CHAPTER III

Stress Rules in IE

3.1 Overview: Stress rules for IE are presented in this chapter. Stress in IE is shown to be syllable-quantity sensitive and therefore stress rules apply to the string generated by rules (syllable structure rules) of the kind presented in Chapter II. The basic thrust of this chapter is towards showing that it is possible to predict word-stress in different regional varieties of IE with one set of rules.

Surface differences between different regional varieties are assumed to be dialectal and predictable by making syllabification and stress rules sensitive to dialect specific preferences for segmental and prosodic structures. It will be claimed at the end of this chapter that the rules proposed here are descriptively more adequate, explain more features of a second-language phonology and are closer to the principles of Universal Grammar outlined in Chapter I, and therefore, simpler than rules proposed in previous studies of stress in IE.

Section 3.2 of the present chapter examines the phonetic correlates of stress in IE. Surface differences of stress between different varieties of IE and inadequacy
of earlier studies to explain them are accounted for in Section 3.3. Similarities of syllable structure rules (henceforth SSRs) (see Chapter II) in different regional varieties of IE is demonstrated in Section 3.4. It is suggested here that stress rules should apply to the output of SSRs. Section 3.5 shows that the metrical theory of stress rules (see Hayes (1981)) is more adequate to describe the dialectal divergences and underlying unity of stress in IE than the SPE kind of stress rules proposed by earlier studies of stress in IE.

A foot construction rule (henceforth FCR) for IE is proposed in Section 3.6. FCR applies to the string generated by SSRs and it is argued to be capable of applying across different dialects of IE. A word tree labelling rule (henceforth WTLR) for IE is proposed in 3.7. WTLR is also shown to be sensitive to dialect specific preferences for prosodic structure of IE words. Some putative counter-examples, mainly bi-syllabic words, to WTLR are thought to be symptomatic of the process of language change. A summary account of conclusions that follow from the present analysis of IE stress is given in Section 3.8.

3.2 Correlates of stress in IE

3.2.1 Stress in IE: Derivations in Chapter II have shown ME
words marked with primary and secondary stresses. It is, however, often asked whether there is such a thing as "stress" in IE. The question, though often asked in lay and linguistic communities (see Nelson (1982)), sounds redundant. Liberman and Prince (1977) (henceforth LP) have rightly argued that where-ever two syllables are pronounced in a sequence, one is likely to be more prominent than the other. Ever since LP this linguistically significant prominence has been supposed to be 'stress'. We use "stress" in this sense of the term and it seems possible to say that there is stress in IE.

A strong evidence for saying that there is stress in IE and that it has features similar to those of stress in other languages comes from a study of the intelligibility of IE by Bansal (1969). Bansal (p. 17) says that "speaker No. 11 (of IE) pronounced the word 'about' as /ɛbáut_. Even though the vowel in the first syllable was not the one used in standard British English, the word was correctly understood by all the five British listeners. On the other hand the word character pronounced as /kæréktər_ was missed by all the five listeners. The responses of these listeners, though varied -- 'director', 'erected', 'adapter' -- had all one thing in common. They all chose words with three syllables having the stress on the second syllable."
This situation indicates that there is something in the second syllable of IE words about and character which is similar to some phonological property of the second syllable in about and director, erected and adapter in BE. This property is unlikely to be segmental since IE character and BE adapter have little segmental property in common. Hence, as Bansal says, this similar property is likely to be stress on their second syllables. Therefore it can be said that like any other language there is stress in IE too.

But the manifestation of stress differs from language to language as it does between IE and BE. In the latter all stressless vowels reduce to \( \tilde{a} \) losing both their quantity and quality whereas in IE stressless vowels appear to lose only their quantity but retain their quality.

BE exaggerates the difference between stressed and stressless vowels, going for very high crest and very low trough of stressed and stressless syllables. IE seems to keep the difference between stressed and stressless syllables to a minimum. BE can, according to Gimson (1962, 4), replace all its vowels by the single vowel \( \tilde{a} \) in any utterance (also see Cottle (1975, 64)). In IE, according to Masica (1972, 7) the difference in prominence between stressed and unstressed syllables may
be less than that in southern British (i.e., RP of London). It is this difference in the features of stressed and stressless vowels in IE and AE/BE that seems to contribute more than anything else to their distinctive phonological characters.

3.2.2 Correlates of Stress in IE: I am, however, aware of only two acoustic studies which can be interpreted to support the assertion that the difference between relatively stressed and stressless syllables in IE is minimal.

The one reported in Gupta (1980) concludes that duration is the only perceptible correlate of stress in IE and that unstressed vowels do not necessarily become /ə/ in IE. I am not so sure about duration as a definite phonetic correlate of stress in IE, with instances like arab and déter in view (see also Sadanandan (1981) and Lehiste (1970)). The duration of a and e in both syllables is nearly the same. It would, nevertheless, appear from data given in the present study also that not all stressless vowels reduce to /ə/.

The other acoustic study reported in Nelson (1982) implies that IE is not stress-timed but a syllable-timed language meaning thereby that all syllables take nearly equal time rather than being organised in terms
of stress-groups where a stressed syllable is followed by reduced stressless syllables. This implication follows from the fact, as Nelson says, that "the AE speakers reduce the length of time given to the base of the derived word, thus fitting the derived word into very nearly the same time as the base word, while the IE speaker does not. These data indicate real difference between IE and AE in the organization of the timing of rhythm units having one or no unstressed syllables following a stressed."

In AE, as Nelson seems to suggest, the length of time given to 'rhythm units' is almost equal irrespective of the number of syllables they contain, whereas the length of time of 'rhythm units' in IE varies according to the number of syllables they have. Since every syllable in the latter takes nearly the same time irrespective of stress, it has been thought better to say that IE is a syllable-timed rather than stress-timed language.

A conclusion of this kind can be proved to be wrong in as much as it assumes that a stressed syllable is inherently longer than an unstressed syllable. In fact studies of Indian languages (e.g., Chatterji (1926/1970)) in the past have also made similar fallacious conclusions.

Recent researches in the phonetics of stress have
shown that length is not a fixed correlate of stress in any language. Sadanandan (1981) rightly feels that length may be a phonetic correlate of stress but this alone does not exclusively signal the presence or absence of stress.

In fact it has not yet been possible to give a unique phonetic description of stress. "Under various circumstances", according to Anderson (1981), "relatively stressed vowels may have greater length, higher intensity or higher pitch than relatively less stressed vowels -- but no one of these by itself can serve as definition of stress." Ladefoged (1980) also feels that "those correlates are by no means invariant across languages...".

The difficulty in giving a phonetic description is not peculiar to stress but to all suprasegmental phonetic features in general. As Lehiste (1970, introd.) notes, this difficulty owes to the fact that "suprasegmental (features) co-occur" so that looking at one suprasegmental feature as distinct from others can be almost impossible. Definitions of stress, then, can be treated as nothing more than plausible conjectures. Length is one such conjecture about its correlates: "It is assumed that there are languages in which a stressed syllable is regularly longer than an unstressed syllable, other factors being kept constant... In English an average
stressed vowel is 50% longer than an average unstressed vowel. There are other languages in which stress seems to be manifested by other phonetic features, and increase in duration is minimal" (Lehiste (1970, 138-140)).

Length, thus, appears to be just one of the several elusive correlates of stress in language which can vary in a range from an exaggerated one as in AE/BE to minimal as in IE. But "there is no one to one correspondence between stress and any single acoustic parameter. Thus, there is also no automatic way to identify stressed syllables" (Lehiste (1970, 110)).

Yet the term stress, to quote Lehiste (1970, 119), is used to refer to "linguistically significant prominence". Following Hayes (1981), stress can be used to refer to a psycholinguistic phenomenon that an AE/BE speaker has in the first syllable of character and most IE speakers have on the second syllable of the same word. Stress rules then can be said to identify this "linguistically significant prominence" and a speaker hearer's intuition about certain property of certain syllable(s) in any word.

By the same stretch of logic then it makes sense to say that even so-called syllable timed languages have
"stress" in any configuration of two or more syllables. The elision of (unstressed) syllables reported in Bansal (1969) and other studies of stress in IE (see also the PRs, particularly in Chapter IV in the present study) and many other Indian languages seems to support this assertion.

Studies of stress in IE (e.g., Vijaykrishnan (1978), Pandey (1980), Sadanandan (1981)) have shown and it will be shown in this chapter too that stress assignment in IE is quite systematic and predictable by rule. Bansal (1969, 171) also observed that "A very common fault among Indian speakers is the incorrect stressing of English words, that is stressing it differently from the usual RP pattern". Bansal's observation about the commonness of this 'fault' seems to support the systematic nature of stress in IE. Hence, a statement of the following kind deserves to be rejected: "Many of IE pronunciations appear to be idiosyncratic to individual speakers and thus may justifiably be regarded as errors" (Wells (1982, 630)).

Stress assignment in AE/BE is governed by the criteria of syntactic category of the word, morphological category of the word, and the weight and context of a syllable within the word. Stress in IE on the other hand, seems to be governed only by the context and quantity of
a syllable. In all varieties of IE (known to me) all heavy syllables are stressed and light ones are stressed, if at all, only word initially. Apart from dialectal variation with regard to main stress, the following sections of this chapter will attempt to show that there is complete uniformity and systematicity in the placement of stress in IE.

3.3 Earlier Studies of IE Stress: Earlier studies of stress in different varieties of IE have not been able to show this uniformity of stress facts in IE. It may be said for them that these studies (such as Vijaykrishnan (1978) Pande (1980), Premalatha (1978) and Sadanandan (1981)) did not set out to propose a stress rule with pan-Indian applicability and therefore any question of the applicability of their rules beyond the studied dialect of IE does not arise at all. I will, however, show in the following paragraphs that these rules are not always the simplest and, therefore, can not account for the stress facts of their respective dialects too in an intuitively satisfactory manner and can not be extended to apply to other dialects of IE even if we want to.

Premalatha's stress rule for MLYE, for instance, does not seem to be adequate to predict correct stress on a large number of words. Her stress rule is given below:
(1) Premalatha's Stress Rule (p. 35)

(a) stress the antepenultimate syllable of a word if it is a heavy syllable or if the word is tri-syllabic;

(b) If not, stress the first heavy syllable from the right. In the absence of a heavy syllable, stress the initial syllable.

