

The Structure and Function of Heavy Syllables in the Phonology of English Language

Abubakar Atiku Alkali

Usmanu Danfodiyo University, Sokoto
Department of Modern European Languages and Linguistics
alkali.abubakar@udusok.edu.ng

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Abstract

This paper examines the place of heavy syllables in relation to syllable structure in English language. Drawing from examples in the literature, it is seen that syllable weight plays a vital role in the placement of stress in English. It is noted that although nouns, adjectives and verbs display different stress patterns, in all of these, it is always the heavy syllables that attract stress. Apart from the issue of stress assignment, the paper looks at other prosodic phenomena in which syllable weight is paramount. These include metrical scansion, compensatory lengthening, language acquisition and the syllable weight in tone languages. All of these indicate the indispensability of heavy syllables in the prosody of human languages.

Key words: Syllable Heavy Weight Phonology English

1.0 Introduction

The syllable in many languages of the world is an essential unit that forms the basis of phonological representation and analysis. In spite of its importance however, it has remained difficult to define. Even though phonologists agree (depending of course on a number of factors which will not be mentioned in this paper) that it is easy for even the 'naive' speaker to recognise the number of syllables in any given word (Kahn 1976; Goldsmith 1990; Giegerich 1992; Ladefoged, 1993) there is equally a convergence of views on the difficulty in defining it. Here, one is faced with a paradox – easy to recognise even by a layman, but hard to define even by a phonologist.

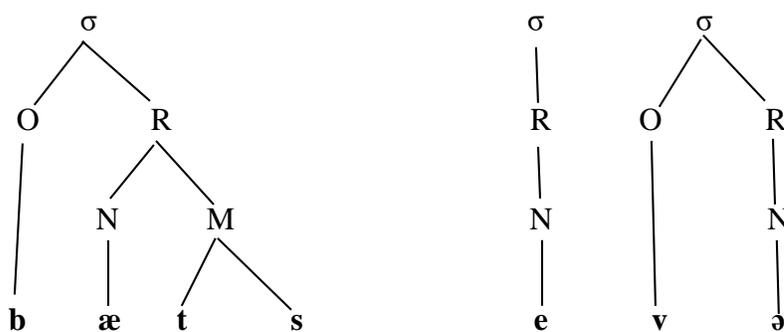
For this reason, the syllable is defined either from the perspective of the Chest Pulse or Sonority theories which in themselves are not fully satisfactory. This paper does not intend to go into the shortcomings of these theories in order not to go out of scope; it will all the same not be out of place to mention that Ladefoged (1993:247) questions the wisdom behind the Chest Pulse theory by refuting its claim thus: "... it is clearly untrue to say

that every syllable is initiated by a chest pulse". Giegerich (1992:137) on the other hand, impugns the Sonority theory by posing some questions that the theory has not yet answered, for example, the categorisation of the word *sticks* as monosyllabic when it contains three peaks of sonority. Consequently, this paper concurs with Ladefoged's description of syllable as "the smallest possible unit of speech" (1993:248).

1.1 Syllable structure

Katamba (1989:153) reports that there are a number of syllable models. This paper however limits its discussion to a brief examination of a branching hierarchical syllable structure. A syllable according to Hyman (1975:188) consists of three 'phonetic parts' – "the onset, the nucleus or peak and the coda". It is a unanimous position of phonologists that an English syllable must at least contain a nuclear segment which constitutes its rhyme – either a vowel or a syllabic consonant. This is because other syllable components such as the onset and coda are said to be optional (Katamba, 1989:155). But is a caveat not necessary here? Is the optionality of the onset particularly absolute? This is because it could be argued that in the second syllable of the word *helping* for example, the onset is necessarily obligatory.

The basic syllable types are exemplified below:

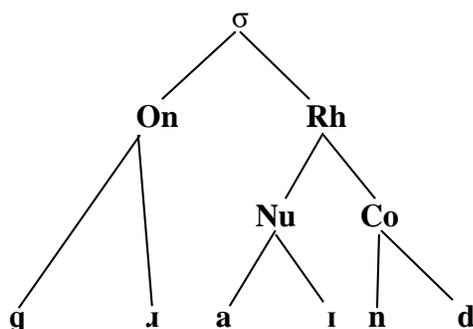


Source: Katamba (1989:154).

