VOWEL REDUCTION IN EDUCATED ISOKO ENGLISH

BY

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CERTIFICATION

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DEDICATION

Dedicated to

My friend of nine years;

Fiancé of five years;

And husband forever:

Mr Emmanuel Oghoghozino Ogbe

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SYMBOLS AND ABBREVIATIONS

/	High tone
\	Low tone
ǀ	Mid-high or down stepped tone
H	High
L	Low
D	Down-stepped
σ	Syllable
μ	Mora
ə	Schwa
ø	Null
<	Less than
S	Strong syllable
W	Weak syllable
NE	Nigerian English
RP	Received Pronunciation
SE	Singapore English
PE	Proto Edoid
BE	British English
RR	Rhythm Ratio
MTs	Mother Tongues
SPE	Sound Patterns of English
EYE	Educated Yoruba English
EIE	Educated Isoko English
SBE	Standard British English
ESL	English as a second language
BSE	British Speakers of English
NRU	Narrow Rhythm Unit
ANA	Anacrusis
PVI	Pairwise Variability Index
nPVI	Normalized Pairwise variability index
rPVI	Raw Pairwise variability index
SSH	Stress and Syllable Time Hypotheses
LCPR	Lexical Category Prominence Rule

NSR	Nuclear Stress Rule
DTE	Designated Terminal Element
ANOVA	Analysis of Variance
ms	Milliseconds
BSE	British speakers of English
SPSS	Statistical Package for the Social Sciences

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ABSTRACT

Vowel reduction, the weakening of strong vowels to the reduced /ə/ sound, is an essential phenomenon in the rhythm of Standard British English (SBE) and it is claimed to be absent in Nigerian English (NE). Some studies on the phonological features of Yoruba and Hausa Englishes, which are major Nigerian languages, have claimed that vowel reduction does not exist in NE. This is with little or no reference to the small group languages including Educated Isoko English (EIE). Therefore, this study investigated the existence or otherwise of vowel reduction in the rhythm of EIE, a minority sub-variety of Nigerian English, with consideration for age and sex variables.

Prince and Liberman's Metrical Theory, and Grabe and Low's Pairwise Variability Index (PVI) served as the theoretical framework for the study. The subjects, who were EIE speakers accidentally sampled, comprised 50 male and 50 female native Isoko speakers, between ages 20-40 and 41-60 andwere residents in Isokoland. Five SBE speakers served as control. Praat speech analyser version 5.1.11 was used to record 10 controlled English sentences divided into sets A and B as uttered by the subjects. Set A consists of words with only full vowels while Set B has words with both full and reduced vowels. Spontaneous speech data of EIE and SBE were recorded to validate findings from the controlled uttered data. The perceptual analysis of grammatical and content words was done using percentages complemented with metrical, statistical and PVI measures. Instances of vowel duration were also subjected to a one-way ANOVA and Fisher's LSD Post-hoc test.

Grammatical words showed 4.1% cases of appropriate reduction and 95.9% cases of inappropriate reduction. There were 98.8% instances of inappropriate reduction and 1.2% cases of appropriate reduction in content words. The vowels /a:/, /e/, /ɔ/, /a/, /u/, /o/, /i/, /ɔ:/ were substituted for /ə/ and /i:/, /i/, /e/ for /ɪ/. /a:/ 40.3% and /i/ 71.6% were the highest occurring variants of /ə/ and /ɪ/, respectively. Planned comparisons showed a significant difference between both sets in SBE and between EIE and SBE in Sets B ($F[3,16]=11.2$, $p<0.05$). No significant difference emerged between both sets in EIE and between EIE and SBE in Sets A. Also, female speakers' high PVIs were significantly higher ($F[3,56]=4.5$, $p<0.05$) than the male speakers' PVIs in both sets. There was no significant effect between the higher PVIs of ages 20-40 (48.48, 50.68) and the PVIs of ages 41-60 (45.43, 47.51), although the former had higher PVIs than

the latter in Set B. The metrical analysis established the presence of strong syllables where there should be weak syllables.

The presence or absence of vowel reduction as well as gender sensitivity distinguishes the rhythms of EIE and SBE. Thus, there is no durational variability between full and reduced vowels in EIE, which reveals that vowel reduction is absent; the rhythm of EIE is syllable-based and gender sensitive but age is insignificant. Therefore, this has great implications for the teaching of spoken English in Nigeria.

Key words: Vowel reduction, Rhythm, Pairwise variability index, Educated Isoko English, Metrical theory

Word count: 491

CHAPTER ONE
GENERAL INTRODUCTION

1.0 Introduction

English, no doubt, has enjoyed a global spread around the world. Evidence of this worldwide phenomenon of language contact, variation and change can be seen through such designations as World Englishes, New Englishes, West African Englishes and so forth. Each of the new Englishes has distinct linguistic and cultural identities largely due to the different historical, geographical, political and socio-cultural factors that gave birth to them.

Nigeria, which is known for its linguistic diversity has been reported to have over 500 languages spoken including English across the country as a result of this diversity (Elugbe, 1994). The contact of these languages with the English language over the years has caused a resultant variety known as Nigerian English (NE). Several scholars (Bamgbose, 1982; Banjo, 1995; Ufomata, 1996; Adegbija, 2004) and others have already established that there is a variety of the English language known as NE and it differs systematically from Standard British English (SBE) in areas of phonology, grammar and lexis. This English which differs from other new Englishes also has sub-varieties or dialects reflecting its multilingual environment. Some of these sub-varieties such as Yoruba, Igbo and Hausa Englishes, for instance, have been vigorously researched while others are scarcely investigated.

The term *Nigerian English* raises several questions as to which Nigerian English is being referred to. Ajani (2007:3) opines that the designation "Nigerian English", for instance, is somehow deceptive. He asks the question, "does a Hausa speaker of NE use English exactly the same way as a Yoruba or Igbo speaker?" What then constitutes NE if the answer to the foregone question is in the negative, which is the case? He further says that the arguments advanced by both language specialists and teachers indicate that there is really no consensus opinion yet as to what constitutes NE.

The features that make up Nigerian English, are they common to the heterogeneous languages found in the country? Are there variations? If yes, to what extent have these variations been incorporated in the Nigerian English to distinguish, for example, Yoruba English from Isoko English? On what basis are the features of Nigerian English collected? Are these features the same for the various Englishes found in the country? In the discussion of the phonology of NE, a question which is likely to be asked, according to Simo-Bobda (1995:249), is "which Nigerian English?" This question, according to him, presupposes the existence of several accents of NE. Against this background of diverse linguistic groups, which cut across Nigeria, the English language in Nigeria predictably, has ethnic variations based on the language spoken in each of the ethnic nationalities. If three broad accents are recognized by Dunstan (1969) in NE as western, eastern and northern accents based on the three 'major' languages, what about the accent of the south? The southern part of Nigeria is highly language heterogeneous. Would scholars of NE say that the English spoken in this part of Nigeria is homogenous?

Based on the foregoing arguments, there is a need to approach NE from a geo-tribal perspective. Thus, Nigerian English cannot be truly defined without researching into the various Englishes found in the country. As such, based on the geo-tribal perspective of investigating NE proposed by Jibril (1982) and re-echoed by Akinjobi (2004), this investigation is being carried out on an aspect of the phonology of a sub-variety of NE, Isoko English. Attempts will be made to look at the phenomenon of rhythm by examining the durational factors of the vowels found in positions where there should be the reduced vowels /ə/ and /ɪ/ in weak syllable positions and ultimately, the rhythm of Isoko English and British English will be compared with respect to the acoustic factors that distinguish them.

1.1 Background to the study

English in Nigeria has often been measured against the norm of SBE. Research results in recent years confirm the claim that NE differs systematically from SBE (Bamgbose, 1982; Eka 1985; Banjo, 1995; Ufomata, 1996; Udofot, 2003; Adegbija, 2004).Akinjobi (2004:89) reports that a major area of deviation from SBE usage for Nigerian speakers of English is in the realization of vowels and syllables that occur in unstressed positions. Ufomata (1996:5) claims that the most frequent sound in SBE, which is the schwa (/ə/), is the rarest sound in NE. Furthermore, Cruttenden (2001:300) opines that the rhythm of English with the related obscuration of weak

syllables is the prime distinguishing feature of the pronunciation of English. Accordingly, in connected speech, unaccented syllables, a majority of which have reduced vowels, considerably outnumber those carrying primary or secondary accents. Cruttenden claims that for learners of English with an African tone language as a background, the problems of English rhythm are especially great and will require prolonged attention.

A crucial feature of English pronunciation is that stressed syllables tend to be weak and have obscure qualities (Gimson, 1975:33). The phenomenon of vowel reduction is central to the rhythm of English. As such, it is important to investigate the phenomenon of vowel reduction which is so central to the rhythm of SBE in a sub-variety of NE which has been said to deviate from SBE in the realization of vowels and syllables that occur in unstressed syllable positions.

Stress is a very important factor in describing the rhythm of SBE. Pitch modulation, duration, intensity and segmental qualities have been identified as cues employed by listeners to identify stress on a syllable, even meaning of words. The duration of weak vowels as compared to full vowels is supposed to be shorter as the intensity of the latter is more than the former. As such, vowel weakening, vowel lengthening and segmental effects are expected where duration is viewed as a correlate of stress. The durational factor is very important to this study as the syllables containing reduced vowels in SBE control will be measured against the production of the EIE subjects for this study. This background information will form a basis for the investigation in this study.

1.2 Nigerian English

Nigerian English (NE) is one of the many varieties of the English language, which developed as a result of the phenomenon of languages in contact situation. It is a variety which has developed in the Nigerian situation as a result of trade and commerce, missionary activities, colonialism as well as the native culture of the country. There have been debates over the years on the concept of NE among scholars. Scholars like Prator (1968), Tomori (1967), and Brann (1975) deny the existence of NE. However, due to some noticeable variations in the use of English in Nigeria, as different from other World Englishes and more especially Standard British English (SBE), scholars such as Banjo (1971), Jowitt (1991), Udofot (1997) assert that a Nigerian English does exist. While these scholars agree to the existence of NE, Banjo (1996) and Akinjobi (2002) observe that the codification of the NE variety is still a

myth, despite the fact that several scholars have attempted and are still attempting to describe the variations.

Different views of NE have been upheld by researchers. Adetugbo (1984:17) sees NE as an almost distinctly Nigerian variety of the English language which is at par with and has much vitality as any other variety of English. Jowitt (1991:x) views it as the variety of English that has English as its first mother and Nigeria as its second, and has defied nature by undergoing gynecological processing. Ugorji (2010:134) notes that as an indigenized variety, NE consists of the English of colonial and decolonized times at its base enriched by the socio-cultural materials which may be uniquely Nigerian. Ugorji and Osiruemu, (2007) opine that NE represents the perfected compromise made of African thoughts of Nigerian instantiations and the more traditional English language expressed in English. In other words, NE can be described as that English by the English, processed in Nigeria by Nigerians and used for her intra-national, national and international communication needs.

There is enough evidence in the literature that Nigerian English (NE) is heterogeneous and that the variation that exists within it can be linked to two major factors, namely, the region of origin and the level of education (Awonusi, 1986; Jibril, 1986; 1991; Udofot, 2004). By listening to the spoken English of a Nigerian, it is normally possible to predict the part of the country such a person came from (Bamgbose, 1971) and this is because the accents of most speakers of NE differ depending on the region they belong to.

Different variety classifications have been made within the NE. The first attempt at variety classification in NE was made by Brosnahan (1958) whose observations were confined, according to Jowitt (1991:38), to the Southern part of the country. He classification is based on educational parameter, thus positing four varieties namely: Variety 1 (Pidgin), no formal education; Variety 2, with primary education completed; Variety 3, with only secondary education completed and Variety 4, with university education. Banjo (1971, 1996), however, proposed a typology of NE based on four varieties. The four varieties are based on the extent of mother-tongue interference, grammatical features, as well as on the approximation to a world standard. According to him, Variety 1 has the greatest density of mother-tongue interference; Variety 2 also has a great density of mother-tongue interference, but not as heavy as Variety 1; Variety 3 has much less mother-tongue interference and Variety 4 has the least of the density of interference. This classification is represented below.

Variety 1	Used by semi-literates and those with elementary school education.
Variety 2	Characterized by fewer negative transfers from the mother tongue; this variety is accepted locally but it lacks international intelligibility.
Variety 3	The variety of educated Nigerian users which makes vital phonetic distinctions and internationally intelligible.
Variety 4	The variety that is close to the Standard British accent; it carries higher international acceptance but is locally disdained.

Bamgbose (1982), however, points out that Banjo's Variety 4 could not have reflected a typical Nigerian performance since it was based on the index of mainly Nigerian Anglo-Saxon speeches. Furthermore, he notes that the parameters for all the other varieties were arbitrary. Bamgbose (1982), thus, fuses Brosnahan's levels 2-4 with Banjo's varieties 1-3, and the new set of varieties correlates with both educational levels and linguistic features.

Just like Banjo (1971), Adesanoye (1973) bases his classification on the proximity to or distance from the British English. In his estimation, there is a close relationship between performance and educational attainment. Based purely on indexical markers, distinct from specific common core characteristics, he identifies three varieties – 1, 2 and 3. Ogbulogo (2005:12), however, observes that Adesanoye's variety 3 is similar in many respects to the Standard Nigerian English in the written form. The question to be asked here is does Nigerian English have a standard form?

In reference to the characterization of NE, Ubahakwe (1974), Adetugbo (1977; 1984), Adeniran (1979), Akere (1982), Jibril, (1982) Obilade (1984), Odumuh (1984) and Kujore (1985)have all pointed to the direction of research in the characterization of NE. They all agree that NE occurs in gradation with all the varieties striving towards a standard. This trend is represented, according to Ogbulogo (2005:14) on a pyramid with a heavy base in Fig. 1.1.

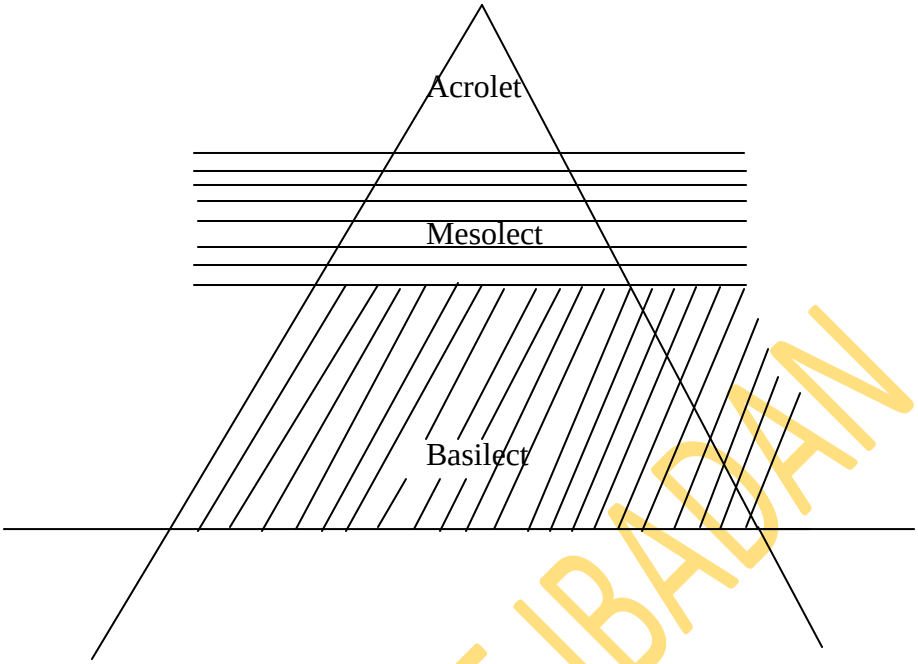


Figure 1.1 A representation of the use of English by Nigerians

Source: Ogbulogo (2005:14)

According to Ogbulogo, the great majority of Nigerian speakers of English fall within the dialect of the basilect. A few are within the middle band of the pyramid, while very few Nigerians who have attained a very high degree of education occupy the tip. He notes that it has been argued that many people, just with the primary or junior secondary level of education, dominate the basilect. The middle band is for many people who have completed secondary school or have had some education at the tertiary level. The top level is occupied by many sophisticated users of the language including well-trained university lecturers, High Court/ Supreme Court judges, very well exposed preachers, top rate journalists and other professionals. The elusive point located outside the pyramid is the prestige variety, Standard British English. He, however, points out that just like other descriptions, this model is still inconclusive.

1.2.1 Isoko English

Since this research investigates the phenomenon of vowel reduction in Isoko English, it is necessary to review what linguists have said about this sub-variety of NE in question. Although, several scholarly articles and works on the Isoko language such as Dunstan (1969), Williamson (1968), Ikime (1972), Mafeni (1972), Idudhe (1990 and 2001) have emerged over the years, there is a dearth of literature on the English of the Isoko people.

The several works done on the Isoko language can serve as a base or reference point from which some conclusions about the English of the Isoko people can be drawn. Dunstan (1969:122) notes that the central vowels /ʌ/, /ɜ:/, and /ə/ are not present in the Isoko language, as a result, these vowels are replaced with other vowels that retain their vowel quality. Since the reduced vowel /ə/ contributes greatly to the formation of weak syllables in a sentence and determines the rhythm of English, its absence in the Isoko language will, no doubt, cause a difference between the rhythms of Isoko English and SBE.

1.2.1.1 Rhythm and the reduced vowel /ə/ in Isoko English

The Isoko language has been reported to lack the central vowels /ʌ/, /ɜ:/ and /ə/ (Dunstan, 1969:122). As such, the general tendency is to replace the central vowels with English and non-English strong or full vowels. For example, Dunstan states that the tendency to replace /ʌ/ with Isoko /ọ/ results in confusing such words as *hut* and *hot.* Since this assertion has been made by Dunstan and Jowitt (1991) claims that /ə/ does not occur in Nigerian MTs, how do Isoko speakers of English realize /ə/ in

unstressed syllable positions and what is the implication for the description of the rhythm of Isoko English?

In examining the rhythm of Isoko English with reference to the durational factors of weak vowels and their quality, Ilolo (2006) carried out an investigation on the weak vowels /ə/ and /ɪ/ using 30 Educated Isoko English speakers of varied-socio economic status as her subjects. She observed that out of the 180 instances of /ə/ reduction in 6 words selected from a read passage of about 158 words, various variants were realized by the EIE subjects as strong vowels in 77% instances while reduction occurred in 23% instances. She, however, notes that not all the 23% reduced cases met the expected /ə/ sound. Rather, 21% was realized as the reduced /ɪ/ and only 2% produced the expected /ə/ sound.

Ilolo (2006) measured the acoustic duration of the reduced /ə/ sound as produced by 4 EIE subjects and their duration in milliseconds were measured against that of a British speaker who served as a control. A word *lecturer* having the reduced vowel /ə/ on the last syllable was chosen from the passage and its duration was extracted using the Praat software. Her findings reveal that the EIE subjects produced the schwa, /ə/, with duration ranging between 0.0573ms to 0.1300ms and it was realized as /a/, a strong vowel while the control produced it with 0.0183ms.

Furthermore, she observes that the accentual pattern of the control in relation to the use of weak forms in function words in a sentence was significantly different from those of the EIE subjects. She notes that there is a striking difference in the way EIE subjects make use of weak forms of grammatical words in English sentences. Her analyses reveal that the strong forms of grammatical words are often substituted for their weak counterparts; as a result, strong vowels are not reduced where they are supposed to be reduced. She is of the opinion that the respondents sampled are not aware of the disparity between the uses of weak versus strong forms of English function words. She, thus, concludes that vowel reduction to /ə/ and /ɪ/ hardly occurs in English words and sentences as produced by the EIE subjects sampled. Rather than reduce vowels in unstressed syllable positions, the EIE subjects used strong or full vowels. The implication of this, she claims is a proliferation of strong vowels in English sentences as produced by Isoko speakers of English.

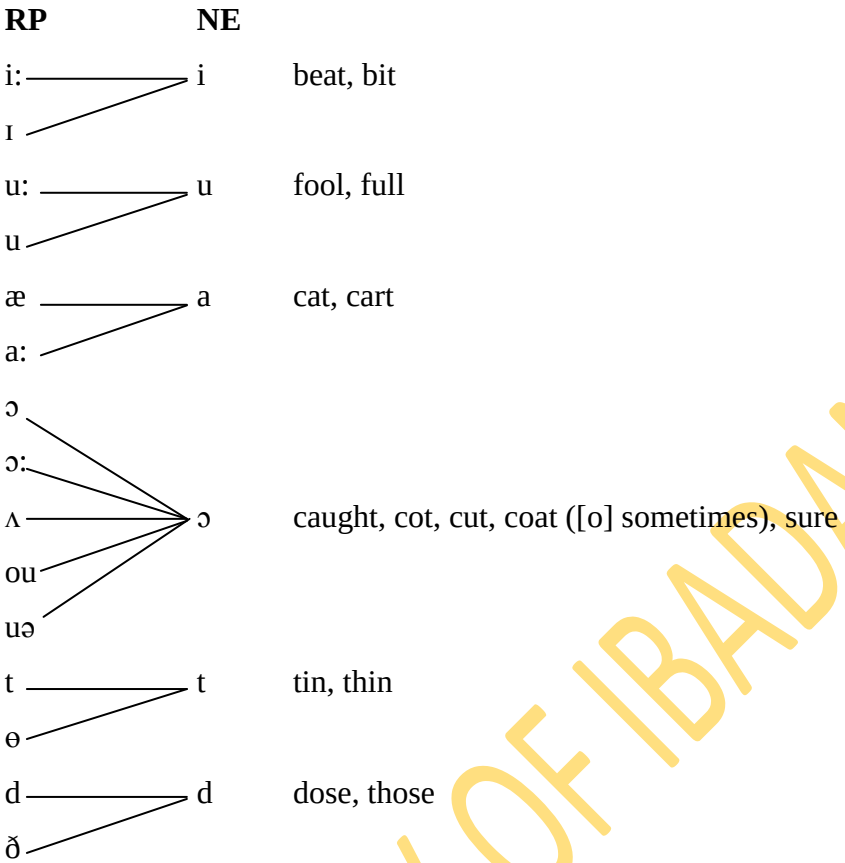
1.3 Nigerian English phonology

NE has persistently been described as different from SBE especially in the area of phonology (Akere, 1980; Jibril, 1982; Eka, 1996; Udofot, 2003; Akinjobi 2004; Ilolo, 2006; Akindele, 2008; 2011; Sunday, 2008). Dunstan (1969) shows the influence of twelve Nigerian languages on English language production in Nigeria. For example, three broad Nigerian accents are clearly identified: the Yoruba accent in the Southwest, the Igbo accent in the East and the Hausa accent in the North. This is basically due to geographical and historical factors among others. The geographical factor is probably the most important according to Simo-Bobda (1995). The vast surface area of Nigeria (923,768 km^2) and its large population gives it an unquestionable propensity for diversity.

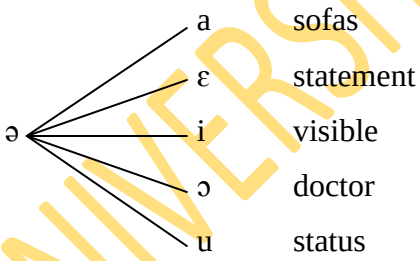
Simo-Bobda (1995) notes that in Yoruba English, the RP /ɜ/ is systematically replaced by /a/ when represented by orthographic *er* (e), *ear* and sometimes *ir*, thus pronouncing *service, were, early, learn, thirty,* as [savis], [wa], [ali], [lɛn], [tɛti] respectively. Awonusi (1986:558) notes that the Igbo pronounce these words as [sɛvis, we, ɛli, lɛn, tɛti]. Contrastively, Simo-Bobda notes that the Igbo characteristically pronounce 'your' as /jua/ or /ja/ as opposed to the Yoruba who have /jɔ/. The peculiarity of the Hausa accent is more evident in the pronunciation of RP /θ/ and /ð/ by some variety of /t/ and /d/ respectively. The Hausa has a high tendency to produce /s/ as /z/ instead. He also notes that for the typical Yoruba and Igbo /ɔ/ as the vowel of *cut, dug,* the Hausa has a vowel very close to RP.

Furthermore, Jibril (1982:76) notes that there is the occurrence of /a/ for RP /ɜ:/ across board in Hausa accent e.g. in *birth* /ba:z/ and *fur* /fa/; where the Yoruba and Igbo would have /ɛ/ and /ɔ/, /bɛt/ and /fɔ/. Also, the replacement of the final syllable schwa by /a/ across board e.g. in *versus* /va:sas/ and *administrator* /administreta/; where the Yoruba and the Igbo would have /versɔs/ and /administretɔ/.

These three accents of NE: Yoruba English, Hausa English and Igbo English as exemplified above have given an insight into the nature of the diversity of pronunciations across the country. There is evidence that a vast majority of features heard in NE cut across ethnic lines and can be considered typical of the Nigerian speaker. Thus, the examples below represent some vowels and consonants which cut across the board of ethnic variation regarded as typical Nigerian sounds. NE has fewer sounds than RP, exhibiting the following classical examples of mergers.



The realization of schwa splits into different segments generally suggested by the spelling .e.g.



Source: Simo-Bobda (1995)

Simo-Bobda claims that the fact that a national standard accent of English transcending ethnic boundaries is emerging in Nigeria is evidenced by the phenomenon whereby a given ethnic group may have a sound distinction like that of Received Pronunciation (RP) in their language and yet neutralize this contrast in their English production, yielding to the national norm. Thus, Hausa and Igbo languages have contrastive vowels similar to RP /i/ and /ɪ/ according to Adetugbo (1987:75), yet Hausa and Igbo speakers do not make this distinction, but say /bit/ for both *beat* and *bit,* like other Nigerians. Also, Dunstan (1969:122) notes that although Isoko has /ị/

which is fairly close to English /i/, most isoko speakers have difficulty in distinguishing between such words as *feel* and *fill, seat* and *sit.*

1.3.1 Vocalic and consonantal processes in NE phonology

NE exhibits some vocalic and consonantal processes which are very peculiar to its phonology, as opposed to that of SBE. Simo-Bobda (1995:255) claims that with regards to vocalic processes, NE does not reduce vowels in unstressed positions thus producing *past[ɔ]r, stat[u]s, statem[ɛ]nt, trib[a]l* etc. Furthermore, NE exhibits a glide formation process which changes vowels into corresponding semi-vowels yielding /faja, lajɔn, pawa, alawans/ for *fire, lion, power* and *allowance.*

Other vocalic processes associated with NE include nasalization and vowel epenthesis. Bamisaye (1990) and others opine that nasalization in NE causes a vowel to become nasal in the environment of a following nasal consonant as in [fãn, bũn, sɔndei, rɔn] for *fan, boon, Sunday,* and *wrong* respectively (Bamisaye, 1990:21). This also holds in SBE. Vowel epenthesis, known to be typical of Hausa English e.g. [rezigineiʃən] for *resignation* (Bamgbose, 1971:42) is reported as a feature of mainstream NE according to Simo-Bobda(1995:263). For example, [silik] for *silk* and [belet] for*belt* are found in Dunstan (1969:123) while Todd and Hancock (1986:306) report [arendʒimɛnt] for *arrangement.*

Furthermore, NE pronunciation also shows the insertion of [u] between final clusters. Data like [aŋgul] for *angle*, [siŋgul] for *single*, [atikul] for *article*, [tebul] for *table* are examples of this phenomenon recorded by Simo-Bobda (1995:263). He states that NE has a rule of u – insertion which can be stated as:

ø ⟶ u/C ⟶ 1#

(insert [u] between a final cluster)

Source: Simo-Bobda (1995:263)

Simo-Bobda explains that the insertion of [u] in the above data is probably due, at least partially to the analogy on *–cular* forms like *angular, singular, particular* etc. which have [u]. He further says that this practice is perhaps further reinforced by the tendency that some African languages e.g. Cameroon Pidgin English vocalize the final or pre-consonantal [l] of European loans e.g. [tɔrɔbu] for *trouble.* He, therefore, states that one can speculate that after this vocalization, the Nigerian speaker of English then adds [l] to remain faithful to the native English replica and also under the pressure of the letter *l.* Thus, the two processes would, therefore, be schematized in the case of *single* for example as:

(RP) sɪŋgl ⟶ singu ⟶ singul.

Source: Simo-Bobda (1995:264)

Simo-Bobda (1995) notes that common consonantal processes include the devoicing of word-final consonants as in /rop/ for *rope*, /lif/ for *leaf*, /ʤɔʧ/ for *judge*. NE also shows the recurrence of spelling pronunciations and analogical deviations. Fakoya (1989) and Simo-Bobda (1993) gave the following examples which include: pes[t]tle, plum[b]er, has[t]en, su[b]tle, de[b]t. They further note that analogical deviations include cases like el[ai]te where [ai] is due to the analogy with other words in *–te*, like *rite*, *finite*, *termite.*

In the pronunciation of *–ing* forms as well as in words involving *–ed*, NE very often pronounce *–ing* as /in/ instead of /ŋ/. For example, Tiffen (1974:198) reports [tĩns] for *things*, [in'trɛstin] for *interesting*, [ʧusin] for *choosing*, [bildin] for *building*. Wells (1982) echoed by Simo-Bobda (1993:60) says that in strict general terms, it cannot be said that homorganic nasal assimilation, ordered in NE after final g – deletion cannot apply since the structural description is no longer met. Thus *building* has the following sample derivations for RP and NE respectively.

Sample derivation for *building* in RP

Input: /bildɪng/

Nasal assimilation: bɪldiŋg

Final g – deletion: bɪldiŋ

Output: [bɪldɪŋ]

Sample derivation for *building* NE

Input: bilding

Nasal assimilation: bildin

Final g – deletion: -

Output: [bildin]

Although the sample derivation given by Simo-Bobda for 'building' in NE for the second syllable is associated with the pronunciation of many Nigerian speakers of English especially after the 'g' deletion, majority of NE speakers from observation (it could be argued) do not pronounce 'bild' but [bju:d].

1.4 The phonology of Isoko language

1.4.1 The Isoko language

Isoko, a South Western Edoid language of the Niger-Congo family (Elugbe, 1973; 1989) is spoken by a population of 423,000 (Gordon, 2005) who live in Isoko

North, Isoko South and Ndokwa Local Government Areas of Delta State. It is estimated that the Isoko people inhabit the area enclosed by longitude 6^0 25' East and latitudes 5^0 40' North of the Delta province of Nigeria (Ikime, 1972:127).

There have been claims that the Isoko language is a dialect of Urhobo. However, there are linguists who consider Isoko an independent language (Hubbard, 1952; Westermann and Bryan, 1952; Wolf, 1959; Ladefoged, 1964; Williamson, 1968; Mafeni, 1972). Williamson (1968) describes Isoko as a language with several dialects and a fairly well-developed standard form based on the Uzere, Aviara and Irri dialects.

1.4.2 Standard Isoko

Mafeni (1972) shares the view of Williamson (1968) but with slight modification. He notes that Isoko is undoubtedly a language and not a dialect cluster, although it consists of several dialects. It has a well established spoken standard form as well as a written standard. He continues that the spoken form, it would appear, is based on the Uzere dialect, although it is popularly believed that standard Isoko, usually referred to as 'central' Isoko is based on the dialects of Uzere, Aviara and Irri. Mafeni notes that, he is unaware of any feature of the Uzere dialect which would be regarded as sub-standard with reference to the spoken standard form of Isoko. Certain features of Aviara and Irri pronunciation, for example, the common use of Aviara speakers of a voiced dental nasal [n̪] instead of a voiced palatal nasal [ɳ] in a word like 'unya' (walking), or the use of Irri speakers of the lax voiced palatal approximant [jr] like 'orhie' (his, hers or its), apart from being indexical, are considered fairly sub-standard.

Mafeni, (1972) based on the above, claims that speakers of standard Isoko could be classified into two broad groups: those who speak the standard language with a neutral or unmarked accent (comparable to that of English where speakers of standard English could be divided into two broad groups – those who speak the standard language with a local accent and those who speak the Received Pronunciation, RP) so that their place of origin or first dialect cannot be traced easily from their speech, and those whose speech show traces of the influence of the accent of their first dialect.

It is, however, difficult to ascertain why or how or when the Uzere dialect became the core of the spoken standard dialect. Mafeni, (1972) notes that it is probable that the emergence of Uzere dialect as the spoken standard form of Isoko was accelerated by two major factors namely: the importance of Uzere as a fishing centre

and the ‘Eni Juju’ which was used allegedly for detecting so-called witches and wizards. People had to travel from all parts of Isoko and beyond for these two factors.

The origin of the written standard form is traced by Mafeni, (1972) to the first publication in Isoko which appears to have been a translation of the gospel according to St Mark by Messrs Omuye and Iloho who are of Uzere and Emede Isoko towns respectively in 1920. The Emede influence in the first Isoko translation of St Mark’s gospel is seen in such words like ‘riri’ in ‘riri, oni me gb’imoni me’ (behold my mother and my relatives) or ‘wuru’ (die) in ‘omote ra o wuru’. Mafeni, (1972) notes that in a later translation of the gospel according to St Mark in 1964, a number of these old forms have been dropped thus bringing the written standard closer to the modern spoken standard.

