INTERFACE OF TONE AND MORPHEME IN ABANKALEKE IGBO

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DEDICATION

To God, for His grace and faithfulness.
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ABSTRACT

The earliest studies of the speech form the Abankaleke people (Ezza, Izii, Ikwo and Ishielu) posit that their language is not Igbo but a different language. Some of these scholars reason that because the speech form of the Abankaleke people sounds, it is another linguistic system while others claim that they migrated from somewhere among the Ntezi and Okpoto people and originally spoke a language of the Bantu family. However, evidence from more recent works point to the contrary and classifies the language of the Abankaleke people as a dialect of the Igbo language. This work therefore sets out to among other things identify the contrastive tone levels in Izii and Ezza varieties of Igbo, find out the extent to which the differences perceptible in tone within Izii and Ezza contribute to the observable variations among the dialects and with the Standard Igbo, determine the relationship between the syllable structures of Izii, Ezza and the Standard Igbo and to verify if the differences observable in the Abankaleke dialects and the Standard Igbo are significant enough to classify them as a separate linguistic system. Random sampling technique was used and three adult speakers of Izii, Ezza and the Standard Igbo respectively were sampled. Structured personal interview was used to elicit three tokens of each item from the respondents. An adapted version of the Ibadan wordlist of 400 Basic items was used and the data were recorded electronically. The data analysis was carried out with the Speech Tools Analyzer Version 3, 0. 1 (1999-2007) and Phonology Assistant Version 2.2 (1995-2005) software packages developed by the Summer Institute of Linguistics (SIL) International. These were used in recording, transcribing and in the acoustic analysis of the data. The theoretical frameworks of lexical phonology and Autosegmental phonology were used in the phonological aspect of the analysis while Acoustic Experimentation was used in the acoustic aspect. In addition to the three level tones in the Standard Igbo, Ezza also has the high raising, the high falling as well as the low rising glides. The syllable structure of Ezza is such that there were instances of closed syllables and consonant clusters. For Izii dialect, there were also instances of closed syllables. The Izii dialect also the high raising tone but no contour tones. The tone pattern of non cognates was however different. The differences perceptible in tone within the Izii and Ezza dialects contribute to the difference in the overall perception of the speech form of the Abankaleke dialects as a result of the occurrence of contour tones and the high raising tone in these dialects. The spectrographic analysis (from the formant features) confirmed the existence of consonant clusters in Ezza and codas in Izii and Ezza dialects. Also the measurement of the fundamental frequency levels revealed no significant differences within the dialects and
the Standard Igbo except for the high raising tone which was found to be higher by about 15Hz than the usual height observable in the dialects. In all, the results of the phonological and acoustic analyses showed that the differences between the Abankaleke dialects and the Standard Igbo were not significant enough to classify them as a separate linguistic system.
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5.1 Findings

5.2 Summary and Conclusion

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CONVENTIONS USED

Tone Marking Convention: Every tone is marked.

\[ \equiv \quad \text{Higеп тоне} \]

\[ \exists \quad \text{Low tone} \]

\[ \downarrow \quad \text{Downstep tone} \]

\[ ! \quad \text{High raising tone} \]

\[ \perp \quad \text{High falling glide} \]

\[ \& \quad \text{Low rising glide} \]

\[ // \]

\[ \text{Hz} \quad \text{Hertz} \]

\[ \text{Fo} \quad \text{Fundamental frequency} \]
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CHAPTER ONE

Introduction

1.1 Background of the Study

Igbo studies in general have received renewed interest and attention from scholars in the recent past. The renewed interest has been a cheering development especially in this period of increasing demand and expectations from the Igbo world for an accelerated pace in the development of the Igbo language. In the face of the present advancement in information technology, linguistic studies need to move with the times and the Igbo language in particular cannot be allowed to be left behind.

It is our belief that every dialect of the Igbo language has a contribution to make towards the development and advancement of the language as the most binding and priceless heritage of the Igbo people. That is why the call has gone out repeatedly from all lovers of the Igbo language that more serious academic research be carried out on the language to make for a better understanding and insight into the form and function of the Igbo language and so enhance its effectiveness as a channel of communication (Ikekeonwu, (2005), Maduewesi, (2005), Ohiri-Aniche, (2006), Emenanjo (2006)).

Abankaleke dialect cluster is among the least studied of all Igbo dialects. It is the hope and aspiration of the researcher to add to the available reliable data on the dialect for further analysis and consequently greater insight into the dialects and the Igbo language in general. However, a number of research works have been carried out on the Abankeleke dialect cluster. Ikekeonwu (1986), in a linguistic and geographical classification of Igbo dialects identifies six dialect clusters as shown below:

- Northern/Waawa Igbo (N/WI) with varieties spoken in Enugu, Nkanu, Nsukka, Awgu, Udi, Achi, Abakaliki and so on.
- Niger Igbo (NI) with varieties spoken in Asaba, Agbor, Ukwualii and so on.
- Inland West Igbo (IWI) with varieties spoken in Onitsha, Awka, Aguata and so on.
- Inland East Igbo (IEI) with varieties spoken in Umuahia, Orlu, Owerri, Ngwa and so on.
- Aro Igbo (AI) with varieties spoken in Arochukwu and other Aro settlements.
- Riverian Igbo (RI) with varieties spoken in Rivers State of Nigeria.
With her classification, it has become acceptable in Igbo academic circles that the speech forms of the Abankaleke people are dialects of the Igbo language, Izii and Ezaa inclusive (Udoh, 2004; Nwaozuzu, 2008). However, some works such as Meir and Meir (1964-1970) and Bendor Samuel (1975) feel otherwise. Unfortunately, there has not been any formal study on the Izii or Ezaa and other dialects within the Abankaleke dialect cluster of any appreciable depth that has systematically established the fact. Ukpabi (2003) attempts to do so but the tonal level is not included in her analysis so that the extent and nature of the perceptible tonal differences between Abankaleke speech forms and those of other Igbo dialects and indeed the Standard Igbo have not been established. There is therefore a need to study the interaction between morphemes and tones in the Abankaleke dialect cluster especially in the two most controversial dialects of the cluster, Izii and Ezaa hence the desire to engage in this work.

1.2 Statement of the Problem

Many Igbo linguists have devoted their time to the study of their own dialects or some other popular dialects resulting in the fact that some dialects have remained largely unstudied. One of such dialects is the Abankaleke dialect of the Northern/Waawa dialect cluster of Igbo. The earliest studies of the speech form of the Abankaleke people (Ezaa, Izii, Ikwo and Ishielu) posit that their language is not Igbo language but a different language. The scholars give reasons for their assertions. One group believes that the language spoken by the Abankaleke people is not Igbo language because the sound is different from the Igbo language. Such scholars include Meier and Meier (1964-1970) and Bendor – Samuel (1975) who wrote grammar books and translated the New Testament of the Holy Bible into Izii. Another group, Duncan (1907) and Hoffman (1987) reason that the Abankaleke people migrated from somewhere among the Ntezi and Okpoto people (their non-Igbo speaking neighbours) to where they now occupy. They therefore argue that the Izii, Ezaa and Ikwo were not originally Igbo speaking. Their original language was of the Bantu family under which they therefore classified the language of the Abankaleke people (Anyanwu, 2005).

However, evidence from more recent works is at variance with the foregoing. Scholars such as Ikekeonwu (1987) Ukpabi (2003) Udoh (2004) Anyanwu (2005) and Nwaozuzu (2008) classify the language of the Abankaleke people as a dialect of the Igbo language. Also, according to Anyanwu (2005),
.....available linguistic evidence points to the probability that the Igbo language started assuming its distinctive form from the Kwa sub-group of the Kordofanian language family at least 6,000 years ago. Ezaa, Izii and Ikwo oral tradition and other available evidence relating to their origin and migration suggest that the group migrated into North-eastern Igboland from Arochukwu which is Igbo speaking at about 1600 AD (Chapman 1932, Alagu 1993). Granted this, it is reasonable to conclude that these Igbo groups migrated to their present abode as Igbo speaking people.

Ikekeonwu (1986) in her classification points out that the Izii dialect is of particular interest because of its tonal patterning. She points out the phonological phenomenon called the “upstep”. She suspects that the ‘upstep’ may account for much of the perceptible difference between Izii and many other dialects of Igbo as no other Igbo dialect has so far been reported to possess the ‘upstep’ phenomenon.

So far, to the best knowledge of this researcher, no investigation of any appreciable magnitude has been carried out to establish the fact or otherwise of the above claim in the Abankaleke dialects. In Okorji (2002), the ‘upstep’ tone is discussed in Igbo but the occurrence is in the Inland West Igbo dialect of Umuchu where she describes the ‘upstep’ as occurring at syllable final position in words, phrases and sentences.

There is therefore a need to study the interface of tone and morpheme in the Abankaleke dialects to find out the interaction between tone and morpheme in them and thus bring to the fore the features responsible for the peculiar tonal phenomenon perceptible in the speech form of these communities specifically in Izii and Ezaa dialects.

1.3 Research Questions

With the above problems in mind, the following questions are posed to serve as a guide and the research is structured in such a way as to provide answers to them.

a. To what extent are tone levels identifiable in Izii and Ezaa?
b. In what ways do tones interact with the syllables in Izii and Ezaa?
c. How does the tone pattern vary on specific linguistic items in Izii and Ezaa?
d. To what extent do the fundamental frequency levels of tone in Izii and Ezaa vary within themselves and with those of Standard Igbo?

e. In what ways are the syllable structures of Izii, Ezaa, and the Standard Igbo related?

f. To what extent can the observable differences between Izii, Ezaa, and the Standard Igbo be used to classify the Izii and Ezaa dialects as a separate linguistic system?

1.4 Purpose of the Study

The purpose of this study is to do the following: to

a. identify the contrastive tone levels in Izii and Ezaa,

b. find out the structure of the syllable in Izii and Ezaa,

c. investigate the consistency of tone in specific linguistic items within Izii and Ezaa,

d. determine the relationship between the fundamental frequency level of tone within Izii and Ezaa and with those of Standard Igbo through acoustic measurements,

e. find out the extent to which the differences perceptible in tone within Izii and Ezaa contribute to the observable variations among the dialects and with the Standard Igbo, and

f. verify if the observable differences between the Izii and Ezaa dialects and the Standard Igbo are significant enough to classify them as a different linguistic system.

1.5 Significance of the Study

The work will make the interaction between tone and morphemes in word formation clearer to the morphologist. It will make available to the phonologist and linguists in general reliable data on Izii and Ezaa dialects in particular and the Igbo language in general for use in further linguistic analysis. The dialectologist will find the work useful as it would further portray tone as one of the criteria for delineating dialects in tone languages.
This work will be relevant to the general public in resolving the age long controversy over the status of the speech forms of the Abankaleke people (Duncan(1907), (Meier and Meier (1964-1970), Bendor-Samuel (1975), Hoffman (1987), Ukpabi (2003) and Ugoji (2009)) especially Izii and Ezaa as dialects of Igbo or separate linguistic systems.

Moreover, the research will give further credibility to the fact that the use of the acoustic parameter in measuring pitch levels in tonal analysis is a necessary component of effective linguistic analysis especially in relation to the suprasegmental features.

1.6 Scope and Delimitation of the Study

The study investigates the interaction between tone and segments at the level of the word in the Izii and Ezaa dialects. Also, the comparison between the pitch levels of tone in these dialects and those of the Standard Igbo is also carried out since absolute pitch may not prove too useful in strict phonological analysis but could be indispensable as some background information.

There are four major dialects in the Abankaleke dialect cluster (Ezaa, Izii, Ikwo and Ishielu). This work will only consider Izii and Ezaa dialects because they are more widely spoken and more controversial than the others. Also, because the essence of this work is to determine the peculiarities in these dialects as opposed to the Standard Igbo at the level of the word, this work will not analyze tonal behaviour in linguistic units higher than the word. As such, constructions such as phrases, clauses and sentences are not considered. In the same vane, morphological processes such as inflection and derivation are outside the limits of this work.

1.7.0 Theoretical Framework

This work investigates the interaction between tone and morpheme using the Abankaleke dialects of the Igbo language as a focal point. We will outline in this section a combination of three basic linguistic theories that interface in morphemes and tone studies generally. These are Lexical Phonology, Autosegmental Phonology, and Acoustic Experimentation. There are other phonological theories that could have been selected (such as the optimality theory) because they were developed later than the ones selected but they are rejected for the fact that they would not bring out properly the purposes of this work. For instance, Optimality Theory (OT) is a phonological theory proposed and developed by Alan Prince and Paul Smolensky (1991 and 1993) and elaborated in MCCarthy and Prince (1993, 1994 and
1995). Though a more recently developed theory, it is rejected because it is more suited for analyzing the processing of language data by the senses before arriving at a surface structure (2008:51) than for outlining the interaction between segments and suprasegments in specific linguistic units.

1.7.1 Lexical Phonology

Lexical phonology was mainly developed by three linguists; Straus (1982), Kiparsky (1985) and Mohanan (1985). In generative phonology, linguists make the distinction between lexical and post lexical levels of rule applications. According to Pulleyblank (1986), when phonological rules apply within the lexicon (in the semantic component), the level of analysis is said to be lexical (phonology). On the other hand if the phonological rules apply to the output of the syntactic component (in the phonological component) it is termed post lexical (sentence or phrasal level) phonology. Since the combination of segmental and the prosodic elements to form words takes place within the lexicon in the semantic component, one of the theories that formed the basis of the analysis of this work is lexical phonology.

1.7.2 Autosegmental Phonology

The work also takes the theoretical stance of autosegmental phonology which was developed by John Goldsmith in 1976. The major contribution of the theory is the formalization of the notion earlier presented by scholars such as Leben (1973) that suprasegments such as tone should be analyzed on a separate level from the segmental. Goldsmith (1990) proposes that the sound flow be analyzed in such a way that the segmental and suprasegmental levels be separated and treated autonomously. He illustrates that certain phonological phenomena cannot be effectively accounted for linearly. His proposition proffers a solution to the hitherto problematic suprasegments as it proves to be efficient in handling tonal behaviours in tone languages such as vowel harmony, contour tones among others. Its association principles are employed formally representing the synchronization of the morphemes and the tones in the formation of words in the dialects under study.

1.7.3 Acoustic Experimentation

Cristal (1987) shows that acoustic phonetics mainly has to do with speech reception, that is, what happens from the time speech leaves the mouth, goes through a medium (water, glass or air) to reach an object (the hearer). Mack (1991) on the other hand states that we cannot discuss acoustics in
isolation without also bringing in speech perception. He states that these two are so related that some 
speech perception researchers do not make clear distinctions between the two. What the listener 
perceives are a set of acoustic stimuli containing information ranging from relatively low to high 
frequencies at varying intensities. Sound perception is wholly concerned with the conversion of acoustic 
stimuli from sound pressure to units of meaningful speech units. Acoustic properties include frequency, 
intensity (acoustic measurement for loudness), duration and phase. The use of instruments in acoustic 
investigations has been viewed as an indispensable aspect that the process is also referred to as 
instrumental phonetics. Acoustic Experimentation is therefore a system of investigation which involves 
the use of acoustic instruments in describing and analyzing language data.

Donwa-Ifode (1995) discusses the advantages of incorporating instrumental investigation in the 
analysis of prosodic language data. This is necessary because our discipline has to be as objective and 
scientific as possible. According to her, it is an extension and aid to our bodily faculties. In other words, 
we first make observations through our senses of hearing, sight and touch; then we make hypothesis 
which the instruments confirm, negate or modify. Thus, the instrumental work serves as a check on the 
excesses of subjectivity by our observations. Furthermore, instrumental work adds detail to our 
observations. She however observes that instruments have their limitations because it is easy to abuse 
the use of instruments. For this reason, their use is secondary and not primary as they are means to an 
end and not an end in themselves. Acoustic Experimentation is therefore incorporated in this work to 
authenticate/validate the perceptual findings.

1.8 Methodology

This section presents the research design, area of study, population, sampling techniques, 
instrumentation and the administration of instrument. The method of analysis of the data also forms 
part of the concern of this section.

1.8.1 Research Design

This research studies two dialects of Abankaleke cluster namely Izii and Ezaa, establishes how 
the morphemes synchronize with the tones to form words in the lexicon and compares the occurrence 
of these processes in the dialects and in the Standard Igbo. We also work on establishing the differences 
at the tonal and segmental levels among the Izii and Ezaa dialects and the Standard Igbo through 
acoustic analysis.
1.8.2 Area of Study

The data for this study is gathered from the Izii and Ezaa dialects of the Northern/Waawa group of Igbo dialects according to Ikekeonwu (1986) classification. These two dialects are spoken in Ebonyi State in the South Eastern part Nigeria. Izii is spoken mainly in Ebonyi, Izii and Abakaliki Local Government Areas while the majority of Ezaa speakers live in Ezaa North and Ezaa South Local Government Areas. However, there are Ezaa speaking communities in Edda, Ohaukwu and Ivo Local Government Areas. There are also two Development Centres in Ishielu Local Government Area that speak Ezaa predominantly. Although a concentration of the speakers of these two dialects live in the areas mentioned above, one may still find speakers of these dialects in other parts of the state.