This rule is inadequate to predict correct stress on words like the following taken from Premalatha (1978, 35):

(2) Calamine, examination

In Calamine her rule would assign stress word initially generating an unacceptable output for MLYE: *calamine. This is so because the word is trisyllabic and the application of (1a) would be triggered. Moreover there is nothing in the rule to say why word initial a in calamine should not be treated as tense when the penultimate is assumed to be so. Similarly, the rule in (1) will also fail to assign any secondary stress in examination which appears to be there even in MLYE. (see Sadanandan (1981)). There are other problems too with the rule in (1) which do not seem to be relevant to the present issue.
Similar problems are there in Vijaykrishnan's (1978) study of stress in Tamilian English (henceforth TE), Pande's (1980) study of stress in Hindustani English (henceforth HE) and Sadanandan's (1931) Study of Stress in MLYE.

Vijaykrishnan, for instance, needs an onset sensitive rule\(^1\) to account for TE stress on a word like minister or November. Sadanandan needs an onset sensitive rule\(^2\) for the following bisyllabic words rather than for trisyllabic words as in TE:

\[(3) \ \text{lament, honest, content, modest, modern, product}\]

Hayes (1981) has shown (also see Section 3.5 of the present chapter) that onsets of a syllable play no role in stress assignment. An onset sensitive stress rule is clearly bizarre and unattested in any other languages so far.

Words in (3), which also occur in TE, are accounted for by Vijaykrishnan by an onset sensitive stress-retraction rule.\(^3\) Pande does not need an onset sensitive rule to account for HE stress on words like minister or develop, but words in (4) below have to be listed as exceptions to his MSR.\(^4\)

\[(4) \ \text{engineer, abolish, deposit}.\]
Between them, thus, Vijaykrishnan and Pande require two kinds of rules to account for stress in words like minister or abolish as do Sadanandan and Vijaykrishnan to account for stress in words like lament and product. Therefore these studies fail to propose an intuitively satisfactory analysis of stress in their respective dialects.

The present study will propose an alternative analysis of stress for these dialects as well as for certain others in IE to show that the stress facts in IE are not as diverse as they appear to be from these rules and that it is possible to predict the dialectal diversity and underlying unity of stress facts in IE with one set of rules. But let us first ascertain the causes of diversity and instances of unity in stress facts of IE.

3.4 Syllable Structure Facts of IE

3.4.1 Diversity in Syllable Structure Facts of IE

Diversity of rules mentioned in 3.3 above is not an exact reflection of the diversity in stress facts of IE. Part of the diversity in stress facts of IE seems to owe to dialectal preferences for syllabic and prosodic structures of a word. Part of the diversity in these rules is due also to their failure to perceive the phonological value of orthography.
It has already been seen in Chapter I, for instance, that words like minister are stressed differently in different dialects of IE depending upon the syllabification of the word medial consonant cluster. A dialect like TE can be said to assign both the word medial consonants in minister to the onset of the final syllable in which case the initial syllable is stressed. HE, on the other hand, has a closed syllable in the penultimate position in this word and has stress there. Thus an elegant rule can be proposed to predict the dialectal diversity by making the stress rules sensitive to preferred syllable structure patterns of dialects.

Formulating a rule of this kind, however, was not possible in the segmental framework of previous studies. The segmental convention based the definition of a heavy syllable on the number of consonants following a relevant vowel rather than on the relation of consonants with the relevant vowels.

A lax vowel followed by two or more consonants may not make a heavy syllable if it is the case that the consonants following it belong to some other syllable. This is what seems to happen in the TE pronunciation of a word like minister and the only way for a segmental convention to predict this seems to be either to mark such
words as exceptions or refer to their onset(s). Both are equally undesirable. Thus part of the diversity in these rules can be ascribed to their inability to capture the dialectal variations in syllable structure facts adequately.

3.4.2 Unity in Syllable Structure Facts of IE

Diversity in the treatment of stress facts of IE in these studies owes partly also to their failure to perceive the phonological value that orthographic symbols have acquired in IE. This failure is manifest in Vijaykrishnan's (1978) Low Vowel MSR by which he treats the words with stressed a and o separately from other words, and in Pande's treatment of imagine, abolish, deposit, etc., as exceptions to the main stress rule in Hs. In Vijaykrishnan (1978) also those words are treated as exceptions to his main stress rule or alternatively are handled by a syntactic category sensitive low vowel stress rule for verbs. Clearly again, such rules and treatments seem to miss significant generalizations in the phonology of IE.

No previous study has reported stress in IE to be sensitive to syntactic category. A word like suspect, for instance, in MLYE (sûpect in ME) retains the same stress contour as both noun and verb. This is unlike
AE/BE. Stress facts in different varieties of IE have many other similarities.

Even a cursory glance at data presented in previous studies of IE indicates that rules of the kind proposed for ME in Chapter II apply with some variation in other regional varieties too. For example, in all varieties of IE known to me (such as TE, HE, MLYE, Rahman (1982) for English in Madhya Pradesh (henceforth MP), Gokhale (1978) for English in Maharashtra, Appa Rao (1978) for Telugu speaker's English, Oriya English (henceforth (OE) and ME) orthographic a and o seem to be interpreted mostly as long vowels and i and u mostly as short underlyingly. The uncertain status of e with regard to its underlying length seen in Chapter II for ME appears to be a pan-Indian feature.

Hence, it seems possible to suggest that ME is not an exception in IE in having orthography as UR. Other varieties of IE also seem to have phonological persistencies seen in Chapter II for ME.

Evidence for Syllable Strength Hierarchy (SSH) (see (13) in 2.4) of Chapter II) hypothesis can be found in other dialects of IE also. A closed syllable (i.e., a syllable heavy due to cluster) is mostly stressed in IE and is stronger than heavy syllables of other kinds.
Similarly a syllable heavy due to the application of a lexical rule is stronger than a syllable heavy due only to vowels such as a, o or e which are interpreted to be long. Some examples from different dialects of IE are given below to illustrate the point:

(5) dialect | Syllable interpreted to be heavy | Syllable made heavy by a lexical rule
--- | --- | ---
TE | develop | eráse
 | gossip | collápse
 | hábit | adáge
 | árab | villáge
HE | máter | salón
MP3 | fáther | abóut
 | óver | suppóse
MLYE | dévélop | devóte

Relevant examples from ME have already been seen in Chapter II. Such examples are numerous in other varieties of IE also. It may be noticed that e is stressed in the initial syllable of develop but stressless in the same position in erase. A similar situation exists with regard to a in habit and erase, with regard to o in gossip and collapse, etc.
Examples in (5) clearly indicate the existence of spelling rule (SPR) presented for ME in Chapter II in other dialects of IE also. Vijaykrishnan (1978; 97) also says that "suffixes like -age and -ate are invariably pronounced as /ejej/ and /eet/" in TE. Premalatha (1978, 35) shows the existence of this rule in MLYE also. Examples given above also show that a syllable made heavy by the application of such rules is stronger than the syllable interpreted to be heavy.

These studies do not have enough data from derived words to enable us to say anything with much certainty about the existence of morphological rules (MPR) in other dialects of IE. Yet the data given below show some similarity in the phonological behaviour of certain suffixes in ME and other dialects of IE:

<table>
<thead>
<tr>
<th>(6) dialect</th>
<th>detensed suffix</th>
<th>tensed suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>magnanimous</td>
<td>initial</td>
</tr>
<tr>
<td></td>
<td>médical</td>
<td></td>
</tr>
<tr>
<td>HE</td>
<td>advisory</td>
<td>university</td>
</tr>
<tr>
<td></td>
<td>promissory</td>
<td>elusive</td>
</tr>
<tr>
<td>MLYE</td>
<td>suspicious</td>
<td>irónico</td>
</tr>
<tr>
<td></td>
<td>individual</td>
<td>privación</td>
</tr>
<tr>
<td>MPE</td>
<td>magician</td>
<td>ovación</td>
</tr>
<tr>
<td></td>
<td>political</td>
<td>phoneticián</td>
</tr>
<tr>
<td></td>
<td></td>
<td>executive</td>
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<tr>
<td></td>
<td></td>
<td>oficial</td>
</tr>
</tbody>
</table>
The data given below also seem to support the contextual rule (Rule (43) proposed for ME in Chapter II:

(7) \begin{tabular}{l|l|l}
 & Contextual Red. & Failure of Red. \\
TB & dévelop & astonish \\
 & envelop & idiomatic \\
 & botany & deposit \\
MLYE & dévelop & carpenter \\
 & Ticonderoga & respective \\
 & contradict & \\
HE & archipelago & menomini \\
 & astronomy & abolish \\
 & economy & \\
MPE & dévelop & athletic \\
\end{tabular}

Data of the kind given above can be found in plenty in all studies of varieties of IE mentioned above.

This, however, does not enable us to claim that these rules are identical throughout IE. In fact a sizeable amount of data in Section 3.6 and 3.7 of the present chapter would show that contextual rules proposed for ME in Chapter II can apply to other dialects of IE only after a certain amount of modification.
It can be assumed, nevertheless, that data in (5), (6) and (7) of the present section exemplify a pan-Indian persistency of the emergence of a new language. All IE speakers seem to attach some definite phonological value to English orthography which appears to be mapped into surface PRs with some rules. It is almost obvious that all IE speakers expand their phonological system to accommodate the idiosyncratic spelling and morphophonemic facts of English as shown in data in (5) and (6). Data in (7) indicate that the Contextual Reduction Rule (CRR) given in Chapter II is not restricted to ME alone.

Thus in the derivations to be given henceforth I will propose one UR for all dialects of IE to which SSAs of the kind proposed for ME in Chapter II should be assumed to have applied to generate an output fed to the stress rules. The string fed to the stress rules may differ between dialects depending upon known dialectal preferences for open or closed syllables.

3.5 Adequacy of Metrical Rules: Stress rules to be proposed in Sections 3.6 and 3.7 below are in the framework of a modified version of the metrical theory of stress rules in Hayes (1981). We have already seen (Section 3.3) that segmental rules fail to explain certain surface
facts and thus proliferate rules, perhaps, unneces-sarily. It will be shown in the fol-low- ing paragraphs that the tree theoretic convention of metrical stress rules can predict dialectal variations and explain the cross-dialectal underlying uniformity of IE stress facts at the same time in a simple way.

