Module 25: Prosodic Features- I: Juncture and Stress

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Objectives:

- To bring up two topics from prosodic phenomena that have come to be studied in depth today, but whose foundations were laid in Structural phonology, in the main the phenomena of juncture and word-stress.

25.1 Introduction
In the American Structuralist tradition of phonology, with which we have been concerned so far, the notion of the phoneme and the phone was extended to include the suprasegmental or prosodic features, namely, juncture, stress, tone and intonation. We look at them in the present and the following modules. Many of the observations of structural phonologists on these phenomena have been at the basis of discussion in later years. In Module 24, we took up the various aspects of the syllable as a unit. The foundation of the notion of syllable was laid by structural phonology. Most of the prosodic phenomena were assumed to be dependent on the syllable as a suprasegmental unit. In Section 25.2, we discuss the main aspects of prosodic features in phonemic analysis. Sections 25.3 and 25.4 are devoted to the description of Juncture and Stress. The other prosodic phenomena—tone, rhythm and intonation—will be taken up in Modules 26, 27 and 28.

23.2 Prosodic Features

Recall the notion of the Phonemic Principle, as discussed in module 18. The Phonemic Principle is re-stated as follows: All languages have a limited number of speech sounds that contrast with each other and that differentiate words from each other. These contrastive units are phonemes.

Prosodic features were assumed to be phonemes on the grounds that they can be extracted from speech as independent phonemes. This was the basic assumption, although in actual practice, prosodic features were often left out from phonemic analysis.

There are two main ways in which prosodic features are different from segmental features. One, not all the prosodic features are phonemic in languages. Stress in words, for example, is phonemic in only a few languages. Thus, among all the Indic languages, only Shina, a Dardic language spoken in Pakistan and India, has phonemic stress. Two, while the segmental phonemes are limited to single units, most of the prosodic features are relative in nature, that is, they need to refer to adjacent units. Thus, the difference between, say a round vowel and a stressed syllable and or a syllable with a certain level of pitch is that there is no need to refer to the segmental feature of roundness, but it is not possible to determine the stress or pitch of syllable as being strong or weak or High or Low, without reference to an adjacent syllable. You can see Sommerstein (1977: 35) for more discussion on this issue. In spite of the fact not all prosodic features are
phonemic in all languages, we shall look at the main points of the description of these features.

23.3 Juncture

The term ‘juncture’ is defined in relation to the occurrence of many phonetic phenomena that occur in the transition from one unit to another across boundaries, such as timing, stretching, release. The juncture phonemes of timing, release, etc. are important because they contrast with phonetically similar phonemes. See Trager (1962) for more on juncture phonemes. Look at the following expressions in English that have identical segments but that contrast in meaning:

23/1 (a) night rate (e.g. in the sentence, ‘What is the night rate for taxis here?)

(b) nitrate (e.g. A preservative used in processed food is sodium nitrate.)

The segments found in the two examples above are /n a t r e t/. The difference between them lies in the transition from /t/ to /r/, represented with the presence of ‘+’ in (a):

23/2 (a) /n a t r e t/ (b) /n a t r e t/

The two expressions are understood differently because of the presence of the juncture phoneme in (a) and its absence in (b).

The presence of juncture between two segments is also known as Open Juncture or Plus Juncture, and its absence as Close Juncture. There are many other expressions of this nature, for example, ‘I scream’ versus ‘ice-cream’ and ‘a rise’ versus ‘arise’. Do you have such expressions in your language, too? You should be able to find examples of juncture in your language, too. An example from Hindi is: /le: kha:/ ‘take, eat (it)’ and /le:kha:/ ‘writing, description’

25.4 Stress

Stress and Accent

Stress is a phenomenon in which a syllable is given greater prominence than a neighbouring syllable in terms of one or a combination of more than one phonetic feature such as duration, pitch, extra breath-force and vowel quality, among others. There are two kinds of stress- word-stress and sentence stress. Sentence stress is dependent on word-stress and syntactic factors such as the Parts of Speech and
Modifier-Head, etc. Sentence stress is also known as Rhythm. We will look at rhythm in Module 27. In the present module, we will focus on word-stress.

The definition of word-stress as a phenomenon in which a syllable has greater prominence than a neighbouring syllable in terms of one or a combination of certain phonetic features includes in it the notion of stress as a phonological process as well as a phonetic phenomenon. In the literature, we find the term ‘stress’ used sometimes distinctly and sometimes interchangeably with the term ‘accent’. Although there is no generally agreed upon understanding about the use of the two terms, we distinguish them here as follows- Accent is a phonological notion of abstract prominence and stress is the notion of the phonetic realization of accent. Phonetically, too, the term ‘stress’ is understood in a general sense of phonetic prominence.

