

An Analysis of the Nucleus Element in the Syllable Structure of Nigerian-English Bilinguals

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ABSTRACT

This study examined the nucleus element in the syllable structure realized by Nigerian-English bilinguals and interpolated it with the same structure in Standard British English (SBE). The purposive sampling technique was used to select seventy (70) undergraduate students in the University of Uyo, Nigeria, comprising respondents from ten (10) linguistic groups. These included the three (3) major-group languages: Yoruba, Igbo and Hausa and six minor-group languages: Idoma, Igala, Eket, Anaang, Oro and Ogoni. The instrument used was tagged "Pronunciation Package for Nigerian English Users" (PPNEU), which contained a corpus in which the nuclei of forty five (45) words were tested. The control was a native speaker of English. The data were analyzed perceptually using simple percentages. The result showed that the nucleus element in Nigerian English is characterized by substitution, vowel insertion and vowel neutralization, as stronger vowels were substituted for weak ones. For instance, [ɔ] was substituted for /ʌ/ and /ə/ in certain phonological environments. Equally, [ɑ] was inserted in the final syllable of global /'gləʊbəl/, among others. It was concluded that some P-rules such as vowel reduction and schwa deletion do not apply markedly in Nigerian spoken English. The study also concluded that the nuclei elements in this variety of English differ significantly from those of Standard British English, thus signifying that in a second language environment, the segmental phenomena inevitably acquire new features resulting in unpredictable phonological forms that suggest an evolving endonormative patterning in the Expanding Circle Englishes (ECE).

Key Words: Syllable Structure, Nucleus element, Nigerian English, Expanding Circle Englishes, spoken English

Introduction

The English language in Nigeria exhibits certain distinctive features that cannot be ignored. This situation results from the range of social, ethnic and linguistic

constraints posed by the second language context in which the language operates. This variety of English has often been assumed to differ significantly from other varieties of English. The phonological features in Nigerian English substantially mark it out from other varieties of world Englishes. This variation in the phonological structure affects both the segmental and the suprasegmental features. The way Nigerians articulate the sounds of English vary from the way the native speakers of English pronounce them. These differences are caused by several sociolinguistic factors.

The knowledge of syllable structure is significant in understanding the constraints of phonotactics in languages. In English, as in other languages, phonemes are grouped in such a way that they form syllables while the syllables are in turn organized to form words and larger units. The English syllable comprises a unit of speech made up of a vowel, a diphthong or a triphthong with or without one or more consonant sounds. The vowel element (also called the nucleus) is obligatory in the syllable structure because it provides the sonorous element. Except where a consonant constitutes a syllabic in an utterance, the vowel element serves as the sonority peak. Based on this background, the researcher is interested in analyzing the nucleus element in the syllable structure of Nigerian English (NigE from henceforth), and in identifying those features that make it different from Standard British English (SBE from henceforth).

Statement of the Research Problem

Speakers of English as a second language (ESL) generally, and in Nigeria in particular, resort to vowel reduction through several ways as a means of simplification. One or more methods of simplification are often employed: some elided by syncope, some inserted as epenthetic vowels while others substitute one phoneme for others, and so on. For instance, Gut (2004) observed that there is the insertion of epenthetic vowels [u] and [i] between word final syllables as demonstrated in *cattle*, realized as [ˈkʌtʌl]. Also, Adetugbo (2004), Adedimeji (2007) and Josiah (2014) confirmed that Nigerian speakers substitute long vowels for the short ones. For instance, /i:/ is realized as [i], /u:/ as [u], /a:/ as [a], and so on. The implication of this simplification method is that it creates different syllable patterns in NigE which may lead to communication failure. Therefore, this study aims at investigating and identifying the features of the nucleus elements in NigE which may result in communicative incompetence.

1.3 Objectives of the Study

The objectives of this study are to:

- i. provide a detailed analysis and evaluation of the nucleus elements in NigE;
- ii. identify the phenomena that characterize the nucleus element in NigE;

- iii. determine quantitatively the durational values of the nucleus element in NigE.

1.4 The Literature

Available literature on NigE phonology is replete with facts about the syllable structure. The nucleus element within that structure appears to have some peculiar features as conjectured in the literature reviewed in this study. For instance, while English permits a complex syllable structure of up to three consonants at the onset and a maximum of four consonants at the coda, often summarized as (c⁰⁻³) v (c⁰⁻⁴), Nigerian languages do not (cf Eka, 1996). This means that the phonotactics of English does not permit more than three consonant clusters initially and four finally in the syllable structure. Kreidler (1989) similarly observes that, in English, there are never more than two vowels in a sequence in single words. This is also true of the syllable structure. Phonotactics is what defines permissible or non-permissible syllable structures and differs significantly from one language to another. The implication is that the phonotactics of SBE syllable structure differs significantly from any of the Nigerian languages.

