The suprasegmentals of bilingual Nigerian adult aphasics

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Much of the research on the phonology of aphasics has neglected the suprasegmentals. Therefore, this paper examined the suprasegmental features of the phonology of 20 bilingual Nigerian adult aphasics, who were bilingual in Nigerian English and Yoruba. Their renditions of a normative text were tape-recorded. Optimality Theory served as the theoretical framework. Syllable simplification and modification were noticed. The stress and intonation patterns were not significantly affected, except in few cases. The rhythm of their speech was characterized by syllables and pauses occurring at roughly regular intervals. Thus, Syllable-Pause Timing is proposed to account for the rhythm of their speech.

Keywords: syllable processes, syllable-pause timing, stress, intonation, bilingual Nigerian adult aphasics

1. Introduction

The study of the phonology of adult aphasics has often concentrated on the segmentals. This is why the description of the phonology of the aphasics has been limited to errors identified in their speeches, such as substitution and deletion. It is not surprising then that not much attention is paid to how insights from the suprasegmental features of their speech could aid speech therapy for them and ensure their quick rehabilitation. Besides, it is just recently that neurolinguists are giving some attention to bilingual aphasics.

Nigeria is a multilingual nation. There are well over four hundred indigenous languages in the land (Bamgbose 1971). These languages compete with and equally influence English, which is the main official language of Nigeria (French is the second official language of Nigeria). The result of the coexistence of these languages is colouration of English by these indigenous languages such that we have a distinct variety of World English, known as Nigerian English (NE). It is a variety that has peculiar segmental and suprasegmental features. Therefore, for effective speech therapy and rehabilitation of Nigerian adult aphasics, it is expedient to have a general description of the suprasegmental features of their phonology, as reliance on the description of the suprasegmenatls of adult aphasics who are users of English as first language cannot effectively serve the purposes of treatment and rehabilitation of Nigerian adult aphasics.

In view of this, this paper examined the suprasegmental features of the phonology of bilingual Nigerian adult aphasics. These patients were bilingual in Nigerian English and Yoruba, a Kwa language group of the Benue-Congo language family, spoken predominantly in south-west Nigeria, some other parts of Nigeria, Togo and Benin (Pulleyblank 1997: 67 Gussenhoven and Jacobs 2005: 280). The suprasegmental features investigated are syllable processes, stress, intonation and rhythm. Optimality Theory (OT) served as the theoretical framework, as it could also cater for the peculiar features of NE too.

2. The suprasegmentals of Nigerian English (NE)

Before these subjects had brain damage, the kind of English they spoke was Nigerian English. Therefore, to objectively assess the suprasegmental features of their phonology after the brain damage, it is imperative to examine the suprasegmental features of NE.

One of the findings of Tiffen (1974), according to Banjo (1995: 221), is that: for Nigerians, "suprasegmentals constituted the main problems, whilst the lexical and syntactic components least". Earlier, Banjo (1979), as reported by Akinjobi (2002: 41), has claimed that it (suprasegmental aspect) is the last hurdle which NE speakers find impossible to cross. The prosodic features of NE raise interesting issues that have engaged the attention of scholars. Some of such issues are examined below.

2.1 *Stress*

The most striking feature of Nigerian pronunciation is the "delayed primary stress" (Kujore, 1985). Simo Bobda (1995: 255) reports some of the findings of Kujore (1985: 2ff) thus:

1. The tendency for forward stress in RP (Received Pronunciation) e.g. **"col'league", "pe'trol"** and **"sa'lad". (**RP**: 'colleague, 'petrol, 'salad)**

(a) recurrence of forward stress in words with final syllable [n] and[i], for example, "**bulle'tin", "car'ton","jave'lin" (**RP**: 'bulletin, 'carton, 'javelin**)
-shift of stress in words with [i] in the final syllable, e.g. **Bap'tist, bis'cuit, ta'xi** RP**: 'Baptist, 'biscuit, 'taxi)**

-women's forenames with a final syllable [i] or a final [n] have their stress on the final syllable, e.g.**Su'san, Vi'vian, A'lice (**RP**: 'Susan, 'Vivian, 'Alice)**

(b) The recurrence of final stress in verbs with final obstruents, e.g. **to boy'cott, to eli'cit, to in'terpret, to hi'jack to soli'cit,** (RP**: to 'boycott, to e'licit, to in'terpret, to'hijack, to so licit)**

(c) The recurrence of forward tress in compounds with final obstruents, e.g**. fire'wood, proof'read, ward'robe, work'shop, bed'room,** (RP: **'firewood 'proofread, 'wardrobe, 'workshop, 'bedroom)** Jowitt (1991:91) gives examples of hyphenated and open compounds which are given special stress marks: **sitting-'room, eye 'hospital, grammar 'school** (RP**: 'sitting-room, 'eye hospital, 'grammar school**). He, however, notes that PNE (Popular Nigerian English, another name for NE) may have the same pattern as RP in the examples just given.

(d) The self-stressing property of certain suffixes: *-ate (v), -ise (v), -fy,-ative, -atory, -ature, -cide,-itive -utive, -utory, -land, -man, -phone,-day,* for example: **indi'cate recog'nise, diversi'fy, indi'cative, expla'natory, candi'dature, pesti'cide, compe'titive contr'ibutive, Ire'land, police'man, tele'phone, holi'day.(**RP**: 'indicate, 'recognise di'versify, in'dicative, 'explanatory, 'candidature, 'pesticide, 'competitive, con'tributive, 'Ireland, po'liceman, 'telephone, 'holiday).**

(e) The tendency of the following suffixes to carry stress forward to the syllables preceding them: *-able, -ible, -age, -al, -ary, -ean, -(graph)er, -ism, -mony, -ous*, for example: **indo'mitable, e'ligible, pa'rentage, pas'toral, pla'netory, photo'grapher, triba'lism, ce'remony, pros'perous. (**RP**): in'domitable, 'eligible, 'parentage, 'pastoral, 'planetary, 'photographer, 'tribalism, 'ceremony, 'prosperous**).

(f) The tendency of strong clusters to pull stress forward to the preceding syllable, e.g. **an'cestor**, **ca'lendar, or'chestra (**RP**: 'ancestor, 'calendar, 'orchestra**)

He notes, however, that there are some exceptions to the patterns given above. Some of them are:

(i) Nouns: **'success, 'assault, 'mosquito, 'technique, sus'pense (**RP**: suc'cess, a'ssault, mos'quito, tech'nique, 'suspense**)

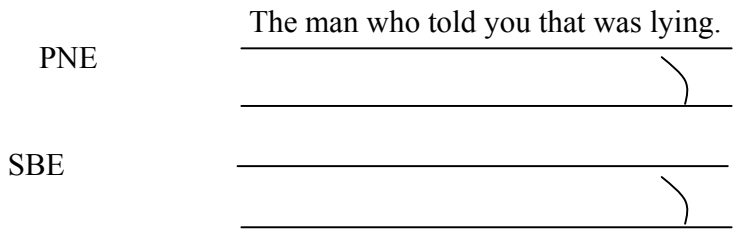
(ii) Adjectives: **'acute, 'extreme, 'appropriate, 'conversant (RP: a'cute, ex'treme, a'ppropriate, con'versant**). He adds that the negative prefix (*in*) and its allomorphs, *im-, il-, ir-,* bring about deviant initial stress, e.g. **'indifferent, 'impossible, 'illegal, 'irregular (**RP**: in'different, im'possible, il'legal, ir'regular)**

(iii) Function words: **'albeit, 'despite, 'unlike, 'towards, 'instead (**RP**: al'beit, des'pite, un'like, to'wards, in'stead**).

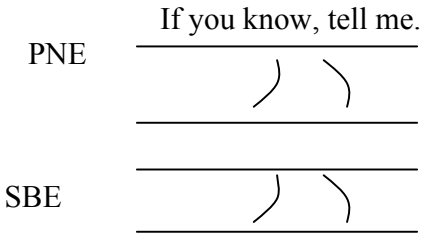
(3) NE, according to him, also reverses the order of primary stress and secondary stress in words such as **'education, 'federation** (RP: **ˌedu'cation, ˌfede'ration).** This claim of Kujore's is highly contestable. It seems that this case, especially with his examples, is limited to few NE speakers. What seems to generally apply is the avoidance of secondary stress; the primary stress still remains intact, such that we have **edu'cation** and **fede'ration**.