The Isoko language is, therefore, a language with a spoken standard form, a religious written standard and a non-religious written form. It has also several dialectal variants; some of them rather similar to the spoken standard forms and others considerably different from it phonologically, grammatically and lexically. Thus, Mafeni, (1972) notes that while the spoken standard form is easily intelligible to all native Isoko speakers no matter what their first dialect is, some Isoko dialects, especially those which are linguistically relatively different from the spoken standard, are completely unintelligible to speakers of other dialects or are intelligible only with great difficulty. Based on this, Williamson (1968) gave the following classification of Isoko dialects:

- Erowha
- Western group (Enwhe, Emevor, Iyede, Igbide and Ume)
- Western-Central group (Oleh, Ozoro, Owhe, Okpe, Ellu,Emede and Ofagbe)
- East-Central (Olomoro, Iyede-Ame, Unogboko, Itebiege, Uti, Iyowo, Ibrede and Oyede)
- Standard language (Uzere, Aviara and Irri).

1.4.3 Isoko vowel system

It has been reported that there are nine vowel phonemes in standard Isoko (Dunstan, 1969; Mafeni, 1972; Donwa-Ifode, 1989; Elugbe, 1989; Idudhe, 1990, 2001). According to Mafeni (1972), they were formally represented with only seven (7) symbols. Table 1.1 shows both old and new representations of Isoko vowels.

Table 1.1. Isoko old and new vowels

Vowel phoneme	Previous representation	New representation	Examples or words in which the phonemes occur.
/i/	i	i	sì*draw*
/ị/	e	ị	sị *refuse*
/e/	e	e	sè *read*
/ẹ/	ɛ/ẹ	ẹ	sè*dress*
/a/	a	a	sà *shoot*
/ọ/	ɔ/ọ	ọ	kọ *plant*
/o/	o	o	kò *sew*
/ụ/	o/e	ụ	kụ *wrap*
/u/	u	u	kù*pour*

Source: Mafeni (1972:148)

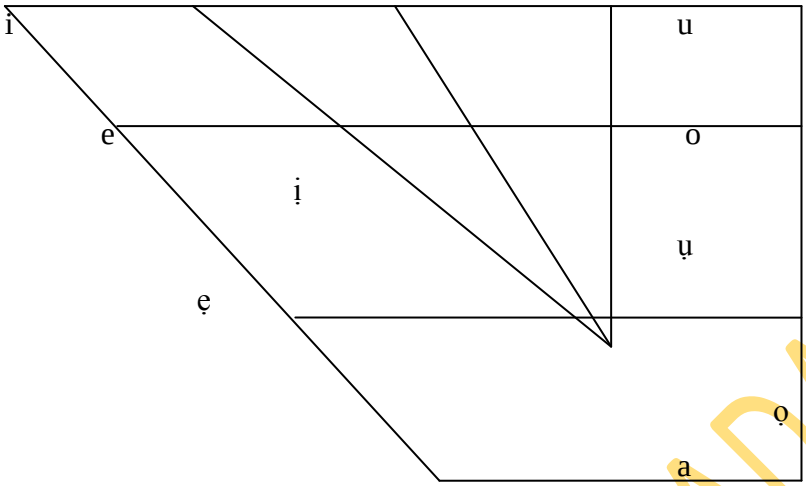


Figure 1.2. Isoko vowel chart

Source: Dunstan (1969:118)

Dunstan notes that the vowel length distinction in English is difficult for Isoko speakers to make. This, it is perceived, is largely due to the fact that there is no vowel length distinction in Isoko vowels compared to English ones. However, Dunstan opines that vowels may be long in which case they are written with two symbols e.g. /ʤáá/ 'jaa' (to try). Furthermore, she states that although Isoko has /ị/ which is fairly close to English /i/, most Isoko speakers have difficulty in distinguishing between such words as 'feel' and 'fill'; 'seat' and 'sit'. It is also obvious from the vowel chart above that the Isoko vowel system lacks the central vowels. It is the opinion of Dunstan that there is a strong tendency for Isoko speakers of English to replace /ʌ/ by the Isoko /ọ/, thus confusing such words as 'hut' and 'hot', but in the case of /ə:/ the pronunciation seems to depend partly on the spelling of the English word, thus 'turn' may be pronounced [tọn]; 'heard', [had] and 'term', [tẹm].Noting these observations made by Dunstan (1969:122), it follows or should appropriately follow that since the central vowels, especially the schwa are absent from Isoko, there is a likelihood that Isoko English will lack the schwa sound.

Since native speakers of English reduce most of their full vowels in connected speech to the schwa, a weak central vowel, which makes it the most common vowel in English pronunciation, its absence in Isoko vowel system and the tendency to replace it with other strong vowels will make a significant difference in the way Isoko speakers make use of English and ultimately make a distinction in the rhythm of their English.

Apart from the nine pure vowels mentioned above, Dunstan (1969:118) and Idudhe (1990:20) recognize the possibility of diphthongs. This is contrary to Jowitt's (1991) assertion that there are no diphthongs in Nigerian mother tongues. Though the exact numbers are not specified, Dunstan states that they occur phonetically. However, they are treated as sequences of two different vowels. Idudhe (1990:19-20) reveals that although these diphthongs occur phonetically in Isoko, they are not included in the present Isoko orthography, but they do exist in the Isoko phonetic alphabet.

1.5 Vowel harmony

Ladefoged (1975:202) opines that "there is said to be vowel harmony in a language if the vowels are constrained so that all the vowels in a single word have some property or properties in common. According to Aziza (1994:1), this means that such a vowel system consists of two parallel sets of vowels and they behave in such a way that the vowels in words are drawn exclusively from one set or the other. However, Iwara (1994:10) observes that although the vowels are divided into two sets

according to some phonetic feature or features, such as ± tongue root advancement and front/backness, such that words from one set occur together, words are not drawn exclusively from one set but minimally within a simple disyllabic word.

According to Crystal (1997:180), harmony is a term used in phonology to refer to the way the articulation of one phonological unit is influenced by another unit in the same word or phrase. The two main processes are consonant harmony and vowel harmony. In languages with vowel harmony systems, all the vowels in a word share certain features and are divided into harmonic sets. Vowel harmony may also be defined as "the sharing of a feature, typically by noncontiguous vowels separated by at least one consonant. The vowels may share the feature in the lexicon or one vowel can trigger a change in another" (Childs, 2003:68).

Hyman (1975) distinguishes between 'partial' and 'complete' vowel harmony. The complete vowel harmony has been seen as a kind of reduplication and is one in which "the vowel of a morpheme completely assimilates to another vowel" (Hyman 1975:233). Examples like 'mere' (made, did) and 'mara' (knew) from the verb stems /me/ 'make, do' and /ma/ 'know' in certain Central dialects of Igbo are cited by Aziza (1994) to buttress this. On the other hand, partial vowel harmony exists if a vowel assimilates in certain features to another vowel. The most common features are front-backness, tense-laxness and labiality. Hyman observes that most cases of vowel harmony belong to the partial type.

1.5.1 Vowel harmony in Isoko

Elugbe (1983), working on the vowels of Proto-Edoid languages reports that there are ten oral vowels in the system and these vowels fall into two harmony sets.

A. Expanded Pharynx		B. Non-expanded Pharynx	
i	u	ɪ	ʊ
e	o	ɛ	ɔ
ə		a	

He notes that PE languages have had their vowels reduced from the original ten vowel system to between nine and seven in various ways, basically due to language change and shift. He reports that the evidence for postulating reduction is overwhelming and conclusive. According to him, while *i and *e have regular i- and e- reflexes respectively, ɪ shifts to i, ɪ, e, or ɛ. Similarly, while *u and *o have u- and o- reflexes respectively, *ʊ has u-,ʊ-,o- and ɔ- reflexes. These observations, he notes are parallel

to what happens in the case of *ə and *a. *ə has a varied set of reflexes but *a does not. Elugbe gives the following vowel system reduction routes in Edoid.

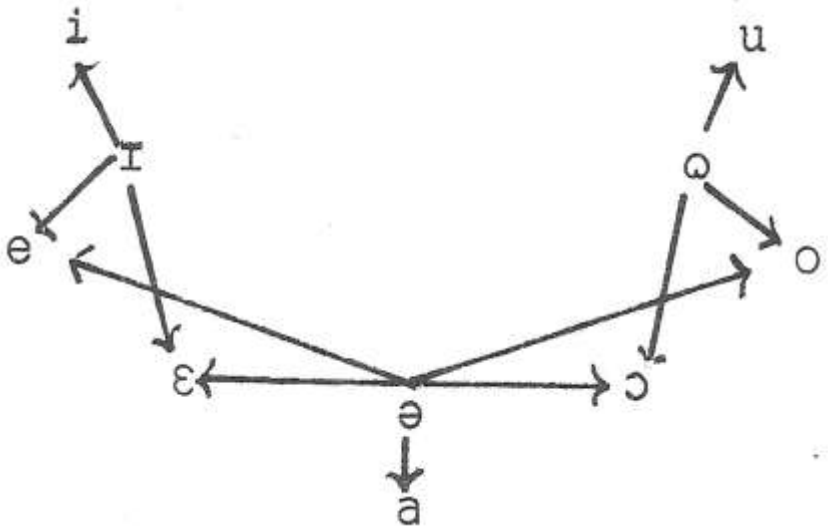


Figure 1.3. Vowel system reduction routes in Edoid

Source: Elugbe (1983:83)

According to Elugbe, PE *ə̲ has the ability to shift to the greatest variety of vowels followed by *ɪ̲ and *ɷ̲. He reports that it becomes obvious that the three most central vowels /ə, ɪ, ɷ/ are the most prone to change and it may well be that peripheral vowels are more resistant to change than non-peripheral vowels, at least within vowel systems of the Kwa type of vowel harmony.

Lindau (1975), using acoustic perturbation theory, identifies two common patterns of vowel merging, namely /ə/ merging with /e/ for acoustic reasons, and /u/ merging with /o/for reasons of structural pressure, resulting in an earlier nine-vowel system becoming reduced to a seven-vowel system. Williamson (1983) has also reported that Proto-Edoid */ə/has merged with /e, ɛ, a/ in a number of languages within the Niger-Congo family. Earlier, it was mentioned that Isoko has nine vowel phonemes.

Linguists differ in the representation of the nine vowel phonemes recognized for Isoko and how they fall into harmonic set. Elugbe (1983) and Donwa (1983) represent the phonemes as /i, e, u, o, ɪ, ɷ, ɛ, ɔ, a/, dividing them into two harmonic set thus:

Set I		Set II	
i	u	ɪ	ɷ
e	o	ɛ	ɔ
		a	

On the other hand, Dunstan (1969), Mafeni (1972) and Idudhe (2001) represent the phonemes as /i, e, ị, ẹ, a, ọ, ụ, o, u/. Idudhe groups the vowels into two harmonic set thus:

Set A		Set B	
a	ị	e	i
ọ	ụ	o	u
	ẹ		ẹ

Idudhe explains that by the above arrangement, the vowels in set A co-occur in the spelling of a word. Thus in spelling, if there is /a/ in the syllable of a word, it will be expected that /ị, ọ, ụ, or ẹ/ will co-occur in the next syllable as in *afịtụ* ‘comb’. Similarly, /i, o, u or e/ in set B will co-occur in the next syllable of a word if the preceding vowel is /u/ in *uvbeli* ‘tail’.

According to Idudhe, it is discovered that the vowel /ẹ/ is a neutral or central vowel i.e. universal. It can occur in the spelling of a word with any of the vowels in either Sets A or B. He, however, notes that although vowel harmony is regular in two-syllable words, in a few of such words, the harmony is altered and the vowels in both Sets A and B co-occur as in *isọ,* 'feaces' *ukọ,* 'messenger' *asoi*' the month, May' etc. As such, Isoko cannot be said to operate 'complete' vowel harmony as Igbo, rather Isoko exhibits 'partial' vowel harmony. Similarly, he explains that in words with more than two syllables, the harmony becomes more irregular; the vowels in Set A and B become mixed in a word as in the following examples: *ikerakere* 'writings', *ukolagbụsa* 'piece of broken calabash', *akpakpasimagha* 'centipede'.

Despite the mix-up, Idudhe reflects that there is a common feature which reveals the influence of vowel harmony because more often than not, more vowels from one set still occur in a word or many syllables. For example, in *i – ke – ra – ke – re* with five syllables, only one syllable contains /a/ from Set A vowels. The vowels in the rest four syllables are in Set B. Despite these examples of words showing partial harmony, vowel harmony in Isoko is still very obvious in words of more than two syllables as in the following examples Idudhe gave; *ẹkpẹlụbọ*'left hand', *ogologo* 'a species of yam', *ozeze* 'cricket', *ụgẹgẹ*'tripod stand', *okpomoku* 'gallon'. A close look at the above examples reveals that the vowels in their syllables belong to the same set, thus vowel harmony still remains an undeniable feature of the Isoko language.

From the foregoing, the loss of /ə/ in Isoko language predicts a tendency for Isoko speakers of English to exclude it from the vowel harmony system of the language and makes it unlikely for vowel harmony to affect its manifestation in Isoko English.

1.6 Isoko syllable structure

The phonotactics of any language specifies how sound phonemes are arranged or how consonant clusters are arranged. There are certain restrictions on the consonants which occur together in a consonant cluster. Jowitt (1991:81) opines that Nigerian mother tongues lack consonant clusters at syllable level and this, he says, accounts for the difficulties encountered by Nigerian native speakers of English in articulating consonant clusters.

Dunstan (1969:118) and Idudhe (2001:21-22) are of the opinion that there are possibilities of consonant clusters in Isoko, especially at the initial position of the syllable. Although, the possibilities of consonant clusters exist in Isoko as opined by

Dunstan and Idudhe, their complexity is not much compared to that of the English language. English is a language which allows a wide range of consonant clusters ((C_3) V (C_4) i.e. the highest consonants that can occur at the onset position of an English word is three while the maximum at the coda position is four. This kind of complexity cannot be found in Isoko. Dunstan (1969:188-189) notes that the following syllable structures are possible in Isoko.

1. V
   /o/ 'he/she/it'
2. CV
   /kpé/ 'to kill'
3. C_1C_2V
   /brú/ 'to cut'
4. $C_1C_2C_3V$
   /egwri/ 'palm oil'

There are, however, restrictions to the consonants that can co-occur in the cluster of CCV or CCCV. According to Dunstan, only /r/, /j/ or /w/ can occur in C_2 position in a syllable of C_1C_2V structure and in a syllable of $C_1C_2C_3$ V structure, C_2 is /r/ or /w/ and C_3 is /r/, /j/ or /w/ following /k/ or /g/.

This kind of restriction to the consonants that occur in the prevocalic or syllable initial position is not peculiar to the Isoko language. English also shows restrictions on how consonants cluster in syllable positions. In initial position, if there are three consonants, the first is always /s/ e.g. /skri:m/ 'scream', /splæʃ/ 'splash' and /swi:m/ 'swim'. If the second consonant of a syllable initial consonant cluster is a plosive, the first consonant must be /s/ e.g. spoil.

1.7 Isoko tone system

Tones according to Catford (1988) are pitch variations which are used in short stretches of syllables length, such as in small grammatical units like words. African languages of the south of the Sahara with very few exceptions have been classified as tone languages (Welmers, 1973:78). In tone languages, tones are capable of changing the meaning of words (Cruttenden 1986:8).

Mafeni (1969; 1972), Idudhe (1990) and (2001) asset that Isoko is a tonal language i.e. different tones give different meaning to a word. They claim that there are basically three tones in Isoko: high, low and mid-high or down stepped tones, which they represent with the following symbols.

/= high

\ = low

|= mid-high or down stepped high.

These tones are exemplified by them in the words below:

ẹkpẹ [èkpè] *leopard* low – low

ẹkpẹ [èkpé] *peeling* low – high

ẹkpẹ [ékpė] *sand* low – mid - high

Mafeni observes that previous orthographies failed to indicate tone in the writing system of Isoko which could lead to difficulty to make out what meaning is intended in many cases and reading speed adversely affected. He, however, notes that a method of indicating tone should form part of the orthography. He reports that it is not always necessary to mark all the tones. According to him, one of the tones, usually the dominant or most commonly used tone in the language (in the case of Isoko, apparently high), the tone could be left unmarked. He gave the following examples:

1. Ọgba a brave man
2. Ọgba thirty
3. Ò gba it is correct.

In (1) above, *Ọ* and *a* carry the high tone while in (2) *Ọ* and *a* carry the high tone and mid-high or down-stepped high tone respectively. From Mafeni's point of view, since (1) and (2) above carry the high or mid-high tones, only the low tone should be marked as represented in (3) above. Similarly, Idudhe (2001:23) reports that one of the methods of indicating tone in the writing system of Isoko language is to double the vowel of the last syllable of a disyllabic tone word with a high tone as is done in some words in Yoruba and Edo. He gave the following examples:

Ọkaa: a kind tree

Ọka: maize

Ụgụụ: spear grass

Ụgụ: soap ash

He, however, notes that where the tone word has three syllables and the middle syllable has a high tone, the vowel in the middle may be doubled so that the word will now be in clear contrast to the one whose middle vowel is not doubled as in the following examples:

iroro: 'thought'

irooro: ‘melon’

uriri: ‘harmattan’

uriiri: ‘kind of rodent’

Idudhe (2001:25), reports that the method does not prescribe doubling the initial, middle or final vowels of every word that has a high tone, when the word with the high tone does not have contrast. For example:

ewholo	‘massage’	not ewhoolo
ekere	‘writing’	not ekeere
ịmẹ̀ẹ̀	‘table’	not ịmẹ̀ẹ̀ẹ̀

It should, however, be noted that although Mafeni (1972) and Idudhe (2001) claim that tones are not marked in the writing system of Isoko and in previous orthographies, examples of tone markings in Isoko words abound in the following studies: Dunstan (1969), Elugbe (1976; 1977; 1983), Donwa (1983).

Dunstan (1969:119) claims that Isoko is a terraced-level tone language. According to her, this means that:

a. Whereas after a low tone, there is only the possibility of a high tone or another low tone, e.g. [àɣá] low-high [_ ¯] ‘knife’;
   [èwàrà náákómé] ‘the things given to me’
   [_ _ _ ¯¯ ¯ ¯]

   L L L HH H H

b. After a high tone, there are three possibilities:
   i. A low tone (L)
   ii. A high tone at the same pitch level (H)
   iii. A high tone which is lower than the preceding high (i.e. down-step (D) + high).
   E.g. /ibú hù/ low-high-low [_ ¯ _] ‘they are not many’;
   /árá/ high-high [¯ ¯] ‘meat’;
   /úkė/ high-down-step + high [¯ –] ‘back’

Dunstan notes that low tone is marked ‘\’, high tone ‘/’ and after down-step is marked ‘|’. According to her, sequences of high-low and low-low are not found within any Isoko word in isolation. Furthermore, she says that there is no limit to the number

of occurrences of down-step in an utterance (except that down-step can only occur between high tones). Welmers (1973:3) notes that in African languages that have terraced-leveled tone system with a down drift, the sequence H-L-H is not realized as [¯ ¯], but rather as [¯-] i.e. the second H is lower in pitch than the first. Stated differently, he notes that the interval from H to L is greater than from L to H. This phenomenon, which he says is known as down drift applies progressively to each H preceded by a L.

Elugbe (1976; 1977) and Donwa (1983) are of the opinion that Isoko does not exhibit the mid-high or down-stepped high tone and there is no terracing or down drift which Mafeni and Dunstan claimed to be present in Isoko. Elugbe (1977) notes that although his investigations revealed that there is a third level (mid), it is totally predictable: occurring only in final positions, having no variants (as might have been expected of a down-step) and conditioned by the phenomenon of final low raising.

1.8 Research methodology

1.8.1 Statement of the problem

Over the years, scholars keep noting the features that make NE different from SBE. In the area of phonology, various claims have been made concerning the rhythm of SBE and NE. Ufomata (1996:15) claims that /ə/, the schwa, the most frequent sound in SBE is the rarest in NE. Consequently, Udofot (1997) has made reference to rhythm as the most acute problem worthy of detailed study. According to her, the perceived differences in the rhythm of SBE and NE stem from the fact that there is the propensity of Nigerian speakers of English to stress more syllables in NE than in SBE. She, thus, claims that the phenomenon of vowel reduction in weak syllables is either totally absent or minimally present in NE. Furthermore, Akinjobi (2004:89) notes that the realization of vowels and syllables that occur in unstressed positions is a major area of deviation from SBE usage for Nigerian speakers. However, the studies that have been carried out on the rhythm of Nigerian English with regards to vowel reduction have dwelt on Yoruba and Hausa Englishes with little or no studies on the small group languages. Therefore, this study will want to fill this gap in the literature.

1.8.2 Aims and objectives of the study

The above claims are major motivating factors in carrying out this study. The study is thus aimed at investigating these claims in Isoko English by:

1. Determining if vowels are reduced to /ɪ/ and /ə/ in unstressed syllable positions;

2. Identifying/highlighting the vowels used in reduced contexts or unstressed syllable positions;
3. Determining if there are any significant differences in the speeches of male and female speakers and the younger and older (20-40 and 41-60) speakers of Educated Isoko English and which of the sexes and age range approximate closer Pairwise Variability Index (PVI) values to SBE; and
4. Defining the rhythm of Educated Isoko English.

1.8.3 Justification of the study

The unique nature of new Englishes has been claimed to pose several problems among which are those of definition, identification, classification, norm, intelligibility, etc. In 'Nigerian English', does a Hausa speaker, for instance, use English exactly the same way speakers of other ethnic groups do? What then constitute NE if the answer to the question is in the negative, which is the case? In defining truly what constitutes the definition, identification, classification, norm etc of NE, there is the need to approach it from a geo-tribal perspective i.e. cognizance must be taken of the various ethnic nationalities in the country, not just defining NE based on the three 'major' languages. Approaching NE from a geo-tribal perspective becomes necessary because there might be divergences in the spoken English of the diverse ethnic groups in the country, which may constitute regional variations from the convergences that are constant in each of the ethnic groups. As such, it becomes necessary to carry out this investigation on Isoko English as part of the ongoing research in defining "truly" what NE is in furtherance of its codification.

1.8.4 Significance of the study

There has been the need for a definition, identification and codification of various forms of New Englishes which cut across the globe. These new Englishes no doubt are significantly different from SBE and the need to define what they constitute for a proper codification is necessary.

An attempt is made to investigate an aspect of the phonology of one of the sub-varieties of NE, Isoko English. The insights got from this study will be significant in contributing to the description of NE as a second language (ESL), as the need arises to characterize what constitutes spoken NE and SBE. Also, it will be significant in helping teachers to concentrate on problem areas in the attempt to teaching the RP model (if there is still one) since the study will provide insights into some divergent

characteristics between spoken NE and SBE. Ultimately, the study will contribute immensely to the researches into the characteristics of an acceptable spoken 'Standard Nigerian English'.

1.8.5 Scope and limitations of the study

There are indeed various sub-varieties of Nigerian English based on the various ethnic nationalities in Nigeria. To differentiate one variety from the other and ultimately arrive at a standard NE, there is the need to research into the grammatical, semantic and phonological make-up of these varieties.

This study is limited to the phonology of a sub-variety of Nigerian English, Educated Isoko English. It is restricted to an aspect of rhythm, vowel reduction with reference to durational factors of the reduced vowels in unstressed syllable positions and its influence on the rhythm of educated Isoko English.

There was the constraint of taking every subject to a speech laboratory for recording void of interferences from the atmosphere, which may have affected the quality of the data recorded. However, this was taken care of by doing the recordings in quiet rooms with a windshield attached to the microphone to minimize atmospheric interferences.

1.8.6 Subjects

One hundred (100) Educated Isoko English (EIE) speakers comprising 50 male and 50 female of varied socio-economic and educational background who were selected through accidental sampling method from different fields of study constituted the subjects for the study. They were between the ages of 20 – 40 and 41 – 60. Five (5) British Speakers of English (BSE) who were all adults and degree holders in various fields of study served as a standard for the already established phenomenon of vowel reduction in Standard British English. The British speakers work with the British High Commission, Lagos and have spent between 2-5 years in Nigeria. The criteria for the selection of the EIE subjects are based on the following: education, non residency in any country where English is spoken as first language and bilinguals in English and Isoko languages who are resident in Isoko land.

1.9 Research procedure

The subjects for the study were made to utter a list of ten (10) controlled declarative sentences (adapted from Low et al (2000) with slight modifications) into a recorder in Praat (version5.1.11), a speech software analyzer with an attached LA 33Y

uni-directional electrets condenser micro-phone placed approximately 5 – 10 inches from the subject's mouth. The uttered sentences were chosen for the study to minimize inappropriate productions or responses that might not include items intended for investigation. The test items were presented in such a way that the subjects were not aware of what the researcher intended to test with their productions. The subjects were given as much time as possible to get familiar with the sentences before they were recorded. Also, spontaneous speeches were recorded and analyzed to corroborate the findings from the uttered prepared text. This was done to account for the variable of naturalness as an important factor in speech production. Since it proved really difficult to take every subject to quiet rooms or soundproof rooms for recording, a windshield was placed on the micro-phone to prevent infiltration of background noise into the data.

The controlled declarative sentences are divided into two sets: Set A and Set B. Set A data contain, by design, five sentences with only full vowels (the Full Vowel Set) while set B data contain five sentences with a mixture of full and potentially reduced vowels (the Reduced Vowel Set). Thus, the recorded data contain one thousand (1000) utterances as produced by the 100 EIE subjects and fifty (50) utterances produced by the five (5) British English speakers. These utterances were subjected to perceptual, metrical and acoustic/statistical analyses.

A perceptual analysis was done by repeatedly listening to the recordings and counting the occurrence of the various sounds that were produced where the weak forms of English grammatical words were expected. These were converted to percentages, and for each word, the variant with the highest percentage was taken as the norm. To corroborate the findings from the perceptual analyses, a metrical and acoustic/statistical analysis of representative renditions of EIE and SBE were carried out. The acoustic analyses were carried out on vocalic segments of Set A and Set B data.

Segmentation of data was done on a computer using the acoustic analysis software Praat (version 5.1.11) relying on audio-visual clues on wave forms and broad-bands. Subjects' productions were segmented into six tiers: sentence, words, syllables, phonemes, vocalic and consonantal intervals on a text grid window. Vocalic intervals were defined as the stretch of signal between vowel onset and vowel offset, characterized by vowel formants, regardless of the number of vowels included in the section (a vocalic section could contain a monophthong, a diphthong, or, in some

cases, two or more vowels spanning the offset of one word and the onset of the next). Intervocalic intervals were defined as the stretch of signal between vowel offset and vowel onset, regardless of the number of consonants included. Glides were included in the consonantal interval segments except for initial glides, which were included in the vocalic interval segments.

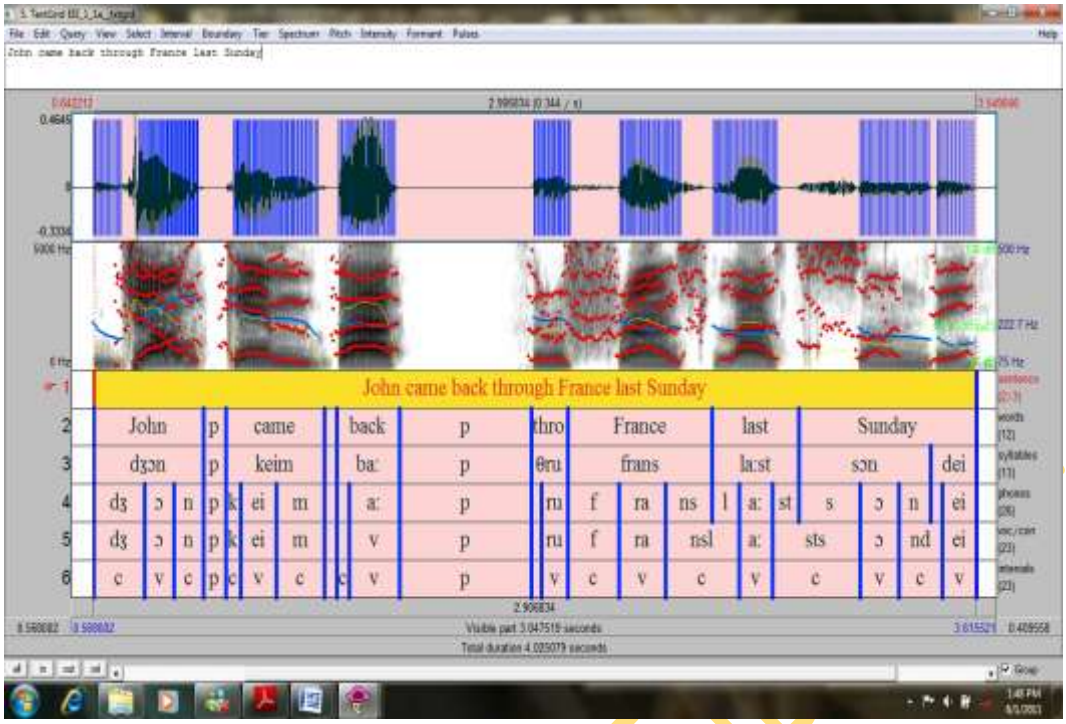


Figure 1.4. Segmentation window for vowels and consonants

Durational measurements of vowels (in milliseconds) were extracted into Excel sheets. Statistical analysis and durational analysis were then conducted using the Statistical Package for Social Sciences (SPSS). Only the vocalic duration were used for analysis. In summary, there were a total of three labels in the segmentation: V for vocalic intervals, C for consonantal intervals and P for pauses, other non-linguistic sounds and hesitations. See Fig. 1.4 above for an example of segmentation.

1.10 Definition of terms

1.10.1 Educated Isoko English

This refers to the English language as spoken by Isokos who were born, nurtured and who live in Isoko land, encountered the English language in a second language context and have obtained not less than OND or NCE qualification.

1.10.2 Pairwise variability index

A measure used in quality speech rhythm, which expresses the average variability of a property most commonly duration from one unit to the next (Low, 1998; Grabe and Low, 2002).

1.10.3 Nigerian English

The variety of English which has developed in the Nigerian non-native English situation as a result of trade and commerce, missionary activities, colonialism as well as the native culture of Nigeria.

1.10.4 Vowel reduction

The process of weakening otherwise strong vowel sounds in unstressed syllable positions.

1.10.5 Vocalic and consonantal intervals

A vocalic interval is located between the onset and the offset of a vowel, or of a cluster of vowels. On the other hand, consonantal or intervocalic interval is an interval located between the onset and offset of a consonant or of a cluster of consonants.

1.10.6 Control

Control, as used in this study, is a standard means of confirming the already established phenomenon of vowel reduction in Standard British English.

CHAPTER TWO

REVIEW OF RELEVANT LITERATURE

2.0 Introduction

Nigeria is known for its extreme linguistic diversity (Elugbe, 1994) and it has been reported that there are over 500 languages spoken across Nigeria as a result of this diversity (Grimes and Grimes, 2000). The contact of these languages with the English language over the years has caused a resultant variety known as Nigerian English (NE). Several scholars (Bamgbose, 1982; Banjo, 1995; Ufomata, 1996; Adegbija, 2004) and others have already established that there is a variety of the English language known as Nigerian English. However, a standard for this variety is yet to be established, hence, still in a state of flux.

There are, however, ongoing researches on the need to standardize NE. Despite these researches on this need, until pockets of studies are done across the country on the various varieties of the NE caused by the linguistic diversity, a standard NE cannot be described. The points of similarities and differences among the various sub-varieties need to be first established and points of convergences and divergences juxtaposed before a standard can emerge. This need has greatly motivated this study.

The noticeable variations in the use of NE as different from Standard British English (SBE) have made scholars to report that SBE differs systematically from NE in many ways – phonology, grammar and lexico-sematics. This research focuses on an aspect of phonology – vowel reduction, a phenomenon which determines, to a great extent, the rhythm of SBE.

English has been reported by early scholars such as Pike (1945) and Abercrombie (1967) as having a stress-timed rhythm because of its supposed alternation and distribution between strong and weak syllables. On the other hand, it has been proved that NE is syllable-timed (Bamgbose, 1982; Udofot, 1997; Akinjobi 2004).The phenomenon of vowel reduction is central to the description of the rhythm of English language. English, which has been suggested by early scholars (Pike, 1945; Abercrombie, 1967) to be stressed-timed, displays phonological vowel reduction such that most English vowels are reduced to the schwa in unstressed positions. Can this

same phenomenon, so central to the rhythm of English, hold true for Isoko English, a sub-variety of NE, which has been suggested to be syllable-timed?

2.1 English prosody

2.1.1 The Syllable

The concept of a unit at a higher level than that of the phoneme or sound segment, yet, distinct from that of the word or morpheme has existed since ancient times. The motion that there exists at the higher level a unit known as the syllable has led to many attempts in recent times to define the term. Attempts have been made to provide physiological, acoustic or auditory explanations and definitions of the syllable. According to the Prominence Theory, which is based mainly on auditory judgments, the number of syllables in a word is determined by the number of peaks of prominence. For example, in the word *entertaining* /entə'teɪnɪŋ/, the peaks of prominence are represented by the vowels /e, ə, eɪ, ɪ/.

