87.	Breast	éŋǎ
88.	Teat; Nipple	ukpaŋā
89.	Gullet	órògbò
90.	Hand	òbɔ̀
91.	Palm	ɛ́tòbò
92.	Fingernail	ɛwóbɔ̀
93.	Elbow	ukwùkwumu-òbɔ → ukwùkwumòbɔ̀
94.	Shoulder	ijaobɔ → ìjòbɔ̀
95.	Arm	òrāòbɔ̀ → òròbɔ̀
96.	Upperarm	íkwɛ́gubò
97.	Forearm	áhímòbɔ̀
98.	Armpit	jégère
99.	Finger	ɛkwɪɛ̄
100.	Back	ike
101.	Spine	igwáki

102.	Heart	ati
103.	Belly	ɛkɛ̄
104.	Guts	ùdù
105.	Liver	ibɛ
106.	Kidney	ákpůdu
107.	Bladder	úkwámòsà
108.	Leg	ówɛ́
109.	Calf	omɛ́là
110.	Heel	izɛ́bɛ̀ ~~izɛ́ → izigówɛ́~~
111.	Knee	Ugwáwɛ̀
112.	Toe(s)	ukāwɛ̀
113.	Foot	ɛtaówɛ̀
114.	Instep	izigówɛ́
115.	Rib(s)	igwétɛ̀
116.	Lung	ókɔ̀nɔ
117.	Buttocks	itikpohò
118.	Faeces	iʃā
119.	Urine	amósɔ̄̀
120.	Penis	ɛkhɛrɛ
121.	Anus	ófisà
122.	Vagina	ekpe
123.	Testicles	ikpévè
124.	Thigh	ɛ́tɔ̀
125.	Hips	itikpohò
126.	Navel	úkhő
127.	Skin	ɛkpaegbe → ɛ̀kpègbè
128.	Flesh	ehū

129.	Muscle	úkòbɔ́
130.	Bodyhair	étègbè
131.	Blood	ɔ́rā
132.	Sweat	èhɔ́hì
133.	Bone	
134.	Vein	ùrìà̀

D.

135.	People	àgbéhà
136.	Person	ɔgbeha
147.	Name	èvà̀
138.	Family	úkwɛ́dɛ̀
139.	Clan	akɛ̄gbéùnù
140.	Blackman	ɔ́gbàlùbì
141.	Bushman	ɔgbalɔ́hùgbò
142.	Man	ɔmɔ́hè
143.	Male	
144.	Woman	ɔkposo
145.	Female	ɔmálèkè
146.	Boy	ɔmɔ́gbàmà̀
147.	Girl	ɔmálèkà̀è
148.	Child	ɔmɔ
149.	Children	ɛ́βìə̀
150.	Baby	ɔmɔ
151.	Youth	ìβìà
152.	Maiden	ɔmɔ́lèkɛ̀

153.	Bridegroom	ɔmɔ́nélɔ́lɛrɔ̀kpɔ̀sɔ̀
154.	Old woman	ɔ̀kpɔ̀sɔ̀diɔ̃
155.	Old person	ɔdiɔ̃
156.	King(Sultan)	ɔ́bà
157.	Chief	ɔ́ldʒè
158.	Master	ɔrɛgwà
159.	Servant	íbɔ́í
160.	Male slave	
161.	Female slave	
162.	God	ɔ̀sàlɔ́bwá
163.	Devil	èsʊ̃
164.	Idol	àrìjɔ̀
165.	Ghost	oñ
166.	Witch	àzɛ̀
167.	Native	ɔmɔ́tɛ́
168.	Medicine	ikhū
169.	Fetish	ikhū
170.	Spirit	àtì
171.	Sacrifice	irwabo
172.	Curse	ékpì
173.	Friend	ósè
174.	Guest	ɔ́rè
175.	Stranger	
176.	Hunter	ògwà
177.	Weaver	ɔlɔ́dwèmì
178.	Potter	ɔmákhè
179.	Thief	òhì

180.	Spy	dùbɛ́

E.