2.2 *Pitch*

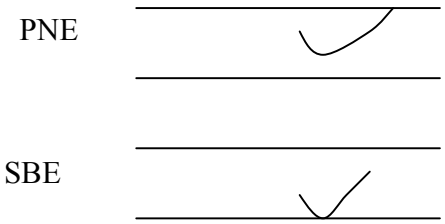
Pitch is used differently in languages to bring about meaning. Yoruba has three well-differentiated tonal levels: high, mid, low. Hausa and Igbo have only two (Jowitt, 1991: 98). The indigenous languages affect the pitch of NE. There is a widespread tendency for NE speakers to give a high tone to a relative pronoun introducing a restrictive clause. Jowitt (1991) gives the following examples:



Similarly, he claims that sentence-initial <u>if</u> introducing a conditional clause always has a high tone, as in



In polar questions, PNE uses "a low tone + high tone sequence for the Aux + Pronoun syntactic sequence: Are you mad? (Highly idiomatic PNE lexis, equivalent to SBE 'You must be mad')" (Jowitt 1991: 99).



2.3 *Rhythm*

Rhythm is a major area where NE deviates from RP in NE (Ufomata 1990, Akinjobi 2002: 42). NE, unlike RP, which is stress-timed, is syllable-timed. Nigerian indigenous languages, except Hausa, which is between both extremes but tends more toward stress-timing, are syllable-timed (Jowitt 1991: 97).

In NE rhythm, all vowels are given prominence; vowel reduction rule is not applied at all (Akinjobi 2002). Eka (1993) views NE as "inelastic timed" rather than syllable-timed. He argues that this is due to the frequency of more prominent syllables than that found in RP; NE speakers do not 'squeeze-in' or 'stretch-out' the syllables in a rhythm unit as do RP speakers.

Ufomata (2000) compares the rhythm of Educated NE to "the pulsation of an African drum" which hardly varies in tempo. She proposes Full Vowel Timing for NE instead of Syllable Timing. In Full Vowel Timing, what is important is "the patterns made in any section of continuous speech by the mixture of syllables containing full vowels with syllables containing reduced vowels" (Bolinger 1981). This, according to Akinjobi (2002) means that "full vowels, whether stressed or unstressed, will be taken with other reduced vowels following it to determine a rhythm unit."

2.4 *Intonation*

Akinjobi (2002:45) claims that NE, apart from not using intonation to show attitude, underdifferentiates intonational tunes. She is of the opinion that NE speakers use loudness instead to show attitude. Jowitt (1991: 104-105), summarizes the use of intonation in PNE thus:

(1) The falling tone occurs much more frequently than in standard British English (SBE). Where SBE uses a rising tone or a falling-rising tone, NE uses falling tone. It is common in PNE to find falling tone in statements.
(2) A rising tone is often assigned to questions and tag questions. This is similar to SBE. PNE also makes use of falling tone in Wh-questions.
(3) PNE avoids the one-syllable falling-rising tone, and the multi-syllable falling-rising tone is seldom used. For example, for SBE falling-rising tone, at the end of a sentence-initial dependent clause, PNE uses a rising tone. Sometimes, some PNE speakers use the rising tone more frequently than SBE speakers do "to mark the end of a dependent clause or phrase".
(4) The rising-falling tone, which is also rare in SBE, does not feature at all in PNE.
(5) Context of utterance does not show in the intonational pattern of PNE. It seems that everything is fixed: a statement has a final falling tone while a question has a final rising tone. PNE, according to him, occasionally uses syntactic devices, such as cleft sentence, to show contrast, as illustrated below:

SBE

I detest this type of behaviour

In PNE, becomes:

It is this type of behaviour that I detest

The point being made here is that nuclear accent creates problem for PNE speakers.

Okon (2001) hints that NE has SWW, SSW and SS patterns for feet as opposed to SBE regular SW and SWW patterns. This results in "machine-gun effect" (Crystal 1987: 169) of NE utterances. She adds that NE speakers do not apply "the Alternation rule which does not allow the occurrence of 2 strong syllables adjacent to each other."

3. The suprasegmentals of Yoruba

Yoruba belongs to the Kwa group of the Niger-Congo language family. As mentioned earlier, it is spoken predominantly in the south-western Nigeria, Togo and Benin (Pulleyblank 1997: 67, Gussenhoven and Jacobs 2005: 280). Yoruba exerts significant influence on the English used by many Yoruba people. The Yoruba suprasegmental features of relevance in this paper are syllable and tone.

3.1 *Yoruba syllable*

The Yoruba syllable could have any of these three structures: V CV N . It does not have coda. The optional onset is made up of only one consonant; consonant cluster is disallowed. Unlike English, it does not have syllabic consonants, but it permits a nasal vowel to constitute a syllable (Owolabi 2004: 134-135). This is why, at times, some Yoruba NE speakers simplify English consonant cluster by inserting vowels to make English conform to the syllable structure of Yoruba.

3.2 *Yoruba tonology*

Yoruba is a tonal language (Owolabi 2004:101). Three tones are used in the language, namely High (´) Low (`) and Mid (Akinlabi 1985, Bamgbose 1990: 41), which are meant to help listeners to distinguish words (Bakare 1995: 32). This tone pattern is often transferred to English. Some users of the language equate the primary stress in English to high tone and the secondary stress to mid tone. In NE, stress is often converted to tone: primary stress becomes high tone, and all others become low tone; at times, mid-tone is used for secondary and tertiary stress. In fact, some teachers encourage their students to follow this approximation. In her study of the interaction of tone and intonation in Yoruba, Laniran (1992) argues that the general pattern of phonetic realization within sequence of similar tones is identical, depending on the tone that precedes the sequence and the total number of tones in the sequence. She adds that H tones are raised above the L tones that follow them; and that, when H and L tones occur in HLHL sequence, they are automatically downstepped (cf. Adeniyi 2009: 77).

La Velle (1974) asserts that the end point of a low tone that is a falling glide from H could be higher than M. He adds that the rate of lowering in a low tone is higher than that of non-low tone (that is, M and H).This ensures that lowering of a non-low tone (that is, M and H) is not confused with the toneme immediately lower than the one in question. Sequences made up of two or three low tones undergo phrase pitch lowering but those with two high or mid tones do not. Initial low tones fall in pitch but initial mid tones averagely rise in pitch from the voice onset to the end of production.

Just as stress is phonemic in English (for instance, *export* changes from a noun to a verb if the stress shifts from the first to the second syllable), tone is phonemic in Yoruba. A word may have five or more different meanings by merely alternating the tones. Let's consider these examples:

(i)	*ọwọ́*	'hand'
(ii)	*ọ̀wò*	'respect'
(iii)	Ọ̀wò	'a town in Ondo State, Nigeria'
(iv)	*ọ̀ wọ*	'drizzle'
(v)	*ọwọ̀*	'broom'
(vi)	*ọ̀ wọ*	'mates'

(ii) and (iii) above have the same tone patterns, but the context of use indicates the one being referred to.

4. Methodology

The data for the analysis were got from 20 adult aphasics sampled at the University College Hospital (UCH) Ibadan, Oyo State, Nigeria. They were both in-patients and out-patients and none of them was less than 35 years old. They were bilingual in NE and Yoruba. They were seen at their wards and the Medical Out-Patient (MOP) clinic of the hospital.

The clinical diagnosis of the patients was done by the consultant neurologists on duty. Other useful details were got from the case notes of the patients. A short normative text was given the patients to read. This text contained expression that test the concepts examined in this paper. This approach was adopted so as to have a uniform pattern of assessing the suprasegmentals of these aphasics. The text was also given to four non-aphasic NE users of English to read, so that, where necessary, comparison can be made.

The analysis of the speech of the subjects was perceptual. The recorded data were listened to by the researcher and a group of 15 postgraduate students at the Department of English University of Ibadan who were bilingual in NE and Yoruba. This was done to ensure that the perceptual analysis is objectively done. The analysis adopted mainly an endonormative approach, by assessing the phonology of the subjects based on NE rather than Received Pronunciation (RP). This was done because the analysis of the deviation or impairment could only be based on what they have already acquired. Some patterns which might be seen as forms of deviation in RP are the norms in NE. It will thus be inappropriate to see such as errors. Those patterns that are instances of deviation from RP but regular in NE are not taken to be peculiar to Nigerian aphasics. After identifying the forms of deviation, Optimality Theory (OT) was used to explicate how some of these instances of deviation, rather than the NE and the RP output candidates, emerged as optimal outputs. Speech Analyzer was used to complement the perceptual analysis.