Equally, Gut and Milde (2002) explain that syllabification is different in NigE compared to British English. In the former, a higher percentage of CV syllable occurs and the ratio of open and close syllables is different from that in British English. This may be due to the dissimilarities between the Standard British English and Nigerian languages in terms of their syllable structure. In a study on the Ibibio language, Gut and Milde (2002) further note that the language has the syllable structures: (V/N), CV, CVV, CVC, CVVC, and CCV. The V/N is the syllabic prefix, which may be either a vowel or a syllabic nasal.

In English, for instance, some syllables of most multi-syllabic words do not often receive emphasis, so they are not accompanied by some kind of “loudness” that is relative to the other syllable in the same utterance or word. Roach (2009) explains that vowels in such syllables tend to be shorter, of lower intensity and different in quality. The phonological consequence of this is that this type of syllable is produced with some silence, little or no emphasis and sometimes totally swallowed or elided by syncope. Such syllables that have these characteristics are called the weak syllables. The most common one is the peak or the nucleus of the syllable which is almost always short, that is, the peaks are made up of short vowel sounds such as /ɪ, e, æ, ɒ, ʊ, ʌ, ə/, which signal the occurrence of weak syllable.

Roach (2009) adds that such a weak syllable, with a short peak is usually an open syllable, with no coda. Sometimes, when it has, the coda is just the final element with one consonant. An example is “cardinal” transcribed as /'ka:dɪnəl/ or /'ka:dɪnl/. In the second transcription, the final syllable has a syllabic consonant /l/ as its peak giving /nl/, thereby completely eliding the schwa /ə/ that ought to be the peak. Here, it is possible to swallow /ə/ because it is a weak vowel. Inversely, if the other vowel sounds, apart from those pointed out above, constitute the peak of a syllable, such syllables are regarded as strong syllables. These vowels are: /i:, a:, ɔ:, u:, ɜ:/ and all of the diphthongs and triphthongs. This is mostly true of the native speakers’ variety of English, but it is doubtful if these short vowels are elided in NigE. As we may discover later in this study, short vowels in NigE have been consistently reported by many researchers as being longer than the short ones in British English, or sometimes, they are substituted for a neutralized form, for instance, [ɔ] may be substituted for /ə/ (cf Adetugbo, 2004; Gut, 2004; Udofot, 2007; Bobda, 2007, Josiah and Soneye, 2015).

In standard English, Akinjobi (2009) maintains that some words have syllables with syllabic consonants such as /n,l/ as peaks rather than vowels that are usually found in that position. It has been observed that educated Nigerian speakers, rather than use syllabic consonants as the peaks of such syllables, usually insert epenthetic vowel between the preceding consonant and the syllabic consonant. This source further maintains that a major area of deviation from the standard usage for Nigerian speakers of English is in the realization of vowels and syllables that occur in unstressed positions. This is because most of the indigenous languages have fewer vowels when compared to those of SBE and they do not show distinctions between the tense and lax vowels. This may be true as NigE has been proven to adopt most features of the indigenous languages and will be tested later in this study.

Akande (2009) opines that, among the Yoruba speakers of English (YSE), the only difference between the vowels in *sit* and *seat*, and between *good* and *rude* is duration, as the monophthongs in each pair have about the same quality. Similarly, according to Alabi (2007), /ə/, /æ/, /ɜ:/ and

/a:/, as in the words *father*, *cat*, *birth* and *star* respectively, may all be replaced with the cardinal [a] by the Nigerian speakers of English. However, this distinction is not always true because a vowel in RP may yield different vowel forms in NigE. For example, the central vowel /ɜ:/ may be realized as: [ɔ:] as in *urged*; [æ] as in *earth*; [e] as in *girl*; and so on.

Udofot (1997) measured the duration of syllables in one read sentence and discovered that syllables containing reduced vowels were, on the average, considerably longer in NigE than in British English. The duration of a single schwa, for example, is almost double in length in NigE than in British English. In accented syllables, those containing long vowels such as [i:] were longer in British English and those containing short vowels such as [ɪ] were shorter in British English than in NigE. Thus, syllable duration across all syllable structures and phonetic types are more similar in NigE than in British English.

Alibi (2012) remarks that reduced vowel is a remarkable quality of NigE, as obtained in many of the local languages. Nigerian users of English generalize and extend the quality of close vowel system to English. For example, /a/ is used for /ɔ,ʌ,æ/ in cases where such sounds feature. Related to this is the alteration of vowel quality by reducing the length of long vowels /ɔ:ɜ:/ to neutralized forms /ɔ/ and /e/ respectively. Also, the introduction of epenthetic vowels to clusters to open up closed final syllables gives rise to the possibilities of words like ['ɔŋku] for *uncle* instead of /'ʌŋkl/; ['botɪn] and ['litu] for /'bʌtn/ and /'lɪtl/ respectively.

Ikima (2012) using markedness approach to syllable errors of Tiv speakers of English concluded that in terms of syllable structure English allows complex syllable margins which are not permissible in Tiv. Therefore, whenever Tiv speakers encounter such uncommon syllable structures, they employ some modification processes to repair the 'alien' phonological structure by using different strategies in accordance with the phonological rule of L1 such as vowel epenthesis where various phonemes are inserted to re-syllabify the consonant clusters. For example: Spread /spred/ may be pronounced as [spírêd] or [spí'rédì], clock /klɔ:k/ as [kí'lɔk] or

[kí'lòkì], junction /'dʒʌŋkʃn/ as [jɔ'kʃɔn'] and Benjamin /'bendʒəmɪn/ as [béndʒamĩn].

