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Linguistics	**Paper : Advanced Phonology**
	Module : Metrical Phonology-Word-stress

Description of Module	
Subject Name	**Linguistics**
Paper Name	**Advanced Phonology**
Module Title	**Metrical Phonology-Word-stress**
Module ID	**Lings_P5_M13**
Quadrant 1	**E-Text**

Metrical Phonology-Word-stress

Introduction

In the course of this and the following modules, you will be introduced to the sub-theory of generative phonology known as Metrical Phonology. You will be introduced to two versions of the theory, a tree-based original version and a grid-based later version. In order to fully understand the working of the current version, it is necessary to have an introduction to the original version. You will also be introduced to rules and their statements that are sensitive to stress or lack of it in words.

Word-stress in SPE

Linear description of word-stress: As noted earlier (in module 25 of Paper 1 and Module 5 of the present course), standard generative phonology as propounded in SPEmade two assumptions about word-stress- one, that it is a binary feature [+- stress] constituting vowels, and two, word-stress is derived by rule, with a provision of inclusion of long stretches of vowels and consonants in the context of the rule.

Both the features can be seen in an expansion of the word-stress rule for nouns in English:

(1)

[+syll, -cons] → [+stress] / ___ C0 ((VC (VC0))

Rule (1) applies iteratively. It has incorporated three sub-rules in it that place stress on different syllables from the right edge of the word- the final syllable, if it is heavy, or the penultimate syllable, if the final syllable is light or the penult is heavy, or the antepenultimate syllable if the final and the penultimate syllables are light. A heavy syllable is V:/ VCC finally and V:/ VC non-finally. A light syllable is VC finally and V non-finally. The stress is not placed beyond the antepenultimate syllable. (Any exception to this generalization on the surface, such as 'secretary, are accounted for by arguing that the underlyingly the word has three syllables; in this case the final 'y' is [-syllabic].) Examples of stress in nouns in English are given below to illustrate the working of the above rule.

(2)

a'larm [ə.'la:m]	u'tensil [jʊ.'ten.sil]	'benefit ['be.nɪ.fit]
sa'loon [sə.'lu:n]	a'sylum [ə'sai.ləm]	A'merica [ə'me.rɪ.kə]

The rule in (1) has two main problems. One of them is that the binary feature specification is unable to account for secondary stresses commonly found in English and other languages, as, for example, in *e,xami'nation, ,sensi'bility,* etc.In these words, secondary stresses occur towards the beginning of the word and primary stresses occur toward the end of the word. If this pattern of the occurrence of primary and secondary stresses in English was found to be regular, then a generalization stating that the leftward stress is secondary could be accounted for keeping the binary specification of stress. However, such regularity is not found, as can be attested in the pattern in words such as *'adver,tise*, *in'tensi,fy*, etc., in which the pattern of primary and secondary stresses is reversed.

The second major problem with (2) is that, as has been pointed out before, there appears to be no restriction on the length of the context in stress rules. It is only for word-stress that phonological rules need to have such long stretches of context.

The above two features of the description of stress in SPE beg the question if word-stress has features that cannot be accounted for in the linear framework of phonology. Hayes (1991, 1995) investigated word-stress in world languages and proposed to account for stress systems within the non-linear framework of Metrical Phonology. The theory that Hayes presented was in two phases. We will deal with both of them in the present and the following modules.

Metrical Theory of Word-stress- Phase I

Hayes (1991), on the basis of the metrical theory in Liberman and Prince (1977) and Selkirk (1980), among others, proposed that stress-systems in world languages can be accounted for on the labelled metrical tree, as shown for the words in (3)

(3)

s w w s

'differ de'fer

The two words *differ* and *defer* have opposite stress patterns, that are shown on the tree by labelling them differently. The tree representation has two main advantages- one that it helps explicate the notion of stress as relative prominence, and two that secondary and other degrees of stress, if any can be easily shown to result from tree structures.

Hayes developed a restrictive theory based on the notion of labelled metrical trees. The branches of the tree had two primitive labels, namely, dominant and recessive. A dominant node was labelled Strong and a recessive node was labelled Weak.