181.	Nature	agbɔ̃
182.	Water	amɛ
183.	River	ɛ́dà
184.	Lake	ɛ̄dókhíhì
185.	Sea	ókũ̀
186.	Rain	amɛ
187.	Cloud	ōku
188.	Smoke	ighɔ̄
189.	Dew	eβu
200.	ice	odwámɛ́
201.	Fog	emilárɛ́zɔ́mì
202.	Thunder	àvɔ̀
203.	Lightning	ɲáɲá
204.	Sky	okū
205.	Wind	ohóhò
208.	Sun	ovɔ̄
209.	Moon	úkí
210.	Star	áɲàɲàuso
211.	Hell	okwuañsènà
212.	Heaven	ókwuañ
213.	Day	òɣò
214.	Night	àsɔ̀
215.	Morning	eβíɛ́

216.	Noon	oɣolótà
217.	Evening	ehámĩ
218.	Dawn	òɣógbe
219.	Darkness	ebibí
220.	Sunshine	ovāósɛ̀
221.	Sunrise	ovaúzɛ̀re
222.	Sunset	ovadeòɣò
223.	Moon-shine	ukeváré
224.	New moon	ukilɔ́gbɔ̃̀
225.	Month	uki
226.	Year	ùkpè
227.	Rainy	àmɛ́rùɛ̀
228.	Dry season	òn̄óvɔ̃̀
229.	Winter	ɔkwakwa
230.	Fire	erā
231.	Charcoal	igɛmi
232.	Ashes	ewūɛ
233.	Tree	orā
235.	Fig-tree	ɔko
236.	Leaf	òbèlogbɔ̃̀
237.	Twig	
238.	Branch	íkawɔ̃
239.	Root	íriwɔ̃
240.	Bark	éhàwòràà
241.	Seed	íkpɔ̃
242.	Trunk	egbésòrā

243.	Fibre	íríríwòwā̀
244.	Camwood	òrùè
245.	Fruit	íkpòrā̀
246.	Flower	óɗòdò
247.	Thorn	ugbō
248.	Grass	ikuku
249.	Mountain	éte
252.	Èarth	agbō
253.	Ground	otɛ́
255.	Sand	ekhɛ̄khɛ̄
256.	Dust	ibubu
257.	Mud	ɔgɔdɔ
259.	Swamp	ɔro
262.	Forest	úgbò
263.	Bush	ugbo

F.

264.	Village	égwè
265.	Town	ìjɔ́fūwō̄
266.	House	òβà
267.	Hut	ékò
268.	Compound	áfɛ́sɛ́
269.	Room	ɛ́khɛ́owò
270.	Wall	ódi
271.	Fence	òɡbà
272.	Door	ulogbo
273.	Doorway	unúɣòkhò
274.	Heart	ìkúkòrā̀

276.	Bed	ébàhɛ́
277.	Roof	égàlɔ̀
278.	Rubbish	ikuku
279.	Dung	ìsɔ́símàlù
280.	Dirt	ikuku
281.	Filth	iku
282.	Path	íxòxò
285.	Well	íkàga
287.	Spring	àmɛ́sùdò
288.	Stone	údò
290.	Iron	emìɣǔ
292.	Gold	ózè
294.	Tin	agolo
296.	Farm	ogwa
298.	Animals/Animal	ɛrā
299.	Aquatic Animal	ɛ̀ràmɛ́dà
301.	Bat	ákògā̀
302.	Scorpion	àkpì
304.	Chamelon	áhòkì
305.	Lion	ógòxò
306.	Leopard	ɛkpī
307.	Civet-cat	ólógbèreúsúgbò
309.	Elephant	ìnl
310.	Ivory	akɔ̄̀sìnl
311.	Buffalo, Bush cow	ɛránùgbò
312.	Bear	ɛrwàgbɔ̄̀
314.	Monkey	áxàrò ǝxǝrò
315.	Crocodile	ɛ̀ràmɛ́dà