1.8.3 Sampling Technique and Size

The sampling technique adopted in gathering the data for this work is the simple random sampling. Two adult male respondents who are L1 speakers of Izii and Ezaa respectively were sampled. The third respondent is an adult male Igbo L1 speaker who had been exposed to formal writings in the Igbo language. He provided the data for the Standard Igbo. Male respondents are selected because male voices are generally preferred to female voices in acoustic experimentation as male voices generally lack the discrepancies and fluctuations in pitch frequencies perceptible in female voices. Care was also taken on the choice of respondents because the nature of the data collected is such that the respondents need to be competent in English language and in the target dialects or the Standard Igbo as the case may be to ensure that the correct variants of the words are elicited.

1.8.4 Instrumentation and Administration of Instrument

Structured personal interview was adopted to elicit information from the three respondents. The interviews were conducted separately in a quiet environment. The respondents were presented with an adapted form of Ibadan wordlist of 400 Basic Items (Trial) English version as presented in Udoh (2003) (a total of about 150 items were randomly selected from the list). Each of the respondents was given the list to study before rendering the words in their dialects (for Izii and Ezaa respondents) and the Standard Igbo (for the standard Igbo respondent). Three tokens of the items were elicited and the data recorded electronically.
1.8.5 **Method of Data Analysis**

The data analysis was carried out with the SIL Speech Tools Speech Analyzer version 3.0.1 (1996-2007) and Phonology Assistant version 2.2 (1995-2005) software packages developed by the Summer Institute of Linguistics (SIL) International. These were used in recording, transcribing and analyzing the data. The advantage of the packages is that they are efficient in segmenting and in carrying out other acoustic analyses such as measuring fundamental frequency, spectrographic and spectral analyses and duration measurements of speech sounds.
CHAPTER TWO

Review of Literature

2.0 Introduction

In a work of this nature, there is the need to bring to the fore ample contributions by scholars in the area of linguistic studies that are directly related to the issues which surround the topic under study. These provide among other things the grounds already covered by previous studies, the gap(s) which are yet to be filled and the theoretical framework on which the present work would be based. For effective handling, the chapter is broadly divided into two sections: theoretical studies and empirical studies.

2.1 Theoretical Studies

In this section, theories of morphology and morphological processes, lexical phonology, tone and autosegmental phonology are discussed.

Morphology is the branch of Linguistics which studies the internal structure of words (Katamba 1993). The history of morphology dates back to the ancient Indian linguist Panini but the term ‘morphology’ according to Wikipedia (accessed 17/11/07) was coined by August Schleicher in 1859. Katamba (1993) opines that morphology played a pivotal role in the reconstruction of the indo-European languages. Tranz Bopp, in support of an earlier claim made by Sir William Jones in 1786 that
Sanskrit, Latin, Persian and Germanic languages descended from a common ancestor gave evidence based on a comparison of the grammatical endings of words in these languages. Furthermore, Jacob Grimm between 1819 and 1837 published his work, Deutsch Grammatik in which he, through analytical comparison of sound systems and word-formation patterns showed the evolution of the grammar of Germanic languages and the relationships of Germanic languages to other Indo-European languages.

Much as these patterns of analyses were interesting and revealing at the time, they were soon abandoned for morphological analysis that was essentially synchronic. The focus of morphology over the years has shifted from being used as a tool for drawing up the origin and ancestry of human languages (Mutter (1899), Matthews (1974)) to a branch of linguistics that studies morphemes and their arrangements in forming words (Nida, 1949).

Under generative grammar, morphology was downplayed and treated under the syntactic and phonological components at the onset of the presentation of the model. The syntactic component was to generate all the well-formed sentences of the language, that is all the permissible sequences of morphemes indicating their syntactic constituents. The readjustment rules then applied on the final syntactic string to make the necessary modifications for the phonological rules to apply thereby leaving the morphological component out of the model. It was not until the 1950s according to Katamba (1993) that scholars such as Robins (1959) and Matthews (1972, 1974) made important contributions to this sphere of study.

It became increasingly clear and necessary for the word to be given proper attention instead of finding ways of circumventing it. Gradually, generative linguists began to explore ways of describing words and developing word-formation rules, thus giving morphology a satisfactory place of importance in grammatical analyses.

There are three major approaches to the study of morphology (Wikipedia (accessed 17/11/07) :

- The morpheme based approach which works in the form of item and arrangement,
- Lexeme based approach that employs items and process procedure, and
- Word-based morphology which assumes a word and paradigm approach.

Morpheme based approach treats words as being composed of morphemes which are strung together as beads on a string. For instance, the word ‘unfortunately’ would be analyzed as being composed of the morphemes un-fortune-ate-ly. This process is the most popular and most easily understood approach. Lexeme-based morphology makes use of item-and-process approach in its analysis of words. Words are
seen as results or outputs resulting from the application of some rules that alter the word-form or stem. Word-based morphology on the other hand takes paradigms as the central focus. It states the relationship between the forms of inflectional paradigms. We assume the stance that combines two approaches of morpheme-based and lexeme-based approaches in our analysis of data. This is because our work takes into cognizance the fact that words are a result of outputs resulting from rule applications and that there exists relationships between inflectional paradigms.

The terms word, word-form and lexeme are sometimes erroneously used interchangeably. However, in morphological analysis, the sense of their usage should be made clear. In his discussion, Matthews (1974) refers to the term in three senses. In one sense, word may be seen as the phonological (or the prosodic) word or the morphological word which in traditional grammar is built up of syllables which are in turn built up by letters or phonemes as in the word ‘country’. This word could be phonetically divided into the syllables [k^n] and [tri] and then into phonemes /k ^ n t r and l / or the letters c – ou – n- t- r- y. In another sense, a word is seen as the fundamental unit from which other forms are derived. These derived forms share a core meaning although they are spelt and pronounced differently. In this sense, it is referred to as the lexeme. Lexemes are the vocabulary items that are listed in the dictionary. For instance, ‘man’ and ‘men’ are seen as different forms of the same lexeme. One word may therefore have different forms (word-forms).

Forms such as ‘he’s’ and ‘I’ve’ in the English language may therefore not be regarded as morphological words because each of them is not a direct result from one fundamental form or lexeme. Matthews distinguishes a third sense in which the word could be seen as having properties which characterize its function. The word ‘begotten’ in the English language is not primitive but could be analyzed into at least two elements one of which is ‘beget’ (the lexeme) and the other element ‘past participle’ (which is referred to as a morpheme) are constitutions. The unit which is ‘built-up’ of ‘begot’ and ‘past participle’ (begotten) is a word in the third sense. Katamba (1993) calls this the ‘grammatical word’. Using sentences 1a, 1b and 1c, he explains this:

1a. Usually, I cut the bread on the table.

b. Yesterday, I cut the bread in the sink.

c. Jane has a cut on her finger.
The cut in sentences (a) and (b) belong to the same lexeme CUT from which two grammatical words cut – [verb, past] are realized. Cut in sentence c above belongs to a separate lexeme CUT – [noun]. It is so because they belong to different word classes.

The term ‘word’ may therefore be used to refer to different entities at a level of discussion but in pure linguistic analysis, proper distinction must be made with regard to the special notion intended to be conveyed. In this work, word is used to refer to the prosodic (or phonological) word; lexeme is used to refer to the lexical word while the grammatical word is referred to as the word-form.

As we saw above, words may be made up of constituents, that is, a word may be composed of more than one isolatable entities (Matthews (1974) Katamba (1993) and Selkirk (1982). The smallest of these isolatable entities is called the morpheme. It may or may not exist independently. According to Katamba the main principle used in the analysis of words is the principle of contrast. Forms are contrasted on the basis of

(i) Phonological shape due to sounds used and
(ii) Meaning, broadly defined to cover both lexical meaning and grammatical function

That is, differences in grammatical function and in phonological sound (phonemes) correspond to the differences in the meaning of word. For instance ‘Goat eats grass and ‘sheep eats grass’, the difference in meaning lies in the lexical meaning of ‘goat’ and ‘sheep’ while the grammatical function marks the difference between words such as ‘eat’ and ‘eats’.

Thus, morphemes can be classified according to function or lexical meaning (Katamba (1993), Mathews (1974) and Spencer 1991) or as free or bound (Ndimele (1999). Ndimele’s (1999) bound morpheme corresponds to a large extent what Katamba (1993), Mathews (1974) and Spencer (1991) call function morphemes. They are referred to as bound in the sense that they cannot exist independently on their own. They must be attached to other morphemes to actualize their meanings. Ndimele (1999) gives the following examples:

<table>
<thead>
<tr>
<th>Bound</th>
<th>Free</th>
<th>Bound</th>
</tr>
</thead>
</table>
### Table

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Base Word</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>un-</td>
<td>interrupt</td>
</tr>
<tr>
<td>b.</td>
<td>trans-</td>
<td>form</td>
</tr>
<tr>
<td>c.</td>
<td>demi-</td>
<td>god</td>
</tr>
<tr>
<td>d.</td>
<td>trans-</td>
<td>continent</td>
</tr>
</tbody>
</table>

Spencer (1991) opines that morphemes have a physical (that is phonological and phonetic) form and also a meaning, and that much of morphological theory is given over to establishing just how the mapping between form and content is achieved. This research is therefore given to establishing how exactly tone comes into play in this mapping (between form and content) in the Igbo language and in the Abankeleke dialects in particular.

Morphs are said to be the representations of morphemes (Katamba 1993) but according to Mathews (1974), ‘caught’ for example would be analyzed into the successive morphs [k :] plus [t] and ‘sailed’ into the morphs [seil] plus [d]. Mathews thus gives the impression that morphs correspond to phones and that morphemes are made up of phonemes. In their arguments however, Spencer (1991) and Katamba (1993) opine that an approach which assumes that morphemes are made up of phonemes leads to a theoretical cul-de-sal” rather they are represented or realized or manifested by morphs.

In support of this suggestion, they proffered reasons:

i) There may be a one –to- one correlation between morphemes and morphs.

Example in French: ‘eau’ /o/ (water) has one morpheme which is realized by one morph.

(ii) As language in itself is arbitrary, particular sounds or string of sounds have no particular meaning in language hence several different pairing of sounds will possibly have different meanings. Examples:

a. / a/ as a single phonological form may be used to represent different morphemes: teach
   - er - nominalizer or

   great – er - comparative morpheme for adjectives.
b. A single morpheme may be represented by a variety of phonological representations. The plural morpheme in the English language [z] is cited as a good example that can be realized as [-s], [-z], or [-lz].

c. The same string of sounds may cumulatively represent several morphemes. Example in the English language: The –s ending in verbs (as in walk -s) can represent three morphemes simultaneously: third person, present tense and singular number. For the fact that morphemes are not consisted of morphs, each of the morphemes would need to be represented by a separate morph thus revealing how abstract morphemes are as opposed to morphs which are their physical representations.

iii) In some cases, the number of morphemes does not correspond to the number of morphs by which they are represented.

a. The number of morphemes may exceed the number of morphs. For example in the English language, as a rule, in sentences with adverbs such as ‘yesterday’, the verbs indicate their past form by an –ed ending. However, in some sentences, this is not the case showing that morphemes exceed morphs. Example:

- Last week, I cut the grass.
- Yesterday, they shut the factory down.
- The mob hit him last week.

Katamba (1993) argues that in the above sentences, the past tense morpheme which is represented by –ed is realized by a zero allomorph. In other words, following the structure of the English language, the verbs in these sentences are in the past tense though the form of the verbs do not overtly show it. So, the past tense morpheme though expressed is not represented by any morph.

b. On the other hand, the unidentifiable morphs represented may be more that the number of morphemes. Consequently some morphs may not represent any morphemes. Such an element is therefore referred to as an empty or zero morph. In the English language, a set of adjectives formed from nouns exemplify this:

c. **Noun** | **Adjective**
---|---
sense /sens/ | sens-u-al /sensjual/
The morph -u- (/ju/) which is inserted immediately before -al in c above (transcribed form) does not represent any morpheme.

The discussion above shows that morphemes are abstract entities which bear lexical meaning or grammatical function and are physically represented by morphs.

Inflection and derivation are morphological processes which involve the changing of the form of words mainly through affixation. Generally, in the literature, a morphological process is referred to as inflectional if it changes the form of the word without changing its word class. In such a case, the form is changed to reflect syntactic conformity and agreement with other words in the same syntactic environment. On the other hand, a process is derivational if the form affected changes its word class. In other words, the output is of a different word class from the input.

In generative grammar, derivational and inflectional processes were treated under different components. Inflectional processes were handled under the syntactic component where the changes in word forms were handled via transformational rules. On the other hand, derivational processes came under the lexicon in the semantic component and were processed using phonological rules. Studies that pertain to such derivations are generally termed lexical phonology.

Lexical phonology was mainly developed by three linguists; Straus (1982), Kiparsky (1985) and Mohanan (1985). In the words of Pulleyblank (1986), “the theory of lexical phonology holds that there are two distinct types of phonological rule applications. The first is when rules apply within the lexicon (the lexical phonology) while the second is when rules apply to the output of the syntactic component (the post lexical, sentence –level or phrasal phonology)”. Clark et al (2007) opine that what the title of the theory reflects is a distinction between ‘lexical’ and ‘post lexical’ components of description. The role of the lexical rules is to modify these forms in accordance with the phonological requirements of the language.

At the lexical level, lexical rules and lexical representations make no reference to redundant or allophonic features. Only distinctive features are given considerations. In Fromkin et al (2000), a lexical entry will contain information that is sufficient to distinguish its surface realization from that of any other form which in the judgment of the speaker is realized distinctly in the same circumstances.
In the proposition by Mohanan (1982), the distinction between lexical and post lexical levels in phonological representations stem from the fact that rules that apply to both components may manifest different properties when applied to the components.

In accordance with the stance of Mohanan (1982), Kiparsky (1982), Pulleyblank (1986), Clark et al (2007) and Fromkin et al (2000), we assume that there is only one set of phonological rules but that the application of the rules may be specified in each case as applying lexically, post lexically or both lexically and post lexically. However, we are concerned with only the rules which apply lexically as our analysis concerns the interaction between tone and segments in the Abankeleke dialects of the Igbo language.

According to Pulleyblank (1989), the proposition that there is a close interdependency between certain phonological processes is not new. It dates back to the pre-generative era linguists such as Sapir (1921), Trubetzkoy (1929), Bloomfield (1933) and Martinet (1965). The representation of such dependency in a principled way had however been an unresolved issue. Kiparsky (1982) and Pulleyblank (1986) opine that the works of Siegel (1974, 1977) and Allen (1978) show that one could define the domain of certain phonological rules in terms of morphologically defined classes demonstrating that the relevant classes of morphemes must be ordered in blocks. This ordering stems from the fact that classes of morphemes occur in particular positions. For example, a particular class of morphemes may occur closer to the stem than members of another class of morphemes and thus trigger different sets of phonological rules. The different classes or levels/strata have different affixes associated with them.

Mohanan (1982) and Kiparsky (1982) posit that in lexical phonology, the output of a stratum of word is submitted to those phonological rules assigned to the relevant stratum in the lexicon. Kiparsky’s schematic representation is presented in figure I below:
In Figure 1 above, we see that a lexical item can undergo affixation at any of a finite number of ordered strata defined for any given language. After affixation, the derived form is scanned by the phonological component, and all phonological rules applicable at the appropriate stratum (and whose structural descriptions are met) will apply to the derived string (Pulleyblank 1986).

Scholars do not agree on whether rule application should be cyclic or not. Cyclic rule application implies that all the morphological rules need not necessarily apply before the application of any phonological rule. In this case, after the application of a morphological rule, the derived form could be submitted to the phonological component for scanning and for the application of the necessary phonological rule(s) before the application of the remaining morphological rules. In such a way, the cycle of rule application is repeated if necessary. That is if the structural descriptions are met. Scholars such as Halle and Mohanan (1985) and Mohanan and Mohanan (1984) are of the opinion that it is possible for all morphological rules to apply before a single phonological rule applies for some strata but for some other strata, the rule must apply cyclically. The above stance is in opposition to earlier propositions by Mascara (1976), Halle (1978), Rubach (1981) and Kiparsky (1982) under the strict cyclic rule application. In their opinion, a rule can only apply to a cycle if its structural description has been
generated on the same cycle. However, using examples from the English language, it was established that while this position is true for some derivations, for others it became problematic. On the problems emanating from the strict cyclic rule application, Pulleyblank (1986) opines that in the following examples:

4a. opacity

b. ivory

the required three syllables for the application of trisyllabic shortening rule was provided by the addition of the suffix -ity to the adjective ‘opaque’ and the rule applies. But for b ‘ivory’ the condition is met in the underlying structure hence the rule does not apply. On the other hand, when we consider other examples:

5. a column hymn
   [m] [m]

b. columnar hymnal
   [mn] [mn]

c. columns hymns
   [m] [m]

d. column shaped hymnbook
   [m] [m]

The final -n deletion had applied in 5a, c and d. It is observed that the stratum on which -al and -ar are added must have come before that of final -n deletion or else unacceptable forms would be generated.

6. (a) *colum(n)ar and (b) *hym(n)ar would be derived.

   From the arguments, the strict non-cycle rule application is too strong. According to Pulleyblank (1986), evidence from tonal languages has shown that tone association and tone rules must be cyclic in nature for a variety of languages. We would therefore assume the stance in this work that phonological
rules within the lexicon apply cyclically because the strict cyclic rule application would generate unacceptable forms in the Igbo language.