It is possible for the metrical theory to do so because of certain mechanisms available to it. A brief introduction to these mechanisms is being given below:

3.5.1 Metrical Apparatus: The mechanisms of metrical theory which concern stress rules are:

(8) a. Rime Projection (RP)
    b. Binary branching tree
    c. Rules for creating and labelling
       i) (stress) foot tree, and
       ii) word-tree.

3.5.1.1 RP: The Rime Projection enables the foot construction rules to measure syllable weight adequately. Following metrical conventions, (9) below shows universal syllable template:
(9) Universal Syllable Template

(Onset)

(\(C_1 \ldots \ldots \ldots \ldots \ldots C_n\))

Rime

\(\sqrt{\text{-syllabic}} \ldots (V) \ldots (C_1 \ldots \ldots \ldots \ldots C_n}\)

nucleus

(coda)

The template in (9) above schematizes the fact that there may be no or any number of consonants, depending upon the language (dialect) specific situation, before and after an obligatory \(\sqrt{+ \text{syllabic}}\) segment in a syllable. The template given above also schematizes the difference in the phonological significance of consonants preceding the \(\sqrt{+ \text{syllabic}}\) i.e., onset, and the consonants following it, i.e., coda vis a vis stress assignment. Onset is the sister node of the rime and has no role to play in stress assignment whereas coda, the daughter node of the rime, can affect the stress assignment to the rime.

Stress rules in segmental convention also have referred to light versus heavy syllables (see SPE, Chapter III) where a heavy syllable is defined as one containing a long vowel irrespective of the number of
consonants following the vowel or as one containing a short vowel followed at least by two consonants. A light syllable is one where neither of these conditions is met, i.e., a syllable containing a short vowel and only one consonant.

This supports the contention in Hayes (1981) that onsets play no role in stress assignment in any language and that the rime alone is significant from this point of view. If long vowels are assumed to be a sequence of two short vowels in the UR, as they have been shown in Chapter II and as the metrical theory assumes them to be, then a heavy syllable would be one where the rime branches. The syllable where the rime does not branch is treated as light.

The examples in (10) below schematize the metrical definition of a heavy syllable.

(10) a. defy b. defect UR

difai
ORO R
V V

! عمر

difekt
ORO R
V V

Where R = rime, 0 = onset

A representation henceforth should be assumed to
be true for all varieties of IE unless otherwise mentioned. Henceforth the application of SSRs will not be shown in detail. It should be assumed that SSRs apply before stress rules to generate the output that is mapped on the syllable template. Stress rules scan the template at this point of derivation.

It may be seen in examples in (10) that the final syllable in both words is heavy which is adequately represented by the branching metrical tree. It should be noted that the final rime in defy branches because of a long vowel and in defect because of a cluster of consonants. For purposes of stress, however, they both appear to be alike, heavier than the preceding syllable.

Since rimes alone matter for stress, it is supposed to be of derivational convenience to have a rule that projects rimes out of the given string. This rule is called the *Rime Projection Rule* (RP) and is the first metrical stress rule to apply in a language where stress is quantity sensitive. It gives foot construction rules access to syllable weight. The following examples may show the utility of this rule:

(11) defy    defect    UR
defai    difekt    SSRs
    i ai    i ekt    RP
The projection in (11) gives us all and only the information required to compute the weight of syllables in these words.

The unambiguous identification of syllable weight is all the more essential in words with consonant clusters in medial position that can be distributed to either of the adjacent syllables. Rime Projection is so far the only known device that facilitates such an unambiguous identification.

As already stated (Section 3.4), SSRs would have created preferred syllables (rimes), and a projection rule will, therefore, automatically say whether or not a particular word-medial consonant belongs to the coda of the preceding syllable or to the onset of the following one. Hence there will also be no need for language-specific stipulations for heavy syllables as required by segmental rules discussed in Section 3.3.

Taking this approach the divergence of rime structure in words like minister, phlogiston, etc., between TE and HE, ME, MPE etc., becomes obvious automatically. The divergence is illustrated in (12) below:
(12a) represents TE and (12b) represents HE, XPR and ME. In (12a) medial $st$ are assigned to the onset of the following syllable, in (12b) $s$ is assigned to the coda of the preceding and $t$ to the onset of the following syllables. Thus whereas there is no heavy syllable in (12a), (12b) has a heavy syllable word medially. This difference between dialects is of consequence for stress-assignment to these words and rime projection enables the stress rules to capture this dialectal difference.

5.1.2 Binary Branching Tree: The relationship of $s$ in minister with the $i$ preceding it varies between (12a) and (12b). In (12b) $s$ is the sister of $i$, in (12a) $s$ is the sister of $t$. Thus inspite of the fact that these elements are contiguous in the string their relationship varies. This variation, which is significant for stress assignment, is represented adequately by binary branching trees in the metrical theory.
We have already seen in Section 3.2 that there does not seem to be any unambiguous phonetic definition of stress. In metrical theory, however, stress is defined as a matter of relative prominence between sister syllables in a given string. Binary branching trees are adequate for capturing this prominence relationship between sister elements at any level, i.e., rime, syllable, foot, etc.

At any point in the tree one mode is more prominent (labelled $s$ for strong) than its sister node at that point (labelled $w$ for weak). Thus a binary branching tree unambiguously predicts that a node dominated by $S$ is more prominent than another dominated by $W$.

Since it is not the contiguity in the string, but the relationship between elements in the tree that matters for stress, the other condition on metrical stress tree concerns the direction in which it branches. The significance of the branching condition is shown with two examples below:

(13) a. america  b. *america  UR

amerika  ameerika  SSR

a ee i a  a ee i a  RP

S  W  W  W  S  W

S  S
It is a part of the convention that the dominant node is at the endmost position of the tree in the direction in which it branches. Since (13a) proposes a left branching tree, the \( \sim \) here occupies the leftmost node of the tree. Violating this condition yields a wrong result as shown in (13b).

The tree in (13b) is also left branching but the strongest node here does not occupy the endmost position. Hence, it gives a false impression that the initial rather than the penultimate syllable is the immediate stressless sister of the stressed antepenultimate syllable in this word. The tree in (13b) also wrongly suggests that the penultimate syllable in America has a greater degree of stress than the initial.

The vowel elision rule for IE given in the next chapter would show that the penultimate rather than the initial syllable is the immediate stressless sister of the strongest node in this word and, therefore, the vowel in this syllable can also be elided optionally by a low-level rule (see 4.3.2 of Chapter IV). Such a result can be predicted only by obeying the condition on the branching of metrical trees. It should, however, be obvious that the question of the direction of branching arises only when there are at least two recessive nodes to be adjoined to a dominant sister node.
3.5.1.3 **Tree Labeling Rules**: Metrical theory has rules for creating and labeling S/W foot tree on syllables and for creating and labeling S/W word tree on feet.

Foot tree labeling rule locates the stressed syllable and thus serves the most vital function of a stress rule, namely of distinguishing the stressed from the stressless syllables. A stressfoot has at least and only one stressed syllable followed (or preceded) by one or more unstressed ones in the foot tree.

A stressed syllable is labelled $\mathsf{s}$ (for strong) and its stressless sisters adjoined to it are labelled $\mathsf{w}$ (for weak). Because of the condition on the stress-foot to have at least and only one stressed syllable, it is possible for a stress-foot to be non-branching, i.e., to be without a stressless syllable. Such trees are not labelled $\mathsf{s}$ (since there are no $\mathsf{w}$s to follow them, S/W being relational labels) and are known also as malformed trees. A horizontal line divides the foot trees from the word-tree.

A word-tree decides the prominence relationship of sister-feet. Since no two sister nodes can be equally prominent, the metrical theory ensures this distinction by gathering feet in a binary branching word-tree and labeling the nodes. A word-tree labelling rule
(henceforth WTLR) locates the most prominent syllable of the given string, the principle being that a syllable labelled \( s \) and dominated by a foot labelled \( S \) is more prominent than any other syllable in the string. In other words WTLR locates the main stress in the given string. The process is illustrated in the following ME word.

\[
\begin{array}{ccc}
\text{executive} & \text{UR} \\
\text{eksekyuutiv} & \text{SSR} \\
\text{ek e uu iv} & \text{RP} \\
S & W & S & W \\
\end{array}
\]

\[
\begin{array}{c}
W \\ S \\
WTLR
\end{array}
\]

In (14) the penult is dominated by \( s \) at both foot- and word-tree levels and, therefore, is the most prominent syllable of the string. Condition on the direction of branching applies to both foot-tree and word-tree. In AE/BE, and I will show for IE, foot-tree is always left branching. French is said to prefer a right branching foot-tree (Selkirk (1980)). In case of more than two malformed feet IE will be shown in Section 3.7 to prefer a left branching word tree in keeping with the direction of branching at foot and rime levels. In AE/BE, however, the direction of word-tree branching is uncertain (Kiparsky (1979)).
3.5.2 Some Notational Conventions: Apart from RP and labeling rules for foot-and word-trees, the metrical theory also allows the use of the following conventions depending upon the language specific situation:

3.5.2.1 Extrametricality Rules: The principle of extrametricality in phonological derivations helps foot-tree/word-tree labeling rule to ignore an element pretending as if it were not there. Word final syllables, for instance, are seldom considered for main stress assignment in AE/BE nouns. Similarly word-final consonant does not add to the weight of its syllable in many languages. Hence, a stress rule can mark such elements extrametrical and scan the rest of the string for stress assignment. It is a part of the convention that nothing can remain extrametrical in two successive cycles. A consequence of this stipulation is that an element marked extrametrical before the application of stress rules in a cycle is adjoined to the tree after the rules have applied.

3.5.2.2 Stray Syllable Adjunction: An extrametrical element, such as the final syllable in AE/BE nouns, is treated as a stray syllable until adjoined to the metrical tree. At the end of the relevant cycle the stray syllable is adjoined to the tree by a process called Stray Syllable Adjunction (henceforth, SSA). A stray element can also
be a foot or a single consonant and in that case the process may be called **Stray Foot Adjunction** / **Stray Consonant Adjunction**. The element thus adjoined is considered recessive. It will be seen in Section 3.6 and 3.7, where we propose IE stress rules, that IE needs only **SSA** and **Stray Consonant Adjunction** but no **Stray Foot Adjunction** unlike AE/BE.