316.	Alligator	ɔ́lĩ
318.	Lizard	úmɔ̀ɣɔ
319.	Red-headed Lizard	ùdékpe
320.	Snake	ɛ̀ɲɛ́
321.	Python	ìkpì
322.	Crab	òzì
323.	tortoise	ɛ̀jɲ̀ĩ
324.	Spider	àɲwā́kwà
325.	Louse	irū
327.	Butterfly	avjɛvjɛ
328.	Anthill	úmàhaɛ
329.	Ant	iχíχĩ
331.	White ant, termite	édó
332.	Mosquito	ewhàwà
333.	Fly	ítʃà̀
335.	Wasp	ásiko
336.	Bee	éjɔ̄́
337.	Honey	amɛ̄́jɔ̀̄
339.	Snail	úrùè
340.	Frog	ákèrè
342.	Squirrel	ɔ̀tà̀
343.	Cow	ɛ́là
344.	Calf	óvímàlù
347.	Goat	ɛ̀gwè
348.	(He) Goat	òmùkò
350.	(Ewe) sheep	agbo
351.	Ram	orúmà
352.	Lamb	ówàgbò

353.	Horse	ɛ́ʃí
355.	Camel	íkwɛ́kwɛ̀rɛ̀
356.	Donkey	ɛrwɛ̀

Various kinds

358.	Antelope	ùzò
359.	Antelope	óχìßò
360.	(Hare) Rabbit	ofelɔ́kwà
361.	Chicken	ɔ̀ɣɔ̀
362.	Cock	ɔ̀ɣɔ́kpà
363.	Guinea-fowl	ɔɣɔ́gbò
364.	Mouse	áròfè
365.	(Bush) Rat	efógbò
366.	Dove	ẹ́lékùkù
370.	Parrot	ayékòtó
371.	Duck	kpɛkpɛjá
372.	Turkey	tolòtolo
373.	Pig	esi
374.	Sow	esilɔ́kpòsò
376.	Boar	òròvì
377.	Porcupine	újɛ̀ɣɛ̀
378.	Dog	àwà
379.	Cat	ológbèrè
381.	Bird	ófìòkū
382.	Feather	urū
383.	Wing	abebe
384.	Egg	ɛkhɛ̀ɔhɔ̀
385.	Vulture	uɣū
386.	Hawk	òdègbè

388.	Claw	ɛgwɛ̄
389.	Shell	úgògòwɔ̄
390.	Horn	ikwɔ̄
391.	Tail	urū
392.	Food	ɛmáhè
393.	Meal	ɛ̀rālɔ́gbɔ́
395.	Fat; grease	égbā
396.	Loin	bùrúkù
397.	Fish	eχhɛ
398.	Soup	ɔ́ʃà
[illegible]	[illegible]	[illegible]
400.	Milk	eɲɛ́là
401.	Sugarcane	ékè
402.	Salt	ugwɛ̄
403.	Pepper	aʃèrè
404.	Red-pepper	aʃelɔ́hɛ̀
405.	Onion	àlùbásà
406.	Yam	erū
408.	Maize	ɔ́kà
409.	Guinea corn	ikhī
411.	Millet	ìhī
415.	Palm tree	ɔ́rādì
416.	Palm oil	aβísàdì
417.	Okra	úkwábɔ́
418.	Beans	lato
419.	Bemi-seed	íkpɔ̄

420.	Oil	aβi
422.	Bambara groundnuts	ságwɔ̀
424.	Rice	íjɛ̀sì
425.	Kolanut	ɛ́βèrè
426.	Wine	áɲɔ̃̀
427.	Palm wine	áɲãdì
428.	Alcholic beverage	áɲɔ̃̂
429.	Beer	áɲɔ̃̀
430.	Banana	ɔgɛdɛ
432.	Cassava	íbɔ̀bɔ́dì
433.	Orange	ómɔ̀kà
434.	Melon	ehɔi
435.	Tobacco	itábà
436.	Cotton	ówũ̀
437.	Cotton plant (tree)	orãwũ̀