However, because the dialects under study are dialects of a tone language and our analysis also involves the influence of pitch on tone, it is therefore pertinent that we also look at pitch, tone and intonation and how each is related to the others.

Pitch is the extent to which a sound is high or low and it depends on the rate of vibration of the vocal cords. The tauter the vocal cords are, the faster they vibrate and the higher the pitch of the perceived sound (Katamba (1989:186). The speed at which the vocal cords vibrate can be measured in terms of the number of times they complete cycles of opening and closing per hundred millisecond. The unit is called the fundamental frequency ($f_0$). It is also the rate at which the speech pressure waveforms repeat. Ladeforged (1982) and Donwa-Ifode (1995) and Ashby and Maidment (2005) agree that the rate of vibration of the vocal cords determines the $f_0$ and the higher the pitch, the higher the $f_0$ and the higher the pitch perceived by the hearer. The unit of measurement for the $f_0$ is the Hertz (Hz). It is not the absolute Hz values of a fundamental frequency contour that matters but the relative values because female speakers generally produce sounds with higher pitch than males. This is because typically women have smaller larynx and shorter vocal cords than men (Ashby and Maidment (2005:154).

Languages utilize pitch in different ways. Pitch may mark words in tone languages or categories higher than the word such as sentences, clauses et cetera. In such a case, the language is said to be an intonation language. In intonation languages, pitch may also perform other functions such as accentuation (allocation of primary stress to the most salient syllable of a word) and syntactic functions. It could also be used to convey attitudinal meanings and structure discourse (Uguru (2006). On the other hand, pitch may function mainly on the domain of the syllable. Within the lexicon, every syllable is marked for a relative contrastive pitch height. Such a language is said to be a tone language.

Pike (1948) defines a tone language as a language having a lexically significant, contrastive but relative pitch on each syllable. Goldsmith (1982:49) opines that in a tone language, the lexical entry present in a given structure includes (or, conceivably consists simply of) complete tonal melody.....” a tone language is that which utilizes tone as a necessary and integral part of every syllable which makes for differences in meaning and marks grammatical distinctions between otherwise identical constructions.
Welmers (1959:2) suggests that Pike’s (1948) definition may be too strong. He therefore proposes that the definition be modified thus: “a tone language is a language in which both pitch phonemes and segmental phonemes enter into the composition of at least some morphemes”. The need for the amendment of Pike’s definition becomes apparent when we consider the fact that some morphemes in tone languages ‘lack a pitch phoneme (tone), while other such morphemes may consist solely of a tone (with no segment)’. However, Hyman (1975) points out that in tone languages sometimes, there are restrictions on the occurrence of tones. These restrictions can either be phonological or grammatical and because of these restrictions, there will be redundancy in the distribution of tone.

Yip (2007) quoting Hyman (2001) defines a tone language as one in which an indication of pitch enters into lexical realization of at least some morphemes. With this definition of Hyman, is the motive to also capture accentual languages such as Japanese or Lithuanian (Blevins 1993 and Welmers 1973) as a sub-type of tone language in which words have one tone (or several) or no tones, and the tone is associated with a particular syllable or Mora.

Tone languages are of two types: the contour tone languages and register tone languages. The classical definition of tone language by Pike (1948) and echoed by Katamba (1989), Nwachukwu (1995), Uguru (2006) and Mbah and Mbah (2010) has it that contour tone languages are languages which involve the changing state of the transition from one pitch to the other in their description of tone. Hulst and Smith (1982) point out that the level tone languages recognize only the points at which the pitch is either raised or lowered. These levels range from high through mid to low. The intervals between these pitches are assumed to be automatic and so of little significance.

The above stance gives the false impression that there is an exclusive dichotomy between level tone languages and contour tone languages: that contour tones do not occur in level tone languages and vice versa. In addition to Welmer’s (1959) contribution, Mazaudon (1973) in Hyman (1975) studies Tamang, one of the languages of Nepal and comes up with the fact that of the four contrastive tones of Tamang, there is not always a perfect one-to-one correspondence in pitch between a given tone on a monosyllabic versus a disyllabic word. For instance, tone 4 is realized as a L tone in a monosyllabic word where it usually falls on utterance final position while on two syllables it is realized as a L followed by a falling tone from H to M, that is L-HM. In her argument, it is not possible to assign an individual tone to each syllable, recognize a two-way tonal contrast with a moveable accent, or to assign tone only to the
first syllable of each word through a phonological rule or a rule spreading each tone over a word. According to Mazaudon, either of these approaches would fail in one way or the other.

Furthermore, while it is possible to classify tone languages into register and contour tone languages, it is not the case that register tone languages lack contour tones as mentioned earlier. Hyman (1975:217) points out that such languages (register tone languages) frequently have rules of tonal assimilation (“spreading” rules) by which falling and rising tones are derived. Register tone languages may also have contour tones as a result of two morphemes coming together. He cites examples from Hausa. One of the two future tenses was used:

7a) /a/ + /ki/  ko zo

“future marker” “you” “you will come”

In the Igbo language, examples 7b and 7c below from Oputa (2006) illustrate this point:

7b ùtútù ùtù ùtù morning

7c àgbóghò àgbó àgbó young girl

In example 7b above, first, consonant deletion takes place then vowel elision occurs. These processes result in a floating tone which gets associated to the initial vowel. The output is a rising glide. For 7c also, the consonant ‘gh’ /ɣ/ is deleted followed by the elision of ‘o/ɔ/’. The tone on the vowel is left floating and is then associated to the final vowel resulting in a falling glide.

Some Igbo language scholars such as Emenanjo (1978) and Mbah and Mbah (2010) uphold the view that Igbo language has two basic tones; high and low plus a downstepped high which is regarded as a grammatical tone. However in more recent works, the downstep tone in Igbo has been shown to perform lexical functions indicating that it is an independent tone. A more detailed discussion on this aspect is carried out later under empirical studies.
In many tone languages; tone is inherently tied to the syllable. We will therefore take a look at the structure of the syllable generally and then specifically examine the syllable structure of the Igbo language in the section that follows.

Zec (2007) in line with Hocket (1955), Fudge (1969), Selkirk (1982) argues that the syllable as an organizing principle for grouping segments in any given language is highly constrained. The set of occurring sequences presents only a fraction of the much larger set that would have resulted if there were no restrictions on concatenation of members of its segment inventory. A number of propositions have been proffered to account for these restrictions, but the most acceptable is the syllable. Kahn (1976) defines the syllable as a prosodic unit ‘larger than the segment and smaller than the word’.

According to Zec (2007), words and sometimes longer sequences are exhaustively parsed into syllables so that the sequencing principles that characterize the syllable naturally extend to larger constituents. He maintains that the syllable is a representational device that encompasses the principles of segment sequencing. “Once the principles of syllable organization are properly stated, they subsume most of the generalizations about segment sequencing”.

Clark et al (2007), Zec (2007) and Ashby and Maidment (2005) agree that languages differ in how the universal principles of segment sequencing are manifested but that they do so in constrained and predictable ways. The simplest syllable structures would consist of a nucleus which is nearly always a vowel (or the most sonorant part) and the two margins, the onset and the coda which are usually consonants. Below is the representation of the most basic types of syllables:

CVC – a syllable with all the principal parts
CV – a syllable that contains only the onset and the nucleus
VC – a syllable that contains only the nucleus and the coda
V – a syllable that contains only the nucleus.

Some generalizations could be made with regard to universal syllable structure. The nucleus is the most basic and stable across languages. The asymmetry lies in the left and the right margins. According to Zec (2007), onsets are highly desirable and codas are less preferred in languages. Onset desirability is portrayed by the fact that every language allows syllables with onsets and no language allows only onsetless syllables. On the other hand, codas are avoided in many languages and they are
never required in all environments. Furthermore, the onset as well as the coda may include more than one consonant according to the structure of the particular language.

Emenanjo (1978), Iloene (1997 & 2007) and Ikekeonwu (1999) opine that the Igbo language has predominantly CV syllable structure that is, the sequence of one consonant followed by a vowel constitutes a syllable. The consonant element (the onset) is optional and there is no coda in Igbo. The stance of non existence of codas in Igbo may be changed presently as we will see later in the findings of this work the minimal occurrence of codas in Abankaleke dialects.

Emenanjo (1978) expresses the foregoing schematically:

(C) T

S

Where T = Tone

O = Optional onset consonant

S = Syllabic element (vowel or syllabic nasal)

The implication of the above submission is that there are two basic Igbo syllable types: V and CV. Examples:

V

Ó/Ọ– Ọ dì ọmá

i/i – ì mèrè nkè ọmá ‘You did well’

É-É gbúlá rínràbú ‘Don’t kill a man’

N – Nǹkú [ŋkú] rínrà [ŋma] ọ́nú [ntú]

‘Firewood’ ‘beauty’ ‘nail’

CV

ǹnyà – ‘female solo graceful dance step’.

pá– [pá] ‘carry’
In tone languages as mentioned earlier, tone is a property of the syllable. In this research work, tone assumes a central focus and as such an efficient tool for tonal analysis is needed. The analysis of data therefore assumes the theoretical framework of the autosegmental phonology as this approach will best suit its purposes. We, therefore, review in the next section the theory of autosegmental phonology.

Autosegmental phonology is a phonological theory that assumes a multitiered approach to phonological analysis. It was introduced by John Goldsmith in 1976. He, however, acknowledged that other linguists had earlier viewed the speech flow from a multitier point of view (Goldsmith (1990). Some of these linguists include Hochett (1958) and Leben (1973). Hockett in his *Manual Phonology* likened the speech flow to the arrangement of a musical piece where some instruments are arranged in such a way that some sounds are superimposed on others.

Also, Leben (1973) in *Suprasegmental Phonology* according to Goldsmith (1990), drew attention to the extreme constraints of analyzing a tone language in a linear format. Using examples from some African languages spoken in Sierra Leone, he illustrated that certain phonological phenomena cannot be effectively accounted for within the linear segmental format. His work pointed out in the clearest way the shortcomings and inadequacy of segmental phonology in analyzing suprasegments such as tone but was unable to proffer solutions in a principled way as to how the inadequacy could be overcome and the problematic suprasegments accounted for formally.

Halle and Vergnaud (1982:67) explain this notion thus; ‘what has been novel in autosegmental phonology is that tones of an utterance are not viewed as diacritics of vowels or syllables: rather the tones are viewed as constituting an autonomous sequence of entities, core of the utterance.’

The following is their illustration:

8. t  t  t  t  t

T  T  T  T  T
The two tiers would then be linked by what Goldsmith calls association lines:

9. Segmental tier

   Association lines

   Chart

   Tonal tier

The segmental tier linked to the tonal tier enclosed in a square bracket is referred to as a ‘chart’:

In order to indicate how the features on the different tiers are to be co-articulated as a single acoustic signal, Goldsmith (1976) proposed the wellformedness conditions (WFC):

10a. all vowels are associated with at least one tone

b. all tones associated with at least one vowel and

c. association lines do not cross.

He stipulates that if any of the representations violates the wellformedness condition, the association lines would then be deleted or added until the representation was well formed. The mapping is to be carried out from left to right and any remaining unassociated tone or tone bearing unit is assigned to the last tone or tone bearing unit.

Some scholars such as Clements and Ford (1979), Haraguchi (1977) Hulst and Smith (1982) and Halle and Vergnaud (1982) in applying the WFC found out that languages met the conditions in a number of ways. Williams (1976) therefore proposes an approach in which he assumes that the multiple assignment of tone to a single syllable could only result from a language specific rule. He formulates a number of rules which he terms Tone Mapping Rules (TMR).
11.  

a. Mapping procedure maps from left to right a sequence of syllables.

b. It assigns one tone per syllables, until it runs out of tones.

c. Then, it assigns the last tone that was specified to the remaining untoned syllables on the right.

d. until it encounters the next syllable to the right belonging to a syllable with specified tone.

e. If the procedure above runs out of syllables, more than one tone may be assigned to the last vowel only if the grammar of the language include a specification to that effect.

In their discussion of William’s TMR, Halle and Vergnaud aver that the TMR does not require that each tone be obligatorily linked to a vowel. They therefore assume that “only tones linked to segments in the phonemic core are phonetically actualized”. Any such unlinked tones are termed ‘floating tones’.

Following the work of scholars such as Pike (1948) Meeussen (1963) Clements and Ford (1979), Halle and Vergnaud (1982), and the result of his subsequent works on tone languages such as Tonga (Goldsmith (1981) Kikuyu (Goldsmith 1990:11) and Sakuma (Goldsmith (1985), Goldsmith modified the WFC a great deal. He called the modifications ‘association conventions’ (AC). In these modifications (Goldsmith (1990), the ideas expressed in WFCs 9a and b are modified to imply that:

12.  

a. All vowels and tones need not be compulsorily associated.

b. Vowels need not be the only tone bearing units.

c. One – to – many mapping can only be realized as a language specific rule.

We will assume in this research work following Pulleyblank (1986) that:

13a. Association conventions be as follows: map a sequence of tone onto a sequence of tone bearing units.

i. from left to right

ii. in a one –to – one relation
b. Well formedness condition – Association lines do not cross. Pulleyblank’s (1986) Morphological Encoding and Association Conventions discusses the interaction of morphology and phonology especially in relation to tone. He argues that tonal association in many languages is predictable and determined by the morphological structure of the string and the phonological conventions for linking tones to segments. Using a number of languages, Pulleyblank (1986) illustrates that for many languages, cyclic tone association should be employed. The lexical rule application in this work will also apply cyclically.

2.2 EMPIRICAL STUDIES

In this section some empirical works which are related to the theories discussed in section 2.1 are reviewed.

Roberts-Kohno (2005) in her analysis of the tone – syntax interface in Kikamba (a Bantu language spoken in Kenya) treats the four phonemic tones in Kikamba: super – low (SL'), low (L unmarked), High (H') and super – High (SH''). Two of these four tones form a natural class which are indicated with the feature [+ extreme]

\[
\begin{align*}
SH &= [+ \text{ upper, + extreme}] \\
L &= [- \text{ upper, - extreme}] \\
H &= [+ \text{ upper, - extreme}] \\
SL &= [- \text{ upper, + extreme}]
\end{align*}
\]

She postulates that there are three different SL tones in Kikamba depending on the behaviour of the SL tone at different levels in the grammar. She identifies them as follows:

14.

a. Lexical SL tone is the type which is underlyingly associated with a lexical item,

b. Grammatical SL tone refers to a tone which has been assigned to a verb as part of the verb tense pattern and

c. Phrasal SL tone is the tone assigned to a verb which is a main clause, affirmative verb.
Of the three types, only the lexical SL tone is directly related to the intents of this work and our discussions will therefore solely dwell on that aspect of the work under review.

A lexical SL tone can be found in large numbers of Kikamba nouns and occurs at the right edge of the word.

15.

a. mo. emi ³ 'farmer'
b. matu ³ 'clouds'
c. kebêti ³ 'wife'
d. ibêti ³ 'wives'
e. vo#v) ³# 'birds'

However, if a noun ending in a SL tone is followed by a modifier, the SL tone must delete so that SL – Alignment constraint is not violated.

Examples:

16.

a. mo. mo. emi moit ³ 'heavy farmer'
b. matu µanµe ³n³ 'small clouds'
c. kebêti ñn³ µe³ 'my wife'
d. ibêti ndwa³ u³ 'sick wives'
e. v)ov) ³ yaakwa³ 'my bird'

Finally, the tone pattern in which only the final syllable bears a SH tone is discussed as shown in 17 below. However, we see in 18 that the SH surfaces as a plain H just in case a modifier follows. In other words, SH tone must be the combination of H and SL tone. When the SL component deletes, only [+ upper] is left and the final vowels in the examples in 20 surfaces with a H tone.
Robert-Kohno’s analysis shows that there is an underlying relationship between H and SL tones. However, the analysis fails to give any indication as to the contrastive status of the different tone types especially SH and SL. In other words, there are no indications of the contrastiveness of the tones using minimal pairs. With this information, it would have been possible to make statements on the interaction of tones with segments in word formation. Motingea (2005) poses a question with regard to the above analysis. “Are SL and SH really phonemic or phonetic?”

The ‘Kikamba Tone – syntax interface is related to this present work in the sense that it pursues a closer understanding of the behaviour of tone in syntactic analysis while this work seeks a better understanding of the interaction of tone and segment at the level of the word. While the similarity between Robert-Kohno’s analysis and this present work lies in the fact that both works pursue an interface study of two levels of linguistic studies.
Another related work is that of Mbah and Mbah (2010). They review the earlier works done on minimal pairs and observe that mostly, inasmuch as they do not differ in their concept of minimal pair, they did not adequately discuss this phenomenon from the perspective of tonal languages. These scholars include Bloomfield (1933), Trubetzkoy (1939), Hocket (1958), Abercrombie (1965), Bolinger (1968), Mathews (1972), Hyman (1976), Aronoff (1976), Clements (1983), and Nartey and Arishi (1989).

Pike (1948) according to Mbah and Mbah (2010) gave the following examples for intonation languages:

19.

a. no!
   no?

b. pan
   ban

In 19a, the pitch or the prosodic level sets them apart while in 19b, it is the segmental tier (/p/) and (/b/) that sets them apart. Pike (1948) therefore concludes that the contrastive lexical units of sounds are phonemes while the contrastive units especially in tone languages form tonemes. Pitch levels in a tone language may contrast based on the difference in their levels in a given context.

