Features of Tone in Nigerian English Stress Pattern

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Abstract

Nigerian English (NE) has a distinct stress pattern that is often credited to influences from the tone of the Nigerian indigenous languages. This study examined the extent of the influence of tone and the characteristics of stress in NE. Three hundred NE speakers were purposively sampled. The data collected through tape-recording of their renditions of a prepared text was subjected to acoustic analysis, complemented by descriptive statistics. The results showed that stress was assigned in a tone-influenced manner; stress was determined by the presence and the position of the high tone. This suggests that NE should be classified as a pitch-accent language. Therefore, prominence in NE words is better discussed in terms of both tone and stress, rather than as either only tone or only stress. **Keywords**: Nigerian English, Pitch-accent language, Tone-influenced, Nigerian indigenous languages, Stress pattern.

Introduction

New Englishes are strikingly different from older varieties of English. The differences have been attributed to the sociolinguistic effects of the global spread of English that requires it to adapt and amend itself to the features of the indigenous languages (Bamgbose, 2001; Kachru, Kachru and Nelson 2006). Studies on Nigerian English (NE) have shown some interesting peculiarities of this variety at both segmental and prosodic levels (see Jowitt 1991; Udofot, 2003; Sunday, 2010a; 2010b; 2011;

2014; Sunday and Oyatokun, 2016; Sunday and Babayemi, 2020; and Sunday and Oke, 2020; Sunday and Fasunon, 2021; Sunday, 2021).

With regard to tone, Jowitt (1991) claims that Nigerian English (NE) speakers equate high tone to primary stress and secondary stress to low tone and that, in order to avoid three consecutive low tones, they shift word stress. This is instantiated in the pronunciation of *interestingly* (Received

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Pronunciation –RP) which is realised as *interes'tingly* in NE.

He observes that NE occupies an intermediate position between RP, which is an intonational language, and the three major languages in Nigeria, namely Hausa Igbo and Yoruba, which are all tonal. Udofot (2003) claims that there are three varieties of NE, namely non-standard, standard and sophisticated. She observes that these three are, however, similar in that they have common features, yet they are different, as evidenced by the output of the control subject she used in her study. She traces this to the syllable-timing rhythm of the tonal mother tongue of the participants.

Gut (2005), whose study concentrates on rhythm and syllabification in NE, corroborates Jowitt's position. She observes that not only were there less instances of complex syllable structure, vowel reduction and vowel deletion in unaccented syllables, there were also more accented syllables than in the British English (BrE) speech. Regardless of the observed disparity, she concludes that there was no systematic difference in word stress between NE and BrE but that individual NE speakers produced other stress patterns that were different from the BrE patterns. Conversely, abundance of dissimilarities between the stress pattern of words in NE and BrE have been proven by Simo Bobda (2010), who argues that the differences are the result of NE speakers' creativity, overgeneralisation of the general clues for English stress and overreliance on erroneously perceived stress weight. In the same vein, Sunday and Oyatokun (2016) also show that the observed differences were not limited to certain individuals but cut across the participants regardless of their ethnic affiliation.

These studies have alluded to the influence of tone on the stress pattern of NE without providing specific phonetic and phonological evidence. Besides the phonetic cues of stress, there are other phonological characteristics of stress. A notable one is the fact that stressed syllables have the full vowel form, while the other unstressed syllables usually have the reduced form /ɪ, ə/, which makes it possible for them to be compressed to constitute a group. Therefore, stress in BrE occurs at a fairly regular interval; hence, the term stress-timed is used to describe English (Geigereich, 1992; Cruttenden, 2008). Nigerian English has been established to lack this important phonological distinction (Gut, 2005) and this constitutes a major departure from the outlook of stress in BrE. This has been viewed to be the effect of tone in the indigenous languages; but the evidence to support this impression remains unexplored. Weight, the moraic content of a syllable, is another phonological factor that can predict stress; whenever a syllable is heavy by virtue of the nucleus or the existence of coda, it is more probable for it to take stress. Research on stress in NE have not reported in the direction that either the nucleus or coda contributes to the weight of a syllable or that weight occasioned by the factors mentioned above is a major determinant of stress.

This study is non-comparative and one concern that may emerge from a non-comparative study of NE stress is that it floats the possibility that a variety of a language can have a fundamental departure from the superstrate variety at the level of prosodic typology. Such possibility will not be completely novel. For instance, Japanese dialects can be either pitch-accent or unaccented (Haraguchi, 1977). Moreover, some studies have advocated that it is possible to consider some varieties of English as belonging to another prosodic typology other than the stress language class (cf. Lim, 2009; Gussenhoven, 2014; Lian-Hee 2016). Lim (2009) argues that some of the nativised English varieties should be considered as tone languages and that the contact varieties of English, called

the New Englishes, should not be viewed as aberrant in comparison to Standard English but recognized as having their own prosodic system partly due to substrate typology.

Given the background that NE exhibits some remarkable differences in word stress pattern, a better understanding of this emergent pattern becomes important, considering the important economic, educational and intercultural communication roles that English plays in Nigeria, and the fact that speakers of NE interact with speakers of other varieties of English.

Aim of the study

There is an obvious deficiency in the explanatory adequacy of accentuation in NE in the previous studies. It is insufficient to observe a diversion from the prosody of the superstrate without further identifying the phonetic and phonological explanations for such differences. This study aims to answer the following questions: Can the variant accentuation pattern observed in NE be credited to tone of the indigenous languages? If yes, to what extent, and what phonetic and phonological evidence exists to support this claim? This study answered these questions by investigating the role and characteristics of pitch in this variety of English in order to determine whether it is functioning as the acoustic correlate of tone or of stress. Specifically, recourse is made to the phonetic and phonological features of tone so as to determine the appropriate prosodic system which NE belongs to.

Review of Literature

Tone

Tone is a phonological concept; its phonetic correlate is pitch and frequency (auditory and acoustic, respectively). From the perspective of phonetics, tone is the articulatory correlate of the acoustic phenomenon fundamental frequency (F_0). Fundamental frequency is the number of pulses produced per second in a particular speech signal (Yip, 2002). It is measured in Hertz (Hz). This is perceived by a listener as pitch. Therefore, the higher the glottal F_0 is, the higher one's impression of pitch will be (Yip, 2002; Cruttenden, 2008). Atoye (1989) refers to tone as the pitch quality at a given point in an utterance, which is described as High, Mid or Low; in other words, the levels of pitch variation are called tones.

Tones are semi-autonomous from their tone-bearing units in that they are on a separate tier but they are linked to their tone-bearing units by association lines (Hyman, 2001). The tone-bearing unit (TBU) refers to the segment a toneme is associated with. This may be the vowel or the mora. Pike (1948) identifies four characteristics of tone: lexical significance; contrastiveness; relativeness and presence on each syllable. Goldsmith (1987) adds that tone has the characteristics of stability and ability to spread.

