THE STRUCTURE OF KOREAN PROSODY

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ABSTRACT

The purpose of this thesis is to establish a theoretical framework of Korean prosody within which the correlation of the four major components -- stress/accent, rhythm, intonation and vowel length -- and their relationship with grammar, pragmatics, information structure and attitude are best described and explained. It is hoped that this thesis will contribute to the analysis of the prosody of other languages and eventually to the typology of prosody.

In chapter 1, it is argued that Korean is a fixed stress language. The Korean Stress Rule is set up and syllable structure and stress shift in Korean are also discussed.

In chapter 2, it is argued that Korean rhythm has a strong tendency towards stress-timing, and that the possible rhythmic patterns of a sentence are determined by the interaction between the rhythmic structure of the sentence, the scope of focus, and the speech tempo and style. The rhythmic structure of a sentence is assumed to be predictable by eight prosodic phrase structure rules.

In chapter 3, the intonation system of Korean is established. It is argued that a tune consists of zero or more phrasal tones followed by one obligatory boundary

tone, the latter conveying the greater part of the information conveyed by the tune. Nine boundary tones and four phrasal tones are set up. Intonation group boundary placement and the functions of the boundary tone are also discussed.

In chapter 4, vowel shortening, both morphophonemic and phonetic, and compensatory vowel lengthening are investigated. It is argued that phonetic vowel shortening can be best described and explained in terms of accent placement. Finally, phonetic variations of vowel length are also discussed.

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ACKNOWLEDGEMENTS

CHAPTER 1. STRESS AND ACCENT

1. The Typological Nature of Korean[1] Prominence

When we try to systematically describe the prosody of a language, the first important step is to investigate the typological nature of prominence observed in the language. It is because stress, tone and pitch accent are closely related to the rhythm and intonation of the language in question, and the rhythm and intonation of stress languages are very different from those of tone or pitch accent languages (see Cruttenden 1986: 8-14 for details).

There have been many controversies concerning the typological nature of Korean prominence. I.S. Lee (1967) claimed that Korean is a tone language. I.S. Zong (1965) insisted on the pitch accent hypothesis and S.N. Lee (1960), H.B. Lee (1973) and others on the stress hypothesis. Since no one has ever satisfactorily justified their hypothesis and falsified the other hypotheses, we shall begin our discussion by carefully examining the three hypotheses.

I.S. Lee (1967) offers the following minimal pairs to illustrate his hypothesis.

(1) a, kisul (High Low)   vs. kisul (Low High)
      (technology)   (description)

   b, uri (High Low)   vs. uri (Low High)
      (pen for animals)   (we)

But for speakers of standard Korean, these pairs are homophonous. He evidently identifies standard Korean with his own dialect which really has distinctive tones.
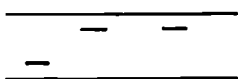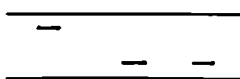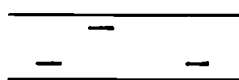
The role of pitch in Korean is not tonal, but intonational. Different pitch patterns of a word may convey different grammatical, pragmatic and/or attutudinal functions, but not lexical differences.

(2) kisul (High Low) _____
                         ●
                         ___●___   : statement

   vs. kisul (Low High) _____
                            ●
                         ___●___   : question

I.S. Zong (1965) conducted spectrographic experiments on recordings of radio news and weather forecasts in order to justify his hypothesis. He selected certain recurring words from each test passage and measured the intensity and fundamental frequency of each syllable of the test words. And he claimed that each word has one accented syllable which is always pronounced highest-pitched within the word, and that the accented syllable is lexically determined.

Even though his measurements were correct, his procedure still has serious methodological defects. First of all, he ignored the length feature, which seems to be the most important determinant of rhythmic patterns (cf. H.Y. Lee 1987) in Korean. Secondly, he failed to notice that any syllable can receive the highest pitch within a word because of intonation, which is determined by speech style, the speaker's attitude, grammar, illocution and so on. The reason why one specific syllable of each test word repeatedly received the highest pitch throughout the test passage is that this passage was said by the same speaker, in the same style (formal reporting style) and with the same attitude (unemotional), which resulted in the use of the same pitch pattern for each word.

In Japanese, which is a typical pitch accent language, the last high-pitched mora is regarded as accented. And the location of accented moras is lexically determined.

(3) higashi

      (east)   (a family name)   (cake)

As we can see above, the word 'higashi' has the three different meanings and these are distinguished by the different pitch accent placements.

But this is not the case in Korean. A word can be said with more than one pitch pattern, without causing any lexical difference. Possible pitch patterns of a word are constrained by the number of syllables the word has, not by the location of a pitch accent, once the pitch pattern of the last syllable is determined.[2] Given that the last syllable of each word is said with the Low Level tone, which typically appears in citation intonation, possible pitch patterns of individual Korean words can be illustrated as follows: (Rhythmic patterns are ignored here. The different pitch patterns may convey different speech styles, attitudes and so on. See sub-section 1.5. chapter 3 for details.)

(4) 2 syllable words:
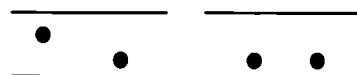
3 syllable words:
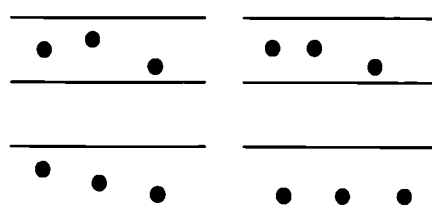
4 syllable words :
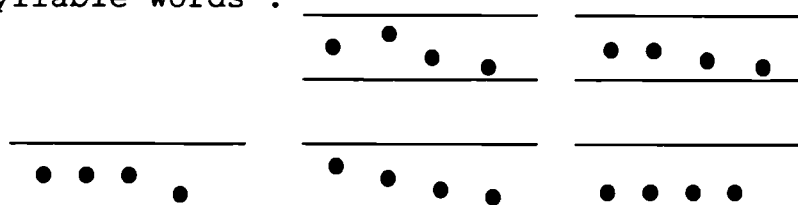
Words with more than 4 syllables: Similar to 4 syllable words.

We find that these pitch patterns follow simple constraints. The second syllable of a word with more than two syllables may be pronounced slightly higher than, or on the same pitch as, or slightly lower than the first syllable, but cannot be pronounced lower than the third syllable (this syllable must be non-final) if there is one. Any non-final syllable other than the first two syllables (in the case of words containing more than 3 syllables) may be pronounced on the same pitch as or on a lower one, but never on a higher one than the preceding syllable. This fact constitutes important evidence that Korean is not a pitch accent language.