Mbah and Mbah (2010) therefore conclude that every word of a language comprises two tiers: the prosodic and the segmental and that minimal pairs can be generated from both levels of analyses each of which must be considered before arriving at any meaningful contrast. The following are some of their examples:

20. Ibibio

a. bit ‘resemble’ (someone)
   bit ‘spread’ (a mat on the floor)

b. bim ‘carry a load on the head’
   bim ‘roast (example ripe palm fruit) (Essien (1990)
21. Igbo

a. àkwá ‘egg’

b. ákwá ‘cry’

c. oke ‘boundary’

d. oke ‘share’

c. àkà ‘green snake’ àkà ‘bead’ (Mbah and Mbah (2010)).

22. Lokaa

a. eti ‘stick’

eti ‘road’

b. epu ‘lip’

epu ‘monkey’ (Iwara 1995).

With these and other examples, Mbah and Mbah portray the lexical function of tone as a common phenomenon across African languages. They further note that pairs of words which differ in more than one segment (that is on segmental and autosegmental tiers) do not count as minimal pairs.

Mbah and Mbah (2010) further aver that the downstep in Igbo is not just a grammatically induced tone but that it contracts minimal pairs generated at the base component. This is in contrast with earlier claims by scholars such as Nwachukwu (1983, 1995), Emenanjo (1978), Clark (1980) and Hyman (1980). The following examples are proffered to clarify their claim:

23. Igbo

a. Òché ‘seat’

òché ‘scoop’ (of fufu)

b. Òkó ‘name’ (of a town)

òko ‘tuber of or stick of’
In the above examples, the contrast between the two words in 23a-b is brought about by the difference in one tone. The minimal pair is therefore contracted by the difference on the tonal tier alone.

In summary, Mbah and Mbah (2010) have argued that minimal pair, trio or set in tone languages is contrasted differently from the way it is contrasted in intonation languages though this is at variance with what is obtainable generally in the literature where minimal pairs are contrasted only at the segmental level even in intonation or stress timed languages. Only phonemes on the segmental tier are usually considered in contrasting minimal pairs. For instance, their examples on minimal pairs involving the down stepped tone have the following patterns: HS (High, downstep).

24.

ókwú ‘word’

Ôkwú ‘altar’

Besides examples of minimal pairs involving HS nouns cited by Hyman (1974) in defining the lexical function of the HS, there are five others cited by Williamson (1986) from Onitsha dialect of Igbo:

25.


<table>
<thead>
<tr>
<th></th>
<th>HH</th>
<th>HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>álú ‘a bite’</td>
<td>áljú ‘abomination’</td>
</tr>
<tr>
<td>b.</td>
<td>ámá ‘open place’</td>
<td>áljma ‘mark, sign’ street’</td>
</tr>
<tr>
<td>c.</td>
<td>ōgó ‘reward, pay’</td>
<td>ōljgo ‘upper part’</td>
</tr>
<tr>
<td>d.</td>
<td>ōné ‘mother’</td>
<td>ōljne ‘many, plenty’</td>
</tr>
<tr>
<td>e.</td>
<td>ódú ‘advice, warning’</td>
<td>ólj du, ‘pestle’</td>
</tr>
</tbody>
</table>
The above data further confirms the fact presented by Mbah and Mbah (2010) that dowstepped high tone in Igbo is not just a grammatical tone but also an inherent tone for some words generated at the base component. In addition to Williamson’s (1986) examples one could cite other examples where the downstep contrasts with low tone in some lexical items.

26.

a. ójú – pestle ódù – tail/market stall

b. éjú – mushroom élò – suggestion/advice

c. Éjú – lake (Agulu Lake) ézù – to meet

These examples are from Aguata dialect of the Igbo language and further clarifies the claim that downstep is an independent tone in Igbo and not just a grammatical tone.

Their analysis has an immense import to this present work because it discusses the intricacies involved in making phonemic and tonemic inventory of a register tone language such as Igbo. The fact that this research delves into the interface of tone and morpheme of the Igbo language makes the contributions of Mbah and Mbah (2010) very relevant.

Pulleyblank (1986) discusses the interaction of morphology and phonology especially in relation to tone. According to him, tone enjoys a degree of independence in phonological representation: tone can constitute an entire morpheme; the tone of one morpheme can be associated with a segment in another morpheme, and much other behaviours. This level of independence notwithstanding, tonal association in many languages is by and large predictable. Pulleyblank takes into account two basic considerations in characterizing this predictability:

a. The morphological structure of the string and

b. the phonological conventions for linking tones to segments.

Using several languages for illustration, Pulleyblank argues that for many languages, cyclic tone association should be employed and that autosegmental association conventions be modified so as to exclude the possibility of automatic spreading of autosegments. He then demonstrates with some
languages certain advantages of the lexical approach to morphological encoding over some other alternative approaches.

Considering the fact that for some languages such as Igbo, tone constitutes part or all of the underlying phonological representation of any given morpheme Pulleyblank (1986) works under two assumptions (one a tenet of autosegmental phonology and the other a tenet of lexical phonology):

a. Autosegmental association conventions apply automatically at all stages of a derivation (Goldsmith (1976)

b. The output of every word-formation process is scanned by the phonological component (Mohanan (1982).

These two assumptions have the combinatory effect that every time two morphemes are concatenated, the result will be scanned to see whether the association conventions (among other things) are applicable. The implication of this is that tone association will be cyclic. He argues that this position is obtainable in a number of languages and illustrates with Tiv, Margi and Tonga Languages. In this review, only the analysis on Tiv will be discussed because the discussions on Tiv are more related to this work than those in the other languages.

Pulleyblank (1986) gives the following proposition: given a configuration such as 27a below.

27a. 

If the association convention is such that tones are assigned to tone-bearing units one-to-one from left to right, then the theory with cyclic tone association would predict the tonal pattern given in 27b while a non cyclic approach would give the pattern in 27c:

27b. 27c.
When there is no special rule for the assignment of the left-over vowels in 27b and c above, they would be assigned default tones. With the above illustration and others, Pulleyblank (1986) concludes that cyclic application of tonal rules and conventions in Tiv correctly determines the linking of tones in tenses like general past and that cyclic application of tonal rules correctly governs the application of a rule like raising. The above analysis by Pulleyblank (1986) proves the stance which this research work assumes: that lexical rules for some languages such as Igbo language must apply cyclically for the right derivation to be reached.

Hombert (1978) aims at finding out how the relevant production phenomena and the acoustic (auditory) or perception phenomena are of importance in accounting for what has been observed in historical change. The observation is that the vowel quality affects the $F_0$ and the pitch of a vowel and that the intrinsic effect of the acoustic signal intended by the speaker may become distorted by the time it is perceived by the listener and that such distortions may give rise to changes over time.

Hombert (1978) compares the results of three studies carried out independent of each other by House and Fairbanks (1953) Lehiste and Peterson (1961) and Mohr (1968). She discovers that although the number of subjects and methods used to measure and average the data differ in these studies, the $F_0$ values of vowels after voiceless (aspirated) stops are higher than after voiced stops. Moreover, the results show that the variation in the $F_0$ values are not consistent in any way to suggest that place of articulation of the stops contribute to the differences. Regrettably, the data give only the average or peak value of $F_0$ so that it becomes impossible to deduce the time course of the $F_0$ perturbation caused by the preceding consonant. Hombert (1978) therefore conducted her own experiments to supply the information lacking in the earlier works.

In the first experiment she selected five subjects who had no history of speech or hearing impairment and who spoke general American English as LI for the experiment. They pronounced six nonsense words with the structure CV with $C = [p \ t \ k \ b \ d \ g]$ and an additional $[m, m]$ for three of the subjects and $V = [i]$. The recording and measurements were made on a minicomputer with a reference
point at the onset of the vowel; $F_o$ values were measured at onset and 20, 40, 80 and 100 msec after the onset. The results obtained reveal a consistency in the fact that there is $F_o$ raising of vowel after voiceless consonants and $F_o$ lowering of vowel after voiced consonants.

Hombert (1978) then points out that the discussions so far on the effect of obstruent on the $F_o$ of following vowels have been on nontonal languages. She therefore carries out a second experiment to find out whether the onset frequency of vowel with a phonologically low tone will still be affected by a voiced consonant and similarly whether a voiceless consonant will lower the frequency of a high tone vowel.

The experiment was carried out on Yoruba language which is a three tone language: High, Low and Mid. The data were collected from two subjects with the aim of finding out the time course of $F_o$ variation after voiced and voiceless stops. From the results of the experiment, Hombert (1978) reached the following conclusions:

a. The lowering caused by a voiced consonant on a following high tone or by a voiceless consonant on a following low tone is greater than the effect of these two series of consonants on a mid tone.

b. The effect of a voiced consonant on a following high tone is greater than the effect of a voiceless consonant on a low tone.

c. The duration of the perturbations caused by prevocalic consonants on the $F_o$ of vowels is shorter in Yoruba than in English.

She further noted that her findings are similar to those of Grandour (1974) on Thai tones. She therefore suggests that there may be a tendency in tone languages (as opposed to nontonal languages) to minimize the intrinsic effect of prevocalic consonants actively. The reason for this she suggests to be “in order to render the different tones maximally perceptually distinct”. For the fact that such intrinsic features can only be determined after the conduction of perceptual studies, another experiment was carried out.

Ten subjects who speak American English and have no hearing impairment were used. Acoustic stimuli consisting of ten instances of the vowel [ı] were synthesized with different fundamental frequency patterns. Each stimulus consists of a slope followed by a level tone maintained constant at 120Hz. The onset frequency is either 10 or 130Hz ($F_o = \pm 10$Hz). The duration of the slope was varied at 40, 60, 100, 150 and 250 msec. the subjects hear the stimuli through earphones at comfortable level of
about 70dB and the parameter values are chosen to stimulate the effects of consonants on neighbouring vowels. Statistical analysis of the data reveals that the two curves are already perceived as significantly different when the onset slope (from $F_0$ onset to level $F_0$) is 60 msec long.

Graphically, the data suggests two things: falling patterns are perceived more accurately than rising patterns and the longer the slope the more accurate the matching.

Hombert (1978) asserts that the realizations of certain tones can be influenced by tonal (as well as segmental) contexts. The phenomenon has been described by scholars in African languages such as Hyman (1973, 1976 and 1978) and by Hyman and Schuh (1974). In Chinese and other Asian languages, the same phenomenon is referred to as tone Sandhi (Hombert 1978).

Redistribution in the tone space is also described by Hombert (1978) as one of the changes in phonetic realization of tones. She is of the opinion that the development of new tones from segmental influence in an already complex tone system may lead to the birth of tones very close to each other in the tone space. In such, cases she says, they can either merge or move away from each other in the tone space.

Hombert’s (1978) work thus provides an insight into the influence of context on $F_0$ values of vowels and the part that the quality of the sound segments play in phonetic as well as perceptual interpretations of tone by the language speakers. In this present work, the above insight is handy as it would facilitate a more accurate analysis of the data from the Abankaleke dialects of the Igbo language under study.

Leben (1978) discusses the morphotonemics of Mende, a Mande language of Sierra Leone. In the work, he considers the behaviour of tone in constructions involving more than one morpheme. However, his main aim is to present tone as a suprasegmental feature which should be best ‘divorced from the segmental representations at some underlying phonological level but should also assume a phonetic representation expressing tone as a segmental feature”. According to him, the evidence observable in the behaviour of tone in constructions involving more than one morpheme in Mende language forms part of the most compelling reasons for viewing tone as a suprasegmental feature which has unique behavioural patterns that can best be handled separately from the segmental procedures.

The major issue in describing Mende morphotonemetics according to Leben (1978), involves a choice of procedures to follow in coping with the fact that certain types of behaviour on the part of the
nature of these tones in their citation form can only be described separately. The above situation had caused scholars to propose different forms of morphophonemic representation for Mende tones which according to Leben “diverge greatly (and perhaps suspiciously) from their surface realizations”. These scholars include Spears (1967a, b) Dwyer (1971), Leben (1971) and Voorhoeve (1975).

Leben (1978) notes that in certain cases, falling and rising tones simplify to level tones. He presents the following data where there is a correspondence between a noun’s citation tones and the tones it bears before the indefinite plural marker – ngaa and the definite marker – i. The change of a to ε before – i is regular.

28. Citation form | indefinite Pl | Definite Sing
---|---|---
a. mbuɛ | ‘owl’ | μβογγαɛα | μβοι
b. mba# | ‘rice’ | μβαιγγαα | μβει

c. pɛɛɛɛ | ‘house’ | πελεγγαɛα | pεεε

d. γγιλαɛ | ‘dog’ | γγιλαɛγγαɛα | γγιλε

In the indefinite plural, a falling tone

In treating this phenomenon, Leben (1978) proposes a number of rules to account for their behaviour:

29. Tone Absorption:

[ H] [ H] [ H] [ H] [ H] [ H]

This rule converts HL L to H L and LH H to L H.

In plural formation, a falling tone simplifies to L while a rising tone simplifies to H.

The above basic rule is then used to describe the following processes:

31. Downstep: H -H/L -
32. Assimilation: L’H  \( \overset{\downarrow}{\text{H}} \text{H} \)

33. Tone spreading: H L/L  \( \overset{\downarrow}{\text{H}} \text{H} \)

The simplification of a rising tone to a H and a falling tone to a L (rule 56) argues for representing falling tone as a HL sequence and a rising tone as a sequence of LH.

Leben’s (1978) work on Mende morphotonemics shows that in the morphology of a tone language like Mende, tone must be assigned the prominence it requires for a satisfactory analysis to be made. This present work, we will assume the stance of Leben (1978) but only in the model of autosegmental phonology (whose formulation drew a lot of insight from Leben’s (1973) work) as proposed by Goldsmith (1976) with the subsequent modifications as reviewed in 2.1.5 earlier in this chapter.

In her study, Okorji (2002) examines the Inland West Igbo dialects with a view to finding out their phonological and prosodic similarities and dissimilarities. Six dialects are selected to represent the dialect cluster. These are Umuchu, Ekwuluobj a, Qka, Enugwuukwu, Qaukwu and Enuọnj cha dialects. Only the tonal aspect of her analysis is of major interest to this present work. She examines the tonal interaction in segments, words, phrases and sentences and finds out that the high and low tones are basic tones in Inland West Igbo dialects while the down step, the high –falling glide, the low-rising glide and upstep are non-basic. Furthermore, she discovers that there is a direct link between syllable and tonology in the dialect cluster and that downdrift and downstep are applicable to all the representative dialects while upstep obtains only in Aguata-Amaiyi dialect representatives. In her findings also, there are effects that emanate from tonal interaction in segments, words, phrases and sentences. Segments, words, phrases and sentences influence pitch. Tone does not overtly affect segments in the study area and the effect that tone has on words, phrases and sentences is semantically and syntactically based rather than phonological. Okorji (2002) therefore concludes that Aguata dialects indeed have a unique tone pattern as stated in Umeasiegbu (1973) and Ikekeonwu (1986) and that there is a direct link between syllable and tone in Igbo.

Donwa-Ifode (1995) discusses the advantages of incorporating instrumental investigation in the analysis of prosodic language data. This is necessary because our discipline has to be as objective and scientific as possible. According to her, it is an extension and aid to our bodily faculties. In other words,
we first make observations through our senses of hearing, sight and touch; then we make hypothesis which the instruments confirm, negate or modify. Thus, the instrumental work serves as a check on the excesses of subjectivity by our observations. Furthermore, instrumental work adds detail to our observations. She however observes that instruments have their limitations because it is easy to abuse the use of instruments. For this reason, their use is secondary and not primary as they are means to an end and not an end in themselves. Because of these advantages of the use of acoustic instruments in analyzing language data, a number of linguist working on the Igbo language incorporate acoustic findings in their work. Some of these works are discussed below.

Ikekeonwu (1993) aims at establishing the fact that grammatical motivation may not be the compelling reason for the features of downstep and that downdrift may not be automatic after all in the Igbo language. Among other things, she opines that downstep is influenced by what she describes as ‘Tonal Intonation Group’ (TIG). In her analysis, downstep is seen as ‘an intonation feature arising as a result of the need for focus or emphasis on particular syllables within the TIG. Using instrumental analysis, Ikekeonwu explains that phonetically, the syllable with the Focal High Pitch (FHP) is higher than all the other syllables in the TIG and that it usually falls on the lexical item being focused on or on the following syllable to the right. Her work is related to this present one in that it incorporates instrumental findings in the analysis of tonal behaviour in Igbo associative constructions among other categories of utterances and this present work intends to also incorporate instrumental findings in the analysis of the interface of tone and the morpheme in Izii and Ezaa dialects of the Igbo language.

Also, Obianika (1999) incorporates acoustic investigation in her autosegmental analysis of tone in Igbo associative constructions. In her work, she investigates the behaviour of tone in constructions of the noun-noun type. Among other things, she finds out that the previous accounts that the occurrence of the downstep on the first syllable of the second noun in some of these constructions come as a result of the existence of a floating low tone in the deep structure is not consistently applicable in all the cases. She also finds out from the acoustic analysis that there is a consistent pitch rise or lowering in the cases investigated confirming the auditory findings. In line with the submissions of Ikekeonwu (1993), she opines that the rise in pitch in the associative constructions is motivated by a need for focus or emphasis and so could not have emanated from an underlying structure. The above work is related to this work in the sense that in as much as both works are investigating different aspects of the Igbo language, they incorporate the acoustic approach in addition to the perceptual analysis before arriving at a conclusion.
Uguru (2006) sets out to authenticate Ika intonation patterns. Using the judgment sampling technique, she collects samples from two informants - two adult male speakers of Igbo and English respectively. The data is analyzed using the praat system package developed by Paul Boersma. The wavelengths of four intonation patterns, HR, LR, FR and RF in the two languages were measured based on the waveforms.