Utulu (2013) agreed that the closing diphthongs /eɪ/ and /əʊ/ are usually monophthongized to [e] and [o] in educated Urhobo English. Using the paradigms of moraic theory, the study established the fact that the monophthongized diphthongs were lengthened to [e:] and [o:] due to the need to preserve the weight of the deleted /ɪ/ and /ʊ/ in SBE /ei/ and /əʊ/ diphthongs. Some examples demonstrated in the study were: *pay* /peɪ/, *play* /pleɪ/, *slow* /sləʊ/, and *blow* /bləʊ/, pronounced as [pe:], [ple:], [slo:] and [blo:] respectively, by educated Urhobo English speakers.

Soneye and Oladunyoye (2015) state that Yoruba and Igbo languages on the one hand have CV, V and N syllable structures. They both allow a maximum of two elements in a syllable. These elements are consonant and vowel (CV). Like English, they both allow syllables with zero onsets. In addition, Yoruba and Igbo allow syllables with a single syllabic nasal (N). However, the two do not allow consonant clusters, long vowels or diphthongs. The syllable structure of Hausa, on the other hand, permits up to three elements: C, V, and X (CVX), where X can be either a vowel or a consonant, in addition to the aforementioned features, but significantly, it does not allow consonant clusters.

Alfred (2016) also asserted that complex onsets such as /br/, /dr/, /pr/, /st/, are simplified through insertion of vowels in Hausa so that store /stɔ:/ becomes [sí'tò], bread /bred/ becomes [bū'ròdi] and driver /'draɪvər/ becomes [dí'rebà]. Also, at the medial position, clusters such as /gr/, /gl/, /kr/, /dr/ are also simplified using [i] and [u]. *Degree* /dɪ'grɪ:/ is pronounced as [digi'ri], and *singlet* /'sɪŋɡlet/ as [sɪŋgi'leti].

Udofot (2017) conducted a study using three West African countries: Nigeria, Cameroon and Ghana. She observed that there appear to be more stressed words/syllables in Nigerian, Ghanaian, and Cameroonian English than there are in an equivalent British English version as indicated by the British speaker's production. Using both perceptual and acoustic approaches, the study indicated that, whereas the speech of the native

English speaker shows stretches of stressed and unstressed syllables, and most of the stressed syllables correlate with high tones and unstressed syllables with low tones, the speeches of the West African English speakers do not systematically show such correlations.

From the literature examined so far, it is noticed that NigE exhibits certain features which mark it as a different variety from SBE. It is basically influenced by the numerous Nigerian languages with which it has co-existed for many years. Most features of the indigenous languages are transferred to NigE. There are cases of monophthongization of diphthongs, substitution, elision, insertion of epenthetic vowels and reduction of sounds duration, and so on. It is also noticed that some features are peculiar to some linguistic groups while some are ubiquitous among many of the linguistic groups in Nigeria.

1.5 Research Methodology

This study was primarily concerned with analyzing the nucleus element in NigE through perceptual means. It made use of three (3) major-group languages and seven (7) minor-group languages and focused, particularly, on vowel substitution, reduction, and insertion. The participants were given a passage containing forty five (45) standard English words to read with a major focus on the nucleus element. An MP3 audio recorder was used to record the passage as produced by the participants. The number of subjects who maintained the control's pronunciation were significantly distinguished from those who did not.

1.5.1 Research Design

The approach adopted for this study was the quasi-experimental design and the research procedure involved the use of one group of respondents who served as the experimental group (EG). The researcher developed an instrument called "Pronunciation Package for Nigerian English Users (PPNEU)" to gather data for the study. The PPNEU had two parts, sections A and B. Section A contained personal data from the respondents, and section B contained a passage used for the production test. The control was

a native speaker of English. The data were analyzed perceptually and the scores were calculated using simple percentages.

The data were subjected to quantitative and qualitative analysis. The phonological rules within the framework of generative phonology (GP) were also adopted for a theoretical thrust. The analysis was based mainly on the corpus read by the subjects into an audio device. Each of the words was classified under different phonological processes that characterize it. The number of deviations were counted using simple percentages.

Research Area, Population and Elicitation Procedure

The area of the study was University of Uyo, Uyo Local Government Area of Akwa Ibom State. A total of 70 subjects were used for the study. These included the three major group languages, Hausa, Yoruba, Igbo, and eight minor group languages which were Ibibio, Idoma, Igala, Eki, Anaang, Oron and Ogoni. Information gathered revealed that these are the subjects' first language while English is used as a second language to communicate in formal situations. The selection criterion was purposive in nature and this covered ten (10) linguistic groups from 24 departments in varying areas of specialization in the University. Table 1 provides detailed information on the population distribution for the study.

Table 1: The Table below shows the population distribution of respondents according to mother tongue.