5. Aphasia types

Some scholars hold the view that aphasia is a general language disorder which crosses all communicative modes; they, for example Darley (1982), therefore, see no need to identify different types of aphasia. However, scholars like Kertesz (1983) Goodglass and Kaplan (1983), Helm-Estabrooks and Albert (1991), hold the view that there are sufficient differences among aphasics that make it expedient to identify different types of aphasia (Wertz 1996: 39). The literature is replete with different taxonomies. The major types of aphasia are discussed below.

a. Broca's aphasia: This is otherwise known as expressive or motor aphasia. The lesion is located in the lower frontal lobe, just anterior to the Rolandic fissure, which divides the frontal and parietal lobes. It is characterized by non-fluent and effortful speech articulation; simplification of consonant clusters; substitution; missing function words and bound morphemes. Broca's aphasics know what to say but lack the means to appropriately present their ideas (Caplan 2003: 585).

b. Wernicke's aphasia: This is also known as receptive aphasia (affecting linguistic comprehension rather than output), or sensory aphasia (because the sensory cortex is damaged). The lesion is located in the upper surface of the temporal lobe, affecting the auditory cortex, and occasionally the parietal lobe. It is characterized by fluent spontaneous speech; phonemic paraphasias (sound substitution); verbal paraphasias (word-form errors); neologisms (nonce-forms/jargons), paragrammatisms (abnormal grammatical sequences); use of general proforms and hackneyed phrases; errors in the use of determiners and pronouns; problems with comprehending the speech of others; problems in retrieving words from memory; and circumlocutions (Parker 1986: 191, Crystal 1987: 271).

However, there are other types of aphasia, but they are all related in one way or the other to the two discussed above. Global Aphasia shows manifestation of these two. Conduction Aphasia tends toward Wernicke's. Transcortical Motor Aphasia exhibits some features of Broca's Aphasia, except that there are better repetition abilities in the former. Transcortical Sensory Aphasia is similar to Wernicke's Aphasia, except that, in it, there is better retention of what is said and repetition is relatively intact; Mixed Transcortical Aphasia is similar to Broca's Apahsia (Whitaker 1975: 38-39, Parker 1986: 208, Wingfield 1992, Edwards 2002: 20, Caplan 2003: 585).

6. Optimality Theory (OT) and prosody

6.1 *OT and syllables*

Prosody, the organization of sounds into larger phonological units, such as syllable, feet and rhythm, is an area that has been successfully studied by OT (Hammond 1997: 33). The knowledge of what constitutes prosody is part of the intuitive knowledge of a native speaker

of a language (Akinjobi 2000). Speakers of a language also have unconscious knowledge of the words of a language and what could constitute a word in that language (Pulleyblank 1997: 33). In other words, they could identify a word, an accidental gap, and a systematic gap. This unconscious knowledge helps the speaker to know what constitutes a syllable in his/her language.

A syllable is defined as consonant(s) and vowel(s) grouped into peaks of sonority and loudness. A word is made up of at least a syllable. This is referred to as **Syllabic Licensing** (Hammond 1997: 35). In OT, three constraints are important to the analysis of the syllable. Following Hammond (1997: 36), the constraints are:

ONSET: syllables begin with a consonant.
NO CODA: syllables end with a vowel.
FAITHFULNESS: pronounce everything as it is.

The above syllable constraints could be ranked in different ways. Hammond (1997: 36) claims that only four rankings are empirically possible. First, FAITHFULNESS could dominate the other two constraints, so that we have FAITHFULNESS>> ONSET, NO CODA. This means that, in such a language, the syllable may or may not have onset and coda, but it must have a vowel. The second empirically possible ranking is ONSET and NO CODA dominating FAITHFULNESS: ONSET, NO CODA>> FAITHFULNESS. This means that such a language obligatorily has onset and vowel. The third empirically possible ranking is ONSET dominating FAITHFULNESS and FAITHFULNESS dominating NO CODA: ONSET>> FAITHFULNESS>> NO CODA. This implies that such a language has obligatory onset and vowel but optional coda. The last empirically possible ranking is NO CODA dominating FAITHFULNESS and FAITHFULNESS dominating ONSET: (O)V. This presupposes that such a language has optional onset but obligatory vowel. The table below captures the foregoing explanation:

Rankings	Types
FAITHFULNESS >>ONSET, NOCODA	(O) V (C)
ONSET, NO CODA>> FAITHFULNESS	OV
ONSET>> FAITHFULNESS>> NO CODA	OV (C)
NO CODA>> FAITHFULNESS>> ONSET	(O) V

Table 1 *All rankings of {FAITHFULNESS, ONSET, NO CODA}* (Adapted from Hammond, 1997:36)

The maximum phonological structure of English syllable is (O°_{-3}) V (C°_{-4}) (Roach 1997: 72). This implies that, at the onset position, English permits maximum of three optional consonants; it has obligatory vowel occupying the nucleus (syllabic consonants –/m n l/ could also occupy this position (Kuiper and Allan 1996: 99); and a maximum of four optional consonants in the coda position. Therefore, English has the ranking FAITHFULNESS>>

ONSET, NO CODA. But Yoruba has the ranking NO CODA>> FAITHFULNESS>> ONSET.

In addition to the three syllable constraints above, English has two other syllable constraints which are unviolated, and, as such, should be ranked above FAITHFULNESS. They are PEAK and LICENSING (Archangeli, 1997:7). The former claims that syllables have one vowel, while the latter claims that all words are composed of syllables (Hammond, 1997:35). Because English permits consonant clusters in onset and coda positions, another constraint is necessary to cater for this feature. The constraint is known as *COMPLEX:

***COMPLEX**: Syllables have at most one consonant at an edge (Archangeli, (1997: 7)

This constraint means that consonant clusters are not acceptable at both the onset and coda positions. This indicates that English does not rank this constraint high. If it does, many structures would have been unacceptable English syllables. When there are consonant clusters in English, there is a constraint that must not be violated, so that not just any consonant cluster will be found in onsets and codas. This constraint is known as SONORITY:

SONORITY: Onsets must increase and codas must decrease in sonority.
(Hammond 1997: 40)

A complete constraint hierarchy for English, as given by Hammond (1997: 41), is:
PEAK, LICENCING, SONORITY>> FAITHFULNESS>> ONSET, NO CODA *COMPLEX

6.2 *OT and stress*

OT adopts and develops the metrical approach to stress. In Metrical Phonology, stress is seen as arrangement of syllables into groupings based on prominence, loudness, length or pitch. It is seen as a relational concept, in that a syllable is prominent because there is another syllable close to it that is not prominent. The pattern of alternation of strong and weak syllable is known as **foot**. If this unit contains a stressed (strong) syllable on the left and not more than a stressless (weak) syllable on the right, such a foot is known as **trochee**. The other common foot pattern is **iamb**, which alternates a stressless syllable with a stressed syllable (Halle and Idsardi 1995, Kager 1995: 368, Sunday 2005: 25-26).

The prosodic hierarchy of a word is:

Pr Wd	Prosodic Word
Ft	Foot
σ	Syllable
μ	Mora

(Napoli 1996: 101)

At the highest level is the prosodic word; next is the foot, comprising two syllables (one strong, the other weak); followed by the syllable, the smallest pronounceable unit; at the

lowest level is the mora, which is the component of the rhyme of a syllable (nucleus and coda). If the rhyme has one element, it has only a mora; but if it has two or more elements, it has two moras (Napoli 1996: 81,100). Besides, the moraic theory claims that the quantity of a syllable depends on the number of its weight-bearing units, or moras. Universally, short vowels are taken to have one mora, while long vowels are taken to have two (Kager 1999: 147).

Stress languages have some properties in common. The first is that stress is **culminative**. This requires that content words or other morphological or syntactic constituents have at least a stressed syllable; grammatical/function words do not need to be stressed. The second one is that stress is **demarcative**, that is, stress tends to be placed close to the edges of constituents. In most cases, across different languages, stress is usually placed at the initial, penultimate, or final syllables. The third property is the **rhythmic property of stress**. This means that there are regular intervals between a combination of strong and weak syllables. This property manifests in the avoidance of clashes (occurrence of adjacent stressed syllables), and 'lapses'–long string of unstressed syllables. Rhythmic alternation is peculiar to an edge of the word – initial or final; thus, it is directional (Kager 1999: 145). The fourth cross-linguistic property of stress is that it is **quantity sensitive**. This implies that the quantity of the syllable, in term of its component parts, is crucial to stress. Long vowels, diphthongs and closed syllables, unlike short vowels, monophthongs and open syllables, tend to attract stress (Halle and Idsardi 1995: 439).

6.2.1 *Metrical constraints*

Rhythm is a powerful cross-linguistic property of stress. Kager (1999: 161-166) identifies three prominent constraints that influence it: **FT-BIN**, **PARSE-SYL**, and **ALL-FT-LEFT:**

FT-BIN: Feet are binary under moraic or syllabic analysis.