With these conventions and theoretical primitives metrical theory is claimed to be equipped to provide the simplest possible account of stress in any language (see Hayes (1981, Chapter I)). Recently, however, the tree theoretic convention of metrical theory has been criticised for its alleged excesses and redundancies by Prince (1983). 14

### 3.5.3 Objections Removed

**Objections:** Prince feels that the tree-theory is not the simplest version of metrical rules and has redundancies like conditions on the depth of embedding and direction of branching. Questioning the branchingness condition on trees, he says that because of "the triviality of uniform branching, depth of embedding is typically confounded with mere linear distance: the less deeply embedded the farther (string wise) from the stressed syllable which heads the presumed constituent." (p. 87)
With processes like de-stressing in mind, Prince finds tree-theory technically more complex: "Despite the appearance of simplicity, ... one must look inside the next foot in order to determine whether or not the rule applies inside the foot of interest..." (p. 65). Prince, on the other hand, claims that in his Grid-theory "also worth noting is a certain amount of technical simplification. If de-stressing is erasure of a grid-entry, it has the stress-forward character of destressing. No cumbersome machinery of node-erasure, pruning, adjunctions, and readjunction is required ... it is appropriate to prefer the more restrictive grid-theory" (pp. 87-88).

Prince proposes a grid-theoretic metrical convention which has six major kinds of rules that need to apply for predicting stress (and tonal accents) in any language. In the following paragraphs I will show that after certain modifications tree theoretic convention is simpler and can explain more facts than the Grid-theory of stress rules.

3.5.3.2 Counter Arguments: It can be seen from rules proposed by Prince for a grid-theory that the rule component here is richer than that in tree-theory. Certain grid-theoretic rules have one to one correspondence with tree-theoretic rules. For example the End Rule
(Prince (119a)) corresponds to the foot and W↓ rules. The End Rule needs information about the edge (right/left) and the level (syllable/foot/word/phrase) of the application of the rule to promote an element in proportion to the degree of its stress.

Prince's Perfect Grid Rule ((P.G. Rule) (119b)) is an equivalent of the branchingness condition since it imposes directionality (left to right/right to left) and altitude (peak/trough) on the (near) perfect grid construction. The End Rule and the PG Rule have a provision of Forward Clash Override which is a grid-theoretic equivalent of Rhythm Rule (see (15) of Chapter I in the present study) to avoid stress clash.

Grid theory also uses extrametricity rules (119c) which are empowered to mark any constituent at any level extrametrical. Mora stuicing Rule (119c) of the Grid-theory is an equivalent of destressing rules in the tree-theory.

Apart from these equivalents of tree-theoretic rules, grid-theory has two other rules that move an element at a given level and adjust its prominence whenever such a shift is required by the principle of the Forward Clash Override (FCO). Thus the rule component in grid-theory in no way appears to be simpler than its tree theoretic counterpart.
Prince's objection against the technical complexity of tree-theoretic destressing seems to be valid, though not in the theoretical framework of the present study. The present framework proposes to drop the destressing rules from the grammar of IE and to treat changes in vowel quantity as consequences of the segmental configuration of a given string. It has been proposed in Chapter II that rules predicting such changes should be part of the syllable structure rules and ordered to apply to the string before the application of stress rules (see Section 2.5.4.3.2 of Chapter II). Hence in the framework of the present study the tree-theoretic convention needs no destressing rule, and therefore, the question of "pruning, adjunction and readjunction" does not arise at all.

Similarly, uniform branching condition on trees is not "trivial" as alleged. Two relatively stressless syllables may be equidistant from a stressed one and yet they may differ in their prominence, as, for example, is the case with the pre-antepenultimate and penultimate in America. Grid theory can not represent this difference as unambiguously as the tree theory. Branchingness condition on the trees helps the metrical tree predict this difference correctly as illustrated in (15) below:
Hence the condition on the uniformity of branching does not seem to be trivial. In fact, as (15) shows, it explains certain phonological facts in a more clear way than grid theory can. The fact that a weakly stressed syllable can be elided in a fast speech and that such an elision would apply more often to the penultimate in (15) than to other weakly stressed syllables (see Chapter IV) seems to be explained in a more satisfactory manner by the tree-theory than it can be by the grid-theory.

Grid-theory shows a similar lack of explanatory power elsewhere too. The all important claim of a metrical theory (over a segmental one) is that it can adequately represent stress as a matter of relational phenomenon, i.e., as a matter of relative prominence between syllables. Relative prominence itself is interpreted abstractly as a relation between sister nodes labelled S/W in the metrical trees. Grid-theory has no way to show this crucial relationship between constituents except by ad hoc assumptions.
For instance, the definition of a heavy syllable so crucial to the quantity sensitive (metrical) stress rules depends on the following ad hoc assumption in the grid theory: "The heavy syllable shows up as stressed by virtue of its internal structure. Bipositional representation (of heavy syllables) equals subsyllabic moras with entire light syllables at the first grid level. In particular the second mora has the same status as an unstressed light syllable. The first mora is stronger than the second, therefore, stronger than its equivalents." (pp. 58-59).

It is obvious that a long vowel may be treated as a bi-moraic syllable only by assuming a branching nucleus. Similarly, a syllable heavy because of a consonant cluster can be shown as bi-moraic only by assuming a branching rime. Now it is possible for a string to have two short vowels adjacent to each other (cf. *arabian*, good also for AE/BE) but they can not be represented bi-positionally if they are not daughters of the same rime. This difference in the relationship of two short vowels from a long vowel can be represented elegantly only in the tree-theory and not in the grid-one. A valuable feature of the tree-theory appears to be its capacity to give a unique representation to every constituent of a given string so that the rules can apply to them unambiguously.
Grid theory does not seem to match the tree theory from this point of view.

Stress rules given below, therefore, are within the framework of the tree-theoretic convention of metrical stress rules.

3.6 Stress Rules for IE

6.1 Foot Construction Rule: The data given in (16) below are representative of all the dialects of IE mentioned in Section 3.4 above. Observe the stress patterns in these words:

(16) I II III
árab appear ordinary
áctor arsenal testimonio
bérлин bótany auspicioso
cáncel consider
city champion
cóver company
déter develop
dóctor benefit
dédiț elicit
frólic limited
gárden medullar
héaven funeral
All words in (16) have stress on their initial syllable.

Final syllable in all words in (16) is light assuming that the word-final consonant does not add to the weight of its syllable and therefore, can be marked extrametrical. Penults in Columns II and III and the antepenult in Column III seem to have been generated as light syllables by the SSRs. In the absence of heavy syllables in the final or medial position in these words, stress is assigned to the initial syllable. The data in (16) indicate that the IE stress foot is left-dominant.

In other words, the stressed syllable always occupies the left-most node in the IE stress foot. Since stress in IE does not seem to be necessarily assigned to the penult or antepenult if it is not heavy, it can be said that the stress-foot in IE is n-ary as against the binary foot proposed for AE in Hayes (1981).
On the basis of the data in (16), the rule in (17) below is proposed as the foot construction rule for IE.

(17) **IE Foot Construction Rule (FCR):** From the string generated by SSRs,

(i) Project the rimes,
(ii) mark the word-final consonant extrametrical,
(iii) form maximal left-dominant foot (feet)

\[ \text{SW} \ldots \ldots \text{W} \] such that W does not dominate a branching rime.

**Rule (17) IE FCR** ensures that stress rules apply to the output of SSRs of the kind proposed in Chapter II. The provision (17i) is the rime projection rule, which, to mention it once again, is sensitive to dialect-specific preference for syllable structures and therefore gives precise information about syllable weight to the foot labeling rule in (17iii).

The provision in (17ii) is the application of an almost universally observed phonological rule which marks the word-final consonant extrametrical since it does not add to the syllable weight.

The provision in (17iii) may be called the foot labeling rule which requires at least two syllables the second of which (i.e., one to the right) has to be light.
In case no such light syllable follows to the right of a heavy one, the provision in (17iii) would form a malformed foot on the heavy syllable as stipulated in the metrical convention (see Section 3.5). The provision in (17iii) may apply more than once while scanning a sequence of rime projection.

Some derivations for words in (16) following the FCR in (17), are being given below:

<table>
<thead>
<tr>
<th>(16)</th>
<th>arab</th>
<th>appear</th>
<th>ordinary</th>
<th>USR</th>
</tr>
</thead>
<tbody>
<tr>
<td>arab</td>
<td>ḍärpiər</td>
<td>oridinəri</td>
<td>SSR</td>
<td></td>
</tr>
<tr>
<td>ḍarab</td>
<td>ḍärpiər</td>
<td>oridinəri</td>
<td>RP (17i)</td>
<td></td>
</tr>
<tr>
<td>ṁa ab</td>
<td>ṁiər</td>
<td>oor iəi</td>
<td>C Ex. (17ii)</td>
<td></td>
</tr>
<tr>
<td>ṁa a(b)</td>
<td>ṁiə(r)</td>
<td>oor iəi</td>
<td>C Ex. (17ii)</td>
<td></td>
</tr>
<tr>
<td>SW</td>
<td>SWW</td>
<td>SWWW</td>
<td>FLR (17iii)</td>
<td></td>
</tr>
<tr>
<td>arab</td>
<td>ḍärpiər</td>
<td>ordi(m)arıi</td>
<td>PR</td>
<td></td>
</tr>
</tbody>
</table>

The FCR proposed in (17) forms one stress foot on each word in (18). To translate the projected rimes back into the full phonological representation, we simply assume that onsets form part of the same metrical constituents as their sister rimes. Other words in (16) will follow the pattern exemplified for respective columns in (18). PRs here presuppose the application of
late phonetic rules (of the kind given in Appa Rao (1978))
that specify vowel quality.

3.6.2 SSA: There is another class of bi- tri- and poly- syllabic
words with only one stress-foot that calls for reasserting
the directionality (i.e., left-dominance) of the IE stress
foot. This class of words given in (19) below also seems
to motivate the tree-theoretic convention of Stray Syllable
Adjunction (SSA) for IE. Words in (19) have identical
prosodic structure in all varieties of IE mentioned in
Section 3.4 above.

(19)  I          II           III
about         arôma         américain
beyond        amâlégam        batalion
 corrupt       attâchéee       
 divide        attôrney        
 erâse         âgenda         
 govern        colânder       
 inâne         lethârgy       
 protést       cylinder       
 pretênd        imagine       
 return         gherâo       
 rejects       remainder      
 satire         remeber       
 usurp         synôpsis       
 village        depôsit
Initial syllable in all words in (19) is generated light by the SSRs. Light syllables can be labelled \( \mathbf{L} \) only when they have at least another light syllable to follow them (in IE). It is clear that the initial syllable in (25) has to be labelled \( \mathbf{W} \).