Williamson (1984:70) sees the syllable as "the smallest unit of language which can be produced, meaning that a word in any language could be divided into pronounceable units, with each unit being pronounced within a breath effort." This corresponds with the Chest Pulse Theory. This theory discusses the syllable in the context of muscular activities and lung movements in the process of speech. According to Atoye (2003:43), the Pulse Theory states that "a syllable is the amount of utterance that you can produce with a single breath force or chest pulse." Experiments have shown that the number of air pressure can determine the number of syllables produced (Gimson 1980:56), thus allowing to associate the number of syllables with the number of chest pulses. However, it is noted that this approach cannot account for cases when two vowels occur one after the other – for example in a word like *being*, the second chest pulse might be almost irrelevant and thus lead erroneously to the conclusion that such English words consist of one syllable only (Cruttenden, 2001:49).

Another approach to the definition of the syllable is presented by the Sonority Theory. According to this theory, the pulses of pulmonic air stream in speech "corresponds to peaks of sonority" (Giegerich, 1992:132). Giegerich states that the sonority of a speech sound is "its relative loudness compared to a peak in the flow rate of pulmonic air. Thus, nuclear elements or syllabic segments can be described as intrinsically more sonorous than marginal or non-syllabic elements. Speech sounds can thus be ranked in terms of their intrinsic sonority according to a 'sonority scale'. For

example, Cruttenden (2001:50) draws a contour representing the varying prominences of *Manchester* in the sonority scale in Fig. 2.1.

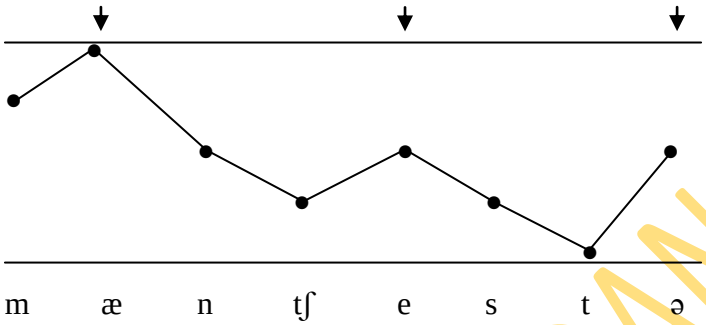


Figure 2.1. Sonority hierarchy of *Manchester*

Source: Cruttenden (2001:50)

In respect to the diagram in Fig. 2.1 above, there are three syllables *mæn-, -ʧes, -tə* as depicted by the height of each syllable represented by the arrows. The syllable /*mæn/* carries the primary accent because it constitutes the most sonorant vowel /æ/, which is the highest in the scale above. In the same vein, the sound /m/ also appears to be more sonorant than the vowels and /n/ is at the same peak of sonorance with the vowels /e/ and /ə/. The reason for this is not far-fetched. /m/ falls into the syllable that carries the primary accent.

Fudge (1990:52) opines that the syllable appears to function in three ways – to carry the phonetic manifestations of the 'suprasegmentals' such as stress or tone; to be the chief domain of patterns of arrangement of phonemes or 'phonotactics' i.e. the study of the possibilities of phoneme combination of a language; and to act as a unit of organization in the process of speech production.

The syllable is a basic unit of speech studied on both the phonetic and phonological levels of analysis. Phonetically, a syllable is viewed based on the way it is produced and the way it sounds (Roach, 1991:67). According to Roach (2000:70), phonetically, syllables are "usually described as consisting of a center which has little or no obstruction to airflow and which sounds comparatively loud; before and after that center … there will be greater obstruction to airflow and /or less loud sound." He states that in the monosyllable word *cat* /kæt/, the vowel /æ/ is the center at which little obstruction takes place, whereas, we have complete obstruction to the airflow for the surrounding plosives /k/ and /t/. Roach, however, reports that there are still problems with the phonetic description of the syllable. He states that an unanswered question is how to decide on syllable boundaries that are found in a connected sequence. For example, should the word 'extra' /ekstra/, which has two syllables, be divided as /e.kstrə/, /ek.strə/, /eks.trə/, /ekst.rə/ or /ekstr. ə/? According to Roach, there is no single rule that can help in deciding the division of the word without bringing up problems. However, he gave some guiding principles on syllable boundary division.

Roach however, notes that recent works in phonology make use of a rather more 'refined' analysis of the syllable in which the vowel and the coda (if there is one) are known as 'rhyme' or rime. The rhyme is divided into the peak (normally the vowel), the coda, which is optional: the rhyme may have no coda and the onset which is not obligatory. A tree diagram represents this phenomenon in Fig. 2.2 below.

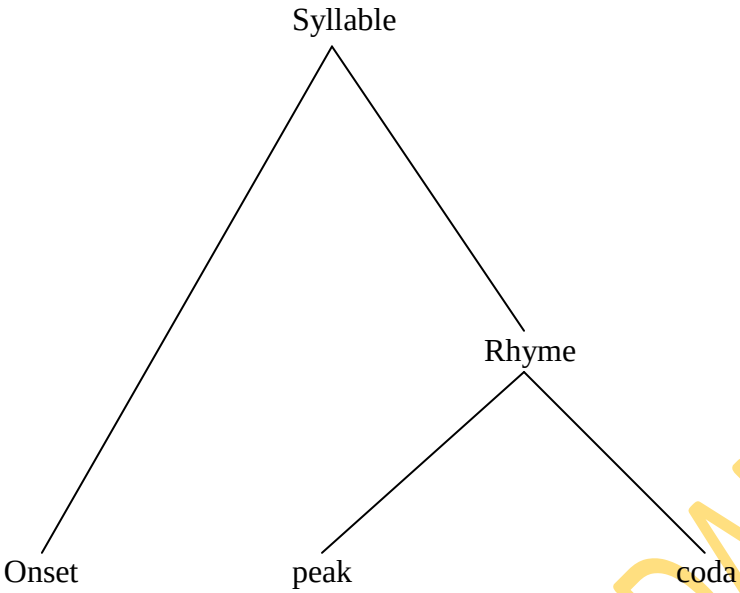


Figure 2.2. Division of the English syllable

Source: Roach (1991:77)

Hyman (1975) observes that, in phonology, the syllable has been viewed on the phonotactic constraints of a given language, subject to some universal tendencies. Thus, Selkirk (1982:337) posits that the syllable is essential in the formal description of phonotactic constraints. He strongly argues that syllable structure is necessary for the most general and explanatory statement of phonotactic constraints for the proper characterization of the domain of phonological rules and for an adequate treatment of suprasegmental phenomena such as stress and tone. For example, there are no English words which begin with the cluster /tl/. As a result, it is correct to generalize that no syllable can begin with a /tl/ cluster in English. The interest of phonologists on the syllable according to Roach (1992:102) is in the structure of the syllables. Following Roach (1992), the structural properties of a syllable will show that it consists of a central peak of sonority (usually a vowel), and the consonants that cluster around this peak. The preceding consonant or consonants cluster is called the onset. For example, the 'k' in the word 'cat' is the onset. The consonant or consonants cluster which is following the peak of sonority is called the 'coda'. For example, the 't' of the word 'cat' is the coda. The peak of sonority is called the 'nucleus'. The nucleus is a vowel in most cases, although the consonants [r], [l], [m], [n] can also be the nucleus of a syllable, in which case they are referred to as syllabic consonants.

Table 2.1. Structural properties of the English syllable

Parts	Description	Optionality
Onset	Initial segment of a syllable	Optional
Nucleus	Central segment of a syllable	Obligatory
Coda	Closing segment of a syllable	Optional

Adapted from Roach (1991)

In English syllables, consonant clusters in the onset position are not arbitrarily formed. This depends on the phonotactic constraints of English language. For example,

1. Syllable initial clusters (onset)

In syllable initial clusters, there is the possibility of a maximum of three (3) consonant clusters. There are two types of syllable initial consonant clusters.

The one composed of 's' followed by one of a small set of consonants.

Examples (two clusters)

sp – speak /spi:k/, spin /spɪn/

st – stick /sti:k/, steam /sti:m/

sk – skin /skɪn/ skim /skɪm/

sl – slam /slæm/, slay /sleɪ/

sw – swim /swɪm/

sj – sue /sju:/

sm – smack /smæk/, smell /smel/

sn – snail /sneɪl/, snare /sneə/

The 's' in these clusters is called the **pre-initial consonant** and the others in the above examples are the initial consonants.

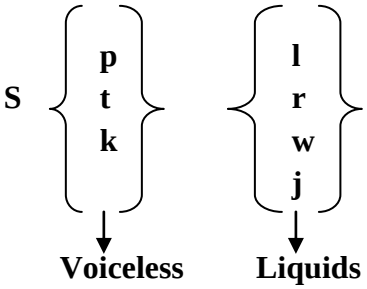


Table 2.2. Initial three cluster consonants

pre-initial	Initial	post-initial			
		l	r	w	j
S plus initial	p	splay splash	spray	-	spew /sju:/
	t	-	string stream street	-	stew /stju:/
	k	Sclerosis	screen scream scratch	squeak	skewer

Adapted from Roach (1991:73)

Table 2.2 above shows the phonotactic constraints of a three consonant cluster. In a three consonant cluster, the first consonant must be /s/, the second must be occupied by only voiceless plosive and the third is one of four approximants or liquids: /l, r, j or w/ except that /t/ does not allow /l/ and /w/ and /p/ do not allow /w/ as a third consonant

The other sort of syllable initial consonant cluster begins with one of a set of about fifteen consonants followed by one of the set /l, r, w, j/. In this set, the first consonant of these clusters is called the **initial consonant** and the second, **the post-initial.**

Examples

pl – play /pleɪ/

pr – pray /preɪ/

bl – blame /bleɪm/, blue /blu:/

br – bread /bred/, brew /bru:/

tr – tree /tri:/, trim /trɪm/, true /tru:/

dr – drew /dru:/, draw /drɔ:/, dream /dri:m/

kl – clean /kli:n/, clue /klu:/

kr – cream /kr:m/, cram /kræm/, crane /kreɪn/

gl – glow /gləu/, glue /glu:/, glad /glæd/

gr – grow /grəu/, grew /gru:/

fl – flay /fleɪ/, flame /fleɪm/, float /fləut/

fr – frame /freɪm/, fry /fraɪ/

θr – through /θru:/, throb /θrɔb/

ʃr – shrewd /ʃru:d/

2. Final consonant clusters (coda)

In final consonant clusters, there is the possibility of a maximum of up to four (4) consonants at the end of a word. It is noted that, if there is no final consonant, there is a **zero coda.** When there is one consonant only, this is called the **final** consonant. Any consonant may be a final consonant except **/h, r, w, j/.** There are two types of final consonant clusters and two types of final three consonant clusters.

Two type final consonant clusters

a. A final consonant preceded by a **pre-final** consonant. The pre-final consonants form a small set: /m, n, ŋ, l, s/.

Examples

bump /bʌmp/

bent /bent/

bank /bæŋk/

belt /belt/

ask /a:sk/

b. A final consonant followed by a **post-final** consonant. The post-final consonants also form a small set: /s, z, t, d, θ/.

Examples

bets /bets/

beds /bedz/

backed /bækt/

bagged /bægd/

eight /eɪtθ/

a. Pre-final plus final plus post-final, as set out in table 2.3.

Table 2.3. Pre-final, final and post-final consonant clusters

		pre-final	Final	post-final
'helped'	he	l	p	t
'banks'	bæ	ŋ	k	s
'bonds'	bɔ	n	d	z
'twelfth	twe	l	f	θ

Source: Roach (1991:75)

b. The second type of three consonant clusters shows that more than one post-final consonant can occur in a final cluster thus: final plus post-final 1 plus post-final 2. Post-final 2 is again one of /s, z, t, d, θ/.

Table 2.4. Final, post-final 1 and post-final 2 consonant clusters

		pre-final	final	post-final 1	post-final 2
'twelfths'	twe	l	f	θ	s
'prompts'	prɔ	m	p	t	s
'fifths'	fɪ	-	f	θ	s
'next'	ne	-	k	s	t
'lapsed'	læ	-	p	s	t

Adapted from Roach (1991:75)

However, there are a small number of cases that seem to defy the above analysis which consist of a final consonant with no pre-final but three post finals. Examples are on Table 2.5 below.

Table 2.5. Final and three post-final consonant clusters

		pre-final	Final	post-final1	post-final 2	post-final 3
'sixths'	sɪ	-	k	s	θ	s
'texts'	te	-	k	s	t	s

Source: Roach (1991:76)

Hyman (1975:186) asserts that only a single division is relevant for phonological purposes namely between the onset and the core consisting of the phonetic peak and coda combined. Laver (1994:114) defines the phonological syllable as "a complex unit made up of nuclear and marginal elements." Nuclear elements are the vowels or syllabic consonants; marginal elements are the consonants or non-syllabic segments.

2.1.2 The internal structure and weight of the syllable

Various models have been suggested for the internal structure and weight of the syllable. Blevins (1995:212) summarizes these models on the internal structure of the syllable as follows:

- The flat structure (i.e. no sub-constituents but the segments themselves) proposed by Anderson (1969); Kahn (1979); Clements and Keyser (1983).
- Moraic approaches: σ ⟶ C_oμ (μ) C_o proposed by Hyman (1985); McCarthy and Prince (1986); Hayes (1989).
- Ternary branching: σ ⟶Onset Nucleus Coda (Hockett, 1955; Haugen 1956; Davis 1985).
- Binary branching with Rime: σ⟶ Onset Rime; Rime ⟶ Nucleus Coda; (Halle and Vergnaud, 1978; Selkirk 1982).

Davies (1985) represents the different models of the internal structure of the syllables in the diagrams below:

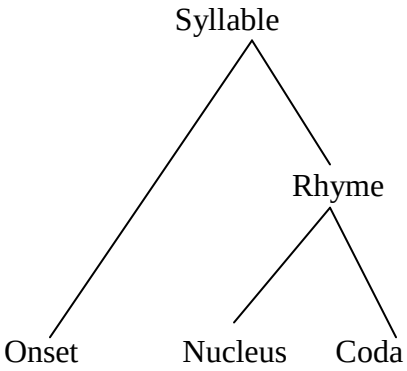


Figure 2.3. Rhyme-structure analysis

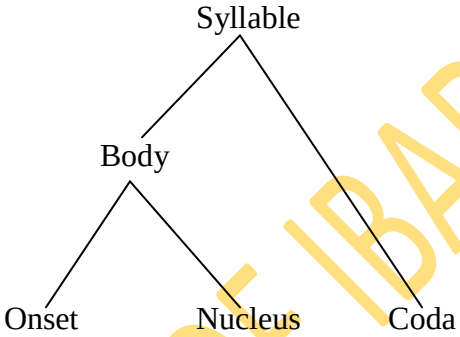


Figure 2.4. Body-structure analysis

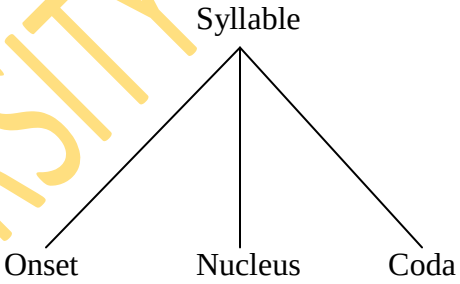


Figure 2.5. Level syllable structure

Studies in syllable internal structure in the framework of moraic phonology gave rise to the following three possibilities exemplified with the English word ‘plant’.

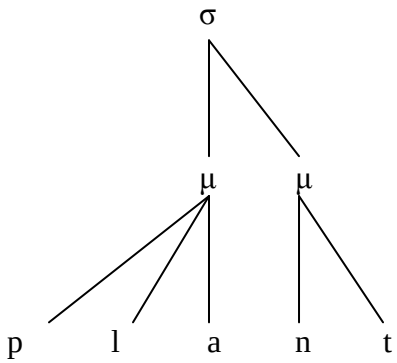


Figure 2.6. Mora-only (=MO) structure

Adapted from Hyman (1985)

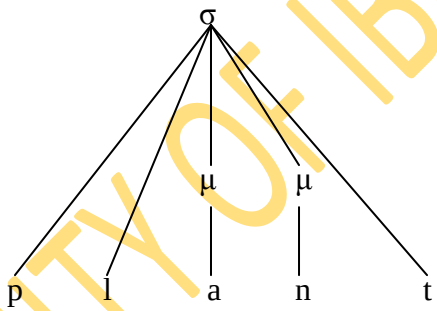


Figure 2.7. Weighted-segment (=WS) structure

Adapted from McCarthy and Prince (1986)

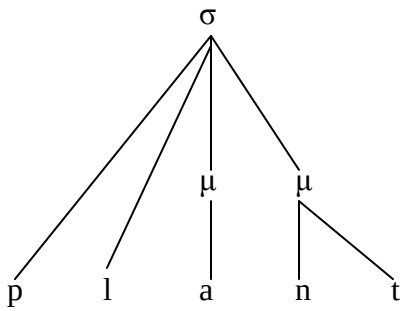


Figure 2.8. Onset and mora (=OM) structure

Adapted from Hayes (1989)

Hyman (1984, 1985), McCarthy and Prince (1986) and Hayes (1989) argue that onset segments do not contribute to the weight of a syllable and the syllable weight may differ from language to language. For example, some languages, such as Latin and English, take CVV and CVC as heavy syllables and CV syllables as light, while in other languages, such as the Australian language, Lardil only the CVV syllable is heavy and CVC and CV syllables are both light. In order to capture the language specific difference in defining heavy syllables, a moraic theory of syllable structure was proposed. The basic assumption in moraic phonology is that languages differ in assigning moraic structures. For example, English assigns two moras to both CVV and CVC syllables and only one mora to CV syllable. While Lardil assigns two moras to a CVV syllable and just one mora to a CVC or CV syllable. Thus, a syllable will be universally considered heavy if it has two moras and weightier syllables have the tendency to be stressed.

2.1.3 Strong and weak syllables

The distribution of strong and weak syllables is a phenomenon that determines the rhythm of the English language among other features. It has been stressed by Roach (1991:75) that one of the noticeable features of English is that many syllables are weak while some are strong. He also states that the term 'strong' and 'weak' are used to refer to phonetic characteristics of syllables which could be described partly in terms of stress e.g. strong syllables are stressed and weak syllables are unstressed. He maintains that any strong syllable will have a vowel phoneme as its peak while weak syllables on the other hand can only have four types of peak namely: the vowel /ə/ (schwa); a close front unrounded vowel in the general area of /i:/ and /ɪ/; a close back rounded vowel in the general area of /u:/ and /ʊ/; and any of the syllabic consonants /n, m, l, ŋ/.

The most frequently occurring vowel in English, /ə/ is always associated with weak syllables and never stressed (Christopherssen, 1956; Roach, 1991; Lomotey, 2010). Roach, however, notes that not all weak syllables contain /ə/, though many do. Two other vowels /ɪ/ and /ʊ/ can also occur in weak syllables. Wise (1957) notes that there is a general tendency for all unstressed vowels in English syllables to shorten and become of lower intensity. Consequently, they gravitate towards the weak centralized vowel /ə/ or /ɪ/ and sometimes /ʊ/, if not to disappear altogether.

Roach is of the opinion that when weak syllables containing vowels with strong syllables are compared, the vowel in a weak syllable tends to be shorter, of lower

intensity and different in quality. For example, in the word 'father' /fa:ðə/, the second syllable, which is weak is shorter than the first, is less loud and has a vowel that cannot occur in strong syllables.

2.2 Stress

Stress is an important prosodic feature which applies to individual syllables and involves most commonly loudness, length and higher pitch (Roach, 1991:73). In English, 'stress' is used in "reference to the degree of prominence of individual syllables". Roach (1992:102) states that stress, a property of syllables makes them stand out as more noticeable than others. Thus, some syllables are in some sense stronger than others and those syllables have the potential to be described as stressed. Ladefoged (1975:102) observes that not every word is actually stressed when it occurs in a sentence because stresses that occur in words sometimes become modified when the words are part of sentences.

Ladefoged (2001:92) sees a stressed syllable as that which is produced with more muscular energy, which can result in increase in pitch, loudness and length. In this same light, Roach (1992:103) states that it seems more likely that stressed syllables are produced with greater effort than unstressed syllables which are manifested in the air pressure generated in the lungs for producing the syllable and also in the articulatory movements in the vocal tract. He continues that these effects of stress produce in turn various audible results: pitch prominence in which the stressed syllable stands out from its context; stress syllables tend to be longer and louder.

Approaching stress from the angle of production, Roach (1991:73) sees a stressed syllable as one which a speaker expends more energy on and from the perceptual point of view, opines that all stressed syllables have one characteristic in common: prominence. Stressed syllables are recognized as more 'prominent' than unstressed syllables. He recognizes that there are at least four different factors that make a syllable prominent: loudness, length, pitch modulation and vowel quality.

Some basic characteristics have been identified with stress assignment in English. Hyman (1975:204) observes that stress is cumulative. Thus, every content word (noun, main verbs, adjectives, adverbs) has at least one stressed syllable and grammatical words are not assigned stress in connected speech unless when marked for emphasis and when in isolation. Apart from the cumulative nature of English stress, it has been claimed that English stress is hierarchical. This shows that in a polysyllabic word, not all syllables attract the same kind/amount/level of stress.

Kenworthy (1987:18) notes that, stress is an essential feature of word identification and there are different levels of stress: primary, secondary and tertiary resulting in a kind of hierarchical ordering of stress in English. Thus, in a word like *congratulation*, only one syllable among the multiple syllables will be made prominent, others will receive less prominence.

2.2.1 Stress levels

Every word (grammatical or content) has at least one stress in its citation form. When grammatical words such as articles, pronouns, prepositions, etc occur in isolation, they retain their citation forms or strong forms, for example 'and' /ænd/, 'the' /ði/, 'a' /eɪ/. But when they occur in connected speech, they are without stress (except when marked for emphasis) and with a reduced vowel as /ənd/, /ðə/, /ə/. On the other hand, content words such as nouns, main verbs, adjectives and adverbs commonly occur with stress in connected speech.

Cruttenden (1986:21) notes that "stresses in connected speech occur with varying degrees of prominence". He states that there is the need to distinguish four such degrees of stress in English within 'intonation-groups'. They are primary, secondary, tertiary and unstressed. Hyman (1975) recognizes three levels, which he indicates with the integers 1, 2 and 3 to mean primary, secondary and tertiary respectively. Hyman states that secondary stresses often have only 'remnants' of primary stress characteristics; though they normally lack the pitch correlates of primary stress, they have other segmental correlates such as failure of a vowel in secondary stress position to reduce to schwa in English.

2.2.2 Word stress

English word stress has a number of characteristics: complexity, variability in time and space, and some degree of predictability. English is characterized as a free stress language. Hyman (1975:204) explains that in a language with free stress, prominence can occur on different syllables unlike French that has fixed stress placement always on the last syllable. Thus, it becomes a complex activity to predict which syllable is assigned stress in English words. Roach (2000:102) observes that like its segmental pronunciation, the word stress of English is "simple enough in theory" when seen through the phonological rules generating it, but "highly complex in practice". O'Connor (1980:115) opines that, "for each new word, learn its vowels, its consonants, and its stress pattern. He further says that;

> There is no simple way of knowing which syllable in an English word must be stressed, but every time you learn another word, you must be sure to learn how it is stressed.

The above views show the complexity of English word stress. Nevertheless, some linguists still believe that a set of rules with exceptions would do better than viewing stress as a property of individual words, each to be learnt with its distinct pattern. According to Cruttenden (1986:19), "a general rule with exceptions is more economical than listing every word with its own unique pattern i.e. listing everything as an exception".

Cruttenden (1986) and Roach (1991) have made attempts to propose a set of rules for English word stress depending on the class of the word, morphological features such as stem, suffixes, etc and according to the number of syllables in a word. The proposed set of rules does not, however, mean that they can be applied wholly to all English words. There are a number of exceptions to every proposed rule. The following are the rules for English word stress placement adapted from Cruttenden (1986) and Roach (1991).Stress placement in stems can be stated as follows:

1. Verbs and adjectives
    a. Stress on the penultimate syllable when final syllable has a short vowel in an open syllable or is followed by no more than one consonant, e.g. sur'render, 'polish, as'tonish, 'rigid, ex'plicit.
    b. Otherwise, stress is on the final syllable (subject to rule (iii) below) e.g. re'late, main'tain, sub'lime, se'vere, re'ject, de'fend, a'brupt.
2. Nouns
    a. If the final syllable has a short vowel, disregard it and apply rules under (1) above e.g. e'lephant, 'moment, comp'lexion, sur'render.
    b. Words of more than two syllables with a long final vowel: stress on the antepenultimate syllable, e.g. a'necdote, 'Fahrenheit, 'pedigree, 'organize, 'escalate, 'moribund, 'erudite. Cruttenden notes that the following words are some exceptions to the above rules e.g. po'sition, 'window and kanga'roo.

The placement of stress in suffixes is adapted from Roach (1991:97-98).

3. Suffixes that do not affect stress placement

-able	'comfort	'comfortable
-age	'anchor	'anchorage
-al	re'fuse (v)	re'fusal
-en	'wide	'widen
-ful	'wonder	'wonderful
-ing	a'maze	a'mazing
-ish	'devil	'devilish

4. Suffixes carrying primary stress themselves
5. Suffixes that influence stress on the stem: primary stress on the last syllable of the stem.

-eous	advantage	advantageous
-graphy	photo	photography
-ial	proverb	proverbial
-ic	climate	climatic
-ion	perfect	perfection
-ious	injure	injurious
-ty	tranquil	tranquility
-ve	reflex	reflexive

Sources: Cruttenden (1986) and Roach (1991)

Despite the complex rules proposed by these authors, the rules could guide, especially the L_2 user of English as hints to the complex stress system of English though they posses many exceptions. The researcher agrees with Cruttenden and Roach that a set of rules with exceptions would do better than viewing stress as a property of individual words, each to be learnt with its distinct pattern.

Evidence for the variation of English word stress in time is reported by Allen (1965) and Crystal (1984) since the eighteenth century and presented in Table 2.6.

Table 2.6. Variation of English word stress in time

Older Form	New Form
ab'domen	'abdomen
an'chovy	'anchovy
frag'ment	'fragmentary
obli'gatory	o'bligatory
pre'cedence	'precedence
re'condite	'recondite
re'plica	'replica
va'gary	'vagary
re'venue	'revenue
il'lustrate	'illustrate
cha'racter	'character
'prosperity	pros'perity
'convenient	con'venient

Sources: Allen (1969:176); Crystal (1984:97)

Wells' (1999) data from a survey at University College London include '*fiance* changing to *fi'ance*, '*mischievous* to *mis'chievous, neces'sarily* to '*necessarily* etc.

Simo-Bobda (2010:61), however, notes that very often, the process is not completed at a particular time and there are several stress patterns in competition. Thus, the traditional and newer forms of the words in Table 2.7below are in use today in different varieties of RP.

Table 2.7. Traditional and newer forms of word stress in English

Traditional form	Newer form
'controversy	con'troversy
'kilometer	ki'lometer
'hospitable	hos'pitable
'exigency	e'xigency
'metallurgy	me'tallurgy
'comparable	com'parable
'reparable	re'parable
'refutable	re'futable
'preferable	pre'ferable

Sources: Allen (1965:176) Straus (1982:29); Wells (1999)

2.2.3 Sentence stress

Stress that occurs in words in isolation most of the time becomes modified in connected speech. The most frequent modification is the dropping of some of the stresses and reduction of strong syllables to weak ones in unstressed positions. Some linguists (O'Connor 1980; Cruttenden, 1986; Roach, 1991; Akinjobi, 2000; 2009) opine that all lexical items of the open class such as lexical verbs, nouns, adjectives and adverbs have an inherent stress pattern while those of the closed class: pronoun, conjunction, determiner, preposition and auxiliary verbs are often unstressed in connected speech except when marked. For example, the lexical items 'is', 'boy' and 'friend' in the sentence 'the boy is my friend' receive stress while 'the' and 'my' remain unstressed.

However, the above stress pattern in connected speech changes when stress is used to signal different purposes in speech such as contrastive, emphatic, new information, etc.

2.3 Vowel reduction

English, which had traditionally been classified as a stress-timed language displays vowel reduction in its phonology such that weak vowels such as the schwa are part of the phonological form of many words in the language. It allows important weakening processes such that some words are constantly unstressed, thus reducing their vowel quality. There are at least two aspects in which the set of phonological effects traditionally referred to as vowel reduction can be said to constitute a unitary phenomenon. First, they target positions that are prosodically or morphologically weak, most especially unstressed syllables or affixes. Second, they neutralize contrasts, producing contracted versions of vowel systems that appear in strong positions. For English, it is generally argued that there is a symmetrical relationship between vowel reduction and stress, such that the 'reduced' vowel, schwa is unstressed, and all other vowels (i.e. 'full' vowels) are stressed (e.g. Ross, 1972; Halle & Vergnaud, 1987; Pater, 2000).

However, the unity appears to dissolve when the specific effects that reduction has on vowel quality is considered. Crosswhite (2001) opines that when described in traditional articulatory terms, these follow two seemingly contradictory routes in vowel space. One is 'centripetal' in which reduced reflexes are drawn into a centralized region. The other according to him is 'centrifugal', in which vowels are

dispersed to the far corners of the space. He further states that the divergence has been attributed to constraints that bring conflicting pressures to bear on vowels in sites targeted by reduction: some constraints call for prominence to be reduced, others for constraints to be enhanced.

2.4.0 Rhythm

2.4.1 The isochrony theory

One of the basic hypotheses behind rhythmic models is that of *isochrony* i.e. the organisation of speech into portions perceived as being of equal or equivalent duration. Bouzon and Hirst (2004) note that there are two interpretations to this hypothesis: strict and weak Isochrony. The strict Isochrony expects the different elements to be of exactly equal duration while the weak isochrony claims that there is a tendency for the different elements to have the same duration; hence, a constituent containing five sub-constituents, for example, will be less than five times as long as a constituent containing only one sub-constituent. Both involve a compression of the sub-constituents for the constituents to have similar duration, but less for weak isochrony.

Lloyd (1940) notes that the clear difference between the prosody of languages across the world e.g. Spanish or Italian on the one hand and English or Dutch on the other hand can be attributed to the difference in rhythm and he used the metaphor "Machine-Gun Rhythm" for the first group of languages and "Morse-code Rhythm" for the second group. Lloyd opines that in the two groups, different elements would recur at regular intervals establishing temporal organization: syllables in the first group and stresses in the other group.

Pike (1945) renamed the two types of rhythm "syllable-timed" and "stress-timed". He states that the rhythm of a language is determined by how chest pulses and stress pulses recur and their mode of succession and coordination. He postulates that there is basically different ways in which the chest-pulses and stress-pulses can be combined and this gives rise to two main kinds of speech rhythm: stress and syllable timed. He opines that in syllable-timed rhythm, the periodic recurrence of movement is supplied by syllable producing the chest pulses and hence syllables recur at equal intervals of time – isochronous. On the other hand, he asserts that in stress-timed rhythm, the periodic recurrence of movement is supplied by the stress producing process: the stress pulses and hence the stressed syllables are isochronous.

Furthermore, he says when one of the two series of pulses is in isochronous succession, the other will not.

Abercrombie's (1967) statement of the stress and syllable timing hypothesis features two mutually exclusive categories of language differentiated by contrasting types of isochronous rhythm. According to him, as far as is known, every language in the world is spoken with one kind of rhythm or with the other: syllable-timed and stress-timed. In syllable-timed rhythm, the syllables recur at equal intervals of time – isochronous while in stress-timed rhythm, the stressed syllables are isochronous. Thus, there is a considerable variation in syllable length in a language spoken with a stress-timed rhythm, whereas in a language spoken with a syllable-timed rhythm, the syllables are equal in length (Abercrombie, 1967:97-98). It can, therefore, be noted that while Abercrombie sees stress and syllable timing as differentiating languages, Pike views stress-timing and syllable-timing as being in phonemic contrast within the same language. Also, while Abercrombie asserts that speech is regular, Jones (1960:242) had noted the extreme difficulty of describing or reducing to rules the innumerable rhythms heard in ordinary connected speech.

Several years before Abercrombie presented his view of rhythm isochrony, Jassem (1952) had claimed that the rhythmic organisation of English was based on two units; first, the *Narrow Rhythm Unit* (NRU), which consists of one stressed syllable and any number of following unstressed syllables *belonging to the same word*. Secondly, all the other unstressed syllables which are not part of the NRU belong to the *anacrusis* (ANA).

Based on the dichotomy in the classification of languages into stress and syllable-timed rhythms, numerous researchers (O'Connor, 1973; Cruttenden, 1986; Roach 1991 and so on) have suggested that English speech tends towards isochrony of syllables and is thus suggested to have stress-time rhythm. Roach (1991:94) thus asserts that English speech has a rhythm that allows it to be divided into more or less equal intervals of time called *feet*. The stress-timed rhythm suggested for English means that it takes an equal amount of time from one stressed syllable to the next (Akinjobi, 2000:18).Cruttenden (1986:24), however, notes that it should not be thought that all syllables within a foot are of equal duration because a stressed syllable is generally longer than an unstressed one, particularly, if the latter has a reduced vowel. Also, he opines that unstressed syllables at the beginning of a sentence i.e. anacrusis have the general tendency in English to be produced with greater speed than any

unstressed syllables within following feet; hence they are extremely liable to be reduced.