This constraint excludes degenerate feet: L(ight) which have only one light (weak) syllable. It does this by insisting that a foot must be made up of either two moras (H or LL) or two syllables. In other words, a monosyllabic foot cannot be found before an unfooted syllable (Hammond, 1997:45).

PARSE-SYL: Syllables are parsed by feet.

This constraint ensures that there is binary alternation of strong and weak syllables; thus, two unfooted syllables cannot be adjacent (Halle and Vergnaud, 1987). It is possible to have what is known as *weak layering*. This is the case when a foot violates PARSE-SYL and it is assumed to be metrified as immediate daughters of Pr Wd (Kager 1999: 162).

ALL FT-LEFT: Align (Ft, Left, Pr Wd, Left):
Every foot stands at the left edge of the PrWd.

This constraint requires that the left edge of every foot coincides with the left edge of a Pr Wd. For this constraint not to be violated, there must be only a single foot standing at the absolute edge of the word. In other words, two feet cannot both stand at the left edge. If this constraint is not dominated, it produces a 'non-iterative pattern, one in which there is a single foot per Pr Wd (Kager 1999: 163). ALL FT-LEFT could resolve ties among candidates with multiple feet. This is done by counting the number of violation marks for this constraint by each foot, which is equivalent to the number of feet that is not in absolute initial position. The sum of violation marks for each foot gives the total violation of ALL-FT-LEFT. The optimal candidate is the one with smallest total violation. Thus, ALL-FT-LEFT is a kind of gradient constraints. There is also the mirror image of this constraint: ALL-FT-RIGHT, which also helps in resolving such ties (Kager 1999: 163).

There are two other important metrical constraints:

***CLASH**: No stressed syllables are adjacent.

This constraint ensures that there are no clashes among the stressed syllables.

Another important metrical constraint is:

NON-FINALITY: No prosodic head is final in Pr Wd.

This constraint is similar to what Metrical Phonology calls extrametricality. An extrametrical foot is 'invisible' to metrical stress rules and the rules are blind to it (Kager, 1995:379). NON FINALITY ensures that the Pr Wd does not end in a stressed syllable, or in a foot (Kager 1999: 165).

6.3 *OT and syncope*

In English, syncope often occurs in fast speech. It involves deletion of vowels in particular positions in words. This reduces the number of the syllables and consequently affects the feet pattern. OT analyses syncope by using the following constraints:

FAITH (σ́): pronounce stressed vowels.
*FOOTLESS: no unfooted syllables
FAITH (σ΄) : pronounce unstressed vowels
FAITH (FINAL): pronounce final vowels.

They are ranked thus:

FAITH (σ́) FAITH (FINAL)>> *FOOTLESS>>FAITH (σ΄)
(Adapted from Hammond 1997: 50)

This ranking shows that stressed vowels resist syncope. Besides, final syllables resist syncope even when they are stresses. This is why FAITH (FINAL) is separated from FAITH (σ́) and is ranked above both *FOOTLESS>>FAITH (σ΄)

Generally, in English, syncope can take place only at the beginning of a word (for example, *savoury*), before a stressed syllable (for example, *cholesterol*), and after a stressed syllable (for example, *circulatory*). Syncopated vowels are not part of the foot structure (Hammond 1997: 47).

7. Data analysis

Table 2 below captures the essential background information on each of the subjects.

	Linguistic/clinical description	Clinical assessment
P1	Fluent spontaneous speech with nasalization of vowels almost resulting in incomprehensible speech; many instances of segment deletion; comprehension and cognition slightly impaired	Wernicke's Aphasia
P2	Non-fluent spontaneous speech marked by pauses, substitution and deletion of segments	Broca's Aphasia
P3	Effortful speech marked by extremely long pauses (approximately 20 seconds); substitution of segments and words	Broca's Aphasia
P4	Fluent spontaneous speech marked by segment deletion and loquacity	Wernicke's Aphasia
P5	Extremely effortful speech characterized by deletion, substitution and addition of segments	Broca's Aphasia
P6	Extremely effortful speech accompanied with occasional stammering; memory loss; replacement of segment	Broca's Aphasia
P7	Incomprehensible speech dominated by neologism	Wernicke's Aphasia
P8	Fluent speech; comprehension seriously impaired; word deafness; deletion and substitution of segments	Wernicke's Aphasia
P9	Unintelligible but relatively fluent speech; occasional stammering; deletion and replacement of segments	Wernicke's Aphasia
P10	Extremely effortful spontaneous speech; profuse salivating, deletion, substitution and epenthesis of segments	Broca's Aphasia
P11	Extremely effortful speech marked by segment deletion	Broca's Aphasia
P12	Extremely effortful and slurred spontaneous speech, characterized by long pauses and laughter and deletion of segments	Broca's Aphasia
P13	Incomprehensible speech perhaps due to the disfigured mouth; effortful speech marked by deletion and	Broca's Aphasia

	substitution of segments	
P14	Fluent spontaneous speech marked by word replacement and segment substitution	Wernicke's Aphasia
P15	Extremely effortful speech dominated by guttural sounds	Broca's Aphasia
P16	Effortful speech marked by fillers and long pauses	Broca's Aphasia
P17	Slightly effortful speech; comprehension slightly affected; substitution of segments	Wernicke's Aphasia
P18	Fluent speech; word retrieval problem	Wernicke's Aphasia
P19	Fluent speech full of neologism	Wernicke's Aphasia
P20	Slurred speech characterized by long pauses and substitution of segments	Broca's Aphasia

Table 2 *Background information on the subjects*

According to this table, 11 of the subjects had Broca's aphasia, while 9 of them had Wernicke's aphasia.

7.2 *Syllable processes*

Two notable syllable processes found in the speech of the patient are syllable simplification and syllable modification. The former involves simplifying consonant clusters in the onset position. Two words from the normative text were used to test these: *quickly* and *proud.* There are two prominent forms of *quickly* realized by the subject. 6 of them pronounced it as /kwʊɪklɪ/, while the remaining 16 subjects pronounced it as /kʊklɛ/. The realization of this word by the 6 subject is similar to the pattern found in NE, in which consonant cluster is sometime simplified. Since this research adopts an endonormative approach, this realization is not due to aphasia. It is the realization of the 16 subjects that is due to aphasia. As for *proud*, there are 9 variants of its pronunciation. 1 subject each realized it as *pround* /prɑondI /ɑi, *poor* /pɔ:/, *prad* /prɑd/, *tout* /tɑot/, *pred* /pred of them realized it as *poud* /pɑod/, 5 of them realized it as *proud* /prɑod/, while 6 of them realized it as *prou* /prɑo/. Of all the realizations only *proud* is not due to aphasia; it is the way the word is realized in NE. The main difference between NE and RP realizations of the word is the diphthong. While RP uses /ɑʊ/, NE uses /ɑo/. However, only two of the realizations are of significance to this study: *prou* /prɑo/ and *poud* /pɑo/. Tableaux 1 and 2 below show how /kʊklɛ/ and *prou* /prɑo/, respectively emerged as the optimal outputs for majority of the subjects.

		NE	RP
1./kʊklɛ/	for *quickly*	/kwɪklɪ/	/kwɪklɪ/
2. /prɑo/	for *proud*	/prɑo/	/prɑʊd/

Input /kwɪklɪ/ (quickly) → Output /kʊkle/

/kwɪklɪ/	*MAX	IDENT(back)	IDENT(central)
(i)kwɪklɪ	*!	*	*
(ii)kwɪkle		*	
☞(iii)kʊkle			

Tableau 1 *The emergence of /kʊkle/*

Input /prɑʊd/ (proud) → Output /prɑo/

/prɑʊd/	*MAX	FAITH V	FAITH C
prɑod	*!	*	
prɑʊd	*!		
☞prɑo		*	*

Tableau 2 *The emergence of /pr /*

As shown in Tableau 1, the first syllable of the word has consonant cluster involving /kw/. This was simplified by the subjects, due to aphasia. The substitution found in '**quickly'** involves three constraints, ranked as *MAX, IDENT (back) >> IDENT (central). The RP output candidate (i) fatally violates *MAX, which allows deletion, in that it does not delete the voiced labio-dental semi-vowel /w/. It also violates IDENT (back), which requires that the output should have a back vowel (/ʊ/ in this case). Again, it violates IDENT (central), which requires that the output should have a central vowel (/ɛ/ in this case). Output candidate (ii) does not emerge as the optimal candidate because it fatally violates IDENT (back), as it contains /uɪ/ instead of /ʊ/. It obeys *MAX, since it deletes /w/. It has /ɛ/ as the final vowel in the word, obeying IDENT (central). Output candidate (iii) emerges as the optimal candidate since it does not incur any violation mark.