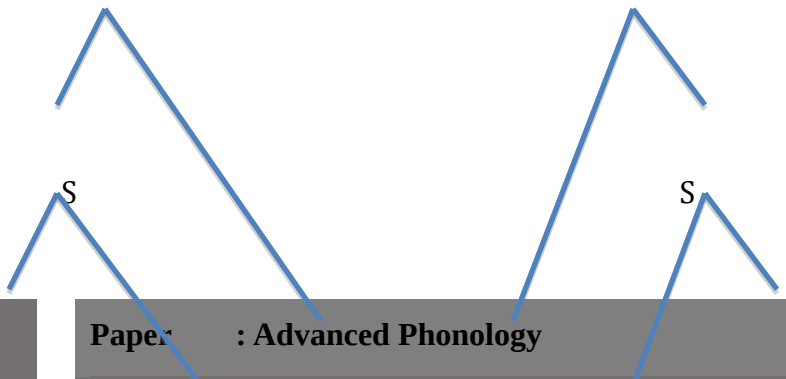
The raising of metrical trees was subject to a principle that determined a basic difference between dominant and recessive nodes:

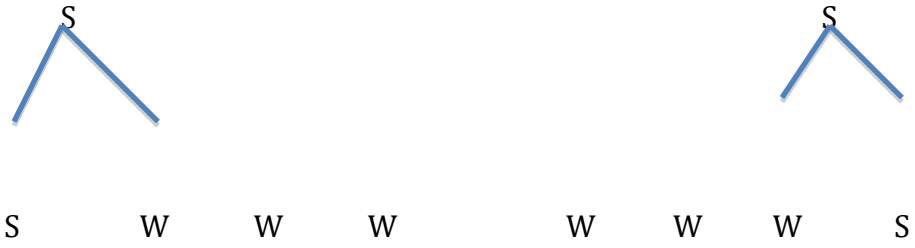
(4) Recessive nodes do not branch.

(4) applies to branching within the structure for a single stress. Following (4), recessive nodes are non-branching; dominant nodes may be branching or non-branching. This restriction was especially found useful for languages that distinguish the weight of syllables as heavy and light and in which heavy syllables attract stress on them.

(4) determines that languages that have initial stress are left-branching and languages that have final stress are right branching in the way shown in (5)

(5)

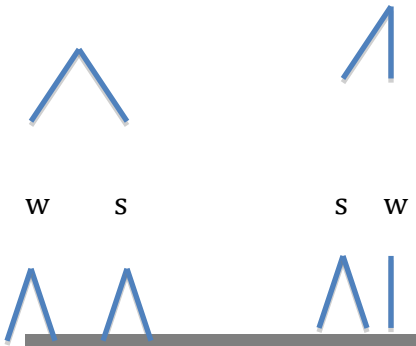




Following Selkirk (1980), the tree structure that has a terminal S node has one stress in it. A metrical tree with single terminal S nodes is a Stress Foot or simply a Foot. In the module on word-stress in Paper 2, we saw how a Foot in phonology relates to the notion of a poetic foot but also differs from it.

A phonological word that has more than one stress has more than one Foot. Thus words such as *e,xami'nation, ,sensi'bility, 'adver,tise* and *in'tensi,fy* have two stress feet each. The two degrees of stress in these wordsare shown thus:

(6)

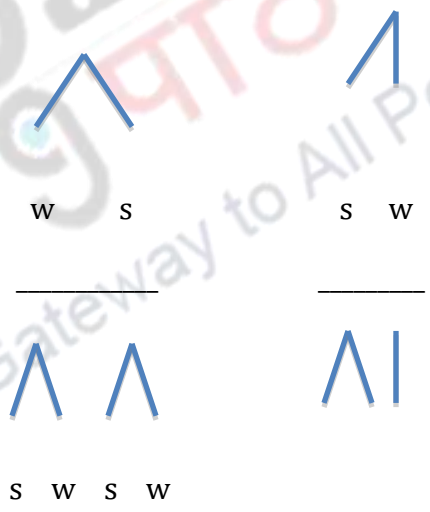


s w s w

e,xami'nation in'tensi,fy

In order to represent more than a foot, feet came to be separated from the Word by a horizontal line, thus:

(7)



s w s w

e,xami'nation in'tensi,fy

The metrical tree theory of stress that Hayes came to propose after a survey of more than 300 languages included the following parameters:

(8)

Quantity-sensitivity: Quantity-sensitive (QS) vs. Quantity-insensitive (QI)

Dominance: Left- dominant (ld) vs. right-dominant (rd)

Boundedness: Bounded vs. unbounded

Directionality: Left-to-Right (LR) vs. Right-to-Left

Gussenhoven and Jacobs (2001) illustrate stress systems that vary along these four parameters. Look at the examples of the following languages as examples of the different systems

Let us turn to see what the various parameters are understood.