For the sake of presentation here, we will continue to use the term stress to mean relative prominence of a syllable in general.

Do all languages have stress in words? All languages with more than one syllable have stress on words. Sometimes, we may find statements in the descriptions of languages that a certain language has no stress. Such a statement is based on the wrong assumption that stress is realized only as strong breath-force. As we will see below, stress may be realized as any of the phonetic features that help establish a syllable as being more prominent than the other syllables in a word.

**Phonetic realizations of stress**

As stated above, stress is realized in terms of any of the following phonetic features: Duration, Amplitude, Vowel Quality, Pitch Change, Extra breath-force. Thus in a language such as Hindi, a stressed vowel is often heard as longer in duration than an unstressed vowel. How do we find whether duration or any of the phonetic features associated with stress are the phonetic cues of stress in a language? A good way to do this is to take up a word with two syllables of identical structure, but one stressed and the other unstressed, and try to compare them in terms of these phonetic features. Thus, in Hindi we find many words with identical syllable structures, such as CV or CVV (i.e. CVː). For example, the ['saːˈlaːnaː] ‘yearly’, with stress on the middle syllable. All the syllables in the word are CVV type, but the middle syllable [əː] is heard distinctly with longer duration than the preceding and the following syllables of the same structure. The preceding syllable, in fact, is often heard shortened in the speech of most speakers- ['səːˈlaːnaː] or ['səːˈlaːnaː] (Note that the nasalization on the final vowel is
being ignored here to avoid distraction from the main point of the illustration. We find two phonetic features being illustrated with the example here- one, the **duration**, and the other **vowel quality** measured in terms of formant frequency differences. In many languages, when a vowel is not stressed, it can get shortened or even reduced, as pointed out several times in the earlier modules. Thus in [sada:na:], the stressed vowel [la:] is full as compared to the first vowel [sa] and [sa]. There are many examples of this phenomenon in English, for example, *pathology* [pəˈθɒlədʒi] and *pathological* [ˌpæθəˈlɒdʒɪk]. When stressed a vowel is pronounced full, but is reduced, when unstressed. Acoustically, vowel quality differences can be measured in terms of the formant frequency differences.

The stressed vowel is often heard louder (with **greater amplitude**) than an unstressed vowel. With regard to pitch change, there is no single feature of pitch that is found to characterize stress. All that can be said is that there is **change in the pitch level** between a stressed and an unstressed syllable. In the following spectrograms and oscillograms of the two words, we can see the differences between stressed and unstressed syllables with identical structures in Hindi.

**Degrees of stress**

At the word level, three degrees of stress are in general recognized to be possible- primary stress or main stress, secondary stress and zero stress or ‘no’ stress. Thus in the following words, you find them all:

\[
\begin{align*}
\text{23/3} \\
i. & \quad \text{develop [dɪˈveləp], pathology [pəˈθɒlədʒi]} \\
ii. & \quad \text{pathological [ˌpæθəˈlɒdʒɪk], devastation [ˌdɛvəˈsteɪʃən]} \\
\end{align*}
\]

The words in (i) have a primary stress and ‘no’ stress pattern. The words in (ii) have a primary stress, a secondary stress and zero stresses. The primary stressed is symbolized with a subscript [ˈ], the secondary stress with a subscript [ˌ], and zero stress without any diacritic.

In the American structuralist tradition, another degree of stress was assumed to be distinctive, namely, tertiary stress. A tertiary level, although uncommon, was found to distinguish the pronunciation of words such as forestation and attestation, as can be seen in their pronunciations- [.fɔːrəˈsteɪʃən] and [.æˈteɪʃən]. The tertiary stress is
symbolized here with the superscript \( ^{\prime} \) for the sake of presentation here. The difference in the pronunciations of the two words in terms of the absence and presence of tertiary stress is seen in the second syllable from the left: the vowel there is \([\text{a}]\) when unstressed, and \([e]\) when stressed. In English, a fully reduced vowel \([\text{a}]\) is found only when it is unstressed. A clearer way of representing the degrees of stress is as below:

![Stress Diagram]

**Factors influencing stress**

What factors influence stress? The factors that influence stress vary among languages. Mainly four factors are found to influence stress in world languages - position of the syllable, the weight of the syllable, the morphological structure of the word and the grammatical category of the word.

**Position of the syllable:** a simple example of the role of the position of the syllable in the word is found in those systems in which primary stress falls on the initial (e.g. Tamil) or the final (e.g. Adi and Tibeto-Burman languages of the North-East India) or penultimate (e.g. Spanish) syllable.