The realization of 'proud' /prɑʊd/ as '**prou'** /prɑʊ/ involves simplification of the syllable, by deleting the coda. Three constraints are involved in this constraint ranking: *MAX (which allows deletion), FAITH C (which requires sameness in the input and the output consonants), and FAITH V (which requires sameness in the input and the output vowels). The NE output candidate violates *MAX and FAITH V, as it does not delete the coda and contains a different diphthong. The RP candidate violates only *MAX, since it does not delete the

coda. The optimal candidate violates FAITH V and FAITH C. But it still emerges as the optimal output because *MAX, which the other two output candidates fatally violate, is ranked higher than the other two constraints. The aphasic ranks the constraints as *MAX >>FAITH V FAITH C.

This analysis shows that the two processes analyzed above involve ranking *COMPLEX higher than other syllable-related constraints. The simplification takes the form of either deletion of a consonant or vowel epenthesis .Vowel epenthesis increases the number of the syllable but consonant deletion neither increases nor reduces the number of the syllables.

7.3 *Stress*

An assessment of the stress pattern of the speech of the aphasics shows that their stress pattern is not affected by aphasia, when compared to the stress pattern of NE; the patients stressed words the way NE speakers do. All the subjects stressed the following words thus:

	NE	**RP**
(i) me'chanic	me'chanic	me'chanic
(ii) cha'llenge	cha'llenge	'challenge
(iii) ma'dam	ma'dam	'madam
(iv) master'minded	master'minded	'masterminded

Tableaux 3, 4 and 5 explain the realizations of the stress patterns of (ii), (iii)and (iv) above:

Input /'mædəm/ →Output /mæ'dæm/

/mædəm/	ROOT	*TROCH	PARSE SYLL
☞mæ'dæm			
'mædəm		*!	

Tableau 3 *The emergence of /mæ'dæm/*

Input /'tʃælndʒ/ → Output /tʃæ'lendʒ/

/tʃælɪndʒ/	ROOT	*TROCH	PARSE SYLL
☞tʃæ'lendʒ			
'tʃælɪndʒ		*!	

Tableau 4 *The emergence of /tʃæ'lendʒ/*

Input /'mæstəmɪndɪd/ (masterminded) → Output /mæstæ'mɑɪnded/

Mæstəmɑɪnd	ROOT	*TROCH	PARSE SYLL
'mæstəmɑɪnd			
☞mæstə'mɑɪnd		*!	

Tableau 5 *The emergence of /mæstæˈmɑɪnded/*

Ignoring segmental details, such as consonants and vowels and their features, three constraints are involved in these tableaux:

ROOTING: Words must be stressed
TROCHEE: Feet are trochaic
PARSE-SYLLABLE: Two unfooted syllables cannot be adjacent. (Hammond 1997: 44)

In '**madam'** and '**challenge'**, the RP output candidates lose because they fatally violate *TROCHEE, which disallows trochaic feet, favouring iambic feet instead. This stress pattern calls for change in the vowel quality; the vowels in the stressed syllables of the aphasics' speech are strong, unlike the weak ones found in the RP output candidates. '**Masterminded'**, which is a compound word, follows the same pattern. The stress shifts forward too, making the second free morpheme to receive the stress, contrary to what obtains in the RP output candidate. The optimal candidate in each case does not violate any of the constraints ranked as ROOT >> TROCH>> PARSE SYLL. The pitch contours for the words are given below:

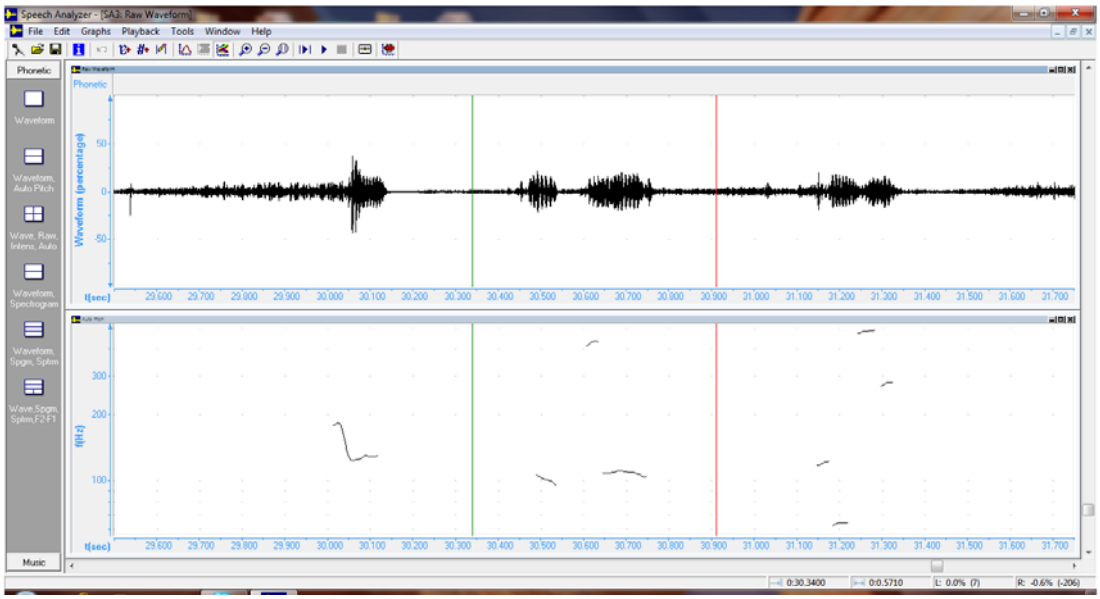


Figure 1 *Waveform and pitch contour for 'Madam'*

This pitch contour shows that the pitch rises from 100Hz to 360Hz before falling. The word has two syllables. The highest pitch is on the second syllable.

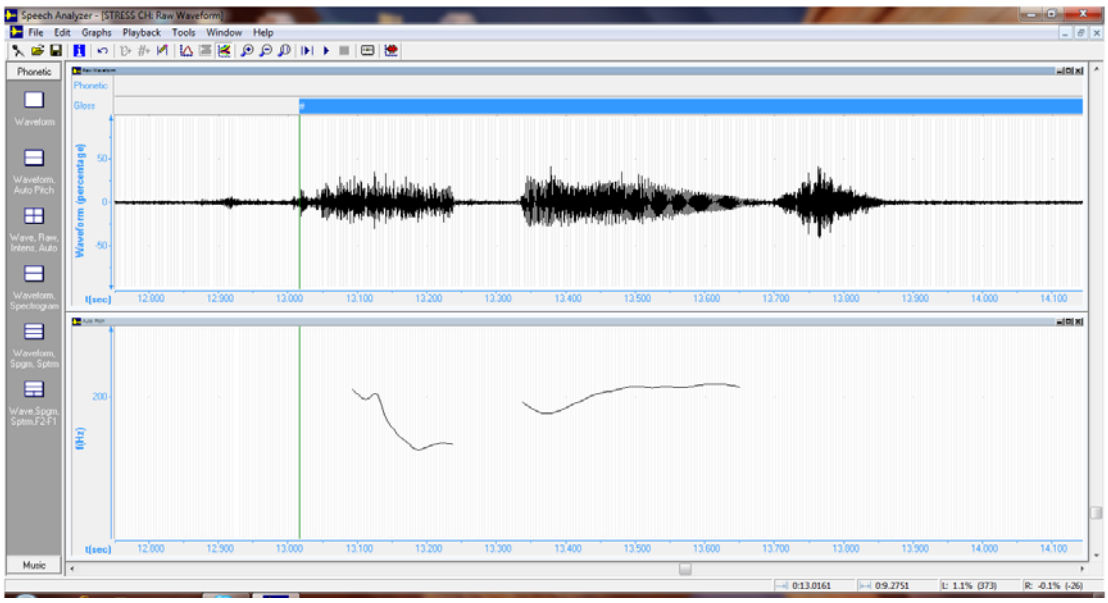


Figure 2 *Waveform and pitch contour for 'Challenge'*

The patient had a pause in between the two syllables. The pitch rises from 160Hz to 200Hz on the second syllable.