The first instrumental search for isochrony of English was carried out by Classe (1939:85). Using kymograph, a wave writer, he measured the intervals between the onsets of nuclear vowels of stressed syllables. Strict isochrony was only observable when the rhythm groups had similar numbers of syllables with similar segmental content and carefully matched grammatical structure. However, subsequent studies (Dauer, 1983; Jassem, Hill & Witten, 1984; Crystal and House 1990) have all refuted the isochrony hypothesis. Nolan and Asu (2009) stress that despite the lack of quantitative evidence for a timing dichotomy, remarks continued to be made about how this or that language or dialect was more syllable-timed or more stress-timed than another. For example, Tongue (1979:3) and Platt and Weber (1980:57) observe how Singapore English was nearer than British English to having syllable-timing or a 'staccato' rhythm.

Given the excellent reasons of believing in rhythmic classes, it could be expected that languages should differ by readily identifiable acoustic or phonetic parameters. However, studies have not proved this. A look will be taken into the reasons for the durability of the stress and syllable timing hypothesis before other measurements of rhythm are considered.

Studies have provided stress and syllable timing hypothesis (SSH) with a defense against research evidence: the 'interference view'. For Jones (1918), the agents of rhythm (the formal properties of the language – speech sounds and grammatical relations) *interfere* with the general tendency to stress-timing. This interference view of the evidence from connected speech is a common theme (Classe, 1939:90), isochrony frequently … only remains as an underlying tendency of which some other factors at times almost completely obliterates the effects. Thus, a consequence of the interference view is that, there is always a ready defense against counter-evidence.

Another reason for the durability of stress and syllable hypothesis is that it is (apparently) easy to demonstrate. For example, Underhill (1994:71) writing for teachers of English as a foreign language suggests working through the following sequence of utterances, speaking the prominent syllables at the same rhythm despite the increase in the number of intervening syllables.

a.	YOU		ME		HIM		HER
b.	YOU	and	ME	and	HIM	and	HER
c.	YOU	and then	ME	and then	HIM	and then	HER
d.	YOU	and then it's	ME	and then it's	HIM	and then it's	HER

Caldwell (2002) notes that demonstrations of the above examples abound in the literature of the syllable and stress timing hypothesis. He, however, stressed that this kind of demonstration is only superficial related to timing – they are, according to him, demonstrations of the plasticity of speech. He, further, states that syllable-timing and stress-timing hypothesis has survived because it is deceptively clear-cut, easily defended, easily demonstrated and applies to all speech styles and all languages.

Furthermore, Caldwell (2002) observes that Abercrombie's syllable-timing and stress-timing hypothesis is, in fact, not a single one, but a collection of hypothesis;

a. All languages fall into one of two mutually exclusive categories: stress-timed or syllable-timed.
b. In stress-timed languages, stresses occur at equal time-intervals (stress isochrony)
c. In syllable-timed languages, syllables occur at equal-time intervals (syllable isochrony)
d. Syllable-length varies in stress-timed languages, but not in syllable-timed languages
e. Inter-stress-intervals vary in length in syllable-timed languages, but not in stress-timed languages.

Caldwell says that these hypotheses are interdependent: (b) and (c) contain the defining characteristics (stress–isochrony, and syllable–isochrony) of the two categories that make up the binary distinction in (a). Thus, if research evidence shows that either one of stress – isochrony (b) or syllable–isochrony (c) does not exist, then, hypothesis (a) is refuted. Hypothesis (a) would also be refuted if it were found that no language is characterized entirely by stress-timing or if it were found that no language is entirely syllable-timed. He says that these hypotheses seem at first sight to be eminently testable. Roach (1982:74-76), however, makes it clear that the methodological problems of testing the hypothesis are difficult to surmount. The problems, he says include:

i. Consistent identification of stresses across languages by researchers and informants.
ii. Deciding where the start and end points should be for measuring inter-stress intervals.
iii. How to allow for variation in tempo.
iv. How to deal with pre-head and post-tonic syllables.

Ramus et al (1999) also note that a considerable amount of phonetic research such as Wenk and Wiolland (1982), Dauer (1983), Roach (1982) etc have been carried out to test the physical reality of the isochrony theory on syllable and stress-timed languages. These researches have negated, rather than confirm the existence of different types of isochronous intervals in spoken language.

2.4.2 Deconstructing isochrony theory

Roach (1982) and Dauer (1983) addressed the issue of the categories 'stress-timed' or 'syllable-timed'. Roach used samples of two minutes of unscripted speech from six speakers, one for each of the languages listed by Abercrombie: French, Telugu, and Yoruba ('syllable-timed' languages) and English, Russian and Arabic ('stressed-timed' language). Dauer (1983:52) compared recordings in two stress-timed languages: (English and Thai) and a syllable-timed language (Spanish), and two unclassified languages (Italian and Greek) of a passage from a modern novel or play, in which a character is speaking in normal everyday language.

In their research, both Roach and Dauer examined inter-stress interval length. Roach found that the 'stress-timed' group of languages (against expectation) had greater variability in the length of inter-stress intervals than the 'syllable-timed' group. Thus, it would seem that inter-stress-interval-length differentiates between the two groups of languages but in the reverse direction of SSH hypotheses (b) and (e) listed above: in order words, the 'stress-timed' group had greater variability in inter-stress-intervals than the 'syllable-timed group. Roach (1982:77), however, attributes these differences to extreme values for one individual, and states that "the figures…are better taken just as grounds for rejecting the hypotheses" rather than evidence for calling the stress-timed group syllable-timed.

Having compared the recordings of languages classified by Abercrombie as earlier mentioned, Dauer (1983) found that while there were no significant differences between languages, there were significant differences between speakers with extremes

of speaking rate, even within the same language group. Her slow speaker of Spanish had significantly different results from her fast speaker of Greek. She also found that English and Spanish were alike in that the timing of inter-stress intervals is proportionate to the number of syllables in both languages. This was what SSH predicts for Spanish (a 'syllable-timed' language) but it is against predictions for English (a 'stress-timed').

Roach, in addition, compared syllable duration across the two groups of languages and found similarities rather than differences: although the 'stress-timed' group showed variability in syllable-length (in line with expectations), the same was found to be true (against expectations) of the 'syllable-timed' group. The evidence from Roach's (1982) and Dauer's (1983) investigations for refuting SSH show variability in syllable-length and variability in inter-stress-interval length. In other words, because of the inter-dependence of the hypotheses, the evidence is against the existence of the categories 'stress-timed' and 'syllable-timed'.

The researches and investigations of Roach and Dauer were based on instrumental means to measure inter-stress intervals in different languages. Couper-Kuhlen (1993) used hearers' perception to identify 'isochronous chains' in just one language, English. She, thus, addressed hypothesis (b), stress-isochrony. Two informants analyzed a two-minute extract from a phone-in program broadcast on Radio Manchester consisting of 23 turns of varying length between the host and a caller. They identified the isochronous chains through repeated listening, searching for stretches of speech sufficiently rhythmic for them to be able to tap a pencil or nod their head to. The informants identified 48 isochronous chains in the recording, but there were some stretches of speech which did not form part of isochronous chains. Couper-Kuhlen (1993:48), thus, concedes that 'English speech is not uniformly isochronous over extended periods of time'. She, however, qualifies this statement: 'but just as significantly, the passage is not wholly un-isochronous either… allowing for discontinuities, a large portion of it is isochronous in one way or another'.

Caldwell (2002) notes that for Couper-Kuhlen, English is not isochronous when viewed from the macro-perspective of the entire temporal extent of a spoken text, but from the micro-perspective of the internal characteristics of each of the 48 chains; it is isochronous. He, further, states that Roach (1982:78) adopting a position similar to Pike (1945) concluded that 'there is no language which is totally syllable-timed or totally stress-timed – all languages display both sorts of timing; languages

will, however, differ in which type of timing predominates'. The wording of this conclusion is such that the categories 'stress-timed' and 'syllable-timed' remain necessary for discussing the rhythms of languages.

Caldwell (2002) notes that Dauer (1983:54) seems to reject SSH in its entirety concluding that 'the difference between English, a stress-timed language and Spanish, a syllable-timed language had nothing to do with the duration of inter-stress intervals', concluding that 'what these data reflect appear to be universal properties of temporal organization in language. However, in the latter part of Dauer's paper, she continues to refer to the rhythmic differences as 'stress-timed' and 'syllable-timed even as she advocates abandoning these terms.

Duaer proposes an avoidance of the word 'timing' favouring the adoption of the term 'stress-based'. For her, a stress-based language is one in which stress plays a large role in word-stress, syllable structure and vowel reduction. It is important to realize that for Dauer, the term 'stress-based' constitutes a rejection of the notion of timing. She also proposes viewing languages as being placed along a dimension (p.59) of 'more or less stress-based rhythm' rather than belonging to one or other of the mutually exclusive categories 'stress-timed' and 'syllable-timed'. It is also important to note that the term 'syllable-based' does not feature on the dimension she proposes. Despite this, a number of scholars (Laver 1994:528, Dalton and Sidlhefer 1994:42) seem to credit her with being the originator of the 'stress-based/syllable-based' continuum.

Nespor (1990) also supports Dauer's view with critical examples, arguing that indeed there are languages whose features match neither that of typical neither syllable-timed nor stress-timed. He gives the example of Catalan and Polish. He observes that Catalan has the same syllabic structure and complexity as Spanish and thus should be syllable-timed, but it also presents the vowel reduction phenomenon associated with stress-timed languages. On the other hand, Polish represents the opposite configuration. Therefore, the two languages would rate as intermediate on a rhythmic scale like the one proposed by Dauer (1987).

Caldwell (2002) notes that while presenting the counter-evidence against SSH, scholars find the categories of stress-timing too tenacious, attractive and convenient to abandon. For Laver (1994:524), the tenacity of the concept of stress-timing is an indication of an underlying truth, though Crystal (1996:8-9) sees the distinction between stress and syllable-timed languages as "extremely crude one and in its bare

form is almost certainly wrong". He, however, notes that it will stay until a more refined classification of rhythmic types arrives on the phonetic scene. Dalton and Seildlfer (1994:110), however, find SSH attractive while acknowledging the difficulties with stress-timing and syllable-timing, they state that "it cannot be denied…that stress-time still represents an appealing neat categorization, so that references to stress-time (especially with regards to English) are still frequent".

2.4.3 Phonological basis of rhythmic types

Based on observations on the phonological properties of languages previously classified as stress-timed, syllable-timed and mora-timed, i.e. English and other Germanic languages, French and other Romance languages, and Japanese, respectively, a number of parameters for a typological study of rhythm have been proposed (Auer, 1993; Dufter, 2003). Essentially, they can be subdivided into stress-related, syllable-related and mora-related parameters and they include processes which belong to prosodic, phonotactic and morphological properties in prototypical rhythm types.

The primary stress-related parameters include the phonetic correlates of stress, segmental effects of stress, and stress placement. In a typical stress-based language like English, stress is phonetically realized by a cumulation of pitch movement, duration and intensity/loudness, i.e. stress-accent (Beckman, 1986). In this respect, languages of this type differ from syllable-based and mora-based languages, whose prosodic systems typically rely on pitch phenomena. The phonology of a stress-based language exhibits a number of segmental rules, which make reference to the presence or absence of stress: vowel reduction in unstressed syllables, vowel lengthening in stressed syllables and consonant changes e.g. aspiration of stops in stressed syllables. For example, the vowel in the second unstressed syllable of the word *Satan* /'seɪtn̩/is reduced, only traceable by the syllabic status of the nasal consonant. In the derived form, *satanic* /sə'tænɪk/, this very vowel appears as a full vowel, whereas the first vowel of the word, now in an unstressed syllable is weak. Unstressed vs stressed syllables are characteristics for stress-based languages and are apparently absent in languages of the two other rhythm classes.

Presumably, Bybee et al (1998) states that these first two parameters are interdependent, such that the magnitude of gesture involved in realizing stress-accent forms the phonetic prerequisite for the evolution of segmental effects of stress. It has been observed that stress placement in stress-based languages is often complex, i.e.

stress placement is conditioned not only by phonological factors, e.g. syllable weight, but also by morphological and lexical factors, e.g. pre-stressing suffixes or distinct rules of stress placement for lexical classes. For example, there is a stress shift in the derivation of *satanic* from *Satan*. The base form has stress on the first syllable. The addition of the suffix –ic, however shifts the word stress to the syllable immediately preceding the suffix i.e. the suffix is pre-stressing.

Since syllable-based and mora-based languages lack vowel reduction and loss in unstressed syllables, they should not exhibit complex systems of stress placement which include morphological or lexical conditioning. Apart from these stress-related parameters, two additional parameters have been mentioned as negatively correlating with segmental effects of stress in stress-based languages. As Auer (1993:7) hypothesized, tonal contrasts are optimally realized on vowels with high sonority i.e. vowel reduction and tone should be incompatible. Furthermore, the spreading of place features across a word domain seems to be at odds with vowel reduction and the neutralization of place features in vowels of unstressed syllables in stress-based languages (Auer 1993:9).

Complex syllable structure in stress-based phonologies may be secondarily associated with the occurrence of two other syllable-related properties. First, due to the availability of several syllable templates, syllable divisions across consonant clusters may vary. The English word *pastry* for example can be syllabified as either /'peɪst/rɪ/ or /'peɪs/trɪ/ which renders the syllable division within the word ambiguous. Second, the complex consonant clusters which emerge through vowel deletion or in morphological processes provide a rich basis for rules of consonant assimilations. Since mora-based and syllable-based languages presumably have simple syllable structure and lack consonant clusters, ambiguous syllable divisions and assimilations across consonants are less likely to appear in these languages. On the other hand, their strong tendency towards simple syllable structure necessitates morphological rules which resolve simple consonant clusters that emerge in the concatenation of morphemes. Such rules which are less likely to occur in stress-based languages include rules of cluster simplification, in which one of the adjacent consonants is deleted, and rules of vowel epenthesis, in which a vowel is inserted to break up the sequence of two consonants. Accordingly, tone and vowel harmony should only be possible in syllable-based and mora-based rhythm, but not in stress-based rhythm.

The mora-based parameters of phonemic length contrasts allow attributing mora-based rhythm a characteristic feature, distinguishing it from syllable-based as well as stress-based rhythm. In the absence of segmental effects of stress and complex syllables, the rhythm of mora-based languages seems to rely on the presence of phonemic contrasts in vowel and consonants (Beckman, 1982; Dufter, 2003). Auer (1993:6) argues that contrasts are in principle possible in languages of other rhythmic types; stress-based phonologies presumably show a high restricted distribution of such distinctions, such that long phonemic segments will not be allowed in unstressed syllables. As such, the English words *Satan* and *satanic* do not have diphthongs or long vowels as syllable nuclei in their unstressed syllables. Schiering (2007) summarizes the parameters and predictions discussed above with respect to their values in languages of different rhythmic types in Table 2.8below.

Table 2.8. Parameters and predictions in languages of different rhythmic types

Parameters	Mora-based	Syllable-based	Stress-based
Stress correlate	Pitch		Pitch, duration, intensity
Stress effect	None		Vowel reduction, vowel lengthening, consonant changes.
Stress placement	Predictable, fixed		Unpredictable, free
Length	Yes	Possible in all syllables	Not in unstressed syllables
Tone	Possible		No
Syllable	Simple		Complex
Syllable division	Unambiguous		Ambiguous
Assimilation	Few		Frequent
Cluster resolution	Yes		No
Vowel harmony	Possible		No

Source: Schiering (2007:5)

He, however, notes that it should be emphasized that most of the proposed parameters for the typological study of linguistic rhythm stem from observations made in the context of European languages. This means that, it is far from clear, which of the proposed phonological parameters of linguistic rhythm will prove reliable in the typology of languages (out of Europe) when a more diverse language is studied.

2.4.4 Instrumental measures of rhythm

Several studies such as Low and Grabe (1995), Low (1998), Ramus et al (1999), Low, Grabe and Nolan (2000), Low and Grabe (2002) and others have proved that objective isochrony simply does not exist. These studies focus on varying syllable complexity and vowel (durational) measures/reduction as correlates of speech rhythm. Their approach to the measurement of speech rhythm is based on the variability of the duration of vowels where durational measurements of speech rhythm are calculated using statistical formulae (the raw and normalized versions of the Pairwise Variability Index (PVI)). According to these researches, the PVI discriminates between stress-timed and syllable-timed languages. It relies on the idea that stress-timed languages allow vowel reduction, in contrast with syllable-timed languages. As such, vowel duration should be more variable in stress-timed languages.

In order to ascertain how well the PVI discriminates between stress and syllable-timed languages, Low et al (2000:383) predicted that:

- PVI values for Singapore English (SE), a syllable-timed language would be significantly smaller than for British English (BE), a stress-timed language, reflecting less durational variability between successive vowels, and a tendency towards syllable-timing. In BE, they expected to find more durational variability between successive vowels, reflecting a tendency toward stress-timing.
- Reduced vowel sets would differ in the two varieties (they hypothesized that SE either has no reduced vowels or that reduced vowels in SE differ from reduced vowels in BE), but that the Full Vowel Sets would not differ across varieties.

The above predictions made for PVI values across the two varieties are summarized in Table 2.9 below.

Table 2.9. Summary of predictions made for duration across varieties

	SE	BE
Total PVI	Different	
Full Vowel Set	Similar	
Reduced Vowel Set	Different	

Source: Low et al (2000:383)

- They expected a durational distinction between full and reduced vowels in BE, but not in SE as such, BE data is expected to find significantly higher PVI values i.e. more variability in the reduced vowel set (which contained full and reduced vowels) than in the full vowel set because reduced vowels tend to be noticeably shorter in BE than full vowels.
- They expect that in the SE data, durational vowel reduction would be absent, and PVI values in the reduced and the full vowel sets would be similar. The table above illustrates their prediction made for PVI values within varieties.

Based on the above predictions, Low et al (2000:384) computed PVI values for SE and BE which were repeatedly subjected to Analysis of Variance measures. True to their predictions, a planned comparison showed that within SE, full and reduced vowel sets did not differ, reflecting the absence of durational distinction between full and reduced vowels, but within BE, the difference was highly significant ($p<0.001$). Also, the planned comparisons showed that the reduced vowels sets in BE and SE differed significantly ($p<0.001$), but the full vowels sets did not. Their durational data showed that SE exhibits less variability in successive vowel duration than BE. Their durational measures are presented in the bar chart in Figure 2.9 below.

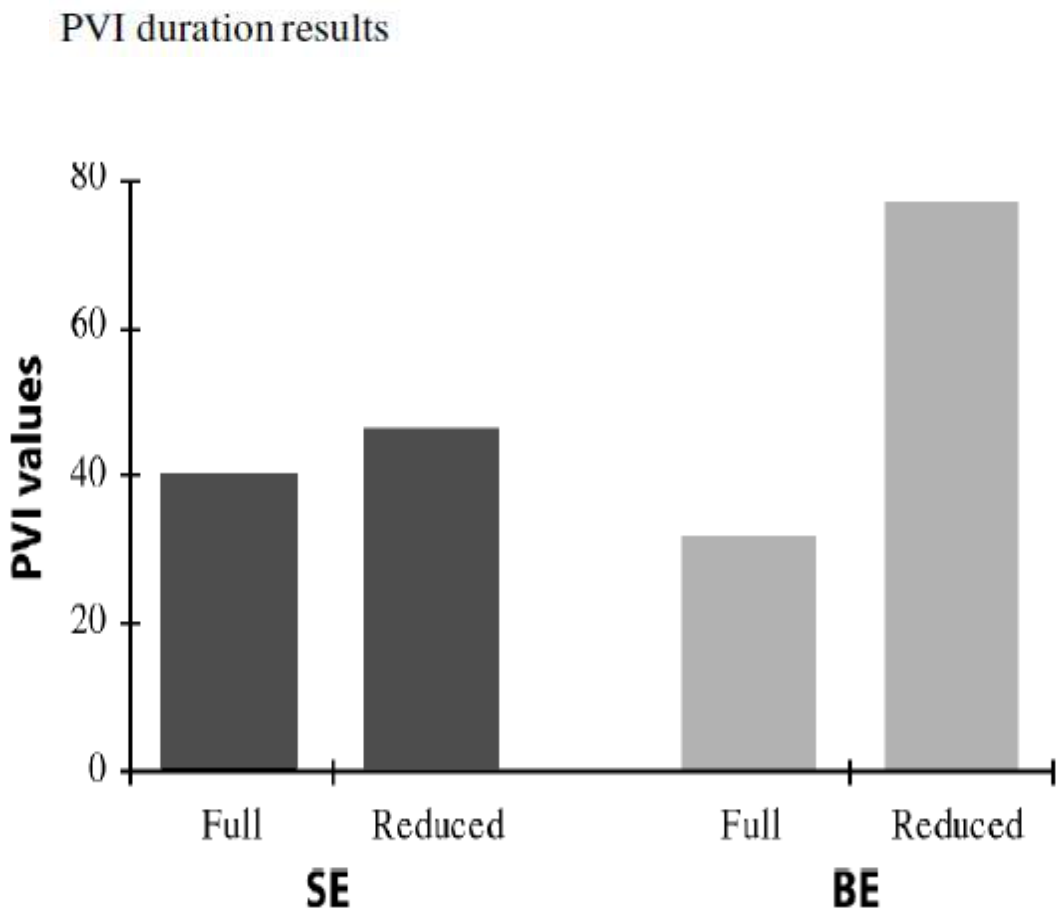


Figure 2.9. PVI duration results for Singapore English and British English
Source: Low et al (2000:384)

Nolan and Asu (2009) note that the low PVIs of Singapore speakers of English compared to British English corresponds to the reports of Singapore English being more 'syllable-timed' than British English and this difference, they say is tied to the finding that, in, part, to vowel reduction behavior. According to Nolan and Asu, the data that elicited this finding is based on the use of paired read sentences where one member of the pair allowed vowel reduction and the other by design did not (e.g. John was sick of Fred and Sandy; John came back through France last Friday). Nolan and Asu suggest that one useful way to conceptualize what the PVI does is to think in terms of the prominence of successive syllables. Accordingly, there is a tendency for prominence to alternate. They note that what the traditional rhythm dichotomy seems to be capturing is the sharpness of this alternation. This, they represent in Figure 2.10 below showing a schematized comparison of idealized 'stress-timed' and 'syllable-timed' languages.

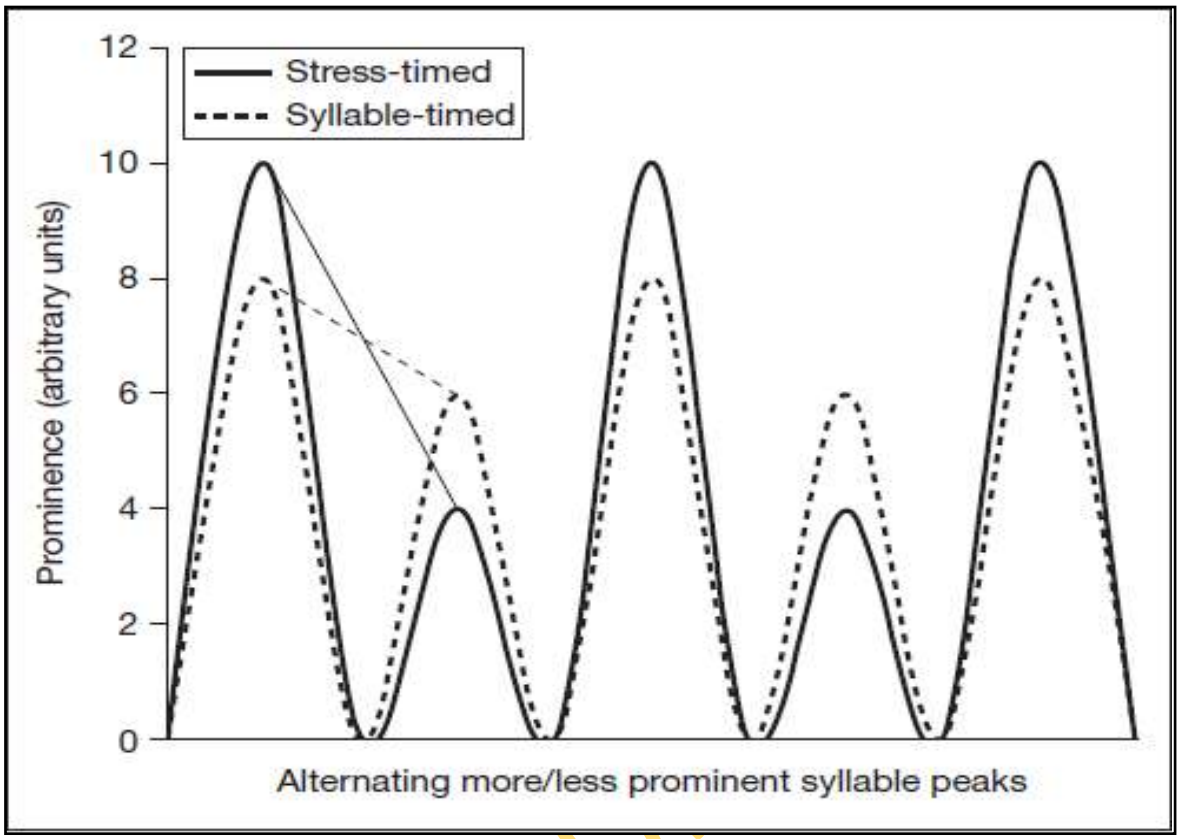


Figure 2.10. Prominence gradient of idealized 'stress-timed' and 'syllable-timed' languages.
Source: Nolan and Asu (2009:4)

Figure 2.10 above is a schematic representation of the prominence gradient. In syllable-timed languages (dotted line), successive peaks of prominence are more even than in a stress-timed language, resulting in a shallow prominence gradient between adjacent syllables. Nolan and Asu show that each of the peaks represents a syllable peak, and the difference between the prominent and less prominent syllable is greater for the stress-timed languages. This is reflected in the 'prominence gradient', represented by the straight line linking the first two syllable peaks which is of course steeper in the case of the stress-timed language. They, however, note that self-evidently, such a schematization is flawed: languages do not achieve a perfect alternation of more prominent and less prominent syllables, yet, they opine that it is the tendency for such an alternation to occur, and for its realization to be more muted in some (syllable-timed) languages.

Using a variant of the PVI measure, Deterding (2001:229) also confirmed with respect to the average duration of all syllables that the behavior of reducible vowels was a major contributor to the rhythmic differences between Singapore and British English. Nolan and Asu (2009), however, observe that the behavior of reducible vowels alone did not account for all the differences. Similarly, Ferrangne and Pellegrino (2004:121) note that although duration modeling has been shown to improve the accuracy of language identity(ID) systems, there is undoubtedly more to rhythm than duration, though it has often been thought to be the most relevant correlate of perceived speech rhythm.

The application of the durational PVI was extended to cross-language comparison by Grabe and Low (2002) who studied the relationship between speech timing and rhythmic classification of languages. They, however, depart from the search for isochrony. Rather than measure inter-stress, they took a direct route from impressionistic observation of rhythmic differences between languages to the acoustic signal. They took one speaker each from eighteen (18) languages and calculated both the normalized vowel PVI and the raw consonantal PVI. In their measurements, the duration of vowels and the duration of intervals between vowels, excluding pauses in a passage of speech was done. Then a Pairwise Variability Index for each type of measurement was computed. According to them, the index expresses the level of variability in successive measurements.

One major problem or short fall of the Grabe and Low (2002) study is that it has only one speaker from each of the languages studied. This may not be

representative enough. However, their study was able to provide acoustic evidence for rhythmic differences between languages traditionally classified as stress-timed (English, Dutch and German) on the one hand and syllable-timed languages (Spanish, Italian, and Yoruba) on the other hand.

In trying to provide acoustic measurements to support the traditional classification of rhythm classes, the Pairwise Variability Indexes (Raw and Normalized) have been applied to various data across those languages that have already been classified. Low and Grabe (1995), Low (1998), Low, Grabe and Nolan (2000) applied the nPVI to vowel duration and their studies show that vowels constitute the lowest level of prosodic hierarchy at least in English. Also, the studies reveal that the so-called stress-timed and syllable-timed languages differ in the durational variability encountered in vowels. Taylor (1981:221-222) claims that vowel duration is the key to syllable-timing. Grabe, Post and Watson (1999) observe that stress-timed languages such as English exhibit more vocalic variability than syllable-timed languages such as French. Also, in vowel quality, English has full as well as spectrally reduced vowels. Consequently, there is a high level of variability in vowel duration. French on the other hand does not have vowel reduction, and the level of vocalic variability is significantly lower.

Low et al (2000) applied the nPVI to data from ten (10) speakers of British English (stress-timed) and ten (10) speakers of Singapore English (syllable-timed). The data provided an acoustic basis for the impression of syllable-timing in Singapore English. Statistically, the analyses showed that vowel duration are significantly more variable in British English than in Singapore English. Similar results were obtained by Deterding (1994) in an investigation of spontaneous speech data from British English and Singapore English.

Low et al (2000) suggest that a combination of vocalic nPVI with a measure of Ramus et al (1999) intervocalic interval variability would provide a better indicator of rhythmic class than the vocalic nPVI alone. Thus, the combination would capture the rhythmic characteristics of stress-timed, syllable-timed and mixed languages. They predict that English should exhibit relatively high variability index values for vocalic and intervocalic intervals because some English syllables are relatively complex and there could be consonant clusters in the onset and in the coda positions while others have a very simple structure. Consequently, intervocalic variability is likely to be high. On the other hand, Spanish (syllable-timed) should have low values in both types of

interval, because successive vowels are similar in length and a large proportion of syllables have simple CV structure according to Dauer (1983), Polish, a mixed language would be low on the vocalic axis and high on the intervocalic axis on the other hand, Catalan which is also a mixed language would be high on the intervocalic axis and low on the vocalic axis.

Using the PVI profiles, Grabe and Low (2002) provide acoustic evidence for rhythmic differences between English, Dutch and German on the one hand, and French and Spanish on the other hand. The former group has been described as stress-timed as they exhibit high vocalic nPVI values, the latter group as syllable-timed and exhibits low vocalic nPVI. This finding supports the rhythmic classification suggested by Pike (1945) and Abercrombie (1967). However, the evidence for this support does not come from isochronous inter-stress intervals or syllable duration. Grabe and Low (2002), however, claim that there is no support for a strict categorical distinction between languages with high vocalic and intervocalic PVI values and languages with low vocalic and intervocalic PVI values. Rather, it appears that languages can be more or less 'stress-timed' or 'syllable-timed'. This is because from their analyses, on the vocalic axis, the prototypical stress-timed languages: German, English and Dutch are well separated from the syllable-timed languages, French and Spanish. It is on the basis of this result that they offer a categorical distinction between the two groups. But the data also show that languages can be more or less stress-timed or syllable-timed.

The predictions made by Grabe and Low (2002) concerning stress-timed languages exhibiting high vocalic nPVI and high intervocalic rPVI, and syllable-timed languages having low vocalic nPVI and low intervocalic rPVI values were proved right by the results of their findings. Table 2.10 below shows the results of their findings.

Table 2.10. Normalized vocalic nPVI and intervocalic rPVI values for syllable-timed and stressed-timed languages

Languages	Normalised Vocalic nPVI	N	Raw Intervocalic rPVI	N
Thai	65.8	161	56.5	164
Dutch	65.5	132	57.4	136
German	59.7	155	55.3	153
British English	57.2	124	64.1	124
Tamil	55.8	149	70.2	150
Malay	53.6	205	63.3	204
Singapore English	52.3	118	68.2	118
Greek	48.7	177	59.6	179
Welsh	48.2	152	54.7	150
Rumanian	46.9	183	47.6	182
Polish	46.6	124	79.1	128
Estonian	45.4	162	40.0	158
Catalan	44.6	144	67.8	139
French	43.5	146	50.4	142
Japanese	40.9	176	62.5	177
Luxembourg	37.7	131	55.4	139
Spanish	29.7	173	57.7	156
Mandarin	27.0	141	52.0	135

Source: Grabe and Low (2002)

Table 2.10 is sorted in ascending order by vocalic nPVI values and it shows that Grabe and Low's (2002) predictions for the intervocalic *rPVI* are supported by the contrast between French (syllable-timed), and British English, Dutch and German (stress-timed). French, which has a relatively simple syllable structure, appears to have a lower intervocalic *rPVI* than English, Dutch and German, which have more complex syllable-structures. Spanish, however, exhibits a lower intervocalic *rPVI* than English but does not seem to be very different from Dutch or German, contrary to their prediction. They, thus, recommend that future research using more speakers needs to be done in order to validate the role of the *rPVI* in capturing rhythmic patterning of different languages.

Grabe and Low (2002) note the following in the result from their data:

1. On the vocalic axis, the prototypical stress-timed languages German, English and Dutch are well separated from the syllable-timed languages French and Spanish. One could offer a categorical distinction between stress-timing and syllable-timing for want of better terms for the rhythmic groupings in question. Also, there is a weak categorical distinction between the group of languages that has been described as stress-timed, and the group of languages that has been described as syllable-timed.
2. There is overlap between the stress-timed and the syllable-timed group and unclassified languages. Japanese is not in a rhythm class of its own. Therefore, although, there is a weak categorical distinction between stress-timing and syllable-timing, it is clear that not all languages of the world fit into that distinction.
3. The vocalic *nPVI* separates languages into a stress-timed and a syllable-timed group, but the intervocalic *rPVI* does not. Instead, the intervocalic *rPVI* shows why Polish does not fit into either of the prototypical rhythm classes, and why Estonian may be difficult to classify. Polish is different because the intervocalic *rPVI* is very high. Estonian is different because the *rPVI* is very low.
4. Languages that exhibit an extreme level of durational variability in one dimension have non-extreme variability in the other.