In her findings, with respect to waveforms, she opines that differences in phonemes and some individual differences in pronunciations may have resulted in certain dissimilarities. The same factors according to her may have resulted in differences in pitch contours of both languages. Also the tunes of both languages, though similar, are not strictly the same while the shapes and directions of rise and fall of their pitch contours are basically the same. Among other things, she concludes that Ika makes use of stress and that the stress is fairly fixed as the nucleus tends to occur sentence-finally. In all according to her, in spite of the relative differences between the intonation patterns compared in English and Ika, it can be said, generally, that the degree of similarity between them is considerably high.

The relationship between the work of Uguru (2006) and the present work lies in the fact that this work will also undertake an acoustic analysis of its data drawn from a different variety of the Igbo language. The difference also lies in the aspect of the speech form studied in addition to the fact that while Uguru (2006) did a comparative work on the intonation patterns of Ika (a dialect of a tone language – Igbo), and that of an intonation language, English, this present work focuses on the interface of tone and morpheme in two dialects of Igbo namely, Izii and Ezaa.

Eme (2006), in her study of the parameters of intersegmental co-ordination in speech analyses her data from Ezaa and Amaezu of the North Igbo dialect as well as from the Akpo and Adazi – Nnukwu of the Inland West Igbo dialect. Generally, she focuses on the result of intersegmental co-ordination in normal speech forms. Part of her concern is also the effect of intersgmatal co-ordination on tones in Igbo speech patterns.

In her findings, under the articulation parameter of intersegmental co-ordination comprising aspiration, lengthening of sounds, vowel reduction, devoicing of sounds, ‘breathy–voiced’ segments and lenition, only lengthening of sounds and devoicing of sounds can be said to have direct influence on tones. She opines that when a sound segment is lengthened as a result of intersegmental co-ordination, the tone attached to that sound automatically becomes lengthened too. Sometimes when a sound is lengthened, its tone remains stable on the same pitch level with the lengthened segment retaining one
of the level pitches of high, low or down step. On the devoicing of sounds, the devoiced vowel is without tone in any of the two specified environments - initially or word finally after a syllabic nasal. In such a way, a segment which ordinarily bears a tone is made to drop its tone as a result of intersegmental co-ordination.

The work of Eme (2006) and this present work are related in the sense that both are concerned with tone (though only partly by Eme (2006) in the same language, Igbo). On the other hand, they are different in that while Eme (2006) works on the result of intersegmental co-ordination perceptually, this present work engages in both perceptual and acoustical analysis of the interface of tone and morpheme in two dialects of Igbo: Izii and Ezaa.

2.3 Summary

In summary, we reviewed theoretical and empirical works relevant to the topic of study. Under theoretical studies, morphology is defined as that branch of linguistic studies that studies the internal structure of words. The history of morphology is traced back to the ancient Indian Linguist Panini. Morphology prospered in the 1700s and 1800s when it was employed in the task of reconstructing the Indo European languages and other groups of languages to find out their origins and levels of relatedness. However, in the early 1900s up to 1950s, morphology suffered a decline in the wake of generative grammar because it was downplayed in that model of grammar as presented by Chomsky in 1957. Between 1959 and 1974, scholars such as Robins and Matthews made major contributions that sparked off the remodeling of generative grammar that resulted in morphology gaining its rightful place of importance in linguistic studies. The word is defined and used in three senses: word refers to the prosodic word; lexeme refers to the lexical word while word-form refers to the grammatical word. Morphemes, morphs and allomorphs were defined and their relationships outlined.

In the next section, we reviewed lexical phonology and defined it as a branch of phonology which holds that there are two distinct types of phonological rule applications: the first type applies within the lexicon (lexical phonology) while the second type applies to the output of the syntactic component (post lexical, sentence level or phrasal phonology) (Pulleyblank (1986). We stated that in this work, we would be concerned with lexical phonology.
Pitch, tone and intonation were defined and their relatedness established. We recognize Igbo as a tone language in line with scholars such as Nwachukwu (1995) Mbah and Mbah (2010) and Emenanjo (1978) and that there are three distinctive tones in Igbo: high (H), low (L) and downstepped high (↓H) 2.2.2).

Autosegmental phonology was reviewed tracing its inception, formation and the remodeling which followed to make it an efficient problem solving tool in tonal analysis. We would employ autosegmental approach in our analysis assuming the stance (following Pulleyblank (1986) that association conventions are: map a sequence of tone onto tone bearing units from left to right in a one – to – one relation and that the wellformedness condition be that association lines do not cross.

Under empirical review, a number of research works which are directly related to the purpose of this present work were reviewed.

Roberts – Kohno’s (2005) On Kikamba Tone – Syntax Interface was reviewed. She postulates that there are three super low tones in Kikamba determined by the level of the grammar the tone operates at: lexical SL tone, grammatical SL tone and phrasal SL tone. Using examples, Roberts – Kohno (2005) outlined the behaviour of the SL tone at these three levels and showed that there is an underlying relationship between SL and SH tones. However, she fails to show whether the relationship is phonemic or just phonetic in nature. The work of Roberts – Kohno (2005) and this work are seen to have (to a degree) a common objective of finding out the interaction between tone and segments within the word. The difference however lies in the fact that while Robert-Kohno’s work is on Kikamba super low tones, this present work is devoted to studying the interface of tones and morphemes in the Abankaleke dialects of Igbo.

Mbah and Mbah (2010) worked on redefining the concept of minimal pairs in the light of tone languages and concluded that every word of a language comprises two ‘tiers’: the prosodic and the segmental and that minimal pairs can be generated from both levels of analysis each of which must be considered before arriving at any meaningful contrast. Mbah and Mbah’s work and this present work share the concern of working on tone in the Igbo language. While their work centers on the roll of tone in defining minimal pairs in a tone language such as Igbo, this work studies the interface of tone and morphemes in a dialect of the Igbo language.

Pulleyblank’s (1986) Morphological Encoding and Association Conventions discusses the interaction of morphology and phonology especially in relation to tone. He argues that tonal association
in many languages is predictable and determined by the morphological structure of the string and the phonological conventions for linking tones to segments. Using a number of languages, Pulleyblank (1986) illustrates that for many languages, cyclic tone association should be employed. The lexical rule application in this work will also apply cyclically.

In Hombert’s (1978) work which was also reviewed here, she sets out to find out how relevant the production phenomena and the acoustic phenomena are of importance in accounting for the fact that vowel quality affects the $F_o$ and pitch of a vowel and that the intrinsic effect of the acoustic signal may become distorted by the time it is perceived by the listener. As a result of several experiments, Hombert (1978) concludes that the context of a vowel influences its $F_o$ values and that the quality of the sound segments play a vital role in phonetic as well as perceptual interpretations of tone by language speakers. While Hombert’s work and the present work are related because both employ the use of instruments in the acoustic analysis of the pitch of vowels in language data, they are different in that Hombert studies the effect of consonants on the pitch of vowels in the American English, this work is concerned with the interface of tone and morphemes in the Abankaleke dialect of Igbo.

In an aspect of the work by Leben (1978) on *Mende Morphotonemics*, he considers the behaviour of tone in constructions involving more than one morpheme and concludes that in the morphology of a tone language like Mende, tone must be assigned the prominence it requires for a satisfactory analysis to be achieved. This conclusion happens to be part of the objectives of this present work.

Also in the work of Okorji (2002), among other things, we see that there are effects that emanate from tonal interaction in segments, words, phrases and sentences and that there is a direct link between syllable and tone in Igbo. In much the same way, the present work seeks to study the interface of tone and morphemes in the Abankaleke dialects. And in Uguru’s (2006) work we saw that a tonal language may also have intonation features and that the Ika dialect of the Igbo language is a good illustration of this fact. While in Eme (2006) we observe that the lengthening of sounds, vowel reduction and the devoicing of sounds have direct influence on tone.

From the contributions of Donnwa-Ifode (1995), we discover the necessity for acoustic experimentation in the investigation of prosodic language data. In Ikekeonwu (1993), we see that the pitch rise in tone in associative constructions among others is motivated by the need for focus and that
the acoustic analysis is indispensable in prosodic analysis of language data. Also, Obianika’s (1999) work underscores the need for objectivity in linguistic analysis especially of prosodic data.

Having seen the extent of work done in related research works, the works that are in similar linguistic subfields are done on dialects other than that of Abankaleke and the ones in the dialect study other aspects or assume other approaches of analyses other than acoustic. In addition, the fact that there has been comments on the peculiarity of the dialect under study when compared with other dialects of the Igbo language, there is the need to study the Abankaleke dialects to ascertain the truth or otherwise of these claims.

CHAPTER THREE

DATA PRESENTATION AND ANALYSIS

3.1.0 Phonemes of Izii Dialect

In this chapter, we will present the data and analyze same.

3.1.1 IZII DIALECT CONSONANTS

<table>
<thead>
<tr>
<th>Plosives</th>
<th>bilabial</th>
<th>Labio denta l</th>
<th>Alveolar</th>
<th>Labio lized alveolar</th>
<th>Palato alveolar</th>
<th>Palatal</th>
<th>velar</th>
<th>Labialise d velar</th>
<th>Labial Velar</th>
<th>glotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>P b t d</td>
<td>C j k g kw gw kp gb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Chart 1 Izii Consonant Chart**

<table>
<thead>
<tr>
<th>Nasals</th>
<th>m</th>
<th>n</th>
<th>ɲ</th>
<th>ɳ</th>
<th>nw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fricatives</td>
<td>φ</td>
<td>β</td>
<td>f</td>
<td>v</td>
<td>s</td>
</tr>
<tr>
<td>Affricates</td>
<td>_pf</td>
<td>донв</td>
<td>ts</td>
<td>dz</td>
<td>tʃ</td>
</tr>
<tr>
<td>Laterals</td>
<td>l</td>
<td>ɭ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approximants</td>
<td>j</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolls</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

34.

/p/ as in ɛ̂πυɔχηιę /ɛpʊʧ ɫɛ/
/b/ as in ɛ̂β_IDENTIFIER α mü /ɛbà/ ‘fat’
/t/ as in ótúbò /ótúbò ‘navel’
/d/ as in ɛ̂γɲʊдʊ /ёgbọdọ/ ‘bush’
/c/ as in èkitchà /èkicà ‘left (side)’
/k/ as in éká /ˈká/ ‘hand’
/g/ as in gidé /ɡidé/ ‘hold’
/kp/ as in ɡкпчч /ˈkpɔ/ ‘bone’
/gb/ as in ègbùshi /àgbọʃ i/ ‘hair’
/kw/ as in ɛkwоɡёнгчп /ɛkwọʃ i/ ‘leaf’
/gw/ as in агвà /əgwà/ ‘beans’
/m/ as in ímí /imí/ ‘nose’
/n/ as in ɡнmp /ɔnə/ ‘mouth’
/ɲ/ as in ẹnọ ə ẹná/ ‘eye’
/ŋ/ as in ọkú ẹkú/ ‘firewood’
/ŋw/ as in nwáanyi ẹnwànjì/ ‘women’
/ɸ/ as in ọphi ọfé / ‘soup’
/β/ as in αββαβηασ / /âbå/ ‘year’
/t/ as in yéfù jéfù/ ‘untie’
/v/ as in nwọ ɲyọ/ ‘nail (finger or toe)’
/s/ as in sàá sàá/ ‘wash’
/z/ as in éz é /ézé/ ‘tooth’
/ʃ/ as in ọsọ ọLf i / ‘head’
/ʒ/ as in ϱγάρζɛ ọgά ọ / ‘guinea fowl’
/pf/ as in ọpfù ọpfrica / ‘palm’
/bv/ as in óbvú óbvu/ ‘thorn’
/dz/ as in ùdzọọmuọ ọ /údzúmini/ ‘rainy season’
/ts/ as in ùtsọọ ọ /òtsó ‘sweet (tasty)’
/ɣ/ as in oγάηọq /ọγù/ ‘cotton’
/hw/ as in ọμεξηξηξọ ọ /imehwo/ ‘intestine’
/h/ as in èhú èhù / ‘body’
/tʃ/ as in ích ítʃ / ‘ear’
/dʒ/ as in èjìågbà èdʒìègba/ ‘beard’
/l/ as in ọlú ọlú/ ‘neck’
/lw/ as in ọlọọ /lọá/ ‘return’
/w/ as in ùwé ùwé/ ‘rob’
In Izii dialect, there are nine vowels. /i e ɛ a u ʊ o œ/.

![Izii Vowel Chart](chart.png)

**Chart 2 Izii vowel chart**

The shwa (ə) is put in parenthesis to show that it does not constitute a tent vowel in Izii but that its occurrence is as a result of vowel reduction in some environments and may further lead to vowel loss. The phenomenon will be illustrated later under acoustic analysis. These vowels are exemplified below;
3.1.3 Tonemes of Izii Dialect

The Izii dialect has the high, the low and the downstep tones just as it is in the Standard Igbo. In addition to these, the high raising tone is observed in the Izii dialect. It is a level tone that occurs in languages. While the upstep occurs after high tones, the high raising occurs after low tones. In the Izii dialect, it occurs between two low tones. The high raising tone is not phonemic in the Izii dialect. The examples are as follows in 36:

36.

/ɪgbɛrì/ ‘guinea corn’
/àʃ imókù/ ‘groundnut’
/mkpúrù/ ‘room’
/éj wéàa/ ‘guest/stranger’
/èkótàra/ ‘right (side)’
/èkà ‘left’
/ϕʊραϕʊρα/ ‘stand (up)’

/ŋáàrìri/ ‘cry’

The examples of the other tones are presented below in 37 as they occur in the Izii dialect;

<table>
<thead>
<tr>
<th>High Tone</th>
<th>Low Tone</th>
<th>DownStep</th>
<th>High Raising</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ɔʃjɛɛkɛ/ arm</td>
<td>/eɡba/ jaw</td>
<td>/ʃkwo ɨhe grinding stone</td>
<td>/əʃ ɨnokù/ groundnut</td>
</tr>
<tr>
<td>/ɛɛγβɛɛj ɬɬ/ hair</td>
<td>/ɪ ɛɛγβɛɛkɛ/ pepper</td>
<td>/Utú ɬte/ mat</td>
<td>/ɛɛwéaa/ guest</td>
</tr>
<tr>
<td>/ɪɛtɔɛɛ/ cookingpot</td>
<td>/ɛɛγβɛɛðɛ/ bush</td>
<td>/ɛkpo ɬkú/ compound</td>
<td>/ɛkotára/ right</td>
</tr>
<tr>
<td>/ŋtɔɛɛ/ ashes</td>
<td>/ɬl ɬɛ/ earth</td>
<td></td>
<td>/ɛkicà/ left</td>
</tr>
<tr>
<td>/ʊɛɛɛɛ/ bow</td>
<td>/okpuɛɛ/ cap/hat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

37. Izii Tonemes

3.2.1 Ezaa Dialect Consonants

The Ezaa dialect consonants are presented in the following chart.
The consonants of the Ezaa dialect are exemplified in 38 below:

38.

/p/ as in pén /pén/ ‘money’

/b/ as in ẹβα /θβα / ‘fat’

/t/ as in itè /ite/ ‘pot’

/d/ as in noδµ /nòdó / ‘sit down’

/k/ as in ẹκι /ɛκι / ‘left’

/g/ as in ọγ /ɔγ / ‘hoe’

/kp/ as in ẹκπο /ɛκπο / ‘mud’

/gb/ as in μγβọ /ɱgbọ / ‘wall’

/kw/ as in ẹκωκα /ɛκωκα / ‘cloth’

/gw/ as in ágwọ /ágwọ / ‘snake’

/m/ as in ọμ /ɔμ / ‘nose’

/n/ as in ọνµ /ɔνµ / ‘mouth’

/p/ as in ẹνψα /ɛνψα / ‘eye’

/ŋ/ as in ɲána /ɲána / ‘drink’

/ŋw/ as in nwόke /ɲwόke / ‘man’

/pf/ as in oπφ /oπφ / ‘word’
3.2.2 EZAA DIALECT VOWELS

The vowels of Ezaa dialect are nine: /i, ɪ, e, ɛ, a, u, ʊ, o, ɔ/. They are presented in the vowel chart below;
In the vowel chart above, it is worthy of note that the shwa (ǝ) is put in parenthesis to indicate that it is not a full fledged vowel but occurs as a reduced vowel. Later we will observe that this reduction in some cases especially in Ezaa further results in vowel loss giving rise to closed syllables and consonant clusters.

39.