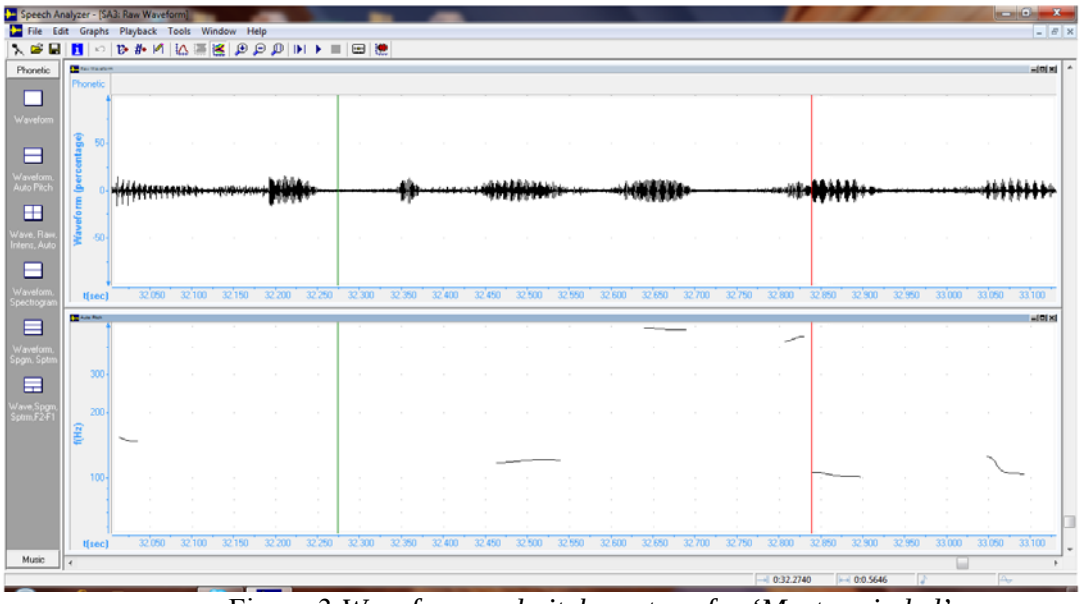


Figure 3 *Waveform and pitch contour for 'Masterminded'*

For this word, the pitch level rises from120Hz to 495 Hz. This rise in pitch is on the syllable '-min-'. The word is demarcated by the two vertical lines.

6.4 *Rhythm*

In English, stress and rhythm are closely related because English is stress-timed. In stress timing, emphasis is on stressed syllable, not all syllables but, in syllable timing, emphasis is on all syllables. The subjects did not make any syllable obscure, making all vowels strong. That is, there is no syllable that has any weak vowel. But among the syllables, one is still identified as most prominent. This is almost done by approximating stress to tone, in which case the most prominent syllable takes the (H)igh tone. This affected the rhythm of their speech and made it peculiarly different from RP, just as NE rhythm is.

In some instances, there was syncope, but its occurrence was not associated with fast speech; rather, the vowels were deleted probably due to the damage that has occurred to the brains of the patients. This vowel deletion reduced the number of the syllables of the word and consequently affected the rhythm of the speech. Let us now examine two of such instances found in the speech of some of the subjects: '**machnic'** (*mechanic*) and '**esday'** (*yesterday*). Tableaux 6 and 7, respectively, represent their rhythm patterns.

Input /mɪkænɪk/(mechanic) → Output /mæʃnik/

Mɪkænɪk	F(σ)	F (F)	*F' LESS	*F (ŏ)
(i)mɪkænɪk				**
☞(ii)mæʃnik				*
(iii)mekænɪk				**

Tableau 6 *The emergence of /mæʃnik/*

Input /jestədɪ/ → Output /esdɛ/

/jestədɪ/	F(σ)	F (F)	*F'LESS	*F (ŏ)
☞(i)esdɛ				*
(ii)jestədɪ				**
(iii)jestædɛ				**

Tableau 7 *The emergence of /esdɛ/*

In the two words under analysis, each optimal candidate violates *F(ŏ), which says do not pronounce unstressed vowels, once; while the other output candidates violates it twice. In Tableau 6, the RP output candidate (i) and the NE output candidate (iii) pronounce the two unstressed vowels in the word. The same applies in Tableau 7.

This pattern seen above indicates that the subjects did not have stress isochrony. If they did, the rhythm of their speeches would have been stress timed. Conversely, the speech of the subjects exhibited syllable isochrony, that is, syllables occurred at regular intervals. This shows that their rhythm is close to syllable-timing. This is the rhythmic pattern popularly proposed for NE. In the third common rhythm theory – Full Vowel Timing, associated with Bolinger (1981), isochrony is based on full (strong) vowels. This means that short vowels following a full vowel are taken to be a part of that full vowel.

Since there is no uniform rendition of most of the words by the subjects (for instance, police has versions such as /polit/, /poli/, /polis/ and /pulis/), the rendition of two sentences from the normative text by two of the subjects are used for analysis below. They show the essential rhythmic pattern of all the subjects.

It has to be hinted that pauses constitute an essential feature of the rhythm of these subjects. At times, pauses occur at roughly regular intervals. But the existing theories on rhythm have not taken cognizance of this important physiological feature of aphasics. The structures below reveal the essential features of the rhythm of the subjects.

I can - - - allenge - - - that - - - adam - - - who - - - masterded - - - minded - - - the - - - attack

The input is 'I can now challenge that madam who masterminded the attack'.

The dots in the speech of the subject above are used to mark the pauses. Virtually each word was accompanied with a long pause. The pauses were not grammatical, as indicated in the splitting of *masterminded.* The rhythmic pattern of this subject is presented below.

——————————————————————————— Feet

aɪkæn---ælendʒ---dat---mædæm---hu---mæstæd---mɑɪnded---di---ætæk

I can allenge that madam who masteredminded the attack

——————————————————————————— Syllables

This analysis shows that the syllables and feet are equal in number (15). It also shows that each foot has a pause as its integral part, except those cases where a word has two feet (for example /ælendʒ/ and /mædæm/. A contrary picture is seen when we consider the rhythmic pattern of the four normal adults used as control subjects. In their own renditions, pauses do not constitute an integral part of the feet; they are not isochronous. The pauses observable in the speeches of the control subjects are normal pauses noticeable in everyday conversation.

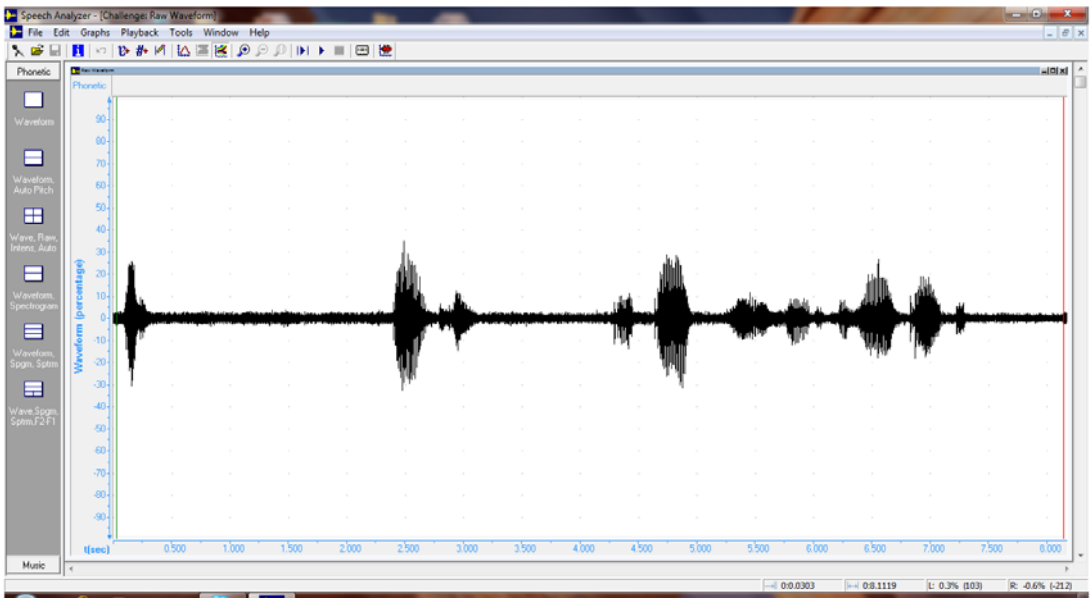


Figure 4 *Waveform for ' I can challenge the madam who masterminded the attack' as rendered by the patient*

This patient joined 'I' and 'can'; there is a pause between can and challenge (2.450 sec); there is a major pause between madam and who(1.650sec); the other pauses before the end of that utterance are roughly regular(0.25sec). This is the average pattern of pauses; there were some subjects that had pauses that were 10 or 20secs long between words.