![Examples of Stress]

**Tamil:**
- \([\text{melaja:lam}]\) 'Malayalam language'
- \([\text{kosu:le}]\) 'by the mosquito'
- \([\text{va:tukku}]\) 'to the beetle'

**Adi:**
- \([\text{a'le}]\) 'leg'
- \([\text{a'lak}]\) 'hand'
- \([\text{me'nam}]\) 'le'

**Spanish:**
- \([\text{en'separ}]\) 'to teach'
- \([\text{alohami'ento}]\) 'accommodation'
- \([\text{seme'hansa}]\) 'similarity'
Weight of the syllable

As discussed in the previous module, languages may distinguish between degrees of weight. There are languages in which syllables are not distinguished according to their weight, as in Adi, Spanish and Tamil. These are termed **Quantity-Insensitive** languages. In these languages, stress occurs with regularity on syllables in specific positions. There are language such as Arabic, English, Malayalam and Sanskrit which are **Quantity-sensitive**. In these languages, stress usually falls on a Heavy syllable, as defined in Module 25 and earlier. These languages normally distinguish two degrees of syllable weight- Light and Heavy, typically with the structures in 25/5, where C stands for a consonant, V stands for a short vowel, and VV stands for a long vowel or a diphthong. Note that the languages have different norms for considering a syllable as light or heavy.

\[
\begin{align*}
(25/5) & \quad \text{a. Light: (C)V} & \quad \text{Heavy: (C)VV, (C)VC} \\
\text{e.g. English} & \quad \text{city} /\text{si}.\text{ti}/ & \quad \text{waiting} /\text{wei}.\text{t}\text{n}/ \\
(b) & \quad \text{b. Light (C)V} & \quad \text{Heavy: (C)VC} \\
\text{e.g. Bangla} & \quad /\text{a}.\text{lu}/ '\text{potato}' & \quad /\text{m}\text{n}.\text{dir}/ '\text{temple}' \\
& \quad /\text{a}.\text{kn}./ '\text{temple}' & \quad /\text{a}.\text{kn}./ '\text{temple}' \\
& \quad /\text{a}.\text{kn}./ '\text{temple}' & \quad /\text{a}.\text{kn}./ '\text{temple}' \\
\text{c. Light: (C)V} & \quad \text{Heavy: (C)VV} \\
\text{e.g. Malayalam} & \quad /\text{ka}.\text{tu}.\text{va}/ '\text{tiger}' & \quad /\text{ma}.\text{la}/ '\text{a name}' \\
& \quad /\text{mu}.\text{n}.\text{i}.\text{la}/ '\text{a name}' & \quad /\text{mu}.\text{n}.\text{i}.\text{la}/ '\text{a name}' \\
\end{align*}
\]

In some languages such as Bangla, that do not have vowel length distinction, only closed syllables are Heavy for weight distinctions, as in 25/ 5 (b). In some other languages, such as Malayalam, that do not have Codas in syllables, Heavy syllables are of the structure 25/5(c). When stress is assigned in the beginning or the middle of a word in these languages, it is assigned on different types of heavy syllables, as shown in 25/6 below.

**25/6 Stress on Heavy syllables**

- **Hindi:** si.'ta:.ra: 'star', bçn.'dʒa:ra: 'a nomadic tribe'
- **Bangla:** ja.'mɔj.to 'all' 'bɔn.ʃəra 'a nomadic tribe'
- **Malayalam:** ma.la.'ja:.lam 'Malayalam', tʃilandiuala Spider web
In the case of certain words, for example, ɓə'hət.tər ‘seventy-two’ in Hindi, you may wonder as to why stress is not assigned on the final syllable, which is also heavy according to the characterization of a Heavy syllable in Hindi. The reason for this is the notion of **Extrametricality** (introduced later in phonological theory), according to which some elements at the end or the beginning of a word are not counted for stress. In Hindi, for example, the final segment, a consonant or a vowel, is not counted for measuring the weight of the syllable. [ɓə'hət.tər] thus is treated as [ɓə'hət.tə<\r>]. <\r> is the extrametrical element here. We will not dwell on the notion of Extrametricality further here, as it was introduced at a later stage and is a topic of discussion in the course on Advanced Phonology (paper 5). Another example of Extrametricality in Malayalam should suffice for now. The word [məˈləjaːli:] ‘Malayalee’ for example, has a long vowel, a heavy syllable, but the final vowel is not considered long because of Extrametricality: [mələˈjaːli<\r>]. This is clearer when we represent long vowels as two occurrences of a vowel, like geminate consonants: [mələ'jaali<\i>]

Continuing with the issue of syllable weight, some languages, such as Hindi and Punjabi have an additional degree of weight, namely, Superheavy or **Extraheavy syllable**, of the following structure:

\[
\begin{array}{c}
25/7 \\
\text{Extraheavy syllable: CVVC/ CVCC.} \\
\text{E.g. Hindi: ta:r ‘wire’ / kəʂʈ ‘pain’}
\end{array}
\]

This third degree of weight is considered important for distinguishing between the stress patterns in words such as ['siːtə:] ‘Sita’ and [siːˈtaːr] ‘sitar’, ['biːmaː] ‘insurance’ and [biːˈmaːr] ‘sick’. Extraheavy syllables are always stressed in these languages, e.g. ['gaːŋɖiːu] ‘(a bow)’, compared to heavy syllables, which are not stressed in certain positions in the word.