/ɪ/ as in ɛnɛn /ɪɛn/ ‘tongue’
/ɪ/ as in èkɪch /èkɪʧ/ ‘left (side)’
/e/ as in épfɛ /épfɛ/ ‘cow’
/ɛ/ as in ɛbɛbɛɛ /ègbɛf/ ‘hair’
/ɔ/ as in ánwù /áŋwʊ/ ‘sunshine’
/ʊ/ as in ùteɛ /úteɛ/ ‘mat’
/ʊ/ as in ùzaɛ /ózaɛ/ ‘pepper’
/ø/ as in ọshiɛ /óʃiɛ/ ‘stick’
/ø/ as in ọnụɛ /ónụɛ/ ‘mouth’

3.2.3 Ezaa Dialect Tonemes
Ezaa dialect has the high, the low and the down step tones as they occur in the Standard Igbo. In addition to these, the high raising tone is also observed in the Ezaa dialect and is exemplified in 40 below;

40.

/ɪgbéri/) guinea corn

/àkáhọ/ old

/èkőtār/ right (side)

/èkícà/) left

The other tones that are mentioned above as observed in the Ezaa dialect are presented in the following table.

<table>
<thead>
<tr>
<th>High Tone</th>
<th>Low Tone</th>
<th>DownStep</th>
<th>High Raising</th>
</tr>
</thead>
<tbody>
<tr>
<td>/àkà/ hand</td>
<td>/èkàgrà/ old person</td>
<td>/mèè/ blood</td>
<td>/ìgbèrì/ guinea corn</td>
</tr>
<tr>
<td>/ʃékà/ small</td>
<td>/èkàgrà/ old person</td>
<td>/mgɔ̀bɛ̀/ sleep</td>
<td>/àkáhọ/ old</td>
</tr>
<tr>
<td>/jwàkökh/ crab</td>
<td>/èkàgrà/ guineafowl</td>
<td>/èkwàró / sleep</td>
<td>/èkőtār/ right (side)</td>
</tr>
<tr>
<td>/ùhwù/ village</td>
<td>/èkàgrà/ ashes</td>
<td>/ògùìgh́wé/ grinding stone</td>
<td>/èkítʃ a/) left</td>
</tr>
<tr>
<td>/ènó/ mouth</td>
<td>/èkàgrà/</td>
<td>/èdʒ/ bad</td>
<td></td>
</tr>
</tbody>
</table>

41. Tonemes of Ezaa
Also in Ezaa dialect we observe the existence of gliding tones. Basically, there are rising glides and marginally falling glides. The examples are as follows:

### 42. Gliding Tones in Ezaa

<table>
<thead>
<tr>
<th>Rising Glide</th>
<th>Falling Glide</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ɛhwà/ name</td>
<td>/ŋwètʃ aʒ/ dog</td>
</tr>
<tr>
<td>/ɛdʒ/ snail</td>
<td></td>
</tr>
<tr>
<td>/ʃíʃts/ dawn</td>
<td></td>
</tr>
<tr>
<td>/ɛwv/ fear</td>
<td></td>
</tr>
<tr>
<td>/ɔkpà/ leg</td>
<td></td>
</tr>
</tbody>
</table>

In the above data, only one of the examples could be explained as occurring as a result of elision. /ʃíʃts/ ‘dawn’ may have occurred as a result of intersegmental coordination in pronouncing the two words /isi/ and /ɔtsɔtsɔ/ after the deletion of the first /ts/ and the elision of the first /ɔ/. The high tone which is left floating now attaches to the next vowel. The last vowel /ɔ/ does not surface because the dialect allows closed syllables.

### 3.4.0 The Syllable Structure of Izii and Ezaa Dialects

As discussed in chapter two, there are restrictions in the occurrence of phonemes of languages in forming syllables. This section looks into the way these restrictions work in Izii and Ezaa dialects.

The syllable structures of Izii and Ezaa dialects are unique in that as dialects of Igbo, it is surprising that they have onsets and codas and that the Ezaa dialect also has consonant clusters.
Generally, they have the following syllable structures.

CVC - onset, nucleus and coda

CCV - consonant cluster as onset and nucleus

CV - onset and nucleus

V - only nucleus.

<table>
<thead>
<tr>
<th>(C)VC (onset (optional) and coda)</th>
<th>CV (onset and nucleus)</th>
<th>V (only nucleus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/gbó/ hair</td>
<td>/jó/ body</td>
<td>/dʒi/ hair</td>
</tr>
<tr>
<td>/ga/ guineafowl</td>
<td>/ka/ hand</td>
<td>/ŋá/ eye</td>
</tr>
<tr>
<td>/opf/ word</td>
<td>/ŋó/ mouth</td>
<td>/li/ land</td>
</tr>
<tr>
<td>/ŋf/ ear</td>
<td>/ọf/ soup</td>
<td>/ọzó/ road</td>
</tr>
<tr>
<td>/bók/ groundnut</td>
<td>/bówó/ song</td>
<td>/ashwá/ wá/ market</td>
</tr>
<tr>
<td>/ákpo/ bark(of tree)</td>
<td>/ákuwá/ root</td>
<td></td>
</tr>
<tr>
<td>/ákwó/ root</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/ọf/ stick</td>
<td>/ọpri/ cow</td>
<td></td>
</tr>
<tr>
<td>/ọg/ hoe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/iíts/ dawn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/skh/ chicken</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

43. Izii Syllable Structure
In 43 and 44 above, we have instances of onsets and codas exemplified in the Izii and Ezaa dialects. Also, there are instances of consonant clusters in the Ezaa dialect. In 44 above, we present the syllable structure of Ezaa dialect. As could be observed in column 1, the first syllables in lines 1-3 and the last syllable in line 4 are made up of only (a vowel) the nucleus. In column 2, the first syllable in line 1 and the last syllables in lines 2-4 are made up of an onset plus the nucleus. Column 3 shows all the last syllables with both onsets and codas while the last column shows the second syllables in lines 1, 2 and 4 and the fourth syllable in line 3 as having consonant clusters. The second syllable in line four of column 3 also has consonant clusters as onset. Note that the respective syllables referred to are underlined.

The occurrence of closed syllables in Izii and Ezaa dialects and consonant clusters in Ezaa may be attributed to an observed ongoing process of sound change in the Igbo language. A look at the classification of Igbo dialects by Nwaozuzu (2008) shows that there is a pattern of change that is taking place. The dialects of the West Niger Group, the North Eastern and the Northern Group of dialects (these are mostly at the geographical periphery of the Igbo heartland) all have nine to ten vowel systems. Each of these dialect groups also have features of vowel reduction where the schwa is used in

---

<table>
<thead>
<tr>
<th>V-only nucleus</th>
<th>cv-onset + nucleus</th>
<th>cvc-onset + nucleus + coda</th>
<th>ccv-onset cluster + nucleus</th>
</tr>
</thead>
<tbody>
<tr>
<td>/èdʒi/ ‘bad’</td>
<td>/lǐ/ ‘small’</td>
<td>/ègbóf/ ‘hair’</td>
<td>/ègrιnà/ ‘old person’</td>
</tr>
<tr>
<td>/èŋά/ ‘eye’</td>
<td>/bɔká/ ‘hand’</td>
<td>/ɔgbàs/ ‘guineafowl’</td>
<td>/ɔglόgό/ ‘long’</td>
</tr>
<tr>
<td>/oḥwé/ ‘soup’</td>
<td>/bọ́/ ‘body’</td>
<td>/ɔtάpf/ ‘thigh’</td>
<td>/ɔɛɛsɛmɛgɔbʊŋp/ ‘turn around’</td>
</tr>
<tr>
<td>/mά/ ‘know’</td>
<td>/ɔzά/ ‘pepper’</td>
<td>/af  bók/ ‘groundnut’</td>
<td>/mɔkprób/ ‘heart’</td>
</tr>
<tr>
<td></td>
<td>/oŋάnɛŋpɔŋuŋɔnɛ́/ ‘older person’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
place of the reduced vowel. On the other hand, the rest of the dialect Groups operate eight vowel systems with the vowels always fully realized.

The case of the Izii and Ezaa dialects of the North Eastern Dialect Group (according to Nwaozuzu (2008) classification) could be seen as a case of the lose of a reduced vowel especially when the occurrence is at syllable final position resulting in closed syllables as seen in Izii and Ezaa and consonant clusters in Ezaa. The case of this vowel lose in Ezaa is observed to be more common than in Izii perhaps because of the closer proximity of the speakers of Ezaa with the speakers of Korin, a language that is reported to have evidence of closed syllables (Anagbogu (2003) and Iloene (2008). We therefore posit that the syllable structures of Izii and Ezaa dialects are a resultant factor of a language that is undergoing a structural change. A closer look at other related dialects of the Igbo language is therefore necessary as it may well confirm this phenomenon.

3.5.0 The Word in Izii and Ezaa Dialects

The word in Izii and Ezaa dialects can be classified using different criteria. In this section, we shall classify the word using the syllable as a criterion thus: monosyllabic, disyllabic, trisyllabic and multisyllabic words.

3.5.1 The Word in Izii Dialect

Izii dialect has monosyllabic, disyllabic, trisyllabic as well as multisyllabic words. The following exemplify this fact.

<table>
<thead>
<tr>
<th>Monosyllabic</th>
<th>Disyllabic</th>
<th>Trisyllabic</th>
<th>Multisyllabic</th>
</tr>
</thead>
<tbody>
<tr>
<td>/bvó/ ‘finish’</td>
<td>/ɛŋaː/ ‘eye’</td>
<td>/tɛtɔːkɔː/ ‘cooking pot’</td>
<td>/ɔːvɔːmənə/ ‘saliva’</td>
</tr>
<tr>
<td>/mó/ ‘me’</td>
<td>/mpló/ ‘oil palm’</td>
<td>/tɛŋbɛːrɪ/ ‘guinea corn’</td>
<td>/ɔːvɔːməkɔːkɔː/ ‘chick’</td>
</tr>
<tr>
<td>/já/ ‘he/she’</td>
<td>/ikweː/ ‘mortar’</td>
<td>/tɛkπeːrɛ/ ‘knee’</td>
<td>/ɔːŋbɛɔːŋpɛːrɛ/ ‘old person’</td>
</tr>
<tr>
<td>/bɛ/ ‘them’</td>
<td>/ànlɛ/ ‘we’</td>
<td>/tɛγbɔːkɛːpɛ/ ‘pepper’</td>
<td>/mɛkπɛːplɛkɔːpɛ/ ‘short’</td>
</tr>
</tbody>
</table>
45. The Structure of the Word in Izii

In the above examples (45), but for the pronouns monosyllables are common in the Izii dialect while the other structures are prevalent.

3.5.2 The Word in Ezaa dialect

As in Izii dialect, Ezaa features monosyllabic disyllabic, trisyllabic and multisyllabic words. It is worthy of note that almost all the multisyllabic words are derived.

Examples:

<table>
<thead>
<tr>
<th>Monosyllabic</th>
<th>Disyllabic</th>
<th>Trisyllabic</th>
<th>Multisyllabic</th>
</tr>
</thead>
<tbody>
<tr>
<td>/oʂp/</td>
<td>/iši/</td>
<td>/o tʊ o mʊ/</td>
<td>U dзи े dʒə/</td>
</tr>
<tr>
<td>/ɛʊə/</td>
<td>/ɛ kpa/</td>
<td>/a kʊʊ dʊ/</td>
<td>/mɪ nɪ/</td>
</tr>
<tr>
<td>/dʒ/</td>
<td>/ɛ hʊ/</td>
<td>/o tʊ bʊ/</td>
<td>/mee/</td>
</tr>
<tr>
<td>/p/</td>
<td>/ʊ za/</td>
<td>/l ʊ ə/</td>
<td>/mée mi nɪ/</td>
</tr>
<tr>
<td>/pɛn/</td>
<td>/ʊ tə/</td>
<td>/l ʊ tʊ /</td>
<td>mée mi nɪ/</td>
</tr>
<tr>
<td>/fɜ/</td>
<td>/sɪ/</td>
<td>/a mʊ/</td>
<td>/ˈdʒʊ/</td>
</tr>
<tr>
<td>/dʒɪ/</td>
<td>/ʃɪ/</td>
<td>/dʊ tʊ /</td>
<td>/ˈdʒʊ/</td>
</tr>
<tr>
<td>/ɛdʒɪ/</td>
<td>/ɪ ʃɪ/</td>
<td>/ʊ tʊ /</td>
<td>/ˈdʒʊ/</td>
</tr>
</tbody>
</table>

46. The Structure of the Word in Ezaa
From the data in 46 above, the occurrence of monosyllables in Ezaa is greater than what is obtainable in the Izii dialect because most of the monosyllabic words would have been disyllabic if Ezaa dialect did not allow closed syllables. The fact that all the monosyllabic examples have codas makes it clear. It is worthy of note that multisyllabic words are rare in the dialect hence all the examples given are derived forms. All the other structures also occur in the dialect.

3.6.0 Word Classes in Izii and Ezaa Dialects

The noun, verb, pronoun, adjective and adverb classes in Izii and Ezaa will be analyzed in this section in terms of the processes employed in forming them. The data collected for this research work are basic vocabularies used for day to day transactions in Izii and Ezaa dialects. We will examine them to determine the processes through which they were realized.

3.6.1 The Noun

The nouns in both dialects are free morphemes. However, some are formed by compounding.

The following are some examples of the compound words.

<table>
<thead>
<tr>
<th>Izii</th>
<th>EZAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ŋ́kpʊ́rʊ́+o+bʊ/</td>
<td>/ŋ́kpʊ́rʊ́o+bʊ/</td>
</tr>
<tr>
<td>‘seed’       ‘heart’       ‘heart’       ‘eater’       ‘oil’       ‘cat’</td>
<td></td>
</tr>
<tr>
<td>/ɛ̀dʒɪ́+ɛ̀ɡba/</td>
<td>/ɛ̀dʒɪ̀ɡba/</td>
</tr>
<tr>
<td>‘hair’       ‘jew’       ‘beard’       ‘head’       ‘jaw’       ‘chin’</td>
<td></td>
</tr>
</tbody>
</table>
In the examples, most of the words are simple compounds of two nouns strung together to form one unitary meaning. Only one example from Ezaa is a complete statement. ọ+r+i+le+ma+nị the first part of the word is a product of another process (suffixation) where a prefix ‘o’ – had been added to the verb ‘ri’ (eat) to form the noun ‘ori’ (eater). The adverb ‘le’ (with) was also added to indicate how the eating is done before the noun ‘ma+nị’ (oil).

### 3.6.2 The Verb

Generally in the Igbo language, the verb is the only word class that accepts affixation. This is also true of Izii and Ezaa dialects. Due to the nature of the data collected, the affixation processes typified in these examples do not exhaust the possibilities obtainable in these dialects. We present below the processes observable in the data collected.

#### 3.6.2.1 Suffixation

<table>
<thead>
<tr>
<th>Izii</th>
<th>Ezaa</th>
</tr>
</thead>
<tbody>
<tr>
<td>/jè +é/</td>
<td>+éèé/ ‘go’</td>
</tr>
<tr>
<td>/là+a//=</td>
<td>+àà/ ‘return’</td>
</tr>
</tbody>
</table>
The above examples show that the suffixes –V, -ta and –ma are affixed to the verbs to express the imperative in Izii dialect. In Ezaa dialect the only difference is that, the -ma is –na.

### 3.6.2.2 Verb Complementation

The process of verb complementation is observed in the data. The following illustrate the fact.
3.6.3 The Pronoun

The pronouns are all free morphemes and do not accept affixes in the two dialects. The different persons and number are reflected by the form of the pronoun.

However, the second person changes for number only but not for grammatical function in Ezaa dialect just as in standard Igbo.

Examples:

<table>
<thead>
<tr>
<th>IZII</th>
<th>EZAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>/mʊ/ ‘I’</td>
<td>/mʊ/ ‘I’</td>
</tr>
<tr>
<td>/mʊ/ ‘I’</td>
<td>/mʊ/ ‘I’</td>
</tr>
<tr>
<td>/mʊ/ ‘me’</td>
<td>/m/ ‘me’</td>
</tr>
<tr>
<td>/m/ ‘mine’</td>
<td>/m/ ‘mine’</td>
</tr>
<tr>
<td>/ŋʊ/ ‘you’</td>
<td>/ŋʊ/ ‘you’</td>
</tr>
<tr>
<td>/i  ‘you(subj.)’</td>
<td>/ŋʊ/ ‘you(subj.)’</td>
</tr>
</tbody>
</table>
50. Pronouns in Izii and Ezaa Dialects

3.6.4 The adjective

The adjectives are also free morphemes and do not accept inflections. However the word /ʊʃwʊʃw/ and /méeme/ in Izii and Ezaa respectively are formed by duplicating the word /ʊʃ/ (cam wood) and (/mée/ (blood) respectively to express the colour (red). Also, the word ‘dry’ is expressed by a phrase /a+kpɔ+hʊ+ŋkʊ/ in Izii.

Examples:

<table>
<thead>
<tr>
<th><strong>IZII</strong></th>
<th><strong>EZAA</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>/òdʒi/ ‘black’</td>
<td>/ùdʒi/ ‘black’</td>
</tr>
<tr>
<td>/ɔ ʃɪf á/ ‘white’</td>
<td>/ɔʃɪf á/ ‘white’</td>
</tr>
<tr>
<td>/ɔʃ ‘e’ʃ ‘e’/ ‘red’</td>
<td>/mée mè/ ‘red’</td>
</tr>
<tr>
<td>/ínu ≪kwu≫ ‘big(great, large)’</td>
<td>/j i ≪i≫ ‘big(big,large)’</td>
</tr>
<tr>
<td>/óbe ≪re≫ ‘small’</td>
<td>/ŋwəŋj i≫ ‘small’</td>
</tr>
<tr>
<td>/ógo ≪lo≫ ‘long(of stick)’</td>
<td>/óglo 2≫qò/ ‘long(of stick)’</td>
</tr>
</tbody>
</table>
3.6.5 The Adverb

This word class is usually a free morpheme and does not accept inflections. From our data, only a few examples are formed by compounding in the two dialects.