I. Implements and Cloths

438.	Stick	òrã̀
439.	Walking stick	orã̂lárɛ̀tsā
440.	Spear	ura
441.	Saber sword	ókpɛ́kù
443.	Arrow	ókpɛ̀kù
445.	Drum	ódèvà
446.	Basket	ákà
447.	Mat	abu
448.	Hook	uɣɛ́lɛ́kɛ̀
449.	Gun	ohíʃi

450.	Powder	eχahĩ
451.	Matchet	ɔ̀pià
453.	Axe	ùwamã̀
454.	Handle	ɔ̀bèmì
455.	Notch	uɣokpa
456.	Hoe	ɛ́gwɛ̀
457.	Sickle	ózúgè
458.	Scissors	ɔmɔ́gàdʒì
459.	Rope	ùwì
461.	Thread	ówù
462.	String	ahílɔ́tɔ
463.	Needle	ágbèdè
464.	Chain	ìɣã̀
465.	Chair	aga
466.	Bench	ɔ̀bè
468.	Ink	óhɛ̀
469.	Soap	ósà
470.	Fan	ɔ́bɛ́bɛ̀
471.	Calabash	úko
472.	Firewood	oralárɛ̀kpɛ̃̀
473.	Pot (cooking)	akì
474.	Water jar (pot)	akjàmɛ
475.	Spoon	síbì
476.	Mortar	ɔ̀kɔ̀
477.	Pestle	ówhɔ̀kɔ̀
478.	Grinding stone	udoláɾɛ̀lɔhèmì
479.	Bag	ɛkpa
480.	Boat	íkèno

482.	Earring	igolúsèjɔ̀
483.	Bracelet	ózè
485.	Beads	ugbakū
486.	Robe (male)	ùgbakū
487.	Dress	emilákùwegbè
488.	Waist-cloth	ɛ̀gbakū̀
489.	Clothing	ukuláhɛ̀fwɛgbè
490.	Cloth	úkpò
491.	Trousers	ísòkòrò
492.	Hat	àrū̀
494.	Shoe	ibāta
496.	Shirt	áwú

J. Life

497.	Thing	èmì
498.	Language	uro
499.	Word	ùrònù
500.	words	ágbɔ̄́
501.	Song	ìjórò
502.	Story	òχà
503.	News	iɲɛmi
504.	Work	ebe
505.	War	óχā
506.	Sleep	émjà
507.	Dream	émùnà
508.	Birth	ékwɛ̀
509.	Death	éwù
510.	Fear	òfɛ̄
511.	Jealousy	règbéòmɛ̀

512.	Corpse	ọrī
513.	Sickness	ɔ́tòmɛ̀
515.	Health: Healthy	ɔ́hī̃tòhɔ
516.	Strength	étòtò
517.	Cough	òwhɛ̀
518.	Hiccup	úkpégèlu
519.	Fever	ibà
520.	Sore: wound	ɛma
521.	Abscess	úkwāíwā́
523.	Truth	ata
524.	Lie	ìχíʒè
525.	Sobbing	ɛ́kɛ́mɛ́jɛɣɛ̀
526.	Place	áwùkpɛ̀
527.	Haste	étwà
528.	Time	ɛɣɛ̀
529.	Fatigue	àbɔ́ífò
530.	Money	éɣo
531.	Market	ákí
532.	Load	ìɣùwà
533.	Hunger	osā
534.	Thirst	òʃámɛ̀
536.	Smallpox	ówàkhè
537.	Shadow	ódìdi
538.	Light	ɔ́khā̀
539.	Heavy	emilɔ́kwa
540.	Light	ɔ́kpā̀
541.	Correct	ɔ́sɛ́