A syllable marked with high tone will typically cause the surrounding non-high tone syllables to assimilate and raise their pitch. Conversely, stress will rob surrounding syllables of any stress they may have (stress reduction rules). High tone and stress have this fundamental difference in their influence on their environment. Also, the concept of downdrift and downstep are very common. The former refers to an instance where a H(igh) tone preceded by a L(ow) tone is realised at a slightly lower pitch than the H tone preceding the L tone (Connell and Ladd, 1990). The latter refers to the lowering of an H tone in the absence of an overt L tone (cf. Gussenhoven and Udofot, 2010).

Nearly always, consonants affect tones rather than the reverse, and this is quite common in African languages.

Some consonants have the ability to lower the tone of the host syllable, and may also block high tone spreading across them. These are generally called depressor consonants. Voiced obstruents have a tone-lowering effect, voiceless obstruents have a tone-raising effect, while sonorants have neither (Yip, 2002).

In a tone language, higher vowels have an intrinsically higher fundamental frequency than low vowels and may possess the natural tendency for pitch-raising. This may consequently contribute to the choice of H tone for a particular syllable (Yip, 2002).

It is estimated that 60-70 % of world languages spread mostly across Africa, East and South-East Asia and the Pacific, and the Americas are tonal (Yip, 2002). A tone language system is one in which the tone is the property of the word. It is a language in which an indication of pitch enters into a lexical realisation of at least some morphemes (Hyman, 2001). Pike (1948) defines a tone language as a language having lexically significant, contrastive but relative pitch on each syllable. Lexical tones are part of the phonological portion of a lexical entry, and thus part of the underlying form that is presented to phonology (Yip, 2002). Tone is usually marked by pitch. A relatively high pitch is perceptually identified as High tone, while a relatively low pitch is perceived as Low tone.

Experimental investigations have shown that there are instances where tone and stress co-occur in a language to create a system of interdependency where one influences the position of the other. Such a relationship is identified in Serbo-Croatian. According to Inkelas and Zec (1988), in this language, tone participates in lexical contrasts and the location of stress is predictable from the location of tone. Haulde, Lujanbio and Torreira (2008) aver that, in Goizueta Basque, the stressed syllable is lexically associated with tonal specification. Also, Bethin (2006) argues that some East Slavic dialects display an unusual type of word prosody: word stress is distinctive yet the immediate pre-tonic vowel is as long as or longer than the vowel under stress.

Hulst (2011) claims that a pitch-accent language is one in which pitch and accent are both present; however, pitch is non-distinctive in such. That is, it does not constitute any lexical contrast. Such a system uses pitch as cue of accent. As noted by Fox (2000), accent is the prominence given to a particular syllable relative to adjacent syllables. Stress is cued by duration, pitch variation and vowel quality (Gussenhoven and Jacobs, 1998) and is used to describe languages in which pitch has no specification at the word-level. Accent, however, could be indicated by a number of other phonetic and phonological cues and is realised as non-distinctive pitch. In fact, the presence of tone functions as a cue for accent (prominence), in which case the cue is not a phonetic one, but a phonological one, which relies on the phonotactic distribution of tone (Hulst, 1999). Languages that attest this pattern are classified as pitch-accent languages.

There are two broad categories of tone languages: level-tone languages or register-tone languages and contour-tone languages. The former are mostly in Africa, while the latter are mostly in Asia. The three Nigerian national languages that have exerted influence on the spoken English of Nigerians, namely Yoruba, Igbo and Hausa, are all level-tone languages.

Phonologies of Yoruba, Igbo and Hausa

Yoruba phonology

Numerous and rich insights have been provided on both the segmental and the suprasegmental dimensions of Yoruba phonology. Notable scholars of Yoruba phonology include Akinlabi (2004) and Owolabi (2013).

The sound system of Yoruba has seven oral vowels, five nasal vowels and eighteen consonant phonemes.

In the Yoruba language, tone manifests in two ways: first, as part of the word's make-up, as much a part of the word as vowels and consonants are; and second, as a distinguishing mark of meaning. For example:

bá (high tone) = meet
ba (mid tone) = hide or dominate
bà (low tone) = (to) land

Yoruba has been generally described as a level-tone language because the presence of contour tone, if ever found, is not lexical; unlike Chinese, where both level tones and contour tones contribute to the morphemic meaning of a word. Owolabi (2013) identifies an instance of contour tone in Yoruba but this is usually restricted to word-final position and is in complementary distribution with a low tone preceded by a high tone. It may be that these syllables have two or more weight units (moras) since word-final syllables are often lengthened cross-linguistically (Yip, 2002). Yoruba is a syllable-timed language, in that each syllable receives more or less equal stress and takes the same amount of time to utter (Tiffen, 1974).

Although studies have often described Yoruba as lacking word-level prominence and intonation (Orie, 1997), Atoye (2004) proves that such description is not correct. He avers that tone and intonation do not belong to the same prosodic levels. Tone operates at the word level, while the sentence is the domain of intonation. In contrast, tone and stress have a number of similarities that qualify them to belong to the same phonological group. Tone languages do not generally have complex intonation systems. In his study, Atoye (2004) shows that Yoruba employs intonation for grammatical purposes, such as interrogation. Sunday and Fadeyi (2016) corroborate this claim by showing that

Yoruba indeed uses intonation to express more grammatical functions than attitudinal functions. Paralinguistic cues, such as face wrinkling and shrugging, are used in addition to tune to convey attitudinal expressions.

In the surface phonology of Yoruba, there are three contrasting tones, High (H), Mid (M) and Low (L) and, in most cases, each syllable is associated to one tone and each tone is associated to one tone. Most words start with a vowel, and have either a Low tone or a Mid tone usually not High tone. Except for this minor tonotactic restriction, tones occur freely in Yoruba words, without any obvious restrictions (Akinlabi and Liberman, 2000). Phonetically, H is realised as Rise after L, and L is realised as Fall after H; these effects can be chained, so that HLH is realised as H-Fall-Rise. In addition, there are widespread phenomena of elision and contraction, which sometimes bring about the association of two tones with one vowel and sometimes create floating tones that are deleted postlexically (Cornell and Ladd, 1990).

Phonology of Igbo

The Igbo language belongs to the West Benue-Congo sub-family of the Niger-Congo language family (Bendor-Samuel, 1989). The Igbo language is spoken principally in south-eastern Nigeria, comprising Abia, Anambra, Ebonyi, Enugu and Imo States, where most Igbo people traditionally live. It is also spoken in some parts of Bayelsa, Delta and Rivers States. The standard Igbo dialect is generally described as having twenty-eight consonants and eight vowels, excluding the phonemes of other dialects (see Nkamigbo (2014).