The Ramus et al (1999) metric for describing the rhythmic structure of languages from acoustic-phonetic measures is based on the finding that infants are able to discriminate between languages of different rhythmic types such that rhythmic properties must rather be directly available in the acoustic signal. Mehler et al (1996)

relied on the syllable-timing/stress-timing dichotomy to explain how infants may learn part of the phonology of their native language. They hypothesized that rhythm type should be correlated with the speech segmentation unit in any given language. In other words, speakers of stress-timed languages should segment speech in feet, speakers of syllable-timed languages in syllables, and mora-timed languages in morae.

The Ramus metric is "a simple segmentation of speech into consonants and vowels" (Ramus et al, 1999:270). They proposed, following Mehler et al (1996), that infant speech perception is centered on vowels because these have more energy and last longer than most signals whether a syllable is strong or weak. Moreover, Bertoncini et al (1988) opine that newborns pay more attention to vowels than consonants, and they are able to count the number of syllables (and therefore vowels) in a word independently of syllable structure or weight. Based on the forgone, Ramus et al (1999) assume that the infant primarily perceives speech as a succession of vowels of variable duration and intensities, alternating with periods of unanalyzed noise (i.e. consonants), or what Mehler et al (1996) called a Time-Intensity Grid Representation (TIGRE).Guided by the hypothesis above, Ramus et al (1999) attempt to show that a simple segmentation of speech into consonants and vowels can:

- Account for standard stress-/syllable dichotomy and investigate the possibility of other types of rhythm,
- Account for language discrimination behaviours observed in infants, and
- Clarify how rhythm might be extracted from the speech signal.

The simple segmentation specifically is the proportion of vocalic intervals and the variability (standard deviation) of consonantal and vocalic intervals within sentences. According to Ramus et al (1999:271), a vocalic interval is located between the onset and the offset of a vowel, or of a cluster of vowels. In other words, it is a vowel and sequences of consecutive vowels regardless of whether they belong to the same syllable (or word for that matter) or not. Similarly, a consonantal interval is located between the onset and offset of a consonant, or of a cluster of consonants. As an example given by Ramus et al, the phrase *next Tuesday on* (phonetically transcribed as /nɛkstjuzdeiɔn/) has the following vocalic and consonantal intervals:/n/ /ɛ/ /kstj/ /u/ /zd/ /eiɔ/ /n/ i.e. 4 consonantal intervals and 3 vocalic intervals.

Ramus et al argue that the dimensions represented by consonant duration variability and proportion of vocalic interval are directly related to syllable structure, in

that, higher consonant duration variability is a direct consequence of the number of different syllable types a language instantiates. Ramus et al's dimension of vowel duration variability represents a number of phonological properties including vowel reduction, contrastive vowel length in specific contexts. According to them, a viable account of speech rhythm should rely on purely phonetic characteristics of the speech signal, as such, speech was segmented into vocalic and consonantal intervals i.e. vowel duration and the duration of intervals between vowels were measured. They computed three acoustic correlates of rhythm from the measurements:

1. %V, the proportion of time devoted to vocalic intervals in the sentence;
2. ΔV, standard deviation of vocalic intervals; and
3. ΔC, standard deviation of consonantal intervals.

2.5 Nigerian English prosody

2.5.1 Nigerian English

The global spread of the English language as one of the most far-reaching linguistic phenomena of our time is already an established fact. Evidence of this world-wide phenomenon of language contact, variation and change can be seen through such designation as 'World Englishes' e.g. Nigerian English, Australian English, and Cameroon English etc. Thus, the contact that English language had made in the Nigerian soil has yielded various sub-varieties spoken in Nigeria such as Hausa English, Yoruba English, Igbo English, and Isoko English among others.

The various varieties of World Englishes differ from Standard British English (SBE) at the different levels of language organization. It has been claimed that Nigerian English differs systematically from SBE at the levels of phonology, vocabulary, syntax and semantics (Adegbija, 2004). Thus, some marked differences will be observed as it relates to suprasegmental features of stress, tone, rhythm and intonation in the prosody of SBE and NE.

The linguistic diversity in Nigeria is so great that one cannot boast of a uniform accent among the speakers of NE. This lack of uniformity can be attributed to the different native linguistic systems that come in contact with the English language in the Nigerian environment. Based on the observation that the native languages of Nigerian speakers of English characteristically influence their accent in English, NE sub-varieties corresponding to the different ethnic groups have been proposed e.g. Jibril (1986), Jowitt (1991).

It is claimed that the many different languages in Nigeria have different phonological systems. For example, Dunstan (1969) notes that Hausa has five vowels which all have phonemic length contrast and a number of realizations that include centralized vowels, Igbo has eight vowels and a set of vowel harmony rules, Yoruba has seven vowels with phonemic vowel length contrast. Jowitt (1991) notes that these differences are claimed to become apparent in the Hausa English, Igbo English and Yoruba English varieties of NE. Some of these phonological features have been discussed in previous sections.

These different phonological features apparent in the various sub-varieties of NE make it quite a difficult task to arrive at a standard since there are some divergences peculiar to these sub-varieties. Until the various sub-varieties are investigated and the differences and similarities juxtaposed, arriving at a standard NE is still a myth or in a state of a flux (Akinjobi, 2002).

2.5.2 Stress assignment

It has been claimed that stress and other suprasegmentals of pitch as important features of spoken English are problematic for Nigerian users of English (Dunstan, 1969; Banjo, 1970; Kujore 1991; Jowitt, 1991; Onuigbo, 1996; Simo-Bobda, 1997; Akinjobi, 2004). Banjo (1979) claims that the suprasegmentals, especially stress assignment is the last hurdle which majority of the speakers of English as second language never manages to cross. Some of the features that mark NE stress assignment from SBE are discussed below.

2.5.2.1 Word stress

Kujore (1985), Simo-Bobda (1997) and Jowitt (1991) claim that word stress in NE is in many cases different from SBE or American English. According to Kujore (1985), the most striking characteristic of Nigerian pronunciation is the delayed primary stress; a feature he claims seems to betray the influence of languages with a rising rhythm as opposed to the falling rhythm of Standard English. He attempts defining the stress assignment rules of Nigerian English and came up with the following:

- The principal stress falls on the last syllable of verbs ending with –ass, -ate, -bit, -fy, -ise/-ize/-ise, -ish, -ment, -ute e.g. *canvass, abbreviate, exhibit, amplify, advertise, distinguish, comment, attribute.*The same applies to nouns ending with -ene, -ine, -oir, -in, -one e.g. *gangrene, ampicilin, iodine, abattoir,*

baritone. Compound nouns and form words such as *aeroplane, backbite, wardrobe,* and *watchman* are also noted to have their stress assigned to the last syllable.

- Some words are also noted to have their stressassigned to the penultimate syllable e.g. *advertisement, beneficent, embarrassment, omnipotent.* Nouns that end with –er, -or –sphere are also affected by this rule e.g. *accelerator, fertilizer, atmosphere.*

Furthermore, he observes that certain words that end with –ive, -tory and –ture that could function as nouns and adjectives are also assigned penultimate stress e.g. *administrative, primitive, accusative, ablative, compensatory, laboratory, agriculture, legislature.* Kujore also notes instances of stress pattern reversal as in *acute, cabal, canoe, cassette* where the first syllables are assigned the primary stress in Nigerian English rather than the second syllables, which are assigned the stress in Standard English.

Jowitt (1991) similarly observed a tendency to shift the primary stress to the right in Nigerian English. He notes that it is more systematic with verbs than with nouns and adjectives. Compound words and complex noun phrases with pre-modification have been observed to have a tendency to shift primary stress as far to the right as possible. Simo-Bobda (1997) also describes a general tendency for stress to be shifted to the right i.e. a marked tendency for forward stress as opposed to the generally backward stress in Received Pronunciation (RP). This can be seen in realizations of the words *sa'lad, ma'ttress* and *pe'trol,* especially with words whose final syllables contain an [n] or an [i], stress is shifted to the right. Examples include *plan'tain bap'tist hy'giene, ten'nis* etc.Verbs tend to have stress on the last syllable if (1) they have final obstruents e.g.*interpret, embarrass, comment, solicit (2)* contain the affixes–*ate, -rise, -ize, -fly or –ish.* Other affixes that tend to attract stress include –*active, -attire, -itive, -utive, -man, -day, -atory, -utory, -cide, etc.* Affixes that tend to bring stress to the preceding syllables include –*able, -ible, -age, -al, -ary, -ean, -er, -ism, -ous, -mony* etc.

Equally, strong consonant clusters pull stress to the preceding syllable as in *ancestor.* In compounds, the second element is stressed, for example, *firewood,* and *proofread.* Simo-Bobda, however, states that it must be noted that word stress patterns are not realized uniformly and that even among educated speakers and even between

productions of one and the same speaker, there is considerable variation in individual words. Gut (2005) also notes that unlike in native varieties of English, NE function words do not have strong and weak forms.

2.5.2.2 Sentence stress

At the sentence level, it has been pointed out that sentence stress is rarely used for emphasis or contrast and given information is not usually de-accented as such, many lexical items can receive stresses that do not usually do so in British English (Eka, 1985; Jibril, 1986; Ufomata, 1996; Jowitt, 2000). Moreover, Gut (2001) notes that a preference for "end-stress" in an intonation phrase, i.e. the placement of the nucleus, the greatest stress, on the last word has been observed. In the dialogue (1) for example:

(1a) Come on who'll volunteer

(1b) I will, if you insist

British English speakers put a nucleus on 'I' in (1b), whereas NE speakers stress 'will' most.

Udofot (1997) claims that when reading a passage of 143 syllables, NE speakers accented between 63 and 121 syllables whereas the British English control had accentuated 61 and in spontaneous speech, differences between British and NE were even more pronounced. She observes that the number of extra accented syllables ranged from 5 to 33 in the Variety III group, from 7 to 34 in Variety II and from 15 to 90 in Variety I. This propensity to stress more syllables in NE than in British English clearly contributes to the impression of differences in speech rhythm between the two varieties.

2.5.3 Vowel reduction and rhythm in Nigerian English

Scholars have often described the rhythm of NE as syllable-timed. Adetugbo (1977:12-15) describes it as a syllable-timed language because of the influence of the syllable-timing in Nigerian languages. This description is upheld by Bamgbose (1982:42) and Jowitt (1991:97). Jibril (1982:274-275), however, disputes the description of NE as syllable-timed arguing that English has a tendency to re-distribute accents according to the length of the utterances so that two accents may not occur next to each other and this important difference from NE is not fairly accounted for by the notion of stress- versus syllable-timing. Eka (1993:1-11) also rejects the syllable-timing description and goes further to describe the rhythm of the variety of the educated variety of spoken NE as "inelastic-timed" because of the tendency to have

more prominent syllables than a native speaker. He notes that the many syllables are ascribed to an inability to "squeeze-in" or "stretch-out" the syllables in a given rhythm unit within the given time as a native speaker who uses elastic-timed rhythm would.

Udofot (1993) studied the rhythm of the spoken English of final year secondary school students whose level of spoken English can be compared to Banjo's (1971) "Variety 2", which approximates Non-Standard Spoken NE. Her analysis confirmed the preponderance of prominent syllables and a tendency towards a syllable-timed rhythm, not syllable-timing in its pure form according to her. Udofot (1997) measured the duration of syllables in one read sentence and found that syllables containing reduced vowels were, on average, considerably longer in NE than in BE. She notes that the duration of a single schwa for example, is almost double as long in NE than BE. In accented syllables, those containing long vowels such as [i:] were longer in BE and those containing short vowels such as [ɪ] were shorter in BE than in NE. As a result, syllable duration across all syllable structure and phonetic types are similar in NE than in BE. Her study concludes that the rhythm of spoken NE sounds more like the pulsation of an African drum, heard as rhythmic, but hardly varying its tempo.

Udofot (2003) opines that since syllable duration in the Nigerian accent of English hardly vary in the distribution between full and reduced vowels, spoken Nigerian English sounds more like the pulsations of an African drum heard as rhythmic but rarely varying its tempo. Perhaps the continuum-spoken Nigerian English may be more amenable to the full-vowel-timing description since the full vowel-timing theory relies neither on the number of accents nor the number of syllables but on the pattern formed by the mixture of full and reduced vowels (Bolinger, 1981). Udofot's observations confirm the results of Gut (2001) who claims that one proposed reason for NE being more syllable-timed than British English is that vowel reduction is less pronounced which leads to a perceptual impression of more equal weight and length of each syllable. Following Ramus et al (1999), Gut (2001) calculated the proportion of vocalic intervals across all speech (%V) and the standard deviation of the length of the consonantal intervals (delta C). Her participants read a story of 268 words. The data were analyzed using ESPS/waves+ and all syllables transcribed phonetically in SAMPA and then converted into syllabic types where vowels were coded as V and stops, fricatives, liquid, nasals, glides, implosives and approximants were coded as C. To test the assumption of syllable-timing in NE, the relationship between subsequent syllables in 10 read sentences of the story produced by the British English speakers

and NE speakers were compared with the Rhythm Ration (RR) proposed by Gibbon and Gut (2001) based on the following formula in Figure 2.11.

$$RR = 100 \sum_{k=1}^{m-1} \frac{d_i}{d_j} / (m-1)$$

Figure 2.11. Rhythm ratio formula

Source: Gut (2001)

Where di=dk and dj=dk+1 if di is smaller than dj and dj=dk and di=dk+1 if di is not smaller than dj. In other words, Gut (2001) explains that for each pair of adjacent syllables, the shorter is divided by the longer. The average of all these ratios is calculated and multiplied by 100. Thus, if the RR equals 100, subsequent syllables have exactly the same duration, the lower the degree of similarity, the lower the RR value.

The analysis of her data reveals that NE speech rhythm, measured in the acoustic variables %V and delta C, groups distinctly from the speech rhythm of British English. She notes that the overall percentage of vowels in NE is higher than in British English. Equally, delta C in NE is higher than that in British English. Based on this result, Gut (2001) notes that compared to other languages classified with Ramus et al's (1999) measurement of rhythm, NE groups with Spanish, Catalan, Italian and French, all of which are presumed to be syllable-timed, in terms of the vowel percentage, but shows a higher standard deviation of consonantal intervals than those languages. Furthermore, in comparison with the speech rhythm of Singapore, Gut opines that NE is similar to Singapore English insofar as the %V is higher than British English. However, Singapore English shows a smaller delta C than NE as reported by Grabe and Low (2002).

Akinjobi (2004) notes that Udofot's findings are quite interesting and the procedure more valid for generalization than that of Eka (1993) because her subjects were drawn from a wide range of linguistic, socio-economic and educational backgrounds. She was, however, concerned about the use of reduced vowels in Nigerian English and the following questions were raised:

- Are the vowels that are supposed to be reduced actually reduced in Nigerian English usage as observed by Udofot?
- How consistent are these forms in words and sentences of various users from different linguistic backgrounds to merit her generalizations?

Akinjobi thus reports that Udofot's full-vowel timing alternative to the previous description of NE rhythm as syllable-timed, however, may be questioned on the grounds that the rhythm descriptions are often based on equivalent rather than equal timing. For instance, the description of Standard English as stress-timed has not been viewed in terms of accurate timing as the term ordinarily implies but in equivalent terms such that the term 'roughly' has been used to indicate that the timing is not absolutely accurate.

Akinjobi (2004) carried out an investigation on vowel weakening and unstressed syllable obscuration in Educated Yoruba English (EYE). Her findings reveal that in polysyllabic and disyllabic words, the weak /ə/ vowel was rendered as strong vowels by 97.1% and 82.2% respectively of the subjects while 86% and 82.2% rendered the weak /ɪ/ sound as strong vowels. She observed that in content words, 83% of the EYE subjects, appropriately uttered strong vowels in the stressed syllables. However, 72.8% inappropriately used strong vowels in the syllables that should have /ə/ as their peaks since they are expected to be weak. She, thus, concludes based on the findings of her perceptual and acoustic analyses that there is a preponderance of strong vowels and a scarce use of the weak vowels /ə/ and /ɪ/ in EYE. Also, the use of the strong rather than the weak forms of grammatical words in word groups was also established.

Ilolo (2006) who carried out a study on the rhythm of a sub-variety of Nigerian English opines that based on the preponderance of strong syllables, which are successive to each other and a display of a very high frequency of full vowels, which implies giving prominence to every syllable, a fusion of the syllable-timing and full-vowel timing theories could be used in describing Isoko English, a sub-variety of Nigerian English.

Simo-Bobda (1995:255) asserts that speakers of NE do not reduce vowels in unstressed syllable positions and that this accounts for why *pastor, status, statement, tribal* are produced as *past[ɔ]r, stat[u]s, statem[ɛ]nt and trib[a]l* respectively. As such, Akinjobi (2004:89) claims that a major deviation from Standard English usage for Nigerian speakers of English is in the realization of vowels and syllables that occur in unstressed positions.

[ə] is a very frequent sound in English as the nucleus in unstressed syllables both in content words and function or grammatical words. Lomotey (2010) who carried out a study on Ghanaians' realization of the schwa observes that the same cannot be said of African languages, especially Ghanaian languages. In British English, the frequency of /ə/ results in the proliferation of weak vowels. This same sound, which is regarded as the commonest in English is reported by Ufomata (1996) as the rarest sound in NE. It has, however, been observed by Jibril (1982) that a sound similar to Standard English /ə/ is present in Hausa, in which, it is the phonetic exponent of certain short vowels. Jowitt (1991:75), however, claims that this kind of vowel reduction does not occur in Nigerian Mother Tongues (MTs). According to

Jibril, however, Hausa English /ə/ lives up to the reputation of RP /ə/ as a convenient resting ground. He notes that Hausa English regardless of what its orthographic representation might be, the distribution does not correspond to that of RP. In this same vein, Jowitt (1991) explains that RP /ə/ occurs in unstressed syllables, [ə] may feature even in stressed syllables in Hausa Popular Nigerian English. In general, Simo-Bobda (1997) observes that in NE, vowels in unstressed syllables, which are produced as [ə] or [ɪ] or deleted in native varieties of English can be realized as either [a, ɛ, ɪ, ɔ or u] usually depending on the spelling. The findings from this study will either confirm or refute Simo-Bobda's claims.

CHAPTER THREE
THEORETICAL FRAMEWORK

3.0 Introduction

Two approaches to the analysis of data collected are adopted in this study: Prince and Liberman's (1977) Metrical Theory and Grabe and Low's (2002) Pairwise Variability Index (PVI) developed for the purpose of measuring the acoustics of rhythm across languages.

3.1 Metrical phonology

Metrical Phonology Theory is adopted in this study to represent stress based on the view of rhythm proposed by Liberman (1975) and later developed into a theory by Liberman and Prince (1977). Liberman and Prince (1977) reinterpreted the basic descriptive data contained in Sound Patterns of English (SPE). This was done by eliminating the numbering of stress levels with its problem of indefinite lowering as in SPE, and replacing it by a system in which stress is defined on a tree structure where nodes divide (only binarily) into *s* (strong) and *w* (weak) branches. Like SPE, the system applies at both the word and sentence levels. They argue that certain features of prosodic systems like that of English, in particular, the phenomenon of "stress subordination", are not to be referred primarily to the properties of individual segments (or syllables), but rather reflect a hierarchical rhythmic structuring that organizes the syllables, words and syntactic phrases of a sentence. Hayes (1988:229) states that the Liberman and Prince's phonological theory is concerned with organizing segments into groups of relative prominence; segments are organized into syllables, syllables into metrical feet, feet into phonological words and words into larger units. Liberman and Prince's (1977) theory employs two basic ideas about the representation of traditional prosodic concepts as:

1. Representing the notion of *relative prominence* in terms of a relation defined on constituent structure; and
2. Representing certain aspects of the notion *linguistic rhythm* in terms of the alignment of linguistic material with a *metrical grid.*

In their thinking, they opine that the perceived "stressing" of an utterance, reflects the combined influence of a constituent structure pattern and its grid alignment.

Hayes (1992:424) states that metrical phonology designates a family of sub-theories of Generative Phonology, intended to characterize insightfully the properties of stress and stress rules. According to him, metrical theory holds that, unlike other phonological properties, stress is not a feature; rather, it is the hierarchical rhythmic organization of utterances. He further states that stress in metrical phonology is seen to have a number of distinctive phonological characteristics. These are presented by Hayes (1992:424) as follows:

a. It is usually *cumulative:* each word or phrase has a single strongest syllable.
b. Stress is *rhythmically distributed:* syllables bearing equal levels of stress tend to occur at roughly equal intervals.
c. Stress is *hierarchical:* in most languages that have stress, it occurs in an indeterminate number of degrees – primary, secondary and tertiary, etc. Such degrees of stress can appear deep within the phonology, rather than being the result of late phonetic rules. In contrast, ordinary features have a limited, predetermined number of contrasting phonological values.
d. Stress does not *assimilate.*

3.1.1 Metrical trees

An English Stress Rule (ESR) assigns [± stress] to all vowels in words. This is done interactively i.e. by repeated application beginning from the end of a word. The English Stress Rule only involves giving plus or minus values to the binary feature [± stress]. It does not involve metrical values. In metrical phonology, based on the framework provided by [±stress], a tree structure is erected which assigns strong and weak nodes in a hierarchy of relative prominence (Cruttenden, 1986:30). According to him, all [-stress] vowels are associated with *w* syllables; [+stress] vowels are most commonly associated with *s* syllables but may be associated with *w* syllables in certain positions e.g.

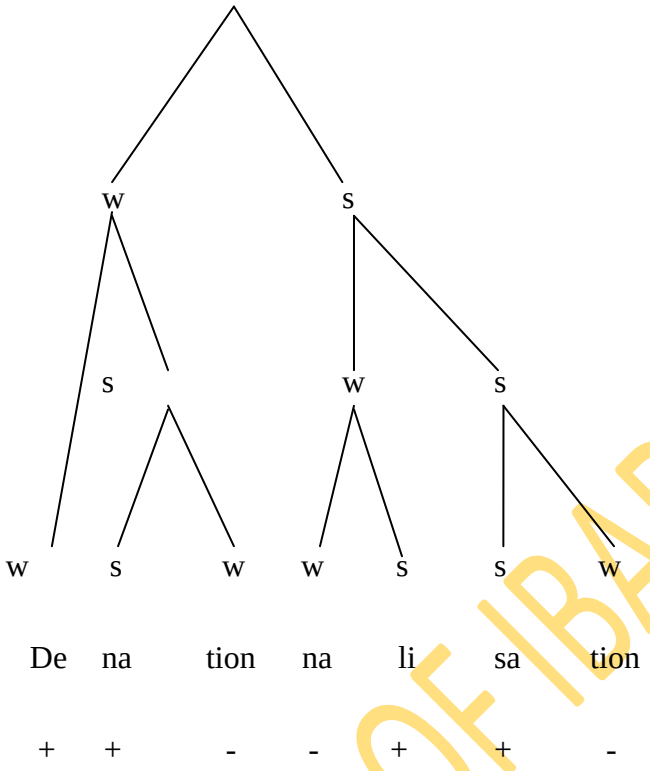


Figure 3.1. Metrical tree for *denationalization*

Source: Cruttenden (1986:31)

Cruttenden notes that the assignment of strong and weak nodes is governed by two rules: a Lexical Category Prominence Rule (LCPR) which covers words and compounds; and a Nuclear Stress Rule (NSR) which applies to phrases and sentences. As explained by Liberman and Prince (1977:257), the theory stipulates that the rule applies as follows:

For any pair of sister nodes [N1 N2]:

- LCPR: If [N1 N2] L where L is a lexical category, then N2 is strong if (iff) N2 branches

-NSR: if [N1N2]P where P is a phrasal category, then N2 is strong.

The operation of the LCPR and NSR is shown in the following example in Figure 3.2.

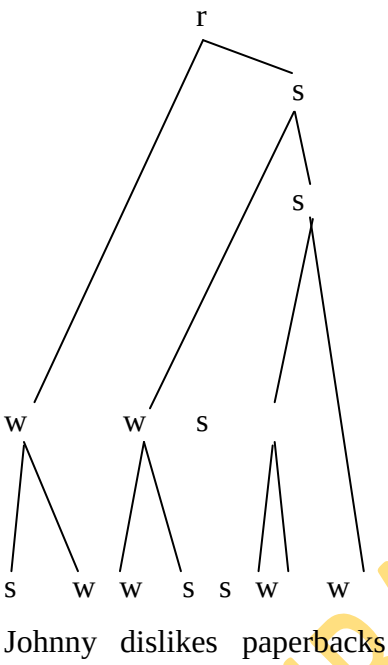


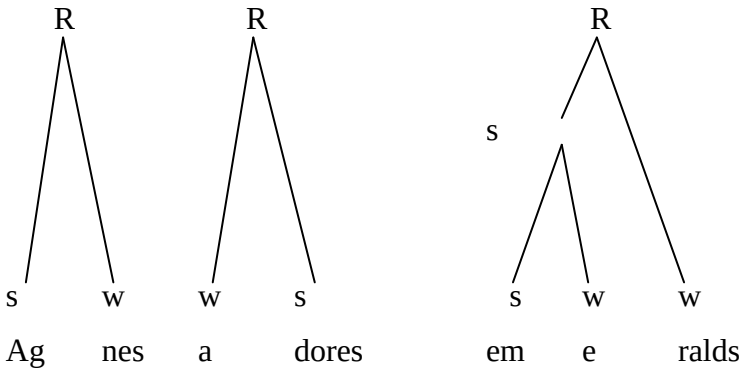
Figure 3.2. Metrical tree for *Jonny dislikes paperbacks*

Source: Cruttenden (1986:31)

Cruttenden explains that *s* occurs on the left branch in the compound *paperbacks* because the right branch does not itself branch (LCPR); whereas at the predicate and sentence levels, *Ss* occur on the right branches (NSR). Furthermore, he states that tree structures of the sort illustrated in Fig. 3.2 represent the relative prominence associated with syllables: for example, the main stress is shown to be on the syllable not dominated by any *w's* e.g. *pap-* in Fig. 3.2 above.

Udofot (2003:206) also illustrates the LCPR and NSR rules with the tree diagram in Figure 3.3below. She explains that in a sentence like *Agnes adores emeralds*, both rules can be exemplified thus:

a.



b.

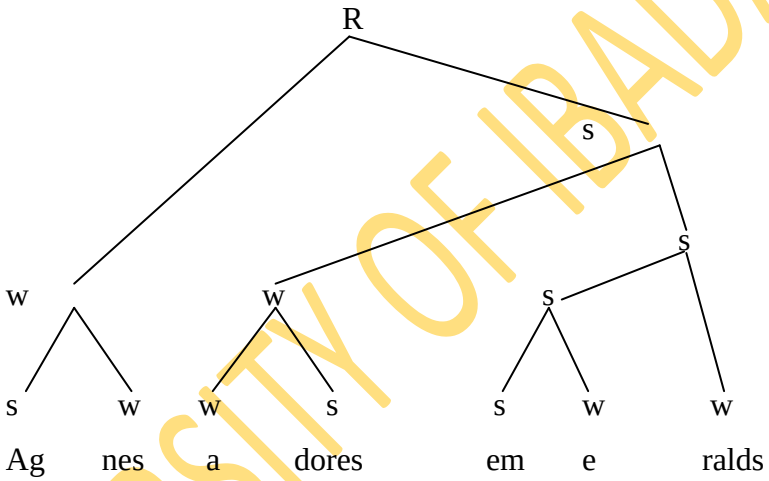


Figure 3.3. Metrical trees for *Agnes adores emeralds*

Source: Udofot (2003)

She explains that S occurs on the left branch in the lexical item *emeralds* because the right branch does not itself branch (LCPR), but at the predicate and sentence levels S's occur on the right branches (NSR). The primary stress is shown to occur on the syllables that are dominated by S's (that is *em-* in Figure 3.3 example), often referred to as the Designated Terminal Element (DTE). This is the point of pitch change.

Stress in metrical phonology is hierarchical. The prosodic hierarchy for the word is shown below:

Pw – Prosodic word

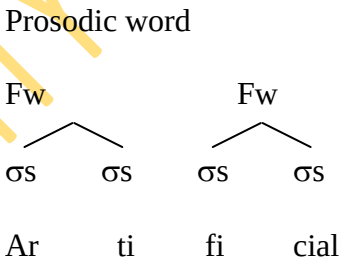
F – Foot

σ - Syllable

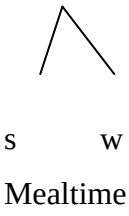
μ - Mora

Source: Napoli (1996: 101)

A prosodic word is the word at the rhythmic level; a foot is the next rhythmic unit after the syllable: it contains two syllables, one of which is strong and the other weak; a syllable is the smallest pronounceable unit of the word; and a mora is the element in the rhyme of a syllable (Napoli 1996: 81, 101). Sunday (2005:27) illustrates the above prosodic hierarchy in the examples below:



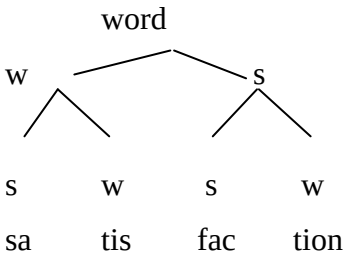
It is possible at times for the metrical tree to show only the syllable and word levels e.g.



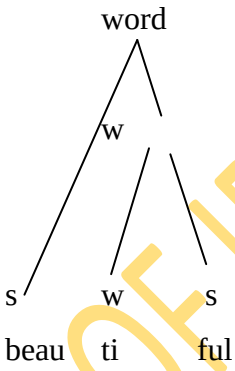
Sunday (2005:27) notes that in drawing the metrical tree of a word, the vowel quality is very important: the presence of /ə/ and /ɪ/ in a syllable often makes it weak; monophthongs and diphthongs are often treated as strong and thus, the syllable that contains them is strong. Furthermore, he stresses that it should be borne in mind that it is the relation that a node (syllable) has with the node next to it that *mainly* determines

whether it will be labeled strong or weak. This, he illustrates with the metrical trees for *satisfaction, beautiful* and *accommodation* respectively in Figure 3.4.

i.



ii



iii.

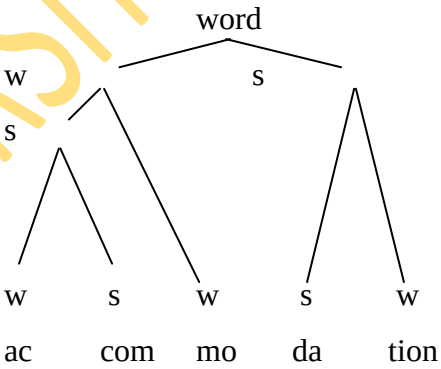


Figure 3.4. Metrical trees for *satisfaction, beautiful* and *accommodation*

Source: Sunday (2005)

In (i), the metrical tree shows that, in relation to the second syllable, the first syllable is strong; in relation to the last syllable, the penultimate syllable is strong; and that the penultimate syllable is the strongest, in that it is this foot that is strong. In metrical tree (ii), there are three syllables. The penultimate and the last syllables constitute a foot, and it is weak. The first syllable is a mora, a syllable and a foot, and it is stronger than the second foot. The last example (iii) constitutes five moras and five syllables. There are two feet. The first consists of three syllables, which are WSW. The first and the second jointly constitute a strong syllable. The second foot consists of 2 syllables, which are SW. In relation to other syllables in the word in (iii) above, the penultimate syllable is the strongest because it is dominated by Ss all through.

Cruttenden (1986:32) notes that tree structures do not represent the timing and rhythm of utterances. Thus, to show the *temporal reality* of metrical trees, they have to be transmuted into *metrical grids.* This conforms to Liberman and Prince's (1977) proposal of using metrical grids as a means of interpreting trees. Schane (1979) accepts the superiority of the Metrical Theory over generative approaches in the representation of rhythm, but does away with *the hierarchical ordered binary branching structures* and preserves the use of SW notations with an additional SWS (ternary system). He argues that hierarchical ordered, binary branching structures are "overly complex" (Schane, 1979:596). S's are assigned directly to base forms and suffixes, taking into account both syllable structure and morphological information (p. 600).

Selkirk (1984) also adopts the SW notation and opts for a ternary structure and posits the Principle of Rhythmic Alternation (PRA) to break the monotony of configurations like SWWW and to maintain the appropriate rhythm. He also uses a grid-only representation in place of tree structures. However, Hayes (1990:234) opines that the most promising kind of representation would be a hybrid combining both tree and grid information.

3.1.2 Metrical grids

The rule for the construction of grids from trees is termed the Relative Prominence Projection Rule (RPPR). Liberman and Prince (1977:316) state that:

> In any constituent on which the strong-weak relation is defined, the designated terminal element is metrically stronger than the designated terminal element of its weak constituent.

Cruttenden explains that the Designated Terminal Element (DTE) is found by following Ss down the tree: so, in the example of *Johnny dislikes paperbacks,* which has the following metrical grid:

```
                    11
8                9  10
1    2   3   4   5  6   7
Johnny dislikes paperbacks
```

Figure 3.5. Metrical grid for *Johnny likes paperbacks*

For the root node (R) at the top of the tree (see Figure 3.2), the DTE of the w branch leads to *John* and that of the s branch leads to *pap-;* hence *pap-* is metrically stronger than *John.* This is clearly seen in the metrical grid in Fig. 3.5 above.