542.	White	emilɔ́fwà
543.	Black	emilɔ́bìhĩ̀
544.	Red	emilósàhɛ̃̀
545.	Green	ɔrɛ́obèbè
547.	Blue	èmìlùbí
548.	Big	èmilɔ́luwà
549.	Large	emilɔ́dòkpè
550.	Small	emilíke
551.	Many	emílɔ́hū
552.	Few	emilɔ́íbū
553.	All	eremɛ̃rɛ̃
554.	Thick	ɔzeze
555.	Thickness	ɔ́kwaíkpòpo
556.	Thin	ózɛ̀gɛ́zɛ́gɛ́
557.	Fat	emílɔ́kwère
558.	Wide	βɛ́
559.	Narrow	hēre
560.	Hard	ɔ́zeze
561.	Soft	ɔrúgwɛ
562.	Difficult	ɔ́mjami
563.	Easy	ɔ̀hìmjàmi
564.	Sweet	ɔ́híɣɛ
565.	Sour	ɔ̀híɛɣè
566.	Bitter	ɔ́làha
567.	(Taste) sharp	ɔ́mū

568.	Fresh	ɔ́gbɔ̄
569.	Ripe	ɔ́χɛ̄χɛ̄
570.	Unripe	ɔbā
571.	Deep	ɔ́giī
573.	Shallow	tèɣɛ́lɛ
574.	Long	ɔ́lua
575.	Short	ókere
576.	Good	ɔ́humâ
577.	Bad	ɔ̀hjúmȁ̄
578.	Early	evjɛ̀
579.	Late	tɛ́gbè
580.	Strange	ɔ́ɲwánwáwɔ́
582.	Empty	óhò
583.	Full	ɔ̀vɔ̄
584.	New	ɔ̀gbɔ̄
585.	Old	ɔ̀gbótɛ̀
586.	Young	ɔ́molike
587.	Wild	ɔ̀whɛ́
588.	Lazy	íkhā́
590.	Round	lɔ́khèé
591.	Smooth	lɔ̀khɔ́ɔ̀
592.	Rotten	ɔ́ràbɔ̄i
593.	Extinguished	ɔ̀fū́
594.	Ended	ɔ̀fo
595.	Dry	ɔ́kaka
596.	Wet	ɔ̀χɔrɔ

597.	Dirty	ɔ́kā
598.	Clean	ɔ́ʃiɛ̄
599.	Dear	ùkùtù
600.	Cheap	lɔ́kpɔ
601.	Greedy	ɔ́hĩ̀bùmɛ́
602.	Stupid	ɔ́zwɔ
603.	Careless	ɛ́fwémíwɔ̀
604.	Rich	áfwé
605.	Poor	ésā
606.	Straight	ɔ́dàdà
607.	Crooked	ɔ́gbɛ̄gwò
608.	Near	sìβa
609.	Far	òhísíβa
610.	Sharp	ɔ́mu
611.	Blunt: dull	oruru
612.	Bright	ɔrɛmi
613.	Shinning	ɔ̀hídàɣáhīɣāhī
614.	Beautiful	òsè
615.	Ugly	ɔχjɛ̄
616.	Hot	ɔ́tòhɟà
617.	Warm	ɔ́tòhɟàwɛ́
618.	Cold	ɔfɔfɔ
619.	Cool	ɔ̀fɔ́fwábɔ́
620.	Strong	ɔtoto
621.	weak	ɔ̀hítòtotàhà
622.	Deaf	ɔ̀ràhèhɔ

3.	Dumb	ódi
4.	Blind	ɔrwaeho
5.	Today	ɛnà
6.	Yesterday	lódɛ̀
7.	Tomorrow	ákwɛ̀
8.	I	mɛ́mɛ́
9.	(You) thou	jɛgwɛ
10.	He	ɔrɛ́
11.	We	ɲãmɲ̃
12.	Ye (you)	wɛ́wɛ
13.	They	ɛ́rɛ
14.	And	bjɛ̀
15.	Because	sale
16.	If	ɔhàhíkirí
17.	Some	èkɔ́wɔ̀
19.	Other	elíkɔ
10.	Where?	kíjèenì
11.	When?	kɛhɛ́ɛ́nì
12.	How	káwùrwɔ̀
13.	How many	èka
14.	Why?	mɔ́híkíhã̀
15.	Who	kɔ́hìkíhã̀
16.	What?	mɔ́níkihã̀
17.	Here	anā
18.	There	jeni
19.	This	ɔ̀nà
50.	That	ɔ̀nì