This same utterance in the speech of the control subjects has the rhythmic pattern shown below:

Feet

aɪ kæn nɑo tʃælendʒ dæt mædæm hu mæstæmɑɪnded di ætæk
I can now challenge that madam who masterminded the attack

Syllable

Here, there are 16 syllables and 16 feet. This is different from that of the aphasic analyzed above, because the aphasic deleted now. The main difference in the rhythmic pattern of the aphasic and that of the control subjects is the pauses. Other differences relate to the segmental differences already analyzed.

If stress-timing, which a native speaker of English will use, is applied, a different rhythmic pattern is seen, as shown below:

Feet

əkn naʊ tʃælɪndʒðt mædəmʊ mæstəmaɪndɪðə tæk
I can now challenge that madam who masterminded the attack

Syllable

Here, there are 16 syllables but there are just 6 feet. The number of the feet tallies with the number of the stressed syllables. The number of the feet would have been 5 if not for masterminded, which has a secondary stress. Another notable feature of the L_1 rhythmic pattern is *anacrusis*, unstressed syllables at the beginning of an utterance (Crutenden 1986: 24). The two rhythmic patterns presented earlier do not have this, as all syllables are given prominence.

Let's now examine the second example taken from subject P6:

I - - - quickly - - - called - - - the - - - police

The input is "I quickly called the police."
The speech of this patient was staccato in form. The sample utterance chosen has the rhythmic pattern shown below:

	Feet
ɑɪ kʊɪkle… kæld… di… polis	
I quickly called the police	
	Syllables

The subject pronounced the words in this sentence one-by-one, with noticeable pauses separating them. The syllables are eight in number, just as the feet are. Only two feet do not have any pause between them: kʊɪkle and polis.

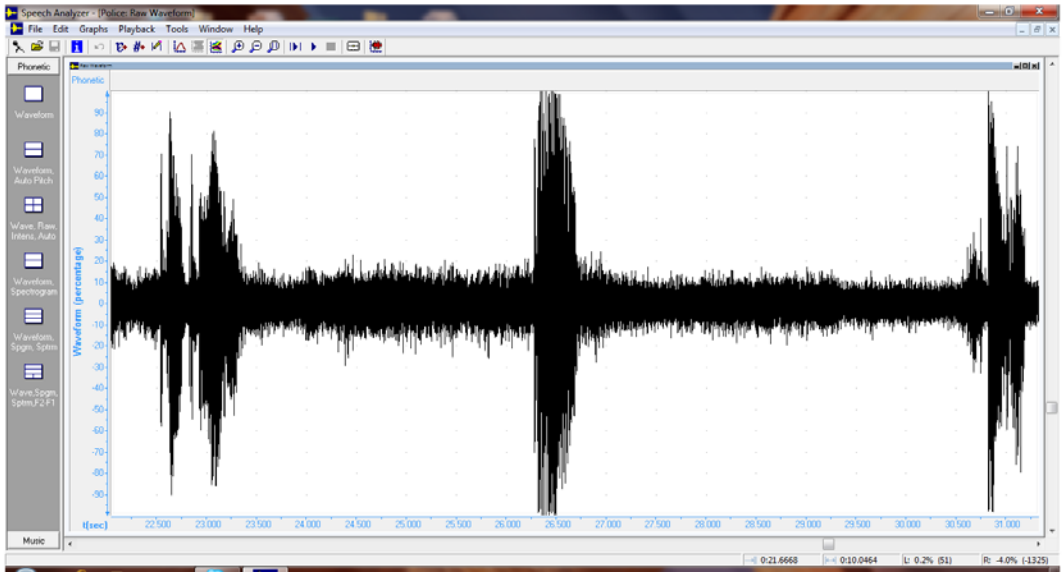


Figure 5 *Waveform for 'I quickly called the police' as rendered by the patient'*

Between quickly and called the pause is 3.500sec; between 'called' and 'police', the pause is 3.900sec.

The rhythmic pattern of this utterance by the normal adults does not contain such pauses:

Feet

ɑɪ kʊɪkle kæld di polis
I quickly called the police

Syllables

Here too, the syllables and feet are equal in number, because of them is weak; that is, each syllable has a full vowel.

An entirely different picture is seen in the RP rhythmic pattern shown below:

Feet

ə kwɪklɪ kældəpə lɪs
I quickly called the police

Syllables

The number of the syllables in this rhythmic pattern is 7 but the feet are 3 in number. The first syllable is an anacrusis while the and po become part of called.

In a nutshell, the analysis of these utterances indicates that none of the three popular rhythm theories (Stress Timing, Syllable Timing and Full-Vowel Timing) adequately caters for the rhythm of bilingual Nigerian adult aphasics, as none of them caters for pauses which are an essential feature of the rhythm of these aphasics. Because each syllable is given prominence in the speech of these aphasics, just as it is in the speech of the control subjects, modifying Syllable – Timing theory to cater for these aphasics, seems reasonable. Therefore, I propose ***Syllable – Pause Timing theory.***

6.5 *Intonation pattern of bilingual Nigerian adult aphasics*

The falling tune was predominant in the speech of these subjects. Even in contexts considered to be traditionally the domains of the rising tune, the falling tune was deployed. For instance, the rising tune is traditionally used to show non-finality in clause boundary. In the first sentence of the normative text, there are three clauses: 'When I was going home yesterday, I saw the mechanic who stole my car'. There should be a rising tune after the first subordinate clause, before the tune finally falls at the end of the whole sentence. All the patients who read the normative text used the falling tune after the first clause, as represented below, using P15:

When I was going home yesterday I saw the mechanic who stoli my car

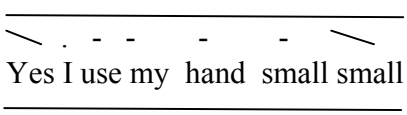
This pattern is not different from what obtains in the speech of the control subjects; only one of them used the rising tune to show this clause boundary.

In RP, intonation is used to show attitudes, such as enthusiasm, interest, standoffishness, reservation and hostility. This function of intonation is virtually absent in NE. The subjects too did not use intonation to show their attitudes to certain questions the

researcher asked them. Instead, they used the perfunctory falling tune. The structures below are illustrative:

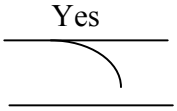
(i) **Researcher**: Ok Ok and when it started were you able to use any of your hand?
Patient: Yes I use my hand small small

The patient's answer has the intonational pattern shown below:



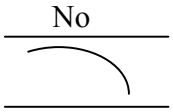
(ii) **Researcher**: Do you understand English?
Patient: Yes

The patient's answer has the intonational pattern shown below:



(iii) **Researcher**: Were you a teacher before? Were you teaching?
Patient: No

The intonational pattern of the patient's utterance is shown below:



The answers of the patients analyzed above could have been said with intonational tunes like rise-fall and fall-rise. These would have shown different attitudes of the patients. The use of the falling tune by these subjects does not indicate lack of interest, because the subjects fully participated in the interaction with the researcher. Conversely, it indicates that the attitudinal function of intonation is not deployed by bilingual Nigerian adult aphasics, just as it is not always deployed in NE. However, in some cases where the rising tune is customarily used in RP and NE, the patients used the falling tune. In a nutshell, the difference in the intonational pattern of these subjects and that of RP is not due to brain damage. This conclusion is based on the fact that the aphasics acquired NE before the language disorder and their intonational pattern is very similar to that of the non-aphasic NE speakers.

8. Concluding remarks

At the suprasegmental level, it was discovered that two processes typically affected the syllable: simplification and modification. The two are resultants of the processes affecting the

segments. Simplification resulted from both deletion and epenthesis; consonant clusters were simplified by either deleting some of the consonants or by inserting vowels. Simplification leads to modification. Vowel epenthesis automatically increases the number of the syllables in a word, because vowels serve as syllable peak.

The stress marking in the speech of the subjects was not affected by the brain damage. They stressed words the way NE does. Generally, the patients shifted stress forward. This makes the feet to be iambic rather than trochaic. The rhythmic pattern of the subjects was a bit similar to that of NE. Syllable timing has been used to describe the rhythm of NE. However, the aphasics, apart from making syllable isochronous, made pauses almost isochronous. This is why I propose ***Syllable-Pause Timing*** to account for the rhythm of bilingual Nigerian adult aphasics.

Intonation was deployed by the subject in patterns similar to those found in NE. The attitudinal use of intonation was completely absent in the speech of these aphasics. The rising tune was virtually absent in their speech. The falling tune predominated. Even in those cases where the rising tune is customarily used in RP and NE, the patients used the falling tune.