S/N	Variable	Number of Respondents According to Mother Tongue											Total	G/Total
		Hausa	Yoruba	Igbo	Ibibio	Idoma	Igala	Eket	Anaang	Oro	Ogoni			
1	Sex Male Female	2	4	4	9	1	1	3	3	1			28	70
		3	8	11	13	1	1	2	2	1		42		
2	Age Range 15-20 21-25 26-30 31-35	1	4	1	3	1	1	2	5	2			17	70
		4	6	12	17	1	1	3				46		
			2	2	2								7	
3	Level of Study 100 200 300 400												2	70
		1	2	1	2	1	1	1	1	1		7		
			2	1	4				1	1		10		
		4	8	13	16	1	1	3	4	1		51		
4	Faculty Arts Pharmacy Science Basic medical Bus. Admin. Social sc. Agric. Environmental St. Clinical sc. education	2	6	10	9		1	2	3	2			35	70
		1			1		1	1	1			3		
			2	1	2	1			1			3		
			2	1	2	1		1				7		
		1	4	1			1				1	6		

Theoretical Issues

Generative phonology is the framework adopted for this research. Noam Chomsky and Morris Halle were the key proponents of this school of phonology in the late 1950s. Halle (1962), cited in Eka (1996), summarized the concept as “a collection of statements, rules and axioms which describe, define or generate all well-formed utterances in a language and only those.” Generative phonology (GP from henceforth), accounts formerly for the competence of a native speaker in his language. It was a phonological description with the goal of accounting for native speakers’ intuitions and attempt to achieve a level of what Chomsky (1964:64) referred to as “description adequacy”. Ultimately, GP aimed at a principled basis, independent of any particular language, for the selection of a descriptively adequate account of any particular language.

In GP, the level of a phoneme was redefined so that it could match the deeper level of abstraction arrived at in the most efficient conception of phonological processes - one which could account for all different types of phonological conditioning found in a language. This redefined notion of the basic unit in phonology has sometimes been referred to as “systematic phonemics” in order to distinguish it from the classical level of phoneme.

Wolfram (1974) states that generative phonology is concerned with a type of rule which accounts for all the predictable changes that take place in phonological units when certain morphemes are combined into words or certain sound sequence are juxtaposed. This is a general principle which is universal in all sound systems. Sounds tend to be influenced by their environment. By environment here, we are referring specifically to the influence of neighboring sounds, the position in which a sound occurs in larger units such as a syllable, morpheme, word, phrase or sentence and the occurrence of certain suprasegmental units such as stress or intonation. Ultimately, the modification of sounds seems to follow natural principles related to physiological or psychological strategies.

Phonological Processes and Rules

Phonological processes are the natural changes that occur in the pronunciation of certain sounds as a result of their occurrence in a particular phonological environment. These changes are realized with the application of some (phonological) rules that link the underlying structure with the phonetic structure. Phonological rules (P-rules) are the directives

which map underlying forms on to the surface forms. In the words of Oyebade (2004: 13), they show “the derivational sequence of an item in its journey from the underlying level to the phonetic level.” The phonetic representation of phonemes is derived by applying the rules. Phonological rules serve in a number of ways to account for appropriate pronunciation in natural languages. The applications of these rules in our pronunciations display our knowledge of the sound pattern of the language. In order to give an accurate account of these processes, the P-rules are scientifically and notationally represented. Formalisation makes the rule relatively easy to understand and predict. For example: the P-rule

$$X \longrightarrow Y/Z$$

means X changes to ‘Y’ in the environment of ‘Z’. X here represents the phoneme while ‘Y’ stands for the allophone that is realized after the application of the P-rule. The slant symbol (/) refers to the environment in which the change occurs. However, the X, Y, Z can be null; in that case, the formula is able to capture different phonological processes. In the case where ‘X’ is null, the rule will appear as follows:

$$\emptyset \longrightarrow Y/Z$$

It should be noted that there are always exceptions to any rule in any language; the most important thing is the frequency of the occurrence of the phenomenon. It becomes a rule when its possibility of occurrence is higher than its non-occurrence. From the above notation, it becomes glaring that there are three important aspects of P-rules: the sounds that undergo transformation, the rules applied on the sounds and the environments where the rules are applied.

The P-rules have specific functions which could be categorized into four:

1. they provide concrete information that is needed for the pronunciation of sounds;
2. they delete and add segments at the intermediate level which will be mapped unto the phonetic level, e.g. epenthesis;
3. they cater for changes in features, e.g. aspiration, assimilation, dissimilation, and so on; and
4. they reorder segments. This is called metathesis rule.

The P-rules that will be considered for this research are deletion rule, insertion rule, and lengthening and weakening rules in that order.