As we have seen so far, it is obvious that Korean is neither a tone language nor a pitch accent language. The role of pitch in Korean is not tonal, but intonational. A word may be said with more than one pitch pattern without causing any lexical difference. Furthermore, possible pitch patterns of a word are determined by the number of syllables the word has, not by tones assigned to individual syllables nor by a pitch accent assigned to one syllable, once the pitch pattern of the last syllable is determined. It is very difficult, however, to justify the hypothesis that Korean is a stress language. The major difficulty has been that Korean stress has no distinctive function. Irrespective of this difficulty, we shall justify the stress hypothesis cogently in the next section.

2. Korean as a Stress Language

The most convincing way of justifying the stress hypothesis is to provide comprehensive phonological (linguistic) motivation for Korean stress and accent. Although Korean stress does not have a distinctive function, Korean shares all other important functions with typical stress languages like English[3].

First of all, stress (or accent) placement may lead us to distinguish between a phrase and a compound, both of which have the same sequence of sounds. We may call this function 'pseudo-distinctive function'. A phrase which consists of two morphemes can normally be pronounced either with one accent or with two, depending on the tempo of speech and the speaker's intention. But if a phrase has a compound counterpart which consists of the same morphemes, the former must be said with two stresses (or accents) and the latter with a single stress (or accent) in order not to be confused.

(5) a, 'k'ŭn 'ŏmma: tall mother (my mother)

   (tall) (mother)

   b, k'ŭ'nŏmma: my uncle's wife (my cousin's mother)

(6)[4] a, 'to:n[5] 'ch'ŏnwŏn : 1000 Won (an exact amount)

   (money) (one thousand Won)

   b, 'to:nch'ŏnwŏn : about 1000 Won

(7) a, ˈchaːl ˈmoːthada : can't do well

      (well) (can't do)

    b, ˈchaːlmothada : make a mistake

cf. ˌblack ˈbird   vs. ˈblackbird

Secondly, stress and accent play an important role in intonation. When a word or a phrase of an utterance is focused and thus accented, prominence is in practice concentrated on a stressed syllable. This syllable is usually involved in the change of pitch level from the preceding syllable and/or a pitch glide. This function is called 'accentual function'.

(8) a, nanŭn ˈhakkyoe ˈkassta.   (I went to school.)

    (I)   (school-to) (went)
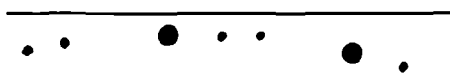
b, nanŭn ˈhakkyoe kassta.

cf. I ˈwent to �‌school. vs. I ˋwent to school.
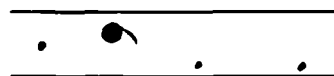
Thirdly, stress and accent also play an important role in rhythm, which we want to call 'rhythmic function'. An accented syllable is involved not only in the change of pitch but also in rhythmic prominence. The two possible versions of the sentence in (8) above show that they have different rhythmic patterns. (8a) has two rhythmic beats whereas (8b) has only one.

Finally, Korean accent marks the beginning of a rhythm unit, which is called 'demarcative function'. The two versions in (8) show that each rhythm unit begins with an accented syllable.

In addition, it will be seen in chapter 4 that accent placement is closely related to the realization of underlying long vowels.

Therefore Korean must be regarded as a stress language, whose stress placement is fixed and predictable by rule (see section 5). It will be seen thoughout this thesis that Korean prosody can be best described and explained by taking stress and accent into account.

3. Definitions -- Prominence, Stress and Accent

The three related terms 'prominence', 'stress' and 'accent' have been used without clear distinction by both Korean and western scholars. We shall distinguish between them in this section because it is advantageous to do so in describing the prosody of Korean and other languages.

3.1. **Prominence**

Jones (1986: 246) defines prominence as 'the degree of general distinctness'. According to his view, prominence is determined by adding prosodic features like stress, length and pitch to inherent phonetic features (sonority). One syllable of a word (or a morpheme) is often heard to be more prominent than its surrounding syllables in Korean due to accent (see below). But it is sometimes difficult to single out the most prominent syllable of a word when a rhythmically prominent syllable and a prominent-pitched syllable do not coincide in actual speech (see H.Y. Lee 1987). Hence it is very useful to distinguish 'rhythmic prominence' from 'pitch prominence'.

Rhythmic prominence is mainly caused by the rhythmic beat. The rhythmic beat can be defined as 'a syllable's increased duration and loudness as compared with the norm'. Hence the perception of the rhythmic beat is strongly influenced by the hearer's mental impression of rhythm, not merely by objective duration and loudness of a syllable. Accordingly, a rhythmically prominent syllable may have a shorter length and/or a weaker intensity than another syllable within a word. For example, the English word 'attitude' has a stress on the first syllable, but the last syllable is normally pronounced longer than this syllable. In the English

word 'bookshop', the second syllable is often pronounced with greater intensity than the stressed first syllable because of its greater inherent intensity.

On the other hand, pitch prominence is characterized (at least in Korean) by the change of pitch level from the preceding syllable or a pause (zero Hz), and/or by a pitch glide (see (8)).

Recently 'prominence' has often been used as a neutral term for stress and accent (e.g. Ladd 1980). It might be acceptable because the most prominent syllable of a word often coincides with the stressed and accented syllable of the word. But I want to keep prominence as a purely phonetic term, as defined by Jones, because I shall assign linguistic functions to stress and accent.

3.2. Stress

We use the term 'stress' both as a purely phonetic concept and as a phonological concept. As a purely phonetic term, we define stress as the 'force of articulation' on the part of the speaker, and as the 'rhythmic beat' on the part of the hearer (probably also the speaker). We regard the auditory impression of stress as the rhythmic beat, not as 'loudness' (unlike Jones 1986), because stress plays a crucial role in timing and an unstressed syllable may be heard to be louder than a stressed syllable because of its greater

inherent intensity, and/or more prominent because of pitch prominence.

As a phonological term, on the other hand, we define stress as a 'pre-condition for potential accent' in that accent is normally concentrated on a stressed syllable (see below for the justification of this definition). An underlying stress in Korean is not realized as a rhythmic beat if a word containing it is unaccented (probably unlike English)[6].

3.3. Accent

Accent can be defined as 'the means whereby a focused part of an utterance is made to stand out in order to concentrate the hearer's attention on it' (cf. O'Connor & Arnold 1973 and H.Y. Lee 1987). Hence we regard accent placement as the phonological manifestation of information focus (cf. sub-section 2.5. chapter 2). Since accent is usually concentrated on a stressed syllable, it inevitably involves rhythmic prominence caused by the rhythmic beat. Accent is also associated with pitch prominence, since an accented syllable usually involves a change in pitch level from the preceding syllable or a pause, and also a pitch glide if a rhythm unit consists of only one syllable. The fact that an accented syllable leads a new pitch (tone) pattern may also influence the perception of pitch prominence. Hence

accent is normally perceived as a combination of both rhythmic prominence and pitch prominence.

Note that an accented syllable is not always the most prominent-pitched one in a word, because an unaccented syllable may attract a more prominent pitch due to intonation. Note also that accent is sometimes concentrated on an unstressed syllable, if only a part of a word which does not contain stress is narrowly focused (see section 6 for stress shift).