Uguru (2009) claims that Igbo is a tone language with two level tones. These are High and Low tones. The High tone is reported as unmarked.

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Igbo also has downstep tone, which is a High tone with a reduced pitch. Tone is contrastive, as it constitutes a part of the lexical composition of words and can, therefore, change the meaning of a word. Following the African languages' usual tone-marking conventions, the High tone is marked with acute accent [′], low tone with grave accent [`], and downstep tone is left unmarked.

An example of the lexicality of Igbo tone is given below:

isi 'head'	akwa 'cry'
isì 'smell'	akwà 'cloth'
ìsì 'blindness'	àkwà 'bed or bridge'
isí 'to cook'	àkwa 'egg'

Nkamigbo (2010: 54)

Eme and Uba (2016) note that the distribution of the downstep tone is highly restricted. It cannot occur after a Low tone; rather, it can only follow a High tone or another downstep tone because it is acoustically regarded as lowering from a particular height and is perceived as such. In addition, it cannot begin a word. The High and Low tones, however, have no such restrictions, as they can occur at all positions –initial, medial and final.

Phonology of Hausa

Hausa is classified as belonging to the Chadic language family of the Afro-Asiatic phylum (Newman, 2010). Malah and Rashid (2015) note that it is spoken in West African countries such as Nigeria, Ghana, Togo, and Niger, as a mother tongue, second language, and lingua franca.

Studies on the Hausa language have identified forty-seven phonemes: thirty-four consonants, and thirteen vowels made-up of ten pure vowels (long and short): /iː/, /i/, /eː/, /e/, /ɔː/, /ɒ/, /aː/, /a/, /uː/ and /ʊ/, and three diphthongs: /ai/, /au/ and /ui/. The syllable structure of Hausa is limited to CV, CVC, CN (nasal). In the orthography, a word may begin with a vowel letter but is always pronounced with an initial glottal plosive /ʔ/ (See Malah and Rashid (2015) for a full description).

According to Miller and Tench (1980), 'each syllable has a tone assigned to it and in certain cases only the tone pattern distinguishes two lexical items which in all other respects are identical.' This means that Hausa is a tone language just like Yoruba and Igbo. There are three tone types in Hausa: High, Low, and Compound (Greenberg, 1941). Some examples of the effect of tone on the meaning of words include the following:

| *wànè* - (which) | iya –(boundary) |
| *wane* (who ?) | iyà –(mother) |

In the traditional orthography of the language, tones are not marked. Readers are often left to deduce the pronunciation from the context of use. For the purpose of explicating the difference, however, the grave accent indicates a Low tone, while the absence of any mark indicates a High tone.

Much attention has been given here to the phonological characteristics of tone in the three main languages in Nigeria. This is in a bid to establish if the manifestation of tone in NE shares any similarities with these indigenous languages.

Methodology

Participants

Three hundred Nigerian speakers of English (one hundred each from Hausa speakers of English,

Igbo speakers of English and Yoruba speakers of English) whose level of spoken English was similar to Banjo's (1996) Variety III (the variety of English used by university graduates) were used for this study.

Data

A specially prepared text containing twenty-two disyllabic words, eighteen trisyllabic words, thirteen polysyllabic words, and sixteen compound words was composed. The words were carefully selected from earlier studies, particularly Jowitt (1991) and Banjo (1996) Simo

Bobda (2010) and Sunday and Oyatokun (2016), which noted that some words have different stress patterns in NE. Some of these were composed into three short texts and others were listed. The composition of the texts was an attempt to contextualise the words so that they would not all occur in isolation. By so doing, the participants were not quite sure what was being tested; therefore, they were not too conscious of their pronunciation. This helped to ensure that they realised the words as naturally as possible. The renditions of the participants were tape-recorded.

Analysis

The renditions of the 300 participants were examined. All the words tested were extracted and classified into the classes they belong to. These were nouns, verbs, adverbs and adjectives. The number of the component syllables was also used as a parameter for classification. The patterns of stress-marking were observed. The most recurring stress pattern of each word was determined based on a simple percentage count of the varying types of prominence patterns for each word. The numbers were presented in tabular forms and the pattern with the highest number of representation was taken as the norm upon which the acoustic analysis was done.

In order to get the best quality production for the acoustics, one of the participants who could be said to represent the most recurring stress patterns was invited to a noise-proof environment where another production of the words was collected and fed into the PRAAT software developed by Boersma and Weenink (2006) for the acoustic analysis. Only one participant was used for the acoustic analysis because s/he exhibited the most recurring stress patterns that could be considered the norm and to ensure that the pitch variation does not distort the results of the analysis. The acoustic analysis was specifically to identify the acoustic cues of fundamental frequency, intensity and duration that may account for the observable patterns. The rest of the analysis, which included taking measurements of duration, intensity and pitch, was performed automatically, running the Prosodypro script. The Prosodypro script is an add-on script written for the purpose of prosodic analysis in PRAAT. It allows the user to systematically process large amount of speech data with high precision (Xu, 2013).

Thereafter, the phonetic and phonological characteristics of tone as tone languages were examined in relation to the observed accentuation patterns. The influence of tone and the degree of such influence were closely observed and explained.

Results: Word stress in Nigerian English

The predominant stress patterns are presented in this analysis. The following keys are used in the tables:

Key: F-   Frequency of occurrence for each word
        1 -   Occurrence of stress on first syllable
        2 -   Occurrence of stress on second syllable

3 -   Occurrence of stress on third syllable

4 -   Occurrence of stress on fourth syllable

(i) Stress patterns in nouns

Nine disyllabic nouns were tested. These were *success*, *magic*, *cigar*, *Baptist*, *engine*, *ally*, *July*, *madam* and *archive*.

From the data, only *engine* and *archive* were observed to have a uniform stress pattern among all the 300 participants, who realised stress on the first syllable, giving 100% in each case. The table below summarises the stress patterns of the disyllabic nouns tested, the total frequency of occurrence, the frequency of occurrence of stress on each of the composite syllables and their percentage values.

Table 1: Prominence pattern for disyllabic nouns

Word	F	1	2
1. Success	300	238 (79.3%)	62 (20.6%)
2. Magic	300	294 (97.3%)	6 (2.6%)
3. Cigar	300	288 (96%)	12 (4%)
4. Baptist	300	87 (29%)	213 (71%)
5. Engine	300	300 (100%)	0 (0%)
6. Ally	298	254 (85.2%)	44 (14.7%)
7. July	300	264 (88%)	36 (12%)
8. Madam	299	137 (45.8%)	162 (54.1%)
9. Archive	300	300 (100%)	0 (0%)
	2697	80.3%	19.7%

(ii) Stress pattern for trisyllabic nouns

Seven words were tested under this category: *committee, faculty, profession, medicine, strategy, interest, comedy* and *seventeen*. *Medicine*, *interest* and *comedy* were all stressed on the first syllable by all the participants, giving 100% value in each instance. *Strategy* had 99.6%

representation of stress on the first syllable. *Faculty* and *profession* enjoyed more median stress, while *committee* and *seventeen* had mostly final stress. This distribution made it impossible to predict any preferred position in trisyllabic nouns. The table below captures this analysis.