652.	As	àβɜ̀èkijà
654.	Everyone	agbɔmɛhɛ̄
655.	Everything	emimɛrɛ̄
656.	Not	χɔ̀
657.	Nothing	àímèmíɔsò
658.	No one	èwɔ́gbéhà
659.	(-) self	jɛ́wɛ́
660.	In	ɛ́kɛhā
661.	Inside	ɛkíso
662.	Interior	ɛ́kā́gbò
663.	In the middle	ɛ́sɛ̄
664.	Side	èfɛ̄
666.	At	ani
667.	Outside	óhè
668.	Exterior	aligboho
669.	Above	ɔ̀kpètè
670.	Underneath	ɔ̀kpòtɛ̀
671.	Until	ɛ́ɣɛ́lùvarè
672.	Around	ílɛ̀gà
673.	For	lɔ
674.	On	usohɔ
675.	With	bí
676.	Front	ízàhɔ́
677.	Behind	ahī
678.	Rear	ɔ̀híkpɔ̀
679.	Left	ɔ́gòbɔ̀

680.	Left-side	ìjɔ́kpɛ́ògbɔ̀
681.	Right	òbɔ̀djɛ̄
682.	Right-side	ísòbòdìɔ̄
683.	Between	ésàa
684.	North	óɣòródò
685.	South	ogedekpósi
686.	East	ígwerékè
687.	West	ólòkudè
688.	End	ɔ̀ʃo

M. Verbs

689.	Be	dè
690.	Eat	èmì
691.	Chew	zuga
692.	Drink	jɔ̄
693.	Swallow	mɔ́jɔ̀
694.	Urinate	enamósà
695.	Defecate	ɔnísɔ̀
696.	Spit	es_ɛ
697.	Vomit	éékpà
698.	Sweat	èhɔ́hì
699.	Coagulate	emíkùgbè
700.	Breather	
701.	Yawn	éhòwàrì
702.	Sneeze	étijò
703.	Snore	ɔ̀hísòbe
704.	(Foam) froth	ópò
705.	Do	rwɔ̀
706.	Go	lɛ̀

707.	Come	vàrè
708.	Come here	varéwànà
709.	Come out	djȁrè
710.	Return	fègbédèlègbè
711.	Enter	ròlɛ̀
712.	Arrive	vàrè
713.	Go out	dóhè
714.	Go about	játjȁtjȁ
715.	Go away	swànárè
716.	(precede) go in front	kpízàrò
717.	Go up	tè
718.	Go down	tɛ̀
719.	Leave (behind)	zɔbɔáhȉ
720.	Accompany	òhùmɛ̀
721.	Migrate	twálɛ̀
722.	Walk	tʃȁ
723.	Run	là
724.	Mount	mɔ́hìjȁ
725.	See	wɔ̀
726.	Hear	hɔ̏
727.	Smell	hā
728.	Stink	
729.	Touch	ròbɔ́swɔ
730.	Examine	wɔ́ìgwè
731.	Taste	ráìgwè
732.	Resemble	ɔ́xɔ̏rā
733.	Climb	hìjā
734.	Drop	onohĩ wɔ́tɛ̀ onchĩuɔ́tɛ̀

735.	Be left behind	zwɔbɔ́ßwɨ̀
736.	Pass by	ràmɛ́rè
737.	Pass in running	làràmɛ́rè
738.	Pass over	ràmɛ́rè
739.	Pass through	ràhérè
740.	Turn around	fègbédèlègbè
741.	Avoid	gwègbè
742.	Rub	rwɔigbórò
743.	Send	jɔókɔ̀
744.	Scratch	tɔ̀lɔ
745.	Scrape	jàwɔ̄
746.	Shave (se) raser	rèhɔ́
747.	Stamp	ahɛrɛ̄
748.	Fight	ókhɔ̄
749.	hit ; Strike	ʃjɔ́
750.	Beat	gbɔ̀
752.	Protect	ákwíkwìhjɔ
753.	Conquer	ɔ̀hóhɔ̄́
754.	Hunt	ébàbà
755.	Catch fish	ɔ́móhɛ́hɛ́
756.	Catch	mù
757.	Chase	χwɔ̀
758.	Escape	lafwè
759.	Shoot (gun)	ʃjoisi
760.	Stab	swɔ̀
761.	Bite	ìjákɔ́
762.	Pierce	ʃjɛ