One solution seems to be to change the direction of foot labeling (17iii). Instead of labeling the foot \( \mathbf{SW} \ldots \mathbf{W} \), it could be labelled \( \mathbf{W} \ldots \mathbf{WS} \). This labeling principle, making the foot right-dominant instead of left-, would give correct result for \textit{about} and other words in Column I of (19). But, for words in Column II where the final syllable is light and in Column III where both the final and the penultimate syllables are light, it will create a bigger problem.

Making the foot \( \mathbf{W} \mathbf{S} \) (right dominant) would shift the problem from the initial to the final syllable in Column II. In Column III the proposed modification will have a sequence of two light syllables crying for the status of a stress foot that does not exist there. If at all such a foot is created, defooting the same would be almost impossible. It does not seem easy to motivate a rule that can carry out the defooting of a branching foot.
An often-used solution is to form a malformed foot on the initial syllable in *about* and other words in (19) and defoot the same later in the same cycle. This is what Hayes (1981) often does despite all the theoretical objections mentioned against it above. And yet, on defooting, the initial syllable would beg for being adjoined as a recessive node to the nearest foot already created by the rule. Moreover, it would involve the technical complexity of what Prince (1983) calls "pruning, adjunction and readjunction." Thus the proposal to treat the initial syllables in (19) as instances of malformed feet also appears to be ad hoc, theoretically suspect and technically quite complex.

The best solution seems to be to treat it as a stray syllable. The concept of stray element (consonant/rime/foot, etc., marked extrametrical) is there on independent grounds in the grammar. A defooted unit is adjoined as a stray syllable and thus as a recessive node to a prominent (i.e., $\bar{S}$) sister. Treating a light syllable as stray (since not attached to the tree) would avoid this cumbersome process of defooting, retain the crucial directionality of the stress-foot (17iii) and also explain a language specific fact that a single light syllable is not a candidate for stress assignment, except in monosyllabic words.
Following this proposal, a convention called **Stray Syllable Adjunction** (SSA) would apply to adjoin a single light syllable as a recessive node to the nearest foot.\textsuperscript{17} The adjunction will take place beyond the horizontal line indicating a stress fact and will be shown through broken lines, as in the standard convention.

Following the proposal some derivations for words in (19) are given in (20) below:

\[(20) \quad \begin{array}{cccc}
\text{about} & \text{aroma} & \text{america} & \text{UR} \\
\text{about} & \text{arooma} & \text{ameerika} & \text{SSRs} \\
a \text{out} & a \text{oo a} & a \text{ee i a} & \text{RP} \\
a \text{ou(t)} & \text{ } & \text{ } & \text{C Ex.} \\
a \text{ou(t)} & a \text{oo a} & a \text{ee i a} & \text{FLR} \\
\text{ } & \text{W} & \text{W S W} & \text{W S W W} \\
\text{ } & \text{S} & \text{S} & \text{SSA} \\
\text{e} \text{b} \text{a} \text{u} \text{t} & \text{e} \text{r} \text{o} \text{m} \text{a} \text{a} & \text{a} \text{m} \text{e} \text{e} \text{r} \text{i} \text{k} \text{a} \text{a} & \text{PR}
\end{array}\]

Treating the initial light syllable as stray helps derive stress correctly for words in (19) in the simplest manner as shown by the derivation in (20). Derivation for other words in (19) will follow the pattern exemplified for the respective columns in (20) above.
3.6.3 Pan-IE FCR: Through two sets of examples, in (16) and (19), the foot construction rule (FCR) proposed in (17) has been shown to apply to a large class of words correctly in all varieties of IE mentioned above. The SSA proposed in 3.6.2 above also seems to be required by all dialects of IE.

Words in (16) and (19), however, seem to have identical syllable structure and hence identical stress-contour throughout IE. But it is not the case that SSRs are the same throughout IE. Varieties of IE seem to differ in their preferences for syllable types and syllabification principles. Some differences have already been pointed out in earlier sections of this chapter and also in some sections of chapter II.

Different varieties of IE also seem to differ in their treatments of configurations of adjacent light and heavy syllables of certain types. ME has been shown to have particular kinds of tensing and detensing rules. Other varieties of IE also seem to have such rules, but not necessarily identical with ME rules proposed in Chapter II.

In ME, for instance, syllabification principle for word-medial consonant clusters and the contextual
reduction rules have been shown to conspire in a way so that heavy syllables are created nearer the right edge of the word. It appears that in TE, MLYE (and perhaps in other south Indian English varieties (see Pitchai (1983) and Upendran (forthcoming)) and in some variants of HE, SSRs conspire to create heavy syllables near or on the left edge of the word.

I am not going to investigate and analyse the exact form and function of SSRs in other varieties of IE. I will only assume some such general preference in syllable types for specific dialects. Such difference in the preferred syllable types causes difference in stress pattern too as appears to be illustrated by words in (21) below:

(21)    TE    HE / ME

a. minister
   chéministry
   fiasco
   modesty

b. cinema
   syllable
   literature
   machinery
   préliminary
In spite of the divergence of stress between varieties shown above, FCR proposed in (17) requires no modification. Following the same steps of derivation it can predict their surface divergences. This prediction is possible because stress rules are ordered to apply after the application of SSRs so that the FCR has access to divergent syllable structures at the same time through rime projection. For example, see the derivation in (22):

(22) TE

<table>
<thead>
<tr>
<th></th>
<th>ME / ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>minister</td>
<td>minister</td>
</tr>
<tr>
<td>minister</td>
<td>minister</td>
</tr>
<tr>
<td>i i er</td>
<td>i is er</td>
</tr>
<tr>
<td>i i e(r)</td>
<td>i is e(r)</td>
</tr>
<tr>
<td>S W W</td>
<td>W S W</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>minister</td>
<td>minister</td>
</tr>
</tbody>
</table>

Stress divergence in these words between particular varieties of IE seems to be due to different syllabification
of word medial consonant cluster. This dialectal difference is adequately caught by rime projection. The foot labeling rule (FLR) then labels the penult in minister $s$ for ME since it is a heavy syllable in this dialect whereas the penult in this word in TE is labelled $W$ and the rule moves leftward to label the initial syllable $S$ in this dialect. Thus the FCR proposed in (17) above seems to be adequate enough to predict correct stress in all dialects of IE without any dialectal modification.

Stress in words in (28b) and (28c) seems to differ between TE and ME, etc., because of possible difference in the application of contextual and morphological rules within the component of syllable structure rules. These rules create a heavy syllable word-medially in these words in ME (and this is true also for MPE, HE, etc.,) There, however, does not seem to be any such application of SSR in words in (28b) and (28c) in TE.

By making such an assumption, dialectal divergence of stress in these words can be explained rather easily. As a consequence, only the initial syllable of these words is stressed in TE whereas ME has stress word medially in (28b) and has two stress feet, the second, word-medially, in (28c). This divergence of
stress appears to be a consequence of divergent applications of SSRs in these dialects. Yet, as the derivations given below show, stress rules proposed in (17) above require no modification to account adequately for their PRs.

(23) a.  **TE/EMYR**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. cinema</strong></td>
<td><strong>cinema</strong></td>
</tr>
<tr>
<td>sinema</td>
<td>sineema</td>
</tr>
<tr>
<td>i e a</td>
<td>i ee a</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>i e a</td>
<td>i ee a</td>
</tr>
<tr>
<td>S W W</td>
<td>W S W</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
</tr>
</tbody>
</table>

Derivations in (23a) predict the dialect-specific stress in words in (21b) and the derivations in (23b) do...
that for words in (21c). As a consequence of divergent application of SSRs, ME requires two applications of FCR (17iii) in asparagus since the first application of FCR (17iii) does not gather all its rimes into one foot. ME, therefore, also requires the application of some kind of a word tree (WT) labeling rule to decide on the relative prominence of the two feet generated by FCR. TE does not seem to have a context for the second application of FCR and, therefore, also does not require the application of any WT rule.

It would be seen shortly that stress in certain IJ words differs between different dialects not only because of the difference in their preferred syllable structure patterns but also because of the difference in their preferred prosodic structure patterns. Given two feet, both either branching or non-branching, TE and certain other south Indian varieties of English seem to prefer the first foot (from the left) for main stress and ME, HE and other north Indian varieties of English seem to prefer the second foot for main stress. The word tree labelling rule proposed in the following section is sensitive to such dialectal preferences.
### 3.7 Word-Tree Labeling Rule (WTLR)

#### 3.7.1 WTLR (First Version): Words given for specific varieties below have two stress-feet each:

<table>
<thead>
<tr>
<th>(24)</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>gráduâte</td>
<td>´octóbér</td>
</tr>
<tr>
<td></td>
<td>ádvocâte</td>
<td>´ángínâ</td>
</tr>
<tr>
<td></td>
<td>cyanide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mánifêst</td>
<td>´ástônísh</td>
</tr>
<tr>
<td></td>
<td>difficult</td>
<td>´admônísh</td>
</tr>
<tr>
<td>MLYE</td>
<td>contradîct</td>
<td>´cárpênter</td>
</tr>
<tr>
<td></td>
<td>démîcîle</td>
<td>´vîndîctîve</td>
</tr>
<tr>
<td></td>
<td>participânt</td>
<td>´rêspèctîve</td>
</tr>
<tr>
<td></td>
<td>mànipulate</td>
<td>´impûlsîve</td>
</tr>
<tr>
<td>Gokhale</td>
<td>distribûte</td>
<td>´consênsûs</td>
</tr>
<tr>
<td>HB</td>
<td>imitâté</td>
<td>thrømbôsis</td>
</tr>
<tr>
<td></td>
<td>diffiđënt</td>
<td>fàctõtûm</td>
</tr>
<tr>
<td></td>
<td>délégate</td>
<td>perspèctîve</td>
</tr>
<tr>
<td>MPE</td>
<td>fôrtunâté</td>
<td>´enjîneér</td>
</tr>
<tr>
<td></td>
<td>fôrtítûde</td>
<td>´atlêtic</td>
</tr>
<tr>
<td></td>
<td>cultîvâté</td>
<td>´convêntîoûnal</td>
</tr>
<tr>
<td>MB</td>
<td>dôcûmènt</td>
<td>´cômpûlsîon</td>
</tr>
<tr>
<td></td>
<td>absôłùte</td>
<td>´abdômen</td>
</tr>
<tr>
<td></td>
<td>árrogânt</td>
<td>´èmbár gó</td>
</tr>
<tr>
<td></td>
<td>cómплícâtê</td>
<td>cîalêctal</td>
</tr>
<tr>
<td></td>
<td>dêfiânt</td>
<td>fantástîc</td>
</tr>
</tbody>
</table>
Words in (24) represent a large class of words in IE. Words in Column I have a malformed foot on the final syllable and those in Column II have it on the initial. The other foot covering the remainder of the given words is a branching one. In neither column does the malformed foot have the main stress of the word. It is regularly assigned to the branching foot. Thus a WTLR for IE can be the following:

(25) **WTLR for IE:** (1st Version): In case of two nodes one of which branches and the other does not, label the branching node S.