The concept of the modularity of language in the brain is further strengthened by the findings in this research. The argument about modularity of language is that there are different sections for language reception and language expression. Another dimension to this, as evident in the findings in this research, is that, apart from the fact that each of these aspects of language can be selectively impaired, there could still be selective impairment within each of these aspects. In the aspect of language production, some suprasegmental features may be left intact, while the segmental aspect is impaired. If this is not possible, how then do we account for the retention of NE stress pattern, and some aspects of the rhythm and intonation of NE in these subjects, whereas the segmental phonology was significantly affected?

References

ADENIYI, Clement A. 2009. The typology of three-tone systems: Ebira, Ghotuo, Yala(Ikom) and Yoruba. M.A Dissertation, Department of Linguistics and African Languages, University of Ibadan, Nigeria.

AKINJOBI, Adenike. 2000. An introduction to English phonetics and phonology.In BABAJIDE, A.O. Ed. *Studies in English language*. Ibadan: Enicrownfit Publishers, 2000, pp. 5-24.

AKINJOBI, A. 2002. Nigerian English or Standard English suprasegmentals: The question of which variety to teach. In BABATUNDE, Sola T. and ADEYANJU, Dele S. Eds. *Language, meaning and society: papers in honour of E.E. Adegbija at 50.* Ilorin: Haytee, 2002, 30-50.

AKINJOBI, Adenike. 2004. The duration and quality factors in Educated Yoruba Spoken English: The realization of syllables with syllabic consonants as peaks. In *Ibadan Journal of English Studies*, vol. 1, 2004, pp. 88-99.

AKINJOBI, Adenike. 2006. A phonological study of the influence of word stress shift on Educated Yoruba English vowels and syllables. In OWOLABI, Kola. and DASYLVA, Ademola. Eds. *Forms*

and functions of English and indigenous languages in Nigeria. Ibadan: Group Publishers, 2006 pp. 558-576.

AKINLABI, Akinniyi. M. 1985. Tonal underspecification and Yoruba tone. PhD thesis. University of Ibadan, Nigeria.

ARCHANGELI, Diana. 1997. Optimality Theory: An introduction to linguistics in the 1990s. In ARCHANGELI, Diana. and LANGENDEON, D. Terence. Eds. *Optimality Theory: an overview.* Oxford: Blackwell Publishers, 1997, pp.1-32.

BAKARE, Clement A. 1995. Discrimination and identification of Yoruba tones: perception experiment and acoustic analysis. In OWOLABI, Kola. Ed. *Languages in Nigeria.* Ibadan: Group Publishers, 1995, pp.33-67.

BAMGBOSE, Ayo. 1971. The English Language in Nigeria. In Spencer J. ed. *The English Language in West Africa*, London: Longman, 1971.

BAMGBOSE, Ayo.1990. *Fonoloji ati girama Yoruba.* Ibadan: University Press PLC.

BANJO, Ayo. 1979. Beyond intelligibility. In UBAHAKWE, E. Ed. *Varieties and Functions of the English Language in Nigeria*, Ibadan: Afriacan University Press, 1979, pp. 7-13.

BOLINGER, Dwight L. 1981. *Two kinds of vowels, two kinds of rhythm*. Bloomington: Indiana University Linguistics Club.

CAPLAN, David. 2003. Neurolinguistics. In ARONFF M. and ROSE-MILLER J. Eds. *The handbook of linguistics.* Oxford: Blackwell, 2003, pp. 582-607.

CRUTENDEN, A. 1986. *Intonation*, Cambridge: Cambridge University Press.

CRYSTAL, David. 1987. *The Cambridge encyclopedia of language*. Cambridge: Cambridge University Press.

DARLEY, Frederick.L.1982. *Aphasia.* Philadelphia: W.B Sanders.

EDWARDS, Susan. 2002. Aphasia. MALMKJÆR, K. Ed. *The linguistics encyclopedia*, London and New York: Routledge, 2002, pp.17-21.

EKA, David. 1993. Timing in Educated Nigerian English. *Journal of Humanities* 3:1-11, 1993.

GOODGLASS, Harold. and KAPLAN, Edith. 1983. *The assessment of aphasia and related disorders*. 2nd Ed. Philadelphia: Lea.

GUSSENHOVEN, Carlos and JACOBS, H. 2005. *Understanding phonology.* London and New York: Hodder Arrnold.

HALLE, Morris. and IDSARDI, William. 1995. General properties of stress and metrical structure. In GOLDSMITH, J.A. Ed. *The handbook of phonological theory.*Oxford and Cambridge: Basil Blackwell.403-443, 1995.

HALLE, Morris. and VERGNAUD, Jean-Roger. 1987. *An essay on stress*. Cambridge, Mass: MIT Press.

HAMMOND, Michael. 1997. Optimality Theory and prosody. *Optimality Theory: an overview.* In ARCHANGELIi, D and LANGENDEON D.T. Eds. Oxford: Blackwell Publishers, 1997, pp 33-58.

HELM – ESTABROOKS, Nancy. and ALBERT, Martin L. 1991. Pharmacotherapy for aphasia *Manual of Aphasia Therapy.* In HELM-ESTABROOKS, N. and ALBERT, M.L. Eds. Austin, TX: PRO-ED, 1991, pp 245-249.

JOWITT, David. 1991. *Nigerian English usage: an introduction*. Lagos: Longman Nigeria Plc.

KAGER, Rene. 1995. The metrical theory of word stress. *The handbook of phonological theory.* In GOLDSMITH, J.A. Ed. Oxford and Cambridge: Basil Blackwell, 1995, 367-402.

KAGER, Rene.1999. *Optimality Theory*. Cambridge: Cambridge University Press,1999.

KERTESZ, Andre. 1979. *Aphasia and associated disorders: Taxonomy, localization and recovery*. New York: Grume and Straton.

KUIPER, Koenrad. and ALLAN W.Scott. 1996. *An introduction to English language: sound, word and sentence*. London: Macmillan.

KUJORE, Obafemi. 1985. *English usage: Some notable Nigerian variations*. Ibadan: Evans Brothers.

LANIRAN, Yetunde. 1992. Intonation in tone languages: the phonetic implementation of tones in Yoruba. PhD thesis. Cornell University.

LA VELLE, Carl. R. 1974. An instrumental study of Yoruba tone*.* In *Studies in African Linguistics. Supplement 5*:185-194, 1974.

NAPOLI, Donna Jo. 1996. *Linguistics: an introduction*. New York and Oxford: Oxford University Press.

OWOLABI, Kola. 2004. *Ijinle itupale ede Yoruba(1):fonetiiki ati fonoloji*.Ibadan: Onibonoje, 2004.
PARKER, Frank. 1986. *Linguistics for non-linguists*. San Diego: College-Hill Press.

PULLEYBLANK, Douglass. 1997. Optimality Theory and features. *Optimality Theory: an overview.* In ARCHANGELI D. and LANGENDEON D.T. Oxford: Blackwell Publishers,1997, pp 59-101.

ROACH, Peter. 1997. *English phonetics and phonology.* Cambridge: Cambridge University Press.

SIMO-BOBDA, Agustin.1995 The phonologies of Nigerian English and Cameroon English. In BAMGBOSE, A., BANJO, A., and THOMAS, A.. Ed *New Englishes: A West African Perspective*, Ibadan: Mosuro, 1995, pp 248-268.1995.

SUNDAY, Adesina. 2005. Introductory metrical phonology. *Perspectives on language and literature*. In OLATEJU, M. and OYELEYE, L. Eds. Ife: Obafemi Awolowo University Press, 2005, pp 25-36.

SUNDAY, Adesina. B. 2004. Compound and phrasal stress(es) in Educated Yoruba English. M.A. Dissertation. Department of English. University of Ibadan, Ibadan.

UFOMATA, Titi. 2000. The rhythm of Educated Spoken Nigerian English: an alternative description. Paper presented at the 22nd West African Languages Congress (WALC). University of Ghana, Legon.

WERTZ, Robert. T. 1996. Clinical description. In WALLACE, G.L. Ed.*Adult Aphasia Rehabilitation*. Boston and Oxford: Butterworth-Heinemann, 1996, pp39-56.

WHITAKER, Harry. A. 1975. Linguistics and neurology *Linguistics and Neighbouring Disciplines*, In P. BARTSCHAND, P and VENNEMANN, T. Eds. Amsterdam: North – Holland Publishing Company, 1975, pp. 33-42.

WINGFIELD Arthur. 1992. Anomia. *International encyclopedia of linguistics.* Vol 1.In BRIGHT. W. Ed. New York and Oxford: Oxford University Press.1990, pp. 64-65, 1.

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