<table>
<thead>
<tr>
<th>IZII</th>
<th>EZAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>/èkọ+tàra/</td>
<td>‘right (side)’</td>
</tr>
<tr>
<td>/è ɗi+cà/</td>
<td>‘left’</td>
</tr>
</tbody>
</table>

52 Adverbs in Izii and Ezaa Dialects

3.7 Cognates

From the data collected, the two dialects under study vary in terms of the lexemes used for identifying items in their environments. The table below exemplifies the fact.

<table>
<thead>
<tr>
<th>Izii</th>
<th>Ezaa</th>
<th>Standard Igbo</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ègbọ/</td>
<td>/ègbọ/</td>
<td>/ntùtu/</td>
<td>‘hair’</td>
</tr>
<tr>
<td>/iɲa/</td>
<td>/iɲa/</td>
<td>/áɲá/</td>
<td>‘eyes’</td>
</tr>
<tr>
<td>/ńtʃì/</td>
<td>/ńtʃ/</td>
<td>/ńtı/</td>
<td>‘ear’</td>
</tr>
<tr>
<td>/áʃ a/</td>
<td>/aʃ iɛgbọ/</td>
<td>/ńtʃì/</td>
<td>‘chin’</td>
</tr>
<tr>
<td>/ńkọ ɛg ɛbù/</td>
<td>/ńkọ ɛgbù/</td>
<td>/ńtʃì/</td>
<td>‘heart’</td>
</tr>
<tr>
<td>/ńʃ i ɛg øka/</td>
<td>/ńkọ ɛbù/</td>
<td>/ńtʃì/</td>
<td>‘arm’</td>
</tr>
<tr>
<td>/úpfú/</td>
<td>/úta ãpf/</td>
<td>/ákpa ãta ãkwó/</td>
<td>‘thigh’</td>
</tr>
<tr>
<td>/ Igba ãkpo/</td>
<td>/úzà/</td>
<td>/ósè/</td>
<td>‘pepper’</td>
</tr>
<tr>
<td>/àf i ãmo ãkò/</td>
<td>/àf bók/</td>
<td>/àhòe ãke ãre/</td>
<td>‘groundnut’</td>
</tr>
<tr>
<td>/ígbarà ãvùo ãj i/</td>
<td>/ákwa ãro ãj/</td>
<td>/m ãgbo ãro ãgwo/</td>
<td>‘root’</td>
</tr>
<tr>
<td>/ítà/</td>
<td>/ibe/</td>
<td>/ítì/</td>
<td>‘ashes’</td>
</tr>
<tr>
<td>/ítà ãkà/</td>
<td>/ítì i ãhw/</td>
<td>/ítì ãñi ã/</td>
<td>‘cooking pot’</td>
</tr>
<tr>
<td>/ákwo ãw hwe/</td>
<td>/éwhò ãro ãw ãgwi ãw hwe/</td>
<td>/igù/</td>
<td>‘grinding stone’</td>
</tr>
<tr>
<td>/ikwè/</td>
<td>/íto ãmo/</td>
<td>/ikwè/</td>
<td>‘mortar’</td>
</tr>
<tr>
<td>/òyú/</td>
<td>/òwù/</td>
<td>/òwù/</td>
<td>‘thread’</td>
</tr>
<tr>
<td>/òkpo ãgà/</td>
<td>/pén/</td>
<td>/é ãgò/</td>
<td>‘money’</td>
</tr>
<tr>
<td>/ibúlì/</td>
<td>/njgbo ãdo/</td>
<td>/ádɔ ãl ãlo/</td>
<td>‘wall(of a house)’</td>
</tr>
<tr>
<td>/ò ãkpòkò/</td>
<td>/ògbò ãwh/</td>
<td>/njgwù ãru/</td>
<td>‘compound’</td>
</tr>
<tr>
<td>/njkpùkpu/</td>
<td>/úhwù/</td>
<td>/èbe/</td>
<td>‘village’</td>
</tr>
<tr>
<td>/ëe ãgò/</td>
<td>/òpf/</td>
<td>/úgbo/</td>
<td>‘farm’</td>
</tr>
<tr>
<td>/ngbo ãdò/</td>
<td>/òfwì ãa/</td>
<td>/òfì ãa/</td>
<td>‘bush’</td>
</tr>
<tr>
<td>/ëf wì/</td>
<td>/çpfè/</td>
<td>/éhìñ ãe/</td>
<td>‘day’</td>
</tr>
<tr>
<td>/èbò/</td>
<td>/èww/</td>
<td>/ègwù/</td>
<td>‘fear’</td>
</tr>
<tr>
<td>/à’àbà/</td>
<td>/àáhwà/</td>
<td>/àrò/</td>
<td>‘year’</td>
</tr>
<tr>
<td>/èbù/</td>
<td>/èvu/</td>
<td>/àbò/</td>
<td>‘song’</td>
</tr>
<tr>
<td>/áko/ ≈</td>
<td>/ihwè/</td>
<td>/ákɔ əko/</td>
<td>‘story’</td>
</tr>
<tr>
<td>/òkà/</td>
<td>/pfédzi’rez/</td>
<td>/âsi/</td>
<td>‘lie(s)’</td>
</tr>
<tr>
<td>/èf wì/</td>
<td>/éphì/</td>
<td>/éhì/</td>
<td>‘cow’</td>
</tr>
<tr>
<td>/jìko əta/</td>
<td>/jìwèf aɊ/</td>
<td>/jìkì əta/</td>
<td>‘dog’</td>
</tr>
<tr>
<td>/bùúsù/</td>
<td>/òrìlèmáɄ-àŋ/</td>
<td>/òlo ə-ɡbo/</td>
<td>‘cat’</td>
</tr>
<tr>
<td>/èdʒì/</td>
<td>/èdʒ̟/</td>
<td>/èdʒ̟uła/</td>
<td>‘snail’</td>
</tr>
<tr>
<td>/jìfo əkɔ/</td>
<td>/jìfò əkh/</td>
<td>/jìsì əkɔ/</td>
<td>‘crab’</td>
</tr>
<tr>
<td>/si ənì ənà/</td>
<td>/òpe ətsa ərma ədz/</td>
<td>/òkẹ́nà/</td>
<td>‘senior/older’</td>
</tr>
<tr>
<td>/jìpà/</td>
<td>/jìndʒù əh/</td>
<td>/épì/</td>
<td>‘friend’</td>
</tr>
<tr>
<td>/jì jì/</td>
<td>/òv/</td>
<td>/ògwù/</td>
<td>‘medicine(charm)’</td>
</tr>
<tr>
<td>/úf wù ə-e/</td>
<td>/mée əmè/</td>
<td>/úfì əe əhì əe/</td>
<td>‘red’</td>
</tr>
<tr>
<td>/swùwù/</td>
<td>/swìwù/</td>
<td>/swà ərâ/</td>
<td>‘new’</td>
</tr>
<tr>
<td>/skɔ/</td>
<td>/ivò əkɔ/</td>
<td>/skɔ/</td>
<td>‘hot(as fire)’</td>
</tr>
<tr>
<td>/èkpotì/</td>
<td>/èkpòtò/</td>
<td>/áp̟ùti/</td>
<td>‘mud’</td>
</tr>
</tbody>
</table>

### 53 Cognates in Izii, Ezaa and the Standard Igbo

In 53 above, we observe that the Izii, Ezaa and the Standard Igbo share a lot of similarities in their lexical items. Most of the items are cognates and in some cases where the words differ, the tones are still the same indicating that at a time in the past, they may have had the same words for the items but that in time the segments changed but the tone had remained the same. Such words include /jìfo əkɔ/ | /jìfò əkh/ | /jìsì əkɔ/ ‘crab’ | /èdʒ̟/ | /èdʒ̟uła/ ‘snail’, /èbvʊ/ | /èwv/ | /ègwù/ ‘fear’
CHAPTER FOUR

ACOUSTIC ANALYSIS

4.0 This chapter will be devoted to acoustic and autosegmental analyses of the data. We shall consider the tone levels in nouns, how they vary within the dialects and with the Standard Igbo (SI) and the levels of fundamental frequencies at which these tones are realized in the Izii and Ezaa dialects and in the Standard Igbo (SI).
4.1 Tone and Pitch Levels in the Standard Igbo and in the Izii and Ezaa Dialects

We shall look at nouns in the dialects and in SI to observe the pitch levels and compare how they vary in Izii, Ezaa and the SI. The data selected are those which are cognates in at least two varieties. The pitch level indicated in each word is the syllabic element with the highest pitch and is underlined.

<table>
<thead>
<tr>
<th>Izii</th>
<th>F₀</th>
<th>Ezaa</th>
<th>F₀</th>
<th>SI</th>
<th>F₀</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1./íʃi/</td>
<td>170hz</td>
<td>/iʃi/</td>
<td>140hz</td>
<td>/iʃi/</td>
<td>150hz</td>
<td>‘head’</td>
</tr>
<tr>
<td>2./ẹɲa/</td>
<td>155hz</td>
<td>/ẹɲa/</td>
<td>130hz</td>
<td>/ẹɲa/</td>
<td>148hz</td>
<td>‘eye’</td>
</tr>
<tr>
<td>3./ntʃ/</td>
<td>198hz</td>
<td>/ntʃ/</td>
<td>160hz</td>
<td>/ntʃ/</td>
<td>170hz</td>
<td>‘ear’</td>
</tr>
<tr>
<td>4./eʃe/</td>
<td>160hz</td>
<td>/eʃe/</td>
<td>130hz</td>
<td>/eʃe/</td>
<td>155hz</td>
<td>‘teeth’</td>
</tr>
<tr>
<td>5/ọtùbọ/</td>
<td>199hz</td>
<td>/ọtùbọ/</td>
<td>170hz</td>
<td>/ọtùbọ/</td>
<td>150hz</td>
<td>‘navel’</td>
</tr>
<tr>
<td>6./mevo/</td>
<td>197hz</td>
<td>/mevo/</td>
<td>120hz</td>
<td>/mevo/</td>
<td>155hz</td>
<td>‘nail(finger/toe’</td>
</tr>
<tr>
<td>7./ikpere/</td>
<td>200hz</td>
<td>/ikpere/</td>
<td>170hz</td>
<td>/ikpere/</td>
<td>180hz</td>
<td>‘knee’</td>
</tr>
<tr>
<td>8./ọọ/</td>
<td>165hz</td>
<td>/ọọ/</td>
<td>155hz</td>
<td>/ọọ/</td>
<td>165hz</td>
<td>‘tree’</td>
</tr>
<tr>
<td>9/ọbà/</td>
<td>160hz</td>
<td>/ọbà/</td>
<td>170hz</td>
<td>/ọbà/</td>
<td>150hz</td>
<td>‘calabash’</td>
</tr>
<tr>
<td>10/ọgù/</td>
<td>180hz</td>
<td>/ọgù/</td>
<td>145hz</td>
<td>/ọgù/</td>
<td>160hz</td>
<td>‘hoe’</td>
</tr>
<tr>
<td>11/ọtá/</td>
<td>170hz</td>
<td>/ọtá/</td>
<td>120hz</td>
<td>/ọtá/</td>
<td>165hz</td>
<td>‘bow’</td>
</tr>
<tr>
<td>No.</td>
<td>Tone Pattern</td>
<td>Language</td>
<td>Tone Level</td>
<td>Language</td>
<td>Tone Level</td>
<td>Language</td>
</tr>
<tr>
<td>-----</td>
<td>--------------</td>
<td>----------</td>
<td>------------</td>
<td>----------</td>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>12</td>
<td>/áʃ wá/</td>
<td>Izii</td>
<td>160hz</td>
<td>/áfwá/</td>
<td>140hz</td>
<td>/áhí ağ/</td>
</tr>
<tr>
<td>13</td>
<td>/ɛ gbó/</td>
<td>Ezaa</td>
<td>145hz</td>
<td>/fwá ağ/</td>
<td>165hz</td>
<td>/lhí ağ/</td>
</tr>
<tr>
<td>14</td>
<td>/úbvú/</td>
<td>SI</td>
<td>160hz</td>
<td>/útvú/</td>
<td>155hz</td>
<td>/úgwú/</td>
</tr>
<tr>
<td>15</td>
<td>/âli /¾/</td>
<td>SI</td>
<td>145hz</td>
<td>/dʒ a/</td>
<td>150hz</td>
<td>/âni ¾/</td>
</tr>
<tr>
<td>16</td>
<td>/ɛpọt ¾/</td>
<td>SI</td>
<td>187hz</td>
<td>/kpo ¾/</td>
<td>195hz</td>
<td>/âpọt ¾/</td>
</tr>
<tr>
<td>17</td>
<td>/iku ¾/</td>
<td>SI</td>
<td>150hz</td>
<td>/iku ¾/</td>
<td>165hz</td>
<td>/iku ¾/</td>
</tr>
<tr>
<td>18</td>
<td>/ēbvú/</td>
<td>SI</td>
<td>192hz</td>
<td>/ēwú/</td>
<td>180hz</td>
<td>/ēgwú/</td>
</tr>
<tr>
<td>19</td>
<td>/ŋʃ j/</td>
<td>SI</td>
<td>170hz</td>
<td>/ŋʃ/</td>
<td>195hz</td>
<td>/ŋʃwú/</td>
</tr>
</tbody>
</table>

54. Tone and Pitch Levels in Specific Linguistic Items in Izii, Ezaa and the Standard Igbo

4.1.2 Tone in Specific Linguistic Items

In the examples in 54, all the cognate linguistic items have similar tone patterns. Even in a few cases where the word for one item is not a cognate in one of the varieties, the tone pattern is the same: /ɛpọt ¾/ (Izii), /kpo ¾/ (Ezaa) and /âpọt ¾/ (SI) (No.16). The same goes for Nos 12 and 14. For No 18, the tone pattern for ‘fear’ in Izii and SI are the same (HL) but in Ezaa, it is a rising glide. Also, No15 has the word as cognates for Izii and SI but a different word and tone pattern for Ezaa. In Nos 13 and 19, the words are different in the three varieties and the tone patterns are also different. In all, for the examples given, 14 lexical items are cognates in the three varieties, 2 are different words (Nos 8 and 16) but the same tone patern in the three varieties, 5 items are different words for Izii and Ezaa. Five of the
words are different in Izii and SI while four differ in Izii and SI. A total of five words are different in Ezaa and SI. Other words that are not cognates have different tone patterns.

4.1.3 Variation in Pitch Levels

The average of the three recorded tokens is presented here. The range of pitch levels in the varieties is not the same. In Izii dialect, the highest pitch level reached is 200 hz (No. 7) and the lowest is 145 hz (No. 13 or 14). For Ezaa, the highest pitch is 195 hz (No.16) and the lowest is 120hz (Nos.6 and11). In SI, the highest pitch recorded is 180 hz (No. 7) and the lowest is 130hz (No. 17). Generally, the pitch range for low tone in word initial position for the three varieties is between 150-140 hz for midial position is 200-145 hz and for final position is 140-120hz.

It is of interest to note that the highest pitch recorded for Izii and Ezaa dialects are for low tones and that they come after the voiceless labio-velar plosive /kp/ though in different words. This shows that absolute pitch may not be relevant in delineation of level tones in tone languages. Another fact here is that consonants do have effect on the pitch levels of the vowels with which they occur. In this case, the pitch is raised where there should have been a pitch lowering (that is, lower than the preceding high tone) considering the fact that the low tone is following a high tone in this environment.

4.2 Spectrographic Analysis
In this section, we will present spectrograms to show the waveforms for some of the peculiar features found in Izii and Ezaa such as closed syllables and the high raising tone in both Izii and Ezaa and consonant clusters for Ezaa.

4.2.1 Spectrographic Evidence of Closed syllables in Izii Dialect

The following are spectrographic evidence of closed syllables in Izii dialect.

Figure 2 showing closed a syllable /əɡəʒ/ ‘guinea fowl’ in Izii dialect (last syllable).
SFigure 3 showing closed syllable /ɛɡʊʃ/ ‘hair’ in Izii dialect (last syllable).

In figures 2 and 3 above, we see the spectrograms of closed syllables in Izii dialect. The spectrograms show the first three segments as voiced. The vertical striations correspond to the vibrations of the vocal cords. While the last segment in Table 1 shows random noise pattern indicative of the friction resulting from the articulation of the voiceless fricative /ʃ/. The absence of vertical striations at the end of the word after the fricative indicates the absence of a vowel confirming that the last syllable is closed. Also in Table 2, though the vertical striations indicate that the segment is voiced, there is no evidence that another segment is following it indicative of a closed syllable.
4.2.2 Spectrographic Evidence of High Raising Tone in Izii and Ezaa Dialects
Figure 4 showing high raising tone /ɛkɪɛ/ ‘left side’ in Izip dialect (second syllable).