The main theoretical reason for distinguishing stress from accent is that it enables us to give a neat explanation of a part of the mechanism involved in accent placement. For example, the underlying sentence in (8) can be pronounced as (8a) or (8b) in careful speech. (Of course, there are more possible rhythmic and intonation patterns.) Note that the verb 'kassta' receives an accent in (8a), but not in (8b), and that accent is concentrated on the first syllable of both 'hakkyoe' and 'kassta', not on other syllables. This can be explained neatly if we assume that both 'hakkyoe' and 'kassta' have a stress on the first syllable at underlying representation, and that the underlying stresses are realized when these phrases are regarded as 'new' information and thus focused and accented. (See the next chapter for details. It will be seen that a stress on a prosodically weak word may not be realized in fast speech even if a word containing it conveys 'new' information).

4. Syllable Structure

In this section, we shall briefly discuss one important phonological unit which is essential for the description of Korean prosody: the syllable. We can provide threefold motivation for regarding the syllable as a significant phonological unit in Korean, as Selkirk (1982) did in discussing English.

First of all, the most general and explanatory statement of phonotactic constraints in Korean can be made only by reference to the syllable structure of an utterance (see W. Huh 1985 for a traditional account).

Secondly, the syllable is the domain of application of many rules of segmental phonology. For example, there is a Labialization process in Korean by which all consonants including semi-vowels are labialized if they are followed or preceded by a rounded vowel or a rounded semi-vowel within the syllable where they belong.

(9) Labialization:

C --> [+round] / $ %___ [-cons, +round]$

e.g. kuk [$g̊uk$] (soup), kwail [$g̊wa$il$] (fruit)
kyo:sa [$g̊jo:$sa$], *[$g̊jo:sa] (teacher)
kamdok [$g̊am$dok$] *[$g̊amdok] (manager)

Note that in 'kyo:sa', the front unrounded semi-vowel [j]
becomes labialized first because of the following rounded
vowel [o] and then the first consonant [g̊] is also
labialized due to the following labialized semi-vowel.

There are also other phonological processes whose
domain of application is the syllable (see below and
Kim-Renaud 1975 for several other relevant processes).

Thirdly, an adequate treatment of prosodic phenomena
can be given only if we take the syllable into account.
For example, stress is assigned to the syllable in Korean
like other stress languages, not to a unit smaller or
bigger than the syllable. For example, stress falls on
the first syllable of the word 'chang$so (place)' when
the whole word is focused. When only the first syllable
of the word is narrowly focused (e.g. in contrast to
'san$so (oxygen)'), stress is still placed on the first
syllable. Furthermore, even when only the first consonant
is narrowly focused (e.g. in contrast to 'sang$so
(appeal)'), stress is still on the initial syllable. (The
focused consonant may be pronounced more strongly.)

And it will be seen in the next section that the
Korean Stress Rule can best be formulated in terms of
syllable structure.

A Korean syllable generally consists of a sequence
of an optional consonant, an optional semi-vowel(glide),
an obligatory vowel, and one optional consonant.

(10) Korean Syllable Structure: (C)(G)V(C)

e.g. i (tooth), shi (poem), shin (shoes)

an (inside), wang (king), kwang (storage room)

Note that this syllable structure is set up on the basis of the phonetic realization of Korean syllables and is therefore different from underlying syllable structure, which may have a consonant cluster after the vowel. An underlying consonant cluster can appear only morpheme finally (e.g. #kaps# [g̊ap] (price)). One element of the cluster is elided in actual speech if the cluster is followed by another consonant or a pause.

(11) kaps (price) + kwa (and) -> [g̊ap$k=wa] (price and)

kaps (price) -> [g̊ap]

cf. kaps (price) + i (subj. marker) -> [g̊ap$q̊=i]

Some speakers of standard Korean pronounce both elements in the case of 'lp, lp' and lk' clusters even if these are followed by another consonant or a pause.

(12) palp$ta (to step on): [b̥ap$t=a / b̥alp$t=a]

ŭlp'$ta (recite): [ɯp$t=a / ɯlp$t=a]

ki$sŭlk (mountainside): [g̊i$sɯk / g̊i$sɯlk]

For these speakers, therefore, the Korean syllable structure in (10) must be modified as (C)(G)V(L)(C).

(Here 'L' stands for 'voiced alveolar lateral'.) But we shall ignore this syllable structure, as our main concern is to describe the speech of the majority of Koreans.

There is a general consensus among Korean scholars concerning the location of syllable boundaries in syllable sequencies, with certain exceptions which will be discussed later. It should be noted that their syllable division is based on their intuition and thus needs phonological justification.

If a morpheme ending in a consonant (this consonant is underlyingly a member of the morpheme final syllable) is followed by a syllable beginning with a vowel, the consonant moves to the next syllable. It conforms to the principle of 'maximal open syllabicity' proposed by Pulgram (1970).

(13) chip (house) + i (subject marker) --> chi$bi
     san (mountain) + i (subject marker) --> sa$ni

On the other hand, if a consonant cluster appears intervocalically, a syllable boundary is placed in the middle of the cluster.

(14) kaps (price) + i (subject marker) --> kap$shi
     son (hand) + pal (foot) --> son$bal
                                   (hands and feet)

We can justify this syllable division in terms of phonotactic constraints. (See O'Connor and Trim 1953 for this approach.) Since consonant clusters, excluding consonant plus semi-vowel clusters, never occur phonetically in utterance-initial or utterance-final positions in Korean (it does not matter whether an 'utterance' is the same as, shorter or longer than a morpheme), the only possible place for a syllable boundary to be located is in the middle of individual consonant clusters. This syllable division is also supported by phonological processes whose domain of application is the syllable (cf. (9)).

However, intervocalic tense consonants (i.e. p', t', k', pp, tt, kk, tch, and ss) and corresponding consonant clusters (i.e. p-h, t-h, k-h, p-p, t-t, k-k, ch-ch, s-s and so on) constitute a real problem in syllable division. Traditionally, based on the syllable division rules discussed above, the former have been analysed as the onsets of the following syllables, whereas the latter have been believed to have a syllable boundary in the middle. Y.S. Kim (1981) explicitly describes phonetic differences between the two groups, a description with which we do not agree. He argues that the consonant clusters have an interruption in the middle caused by checking an air stream coming from the lungs at the larynx whereas the tense consonants do not have. He further claims that the interruption causes an increase

of air pressure in the oral cavity, which results in the tensification[7]of the following consonants.

On the other hand, W. Huh (1985) claims that the intervocalic consonant clusters mentioned above become corresponding single tense consonants[8] and are subsequently lengthened, which implies that the two groups are pronounced identically between vowels. J.W. Yu (1988) incorporates this view into his discussion of stress placement by treating intervocalic tense consonants as being ambisyllabic. J.W. Yu (1989) claims further that individual tense consonants must be regarded as consisting of two phonemes: two identical lax consonant phonemes in the case of unaspirated tense consonants and one lax consonant phoneme plus one voiceless glottal fricative /h/ in the case of strongly aspirated tense consonants. His view certainly has the advantage of reducing the number of Korean consonant phonemes from 19 to 10. But this approach leaves problems to be solved.