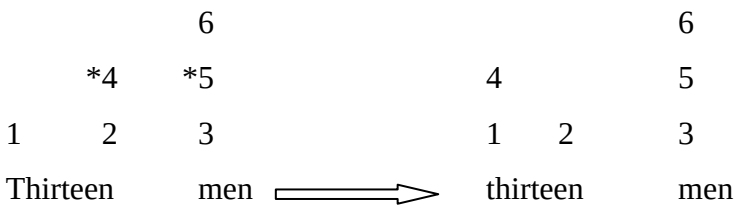
Metrical grids are also used to represent stress or show the rhythm of utterances. To construct a grid, each syllable is assigned a number at the first level. At the second level, the prominent syllables of each word in the utterance are given a number (Udofot, 2003) or marked*x* (Sunday, 2005) and finally, the tonic syllable is given a number as shown by Udofot (2003:206) below.

Level 3					11		
Level 2	8		9		10		
Level 1	1	2	3	4	5	6	7
	Ag	nes	a	dores	em	e	ralds

Figure 3.6. Metrical grid for *Agnes adores emeralds*

Udofot notes that when two strong stresses occur together i.e. adjacent accent as in *thir'teen 'men* a clash of stress is avoided by applying what Liberman and Prince (1977:312) call the Iambic Reversal Rule. Syllables are said to be adjacent when they are on the same level (e.g. feet) and no other element on that level comes between them (Cruttenden, 1986:32). He opines that elements will metrically clash if their counterparts at the next lower level are also adjacent. By the Iambic Reversal Rule the first stress moves to the left (first syllable) to yield '*thirteen 'men.* By so doing,

metrical grids space out stress so that the notion of stress-timing in English is ultimately maintained.



* metrical clash

Figure 3.7. Metrical grid clash in *thirteen men*

Metrical trees only show the relative prominence of nodes; they do not show rhythmic alternation between strong and weak syllables (Sunday 2005). One advantage of the metrical grids over the tree structures is the fact that the grids show the syllable that is next in hierarchy to the most prominent one and adequately caters for accent clashes. The rule that moves grid marks (move x) which involves a (left-ward or right-ward) shift of a mark to resolve a clash (Kager, 1995:386) moves only one grid mark at a time (Napoli 1996:118) and movement must take place only along the level at which the clash occurs. In essence, (Kager, 1995:382) opines that 'metrical grid represents stress as a hierarchical rather than a relational property'. Sunday (2005:32) notes that in metrical grid, the height of a grid mark represents prominence levels while horizontal distance between grid marks stands for rhythmic structure.

Following Udofot (2003), we shall adopt the notation of Schane (1979) in the representation of rhythm. This means that rhythm shall be viewed as resulting mainly from the alternation between strong and weak syllables represented only with metrical grids. Also, the Iambic Reversal Rule of Liberman and Prince (1977), the Continuous Column Constraint of Napoli (1996) and the Principle of Rhythmic Alternation where there are contiguous strong syllables will not apply in this study as this will highlight the similarities or differences between the performance of the Educated Isoko speakers of English (EIE) subjects and the controls.

3.2 The pairwise variability index

Various methods have been used to quantify the rhythm measurements of various languages since empirical evidence is not in the favour of isochronous chains in speech utterances. A more recent metric used in quantifying speech rhythm is the Pairwise Variability Index. It expresses the average variability of a property (most

commonly duration) from one unit to the next (most commonly, the vowel) and it was first applied by Low (1998) comparing British and Singapore English.

The Pairwise Variability Index (PVI) is based on the insight that stressed and unstressed vowels in languages employing stress rhythm vary widely in duration whereas the duration of vowels in syllable rhythm languages vary less. Following Grabe and Low (2002), the raw Pairwise Variability Index (rPVI) is calculated from the absolute value of difference in vowel duration between successive syllables divided by the average duration of the pair. The formula for the rPVI is given in equation (1), Figure 3.8.

(1)

$$rPVI = \left[\sum_{k=1}^{m-1} \left| d_k - d_{k+1} \right| \ / (m-1) \right]$$

Figure 3.8. Raw PVI formula

According to Grabe and Low (2002), the formula consists of two parts, the *raw PVI* and the *normalized PVI*. The former is used to calculate the consonant intervals while the latter the vowel intervals. Where *m* is the number of vocalic or intervocalic intervals in a passage of speech and *d* is the duration of the kth interval. According to Ramus et al (1999:271), a vocalic interval is located between the onset and the offset of a vowel, or of a cluster of vowels. In other words, it is a vowel and sequences of consecutive vowels regardless of whether they belong to the same syllable (or word for that matter) or not. Similarly, a consonantal interval is located between the onset and offset of a consonant, or of a cluster of consonants. These, they exemplified using the phrase *next Tuesday on* (phonetically transcribed as /nɛkstjuzdeiɔn/ having 4 consonantal intervals and 3 vocalic intervals

/n/ /ɛ/ /kstj/ /u/ /zd/ /eiɔ/ /n/

Grabe and Low (2002:16) acoustically define vocalic intervals as the stretch of signal between vowel onset and vowel offset, characterized by vowel formants, regardless of the number of vowels included in the section noting that a vocalic section could contain a monophthong, a diphthong, or, in some cases, two or more vowels spanning the offset of one word and the onset of the next. They defined intervocalic intervals as the stretch of signal between vowel offset and vowel onset, regardless of the number of consonants included. Low and Grabe discovered that vocalic duration is directly correlated with speaking rate. In order to account for speaking rate effect that can be present, a normalized version of the PVI (nPVI) was adopted for vocalic PVI represented in equation (2), Figure 3.9 below.

(2)

$$nPVI = 100 \times \left[\sum_{k=1}^{m-1} \left| \frac{d_k - d_{k+1}}{(d_k + d_{k+1})/2} \right| \Big/ (m-1) \right]$$

Figure 3.9. Normalized PVI formula

Equation (2), Figure 3.9 shows that the nPVI is compiled by calculating the difference in duration between each pair of successive measurements, taking the absolute value of the difference and dividing it by the mean duration of the pair. Equation (1) for the rPVI differs only in omitting the third step. The differences are then summed and divided by the number of differences. The output is multiplied by 100 because the normalization produces fractional values.

CHAPTER FOUR
PILOT STUDY

4.0 Analysis

In this chapter, a pilot study of fifty (50) subjects out of the total number of subjects (100) that will be used for this study is presented. The pilot study is aimed at validating the research instruments intended to be used in the main study.

4.1 Perceptual (grammatical words)

In English, grammatical words occur in two forms – strong and weak. They are strong when produced in citation form and in instances of contrasting stress. But when they occur in sentences, there is no contrast and they are rendered weak. Akinjobi (2009), Lomotey (2010) and Ilolo (2011) note that the weak forms are characterized by vowel reduction especially by the manifestation of the schwa vowel /ə/ in positions occupied by full vowels in the strong stressed forms. As such, grammatical words such as pronouns, conjunctions, determiners, prepositions and auxiliary verbs, which are often one–syllable words, and which are usually stressed when they occur in isolation consequently become unstressed.

Akinjobi (2009) observed that in a sub-variety of NE, Educated Yoruba English (EYE), speakers scarcely use the weak forms of English grammatical words as such in most instances, they use strong sounds in the position of the expected weak forms and more often than not, strong vowels from the mother tongue were substituted for the weak sound /ə/, which is the commonest vowel found in the weak forms of English grammatical words. Lomotey (2010) reports that although [ə] exists in Ewe, a Ghanaian language, and the speakers she recorded failed to realize it in the English words they were given, the result of her study shows that Ghanaians do not unstress any vowel in any position in a word rather, they produce the vowel sounds usually according to the way they are spelt. This leads to Ghanaians stressing the unstressed vowel [ə], no matter its position in a word. Ilolo (2011) working on a sub-variety of NE, Educated Isoko English also confirms the results of Akinjobi (2009). She reports that rather than use weak forms of grammatical words, their strong forms are retained

and other variants used. Furthermore, she notes that the percentage of weak forms used by her speakers is very negligible compared to non-usage.

In the perceptual analysis, a total number of 1200 cases of vowel reduction are expected from the 50 EIE subjects employed for this study: 250 cases of reduction to /ɪ/ and 950 cases of reduction to /ə/.

Table 4.1. Pronouns and prepositions in unstressed syllable positions in English sentences (Pilot Study)

Word	Expected realization	Total no of occurrences	EIE variants	Vowel quality	Frequency	Percentage
'his'	/ɪz/	100	[hiz]	Strong	56	56
			[ɪz]	Weak	13	13
			[his]	Strong	31	31
'he'	/ɪ/	50	[hi]	Strong	42	84
			[ɪ]	Weak	2	4
			[hi:]	Strong	6	12
'her'	/ə/	50	[ha:]	Strong	34	68
			[ə]	Weak	3	6
			[he]	Strong	13	26
'of'	/əv/	150	[ɔv]	Strong	61	40.7
			[ɔf]	Strong	89	59.3
'at'	/ət/	150	[a:t]	Strong	2	1.3
			[at]	Strong	148	98.7
'to'	as /tə/ before consonants	100	[tu]	Strong	22	22
			[to]	Strong	78	78

His as /ɪz/ is expected to occur in 100 instances. It is realized as [hiz] in 56% of the number of occurrences, as [his] in 31% instances and the expected realization, [ɪz] in 13% of the total expected instances. *He*, which is expected to be realized as /ɪ/ was produced as [hi] in 84% of the total number of occurrences, as the appropriate realization [ɪ] in 2 instances i.e. 4% and as [hi:] in 6 cases constituting 12% of the expected number of realization. *Of* as /əv/ occurred as [ɔv] in 61 instances constituting 40.7% of the total number of occurrences and as [ɔf] in 89 instances i.e. 59.3%.*At*,which is expected to be realized as /ət/ was produced as [a:t] in 1.3% of the occurrences and as [at] in 98.7%. Where *to* was expected to be /tə/ before consonants, it was realized as [tu] in 22% and as [to] in 78% of the total number of occurrences.

Table 4.2. Conjunctions and determiners in unstressed syllable positions in English sentences (Pilot Study)

Word	Expected realization	Total no of occurrences	EIE variants	Vowel quality	Frequency	Percentage
'and'	as /ən, ənd/	100	[a:n] [and] [ənd] [ən]	Strong Strong Weak weak	68 10 16 6	68 10 16 6
'the'	as /ðə/ before consonants	100	[ðə] [di]	Weak Strong	9 91	9 91
'the'	as /ðı/ before vowels	100	[ðı] [di]	Weak Strong	38 62	38 62

The conjunction *and* is expected to be realized as /ən/ and /ənd/ in its occurrence in the data analyzed. It was realized as [a:n] 68%, as [and] 10% and as the expected [ən] and [ənd] in 6% and 16% respectively of the instances of occurrence. *The* is expected to be realized as /ðə/ before consonant and it was realized by the EIE subjects as [ðɪ] in 22%, as [di] in 69% and as [ðə] in a negligible 9% of the instances of occurrence. *The* which is expected to be weakened to /ðɪ/ before vowels was realized as [di] 62%, as [ðə] 22% and as the expected [ðɪ] in 16% of the occurrences.

Table 4.3. Auxiliary verbs in unstressed syllable positions in English sentences

Words	Expected realization	No of occurrences	EIE variants	Vowel quality	Frequency	Percentage
'was'	as /wəz/	150	[wɔz] [wɔ:z]	Strong Strong	21 129	14 86
'has'	as /əz/	150	[ha:z] [haz]	Strong Strong	130 20	86.7 13.3

Was was produced as [wɔz] in 14% and as [wɔ:z] in 86% and in no instance was the expected /wəz/ realized. Has as /əz/ was realized as [ha:z] and [haz] in 130 and 20 instances constituting 86.7% and 13.3% respectively.

Table 4.4. Summary of perceptual analysis (pilot study)

Code	Frequency	Percentage
Presence of Reduction to /ɪ/ and /ə/	87	7.2
Absence of Reduction	1113	92.8
Total	1200	100

In Table 4.4 above, the summary of reduction to /ɪ/ and /ə shows that where EIE subjects were expected to reduce otherwise strong/full vowels in unstressed syllable positions in 1200 instances, only 7.2% realized the expected reduction. This is a very negligible percentage compared to the magnitude of the absence of reduction represented by 92.8% of the expected instances of vowel reduction. The pie chart in Figure 4.1 below shows a vivid representation of the percentage difference between the presence of reduction to /ɪ/ and /ə and the absence of reduction as produced by the EIE subjects.

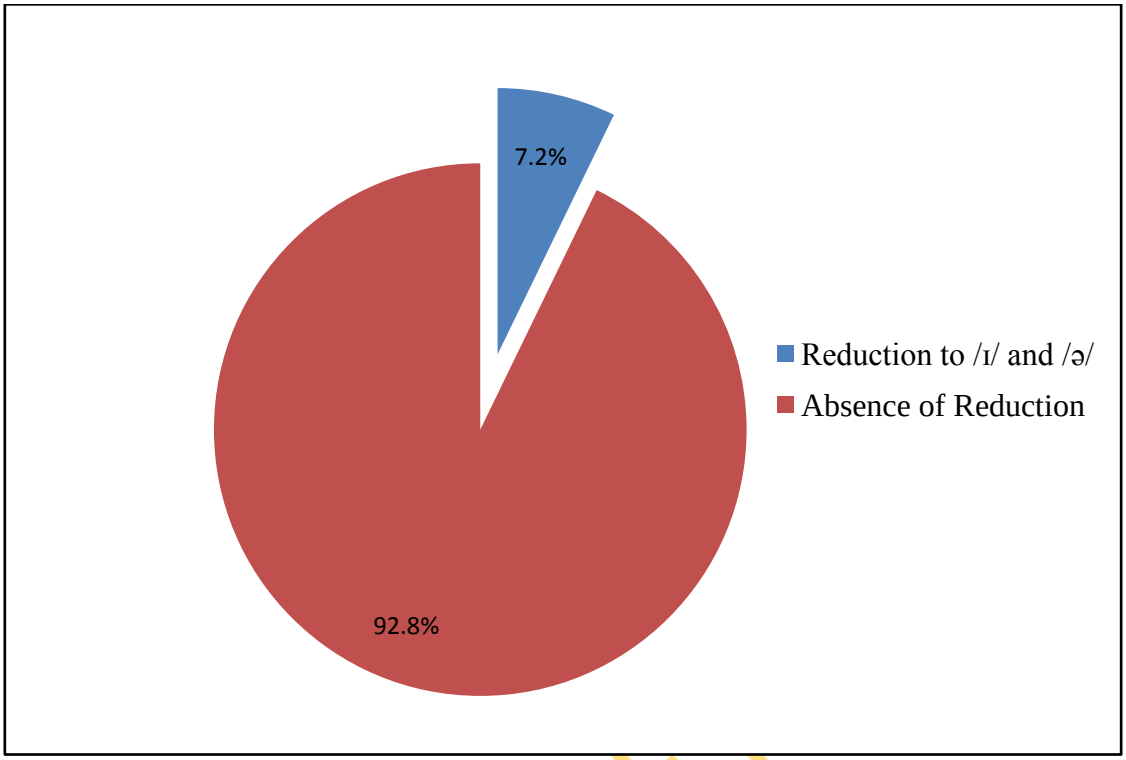


Figure 4.1. Summary of reduction to /ɪ/ and /ə/ (pilot study)

Table 4.5. EIE variants of /ɪ/ and /ə/

Vowels substituted where there is absence of reduction to /ɪ/	**Frequency**	**Percentage**
/i/	191	97
/i:/	6	3
Total	197	100
Vowels substituted where there is absence of reduction to /ə/		
a:	234	25.5
e	13	1.4
ɔ	171	18.7
a	178	19.4
u	22	2.4
o	78	8.5
i	91	9.9
ɔ:	129	14.1
Total	916	100

Table 4.5 shows that two vowels /i/ and /i:/ were substituted for the reduced /ɪ/ vowel, /i/ having 97% while /i:/ has 3%. The pie chart for the substitution is represented in Figure 4.2below.

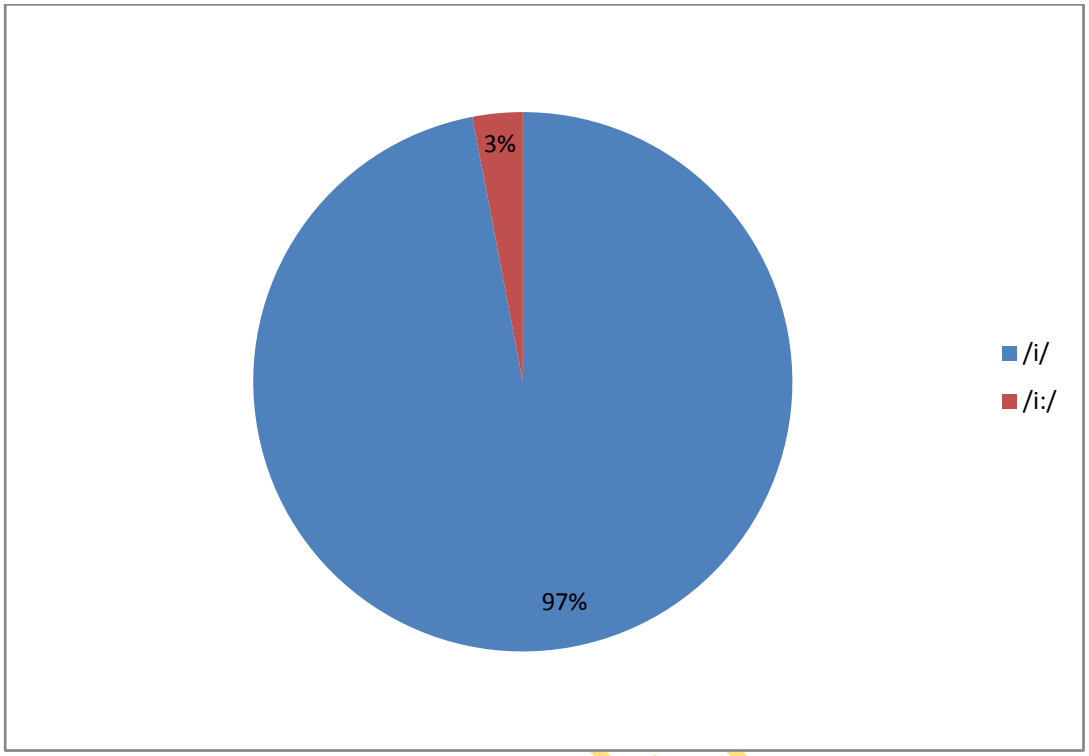


Figure 4.2. Variants of /ɪ/ produced by EIE subjects

Table 4.5 shows that eight vowels /a:, e, ɔ, a, u, o, i/ and /ɔ:/ were substituted for the schwa /ə/ with /a:/ having the highest percentage of 25.5%, followed by /a/ with 19.4% and /ɔ/ with 18.7%. This is followed by /ɔ:/with 14.1%, /i/ 9.9%, /o/ 8.5%, /u/ 2.4% and /e/ 1.4%.These results further confirm Simo-Bobda's (1997) observation that in NE, vowels in unstressed syllables which are produced as [ə] or [ɪ] or deleted in native varieties of English can be realized as either [a, ɛ, i, ɔ or u] usually depending on the spelling.The above explanation is captured in Figure 4.3.

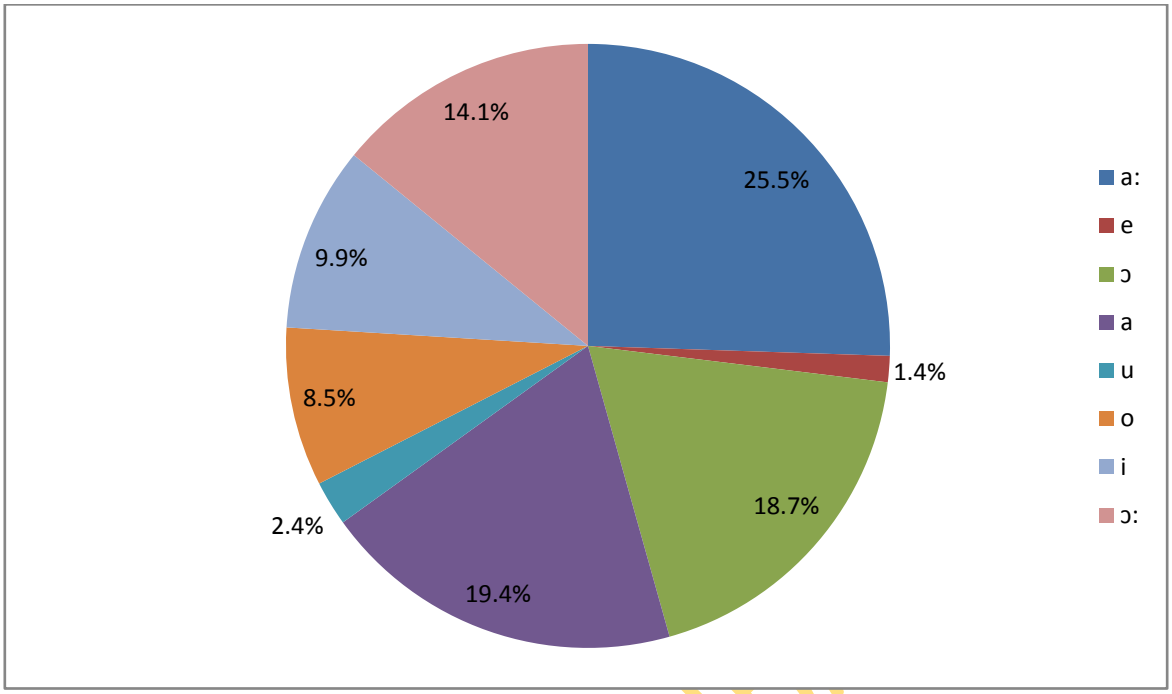


Figure 4.3. EIE substituted vowels for /ə/

4.2 Metrical analysis

A metrical analysis of sentences one and four in Set B as produced by five EIE speakers and a control was carried out. This is represented in Figure 4.4.

Sentence One Set B

CONTROL	S	W	S	W	S	W	W	S	W	S	W	W	S	W	W	S	W	W	S	W	S	W	W	S	W	W			
EIE 1	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	W	S	S	S			
EIE 2	S	S	S	S	S	S	S	S	W	S	W	S	S	S	W	S	W	S	S	S	S	W	W	S	S	W			
EIE 3	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	W			
EIE 4	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	W	S	S	S				
EIE 5	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	W	S	S	S				

* dʒɒn wəz sɪk əv vɪ sɪ tinŋ fred ən sæn dɪ ɪz brʌ ðəən sɪstə rɪs pek tɪv li: ət ðəhɔs pi tḷ

Figure 4.4. Metrical analysis of *John was sick of visiting Fred and Sandy his brother and sister respectively at the hospital*

Subjects	**Sentence Four Set B**							
Control	S	W	S	W	S	W	S	W
EIE 1	S	S	S	S	S	W	S	S
EIE 2	S	S	S	S	S	W	S	W
EIE 3	S	S	S	S	S	S	S	S
EIE 4	S	S	S	S	S	W	S	S
EIE 5	S	S	S	S	S	W	S	S
*****	ʤeɪn	həz	fɔ:	tə	la:st	ðə	wɪn	tə

Figure 4.5. Metrical analysis of *Jane has four to last the winter*

KEY

S: Strong

W: Weak

* The transcription does not represent the pronunciation of any of the subjects but just a phonetic representation of the syllables.

It is observed that the pattern of vowel reduction represented by the S and W notations produced by the EIE subjects were different from that of the control. Proliferation of strong syllables by the EIE subjects is observed as opposed to the control's production in the metrical analysis carried out. Out of the 26 syllables produced by the control in Figure 4.4, 16 syllables were realized as weak while only 10 were accented. It is, however, observed that reverse is the case with the EIE subjects. The highest number of weak syllables in the EIE productions in Figure 4.4 is 7 realized by EIE 2; the others only have an instance each of a weak syllable. Proliferation of strong syllables is also evidence in Figure 4.5. The alternation of s and w syllables is not maintained by the EIE subjects compared to the control's production.

4.3 Acoustic analysis

The mean vowel duration for five speakers of EIE Sets A and B (Full and Reduced Vowel Sets) and five speakers of SBE Sets A and B (Full and Reduced Vowel Sets) are presented in Table 4.6 followed by a bar chart in Figure 4.6.

Table 4.6. Mean vowel duration (in seconds) for EIE and SBE full and reduced vowels sets respectively

Variety	EIE		SBE	
Subjects	Full	Reduced	Full	Reduced
1	0.17	0.13	0.14	0.09
2	0.13	0.12	0.16	0.09
3	0.14	0.12	0.15	0.09
4	0.12	0.14	0.11	0.09
5	0.14	0.12	0.13	0.09
Overall Mean	0.14	0.13	0.13	0.09

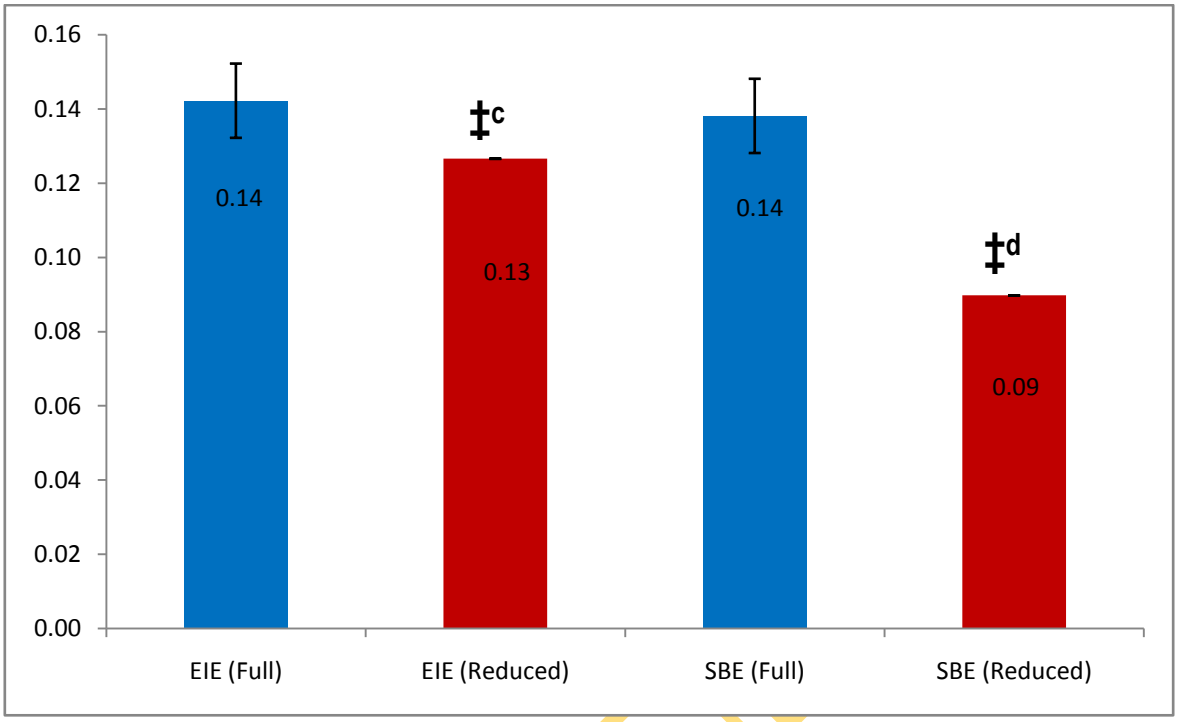


Figure 4.6. Overall mean vowel duration (Full and Reduced) for EIE and SBE across speakers.

'Bars' are means ± SD. n= 5 for each group. Data are analyzed by one-way ANOVA followed by Fisher's LSD Post-hoc Test. ‡ *p< 0.001. a= EIE Full vs EIE Reduced, b= EIE Full vs SBE Full, c= EIE Reduced vs SBE Reduced, d=SBE Full vs SBE Reduced.*

The mean vowel duration values were subjected to a One-Way Analysis of Variance (ANOVA) with the dependent variable "mean vowel duration" and the independent variable "EIE (Full & Reduced Vowel Sets)" and "SBE (Full & Reduced Vowel Sets)". Planned comparison showed that within EIE, vowel duration between Full and Reduced Vowel Sets did not differ, reflecting the absence of a durational distinction between full and reduced vowels, but with SBE, the difference was highly significant ($p<0.001$). The planned comparison also showed that between varieties (EIE and SBE), the Reduced Vowel Sets were highly significant ($p<0.001$), but the Full Vowel Sets were not. (See Figure 4.6 for comparisons).

4.4 Results

The results obtained from the pilot study show that Educated Isoko English speakers scarcely make use of the weak forms of English grammatical words such as determiners, conjunctions, pronouns and auxiliary verbs where otherwise strong vowels in their citation forms are normally reduced to /ə/ and /ɪ/ in British English. The study also showed that contrary to the control's production characterized by an alternation between strong and weak syllables in the metrical analysis, there was a proliferation of full vowels in the EIE subjects' productions.

It is also observed that as predicted within EIE, the mean vowel duration between Full and Reduced Vowel Sets did not differ, reflecting the absence of a durational distinction between full and reduced vowels, but within SBE, the difference was highly significant ($p<0.001$). Between varieties (EIE and SBE), the Reduced Vowel Sets differed significantly ($p<0.001$), but the Full Vowel Sets did not.

The pilot study has, thus, been able to re-establish that NE viewed from a geo-tribal perspective (Isoko) does not make use of vowel reduction. As a result, there is no variability in successive vowel duration pointing Isoko English more towards syllable-timing description than stress-timing description. However, where there was reduction to /ə/ and /ɪ/ the percentage was minimal compared to the use of strong vowels.

CHAPTER FIVE

PERCEPTUAL, METRICAL, ACOUSTIC/STATISTICAL ANALYSES AND DISCUSSION

5.1 Main data analysis and discussion (perceptual)

One hundred educated speakers of Isoko uttered the text used in investigating the phenomenon of vowel reduction in unstressed syllables in Educated Isoko English (EIE). They have at least two (2) years post-secondary education. The SBE speakers served as control to confirm the already established phenomenon of vowel reduction in Standard British English. Set B (the Reduced Vowel Set) containing full and reduced vowels is used to test vowel reduction in grammatical as well as content words.

5.1.1 Vowel reduction and sentence stress

In this section of the analysis, the use of sentence stress by EIE with particular reference to the use of English grammatical weak forms in unstressed syllable positions is tested. One of the characteristics of spoken English is that grammatical or function words occur in two forms – strong and weak. They are strong when produced in citation form and in instances of contrasting stress. However, when they occur in sentences, there is no contrast and they are rendered weak.

Akinjobi (2009), Lomotey (2010) and Ilolo (2011) note that weak forms in SBE are characterized by vowel reduction especially by the manifestation of the schwa vowel /ə/ in positions occupied by full vowels in the strong stressed forms. As such, grammatical words such as pronouns, conjunctions, determiners, prepositions and auxiliary verbs, which are often one-syllable words, and which are usually stressed when they occur in isolation consequently become unstressed.

A total number of 2400 (500 reductions to /ɪ/ and 1900 reductions to /ə/) cases of vowel reduction in grammatical words are expected from the 100 EIE subjects.

Table 5.1. Pronouns and prepositions in unstressed syllable positions in English sentences (main data)

Word	Expected realization	Total no of occurrence	SBE	EIE variants	Vowel quality	Frequency	Percentage
'his'	/ɪz/	200	[ɪz]	[hiz]	Strong	123	61.5
				[ɪz]	Weak	17	8.5
				[his]	Strong	60	30
'he'	/ɪ/	100	[ɪ]	[hi]	Strong	81	81
				[ɪ]	Weak	6	6
				[hi:]	Strong	13	13
'her'	/ə/	100	[ə]	[ha:]	Strong	72	72
				[ə]	Weak	3	3
				[he]	Strong	25	25
'of'	/əv/	300	[əv]	[ɔv]	Strong	111	37
				[ɔf]	Strong	186	62
				[ə]	Weak	3	1
'at'	/ət/	300	[ət]	[a:t]	Strong	222	74
				[at]	Strong	78	26
				[ə]	Weak	0	0
'to'	as /tə/ before consonants	200	[tə]	[tu]	Strong	42	21
				[to]	Strong	158	79
				[tə]	Weak	0	0

His as /ɪz/ is expected to occur in 200 instances. It is realized as [hiz] in 61.5% of the number of occurrences, as [his] in 30% instances and the expected realization, [ɪz] in 8.5% of the total expected instances. *He* which is expected to be realized as /ɪ/ was produced as [hi] in 81% of the total number of occurrences, as the appropriate realization [ɪ] in 6 instances i.e. 6% and as [hi:] in 13 cases constituting 13% of the expected number of realization. *Her* which was supposed to have the weak form /ə/ in the context of the passage was realized as the strong [a:] in 72% of the instances of occurrence, as [he] in 25% instance and as the appropriate weak sound /ə/ only in 3%. *Of* as /əv/ was realized as [ɔv] in 111 instances constituting 37% of the total number of occurrences and as [ɔf] in 186 instances i.e. 62%. There were only 3 instances i.e. 1% appropriate realization by the EIE subjects.*At* which is expected to be realized as /ət/ was produced as [a:t] in 74% of the occurrences and as [at] in 26%; none of the EIE respondents produced the expected /ə/ realization. Where *to* was expected to be produced as /tə/ before consonants, it was realized as [tu] in 21% and as [to] in 158 instances i.e. 79% of the total number of occurrences; in no instance was the expected sound produced.