The syllable in the word *bats* (first left), has both an onset and a rhyme consisting of a nucleus and a coda. The word *ever* is a disyllabic word containing a single syllable with neither onset nor coda whereas the last syllable has an onset but without a coda.

1.2 Syllable template

From the foregoing illustrations, it is possible to consider what constitutes a syllable template in English. The concept of syllable template is important in the understanding of syllable structure. It provides a fit to which every acceptable English syllable must conform. The most promising way of organising a syllable template is by recourse to the Sonority theory, notwithstanding its shortcomings as highlighted by various scholars. English syllables are made of structures that may be seen as maximal (Hogg & McCully 1987; Giegerich 1992) but these are often violated both in onset and coda positions by some 'non-compliant' segments. /s/ for example is notorious for violating not only the maximal onset requirements but also that of sonority. Fortunately, or so it may seem, it is the only 'offender' in the onset position (/ʃ/ is reported to occur rarely in Yiddish loan words), so it is easy to handle. This is because it has been identified that there are selectional restrictions imposed on which segments should become its immediate neighbours to the right in syllable onsets – the voiceless obstruents: /p/, /t/, /k/. In the coda position, /s/ again violates the phonotactic constraints of English, but here, it has some 'allies' such as /t/, /d/, /z/, /θ/ and /dʒ/ (Giegerich 1992:150). Consequently, a normal English syllable template looks like this:



Source: Hogg & McCully (1987:41).

However, with the admission of 'appendices' that violate both the maximal projection and sonority (Giegerich, 1992:150), a more elaborate syllable template emerged to accommodate three 'X' positions in the onset and six 'X' positions in the rhyme (two in the peak and four in the coda).

Notwithstanding the above, there is again a consensus among scholars that a CV type syllable is the most natural. Hyman (1975:188) citing Malmberg (1963:29) contends that this type of syllable is the 'most primitive' as well as the earliest in addition to being present in all languages. Hyman (ibid) himself is of the view that it is difficult to establish syllable boundaries in syllables with complex structure.

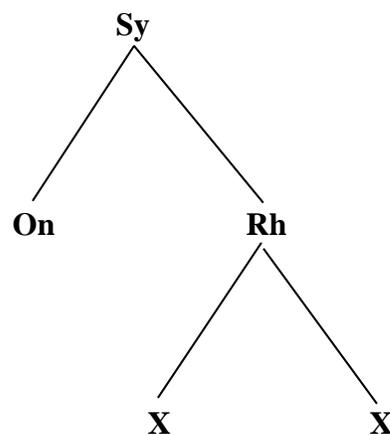
2.0 Syllable weight

The preceding discussion is aimed at providing a snippet of what a syllable is and how its structure looks like. In this and subsequent sections, syllable weight (which is the focus of this paper), is discussed. Gussenhoven & Jacobs (2011:173) view syllable weight in terms of the presence or absence of moras (morae). A mora is understood to refer to a phonological unit which is beyond the segment but below the syllable. They call it "intermediate level structure between segments and the syllable". Weight therefore according to them represents the "opposition between monomoraic and bimoraic syllables". This implies that any syllable with a single mora is light while the one containing two moras is heavy. Giegerich (1992: 47) considers weight from the perspective of the 's-nodes' that a syllable dominates in a structure; hence, the distinction between a heavy and light syllable is thus: the "root" of a heavy syllable "dominates an 's' which in turn dominates an 's' (the nucleus)" while that of a light syllable only "immediately dominates the nucleus". Katamba (1989:176) equally contends that "a syllable is heavy if it contains a branching rhyme" and light if otherwise. A heavy syllable will therefore necessarily contain a tense vowel or a diphthong whether or not followed by a consonant; or at least a short vowel followed by a consonant. The difference between the two proposals above seems to be that Gussenhoven & Jacobs adopt a moraic model while Giegerich opts for the skeletal slot model in their

representations of weight. The discussion that follows dwells on the role of heavy syllables in the phonology of English.

3.0 Function of heavy syllables in the phonology of English language

In the preceding section, an attempt was made to identify heavy and light syllables. This section is devoted to a discussion of the functions of heavy syllables. It is however considered important to look at the structure of a heavy syllable below:



Source: Giegerich (1992:146).