Let us consider the word 'pat'' (field) as an example in order to discuss one of the problems. According to his approach, this word is analysed as /b̥-a-d̥-h/. (Here dashes are used to emphasize the phonemic status of /h/). This is believed to be pronounced as [b̥ad̥][9] if nothing else follows. The traditional account of this is that strongly aspirated tense consonants are neutralized with corresponding lax

consonants.[10] Yu, on the other hand, explains this process in terms of the existing Syllable-Final Cluster Simplification Rule,[11] by which the second element of the cluster is elided. It is obviously a better explanation. Yet how are we to account for the pronunciation [b̥at$k=wa], which is the phonetic realization of '/b̥-a-d̥-h/ (field) + /g̥wa/ (and)'? This phrase should be pronounced as [b̥ad̥$kʰwa] instead in his framework, for a morpheme-final /h/ phoneme usually combines with the following obstruent to produce a strongly aspirated tense consonant. (Compare '/s-i-l-h/ (stem: dislike) + /d̥a/ (ending) --> [ɕil$tʰa]' and '/m-a:-n-h/ (stem: be many) + /d̥a/ (ending) --> [ma:n$tʰa]'.) Within his framework, there is no way of explaining the right pronunciation.

The next problem is that we have to modify the Syllable-Final Cluster Simplification Rule, which he adopted without any modification, to accommodate examples like '/ɯ-l-b̥-h/ (stem: recite)', which has a syllable final cluster consisting of three phonemes. (This morpheme is normally pronounced as [ɯp] before an ending beginning with a consonant. See (12).)

Another problem is that he overlooked the fact that the duration of the tense consonants (corresponding consonant clusters appear only intervocalically)is longer between vowels than anywhere else (e.g. 'kk' (/g̥-g̥/ in Yu 1989) in 'akka (some time ago)' vs. that in 'kkada (peel)' or in 'kangkka (beside a river)'). And he failed

to observe the fact that the tense consonants and corresponding clusters are pronounced with single articulatory gestures, contrary to his observation that only the second elements (recall that in his view a tense consonant also consists of two lax consonant phonemes) are tensified in the course of making efforts to retain the closure phase of the preceding elements.

One more problem we want to point out is that his view is obviously based on the biuniqueness principle of taxonomic phonemics in that he claims to assign the tense consonants the same phonological structure as the corresponding consonant clusters because they are pronounced identically in actual speech. But we prefer to assign different phonological structures to the two groups because Koreans have a linguistic knowledge (competence) that there is a morpheme boundary in the middle of the consonant clusters whereas there is no boundary within the individual tense consonants. For example, although the words ‛okkae (shoulder)’ and ‛ok#kae (a hundred million pieces)’ are pronounced identically in normal speech, we have a clear knowledge that the former consists of only one morpheme whereas the latter consists of two morphemes. This fact is sometimes reflected in actual speech. We may prolong the duration of the first consonant in ‛ok#kae’ and pronounce the second consonant without tensifying it when each of the

two morphemes are narrowly focused. This phonetic realization cannot happen in the case of `okkae'.

Therefore we shall assume that the tense consonants are single phonemes and the corresponding consonant clusters consist of two consonant phonemes, following W. Huh (1985). In this way, we succeed in incorporating the following phonetic facts into our phonological framework: 1) The tense consonants and corresponding consonant clusters have the same phonetic realization between vowels. 2) These are pronounced with single articulatory gestures. 3) These are always pronounced longer than lax consonants but the same length as, or sometimes shorter than, other intervocalic consonant clusters. 4) Tense consonants (clusters can appear only intervocalically) are longer between vowels than anywhere else (i.e. after a pause or another consonant). In order to offer a plausible phonological explanation for these phonetic facts, we shall assume that the consonant clusters, corresponding to the tense consonants, are combined by the Coalescence[12]process (this process also includes the Frication of the `h-j and h-w' as `[ç] and [ʍ]' as in (19) below) and thus become identical to corresponding tense consonants, and that at the next stage these coalesced consonant clusters, together with original tense consonants, are lengthened by the Ambisyllabification process between vowels, not anywhere else (see (21) for the formulation of this rule).

We still need to explain why tense consonants are produced when two (underlying) lax consonants are merged. A traditional account for this is that the second consonants are tensified by the preceding ones, which implies that the first consonants are lax whereas the second ones are tense due to the Tensification process (see above for Y.S. Kim (1981)'s account and see also J.W. Yu (1989)). On the contrary, our account is that the preceding lax consonants are tensified by the Glottal Reinforcement process[13] and that the second ones are subsequently tensified by the preceding tensified consonants. Hence the two tensified consonants are merged by the Coalescence process, resulting in the tense consonants, from our point of view.

Let us consider the following nice set of examples to illustrate the above discussion.

(15) a, pach'ida (dedicate)

: pach'i (stem) + ta (ending)

b, patch'ida (put up (an umbrella))

: pat (stem) + ch'i (emphatic pre-ending) + ta

c, pathida (be gored)

: pat (stem) + hi (passivization stem) + ta

d, pat'ch'ida (filter: verb)

: pat' (stem) + ch'i (emphatic pre-ending) + ta

Although these words have different internal morpheme structures, they are pronounced identically as [b̥at͡ɕʰːida] unless we intentionally try to pronounce each morpheme accurately, and even in that case there is no way of distinguishing (15b) from (15d).

Let us work out how the identical phonetic form is derived from the four different words. The derivation from (15a) to the phonetic form is straightforward. Only the Ambisyllabification rule is applied to the underlying form. (15b) undergoes the Glottal Reinforcement process first, by which the stem final consonant is tensified. And then the Coalescence rule is applied to the output of the Glottal Reinforcement, resulting in [b̥at͡ɕʰ ida]. At the final stage, the Ambisyllabification rule lengthens the intervocalic strongly aspirated tense affricate. In the case of (15c), the stem final consonant is tensified by the Glottal Reinforcement like (15b). And this tensified consonant and the following consonant /h/ are combined to form a strongly aspirated tense consonant /tʰ / by the Coalescence process. At the next stage, the Palatalization process,[14] which causes the coalesced consonant /tʰ / to be palatalized by the following high front vowel /i/, takes place, resulting in the voiceless strongly aspirated palatal affricate /t͡ɕʰ/. And this intervocalic consonant is lengthened by the Ambisyllabification rule at the final stage. Lastly, the stem-final strongly aspirated tense consonant /tʰ / in

-31-

(15d) becomes /d̥/ by the Neutralization process. This lax consonant is tensified by the Glottal Reinforcement, and then merged with the following affricate by the Coalescence process. And the coalesced tense affricate is lengthened by the Ambisyllabification process.