Table 5.2. Conjunctions and determiners in unstressed syllable positions in English sentences (main data)

Word	Expected realization	Total no of occurrences	SBE	EIE variants	Vowel quality	Frequency	Percentage
'and'	as /ən, ənd/	200	[ən]	[a:n] [and] [ənd] [ən]	Strong Strong Weak weak	107 68 18 7	53.5 34 9 3.5
'the'	as /ðə/ before consonants	200	[ðə]	[ðə] [di]	Weak Strong	9 191	4.5 95.5
'the'	as /ðı/ before vowels	200	[ðı]	[ðı] [di]	Weak Strong	35 165	18 82

The conjunction *and* is expected to be realized as either /ən/ or /ənd/ in its occurrence in the data analyzed. It was realized as [a:n] 53.5%, as [and] 34% and as the expected [ən] and [ənd] in 3.5% and 9% respectively of the instances of occurrence. *The* is expected to be realized as /ðə/ before consonant and it was realized by the EIE subjects as [di] in 95.5% and as the expected realization [ðə] in a negligible 4.5% of the instances of occurrence. *The* which is expected to be weakened to /ðɪ/ before vowels was realized as [di] 81%, and as the expected [ðɪ] in 19% of the occurrences.

Table 5.3. Auxiliary verbs in unstressed positions in English sentences

Words	Expected realization	No of occurrence	RP	EIE variants	Vowel quality	Frequency	Percentage
'was'	as /wəz/	300	[wəz]	[wɔz] [wɔ:z] [wəz]	Strong Strong Weak	221 79 0	73.7 26.3 0
'has'	as /əz/	300	[əz]	[ha:z] [haz] [əz]	Strong Strong Weak	230 70 0	76.7 23.3 0

Was as /wəz/ was produced as [wɔz] in 73.7% and as [wɔ:z] in 26.3% and in no instance was the expected /wəz/ realized. Has as /əz/ was realized as [ha:z] and [haz] in 230 and 70 instances constituting 76.7% and 23.3% respectively. There was no instance of the expected realization.

Table 5.4. Reduction/absence of reduction to /ɪ/ and /ə/ in grammatical words

Code	Frequency	Percentage
Reduction to /ɪ/	58	11.6
Absence of reduction to /ɪ/	442	88.4
Total	500	100
Reduction to /ə/	40	2.1
Absence of reduction to /ə/	1860	97.9
Total	1900	100

Table 5.5. Summary of reduction to /ɪ/ and /ə/ in grammatical words

Code	**Frequency**	**Percentage**
Presence of Reduction to /ɪ/ and /ə/	98	4.1
Absence of Reduction	2302	95.9
Total	2400	100

Table 5.4 shows that where EIE subjects were expected to reduce otherwise strong/full vowels in unstressed syllable positions, only11.6% of appropriate reductions to /ɪ/ and 2.1% reductions to /ə/ were realized out of the 500 and 1900 cases respectively. The greater percentages: 88.4% and 97.9% for absence of reduction to /ɪ/ and absence of reduction to /ə/ respectively were produced by the EIE subjects.

In summary, in Table 5.5, EIE productions were coded for "presence of reduction" and "absence of reduction". Presence of reduction included schwa productions and reductions to /ɪ/. The summary table vividly suggests that the EIE subjects hardly reduce otherwise strong vowels to /ɪ/ and /ə/ as their appropriate realizations constituted a negligible 4.1% of the total number of reductions to /ɪ/ and /ə/. 95.9% cases are instances of absence of reduction. The pie chart in Figure 5.1 illustrates the summary.

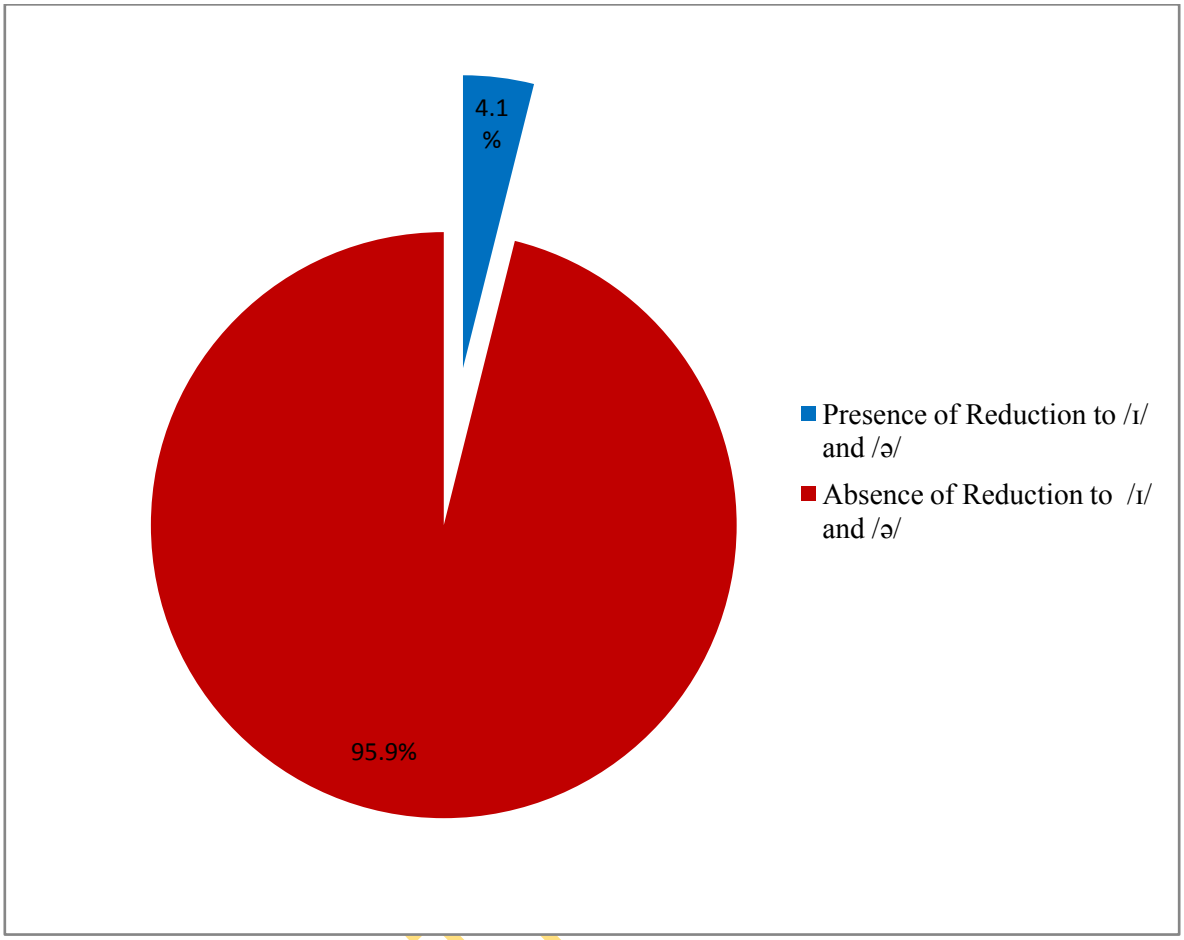


Figure 5.1. Summary of reduction to /ə/ and /ɪ/ in grammatical words (main data)

5.1.2 Vowel reduction to /ə/ and /ɪ/ in content words

In this section of the analysis, the reduction of otherwise strong vowels to the weak vowels /ə/ and /ɪ/ when they occur in unstressed positions in content words having two or more syllables is tested. A total number of 900 cases of vowel reduction in content words are expected from the 100 EIE subjects employed for the main data analysis: 200 cases of reduction to /ɪ/ and 700 cases of reduction to /ə/.

Table 5.6. Testing Reduction to /ɪ/ in content words

Variety	Sounds	Frequency	Percentage	Vowel quality
RP (Control)	/ɪ/	2	100	Reduced
EIE VARIANTS	/ɪ/	6	3	Reduced
	/i:/	72	36	Strong
	/i/	22	11	Strong
	/e/	100	50	Strong
Total		200	100	

Four variants of the expected /ɪ/ were produced by the EIE subjects as shown in Table 5.6: /i:/, /i/, /e/ and /ɪ/ having 36%, 11%, 50% and 5% respectively. Compared to the percentage of full vowels used in substitution for the expected realization, the percentage of /ɪ/ produced by the EIE subjects (3%) is very minimal.

Table 5.7 below showing test of reduction to /ə/ in content words reveals similar results. Four full vowels: /a:/, /ɔ/, /a/ and /ɔ:/ were used in the place of reduction to /ə/ with /a:/ having the highest percentage, 58.7%, followed by /a/ 29.8%, /ɔ/ 7.4% and /ɔ:/ 3.4%. The appropriate reduction was realized only in 0.7% of the expected number of occurrences.

Table 5.7. Testing reduction to /ə/ in content words

Variety	Sounds	Frequency	Percentage	Vowel quality
EIE VARIANTS	/a:/	411	58.7	Strong
	/ɔ/	52	7.4	Strong
	/ə/	5	0.7	Weak
	/a/	208	29.8	Strong
	/ɔ:/	24	3.4	Strong
Total		700	100	

Table 5.8. Summary of reduction to /ɪ/ and /ə/ in content words

Code	**Frequency**	**Percentage**
Presence of Reduction to /ɪ/ and /ə/	11	1.2
Absence of Reduction	889	98.8
Total	900	100

Table 5.8 above shows the summary of vowel reduction to /ɪ/ and /ə/ as produced by the EIE subjects. The results reveal that there was only 1.2% instance of the presence of reduction to /ɪ/ and /ə/ and 98.8% of absence of reduction to /ɪ/ and /ə/. The results obtained show that; EIE subjects hardly reduce otherwise strong vowels in unstressed syllable positions to /ɪ/ and /ə/, and in their stead; strong vowels are retained or substituted. These results have great implications for a syllable-based description for the rhythm of EIE.

Table 5.9. Summary of EIE variants of /ɪ/ and /ə/ in grammatical and content words combined (Main data)

(a) Vowels substituted for /ɪ/	**Frequency**	**Percentage**
/i/	451	70.9
/i:/	85	13.4
/e/	100	15.7
Total	**636**	**100**
(b) Vowels substituted for /ə/		
/a:/	1042	40.8
/e/	25	1
/ɔ/	570	22.3
/a/	424	16.6
/u/	42	1.6
/o/	158	6.2
/i/	191	7.5
/ɔ:/	103	4.0
Total	**2555**	**100**

Substituted vowels for /ɪ/ in both grammatical and content words in EIE

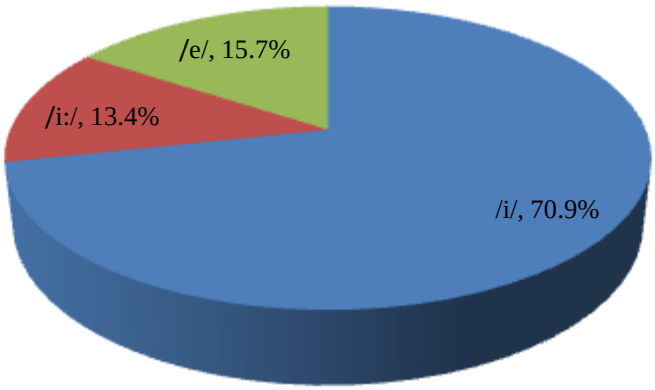


Figure 5.2. EIE variants for /ɪ/ in both grammatical and content words (main data)

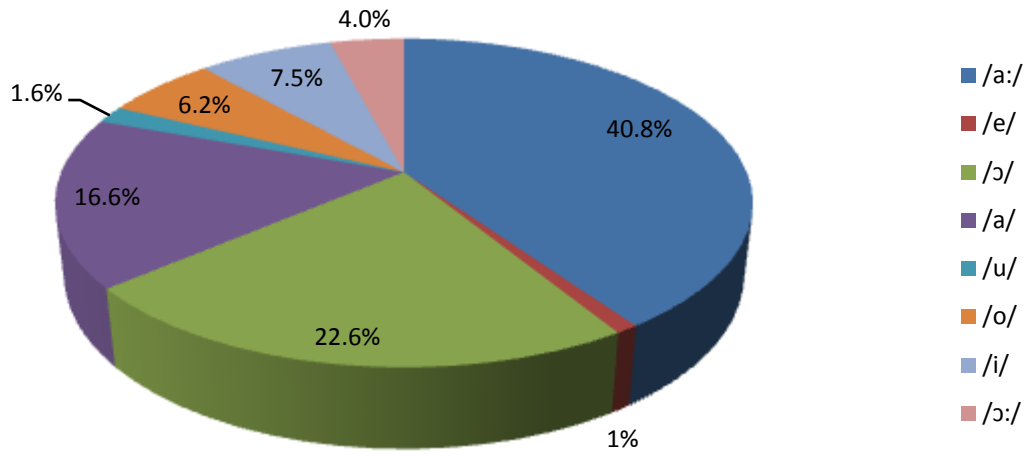


Figure 5.3. EIE variants for /ə/ in both grammatical and content words (main data)

The conclusion reached from the finding of the perceptual study is that the EIE subjects do not reduce strong vowels in the weak forms of grammatical words. Rather, they substitute strong vowels in place of the reduced /ə/ and /ɪ/.

5.2 Metrical analysis

In Metrical Phonology, the basic descriptive data contained in Sound Patterns of English (SPE) is reinterpreted eliminating the numbering of stress levels with its problems of indefinite lowering and replacing it by a system in which stress is defined on a tree structure where nodes divide binarily into s (strong) and w (weak) branches. An English stress rule assigns [± stress] to all vowels. All [-stress] vowels are associated with *W* syllables while [+stress] vowels are most commonly associated with *S* syllables though Cruttenden (1986) notes that *S* syllables may be associated with *W* syllables in certain positions. It is, however, expected that there should be an alternation between the S and W syllables. The assignment of strong and weak nodes is governed by two rules: a Lexical Category Prominence Rule (LCPR) which covers words and compounds and a Nuclear Stress Rule (NSR) which applies to phrases and sentences. Figure 5.3 shows the metrical analysis of 10 EIE speakers taken from the 100 subjects for the main data analysis. One of the SBE speakers served as a control to confirm the alternation of S and W syllables already established in British English. Sentence four in Set B is chosen for this analysis.

CONTROL	S	W	S	W	S	W	S	W
EIE 1	S	S	S	S	S	W	S	W
EIE 2	S	S	S	S	S	S	S	S
EIE 3	S	S	S	S	S	S	S	S
EIE 4	S	S	S	S	S	S	S	S
EIE 5	S	S	S	S	S	S	S	S
EIE 6	S	S	S	S	S	W	S	S
EIE 7	S	S	S	S	S	S	S	S
EIE 8	S	S	S	S	S	S	S	S
EIE 9	S	S	S	S	S	S	S	S
EIE 10	S	S	S	S	S	W	S	S
*	ʤeɪn	əz	fɔ:	tə	la:st	ðə	wɪn	tə
	(Jane	has	four	to	last	the	win	ter)

Figure 5.4. Metrical analysis of *Jane has four to last the winter* produced by 10 EIE subjects and a control

* The transcription does not represent the pronunciation of any of the subjects but just a phonetic representation of the syllables.

KEY

S Strong

W Weak

The analysis in Figure 5.3 reveals that out of the 10 EIE subjects, only EIE 1 applied the LPCR on the word *winter* as did the control. The rest did not apply the rule. It is, however, observed that most of the syllables which ought to be weak resulting to the alternation between S and W syllables as produced by the control are all rendered strong by the EIE subjects. Thus, the results of the metrical analysis confirm the proliferation of strong syllables where there should be weak syllables in the productions of the EIE subjects.

5.3 Variety analysis

The acoustic analysis carried out in this session is aimed at confirming the findings from the perceptual analysis. The Pairwise Variability Index is applied to the data collected. However, for thorough analysis, which makes it difficult to carry out acoustic analysis on all 100 subjects, a representative rendition of 5 EIE and 5 SBE subjects is used for this part of the analysis. The SBE subjects serve to confirm the already established claims on the quality of Standard English vowels in syllables with a view of comparing their quality with the quality of vowels found in unstressed syllable positions in EIE subjects' productions.

The acoustic measure of mean normalized pair-wise variability indices for EIE (Full and Reduced Vowel Sets (Sets A& B)) and SBE (Full and Reduced Vowel Sets (Sets A & B)) for five EIE and Five SBE speakers is presented in Table 5.10.

Table 5.10. Mean nPVI for five EIE and five SBE Sets A and B

Variety	EIE		SBE	
Set	Set A	Set B	Set A	Set B
Subject 1	45.89	51.32	43.86	59.69
Subject 2	53.50	62.99	45.18	61.94
Subject 3	38.21	51.19	34.71	64.35
Subject 4	57.60	51.52	43.92	55.88
Subject 5	42.34	52.09	43.57	66.28
Overall mean	47.51	53.82	42.25	61.63

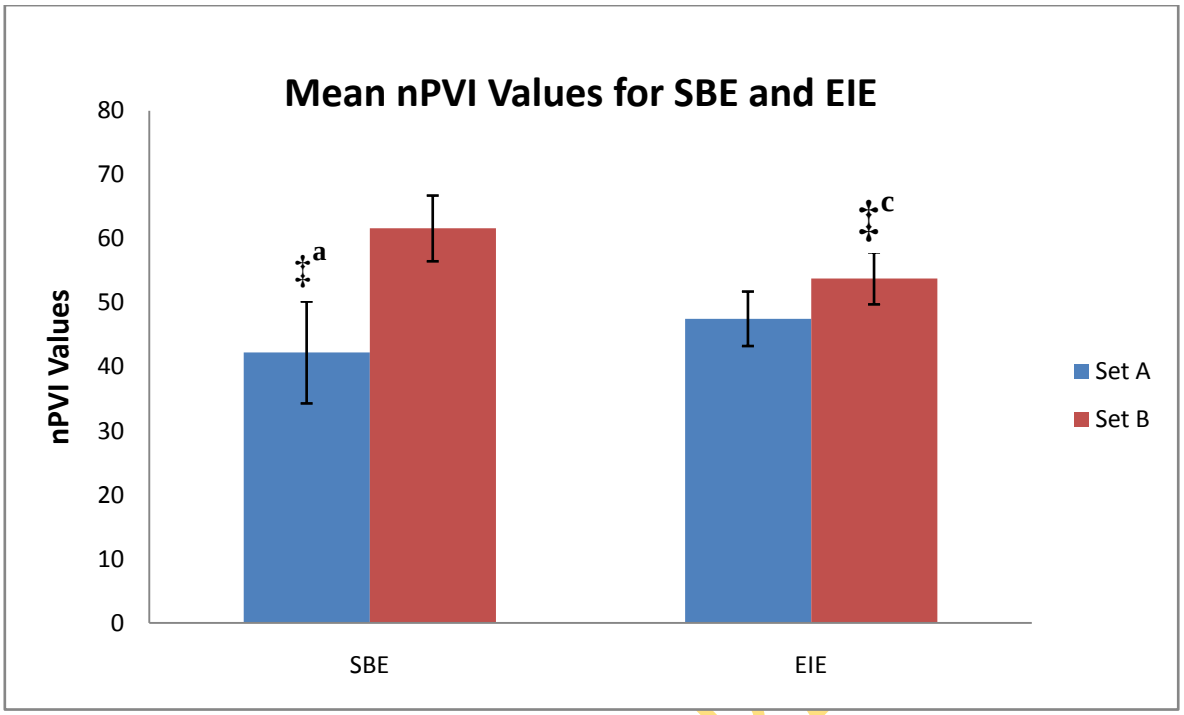


Figure 5.5. Mean nPVI Values for SBE and EIE (Set A and B)

'Bars' are means ± SD. n=5 for each group. Data were analyzed by one-way ANOVA followed by Fisher's LSD Post-Hoc Test. ‡ p<0.05 a=SBE Set A vs SBE Set B, b=SBE Set A vs EIE Set A, c=SBE Set B vs EIE Set B, d=EIE Set A vs EIE Set B.

The PVI results for duration supported the predictions made in this study and other studies. They are illustrated in Figure 5.5 above. The mean nPVI values were subjected to a One-Way Analysis of Variance (ANOVA) with the dependent variable "mean nPVI values" and the independent variables "EIE (Set A and B)" and "SBE (Set A and B)". Significant difference emerged between SBE Full Vowels (Set A) and Reduced Vowels (Set B) and between EIE Reduced Vowels (Set B) and SBE Reduced Vowels (Set B) ($F[3,16]=11.2$, $p<0.05$). Planned comparison showed that as predicted within EIE, vowel duration between Full and Reduced Vowel Sets (Sets A and B) did not differ, reflecting the absence of a durational distinction between full and reduced vowels, but with SBE, the difference was significant ($p<0.05$). Also, the planned comparisons showed that the Reduced Vowel Sets in EIE and SBE differed significantly ($p<0.05$), but the Full Vowel Sets did not.

Thus, the durational analysis of the data showed that EIE exhibits less variability in successive vowel duration than SBE. This finding supports the predictions made in this study, and is consistent with other studies that have applied the PVI rhythm measures that languages, which have been said to be syllable timed exhibit less variability in vowel duration compared to languages that are stress-timed, which exhibit high durational variability because of the presence of both full and reduced vowels. Additionally, the data also suggest that an absence of durational vowel reduction plays a significant role in the impression of syllable-timing in EIE.

Durational distinction within varieties in the Full and Reduced Vowel Sets is represented in the XY Scatter charts in Figures 5.6 and 5.7.

Table 5.11. Mean nPVI duration for EIE full and reduced vowel sets

Variety	EIE	
Set	Full	Reduced
Subject 1	45.89	51.32
Subject 2	53.50	62.99
Subject 3	38.21	51.19
Subject 4	57.60	51.52
Subject 5	42.34	52.09
Overall mean	47.51	53.82

Table 5.12. Mean nPVI duration for SBE full and reduced vowel sets

Variety	SBE	
Set	Full	Reduced
Subject 1	43.86	59.69
Subject 2	45.18	61.94
Subject 3	34.71	64.35
Subject 4	43.92	55.88
Subject 5	43.57	66.28
Overall mean	42.25	61.631

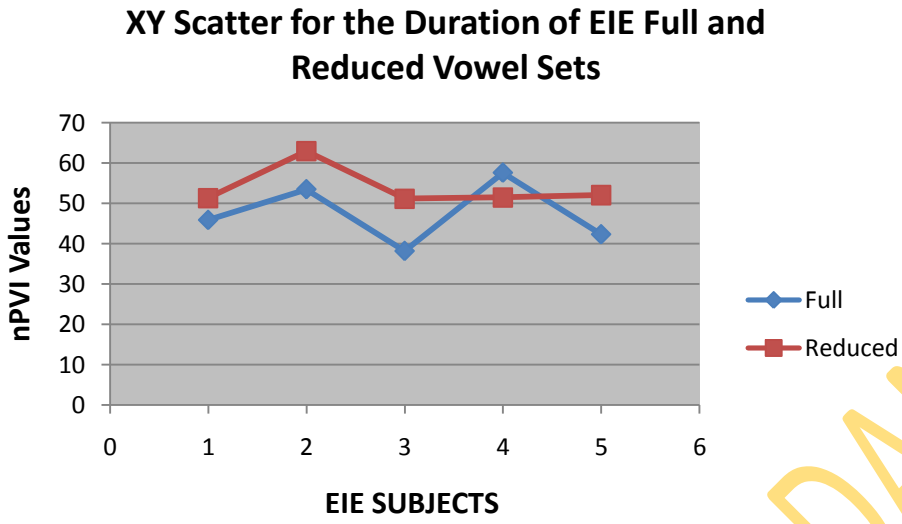


Figure 5.6. XY Scatter chart for EIE full and reduced vowel sets

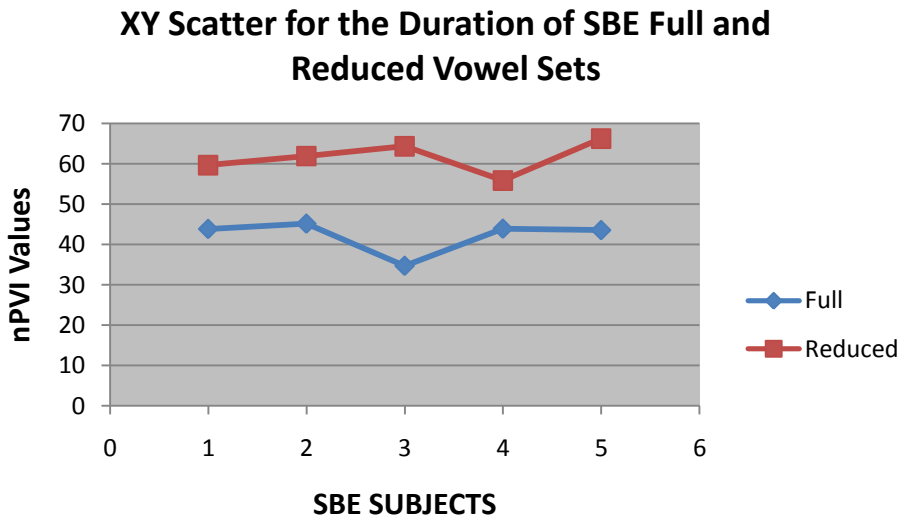


Figure 5.7. XY Scatter chart for SBE full and reduced vowel sets

The XY Scatter charts in Figures 5.6 and 5.7 above reveal a remarkable difference in the distinction made in SBE Full Vowel Set and the Reduced Vowel Set compared to EIE. SBE Full Vowel Set clearly seperates from the Reduced Vowel Set. However, there seems to be an overlap in EIE. This suggests that full and reduced vowels are more or less equal in duration and there is difference between full and reduced vowels in EIE.

Table 5.13. Mean Vowel Duration for all Reduced Vowels in Set B across Varieties (SBE, EIE)

Subjects	SBE	EIE
1	0.07	0.12
2	0.06	0.08
3	0.06	0.10
4	0.04	0.12
5	0.05	0.10
Overall Mean	0.06	0.10

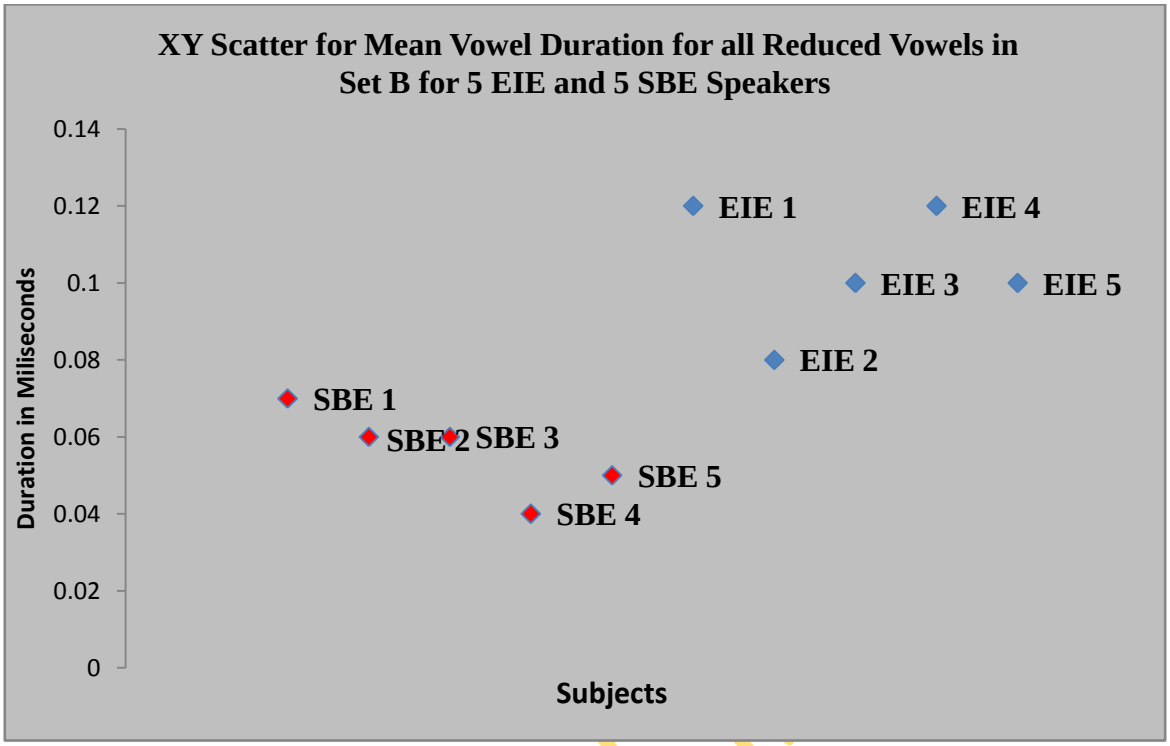


Figure 5.8. Mean Vowel Duration of all Reduced Vowels in Set B for SBE and EIE

The mean vowel duration of all reduced vowels in the Reduced Vowel Set for five (5) SBE speakers and Five (5) EIE speakers were measured and plotted in the XY Scatter chart in Figure 5.8 above. The values reveal that the duration for reduced vowels in EIE are higher than those of the SBE speakers. The lowest duration recorded for the EIE subjects measured is 0.08 produced by EIE 2, which is still higher than any measured in the SBE speakers. This result futher confirms that the duration of reduced vowels is shorter in SBE compared to EIE.

5. 4 Variable analysis

5.4.1 Gender

Callier (2011) and Benton et al (2007) applied the PVI to the gender variable. They show that PVI values for women were significantly higher than PVI values of their male counterparts. To test for gender difference in the speaking style of EIE, 15 male and 15 female speakers were accidentally selected from the 100 subjects for this study. The mean nPVI of Full and Reduced Vowel Sets (Sets A and B) were calculated for the male and female speakers selected for the sex variable analysis.

The analysis of PVI values for 15 female and 15 male speakers respectively compared to the PVI values for 5 SBE speakers was also carried out. This was to determine which of the sexes approximate closer PVIs to Standard English. To determine this, ANOVA was used followed by a Post-Hoc LSD test.

Table 5.14. Mean nPVI values for EIE male and female speakers

Variable	MALE		FEMALE	
Set	Set A	Set B	Set A	Set B
Subjects				
1	45.50	46.12	45.22	46.57
2	43.41	51.58	48.21	46.10
3	40.57	43.91	46.60	49.16
4	48.18	51.07	43.34	44.87
5	49.04	45.31	45.03	50.29
6	40.21	43.56	44.04	44.33
7	45.50	45.04	43.48	47.25
8	40.48	48.75	47.00	50.89
9	48.98	41.38	50.36	51.86
10	45.24	43.20	46.08	48.24
11	40.08	43.91	48.23	50.47
12	48.30	50.59	44.59	44.46
13	41.11	43.51	46.98	46.01
14	45.49	49.66	48.17	51.98
15	40.96	40.34	49.01	51.72
Overall Mean	44.20	45.86	46.43	48.28

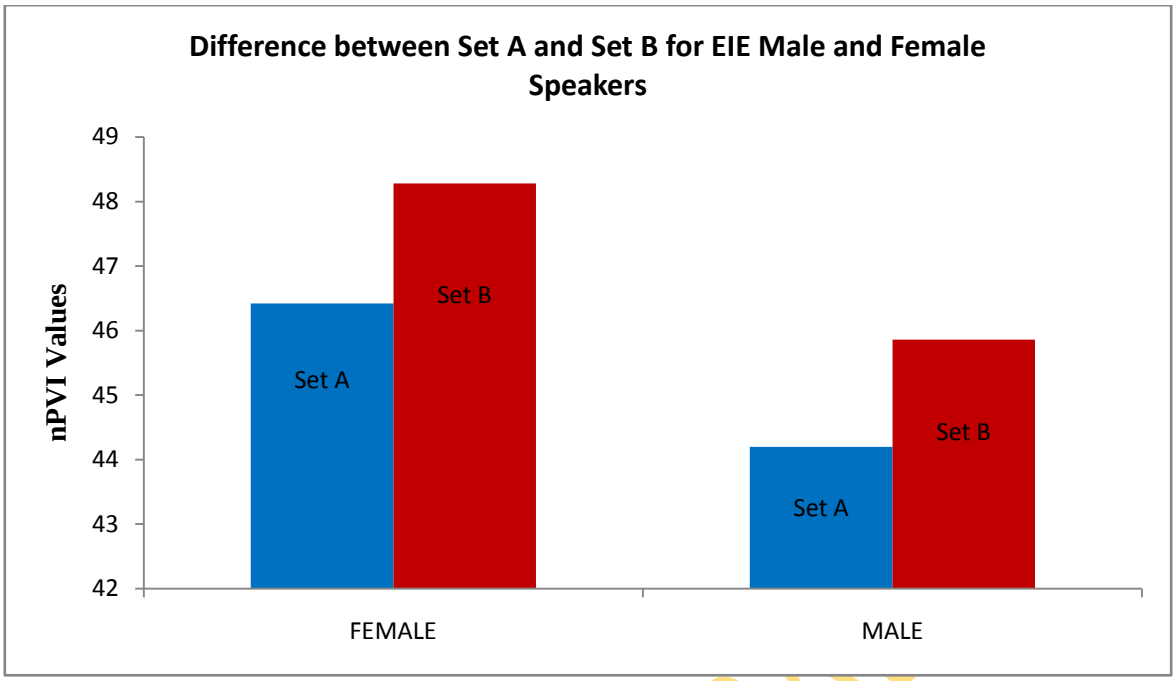


Figure 5.9. Overall mean nPVI for EIE male and Female Speakers

Table 5.14 gives the mean nPVI values for each speaker and the overall mean nPVI values for each gender and the values are plotted on the chart in Figure 5.9. The chart shows that durational values obtained for EIE female speakers are noticeably higher in both sets (A and B) than the values of their male counterparts. However, to test if these values have any significant effect, Analysis of Variance (ANOVA) was conducted followed by a Post Hoc test. Planned comparisons showed that Female speakers' high PVI values were significantly higher ($F[3,56]=4.5$, $p<0.05$) than the male speakers' PVI values in both Full and Reduced sets. This means that, the speaking rate and style of female EIE speakers are different from those of the male speakers.