**The role of grammar in stress assignment**

Languages vary according to whether stress in them is sensitive to grammatical category distinction. Thus stress systems can be distinguished as grammar-sensitive
and grammar-insensitive. The English stress system is known to be grammar-sensitive. Consider the words that are called doublets in 25/8

Increase (Noun), increase (Verb), protest (N), protest (V).

In English the stress in these words differs according to whether it is a noun or a verb: ‘increase (N), in’crease (V), ‘protest (N), pro’test (V), etc.

How are the words in 25/8 pronounced in Indian English varieties commonly? Most speakers do not distinguish between the two forms in the doublets: in’crease (N), in’crease (V), pro’test (N), pro’test (V). With regard to stress, Indian English varieties are thus grammar-insensitive, compared to native English varieties, which are grammar-sensitive.

Regular and idiosyncratic or lexicalized stress

In a majority of languages, stress is an allophonic process assigned by rule. Consequently, stress patterns are regular in these languages. In the present-day terminology, we call them derived stress. In some languages, such as English, stress in some words is irregular or idiosyncratic. For in words such as ‘waiter, ‘driver, ‘master, ‘differ,’suffer,’utter, etc. stress is assigned regularly on the first syllable. But in some words of similar structure, the stress pattern is different, for example: a’ver, de’fer, a’ccur, etc. In the latter group, stress is irregular or idiosyncratic. In the present-day terminology, we call it lexicalized or underlying stress. The stress in these words is learnt like the vowels and consonants in the word; it does not follow a regular pattern.

Fixed and Free stress

Unlike languages such as Adi and Spanish in which stress is considered to be assigned on a particular syllable in the word, final or penultimate in these cases, there are languages, in which stress can be assigned on any syllable in the word. We have thus two types of languages according to whether stress is assigned on a specific syllable in the word, Fixed-stress languages, or on any syllable in the word, Free-stress languages. English is an example of a Free-stress language, with stress being assigned on the first, the second, the third and other syllables from the end, as can be seen in 25/9:
One of the features of a free-stress language is that when complex words are formed from simple words, stress can shift from one syllable to another.

Stress may also fail to shift in English on the grounds of grammatical organization of stress. In the case of certain suffixes, such as -able, -ness, -ance, etc. stress is not affected when they are added to a word, for example, in the words in 25/11:

On the grounds of their ability to affect change in the stress pattern of the stem, suffixes in English are divided into two classes - stress-sensitive and stress-insensitive suffixes.

English is an example of a complex stress system. Few languages are as complex as English in their stress patterns. The main reason for this complexity is language contact leading to a mixing of two different types of stress patterns. On the one hand, English belongs to the Germanic group of languages, which prefer word-initial stress. On the other hand, French and Latin, from which English has borrowed a large vocabulary, belong to the romance group of languages, which prefer stress towards the end of words. We thus have a mixed system. It is on this account that there are irregular and lexicalized stress patterns in English.

The complexity observed in Standard English is missing from the second language varieties of English, such as Indian English varieties.

**Stress in Indian English**
In general word-stress in Indian English varieties is not sensitive to the syntactic category of words, and is regular rather than lexicalized. Thus, doublets such as import, protest etc. have a single pattern for both syntactic categories— for example, ex’port, pro test in Hindi English. And lexicalized stress, e.g. de’fer, de’gree, etc. are pronounced in the regular way like differ, ’city, etc.

25.5 Summary

In this module, we have looked at two prosodic phenomena, juncture and word-stress, that were considered phonemic. Both today are part of the unified theory of prosodic phonology. Most of the aspects of word-stress discussed above were part of structural phonological study. A couple of notions such as ‘extrametricality’ and lexicalized stress were introduced for the sake of clarity of presentation. Besides, they are now accepted as generally valid. We looked at the following aspects of word-stress: the terms ‘stress’ and ‘accent’, degrees of stress, phonetic realization of stress, factors affecting stress, etrametricallity, the role of grammar in stress assignment, regular and idiosyncratic or lexicalized stress and fixed and free stress. In the end we briefly looked at stress in Indian English, especially because Indian English differs from native varieties of English in the realization of stress.