With the development of Metrical Phonology, many scholars have come to believe that the syllable is hierarchically structured. A syllable consists of optional onset and obligatory rhyme. The rhyme is composed of obligatory nucleus and optional coda.

(16) Syllable Structure (a metrical version):

```
              Syllable
          _____
      Onset          Rhyme
                     _____
                  Nucleus  Coda
```
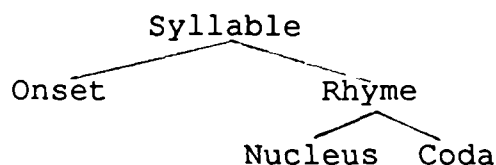
The assumption that the nucleus and the coda form a single constituent -- the rhyme -- is well supported by the Korean Stress Rule, which will be discussed in detail in the next section. The Korean Stress Rule depends on the weight of the first syllable -- whether it is heavy or light. And the distinction between heavy and light syllables is determined by the structure of the rhyme (see (23) and (24)). The onset does not play any role in stress assignment in Korean.

When we analyse Korean syllables in terms of the syllable structure in (16), three important questions

arise: 1) How do we analyse phonologically long vowels? 2) How are we to deal with semi-vowels? Do we include these in the onset or in the rhyme? 3) How do we deal with intervocalic tense consonants and corresponding consonant clusters, which are assumed to be ambisyllabic?

As for the analysis of phonologically long vowels, there are two alternatives. The first alternative is to simply regard a long vowel as a single constituent of the nucleus as in (17a). The second alternative is to regard the long vowel as consisting of two identical short vowels as in (17b).

(17) sa:$sang$ga (philosopher)

```
a,           s                    b,            s
           /   \                              /    \
         On     Rh                          On      Rh
          |      |                           |       |
          |      Nu                          |       Nu
          |      |                           |      /  \
          s      a:                          s     a    a
```
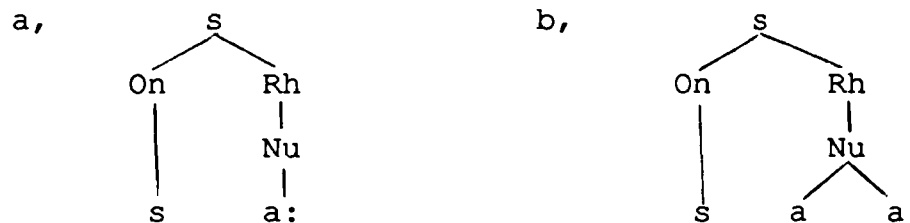
(Only the first syllable is analysed.)

If we adopt the first alternative, we are bound to assign the same syllable structure to the first syllable of 'sa$saeng$a (illegitimate child)' in (18) below, which has different stress patterns from that of 'sa:$sang$ga'. That is, stress usually falls on the first syllable of 'sa:$sang$ga', but either on the first or on the second syllable of 'sa$saeng$a'. This difference is caused by the different structures of the first syllables.

(18)   sa\$saeng\$a (illegitimate child)

```
              s
            /   \
          On      Rh
          |        |
          |        Nu
          |        |
          s        a
```
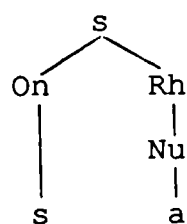
(Only the first syllable is analysed.)

It follows that the second alternative is better than the first one because it has an advantage of representing an important structural difference between the syllables with a short vowel and those with a long vowel.

The second question, concerning the treatment of semi-vowels in Korean, arises because they have characteristics of both vowels and consonants. Semi-vowels have been treated as the first elements of diphthongs (cf. W.Huh 1985 for example), which implies that they are constituents of the rhyme, not of the onset. But we want to assume that semi-vowels are governed by the onset. We have four important arguments for this view.

The first argument is that semi-vowels are always nonsyllabic. Hence they cannot appear without a vowel in a syllable and they appear only at the edge of a syllable, not at the centre, which is a typical consonant characteristic.

The second argument is that semi-vowels are always pronounced as voiceless fricatives after a strongly

aspirated tense consonant or after a voiceless glottal fricative /h/, as mentioned earlier. (It also happens in English. See Gimson 1980: 212.)

(19) p'yŏnanhan (comfortable) : [pçənanɦan]

k'waerak (pleasure) : [kʌɛɾak]

hyŏndae (modern age) : [çə:ndɛ]

hwal (bow -- weapon) : [ʌal]

Note that vowels do not undergo the Devoicing and Frication (Coalescence) process in the same environment unless a word is emotionally coloured (e.g. p'aran (blue): [pḁ:ɾan] in contrast to normal [pʰaɾan]).

The third argument is that semi-vowels do not play any role in stress assignment. For example, stress falls on the first syllable of 'kwa:bansu (a majority)' whereas stress falls either on the first or on the second syllable of 'kwajemul (homework)'. If we compare this pair with the other pair in (17) and (18), the fact that the semi-vowel /w/ does not play any role in stress assignment becomes apparent.

The last argument is that we do not need to set up a complex diphthong system in Korean, which in W. Huh (1985)'s framework, consists of 12 diphthongs (all are semi-vowel plus vowel combinations), if we include the three semi-vowels /j, w, ɥ /[15]in the consonant system (see

Gimson 1980: 95-96 for a similar discussion). We believe this approach to be more reasonable and economical.

The syllable structures of several syllables containing a semi-vowel are illustrated below:

(20) a, pyŏ:n$hwa (change)   b, p'yŏl$li (convenience)

```
            s                              s
      _____|_____                  _____|_____
     On           Rh                On           Rh
    / \          / \               / \          / \
   /   \       Nu   Co            /   \       Nu   Co
  /     \     / \    |           /     \       |    |
 p    y[j]  ŏ   ŏ    n          p'   y[j]      ŏ    l
```
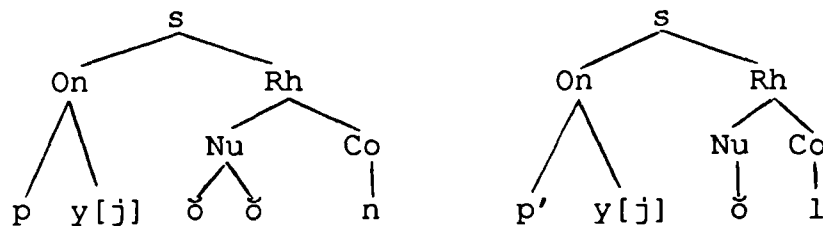
c, kwa:bansu (majority) d, kwajemul (homework)

```
            s                              s
      _____|_____                  _____|_____
     On           Rh                On           Rh
    / \            |                / \           |
   /   \          Nu               /   \         Nu
  /     \         / \             /     \         |
 k       w       a   a           k       w        a
```
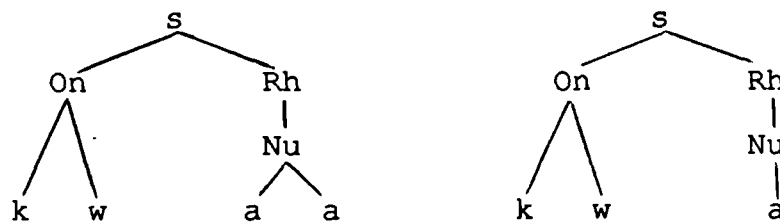
(Only the first syllables are analysed.)