Table 2: Prominence pattern for trisyllabic nouns

Words	F	1	2	3
1. Committee	300	0 (0%)	81 (27%)	219 (73%)
2. Faculty	300	46 (15.3%)	254 (84.6%)	0 (0%)
3. Profession	300	0 (0%)	300 (100%)	0 (0%)
4. Medicine	300	300 (100%)	0 (0%)	0 (0%)
5. Strategy	300	299 (99.6%)	1 (0.3%)	0 (0%)
6. Interest	300	300 (100%)	0 (0%)	0 (0%)
7. Comedy	300	300 (100%)	0 (0%)	0 (0%)
8. Seventeen	300	16 (5.3%)	0 (0%)	284 (94.6%)
	2400	52.5	26.5	20.9

(iii) **Stress pattern for polysyllabic nouns**

As seen in Table 3, the majority of the respondents stressed the third syllable in all the words: *television* (98.6%); *democracy* (99.3%); *identity* (89.3%) and *category* (86.3%). None of these patterns matches the RP stress patterns of the words.

Table 3: *Prominence pattern for polysyllabic nouns*

Word	F	1	2	3	4
1. Television	298	2 (1.3%)	0 (0%)	296 (98.6%)	0 (0%)
2. Democracy	300	0 (0%)	2 (0.6%)	298 (99.3%)	0 (0%)
3. Identity	300	0 (0%)	32 (10.6%)	268 (89.3%)	0 (0%)
4. Category	300	41 (13.6%)	0 (0%)	259 (86.3%)	0 (0%)
		43 3.5%	34 2.8%	93.6%	

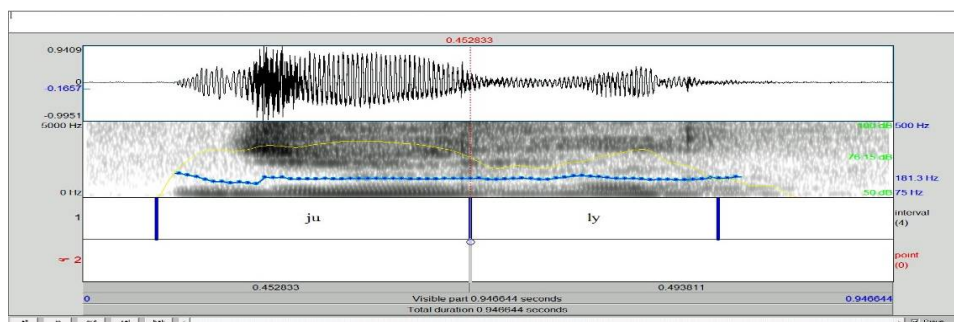Below are the PRAAT images of some of the words.

Figure 1: Pitch contour for *July*

The first syllable labelled 'ju' /dʒu/ had a maximum fundamental frequency of 209.9, an intensity mean of 83.7 dB and a duration value of 366. 9 milliseconds. This showed a higher value than the second syllable /laɪ/, which had an F_0 of 194.6 Hz, an intensity value of 75.4 dB and duration of 288.6 milliseconds. This made the first syllable more prominent than the second syllable.

For *madam*, the figure below shows the pitch and intensity curve of the constituent syllables of the most common realisation of the word.
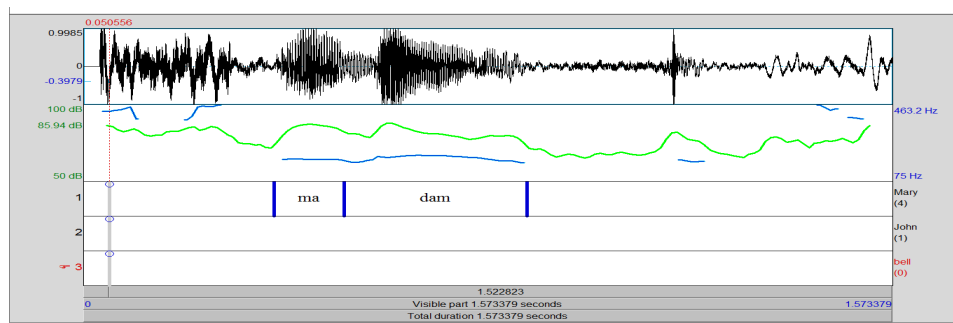
Figure 2: Pitch contour for *Madam*

Based on the values of these variables, the first syllable had a maximum F_0 value of 196.7 Hz, 87.3 dB and 136 ms, while the second had a maximum F_0 value of 217.4 Hz, 88.2 dB and 354 ms, making the second syllable more prominent. The figure below captures the acoustic variables of stress in ***faculty.***

Faculty had two variant primary stress-marking. The first is represented below:
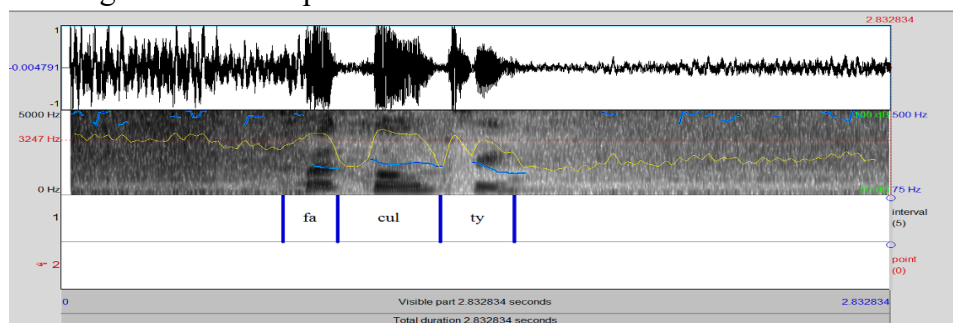

Figure 3: Pitch contour for *Faculty*

In this production of *faculty*, the first syllable had an F_0 of 224.9 Hz, 86.2 dB and 185 ms; the second had 254.2 Hz, 88.4 dB and 351.5 ms; while the third had 239.4 Hz, 85.3 dB and 253.4 ms. These values placed the second syllable as the most prominent; therefore, it was taken as the stressed syllable.