Figure 5 showing high raising tone /mu:kpu/ in Izip dialect (second syllable).
Figure 6 showing high raising tone /ιΝβεμένυι/ γρυωννυντε κα ξα α διαλεγετ.(second syllable).

Figure 7 showing high raisig tone /αΣβεολ/ γρουουνυντε κα ξα α διαλεγετ.(last syllable)
Figure 8 showing high raising tone /∅γβε%ρι/ ‘guinea corn’ in Ezaa dialect (second syllable).

In figures 4-8 we see that the pitch levels of the second syllables which are following low tones should have been a bit lowered ordinarily as high tones following low tones are known to have lowered pitches induced by the preceding low tone but this is not the case. Given the fact that velar plosives are known to raise the pitch of vowels following them, it should be noted that it is not all the syllables that bear the high raising tone that follow velar plosives. Figure 6 above /αΣποχ/ γηρουνδουτες is an example in both Izii and Ezaa dialects. The pitch is rather raised to between 15-20Hz, an unusual height for a high tone following a low tone. The usual pitch range of high tones following lows is about 10Hz. The indication is that the tone is a high raising tone and not just a high tone. The high raising tone is known to follow a low tone unlike the upstep which follows a high tone. However, the high raising tone is not observed to be phonemic in the Izii dialect.
4.3 Spectrographic Evidence of Closed Syllables and Consonant Clusters in Ezaa Dialect.

The following section will show spectrograms of closed syllables and consonant Clusters in Ezaa dialect.

Figure 9 showing closed syllables /ας βοην ονυτ/ in Ezaa dialect (first and second syllables).
Figure 10 showing closed syllable /m kp ʊ r ʊ o pf/ ‘word’ in Ezaa dialect (last syllable).

Figure 11 showing closed syllable /ʒ oɲ ɛ ts a r m a dz/ ‘older/senior person’ in Ezaa dialect (last syllable).
In figures 9 - 11 above we see evidence of closed syllables in Ezaa dialect. The random noise pattern shows that the segment is a fricative while the absence of vertical striations indicates that there is no syllabic element at the end of the word.

Figure 12 showing consonant clusters /ɔ́ɡɪɾɪnà/ ‘old person’ in Ezaa dialect(second syllable).
Figure 13 showing consonant clusters $\delta \varepsilon \theta \varepsilon \eta \varepsilon \zeta$ /‘turn around’ in Ezaa dialect (third syllable).
Figure 14 showing consonant cluster /oɲɛɾαɾoæɾɛδɛ/ ‘older/senior person’ in Ezaa dialect (third syllable).

Figures 12-14 show consonant clusters in Ezaa dialect. The consonants are /ʃb/, /gr/, /gbr/ and /rm/. It should be noted that the clusters involve plosives and trills most of the time. As explained in 4.2 above, the waveforms show that the segments are consonants and that there are no syllabic elements between the consonants.

4.4 Autosegmental Analysis

In this section, we analyze the data using the autosegmental model of analysis. First, the Izii dialect data is analyzed followed by that of Ezaa.

4.4.1 Izii Dialect

Monosyllabic words

55. /bvʊ/ to finish /mʊ/ ‘me’ /já/ ‘he/she’ /bé/ ‘them’

a.

bv ʊ

H

b.
Disyllabic words

56. /ɛŋa/  ‘eye’ /mplɔ/  ‘palm’ /ɪkwɛ/  ‘mortar’ /æŋi/  ‘we’ /dʊŋ/  ‘you(pl)’
a.
\[ \varepsilon \ n \ a \]
\[
\]
\[ H \ H \]

b.
\[ m \ \text{pf} \ \sigma \]
\[
\]
\[ H \ H \]

c.
\[ i \ kw \ e \]
\[
\]
\[ H \ L \]

d.
\[ a \ j \ i \]
\[
\]
\[ L \ H \]
In the monosyllabic and disyllabic examples in 55 and 56 above, we observe that there are no structural changes from the underlying to the surface structures.

**Trisyllabic Words**

The following example of a trisyllabic word shows that there is a structural change from the underlying to the surface structure

57. itɔkʊ /itɔkʊ/ cooking pot

Underlying Representation

```
i   t   e  k   u
```

→

```
L   L   H   H
```

By vowel deletion
The word is formed from two separate words itè+okù. At the formation of the new word, the last vowel of the first word is deleted but the tone is left floating. The floating tone is then relinked to the vowel on the right forming a rising glide. The examples in 58-59 below do not undergo any structural change to get to their surface structures.

58. / ɪgbèrì / guinea corn / ɪk pérdè / knee / ɪgbàkpɔ / pepper
Multisyllabic Words
In the following example, there is a structural change from the underlying to the surface structure.

61. ṣẹ̀wọ̀ọ̀kù /ọ̀wọ̀ọ̀kù/ chickens

Underlying structure:

\[
\begin{array}{ccccccc}
\sigma & nw & o & k & o & k & o \\
\hline
L & H & L & H & L
\end{array}
\]

By Deletion of consonant [k]

\[
\begin{array}{ccccccc}
\sigma & nw & o & \overset{\circ}{k} & o & k & o \\
\hline
L & H & L & H & L
\end{array}
\]

By the deletion of the vowel [o]

\[
\begin{array}{ccccccc}
\sigma & nw & o & \overset{\circ}{o} & k & o \\
\hline
L & H & L & H & L
\end{array}
\]

By relinking of \( \text{H} \) tone

\[
\begin{array}{ccccccc}
\sigma & nw & o & k & o \\
\hline
L & H & L & H & L
\end{array}
\]
In the example in 61 above, the word is formed from two separate words underlyingly. First, the consonant [k] is deleted then [ʊ] is also deleted leaving the H tone floating. The floating tone is then relinked to the syllable on the left.

62. ọnyébọ́gíríyì /ọnebọ́gíríni/ elderly person

Underlying structure

L H H L L L

By deletion of the vowel (ʊ)

L H H L L L L L

→
By relinking of the H to the next syllable on the right

\[ \text{Surface Structure} \quad o \, n \, e \, b \, ɔ \, g \, ị \, r \, i \, n \, i \]

\[ \quad \xrightarrow{\text{→}} \]

\[ L \quad H \quad H \quad L \quad L \quad L \quad L \quad L \]

In 63 above, though formed from two different words ọnụ+mini, no structural change is needed from the underlying to the surface structure.
4.5.2 Ezaa Dialect

Monosyllabic words

64. /opf/ ‘word’ /ewv/ ‘fear’ /ɔv/ ‘medicine’ /ɔg/ ‘hoe’

a.  
o  pf
   H

b.  
ɔ  v
   H

c.  
e  wv
   H

d.  
ɔ  g
The examples in 64 above, /opf/ /ewv/ /ɔv/ and /ɔg/ do not need any structural change to get to their surface structures.

65. ěj /ědʒ/ snail

Underlying structure

\[
\begin{array}{ccc}
  e & e & \text{ʃ} \\
  \hline
  \hline
  \text{L} & \text{H}
\end{array}
\]

By deletion of vowel [e]

\[
\begin{array}{ccc}
  \text{e} & e & \text{ʃ} \\
  \hline
  \hline
  \text{L} & \text{H}
\end{array}
\]

By relinking

\[
\begin{array}{cc}
  e & \text{ʃ} \\
  \hline
  \hline
  \text{L} & \text{H}
\end{array}
\]

surface structure

\[
\begin{array}{c}
e \\
\end{array}
\]

LH

66. /\textit{ok}/ chicken

Underlying Structure

\[
\begin{array}{c}
\text{c} \quad \text{k} \quad \text{a} \quad \text{k} \\
\end{array}
\]

by consonant deletion

\[
\begin{array}{c}
\text{c} \quad \circ \quad \text{k} \quad \text{a} \quad \text{k} \\
\end{array}
\]

By final vowel deletion

\[
\begin{array}{c}
\text{c} \quad \text{a} \quad \text{k} \quad \circ \\
\end{array}
\]
By vowel deletion

\[
\text{\v{c} \text{\v{c}k}}
\]

surface structure

\[
\text{\v{c} \text{k}}
\]

Disyllabic words

67. /i{s}i/ head, \text{\v{c}kpà /\text{\v{c}kpa/}} leg, mé\text{\textdownarrow\textdownarrow} /\text{mé\textdownarrow\textdownarrow/} blood, úzà /\text{úzà/} pepper, útá /\text{úta/} arrow

a.

\[
i{s}i
\]
b.

a

H L

c.

e h o

L H

d.

m e e

H ↓H

e.

o z a

H L
Trisyllabic words

68. ákwäräósh /akwaraoʃ/ root (of tree)

underlying structure

```
  a kw a r a o sh i sh i
```

```
H H H H H H
```

By consonant Deletion /

```
  a kw a r a o sh i sh i
```

```
H H L H H H H
```
By vowel deletion

\[
\begin{array}{ccccccc}
\text{a kw a r a o sh} & \text{\textbullet} & \text{\textbullet} & \rightarrow & \\
\end{array}
\]

\[
\begin{array}{ccccccc}
\text{H} & \text{H} & \text{L} & \text{H} & \text{H} & \text{H} & \text{H} & \\
\end{array}
\]

Surface Structure

\[
\begin{array}{ccccccc}
\text{a kw a r a o sh} & \rightarrow & \\
\end{array}
\]

\[
\begin{array}{ccccccc}
\text{H} & \text{H} & \text{L} & \text{H} & \\
\end{array}
\]

69. ótúbó /otubo/ navel, ótúmù /otumù/ axe

a.

\[
\begin{array}{ccccccc}
\text{O t u b o} & \\
\end{array}
\]

\[
\begin{array}{ccccccc}
\text{H} & \text{L} & \text{L} & \\
\end{array}
\]

b.

\[
\begin{array}{ccccccc}
\text{o t u m u} & \\
\end{array}
\]

\[
\begin{array}{ccccccc}
\text{H} & \text{L} & \text{L} & \\
\end{array}
\]
In 69a and b above, there are no structural changes.

70. *pféjiré* /pfedʒire/ lie(s)

In 70, though the word is a phrase (*pfé* (thing) *jì* (not) *ré* (good)) there are no structural changes.

71. *ísìụt* /isiụt/ dawn

Underlying structure
By consonant Deletion

i s i ʊ ʊ t ʊ →
H H L H L

By vowel Deletion

i s i ʊ ʊ t ʊ →
H H L H L

By vowel deletion

i s i ʊ ʊ t ʊ →
H H L H L

By vowel deletion

i s i ʊ t ʊ →
By Relinking of floating tone

\[ \text{isiot} \rightarrow \text{isi} \]

surface structure

\[ \text{isiot} \rightarrow \text{isi} \]

71 shows the structural changes from the underlying structure /isiot/ to the surface structure /isi/.

First, by consonant deletion, /t/ is deleted then, the low toned /ʊ/ is deleted leaving the tone floating. The final vowel /o/ is deleted and finally, the floating tone is then relinked to the next syllable on the right to form a rising glide.

72. m↓gbo↓do wall

\[ \text{mgbodo} \rightarrow \text{m↓H↓H} \]
There is no structural change in 96 above.

Multisyllabic

73. mĩiatsĩsí rainfall

| m | i | a | t | s | i | t | s | i |

H H H H H H

There is no structural change in the multisyllabic word in 73 above.

74. òrlèmánú cat

Underlying Structure

| o | r | i | l | e | m | a | n | ñ |

L H L H ↓H

By Deletion of the consonant [l]

| o | r | i | ɓ | e | m | a | n | ñ |

L H L H ↓H
Surface structure

```
  o r i e m a n ů
   |   |   |   |   |
L   H   L   H   ↓H
```

In 74 above, the consonant /l/ was deleted to get to the surface structure.

75. èjégbà /edzegba/ beard

Underlying structure

```
  e   dz   i   e   gb   a
   |   |   |   |   |
L   H   L   L   →
```

By deletion of the vowel /i/

```
  e   dz   ₀   e   gb   a
   |   |   |   |   |
L   H   L   L   →
```

By vowel insertion
In the example above, there is a deletion of the vowel /i/ and an insertion of the vowel /œ/ and finally, the H tone that was left floating by the deletion of /i/ is then relinked to the vowel /œ/.

In this chapter, we have analyzed our data perceptually, acoustically and using the autosegmental approach. We shall present in the following chapter our findings, summary and the conclusion to the entire work.

CHAPTER FIVE

Summary of Findings and Conclusion
5.0 In this chapter, we will outline the salient findings of this work, summarize and present the conclusions to be deduced from the findings.

5.1 Findings

In our findings, Izii dialect has thirty two consonants and nine vowels while Ezaa dialect has thirty three consonants and nine vowels. The two dialects have the level tones high, low, downstep and the high raising while in Ezaa we also observe the existence of the low rising glide and marginally the high falling glide. The syllable structures of Izii and Ezaa are cvc, ccv, cv and v though we observe the occurrence of closed syllables and consonant clusters more in the Ezaa dialect. The word classes in Izii and Ezaa are free morphemes while only the verb accepts inflectional morphemes. Other derivational processes involving other word classes are mainly cases of compounding. We also found out that the occurrence of cognates in the dialects and the Standard Igbo is such that many of the lexical items are cognates and that even in some cases where they are not cognates; the tone pattern is often the same.

Through the acoustic analysis we found out that the pitch levels are not the same in the dialects and in the Standard Igbo. In Izii dialect, the highest pitch obtained is 200hz and the lowest is 145hz. For Ezaa, the highest pitch is 195hz and the lowest is 120hz. In the Standard Igbo, the highest pitch recorded is 180hz and the lowest is 130hz. It should be noted that the highest pitch recorded for Izii and Ezaa are for low tones and that they come after the voiceless labio-velar plosive/kp/ though in different words. The spectrographic analysis confirms the auditory perception of consonant clusters in Ezaa and closed syllables in both Izii and Ezaa dialects. This is shown in the waveforms in the spectrograms.

5.2 Summary and Conclusion
In this work, we have looked at the interface of tone and morpheme in the Igbo language using Izii and Ezaa dialects of the Abankaleke dialect cluster of the Igbo language as our focal point. We have identified thirty two consonants and nine vowels in the Izii dialect and thirty three consonants and nine vowels in Ezaa dialect while the tonemes of the two dialects are high, low, downstepped high and the high raising tones. In addition to these level tones, Ezaa dialect also features the rising glide and marginally, the falling glide.

We also analyzed the syllable structures of the two dialects and found out that the two dialects have the syllable structures, v, cv, cvc for both Izii and Ezaa dialects and in addition, ccv for the Ezaa dialect. We also found out that the closed syllables are more prevalent in the Ezaa dialect while consonant clusters are absent in the Izii dialect. This fact we suggest may have been as a result of vowel loss occasioned by vowel reduction observable in the North East, Northern and West Niger dialect clusters of the Igbo language. The geographical proximity between the Ezaa speakers and their Okpoto/Ntezi neighbours may have informed the occurrence of codas and glides in their speech form more than these occur in Izii dialect. Koring, the language of Okpoto and Ntezi people is replete with closed syllables from the studies of scholars such as Anagbogu (2003) and Iloene (2008). Lexical variation also occurs among the two dialects and with the Standard Igbo featuring many cognates. Sometimes the lexemes differ but the tone pattern remain the same suggesting that they may have had these lexemes as cognates but that over time, the segments had varied but the tone had remained unchanged. Word formation processes in the dialects reveal the fact that only the verb accepts inflectional affixes in the dialects, just as in the Standard Igbo and that the morphological processes involving other word classes are cases of compounding.

Acoustic analysis was also carried out to authenticate the result of the perceptual analysis. From the acoustic analysis, we deduce that the pitch levels attained in the articulation of the data are not
the same among the dialects and with the Standard Igbo. Inasmuch as we appreciate the fact that idiosyncratic differences among the respondents may have contributed to the disparity in the pitch levels obtained, we however assume that the difference is not significant as all the subjects are adult males. The highest pitch recorded for Izii dialect is 200hz while the lowest is 145hz. For Ezaa dialect, the highest pitch is 195 and the lowest is 120hz. In the Standard Igbo, the highest pitch is 180hz and the lowest is 130hz. The spectrographic analysis shows that the perceptual result that there are consonant clusters in Ezaa and codas in both Izii and Ezaa dialects is correct.

We therefore conclude that there are thirty two consonants and nine vowels in the Izii dialect while Ezaa dialect has thirty three consonants and nine vowels. The evidence of perceptual result which is further confirmed by the acoustic result of the occurrence of closed syllables in the Izii and Ezaa dialects and consonant clusters in the Ezaa dialect of the Abankaleke dialect cluster under study shows that there are consonant clusters and closed syllables in the Igbo language howbeit in the dialects. The highest pitch level recorded for the two dialects are for low tones confirming the stance that absolute pitch may not be relevant in delineating tonal levels in tone languages. Also the highest pitch recorded for the dialects are for low tones following the voiceless labio-velar plosive /kp/ confirming the stance that consonants do have effect on the pitch of tone of the syllables in which they occur. In all, the evidence provided by the acoustic analysis further gives credence to the fact that acoustic analysis is indispensable in any tonal and indeed any serious prosodic study in language analysis. Finally, from the evidence presented in our findings, the consonantal, vocalic, tonal, lexical as well as morphological variation between the dialects and the Standard Igbo are not significant enough to classify them as a separate linguistic system from the Igbo language.
References


2, 23-68.


In IALL.ahn, (1978).