The last question concerns with how to represent ambisyllabic consonants. We have seen earlier that intervocalic tense consonants and corresponding consonant clusters are pronounced identically as single tense consonants by the Coalescence process and they are lengthened by the Ambisyllabification process. We have given this name to the lenthening process because it causes intervocalic tense consonants to be members of both syllables. We shall assume that both original tense

consonants and coalesced tense consonants are the onsets of the following syllables like other intervocalic single consonants at one stage and subsequently are lengthened, so that they become both the codas and the onsets of both syllables by the Ambisyllabification process. Just as we analyse long vowels as two identical short vowels, we shall regard the lengthened consonants as consisting of two identical tense consonants. The Ambisyllabification rule can be formally represented as follows (cf. Hogg & McCully 1987: 57):

(21) Ambisyllabification:

('C' must be a tense consonant.)
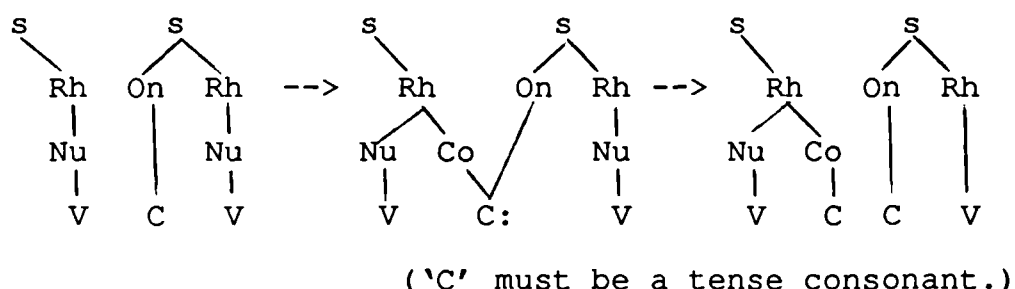
Note that the Ambisyllabification process takes place whenever an intervocalic tense consonant appears within a rhythm unit and thus may occur after certain other processes (e.g. Glottal Reinforcement, Coalescence, Palatalization and so on). Note also that the Ambisyllabification process causes the preceding light syllable to become a heavy one, so that the Korean Stress Rule applies to the output of this process. These points are illustrated below with the example in (15d).

(22) pat'#ch'i#da

```
        s                   s                              s              s
      /  \                /  \                           /  \           /  \
   On     Rh           On     Rh                      On     Rh      On     Rh
    |    /  \            |      |          Neut.        |     / \      |      |
    |  Nu   Co           |     Nu        ----->         |   Nu  Co     |     Nu
    |   |   |            |      |                       |    |   |     |      |
    p   a   t'          ch'     i                       p    a   t   ch'      i
```

```
              s              s                                  s              s
            /  \           /  \                               /  \           /  \
  Coalesc. On   Rh      On     Rh            Ambisyl.       On     Rh      On     Rh
  ----->    |    |       |      |            ----->          |     / \      |      |
            |   Nu       |     Nu                            |   Nu  Co     |     Nu
            |    |       |      |                            |    |   |     |      |
            p    a      ch'     i                            p    a  ch' ch'      i
```
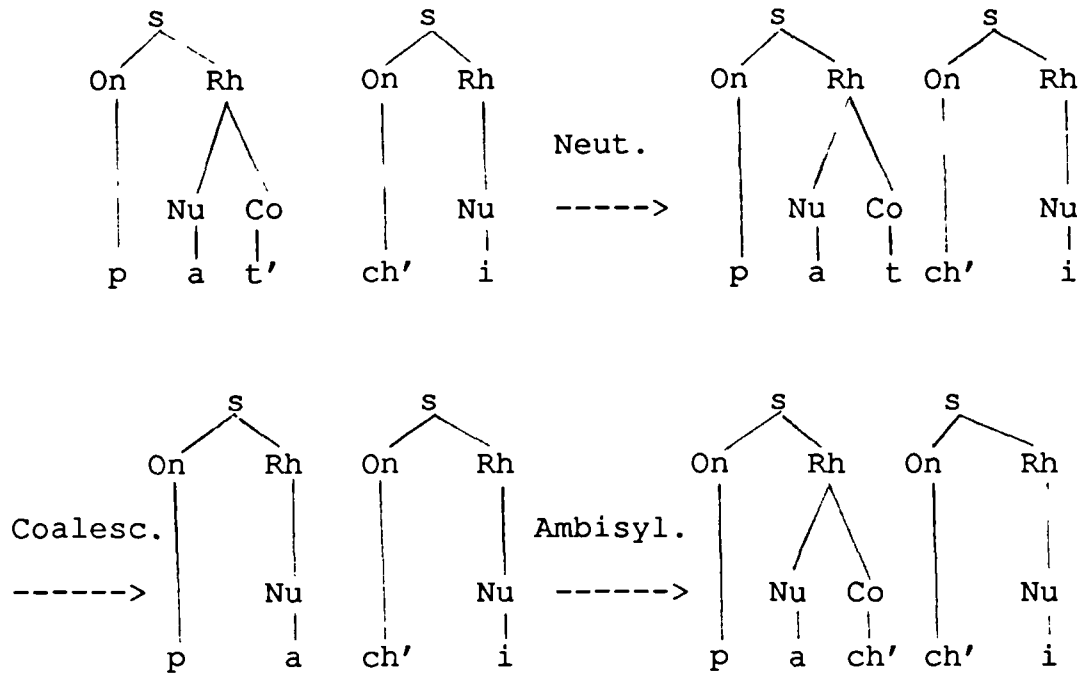
(Only the first two syllables are analysed.)

We can now formally define 'heavy' and 'light'
syllables. 'Light' syllables are those whose rhyme
contains only one short vowel. On the other hand, 'heavy'
syllables are those whose rhyme consists of more than one
element: 1) two identical vowels optionally followed by
one consonant, or 2) one vowel plus one obligatory
consonant. Hence we formally define 'heavy' and 'light'
syllables as follows:

(23) 'Heavy' and 'Light' syllables:

A syllable is **light** if the rhyme consists of

only one constituent, and **heavy** otherwise.

The following is the list of the syllable structures of Korean 'heavy' and 'light' syllables (cf. S.J. Rhee 1987).