The image below represents the intensity and pitch curves as well as the duration of each component syllable in the pronunciation of *television*.
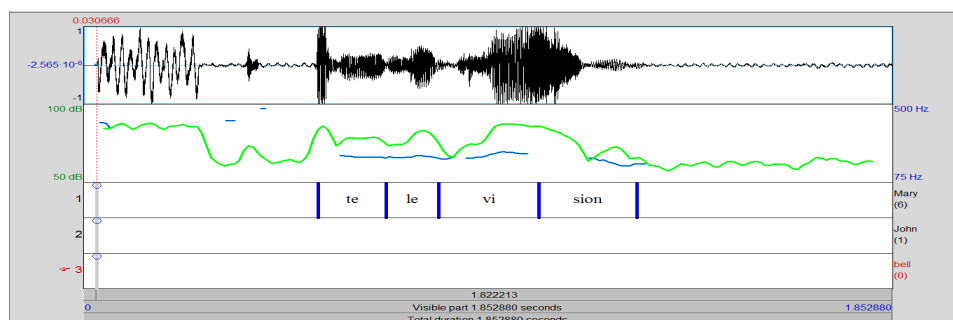

Figure 4:   Pitch contour for *Television*

This image contains the acoustic cues that made the third syllable of *television* stand out as the most prominent. The first

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syllable /te/ had an F_0 value of 219.1Hz, an intensity mean value of 85dB and duration of 156 ms; the second /lɪ/ had an F_0 value of 219 Hz, an intensity mean value of 83 dB and duration of 119 ms. The third syllable /vɪ/ had an F_0 value of 240.4 Hz,

an intensity mean value of 87.5 and duration of 229, while the fourth /ʃɒn/ had

an F_0 value of 201.3 Hz, an intensity mean value of 72.2 dB and duration of 224 ms. As indicated in the results, the third syllable had higher values for all three variables; therefore, it was the most prominent.

(iv) **Stress patterns in adjectives**

For disyllabic adjectives, five words were tested: *curious*, *loyal*, *mystic*, *urban* and *corrupt*. The table below presents the observed stress patterns.

The occurrence of stress for each word tested for this category is presented in Table 4 below:

Table 4: Prominence pattern for disyllabic adjectives

Word	F	1	2
1. Curious	300	300 (100%)	0 (0%)
2. Loyal	300	300 (100%)	0 (0%)
3. Mystic	300	276 (92%)	24 (8%)
4. Urban	300	5 (1.6%)	295 (98.3%)
5. Corrupt	300	0 (0%)	300 (100%)
	1500	58.7	41.2

The table reveals that *loyal*, *curious* and *mystic* had the primary stress placed on their first syllables by all the participants. However, *urban* and *corrupt* showed preference for word-initial stress, with 276 (92%) tokens of occurrence; while *corrupt* showed preference for word-final stress, with frequency of 295 (98.3%). On the whole, the percentage of stress on the first syllable (58.7%) gives the impression that there is preference for word-initial syllables in disyllabic adjectives. This may, however, be misleading because the preference for final stress in *urban* and *corrupt* is indicative of lack of a uniform stress pattern for disyllabic adjectives.

(v) **Stress pattern for trisyllabic adjectives**

Difficult, relevant and *fortunate* were tested for this category. The results are presented in the table below:

Table 5: Prominence pattern for trisyllabic adjectives

Word	F	1	2	3
1. Difficult	300	300 (100%)	0 (0%)	0 (0%)
2. Relevant	300	300 (100%)	0 (0%)	0 (0%)
3. Fortunate	300	300 (100%)	0 (0%)	0 (0%)
	900	100		

There was no variant stress marking for this category because all the participants stressed all three trisyllabic adjectives tested on their third syllables.

(vi) **Stress pattern for polysyllabic adjectives**

Three words were tested for this category. These were *responsible*, *necessary* and *temporary*.

Table 6: Prominence pattern for polysyllabic adjectives

Adjective					
Word	F	1	2	3	4
1. Responsible	300	0 (0%)	7 (2.3%)	293 (97.6%)	0 (0%)
2. Necessary	300	300 (100%)	0 (0%)	0 (0%)	0 (0%)
3. Temporary	300	300 (100%)	0 (0%)	0 (0%)	0 (0%)
		66.6	0.8	32.5	

The table indicates that the third syllable of *responsible* was most preferred by the majority of the participants (293 participants) for stress. The rest (2.3%) stressed the second syllable. All the participants realised stress on the first syllable of *necessary* and *temporary*.

(vii) **Stress patterns in verbs**

For this category, *agree, comfort, purchase, translate, employ* and *attend* were tested**.** *Agree*, *attend* and *employ* received stress on their second syllables by all the participants. Only *comfort* had two variant stress patterns: a total of 207 (69%) participants stressed the first syllable and 93 (32%) participants stressed the second syllable. There was preference for the final stress in *purchase* and *translate,* with 209 (69.6%) and 240 (80%) tokens of occurrence, respectively.

The table below presents summary of the stress patterns of the disyllabic verbs

tested.

Table 7: Prominence patterns for disyllabic verb

Word	F	1	2
1. Agree	300	0 (0%)	300 (100%)
2. Comfort	300	207 (69%)	93 (32%)
3. Purchase	300	91 (30.3%)	209 (69.6%)
4. Translate	298	58 (19.4%)	240 (80.5%)
5. Employ	300	0 (0%)	300 (100%)
6. Attend	300	0 (0%)	300 (100%)
		19.8	80.2

Although from the general percentage representation, the word-final syllable is more generally preferred to the first, *comfort* appears to stand out. This radical diversion from the pattern witnessed in the other verbs implies that affirming preference for word-final stress in disyllabic verbs may not be appropriate.

(viii)   **Stress pattern for trisyllabic verbs**

Five words were tested for this category. These were *determine, contribute, interpret, indicate* and *develop.* The results are presented in the table below:

Table 8: Prominence pattern for trisyllabic verbs

Word	F	1	2	3
1. Determine	300	0 (0%)	288 (96%)	12 (4%)
2. Contribute	300	0 (0%)	61 (20.3)	239 (79.6%)
3. Interpret	300	0 (0%)	36 (12%)	264 (88%)
4. Indicate	300	7 (2.3%)	0 (0%)	293 (97.6%)
5. Develop	300	0 (0%)	300 (100%)	0 (0%)
	1500	0.5	45.6	53.8

The table indicates that the initial syllables were not preferred in trisyllabic verbs. *Determine* and *develop* showed median stress, with 96% and 100%, respectively.

For *indicate* only 2.3% (7 participants) realised stress on the first syllable; 97.6% (293 participants) realised stress on the third syllable. Preference for the third syllable was also observed in *contribute* and *interpret,* with 79.6% and 88%, respectively.