Table 5.15. Comparison of nPVI values of EIE (Male and Female) speakers with SBE speakers

Subjects	EIE				SBE	
	Male		Female			
	Set A	Set B	Set A	Set B	Set A	Set B
1	45.50	46.12	45.22	46.57	43.86	59.69
2	43.41	51.58	46.60	49.16	45.18	61.94
3	45.50	45.04	45.03	50.29	34.71	64.35
4	45.23	43.20	46.08	48.24	43.92	55.88
5	45.48	49.66	46.98	46.01	43.57	66.28
Overall mean	45.03	47.12	45.98	48.05	42.25	61.63

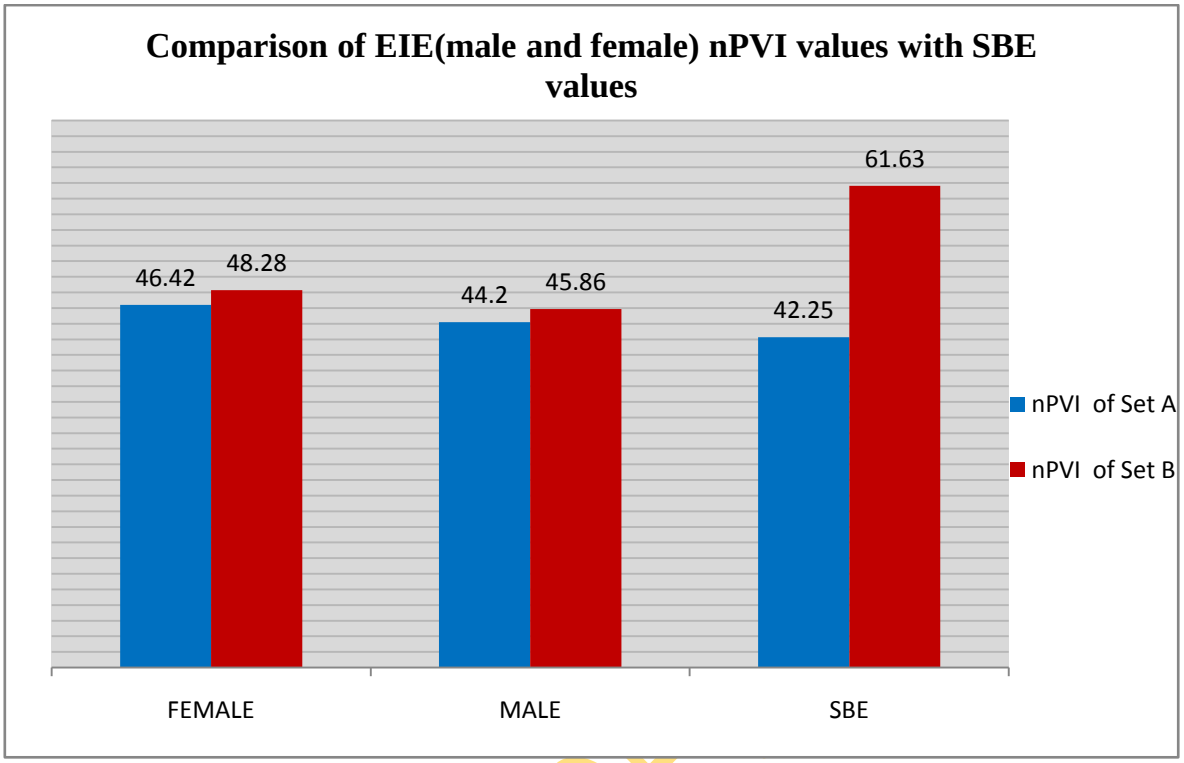


Figure 5.10. EIE (male and female) nPVI values compared with SBE values

Table 5.15 shows the mean nPVI values of Full and Reduced Vowel Sets for EIE (male and female) speakers and SBE speakers respectively. To determine which of the sexes approximate closer PVI values to Standard English, ANOVA was conducted on the values in Table 5.15 followed by Fisher's LSD Post-hoc test. In Figure 5.10, paired comparisons show that in the full vowel set (Set A), EIE male speakers approximated closer PVI values to SBE values than the female speakers and in the reduced vowel set (Set B), female speakers approximated closer PVI values to SBE values than the male speakers, although, the difference in the approximated values between full and reduced vowel sets for EIE male and female were not statistically significant in any way.

5.4.2 Age

Table 5.16. Overall mean nPVI values of full and reduced vowel sets for ages 20-40 and 41 and above

Variable	20 – 40		41 and Above	
Set	Set A	Set B	Set A	Set B
Subjects 1	43.22	46.57	48.21	50.10
2	65.50	66.12	42.34	43.87
3	45.60	49.16	49.03	50.29
4	48.41	51.58	41.04	44.33
5	42.57	43.91	40.48	44.25
6	48.18	51.07	40.48	42.75
7	50.04	55.30	47.00	49.895
8	52.21	53.56	49.36	50.86
9	45.50	45.04	47.08	48.24
10	43.59	44.46	49.23	50.47
Overall mean	48.48	50.68	45.43	47.50

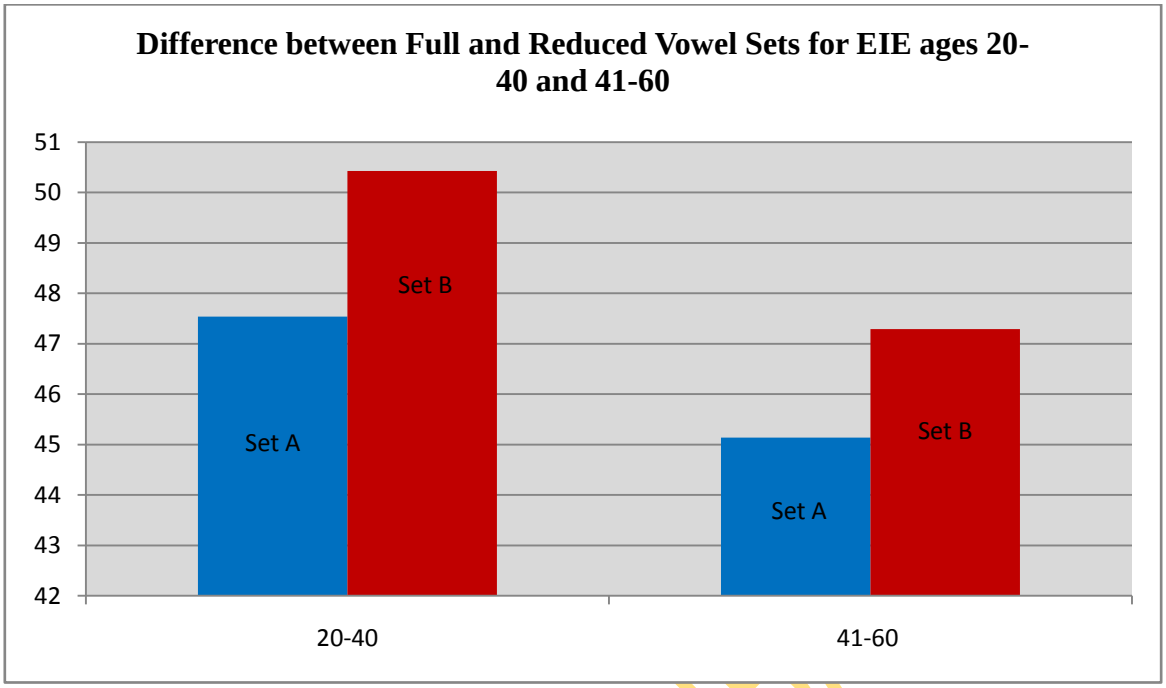


Figure 5.11. Overall mean nPVI for ages 20 -40 and 41-60

The values in Table 5.16 above show that speakers within the age range of 20-40 have higher PVI values than those whose ages fall within 41-60. This information is clearly depicted in the bar chart in Figure 5.11 above. However, to test if there is a significant difference between the two age groups, the mean nPVI values (Full and Reduced Vowel Sets) for each group were subjected to a one-way analysis of variance (ANOVA), followed by a post hoc test. Paired comparisons of Full and Reduced Vowel Sets (Sets A and B) between the two groups showed no significant effect.

Table 5.17. Comparison of nPVI values of EIE ages (20-40 and 41-60) speakers with SBE speakers

Subjects	EIE				SBE	
	20-40		41-60			
	Set A	Set B	Set A	Set B	Set A	Set B
1	45.60	49.16	48.21	50.10	43.86	59.69
2	48.41	51.58	42.34	43.87	45.18	61.94
3	48.18	51.07	41.04	44.33	34.71	64.35
4	50.04	55.30	47.00	49.89	43.92	55.88
5	45.50	45.04	47.08	48.24	43.57	66.28
Overall mean	47.54	50.43	45.14	47.29	42.25	61.63

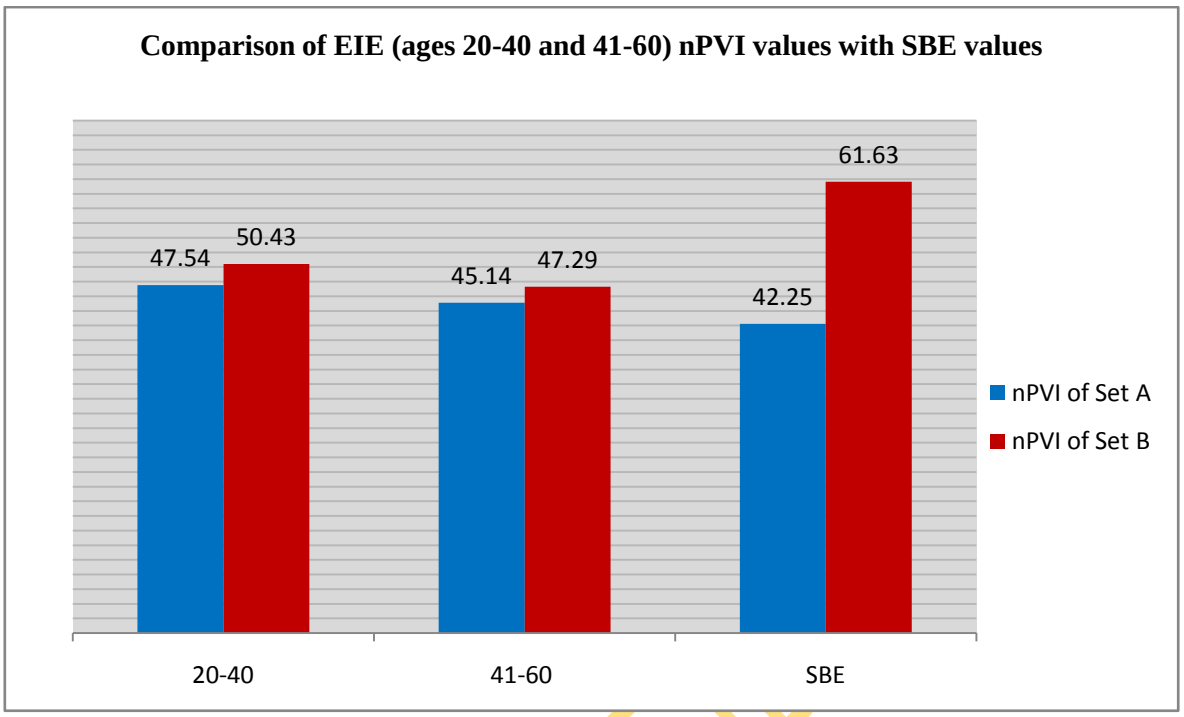


Figure 5.12. EIE (ages 20-40 and 41 and above) nPVI values compared with SBE values

Figure 5.12 shows the age range that approximates closer PVI values to SBE. The PVI values show that speakers whose ages fall within 41-60 approximate closer PVI values to SBE than those whose ages fall between 20-40 in the full vowel (Set A) sets but in the reduced vowel (Set B) sets, ages 20-40 approximate closer PVI values to SBE than ages 41-60. The difference in the approximated values between ages 20-40 and 41-60 in the full and reduced vowel sets were, however, not significant.

5.5 Spontaneous speech analysis

This section of the study examines or tests the phenomenon of vowel reduction in unstressed syllable positions in Educated Isoko English spontaneous speech. It accounts for the variable of naturalness as an important factor in speech production. It is also aimed at corroborating the findings obtained from the controlled uttered text, which though were monitored to be produced as natural as possible were derived from prepared texts.

The sermon of an educated Isoko speaker of English was recorded and excerpts were transcribed and analyzed. The EIE speaker is a renowned preacher in Warri metropolis who had all his schooling (primary – university) in Nigeria. He worked as the secretary to Delta State Christian Pilgrim Board for about ten (10) years. Similarly, the SBE spontaneous data which served as control and taken as a point of reference is an audio sermon of a British born preacher. A portion of the recorded data was listened to, transcribed and analyzed. A perceptual analysis of content words, sentence stress with reference to grammatical words in unstressed syllable positions and an acoustic analysis of some selected grammatical words was carried out.

5.5.1 Perceptual

5.5.1.1 Vowel reduction in unstressed syllable positions in content words

The following words: *department, average, awaits, teacher, about* and *reward, remind, refused* were selected from the spontaneous speech excerpt to test vowel reduction to /ə/ and /ɪ/ in content words respectively in educated Isoko English.

Table 5.18. Vowel reduction in unstressed syllable positions in content words (Spontaneous analysis)

Words	Expected SBE Production	EIE Production
Reduction to /ə/		
Department	/dɪ'pa:tmənt/	[dipa:tmɛnt]
Average	/'ævr(ə)ɪʤ/	[a:vrịʤ]
Awaits	/ə'weɪts/	[awɛ:ts]
Teacher	/'ti:tʃə/	[ti:tʃa]
About	/ə'baʊt/	[ɛbat]
Reduction to /ɪ/		
Reward	/rɪ'wɔ:d/	[rịwɔd]
Remind	/rɪ'maɪnd/	[rịmaind]
Refused	/rɪ'fju:zd/	[rịfu:z]

The analysis of the content words taken from the spontaneous speech data shows that the EIE speaker used full and strong vowels some of which are not English vowels i.e. native Isoko vowels in unstressed syllable positions where the reduced vowels /ə/ and /ɪ/ are expected. This confirms the findings reached with the analysis of the prepared uttered texts that in educated Isoko English, full or strong vowels are substituted for reduced vowels in unstressed syllable positions. However, to determine the quality of some of these vowels substituted for the reduced ones, an acoustic analysis of vowel duration of some grammatical words used in similar contexts in the spontaneous speeches of the SBE and EIE speakers is undertaken in subsequent sessions.

5.5.1.2 Vowel reduction and sentence stress (grammatical words)

Table 5.19. Pronouns in unstressed syllable positions (spontaneous analysis)

Words	Expected SBE productions	EIE Productions
'I'	/ə/	[ai]
'my'	/mə/	[mai]
'you'	/jə/	[ju]
'them'	/ðə/	[ðem]

Table 5.20. Prepositions and conjunctions in unstressed syllable positions (spontaneous analysis)

Words	Expected SBE Productions	EIE productions
'to' before consonants	/tə/	[to]
'of' before consonants	/əv/	[ɔf]
'and'	/ən/	[a:n]
'but'	/bət/	[bet]

Table 5.21. Determiners and auxiliary verbs in unstressed syllable positions

Words	Expected SBE Productions	EIE productions
'an'	/ən/	[an]
'the' before vowels	/ðɪ/	[di:]
'the' before consonants	/ðə/	[di:]
'are'	/ə/	[a:]
'was'	/wəz/	[wɔz]

In Tables 5.19, 5.20 and 5.21, a perceptual analysis of grammatical words as used in the spontaneous speech of the EIE speaker is presented. A very clear distinction is observed between the productions of the EIE subject and the expected SBE productions. It is obvious that the EIE subject used only strong vowels in place of reduced ones. In no occasion were full vowels reduced. This finding has great implication for a rhythmic description of Isoko English.

5.5.2 Acoustic

As earlier mentioned, to determine the quality of some of the vowels substituted for the reduced ones in the spontaneous speech, an acoustic analysis of vowel duration (in milliseconds) of some grammatical words used in similar contexts in the spontaneous speeches of the SBE and EIE speakers is undertaken. Table 5.22 shows the durational measures in milliseconds and the values are plotted on the clustered chart in Figure 5.13.

Table 5.22. Duration measures of some grammatical words used by SBE and EIE speakers in spontaneous speech data

Words	Duration (ms)	
	SBE	EIE
you	0.16	0.20
are	0.11	0.24
to	0.11	0.15
of	0.09	0.21
and	0.10	0.16
but	0.12	0.13

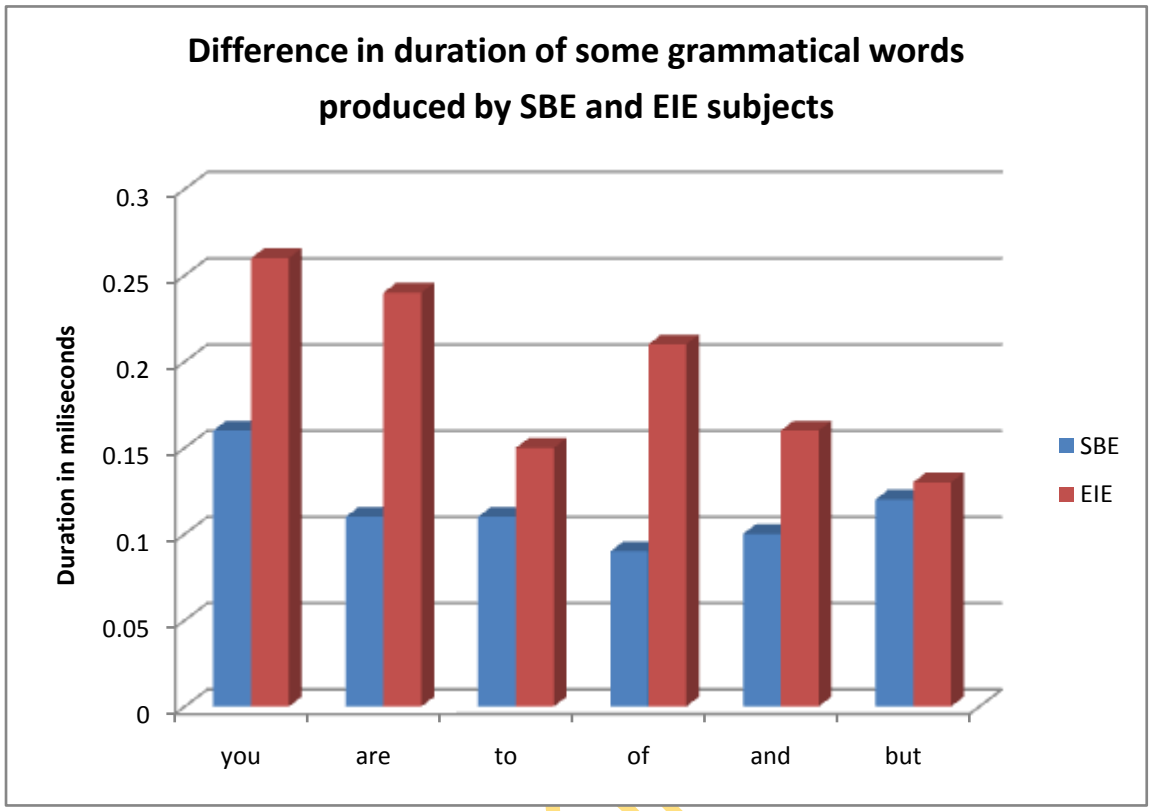


Figure 5.13. Clustered columns for duration of some grammatical wordsin SBE and EIE Spontaneous speech data

Having gone through the acoustic analysis of the natural speech of both EIE and SBE, the findings reveal that there is a preponderance of strong or full vowels in educated Isoko English confirming the results from the prepared uttered text, that there is little or no use of vowel reduction in Educated Isoko English. In the length, i.e. duration of the grammatical words measured (you, are to, of, and, but) in the spontaneous speeches of the SBE and EIE subjects taken from similar contexts, the words produced by the EIE subject were remarkably longer than those produced by the SBE subject. Consequently, the sounds are rendered quantitative i.e. strong.

5.5.3 Metrical analysis of some words extracted from the EIE spontaneous speech

A metrical analysis of the following words: department, teacher, awaits, reward and refused as produced by the EIE subject in a natural context is presented below.

EIE Productions	Expected SBE Productions
s s s	w s w
di pa:t mɛnt	dɪ pa:t mənt
(department)	(department)
s s	s w
ti: ʧa	ti: ʧə
(teacher)	(teacher)
s s	w s
a wɛ:ts	ə weɪts
(awaits)	(awaits)
s s	w s
rị fu:z	rɪ fju:zd
(refused)	(refused)
s s	w s
rị wɔd	rɪ wɔ:d
(reward)	(reward)

The metrical analysis of the selected words from the EIE subject's spontaneous speech data confirms the result carried out on the controlled uttered prepared texts. The metrical analysis shows that as opposed to the SBE expected productions. The EIE subject produced only S (strong) syllables rather than the tree nodes dividing into S

and W nodes which are expected to alternate. Thus, only strong vowels are used resulting in the proliferation of the S nodes observed in his productions.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATION

6.0 Summary and conclusion

The study, vowel reduction in Educated Isoko English, approached Nigerian English from a geo-tribal perspective (Educated Isoko English) by investigating whether vowels are reduced in unstressed syllable positions to /ɪ/ and /ə/ as is customary in Standard British English. It identifies the vowels that are used in reduced contexts, determines if there are any significant differences in the utterances of male and female speakers and the younger and older speakers of Educated Isoko English and which of the sexes and age range approximate closer Pairwise Variability Index values to SBE and finally, defines the rhythm of Isoko English based on the findings reached in the study.

Vowel reduction has been established as one crucial factor that contributes to the perceived rhythms of the world's languages among other factors. This is an essential feature in the rhythm of Standard English, which makes it different from other languages of the world, especially those referred to as "syllable-timed" languages, to which Nigerian English belongs.

Having gone through the perceptual, metrical, statistical and acoustic analyses of the uttered texts corroborated with spontaneous speech data analyses, it is observed that educated Isoko English shows marked differences with regards to reduced vowels in unstressed syllable positions or weak contexts compared to Standard British English. The findings and the conclusions reached are as follows.

The investigation into vowel reduction and sentence stress with particular reference to the use of grammatical words such as pronouns, conjunctions, determiners, prepositions and auxiliary verbs in weak contexts revealed a very minimal use of reduced vowels in unstressed syllable positions in educated Isoko English. There was predominant use of strong vowels some of which are non-English vowels. As such, grammatical words which are supposed to be rendered weak in unstressed syllable positions maintained their citation forms with strong vowels. Out of the two thousand four hundred (2400) cases of expected reduction to /ɪ/ and /ə/ in grammatical

words, there were 2302 i.e. 95.9% inappropriate absence of reduction and only 98 instances i.e. 4.1% appropriate presence of reduction. Similar results were obtained with reference to content words: 889 i.e. 98.8% instances of inappropriate reduction and 11 instances i.e. 1.2% cases of appropriate reduction. 200 cases of reduction to /ɪ/ and 700 instances of reduction to /ə/ in content words were expected. Four variants of /ɪ/ were produced by the EIE speakers: /i:/ 72 (36%); /i/ 22 (11%); /e/ 100 (50%) and the expected realization, /ɪ/ in only 6 instances i.e. 3%. For reduction to /ə/, five variants were produced by EIE speakers: /a/ 411 (58.7%); /ɔ/ 52 (7.4%); /a/ 208 (29.8%); /ɔ:/ 24 (3.4%) and the expected appropriate realization, /ə/ in only 5 instances i.e. 0.7%. These results show that in unstressed syllable positions where the vowels /ɪ/ and /ə/ are expected to occur, majority of the time, strong vowels are substituted resulting in a proliferation of strong vowels and syllables. This has great implications for a syllable-based rhythm in Educated Isoko English.

The highest occurring variants recorded for reduction to /ɪ/ and /ə/ in both grammatical and content words combined are /i/ (71.9%) and /a:/ (40.8%). The variants /u/ (1.6%) and /i:/(13.4%)recorded the least percentages for /ɪ/ and /ə/ respectively in grammatical and content words combined. One of the possible reasons that could be adduced for this is reported by Aziza (2008) that in Isoko, a Proto Edoid (PE) language, the 10 vowel system has reduced to nine and for acoustic reasons, vowel shift and change the vowel /ɪ/ has merged with /e/. Also, Donwa-Ifode (1989) who examined vowel behaviour in Eruwa and Isoko reports that PE /ə/ has merged with /a/ and /ɛ/. The tendency, therefore, is for Isoko speakers of English to replace the vowels /ɪ/ and /ə/ with their mergers /e/ and /a, ɛ/ respectively.

The metrical analysis reveals that EIE subjects were found to produce only strong syllables rather than the tree nodes dividing binarily into S and W nodes. As such, there was no alternation between S and W syllables. This is because syllables, which were expected to be weak as a result of the presence of /ɪ/ and /ə/ maintained their strong qualities. Out of the ten representative subjects who uttered the sentence *Jane has four to last the winter*, only one subject observed the LCPR and the NSR on the word *winter*. The rest did not. Although the subject was able to observe the LCPR and NSR, he could not maintain the alternation of S and W syllables as characterized by the control's production. This led to metrical clashes which could not be resolved.

As contained in the literature, predictions have been reached, in the application of the Pairwise variability index to speech data that languages, which are stress-timed,

would exhibit durational distinction between full and reduced vowels and stress-timed languages would have higher PVI values than syllable-timed languages. Significant difference emerged between SBE Full Vowels (Set A) and Reduced Vowels (Set B) and between EIE Reduced Vowels (Set B) and SBE Reduced Vowels (Set B) ($F[3,16]=11.2$, $p<0.05$). Planned comparison showed that as predicted within EIE, vowel duration between Full and Reduced Vowel Sets (Sets A and B) did not differ, reflecting the absence of a durational distinction between full and reduced vowels, but with SBE, the difference was significant ($p<0.05$). Also, the planned comparisons showed that the Reduced Vowel Sets in EIE and SBE differed significantly ($p<0.05$), but the Full Vowel Sets did not.

The findings of the investigation revealed that the PVI values obtained in the study confirmed the predictions reached. PVI values, especially the reduced vowel set for EIE, were significantly lower than SBE values and the latter showed great variability in vowel duration than the former. This is so because the data established that there is the absence of the use of reduced vowels in EIE whereas; SBE has reduced vowels hence the variability exhibited in its data.

One characteristic feature of reduced vowels is lower duration when compared to full vowels. The acoustic analysis of vowel duration of all reduced vowels in Set B for five EIE speakers and five SBE speakers shows that the EIE speakers have higher duration ranging between 0.08 milliseconds and 0.12 milliseconds compared to SBE lower duration ranging between 0.04 milliseconds and 0.07 milliseconds. The retention of strong vowels in supposed reduced contexts as shown in the perceptual analysis may have contributed to the high duration of EIE speakers. This confirms the claims in the literature that reduced vowels have shorter duration than full vowels.

The PVI index was applied to the variables of sex and age to determine which of the sexes and age range approximate closer PVI values to Standard English. The PVI values for EIE female speakers when compared to their male counterparts were noticeably higher in the full and reduced vowel set. This confirms Callier (2011) and Benton et al's (2007) reports that in applying the PVI index to the sex variable, female speakers have higher values than their male counterparts. However, to test for significant difference, ANOVA was conducted on the values. Significant effect emerged between the female higher values and male values in both sets ($F[3,56]=4.5, p<0.05$). The statistical analysis also showed that when EIE (male and female) speakers were compared to SBE speakers, the male speakers approximated

closer PVI values to Standard English than the female speakers in the full vowel set. But the female speakers approximated closer PVI values to Standard English than the male speakers in the reduced vowel set. The difference obtained in the approximated values between EIE male and female speakers' (full and reduced vowel sets) were, however, not statistically significant. The younger generation represented by the age range 20-40 were shown to have higher PVI values than the older generation represented by the age range 41-60. ANOVA conducted on the PVI values showed no significant effect in both full and reduced vowel sets. However, the younger generation was seen to approximate closer PVI values to Standard English in the reduced vowel set but reverse is the case with the full vowel set.

It is deduced from the results obtained in this study that the speaking style of the female speakers and the younger generation may have accounted for the high PVI values observed and closer approximation to Standard English especially in the reduced vowel set which shows variability between full and reduced vowels. As such, the variables of sex and age may play a significant role in the description of a language's rhythm.

To corroborate the data gathered from the prepared uttered text data, a spontaneous analysis of the sermons of EIE and SBE speakers were analyzed. The results showed that in unstressed syllable positions in content words, the EIE speaker realized /ə/ and /ɪ/ as /a, ɛ/ and /ị/, which are full vowels respectively, thereby retaining their strong vowel quality. Some of these vowels /ɛ/ and /ị/ are non-English vowels. The duration of grammatical words which are supposed to be produced in their weak forms shows that the words *you, are, to, of, and, but* produced by the EIE speaker were remarkably longer than those produced by the SBE subject.

The analysis of some selected content words from the spontaneous speech data showed that the EIE speaker produced only S syllables rather than the tree nodes dividing binarily into S and W nodes. This confirms the impressions revealed in the uttered text data of EIE subjects' inability to observe the LCPR thus establishing the proliferation of strong syllables where there ought to be weak syllables.

The findings from the analyses of spontaneous data confirm the findings reached through auditory impressions:

1. There is little or no use of weak vowels in unstressed syllable positions hence no variability in vowel duration in EIE,

2. Rather than use weak vowels, strong vowels (some of which are native Isoko vowels) are employed in EIE, and
3. The vowels substituted for the weak /ɪ/ and /ə/ which are strong vowels, were noticeably longer in duration than the productions of the control.

Based on the above, the study confirms that there is no durational variability between full and reduced vowels in Educated Isoko English; as such, vowel reduction is absent. Thus, the study concludes following Dauer's (1983) proposal that educated Isoko English is more of a syllable-based language than a stress-based language.

6.1 Recommendation

The study which has investigated an aspect of Nigerian English rhythm from a geo-ethnic perspective will no doubt contribute towards the description of spoken Nigerian English especially in the present clamour for the standardization of Nigerian English. It will benefit phonologists, socio-linguists, language policy planners, language academies and teachers of English in a second language setting.

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APPENDIX I

SET A (FULL VOWEL SET)

1. John came back through France last week
2. Don seemed quite cross with John last week
3. Paul drives huge towns by highway
4. Jane gets four by post each Thursday
5. Grace walks through huge mounds each Friday

SET B (REDUCED VOWEL SET)

1. John was sick of visiting Fred and Sandy his brother and sister respectively at the hospital
2. On his way to the hospital, he saw Don who was across at Jonathan's restaurant
3. Paula passed her trial of courage at the Women's Tennis Open Championship in Los Angeles
4. Jane has four to last the winter
5. Grace was tired of Matthew Freeman

APPENDIX II : SPONTANEOUS SPEECH DATA

(EIE SPEAKER)

I have seen people working in different departments and in most cases, the average human being work in recognition of what reward awaits them, true or false? Am I talking to somebody? Now, this is what I mean. If you are working in an office where you are well paid, you don't need anybody to remind you to go to work early, true or false? Talk to me! If you are conscious of what you are going to have a reward because you don't want to miss the work and you don't want to miss the salary, you get there before time. Many times I ask Christians and I was talking to one of my children here. You work in an oil department, in an oil company, if rain is falling on the day you are supposed to go to court, go to work, your car even refused to kick, what will you do? I don't know about the teaching scale now, teaching salary now but the average teacher will wait until the rain stops and then strolls with the pocket, the hand in the pocket. That's what it use to be in those days o. it is not so now.

APPENDIX III: SPONTANEOUS SPEECH DATA

(SBE SPEAKER)

For today's gospel le lesson is this, abandon all pretense that you are entitled to God's saving grace because of your relationships or because of your religiosity or because of your doctrine and theology. Abandon all pretence that you are entitled to God's saving grace because you have those things, but if you do not abandon that pretense, you will soon despise Jesus Christ and find him dispensable…. Now it is true, it is God who gives us our relationships…but he doesn't give us these things so that we can avoid Jesus.