The tree diagram above indicates that a heavy syllable dominates two 'X' nodes in its rhyme as opposed to a light syllable which dominates one. Having seen this, the paper now proceeds to discuss the functions of heavy syllables.

3.1 Stress placement

It can be argued that stress placement is about the most noticeable function that a heavy syllable performs. English stress placement is said to be dependent on a number of variables. Loudness in itself does not determine where stress falls; other parameters such as "duration, pitch variation and vowel quality" are of tremendous importance (Fudge 1984; Gussenhoven & Jacobs, 2011). A stressed syllable will therefore

naturally be more prominent relative to other syllables in the same word. As the focus of this paper is on syllable weight generally, the discussion of stress is limited to lexical stress only.

The function of heavy syllables is seen in the basic rules of stress placement as outlined by Fudge (1984:29). Monosyllabic words he observes, offer no choice as they are usually stressed. (This statement should be selective because function words, most of which are monosyllabic, are not stressed except for effect). Two-syllable words take penultimate stress while three and longer syllable words receive either penultimate or antepenultimate stress "depending on a number of factors: if the final syllable is strong, stress falls two syllables back from that syllable", otherwise "if the penultimate syllable is strong, then it is stressed". Alternatively, the syllable preceding the penultimate is stressed "if the penultimate is weak". This however, applies only to nouns. Verbs and adjectives have different stress patterns as shown in the examples below, taken from Davenport & Hannahs (2010:81-83 emphasis added):

(1) e.le.phant

wa.la.by

al.ge.bra

oc.to.pus

(2) hy.e.na

com.pu.ter

po.ta.to

ko.a.la

(3) ve.ran.da

u.ten.sil

con.vic.tion

pen.tath.lon

The examples above, show the relevance of heavy syllables in the assignment of stress in English nouns. The nouns in (1) have antepenultimate stress because those are the syllables that are heavy relative to the remaining ones in each of the words. In the examples in (2) and (3) however, the penultimate syllables are the ones bearing stress because they are heavy. The following examples from verbs show a different pattern:

(4) a.**ppeal**

en.ter.**tain**

con.**fuse**

de.**ny**

(5) in.**tend**

co.**llapse**

re.pre.**sent**

su.**ggest**

In both the examples in (4) and (5), all the verbs have final heavy syllables and they are the stressed ones unlike in the examples in (1), (2) and (3) for nouns. It should be noted however, that verbs in which the stressed syllables are not the final ones exist. Examples are in such words as con.**si**.der, a. **sto**.nish, i.**ma**.gine, **pro**.mise, etc. which all have penultimate stress because those are the heavy syllables in the words. This inconsistent occurrence with respect to verbs is outside the scope of this paper and is therefore not discussed further.

The last examples are from adjectives as in the following:

(6) **won**.der.ful

in.cre.di.ble

con.fi.dent

(7) en.**thra**.lling

u.**ni**.ted

a.**ma**.zing

(8) a.**ttrac**.tive

tri.**um**.phant

a.**ttack**.ing

In the examples above, all the adjectives show a stress behavior that is similar to the one exhibited by the nouns in (1), (2) and (3) above. The antepenultimate syllables are stressed in (6) because they are heavy while only the penultimate syllables in (7) and (8) are stressed as they are the heavy ones. In (9), (10) and (11) below, the adjectives display a different pattern of stress.

(9) **so**.lid

sim.ple

ur.gent

(10) in.**sane**

com.**plete**

ob.**tuse**

(11) co.**rrupt**

un.**kempt**

in.**tact**

In all the examples in (9), (10) and (11), the adjectives behave like verbs in their stress patterns. A learner of English would be excited that stress placement in the language is not only predictable but indeed has a set of rules, only to become disappointed by realising that "the stress rules of English are ... riddled with exceptions" (Kahn, 1976:85). English nouns for example, are "extrametrical". The final syllables in nouns are therefore invisible to the rules of stress. However, the -ee in the nominalisation of 'detain' by suffixation, i.e. detainee, attracts stress but suffixes like -ity pass stress to the penultimate syllable (Katamba, 1989:255). Words like *badminton*, *calendar* and *cylinder* (all containing heavy penultimate syllables) are stressed on the antepenult

whereas the penults of *vanilla*, *Madonna* and *confetti* which are light, take stress by resorting to "ambisyllabicity" (Giegerich, 1992:188-189). What an inconsistency!