(ix)   *Stress pattern for polysyllabic verbs*

Three words were tested for this category. These were *investigate, participate* and *initiate.*

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Table 9: Prominence pattern for polysyllabic verbs

Verb					
Word	**F**	**1**	**2**	**3**	**4**
1. Investigate	300	0 (0%)	15 (5%)	0 (0%)	285 (85%)
2. Participate	300	0 (0%)	39 (13%)	0 (0%)	261 (87%)
3. Initiate	300	0 (0%)	0 (0%)	0 (0%)	300 (100%)
			54 6%	846 94%	

The table indicates the frequency of occurrence for the different stress placements of each word. The final syllables of *investigate*, *participate* and *initiate* were stressed by the majority of the respondents. Only *initiate* had all the participants (100%) stress the final syllable. The other two words had two forms. *Investigate* was stressed on its second syllable by 15 (5%) participants and on the final by 285 (85%) participants. A total of 39 (13%) participants stressed *participate* on its second syllable and 261 (87%) stressed the final syllable. The less representation of stress on the second syllables of *investigate* and *participate* shows the effort some of the respondents made to approximate to the RP stress patterns.

The figure below captures the intensity and pitch curves of the words as well as the duration of each component syllable in the pronunciation of *investigate*.
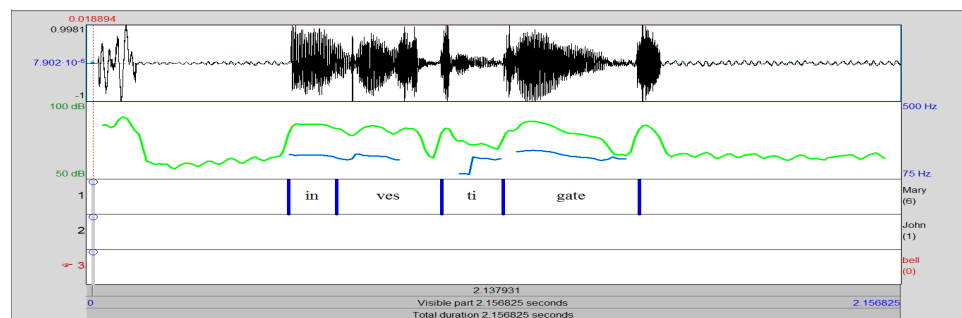

Figure 5: Pitch contour for *Investigate*

In *investigate*, /geɪt/, the final syllable, was considered the most prominent because of the following values: F_0 of 232 Hz, intensity of 89.1 dB and duration of 221 ms. The first syllable had 203 Hz, 81.2 dB and 151 ms; the second syllable had 212 The figure shows the intensity and F_0 curves for *interpret*.

Hz, 80.1 dB and 201 ms; while the third syllable had 204 Hz, 78.8 dB and 207 ms. These values showed clearly that the final syllable was the most prominent and, consequently, the stressed one.
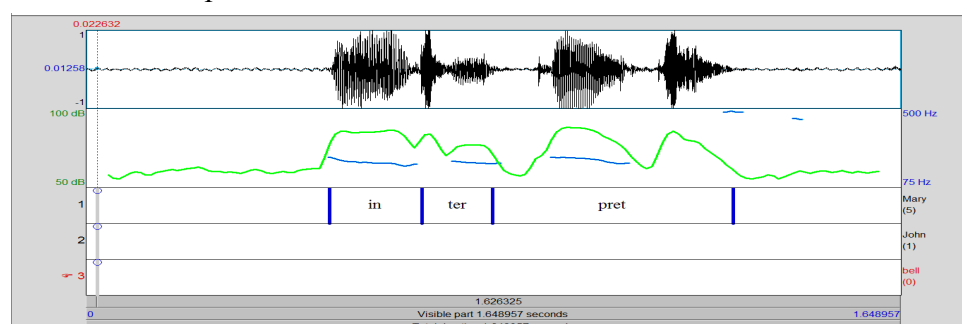

Figure 6: Pitch contour for *Interpret*

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In the verb *interpret,* there were two variant stress patterns. However, the above representation was more common. This image reveals that the last syllable was marked for prominence over the other two syllables. The first syllable had F_0 of 246.4 Hz, 86.4 dB and 235.2 ms; the second had 230.7 Hz, 77 dB and 194.1 ms; while the

third had 254.7 Hz, 89.3 dB and 288.1 ms. These values made the third syllable more prominent.

(x) **Stress patterns in adverbs**

Two items were tested for this category: *perhaps* and *very*.

Table 10: Prominence patterns for disyllabic adverb

Word	F	1	2
1. Perhaps	300	3 (1%)	297 (99%)
2. Very	300	300 (100%)	0 (0%)
		50.5	49.5

Three participants (1%) realised stress on the first syllable of *perhaps,* while 297 (99%) of them realised stress on the

second syllable. All the participants stressed the first syllable of *very*.

(xi) **Stress pattern for trisyllabic adverbs**

For this category, two trisyllabic adverbs were tested. These were *suddenly* and *frequently*.

Table 11: Prominence pattern for trisyllabic adverbs

Adverbs				
Word	F	1	2	3
1. Suddenly	300	300 (100%)	0 (0%)	0 (0%)
2. Frequently	300	293 (97.6%)	7 (2.3%)	0 (0%)
		98.8%	1.2%	

The table shows that NE speakers preferred to assign primary stress to the first syllable of these words.

From the analysis thus far, trisyllabic nouns do not show marked preference for any syllable; while verbs show a general trend for word-final stress.

(xii) **Stress pattern for polysyllabic adverb**

For this category, three words were tested: *successfully*, *necessarily* and *temporarily*. The stress patterns of the words tested under this category are presented below.
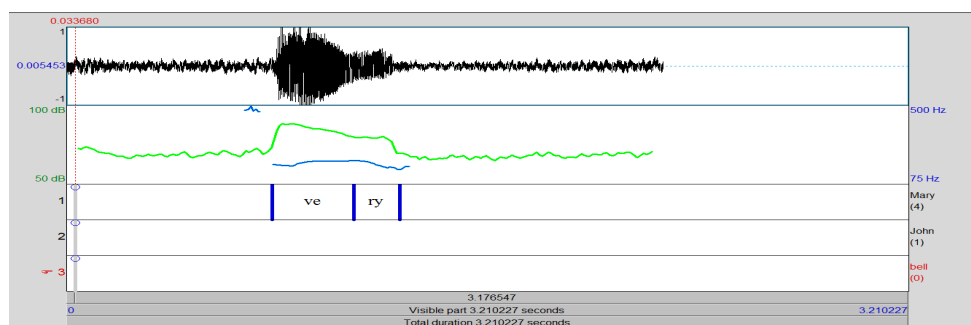
Table 12: Prominence pattern for polysyllabic adverbs

Adverb					
Word	F	1	2	3	4
1. Successfully	300	21(7%)	0 (0%)	279 (93%)	0 (0%)
2. Necessarily	300	300 (100%)	0 (0%)	0 (0%)	0 (0%)
3. Temporarily	299	299 (100%)	0 (0%)	0 (0%)	0 (0%)
		33.2	35.7	31.0	

The data presented in the table above indicate that 7% (21 participants) and 93 % (279 participants) realised stress on the second and third syllables of *successfully*. Both *necessarily* and *temporarily* had their first syllables stressed by all the participants.