Derivations given below show that Rule (25) WTLR predicts correct stress for words in both columns of (24):

(26) 

<table>
<thead>
<tr>
<th>Graduate</th>
<th>October</th>
</tr>
</thead>
<tbody>
<tr>
<td>graadzueet</td>
<td>oktoober</td>
</tr>
<tr>
<td>aa uuet</td>
<td>ok oo er</td>
</tr>
<tr>
<td>aa uee(t)</td>
<td>ok oo e(r)</td>
</tr>
<tr>
<td>S W</td>
<td>S W</td>
</tr>
<tr>
<td>S W</td>
<td>S W</td>
</tr>
</tbody>
</table>

3.7.2 **Excursus:** Derivation for other words in (24) follows the pattern exemplified for respective columns above. It may be recalled and emphasized that the branchingness condition, so important for predicting stress in IE, is
far from 'trivial'. It may also be recalled that tree-theoretic metrical convention alone can represent this distinction between two heavy syllables of words in (24) clearly.

Branchingness condition on metrical trees seems to be so important that it can be said that the rule proposed in (25) WTLR alone can explain the prosodic structure of a very large variety of words throughout IE. Some examples of different kinds from some dialects of IE are given below:

<table>
<thead>
<tr>
<th>(27)</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>anécdote</td>
<td></td>
</tr>
<tr>
<td>Gokhale</td>
<td>appendix</td>
<td></td>
</tr>
<tr>
<td>ALYR</td>
<td>redundánt</td>
<td>abúndánt</td>
</tr>
<tr>
<td>MPN</td>
<td>exactitude</td>
<td>conveniência</td>
</tr>
<tr>
<td>HH</td>
<td>détérgeñt</td>
<td>expériment</td>
</tr>
<tr>
<td>recogníse</td>
<td>impédimen</td>
<td></td>
</tr>
<tr>
<td>relúctánt</td>
<td></td>
<td>saturníne</td>
</tr>
</tbody>
</table>

Malformed foot created by FCA (17iii) on the penultimate syllable of words in Column I of (27) becomes
a branching foot after SSA joins the initial stray syllable to this foot as a recessive node. The penultimate syllable, thus, becomes the head of a branching foot and gets main stress. Derivation in (28) shows this process clearly:

(28) anecdote UR
     anekdoot SSR
     a ek oot RP
     a ek oo(t) C Ex
           FCR

Derivation in (28) shows that the application of SSA to the nearest foot i.e., before the application of WTLR, is crucial. Derivation for other words in Column I of (27) will follow the pattern given in (28) above.

Words in Column II of (27), however, raise a different kind of issue altogether. These words, such as exactitude, have a branching foot in the medial position. This branching foot is flanked by two malformed feet. This situation raises a crucial question of the direction of branching of the word tree. If the
malformed foot on the initial syllable of the word is gathered first as the immediate sister of the branching foot, the WT would become left-branching. Otherwise the WT would be right branching. No such directionality has been suggested so far for the WT in IE.

The question of the directionality of the WT branching would be taken up shortly. It may be seen, however, that in the case of words in Column II of (27) such as **exactitude**, this question is not very important. In either direction, that is whether the tree is left or right branching, the branching foot in the middle of the word would be labelled S by Rule (25) WTLR. On second adjunction, in either direction, the branching node would continue to get an S. Hence, rule (25) seems to predict correct stress in words in Column II of (27) also in a very simple manner as illustrated by the derivation given below:

(29)  

\[
\begin{array}{l}
\text{exactitude} & \text{UR} \\
\text{egJaakticuud} & \text{SSR} \\
\text{egaak i uu} & \text{RP} \\
\text{egaak i uu(d)} & \text{C Ex} \\
\end{array}
\]

\[
\begin{array}{l}
S & \\
& W \\
& S & W \\
& & WTLR \\
& & S \\
& \text{egJaakticuud} & \text{PR} \\
\end{array}
\]
Derivation in (29) above supports the metrical (tree-theoretic) assumption that the syllable exclusively dominated by $S$ has the main stress and other syllables have various degrees of secondary stress in proportion to the depth of their embedding. It also shows that contrary to the allegation of Prince (1983) the notion 'depth of embedding' is not trivial.

3.7.3 **Direction of Branching:** Derivation in (29), however, assumes that the IE word-tree is left branching where the head of the tree(s) is occupied by the left node. Derivation in (29) does not seem to support this direction of branching uncontroversially. A directionality of this kind can be established on the strength of words with at least three malformed feet as given below:

(30) complaisant
    alternate
    contemplate
    intersect
    intervene
    introspect
    exercise
    nightingale
    martingale

Representation (of stress) in (30) has a pan-Indian agreement. The stress-contour can be predicted
only by assuming a left-branching word-tree on the mal­
formed feet created by FCR (17iii) as in the derivation
given below:

\[
\begin{array}{ccc}
\text{alternate} & \text{UR} \\
\text{aalternaat} & \text{SSR} \\
\text{aal er aat} & \text{RP} \\
\text{aal er aa(t)} & \text{C Ex} \\
\end{array}
\]

Assuming a left-branching word-tree can predict
correct stress contour on all words in (29). The direction
of branching here is like the direction of branching at
other (lower) levels of tree geometry in IE.

Foot-tree at the immediately lower level, is also
left-branching in IE as it is in AE/BE and also in Indian
languages. It seems idiosyncratic on the part of the AE/
BE word tree to have an uncertain branching directionality
(see Kiparsky (1979)). IE appears to have removed this
uncertainty from the word-tree and regularized its direction
like the direction of branching of the metrical tree at
other levels. We have seen in Chapter I that such a
regularisation of rule is characteristic of all child-
language, pidgin-language and second-language phonologies.
Dialectal WTLR: Rule (25) WTLR (1st version) has been motivated on the strength of unequal nodes, i.e., on two nodes one of which does not branch and the other does. Therefore it can be said that it does not need a WTLR in (25) to say that the branching sister of a non-branching node be labelled $S$. It seems to be a part of the metrical convention that all other things being equal (in terms of syntactic and morphological category, etc.,) the branching sister of a non-branching element would be the dominant node. Rule (25) WTLR only shows that this metrical convention applies in an exceptionless manner in IN.

The need for a WTLR in metrical structures is felt when the question of prominence between contending equals has to be decided, that is, when labeling rule has to apply to two feet both of which are either non-branching or branching. This is perhaps one reason why WTLRs characteristically take the form "if and only if (iff)" (see LP's uCPK, and Hayes (1981, Chapter 5)). This form of WTLRs facilitates their application to marked situations and by (their elsewhere) implication they apply to unmarked situations as well.

Thus, when a WTLR, such as that in LP or Hayes (1981), says "$N_2 S$ iff it branches", it predicts three possibilities:
(32) a. \( N_1 S \) when both nodes do not branch; or
b. \( N_1 S \) when \( N_1 \) branches and \( N_2 \) does not; or
c. \( N_2 S \) if it branches whether or not \( N_1 \) does.

It is, therefore, clear that a WTLR in order to be viable should be formulated in a manner so as to be applicable in situations of both equality and inequality alike. In other words there is a need for a WTLR for IE that would label a word-tree with two nodes when both nodes are either non-branching or branching.

3.7.4.1 Two Non-branching Feet: There seems to be a good deal of confusion about the kind of labeling rule required by words with two non-branching feet in all dialects of IE considered here. No dialect and, as ME data indicate, no speaker seems to have a consistent pattern for a situation where the dialect (or the idiolect) has to decide on the prominence between two malformed feet.

The stress pattern in this class of words seems to be fairly erratic in all dialects of IE. As already stated in Section 3.3 of this chapter, Vijaykrishnan and Sadanandan have to bring in onset sensitive stress rules particularly for words of this kind. Vijaykrishnan has words like archive, and carbine, and obscene and gentle, etc., in his data. So has Sadanandan: suspect and exist,
cúrtáil and impále, etc. For Pandey's rule (1.3) also it would not be easy to account for stress pattern in words like abstract, extrême, sacrásm, obstrúct, etc. Examples in (33) present this challenge for stress rules clearly:

<table>
<thead>
<tr>
<th>(33)</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>abstract</td>
<td>absurd</td>
</tr>
<tr>
<td></td>
<td>cúrtáil</td>
<td>convict</td>
</tr>
<tr>
<td></td>
<td>cóntëst</td>
<td>consist</td>
</tr>
<tr>
<td></td>
<td>dírect</td>
<td>disguise</td>
</tr>
<tr>
<td></td>
<td>éarnëst</td>
<td>éxcláim</td>
</tr>
<tr>
<td></td>
<td>Éïenstëin</td>
<td>extrême</td>
</tr>
<tr>
<td></td>
<td>obscure</td>
<td>obscéne</td>
</tr>
<tr>
<td></td>
<td>óbjëct</td>
<td>ëurbâne</td>
</tr>
<tr>
<td></td>
<td>maintäin</td>
<td>mâniàte</td>
</tr>
<tr>
<td></td>
<td>survey</td>
<td></td>
</tr>
<tr>
<td></td>
<td>suspëct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tórment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tempëst</td>
<td></td>
</tr>
</tbody>
</table>

Not all of these examples would be found in all studies of IE mentioned above. But mutually contradictory pairs are there in every one of them.

Should the data in (33), then, be taken to indicate that stress-assignment in IE is asystematic and can not be
predicted elegantly by phonological rules? Before such a conclusion is formed, certain facts of these words need to be taken into account.