763.	Set a trap	twɔ́jtákùtè
764.	Domesticate	gbɔ́ɪɛ́rògbè
766.	Slaughter	vàlɔ
767.	Kill	gbɛ̀
768.	Die	húwù
769.	Skin	ɛ́kpàigbè
770.	Peel	χɔ́rɔ
771.	(leak) flow	élà
772.	Float	swámɛ́
774.	Dip	ʃɛ̀ɔ̀wɛ́kɛ̀ɔ̄
775.	Drip	ʃɔ̀ikúβɔ́
776.	Flap the wings	gbàbèbèsɔ́
778.	Pull	màjɛ̄
779.	(bring) carry	mwɔ́rè
780.	Carry a child	mwɔ̀mɔ̀
781.	Carry a child on the back	mùɔ́mɔ́βɔ̀βɔ̀
782.	Carry on the head	mɔ́ìgwà
783.	Drag	sùmɔ
784.	Lift	mɔreté
785.	Put:lay down	mɔ́ótɛ́
786.	Put away	mɔsuánìrè
787.	Put into	mɔ́wɛ́kɛ́wɔ̄
788.	Put straight	mɔ̀wɔdádá
789.	Put through	mòmɛwɛ́ òkwèrè
790.	Lie down	mjɛ̀wótɛ̀

791.	Sleep	mjɛ̀
792.	Dream	mùnà
793.	Rest	èχìhaβɔ̀
794.	Be tired	àbófòmɛ̀
795.	Shelf	emiláxùáúkpòhe
796.	Garden egg	ohóxò
797.	Owl	ígbògbogùò
798.	Wound	mìkùʃè
799.	Ashes	ewuɛ
800.	Tadpole	íkpòwùso
801.	Loincloth	úkpólárèmiɛ
802.	Ridge	íkilɛ
803.	Swelling	ɔ̀vɔ̄
804.	Vulture	úgwṹ
805.	Throat	ɔ́kɔ̀nɔ̃́
806.	Club for fighting	ukpákpòlárɛ̀gbégbè
807.	Large sore	òβàlɔ́ɣī
808.	Weed	irū
809.	Termite	ehɛ̄
810.	eclipse	ùkìbíhɔ̀hiù
811.	lung	ɔ́hɛ̃́
812.	Place	áhùkpà
813.	Herb/leaf	òbè
814.	jug	emíláxùmàhe
81-	ele phant grass	òbènì
816.	jigger	uwam
817.	Monkey	áhiɣà

818.	razor	ubɛ
819.	sand paper tree	obilárɛ̀kuɛ̀rà
820.	men's dance	èbàsímɔ̀he
821.	notorious person	ɛ̀hɔ
822.	lizard	úmɔ̀ɣā
823.	mirror	ùɣegbe
824.	monkey kola	efesáhīgà
825.	baboon	áxàro
826.	cough	òwɛ̀
827.	bangle	ózè
828.	heavy shoes	ìbàtàlekùà
829.	witchcraft	azɛ̄
830.	name	èvɔ̀
831.	toilet	ejánìsɔ̀hé
832.	python	íkpì
833.	bachelor	ɔ̀mɔ́lɔ́hírɔ̀kpòsò
834.	potato	èrébò
835.	juju	árìɔ̀
836.	mosquito	èvàvà
837.	rice	íhɛ̀sì
838.	hawk	ɔ̀dègbèlikpɔ́kpɔ̀
839.	summit	ákúsògbè
840.	whistle	ífèrè
841.	fishing net	ɔhāxā
842.	female bag	ɛkpásɔ́kpòsò
843.	snail	íkpèdi
844.	cocoyam	íkúòkúò