(24) a, 'Heavy' syllables:

```
         S                      S                       S
       /  \                   /   \                   /   \
    (On)   Rh              (On)    Rh              (On)    Rh
    / \     |              / \    /  \             / \    /  \
   /   \    Nu            /   \  Nu   Co          /   \  Nu   Co
  /     \  / \          /     \ / \   |         /     \  |    |
(C)    (G) V   V       (C)   (G) V  V  C       (C)   (G)  V    C
```

b, 'Light' syllables:

```
         S
       /   \
    (On)    Rh
    / \      |
   /   \     Nu
  /     \    |
(C)    (G)   V
```
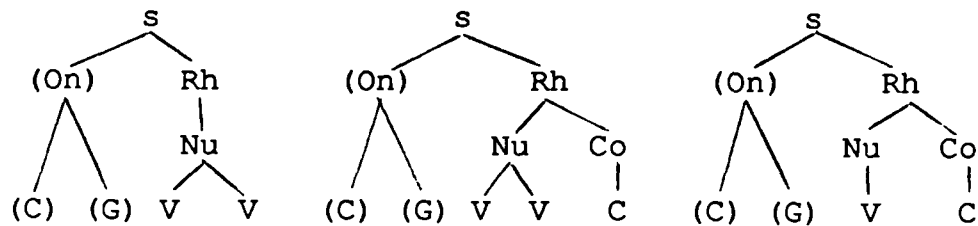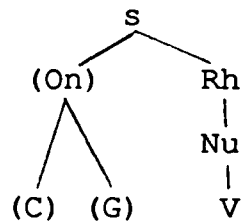
('C': consonant, 'G': glide, 'V': vowel)

5. The Korean Stress Rule

Among advocates of the stress hypothesis, there has been no consensus on the stress rule in Korean. We shall briefly summarize different stress rules put forward by several scholars and then seek a way of unifying them. It should be noted that most of the scholars have used the term 'accent', which should be interpreted as 'stress' in our framework.

Polivanov (1936), quoted in Trubetzkoy (1939: 246), claims that stress falls on the final syllable of a word sentence-internally but on the initial syllable sentence-finally. Trubetzkoy (1939: 246) quotes Polivanov's observation on the Korean stress placement as an example of 'fixed accent', which signals a word boundary.

S.N. Lee (1960) provides a very complicated stress rule. As S.J. Rhee (1987) and J.W. Yu (1988) point out, his view has two major problems. First of all, he seems to confuse stress with intensity. Second, he regards the type of syllable initial consonants as one of major determinants of stress assignment in Korean, a view which we cannot accept. There seems to be no language whose stress placement is determined by syllable-initial consonants. Hence we shall not discuss his stress rule any further. However, it should be noted that he is the first scholar to note the importance of vowel length and syllable structure in stress assignment.

W. Huh (1985) claims that the first syllable tends to be pronounced more strongly than the other syllables within a phrase. He also notes that the second syllable may be pronounced stronger than the first syllable. He evidently defines stress as the 'force of utterance', following Jones (1986).

H.B. Lee (1973) puts forward the most influential accent rule as follows:

(25) The Korean Accent Rule (H.B. Lee 1973: 11-14)

    1. Monosyllable Words:

       1) Monosyllable words have an accent in citation forms.

    2. Two or Three Syllable Words:

       1) If the first syllable has (C)V structure and either the first or the second syllable has a long vowel, accent falls on the syllable with the long vowel.

       2) If the first syllable has (C)VC structure and the second syllable begins with a consonant other than /h/, accent falls on the first syllable.

       3) If both the first and the second syllable have an underlying long vowel, accent falls on the first syllable.

       4) If a word has only short vowels and the first two syllables have (C)V + (C)V(C) structure, accent falls on the second syllable.

       5) If a word has only short vowels and the first two syllables have (C)VC + (C)V(C) structure, accent falls on the first syllable.

    3. Four or Five Syllable Words:

       1) Accent placement is determined on the basis of the rules for two or three syllable words formulated above.

Note that he defines stress and accent in purely phonetic terms. He seems to use the term 'stress' as the 'force of utterance' for the speaker and as 'loudness' for the hearer as defined by Jones (1986), although he does not explicitly mention it. On the other hand, he defines the term 'accent' as 'the means by which a particular syllable is heard better and made to stand out, that is, more prominent than surrounding syllables'. It follows that he seems to identify accent with prominence. He claims that Korean accent is the combination of stress, length of a syllable, and vowel quality, and that pitch is not an essential component of Korean accent. Among these components, he argues, duration is the most important and vowel quality the least important. Hence he sets up the above accent rule based on the rhythmic patterns of individual words, which are largely determined by the length of individual syllables.

In H.Y. Lee (1987), I successfully simplified H.B. Lee (1973)'s complex accent rule in (25) by adopting the terms 'heavy' and 'light' syllables.

   (26) The Korean Stress Rule (H.Y. Lee 1987: 39)

      1) If the first syllable is heavy, stress falls on this syllable.

      2) If the first syllable is light, stress falls on the next syllable. But when emphasised, stress falls on the first syllable.

I defined accent as 'a feature of utterance with which
the speaker makes a syllable to be heard as prominent so
as to attract the hearer's attention to an important part
of his or her utterance'. And I claimed that this rule
has an explanatory power. As the syllable structure
suitable for carrying out this function is the heavy
syllable, the first heavy syllable (it should be either
the first or the second syllable) receives accent. But
if the first syllable is light and thus not suitable for
such a function, the second syllable is accented and thus
pronounced longer and stronger than the other
syllable(s). Note that both H.B. Lee (1973) and H.Y. Lee
(1987) (and S.N. Lee 1960) confine stress assignment to
the first two syllables of words.

J.W. Yu (1988) offers a slightly different stress
rule, claiming that accent can be placed on a syllable
other than the first two syllables in a 'mot phonétique',
which roughly corresponds to the 'rhythm unit' in our
terminology, if the first two syllables are light.

(27) The Korean Accent Rule (J.W. Yu 1988: 322):

a, Give the primary accent to the leftmost heavy
syllable of a 'mot phonétique'.

b, If there is no heavy syllable in the 'mot
phonétique', give the primary accent to the
rightmost light syllable.

He defines accent as 'the phenomenon that the speaker produces a particular syllable with more force in order to be heard more prominently than the other syllables in the same 'mot phonétique''.

As we have seen so far, the crux of the matter concerning stress assignment in Korean is whether stress falls 1) only on the first syllable, 2)only on the first two syllables, 3) on the last syllable of each word or rhythm unit, or 4)on the leftmost heavy syllable. Another problem is what the domain of stress assignment is. Morpheme, word, phrase or rhythm unit?

Let us first discuss whether stress falls on the last syllable of each utterance-internal rhythm unit by considering the following example.

(28) ch'inguga sŏ:nmŭrŭl sassta.

(friend) (gift) (bought)

(My friend bought a gift.)