On careful observation it emerges that both syllables in words in (33) are phonologically heavy syllables. They are heavy either because their nuclei immediately precede a consonant cluster or because they form complex nuclei as a consequence of spelling rules (SPR) of the kind proposed in Chapter II. In either case they are phonologically heavy syllables and do not seem to be subject to reduction even though they create a situation of clash.

The situation of clash arises in such a restricted context (i.e., a string of only two syllables both of which are heavy) that there is no place for adjusting the stress contour to relieve the clash. This may be treated as a baffling situation for an IE speaker who is unlikely to have experienced it in such a large scale in his native phonology. Therefore, while reading a word-list aloud, he seems to be at a loss not knowing whether to give greater prominence to the initial or the final syllable. Derivations given below highlight this confusion of an IE speaker:
Derivation in (34a) and (34b) highlights the identity of syllable structure in the given pairs. These derivations also draw our attention to the proximity of heavy syllables, inevitability of clash and the consequent confusion and indecisiveness as to the application of WTLR of the IE speaker.

This indecisiveness, however, is not unique to IE. It is witnessed commonly in periods of great linguistic influx i.e., in periods in which a language comes in
close contact with another language such as that in many pidgin languages (see Bickerton (1975, pp. 1-23)) or when a language borrows lexical items on a large scale from another language. In the beginning a lexical item new to the language often retains its native phonological structure, but in course of time gets generally levelled out to the phonological patterns of its new users.

A situation of uncertainty of this kind seems to have occurred in old and middle Englishes also when words from Romance languages were borrowed on a large scale by the English speaking community.

To quote Sweet (1891, 786): "When first introduced into middle English, French words kept their original stress: na.ture, o.núr, etc., but such words afterwards threw the stress back to the first syllable by the analogy of the native English words such as fá.der, bó.di, etc."

Sweet's account of the nativization of French words by the English speaking community is a good account also of the process of pidginization (see Chapter I). It seems that change in the structure of a natural language is not sudden and abrupt but gradual and necessarily passes through a phase of indecision.

This phase of indecision may possibly throw a borrower's lexicon in disarray for sometime. This is
what seems to have happened to Middle English in the 14th-16th centuries. To quote Halle and Keyser (1971) "as long as the number of words that violate one of the rules of the language is small, they can be handled as lexical exceptions... there is thus a special subdivision in the grammar of those speakers which deals with the morphology and phonology of this portion of their vocabulary... The non-native vocabulary of Chaucer consisted of two types of words, namely learned words largely of Latin origin and everyday words borrowed from old French or Anglo-Norman. These two classes had different stress patterns. The words of Latin origin were stressed differently from the words of old French. As far as the speaker of the language was concerned, we claim only that he was aware of two classes of words with distinctly different stress-patterns which later got mixed up and can be explained as lexical shift" (pp. 97-99, underlining mine).

This instability persisted in English until about Shakespeare's time. Commenting on Shakespeare's pronunciation, Kokeritz (1953, Chapter 3) says, "The functional or phonemic use of stress illustrated in modern English by *éxtràct* (N) vs. *extràct* (Vb) is not yet fully established or fixed."
This long digression was undertaken to say that what is possible in time (diachronically) is also possible in space (synchronously) and that there is nothing unnatural in the unstable nature of some bi-syllabic words in IE. They are, in Halle and Keyser's words, passing through a period of 'lexical shift.'

3.7.4.2 Two Branching Feet: This does not, however, mean that the pronunciation of this class of words will stabilize along the lines suggested in Kokeritz above, i.e., that these words will have functional stress contrast of $\text{abstract}_N$ vs. $\text{abstract}_V$ found in AE/BE. Yet it seems quite likely that the pronunciation of these words of the class abstract, absurd, etc., given in (33) may stabilize along the preferred prosodic patterns in IE speaker's native phonology.

The IE speaker's preference for prosodic patterns can be seen in words with two branching feet. It may be noticed that the words of this class are generally without any instances of clash between adjacent heavy syllables unlike in words with two non-branching feet. The IE speaker's phonological intuition, therefore, can be said to apply uninhibitedly in these words to assign the relative prominence to sister nodes.
Some words with two branching feet are given in (35) below. On the basis of these words I will propose a WTLR which will be seen to apply to words with contending equals, i.e., two branching feet, as well as to words where one foot branches and the other does not. I will later go back to words in (33) and show that the WTLR proposed for words given below applies to the uncertain situation of words with two non-branching feet also to some extent. Let us first look at some words with two branching feet from various dialects of IE given below:

(35)  

<table>
<thead>
<tr>
<th>TE</th>
<th>MLYE</th>
<th>HE</th>
</tr>
</thead>
<tbody>
<tr>
<td>idiomático</td>
<td>contraceptiva</td>
<td>poliandrus</td>
</tr>
<tr>
<td>manufactura</td>
<td>tapioca</td>
<td>balalaika</td>
</tr>
<tr>
<td>médiéval</td>
<td>Ticonderoga</td>
<td>examinación</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OE</th>
<th>MPE</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>democrácia</td>
<td>qualificación</td>
<td>Coriolánus</td>
</tr>
<tr>
<td>biología</td>
<td>artificial</td>
<td>casitánkerous</td>
</tr>
<tr>
<td>axiomático</td>
<td>artificial</td>
<td>monomácia</td>
</tr>
<tr>
<td>diplomático</td>
<td></td>
<td>monogenésis</td>
</tr>
</tbody>
</table>

From the data given above, it appears that there is a pan-Indian preference for main stress on the second foot if it branches. This preference, however, is unsupported by later studies of some South Indian varieties of English.
Upendran (forthcoming), for example, has shown such a preference for the word-initial foot in English words spoken by Tamil speaking children. This is supported by data in Pitchai's (1983) study of Stress in Tamil Speaking College Students' English also. Vijaykrishnan (oral communication) has also suggested that Tamil (and possibly, therefore Tamil English also) has a general preference for main stress on the word-initial foot. Mohanan (1982) has shown the existence of a similar preference in Malayalam. Sadanandan (oral communication) is now of the opinion that this may be true also of MLYE.

Upendran's data, for instance, contains a bulk of polysyllabic monomorphemic words with two branching feet where the main stress is assigned to the initial foot. This stress pattern is supported also by his data of nonsense words. Stress contours on these words in Upendran's data and in ME data (see Chapter II) differ quite systematically as shown in (36) below:

(36) Upendran          ME
    winnipesaukee          winnipesaukee
    H'alicarnassus          H'alicarnassus
    Tic'onderoga           Tic'onderoga
    mulligatawny           mulligatawny
    Monongahela            Monongahela
Examples in (36) contain many American place-names taken from SPE. IE speakers, both Upendran's informants and NE speakers, are unlikely to be familiar with these words and, therefore, it seems possible to say that the pronunciations of these words mentioned in (36) are intuitive IE pronunciations of these words.

It seems quite likely then that Upendran's informants in particular and South Indian speakers of English in general prefer main stress on or near the word-initial position and hence label the initial foot $S$. The preference in ME, HE, MPE and other north Indian dialects of English on the other hand seems to be for assigning main stress on or near the word-final position and, therefore, for labeling the final foot $S$. Perhaps that is a dialectal difference in the preferred prosodic structures of Northern and Southern varieties of IE. Such a difference can be observed in North and South Indian pronunciations of Sanskrit words also.20

It may be recalled that Northern and Southern varieties of IE differ in their preferred syllable structure patterns also. Southern varieties of IE seem to prefer open syllables and Northern varieties generally prefer closed syllables (see Chapter I, Section 1.6, Chapter II Section 2.2, and Chapter III, Section 3.3 earlier). The data given in (36) above seem to be instances of a similar
dialectal difference in the preferred prosodic structure patterns between these varieties of IE.

It has been observed in earlier studies of IE also, as, for example, in Rubdy (1981), that some such difference exists between the phonologies of Northern and Southern dialects of IE. Examples in (36) support such observations. Hence, notwithstanding the data in (35) it can be said that there is a general preference in South Indian varieties of English for assigning main stress to the word-initial foot.

But even if such a dialectal preference in WTLR exists in IE as indicated by the data in (35) or by Upendran's data in (36) above, it is easy to propose a WTLR sensitive to such dialectal preferences following the standard metrical conventions. Such a rule is given below:

(37) **IE Word Tree Labeling Rule** (final version)

a. In a configuration \( N_1 N_2 \), label \( N_2 S \) iff it branches and \( N_1 \) does not; or
b. In a configuration \( N_1 N_2 \), label \( N_1 S \) iff it branches and \( N_2 \) does not.

It is obvious that (Rule 37b) is the mirror image of Rule (37a). Rule (37a) applies to Upendran's data and
any other dialect, such as that in Pitchai (1983), or certain variants of HE that prefer main stress word initially. Rule (37b) on the other hand applies to ME, MPE, HD or any other dialect that prefers main stress closer to the word-final position. The information that WTLR (37a) or (37b) applies is dialect specific. The application of this rule is illustrated by the following derivations of the divergent pronunciations of a word in (36):

(36) a. winnipessauke b. winnipessauke
   win ipesauke win ipesauke
   i i e au e i i e au i

   i i e au e i i e au i
   S W W S W S W W

   S W W S W

   winipesauki winipesookii

Derivation in (38a) predicts the pronunciation of winnipessauke as recorded by Upendran whereas (38b) predicts the ME pronunciation of the same word. Stress in words in (35) can also be predicted using WTLR (37b) as shown by the following derivations.
Derivation for other words from respective dialects in (35) or (36) will follow along the lines exemplified here. It should be noted that we still propose one UR and one derivational-procedure for all dialects of IE though part of the syllable structure and prosodic structure rules differ between dialects according to dialectal preferences.

Assuming this hypothesis of dialectal preference can remove a lot of uncertainty in the stress-pattern of bi-syllabic words like abstract, absurd, etc., with two non-branching feet seen in (33) above. It seems possible to predict now that dialects like the one in Upendran (forthcoming) will have main stress word-initially in these words and dialects like ME will have it word-finally.
Such a trend can already be seen in the use of these words in native sentences of IE speakers. An ME speaker, for instance, mostly says complete when this word is used in a Maithili sentence such as the following:

hamar kaaj kampliit achi
"my work complete is"
(My work is complete)

I believe such a trend is there in other dialects of IE as well. In other words the indecisiveness of prosodic structure caused by the process of 'lexical shift' seen in words with two non-branching feet (Section 3.7.4.1 above) seems to be settling along the lines of preferred prosodic patterns in IE speakers' first language phonology.