The figure below shows the pitch and intensity curve of very.

The image below represents the intensity and pitch curves of the words as well as the duration of each component syllable in the pronunciation of *Very*.

Figure 7: Pitch contour for *Very*

The pitch of the first syllable was measured at 201.9 Hz as against 199.7 Hz of the second syllable. Its duration of 291 ms and intensity of 87.9 dB against the 142 ms and 79.9 dB of the second syllable distinguished this first syllable as the more prominent of the two.

Discussion of findings

In the analysis, it was easy to adapt the HML (high, mid, low) tonal system of most Nigerian indigenous languages to the words. This corroborates the submission that Nigerian English has a more static pitch movement. Each syllable was assigned the perceived toneme. Almost all the words pronounced by the participants fitted into the tone-marking system of three contrastive tones: High (H), Mid

(M), and Low (L). Some syllables had contour tones of high-fall; however, instances of this were limited to the word-final position. This is similar to tone distribution in Yoruba and many Nigerian indigenous languages (Owolabi 2013; Yip, 1989). Only a few syllables, especially the rightmost, were a little difficult to adapt to the tonal association. However, this difficulty was resolved by treating such as two syllables and associating each to the appropriate tonemes. In most cases, the result was a falling contour tone (HL). No low-rise contour was identified and rise-fall was mostly limited to the rightmost edge of the word. Instances of this were found in *investigate*, *participate*, *initiate interpret* and *substitute*.

In RP, the final syllable of *July* has the diphthong [ɑi] as its peak. This makes it bimoraic and thus heavier. This characteristic makes the final syllable

attract stress naturally. For most of the participants, *July* did not show this characteristic, as the final syllable, which was expected to project two moras, did not; hence, it did not yield a contour tone. Rather, it easily associated to an L-tone. This resulted in the backward stress shift to the first syllables, which had an H-tone.

It was noted that the presence of a coda did not specify a syllable for a particular toneme. The expectation is that, since the coda contributes to the syllable weight in RP and makes such a syllable a contender for stress, syllables that have coda should be favoured over syllables that have the CV structure. Therefore, it was expected that syllables with coda would have H-tone. The data revealed that this was not the case in NE. The structure of the syllable did not appear to have any influence on the choice for a tone. For instance, in *substitute*, the first syllable has CVC but an M-tone; in *temporarily*, the first syllable has CVC but an H-tone; while in *responsible*, the first syllable has a CVC but an L-tone.

The tables below present the overall tonal association of the words tested.

Table 13: Tonal representations in disyllabic words

Disyllabic Nouns	Disyllabic Adjectives
1. Success 'HL	1. Curious – 'HL
2. Magic –'HL	2. Loyal –'HL
3. Cigar 'HL	3. *Mystic* 'HL
4. Baptist –M'HL	4. Urban –'HL
5. Engine – 'HL	5. Corrupt –L'HL
6. Ally –'HL	**Disyllabic Verbs**
7. July – 'HL	1. Agree –L'HL
8. Madam –L'HL	2. Comfort –'HL
9. Archive –'HL	3. Purchase –L'HL
Disyllabic Adverbs	4. Translate –M'HL
1. Perhaps –L'HL	5. Employ –L'HL
2. Very –'HL	6. Attend –L'HL

Table 14: Tonal representations in trisyllabic words

Trisyllabic Nouns	Trisyllabic verbs
1. Committee –MM'H	1. Determine – L'HL
2. Faculty –MH'L	2. Contribute – MM'HL
3. Profession – L'HL	3. Interpret – MM'HL
4. Medicine – 'HHL	4. Indicate – MM'HL
5. Strategy – 'HHL	5. Develop–- L'HL
6. Interest – 'HHL	**Trisyllabic adjectives**
7. Comedy – 'HHL	1. Difficult – 'HHL
8. Seventeen - MM'HL	2. Relevant – 'HHL
Trisyllabic adverbs	3. Fortunate – 'HHL
1. Suddenly – 'HHL	
2. Frequently – 'HHL	

Table 15: Tonal representations in polysyllabic words

Polysyllabic nouns	Polysyllabic adjectives
1. Television – MM'HL	1. Responsible – LH'HL
2. Democracy – LH'HL	2. Necessary – 'HHHL
3. Identity – LH'HL	3. Temporary – 'HHHL
4. Category – LH'HL	**Polysyllabic adverbs**
Polysyllabic verbs	1. Successfully –LH'HL
1. Investigate –MMM'HL	2. Necessarily – 'HHHHL
2. Participant –MMM'HL	3. Temporarily – 'HHHHL
3. Initiate – MM'HL	

Tables 13, 14 and 15 above indicate that every word had at least one H-tone and there could be as many as possible with polysyllabic words. For instance, *temporarily* had four contiguous H-tones. NE displayed a common characteristic of tone languages: which is to have a restricted distribution of M-tone. As it is common with many tone languages, M-tone showed restricted distribution: there was no M-tone immediately after H-tone, and M-tone was not found in the word-final position (cf. de Lacy, 2002).

Based on the tonal markings above, stress is preferred on the leftmost H-tone not preceded by an L-tone: for example, *Success*-'HL, *Baptist* –M'HL, *Comedy* – 'HHL, *Committee* –MM'H, *Contribute* – MM'HL, *Strategy* –'HHL, *Interest* –'HHL, *Necessary* –'HHHL, *Investigate* –MMM'HL, *Necessarily* –'HHHHL. When immediately preceded by L-tone, the next H-tone is stressed, for instance, *Democracy* -LH'HL. However, where there is only one H-tone, it takes the stress,

such as *Determine* –L'HL. Finally, when H-tone is the head of a contour, the weight of the contour prevails over the leftmost high, hence stress is attracted to the contour head, for example, *Archive* – H'HL.

A restricted distribution of the M-tone was also observed in the data, where no M-tone was found word-finally. This is consistent with the characteristics of tone languages (de Lacy, 2002). The distribution above reveals no class distinction for the position of stress. Rather, stress is determined by the presence and the position of the High tone.

Role of Intensity as Cue for Prominence in Nigerian English

To examine the possible role of intensity as a cue for stress in NE, the proportion of prominent syllables with highest intensity value among the words was observed. The table below presents the intensity values and duration of the constituent syllables of some of the words tested.