Deletion Rule

Amongst the functions of P-rules is the addition and deletion of segments. This involves a process whereby a segment becomes null as a result of its existence with some sounds. Both vowels and consonants can be deleted depending on the phonological environment. This process occurs in different forms. The rule states that A is deleted in an environment when it occurs after B or before B. This rule can be formalized as follows:

$$A \rightarrow \emptyset / \left\{ \begin{array}{l} \text{--- B} \\ \text{B ---} \end{array} \right\}$$

Schwa deletion rule

The rule states that schwa may be deleted in an environment where the preceding consonant is in turn preceded by a vowel; hence, the word category is pronounced as /'kætəgrɪ/ in rapid speech. The rule can be re-written as:

$$/ə/ \rightarrow \emptyset / [+vowel] [+consonant]$$

The rule states that the schwa /ə/ is deleted [∅] when it appears immediately after a consonant that is preceded by a vowel (Shane, 1973; Oluwatosin, n.d). In the view of Clark, Yallop and Fletcher (2007), these rules, which reveal linguistically significant generalizations in phonology, are either optional or obligatory. This is often done for cluster reduction.

Insertion Rule

Oyebade (2004) defines insertion as a phonological process whereby an extraneous element not present originally is introduced into the utterance usually to break up unwanted sequence. Alfred (2016) posits that vowel insertion (epenthesis) is a common process in languages. This case is peculiar to the loan words whose phonotactic constraint do not allow cluster of sounds. In English, according to Katamba (1989), the morphophonemic rules give room for vowel insertion in pluralization which results in the co-occurrence of sibilants '-s/-z' and alveolar '-t/-d' as in judges ['dʒʌdʒɪz], buses ['bʌsɪz], wanted ['wɒntɪd], loaded ['lɒʊdɪd], etc.

Lengthening and Weakening Rules

a. Vowel Reduction

Non-tense vowels specified as [-stress] reduce to [ə] fairly generally. Thus, Chomsky and Halle (1968:111) formulate the vowel reduction rule as:

$$\left(\begin{array}{l} \text{-stress} \\ \text{-tense} \\ \text{V} \end{array} \right) \longrightarrow [\text{ə}]$$

The rule states that a vowel becomes weakened when it occurs in an unstressed syllable. The rule accounts for the fact that the vowel reduces in the first syllable of *machine*, for instance, but not in the second, and in the second syllable of the verb *delegate*, but not in the first or third. In each case, a vowel which has never received primary stress (and therefore retains the specification [-stress]) reduces, and a vowel which has at some point received primary stress (and thus belongs to the category [+stress]) is immune from phonological reduction.

b. Vowel Lengthening Rule

Vowel lengthening rule, according to Kenstowicz (1994), specifies vowels as long before a voiced consonant. The rule is formalized as follows:

$$V \rightarrow [+long] / \text{---} \left[\begin{array}{l} \text{cons} \\ \text{+voice} \end{array} \right]$$

The rule says, a segment having the feature [+vowel] is assigned the feature [+long] if the segment stands immediately before another segment having the feature [voiced] and [consonant].

In this study, there will be an attempt to apply these P-rules in order to account for the various instances of vowel deletion, insertion (epenthesis), substitution or lengthening, as the case may be. In the end, it will be possible to specifically state if the subjects used for this study observed any of the P-rules involving the nucleus element within the syllable structure.

Data Analysis/Results

This was an aural or a perceptual exercise. The data collected from the respondents were listened to, transcribed and used for the analysis. A total of 45 words were transcribed.

Vowel Substitution

Table 2 presents the number of respondents who substituted other sounds for the SBE sounds. Seventeen (17) nuclei were tested in all. The general results indicate that most SBE vowels were either modified by shortening, lengthening, insertion or substitution in NigE. The data yielding this result is presented in Table 2.

Table 2: Performance of Subjects on Vowel Substitution

Words	SBE model	CP	NWS	%	VVS	NWDS	%	TNS
Just/ɟʌst/	/ʌ/	/ʌ/	68	97%	[ɔ]	2	3%	70
Matters/mætəz/	/ə/	/ə/	63	90%	[ɑ]	7	10%	70
Fulfill/fʊlfl/	/ʊ/	/ʊ/	65	93%	[ui]	5	7%	70
Will/wɪl/	/ɪ/	/ɪ/	70	100%	[i]	2	3%	70
Affordable/ə'fɔ:dəbəl/	/ɔ:/	/ɔ:/	60	86%	[ɔ]	10	14%	70
Serve/sɜ:v/	/ɜ:/	/ɜ:/	54	77%	[e,ɑ:]	16	23%	70
People/'pi:pl/	/i:/	/i:/	62	89%	[i]	8	11%	70
Local/'ləʊkləl/	/əʊ/	/əʊ/	69	99%	[o]	1	1%	70
Sure/ʃʊə/, /ʃɔ:/	/ʊə/	/ʊə/	70	100%	[ɔ,ɔ:]	-	-	70
Aspiration /æspəreɪʃən/	/eɪ/	/eɪ/	66	94%	[e]	4	6%	70
Country /kʌntri/	/ʌ/	/ʌ/	52	74%	[ɔ]	18	26%	70
Learned /lɜ:nd/	/ɜ:/	/ɜ:/	45	64%	[e,ɑ:]	25	36%	70
Way/weɪ/	/eɪ/	/eɪ/	69	99%	[e,e:]	1	1%	70
Need /ni:d/	/i:/	/i:/	38	54%	[i]	32	46%	70
Minister /mɪnɪstə/	/ə/	/ə/	65	93%	[ɑ]	5	7%	70
With /wɪə/	/ɪ/	/ɪ/	70	100%	[i]	-	-	70
Majesty /mæɟesti/	/æ/	/æ/	70	100%	[ɑ]	-	-	70

Key: CP = Control's pronunciation; NWS = number who substituted; VVS = variants of vowels substituted; NWDS = number who did not substitute; TNS = total number of subjects; %= percentage.