3.8 Summing up

3.8.1 Validity of Rules: There are examples like chivalrous in TE stress in which can not be predicted by the rules, PCE (17) and WTLR (37), proposed in this chapter. Such examples may be found in other varieties of IE also. It is possible to treat such examples as exceptions to the rules here and list them as such.

But I believe that examples like TE chivalrous are instances of what has conventionally been called
'learnt pronunciation' of borrowed words. We can come across many IE speakers whose pronunciations of some words may be similar to BE/AE pronunciations of these words. A similar situation seems to have existed in middle English when a number of French words retained their original stress in English (see Halle and Keyser (1971)).

Since a very large bulk of IE pronunciation (of other English words) differs systematically from AE/BE pronunciations of these words, I think it is reasonable to treat the limited set of pronunciations as instances of learnt pronunciation and propose rules for the rest of the data. This is what I have attempted in the present study and counterexamples like chivalrous do not seem to invalidate the rules proposed here.

It is, therefore, claimed that the rules proposed here, Rule (17) FOR and Rule (39), WTLR are valid rules in the phonology of IE. It is also claimed that these rules explain the underlying unity and surface divergences between different dialects of IE in the simplest manner. I have also tried to show that the phonology of all the dialects of IE examined here differs in a similar manner and systematically from the AE/BE phonologies. Quite crucially it has been shown that it is possible to predict the pronunciation of IE words in all dialects by
posing the same URs which are different from the URs in AE/BE. I hope this should explain why a typical IE speaker has very great difficulty understanding American or British English pronunciation, or, as Kushwant Singh (Section 1.2, Chapter I) and Bansal (1969) say, why American and British English speakers have difficulties understanding IE pronunciations even though syntax, morphology and semantics of IE and AE/BE do not seem to differ so greatly.

3.8.2 A Glimpse of AE/BE Stress Rule: A major cause of divergence between the IE and AE/BE phonologies to me seems to be due to the fact that whereas AE/BE stress rules have a number of idiosyncratic language specific features, IE stress rules appear to follow directly from universal metrical principles. In this section we shall take a brief look at the AE/BE stress rules as in Hayes (1981) and then compare them with IE stress rules in the next section.

It has already been noted that the syntactic and morphological categories of word affect stress assignment in AE/BE. There are additional complexities as demonstrated by the derivation below:
Derivation in (40) above focuses on several idiosyncratic features of AE/BE stress—such as adjective extrametricality and quantity insensitive strong retraction rule, etc. Languages display such tendencies even though the grammar of such a language is likely to have relatively marked and complex rules.

It may not be out of place to look at one such idiosyncracy in AE/BE which motivates the application of SSA, that adjoins the extrametrical -ous suffix to the word-tree rather than to the foot tree. Adjoining it to the foot tree would make the recessive node branch in relation to the malformed dominant node. To avoid this the extrametrical suffix is adjoined to the word-tree rather than to the nearest foot. This is not strictly
stress rules for nouns, verbs and adjectives. It can also be added that IE needs only one FCR in place of two in AE, viz. BSR and SSR as shown in (40) above, and, hence, IE stress rules are simpler than those in AE/BE.

Such a notion of simplification does not seem to be quite adequate to describe the true nature of simplification in IE. If stress rules in IE do not need syntactic information, and very little of morphological information, then it is also to be noted that IE has neutralized the functional stress contrast between \( \underline{\text{abstract}}_N \) and \( \underline{\text{abstract}}_V \).

The loss of such a contrast is likely to add to the functional load of the existing rule(s). The same rule has to apply to both verbs and nouns instead of two rules applying to these categories. This may also at times confuse the listener. Bansal (1968, p. 15) found that IE speakers may have to "repeat or even spell (the word) before the listener understands them correctly". The functional load of the rules is, thus, assigned in part also to the semantic context of discourse.

This situation seems to be quite similar to the situation in child-language. In child-language also the functional load on rules is equally heavy. The child has to repeat himself or point to the objects around...
him before he is clearly understood on several occasions. Bickerton (1981) thinks that it is to avoid this kind of functional pressure that the rules start having exceptions or start taking complex forms. But rules in child-language have generally no such exceptions or complex forms.

Therefore to say that IE has fewer stress rules does not give us an exact idea of the extent of simplification in it. However there is some difference between AE and IE stress rules in terms of number. Except lexical category extrametrical rules and Strong Retraction Rule as in (40) above, IE also needs syllable structure information (RP), foot and word-tree labeling rules, stray adjunction rules, etc., as in AE/BE.

3.8.4 Conclusion: Following the simplicity criterion (9) of SPE, a rule can be said to be simple if it requires no ad hoc stipulations in comparison with a rule where such stipulations are required.

From this point of view IE stress rules appear to be simpler than those in AE/BE. IE stress rules require no stipulations beyond the ones available in the unmarked principles of the theory itself. A comparison of the derivation given in (40a, b) with any given
for IE in this chapter would show that IE stress rules strictly follow the unmarked principles of metrical theory (described in 3.5). The derivation given in (40) shows that the situation is far more complicated in AE/BE. Therefore it can be claimed that stress rules in IE have been simplified. Similar instances of simplification are attested in most child-language, pidgin and creole language and second-language varieties.
Notes

1. Stress in minister and November in TE is predicted by case (ii) of Vijaykrishnan's Rule XII given below:

   Rule XII MSR for TE (final version)
   \[ V \rightarrow [\text{stress}]_1 \bigg/ \left\{ \begin{array}{c}
   \left[ \text{low} \right]_V \left[ \text{tense} \right]_C_0 \left[ \text{tense} \right]_C_1 \\
   \left[ \text{tense} \right]_C_2 \left[ \text{tense} \right]_C_0
   \end{array} \right\} \text{Case (i)} \\
   \left\{ \begin{array}{c}
   \left[ \text{tense} \right]_C_0 \left[ \text{tense} \right]_C_2 \\
   \left[ \text{tense} \right]_C_1 \left[ \text{tense} \right]_C_0
   \end{array} \right\} \text{Case (ii)} \]

2. MLTE Rule 2

   \[ V \rightarrow [\text{stress}]_7/ \left\{ \begin{array}{c}
   C \rightarrow C_0 \\
   V \rightarrow C_1
   \end{array} \right\} [\text{stress}]_7# \]

3. TE Stress Retraction Rule (Rule XIII)

   \[ V \rightarrow [\text{stress}]_7/ \left\{ \begin{array}{c}
   \left[ \text{tense} \right]_C_1 \rightarrow C_2 \\
   \left[ \text{tense} \right]_C_0 \rightarrow V
   \end{array} \right\} [\text{stress}]_7\text{-}C_0# \]

4. MSR III for HE

   \[ V \rightarrow [\text{stress}]_7/ [\text{tense}]_X \rightarrow C_0 \left( [\text{tense}]_C_0 \left( [\text{tense}]_C_0 \right) \right)
   \]

5. See LP (1977) for reasons for calling SPE framework a segmental framework.

6. Case (i) of Rule XII TE MSR given in fn: (i) above is Vijaykrishnan's low level MSR which accounts for stress on words like academy and calamity in TE.
7. Vijaykrishnan (1978, p. 72) says: "It is possible to account for stress-placement in verbs in Set 25 (i.e., imagine, abolish, deposit, etc.) by modifying the low vowel MSR thus:

\[ V \rightarrow \left[ \begin{array}{c} + \text{stres} \end{array} \right] \left[ \begin{array}{c} + \text{low} \end{array} \right] \text{C}_0 \left( \begin{array}{c} - \text{tense} \end{array} \right) \text{C}_1 \right] \] 

8. Sadanandan (1981, p. 54) seems to be aware of this feature in the phonology of IE: "vowels /\text{\textit{e}}/ \text{ and } /\text{\textit{o}}/ \text{ in } \text{\textit{MLY}}E \text{ are } /\text{\textit{+tense}}/." She goes on to say, "... In fact it would be impossible to account for stress in \text{\textit{MLY}}E, with some semblance of generality and consistency if one were not to regard them as tense vowels." But she does not pursue this line of enquiry further, perhaps in view of words like develop where \textit{o} is not realized as tense in \text{\textit{MLY}}E.

9. Data for Oriya English have been taken from term papers submitted by Sahu and Mishra for the M.Litt. (phonology) course at CIEFL, 1980-81.

10. For detailed arguments against the segmental convention see LP (1977) and Hayes (1981, Chapter I).

11. I will show towards the end of the Section 3.5 that grid-theoretic convention of metrical stress rules is not capable of providing the simplest and intuitively
satisfactory explanation of stress facts of IE. A modified version of tree-theoretic convention can do this better.

12. In cases of Tamil speaking children's English, Upendran (forthcoming) has found that branching within the nuclei of the first two syllables is all important for main stress assignment. In such cases a nucleus projection rule could be proposed.

13. Word-final consonants do not add to the weight of their syllables. See (Hayes (1981) for further discussion of this aspect. See also Section 3.6 below.


15. See Prince (1983) for details of the formulation and application of these rules.

16. auspicious seems to be one of the limited number of exceptions to the morphological projection rule (MPR) proposed in Chapter II.
17. The question of two choices, such as that for the attachment of penult in Adirondack for AE proposed in Hayes (1981) does not arise here at all. Hayes has to decide between right or left attachment of the penult since he removes the foot on \-ron\- by a detressing rule. Since we have no destressing rule in this framework, there will be only one choice for the foot attachment.

18. Stress on preliminary for ME seems to be exceptional. Going by MPR in Chapter II it should be *preliminary.

19. I feel that asparagus in TE also has two stresses. But because of, as we shall see shortly (Section 3.7), dialectal difference in word-tree labeling rule, the main stress in TE pronunciation of this word is on the initial syllable and the secondary on the penult. Vijaykrishnan, however, does not mark any secondary stress in this word. Nevertheless my feeling about stress in TE pronunciation of this word seems to be supported by data in Upendran (forthcoming).

20. To a question, most speakers of English from North India at CIEFL, Hyderabad said they saw 'GANDHI' Cinema at \S\^ongiit\_\ where as speakers from the South said \S\^ongiit\_\ which shows the difference in the preferred prosodic patterns between North and South Indian languages.