845.	lamp	ɔ́kpɔ̀
846.	worm	úrū
847.	headtie	isíkàfù
848.	ocean	úḳū̀
849.	groundnut	ságùɔ̀
850.	boundary	uru
851.	Rheumatism	ijáxè
852.	millipede	úrumórè
853.	molar	akɔmíxìā̀
854.	badluck	ɔ̀hàmúhà
855.	bow	tɛ́gànà
856.	tax	àbɛxò
857.	book/studies/education	òbè
858.	army ant	èlégbàlɛ́xɛ́
859.	hamarttan	ɔkuakua
860.	rag	érākpò
861.	bighat	arūlékùà
862.	comb	ásɔ̀hɔ̀
863.	jug	úkó
864.	soap	ósà
865.	wallgecko	ɔxowa
866.	grasshopper	ódìgbátò
867.	lid	ígògɛ́hò
868.	pool	ógū̀
869.	lock	fjɔ́
870.	metal	èmìxū́
871.	hail	exa

872.	bone	ùgùa
873.	shadow	ódìdì
874.	ritual place	àbo
875.	veranda	áfɛ̀sɛ̀
876.	a day of the week	ɛlɔkpósɛ̀
877.	fowl cage	jawáɔ̀xɔ̀hè
878.	white yam	erūlɔ́fúà̄
879.	odour	ɔ̀hià
880.	breath	eɲɛ̄
881.	eye mucous	exɔ
882.	maggot	exɔ
883.	feast	ùkpè
884.	porcupine	újɛ̀gɛ̀
885.	net	axɔ̄
886.	imprisonment	íɣā
887.	breast	ìjɛ
888.	centipede	ɔ̀haβi
889.	chimpazee	áxàrò
890.	pumpkin	ɛ̀ʃɲɔ́
891.	trunck	ékùòrà
892.	squirrel	ɔ̀tā̀
893.	cockroach	àhɛ́hɛ̀
894.	storm	óhò
895.	boil	ɛma
896.	penalty	ehere
897.	pepper	àʃè
898.	bicycle	íkɛ́kɛ

899. light ɔ́kpā̀
900. crack ɔ̀vá
901. family étù
902. necklace ilé
903. ringworm úgbàlehò
904. funeral àhíguɛ
905. pillar oruku
906. bowl ítàgana
907. dish tɛgalékúà
908. ladder ígbàlàkà
909. belt ùgbàkū
910. hare éhɔ̄̀
911. spoon ʃibi
912. Load igùà
913. eye catarach ɔ́tòmɛ́séhò
914. kernel ivī
915. tongue ówɛ́rɛ
916. truth ata
917. weck ɔhɛ
918. spear ùra
919. bull òrumà
920. broom ohī̀sà
921. case ɛ́zɔ̀
922. grave idi
923. flood ùwóyò
924. tooth àkɔ̄
925. friend ɔ́sè
926. law uyi

927. voice uro
928. small intestine eha
929. whistle ifere
930. circumcision ɛ́kùɛ̀
931. oracle ahìkùɛ́
932. orphan ɔlɔhímɛ̀rábìɔ̀
933. traditional gong ódètàlèdʒɔ̀
934. chalk/clay ówɛ̀
935. bush úgbò
936. wine àɲɔ̀
937. debt òsà
938. wild pig èsúgbò
939. antelope ùzò
940. rainbow ɔ̀mɔ́gàdʒì
941. grasscutter ibùà
942. knee ùgùàhɔ́hɛ̀
943. god árìɔ̀
944. drum ódèʃà
945. dysentary ɛ́kɛ̀̃là
946. bitterleaf òlàha
947. charcoal ígɛ̀mì
948. pillar/support oruku
949. permanent farm ògùàmɛ̀
950. play édòhò
951. sole òdèhò
952. gum tʃɔ́hìbà