As shown in Table 2, in the pronunciation of /ʌ/ sixty-eight (68) subjects representing 97% substituted the sound [ɔ] for it in *just* and fifty-two (52) representing 74% also substituted [ɔ] for the same sound in *country*. Also, sixty-three (63) subjects representing 90% substituted [ɑ] for /ə/ in *matters* and sixty-five (65) representing 93% also substituted [ɑ] for /ə/ in *minister*. Cases of substitution were also recorded in the realization of /ʊ/. Sixty-five subjects representing 93% substituted either [u] or [i] for it in *fulfil*. None of the subjects could give the standard realization of /ɪ/ in *will* and *with*, instead [i] was substituted for it by all the 70 subjects. Also, no subject could realize [æ] in *majesty*; all the 70 subjects substituted [ɑ] for it. Sixty (60) subjects representing 86% substituted [ɔ] for /ɔ:/ in *affordable* while only ten (10) subjects representing 14% maintained the SBE pronunciation.

In the cases of long vowels, [e, ɑ] were substituted for /ɜ:/ by fifty-four (54) subjects representing 77% in the word *serve*, and forty-five subjects representing 64% in the word *learned*. The sound /i:/ also posed difficulties for the subjects as a greater percentage could not realize the correct length. For instance, [i] was substituted for /i:/ by sixty-two subjects representing 89% in *people* and thirty-eight subjects representing 54% in *need*.

In the pronunciation of diphthongs, a greater percentage of substitution was recorded. It was noted that for the nucleus in *sure*, which has two variants /ʊə/ and /ɔ:/, while the control went for the former, some of the respondents used the latter. In many cases, the sound was reduced in length to [ɔ]. Also, [e] and [e:] were substituted for /eɪ/ by sixty-nine (69) subjects representing 99% in *way* and sixty-six subjects representing 94% in *aspiration*. Sixty-nine subjects representing 99% also substituted [o] for /əʊ/ in *local*.

Vowel Reduction

Table 3 presents cases where tense vowels were substituted for the schwa /ə/ which is a weak vowel.

Table 3: Performance of Subjects on Vowel Reduction.

Word	SBE model	TNS	NAR	%	NUR	%	VV
Continue	/kən'tɪnju:/	70	2	3%	68	97%	[ɔ]
Parliament	/'pɑ:ləmənt/	70	2	3%	68	97%	[ia,e]
Concerns	/kən'sɜ:nz/	70	1	1%	69	99%	[ɔ]
Success	/sək'ses/	70	3	4%	67	96%	[ɔ]
Priorities	/'praɪ'ɒrətɪz/	70	5	7%	65	93%	[i]
Protect	/'prɒ'tekt/	70	18	26%	52	74%	[o]
Purpose	/'pɜ:pəs/	70	11	16%	59	84%	[o]
Government	/'gʌvənmənt/	70	4	6%	66	94%	[e]

KEY: TNS = Total number of subjects; NAR = number able to reduce; NUR = number unable to reduce VV = variations of vowels

As noted in Table 3, a greater percentage of the subjects could not reduce the vowels in unstressed syllables to the schwa. In most cases, tense vowels were substituted for the schwa in different environments. For instance, Sixty-eight subjects representing 97% pronounced 'con' of *continue* with a stronger vowel [ɔ]. The pronunciation of *concern* was the most difficult. In this item, sixty-nine (69) subjects representing 99% substituted [ɔ] for the schwa in the first syllable. For the first syllable in *success*, sixty-seven (67) subjects representing 96% replaced the schwa with [ɔ] while fifty-two subjects representing 74% pronounced the first syllable of *protect* as [o]. In *priorities*, [i] was substituted for the schwa /ə/ by sixty-five subjects representing 93%. The nucleus in the final syllable of *purpose* was pronounced as [o] by fifty-nine subjects representing 84% while that of *government* was realized as [e] by sixty-six (66) respondents accounting for 94% of the performance.

Vowel Insertion

Table 4 presents cases where vowels are inserted in syllables with syllabic consonants as peaks.

Table 4: Performance of Subjects on Vowel Insertion.