Quantity-sensitivity: Quantity-sensitive (QS) vs. Quantity-insensitive (QI)

Languages in which stress is sensitive to the weight of syllables are QS

Different types of quantity-sensitivty

Heavy syllable: V: and VC (Hindi); only V: (Malayalam), only VC (Bangla).

Dominance: Left- dominant (ld) vs. right-dominant (rd)

Tamil (ld) vs. Adi (rd)

Note that dominance relation at the Foot and the Word levels may be the same or different.

Boundedness: Bounded vs. unbounded

Unbounded: Word-initial or word-final, irrespective of the number of syllables in a word. Examples of bi-syllabic, tri-syllabic and tetra-syllabic words with initial or final stress.

Languages that are sensitive to heavy syllables (long vowels or closed syllables) are also unbounded, as far as the placement of primary stress is concerned. Thus in Malayalam, the first syllable with a non-final long vowel is stressed in a word to give the primary stress. In the absence of a long vowel, the first syllable is stressed. In Bangla, the first closed syllable after the final syllable is stressed. If there is no closed syllable, the initial syllable is stressed.

Bounded: Systems in which stress is placed within a limited number of syllables, the penult or the antepenult, is a bounded system.

In Hayes restrictive universal theory, all bounded systems are binary. Exceptions to this claim are explained a little later below.

Secondary stresses that are predictable on the surface are also on account of bounded feet.

Directionality: RL or LR

How to find out whether a system is RL or LR? Look at both even numbered and odd numbered syllables. The odd-numbered syllables will reveal the directionality.

Degenerate feet

Rules for assignment of Stress feet

Exercises

Discussion of exercises

Now let us turn to the discussion of the analysis of stress systems in different languages. For the sake of ease of convenience and economy, we propose to look at the exposition of stress systems in Gussenhoven and Jacobs (2001), chapters 13 and 14. The excerpts form the two chapters can be found on the following link:

Stress systems

Unbounded Foot

Unbounded foot, Q-I, ld

Unbounded foot, Q-I, rd

Unbounded foot, Q-S, ld

Unbounded foot, Q-S, rd

Bounded Foot

a. Bounded Foot, Q-I, ld

b. Bounded Foot, Q-I, rd

c. Bounded Foot, Q-S, ld

d. Bounded Foot, Q-S, rd

Languages vary with regard to two aspects of stress systems, in addition to the foot types described above:

1. Extrametricality

Illustrations of extrametricality systems

Unbounded Foot- Extrametricality

a. Unbounded foot, Q-I, ld

b. Unbounded foot, Q-I, rd

c. Unbounded foot, Q-S, ld

d. Unbounded foot, Q-S, rd

Bounded Foot- Extrametricality

a. Bounded Foot, Q-I, ld

b. Bounded Foot, Q-I, rd

c.Bounded Foot, Q-S, ld

d. Bounded Foot, Q-S, rd

2. Primary and secondary stresses being of identical or different (e.g. Garawa) types of feet. The dominance relation at the word level determines their primary or secondary stress statuses.

3. The dominance relations at the foot and the word levels being identical (unmarked case) or different.

Exercises

Revised Metrical Stress Theory (Hayes 1995)

Main aspects of revision:

1. Feet and words can have autosegmental representation in terms of grids in parentheses

(X .) σs σw

As many stresses so many parentheses. Stressed syllables represented as [X], and unstressed syllables as [.]

2. Unbounded trees at the Foot and the Word level are expressed by the rule End Rule with a parametric variation –Initial and –Final: End Rule (Initial) and End Rule (Final).

Thus, Foot in the illustrations (numbered)

Word in the illustrations (numbered)

3. The left-dominant and right-dominant bounded feet can be described using the traditional terms *trochee* (ld) and *iamb* (rd). The four types of bounded feet can be parsimoniously described as

a. Syllabic trochee (i.e. bounded foot, Q-I, ld)

b. Moraic trochee (i.e. bounded foot, Q-S, ld)

c. Syllabic iamb (i.e. bounded foot, Q-I, rd)

d. Moraic iamb (i.e. bounded foot, Q-S, ld)

According to Hayes (1995), of the four types of bounded foot, type d), the foot type moraic iamb (i.e. bounded foot, Q-S, ld), is not found in world languages. The foot types can be reduced to be of the following three types

a. Syllabic trochee
b. Moraic trochee
c. Iamb

The foot and tree structures of various types discussed in the last module can thus be described in the revised framework in the way shown below.

Illustrations

Stress Clash and stress clash resolution

Utility of tree structure: statement of foot-based rules.