3.2 Metrical scansion

Metrical phonology developed out of the analysis of the traditional verse structure in poetry although Gussenhoven & Jacobs (2011:15) are quick to point out that the concept of foot in metrical phonology is "similar" to that of metrical poetry but they are not "identical". The applicability of this theory to syllable weight is restricted only to English language in this discussion. Goldsmith (1990:169) posits that the theory was propounded on "two formalisms: the metrical tree and grid" using S(trong) and W(eak) notations either by adjoining lines on trees or 'X' notations on grids. The concern of this paper is in the construction of feet in English.

Hogg & McCully (1987:65-70) posit that the S/W notation implies "stronger than" or "weaker than"; meaning that since the constituents are "binary branching" a node is either stronger or weaker than its sister node. Thus, any node that is S-dominant is considered "the most prominent" and identified as the "Designated Terminal Element (DTE)". Archibald (1993:46) gives a summary of English metrical parameters as:

- The word tree is strong on the right.
- Feet are binary.
- Feet are built from the right.
- Feet are strong on the left.
- Feet are quantity-sensitive.
- Feet are QS to the [RIME].
- There is an extrametrical syllable; and it is extrametrical to the [Right].

Two issues are of utmost interest to this paper: feet are binary and that feet are quantity-sensitive. Why? Because feet are binary suggests that a foot is made of two syllables (except where there is a degenerate foot):

strong and weak, in which one, the strong, dominates and therefore decides where stress falls. Feet are quantity-sensitive means "branching rhymes are stressed while non-branching rhymes are not". This takes us back to our description of heavy syllables where it was indicated that heavy syllables, contain branching rhymes and herein lies the relevance of Metrical Phonology to the function of heavy syllables in the phonology of English.

3.3 Compensatory lengthening

This paper does not intend to go into the controversy surrounding compensatory lengthening, but it is just being mentioned in view of its relevance to syllable weight. Goldsmith (1990:73) contends this process involves the "lengthening of a segment – most commonly a vowel, but not always" triggered by the removal or taxing of a "segment" that is otherwise "present". A segment he says "makes up" for what is lost by another segment in speech. This paper, except in Old and Middle English examples (and of course in non-rhotic English dialects in which the dropping of /r/ leads to the lengthening of the preceding vowel, for example *art* becoming [ɑ:t] rather than [ɑ:rt]), has not come across any literature on this process in English, but it is found in many languages such as the Turkish deletion of /h/ at the end of a syllable "before a continuant or a stop" forcing the vowel before it to lengthen in compensation, e.g. [kahya] → [ka:ya] (Goldsmith, 1990:76) and Fula in which following the prohibition against /h/ in the coda, it deletes while the vowel preceding it lengthens. Examples are in the words for *build* "mah-" but *maadi* 'building' and *walk* "yah-" but *yaadu* 'way of walking' (Paradis, 1992). In both examples, the deletion of /h/ triggers the lengthening of the preceding vowel (long vowels are represented by two letters in Fula orthography). The essence of this illustration is to show the role of syllable weight in languages generally and specifically the indispensability of heavy syllables in all languages.

3.4 Language acquisition

A passing comment on language acquisition is made in this paper to demonstrate the function of heavy syllables. Archibald (1993:58) notes that children's incipient use of language involves only heavy syllables because they "find it easier to produce and perceive words with initial stress" than otherwise.

3.5 Syllable weight in tone languages

Gordon (n.d) indicates that most languages permit level tones on all syllable types regardless of their weight but selectively assign contour tones to some heavy syllables. Gussenhoven & Jacobs (2011:151) indicate that depending on the language, either a syllable is the "tone-bearing unit (TBU)" in which case tense vowels constitute one TBU or the mora serves as the TBU; in which case, tense vowels represent two TBU's. The sum total of what is being implied here is that even in tone languages, heavy syllables are crucial in the assignment of tones.

4.0 Conclusion

The paper has examined the structure and functions of heavy syllables in the phonology of English. Heavy syllables are those syllables dominating two 'X' positions in the syllable structure (i.e. that contain a branching rhyme) and are therefore absolutely necessary in every language. The weight of a syllable also, manifests not only in the structure of its rhyme, but also in the configuration of its coda.

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