Word	SBE model	TNS	NWDI	%	NWI	%	VV
Apirations	/æspə'reɪʃən/	70	3	4%	67	96%	[ɔ]
Global	/ˈglɔːbəl/	70	22	31%	48	69%	[ɑ]
Potential	/pəʊ'tenʃəl/	70	5	7%	65	93%	[ɑ]
Mission	/ˈmɪʃən/	70	12	17%	58	83%	[ɔ]
Privilege	/ˈprɪvələdʒ/	70	1	1%	69	99%	[i]
Action	/ˈækʃən/	70	10	14%	60	86%	[ɔ]
Century	/ˈsentʃəri/	70	2	3%	68	97%	[u]
Britain	/ˈbrɪtən/	70	52	74%	18	26%	[e,i]
Invitation	/ˌɪnvɪ'teɪʃən/	70	9	13%	61	87%	[ɔ]

Key: TNS= total number of subjects; NWDI = number who did not insert;

NWI = number who inserted; VV = variations of vowels.

Table 4 also reveals a greater percentage of vowel insertion in syllables with syllabic consonants as nucleus. In the production of '-ion' in *aspiration*, *mission*, *action* and *invitation*, [ɔ] was inserted by majority of the subjects. For example, *aspiration* recorded 96% index, *action* recorded sixty (60) respondents representing 87% while *invitation* had sixty-one (61) respondents representing 87%. [ɑ] was inserted by forty-eight (48) representing 69% of the subjects in the final syllable of *global* and by sixty-five (65) representing 93% in the final syllable of *potential*.

Privilege received the greater percentage of insertion as sixty-nine (69) respondents representing 99% inserted [i]. In pronouncing *century*, sixty-eight (68) representing 97% inserted [u]. *Britain* was the only word realized by a greater percentage without insertion. Fifty-two (52) subjects representing 74% maintained the standard pronunciation and only eighteen (18) representing 26% inserted [e,i].

Discussion of Findings

The findings of the study are discussed based on the processes analyzed in Tables 2-4.

Vowel Substitution

The result in Table 2 shows that while the control, a Briton, maintained the SBE pronunciation, a greater percentage of substitution was recorded among the Nigerian speakers. The result implies that substitution is one of the phenomena which characterize NigE (see Josiah, 2017). As noted among the short vowels tested, [ɔ], [ɑ], [u], [i] and [ɒ] were substituted for /ʌ/, /ə/, /ʊ/, /ɪ/, and /æ/ respectively. In the cases of long vowels, /ɔ:/, /ɜ:/ and /i:/ were replaced with [ɔ], [e:, ɑ:], and [i], respectively.

This result corroborates Adetugbo (2004), Adedimeji (2007), and Josiah and Babatunde (2011) all of which observed that Nigerians tend to substitute the short vowels for the long ones. Hence /i: a:, u:, ε:/ are realized as [i, a, u, ε/ and the short /ʌ, ə, æ/ were realized as [ɔ, ɑ, ɒ']. Alibi (2012) earlier remarked that Nigerian users of English generalize and extend the quality of close vowels system to English so that /a/ is used for /a:/ in cases where such sound feature. Similarly, there is the obliteration of long vowel quality by reducing the length of vowels such as /ɔ:, ɜ:/, to [ɔ] and [e] respectively.

In the cases of diphthongs, according to the result, /əʊ/ and /eɪ/ were realized as [o] and [e, e:] in *local* and *way*. Again, this result agrees with Adetugbo (2004) and Utulu (2013) which discovered that closing diphthongs such as /eɪ/ and /əʊ/ are usually monophthongized to [e] and [o], and that the monophthongized sounds can be lengthened to [e:] and [o:] due to the need to preserve the weight of the deleted /ɪ/. As clearly noted in these studies, the reason for substitution is the lack of these vowels in the mother tongues of Nigerian speakers of English.

Observably, the subjects deviate from the vowel lengthening rule of SBE signified as follows:

$$V \rightarrow [+long] / \left[\begin{array}{c} \text{cons} \\ +\text{voice} \end{array} \right]$$

The rule states that a segment having the feature [+vowel] is assigned the feature [+long] if the segment stands immediately before another segment

having the feature [+voice] and is a consonant. Thus, cases of substitution of short vowels for long vowels as in *people* /'pi:pl/ being realized as [ˈpipl], attract the following rule:

$$\text{Rule 1: + long } \left[\begin{array}{c} \text{V} \end{array} \right] \rightarrow [-\text{long}] / -C$$

The rule states that a long vowel becomes short when it is between two consonants.

Vowel Reduction The result from Table 3 shows that in syllables where the nuclei elements were reduced to the schwa, Nigerian speakers used tensed vowels instead of the weak or lax forms. These findings indicated a deviation from the vowel reduction rule formulated by Chomsky and Halle (1968:111) as:

$$\left(\begin{array}{c} -\text{stress} \\ -\text{tense} \\ \text{V} \end{array} \right) \longrightarrow [\text{ə}]$$

The rule states that vowel [v] becomes weakened to [ə] in an unstressed [-stress] syllable. This rule, based on the results obtained from the subjects, does not apply in NigE. This corroborates Akinjobi's (2006) assertion that there is the reduction of vowels in unstressed syllables of SBE words, but in NigE, the vowels remain strong and full. In the study, the researcher concluded, '-mar' in *grammarian* which should be produced with /ə/ as the unstressed syllable, is produced as [ɑ], which results in a strongly stressed syllable.