Table 16: Intensity and duration values

S/N	Word	Syllables	Intensity (dB)	Duration (ms)
1	Madam	1	87.3	136
		S2	88.2	354
2	Corrupt	1	86.5	188
		S2	87.9	382
3	Purchase	1	83.7	233
		S2	83.9	305

4	Comfort	S1	88.2	288
		2	87.4	267
5	Very	S1	87.9	291
		2	79.9	142
6	July	S1	83.7	366.9
		2	75.4	288.6
7	Faculty	1	86.2	185
		S2	88.4	351.5
		3	85.3	243.4
8	Committee	1	86.1	143
		2	85.3	167
		S3	87.6	295
9	Interpret	1	86.4	235.2
		2	77	194.1
		S3	89.3	288.1
10	Television	1	85	156
		2	83	119
		S3	87.5	229
		4	72.2	224
12	Investigate	1	85.3	127
		2	83.1	278
		3	73.9	163
		S4	87.2	358

The results in the table above indicated that the intensity values of all the syllables marked as prominent (those with an 'S' marking) were higher than those of other constituent syllables. Consequently, the role of intensity in determining prominence appeared to be very significant. This finding is contrary to what would be expected in the RP stress pattern, going by Crittenden's (2008) assertion that greater intensity is not in itself usually the most important factor in rendering a sound prominent in English (RP).

What is prominence in NE: Stress or High tone?

Both stress and tone are phonological representations of the acoustic cues of F_0 (pitch), amplitude (intensity) and duration (length). For this reason, the presence of either of the two can more appropriately be determined phonologically and not phonetically. From the acoustic analysis, the following have been observed in NE:

i.   In NE, multiple high tones can be contiguous, possibly an evidence of the ability of tone to spread. This is contrary to the situation in RP, where gradient stresses are usually not in adjacent positions. That is, it is not common to find a primary stress and a secondary stress occurring next to each other. Also, considering the fact that the height of the contiguous high pitch (High tone) decreases as it moves rightward, one may say that tone spreading in NE is rightward.

ii.   The effects of tone and stress on their environments are quite different. High tone will typically cause surrounding non-high tones to assimilate and raise their pitch. On the contrary, stress will rob surrounding syllables of any stress they may have. In the data, non-High

tones were not so low, which may be the raising effect of the High tone. This raising of non-High tones gave NE the characteristic 'intonational' flatness and robbed it of the usual rhythm that accompanies RP. A closer look at the figures revealed that the movement of the pitch is not as drastic as would have been expected of a stress-timed language like English. Again, the vowel of the unstressed syllable was expected to approach schwa quality. The data showed that the vowels of the low-tone syllables were not reduced. The nucleus of each syllable was qualitative in NE, that is, each syllable had a distinct identity. Syllables were not squeezed into a group. This is unlike RP, where some syllables lose their identities to other more prominent syllables. In short, there was little or no instance of syncope.

iii. Studies (Hyman, 2001; de Lacy, 2002) have shown that tone is affected by its environment but stress affects its environment. In other words, the type of consonants and vowels can determine whether there will be a High tone or a Low tone. Conversely, stress infuses more quality into the nucleus that houses it. A careful examination of the syllables with High tones revealed that they shared some segmental similarities. Voiced obstruents exerted a lowering effect on the tone; instances were found in *engine*, *ally,* and *cigar.* When there is a competition, the lowering effect of nasals on the pitch height was not as strong as that of voiced obstruents. Therefore, in *magic*, the onset of the first syllable did not occasion any lowering, while the onset of the second syllable, being a voiced obstruent, occasioned a lowering. In *curious*, /r/, a liquid and a sonorant, did not exert any influence, while the onset /k/ of the first syllable, a

voiceless obstruent, raised the tone. This also explains the choice of tone in *ally* and *July.* Voiceless aspirated obstruents were even more notable for their tone-raising effect.

iv. The issue of secondary stress may be considered as secondary prominence only if the next highest pitch value is considered for such a title. This is because prominence in NE was not marked by a change in pitch; rather, high pitch is an important marker of prominence.

v.   The two major characteristics of obligatoriness and culminativity were present in NE.

vi. There was no word without at least one H-tone syllable and at most one High tone which stood out as the most prominent. This made it look like stress but the fact that this was with regard to tone would not qualify NE prominence as the same as prominence in RP. This situation presented a pattern that was inconsistent with both stress languages and tone languages.

vii. It was easy adapting the HML tonal structure of most Nigerian indigenous languages to NE, where each syllable had a distinct tone. In addition, the position of each tone type relative to other tone types was also indicative of the presence of tone. The restricted distribution of M-tone also supports the presence of tone in NE.

viii. From the four word-classes tested, one may expect that there should be some classificatory paradigms that determined the position of stress. There was no evidence supporting the influence of either the word class or the syllable count in stress assignment.   33

ix.   There was a culminative word prominence in the data. This prominence did not seem to favour any particular syllable type (open or close). However, the edges (right or left) had more stress on them because of the Voice Onset Time and downdrift, respectively, which elongated the realisation time, in addition to other phonetic cues of pitch and intensity. Each syllable had a nucleus, which was always a vowel, although, for some of the participants, the vowel could sometimes be subtle in an attempt to approximate syllabic consonants.

The observations noted above point in the direction that NE is not like Standard British English, especially with regard to stress. In view of this, prominence in NE words is better discussed in terms of both tone and stress rather than as either only tone or only stress.

Conclusion

Some studies (Simo Bobda, 2010; Sunday and Oke, 2020) have treated NE as a stress language just like the meta-variety but different with respect to some segmental and prosodic features that distinguish it from other varieties of English. This is true to some extent. However, close observation suggests that the peculiarities of NE extend beyond minor segmental and prosodic variants. This implies that NE is not a stress language. It has a peculiar prosodic system that is typologically incompatible with a stress language system. Unlike SBE, NE has no stress distinctions independent of the distinctions between accented and unaccented syllables. It is also not a tonal language because accent-marking does not contribute to lexical differentiation in words.

There are two independent prosodic phenomena active in NE: tone and stress. It is evident that stress is attracted to a higher tone. There were no observable instances where an L-tone syllable was specified for stress over an H tone. The fact that, in NE, every word had at least one H tone further reinforces de Lacy's (1999) assertion that high-toned moras attract metrical prominence. From the analysis, it can, therefore, be concluded that NE belongs to the prosodic typology of languages called pitch-accent, where tone acts like stress. This kind of tone-dependent accentuation pattern observed in NE does not seem to fit into any of the categories of the pitch-accent so far identified. This study is, therefore, a contribution to the discourse on pitch-accent and how varieties of world languages could gradually be taking on a new life of their own based on influences from their linguistic environment.

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