From the result of the test, it has been proved that vowel reduction is not characteristic of NigE variety. Rather, most unstressed syllables are stressed possibly because most Nigerian mother tongues are tonal languages which necessitate the assignment of tone to many nuclei elements in English. This process can be captured using a P-rule such as:

Rule 3: /ə/ → tense /-stress

The rule implies that the schwa /ə/ becomes a tense vowel in an unstressed environment. This rule applies to NigE because, from the

results, the first syllables of words like *protect* and *concern*, which are unstressed, were realized as [protekt] and [kɔnsen] by the subjects.

Vowel Insertion

As observed in Table 4, the subjects inserted vowels into syllables which syllabic consonants function as the nuclei. From the findings, [ɔ] was inserted in '-tion' and '-sion' of *aspiration*, *action* and *mission* thus rendering them as [aspi'reʃɔn], ['akʃɔn] and ['miʃɔn]; [ɑ] was also inserted in '-al' of *global* and *potential*, relatively rendering them as [gloʊbəl], and [potenʃəl] instead of /gləʊ b(ə)l/ and /pəʊ'tenʃ(ə)l/.

These findings indicated a deviation from the schwa deletion rule: (/ə/ → Ø/[+vowel] [+consonant]), which states that a schwa may be deleted in an environment where the preceding consonant is in turn preceded by a vowel. The findings corroborate Akinjobi (2009) which revealed that there is the insertion of vowels between the preceding consonant and the syllabic consonant in NigE, where /-tl/ of *hospital* was produced as [-tul] and [tal] and /-fn/ of *passion* was produced as [-ʃɔn].

Oyaebade (2004) noted that vowel insertion is usually introduced to break up unwanted sequences. This is because most Nigerian mother tongues have monosyllabic lexical forms with only a few having diphthongs as the nuclei elements (cf Urua, 2000). Besides, it was observed in this study, that since the phonotactic components of Nigerian languages do not permit consonant clusters, the subjects who were from various linguistic backgrounds in Nigeria inserted vowels instead of maintaining syllabic consonants evidenced in standard English as nucleus.

The observed vowel insertion can be captured using epenthetic rule which has the form: Ø → B/X-Y, meaning that the segment B is inserted between X and Y, where Ø means zero allomorph or the absence of a segment. This can be applied to NigE thus:

Rule 2: Ø → [v] / C – C

The rule says that a vowel segment is inserted between two consonants.

Summary of Findings

From the perceptual analyses of the nuclei elements in the speech production of Nigerian undergraduates done so far, the following are the key findings observed in the study.

- (i) To a greater extent, there is the influence of mother tongue on the speech of NigE users. Nigerian speakers substitute the vowels from their mother tongue for problematic ones in SBE. For instance, [ɔ] was substituted for /ʌ/ in *country* and [ɑ] for /ə/ in *matters*.
- (ii) In NigE, the vowel reduction rule of GP is not observed. Stronger vowels are used in unstressed syllables instead of the schwa /ə/. This was indicated by the greater percentage of the respondents who replaced the schwa [ə] with stronger vowels, such as [ɔ] in *concern* and [o] in *protect*.
- (iii) There is also a higher level of insertion of vowels in syllables with syllabic consonants as nucleus. This is because Nigerian languages do not permit consonant clusters. For instance, [ɑ] and [ɔ] were inserted in syllables with /l/ and /n/ as nuclei as evidenced in the realization of the words *global* and *invitation*. The control did not insert any vowel between the syllabic consonants and the preceding sounds as the performance indicates.
- (iv) The duration of long vowels in NigE is shorter, compared to that of SBE: /ɔ:/ became [ɔ] in *affordable* and /i:/ became /i/ in *people*. Thus vowel coalition or neutralization is an unavoidable feature in spoken NigE.
- (v) Diphthongs were usually monophthongized by the subjects. In some cases, the monophthongized diphthongs were lengthened to maintain the weight of the lost segment. /eɪ/ for instance was produced as [e:] in *way* by a greater percentage of the subjects.
- (vi) Triphthongs have earlier been attested to by other studies as absent in Nigerian spoken English (cf Jowitt 1991; Josiah and Babatunde, 2011). Rather, they occur as vowel sequences.

Conclusion

The study analyzed the nucleus elements in the syllable structure of spoken NigE with the aim of bringing out its features. Apparently, it has become evident from our analyses that most of the P-rules offered in GP do not correspond markedly with what obtains in the NigE variety. Subjects' renditions of the nuclei elements in NigE exhibited various levels of deviations from SBE as illustrated in the analyses carried out so far in this study.

The researchers, therefore, draw the conclusion that the nuclei elements in NigE are characterized by neutralization of vowels resulting in coalescence, haplology, dissimilation, metathesis (in cases where there are consonant clusters), and non-vowel reduction (and sometimes resulting in lengthening of very short vowels), vowel insertion (epenthesis) and substitution, among others. This study has thus confirmed earlier observations that the nucleus element in NigE are significantly different from those of SBE, further providing evidence that the non-native English in second language environment is tending towards an endonormative, rather than the exonormative or exoglossic, monolithic model.

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