As we see above, Polivanov's observation is right as far as pitch prominence is concerned. The last syllables of the first two rhythm units, but the first syllable of the last rhythm unit have the highest pitch in each rhythm unit. But we treat these syllables as being unaccented because they lack rhythmic prominence. (Recall that

accent is perceived as the combination of pitch prominence and rhythmic prominence.) As will be discussed in chapter 3, the high pitch on the syllables 'ga' and 'rŭl' functions to mark a rhythm unit (and a phrasal tone assigned to this) boundary. But it does not function as an accent marker, for it is not accompanied by rhythmic prominence which falls on one (stressed) syllable of a focused rhythm unit. On the other hand, the first syllable 'ch'in' also has pitch prominence because of its high pitch (as compared with the pause (zero Hz)). And the first syllables of the last two rhythm units, 'sŏ:n' and 'sass' respectively, also have pitch prominence in that there is a step-down in pitch from the preceding rhythm units. Furthermore, all these three syllables have rhythmic prominence. That is, they have a rhythmic beat, which is characterized by increased duration and loudness as compared with the norm. Hence we regard the first syllable of each rhythm unit as being accented.

J.W. Yu (1988) provides the following example in order to support his stress rule in (27).

(29) a, kaeguri (frog) + han (one) + mari (head)

----> kaeguri 'hanmari (one frog)

b, haebaragi (sunflower) + han + songi (bloom)

----> haebaragi 'hansongi (one sunflower)

He argues that the leftmost heavy syllable `han' in both phrases are stressed by his rule. But we believe that these versions are possible only when the word `han (one)' is narrowly focused, in contrast to `two frogs' and `two sunflowers' respectively. When these phrases are broadly focused, we pronounce them either as `'kaeguri 'hanmari' and `'haebaragi 'hansongi', or as `'kaeguri hanmari' and `'haebaragi hansongi' (see the next chapter for accent placement). Recall that we distinguish stress from accent in order to explain these facts.

The next issue to discuss is whether stress can fall on the second syllable of a word which begins with a light syllable. Let us consider two-syllable words first.

(30) a, sarang (love):

b, shigye (watch):
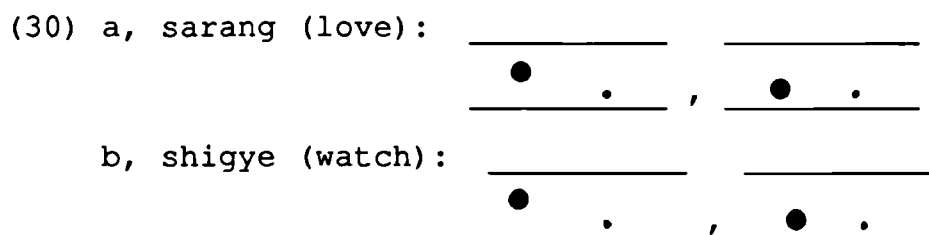
These words have the above intonation patterns in citation. Even though the second syllables are actually pronounced longer than the first syllables, we regard the first syllables as having stress because they are pronounced with greater length and intensity than the norm.

But when these words are followed by a postposition[16]
stress may also be placed on the second syllables.

    (31) a, sarang + kwa (and) + ya:mang (ambition)

        ----> saranggwa ya:mang (love and ambition)

        ● · · ● . , · ● · ● .
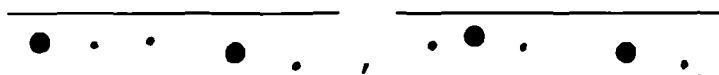
    b, shigye + rŭl (object marker) + sassta (bought)

        ----> shigyerul sassta. ((I) bought a watch.)

        ● · · ● . , · ● · ● .
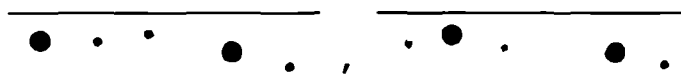
As we shall treat postpositions and endings as clitics, which do not have their own stress but form with the preceding morpheme a unit to which the Korean Stress Rule in (36) is applied, each of the first rhythm units follows the rule for words (morphemes) of more than two syllables (see below).

Let us consider words consisting of more than two syllables with the following examples.

    (32) a, chadongch'a (car):   ● . . , · ● .
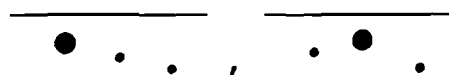
    b, kaeguri (frog):   ● . . , · ● .
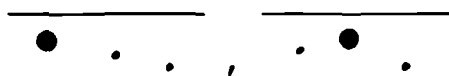
We find that these words can be pronounced either with the rhythm pattern '.●.' or with the pattern '●..'. The latter pattern often sounds emphatic in citation, as pointed out in H.Y Lee (1987). But this pattern may sound natural in utterances containing more than two rhythm units as in (33a) below.

(33)   kaegurinŭn nonesŏ sa:nda.

    a, _____
         ● · · •   ● · •   ●
                                    ·
       _____

    b, _____
         · ● · ·   · ● ·   ●
                                   ·
       _____
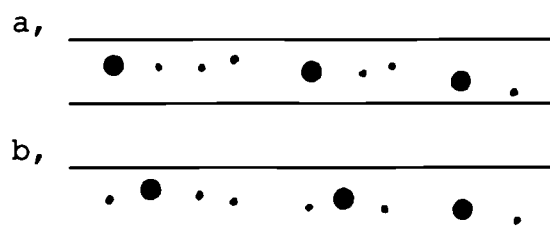
Both patterns can be used for an emphatic purpose. The above versions may sound emphatic if we pronounce the accented syllables with extra force of articulation. Hence we assume that stress falls on either the first or the second syllable of three or more syllable words (morphemes) beginning with a light syllable.

Let us discuss the domain of stress assignment in Korean. As we can see from the stress rules set up by several scholars, Polivanov (1937), H.B. Lee (1973) and H.Y. Lee (1987) (and S.N. Lee (1960)) confine the domain of stress assignment to the 'word', W. Huh (1985) to the 'phrase', and J.W. Yu (1988) to the 'rhythm unit'. The sentence obviously cannot be the smallest domain, as there can appear more than one accent (and thus stress)

within an utterance, as in (33) above. The rhythm unit
seems be the appropriate domain of stress assignment,
because by definition there appears only one accent
within a rhythm unit. But a sentence can be pronounced
with different numbers of accents. For example, the
sentence in (33) may also be pronounced as follows.

(34)   kaegurinŭn nonesŏ sa:nda.

a,

b,
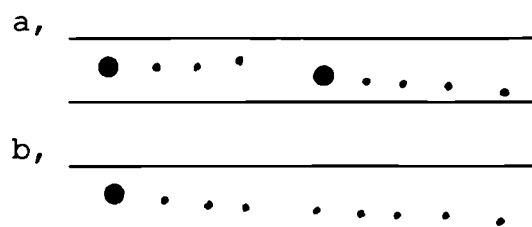
Hence stress must be assigned to a grammatical unit, not
to a prosodic unit.

     In order to find what grammatical unit is the basic
domain of stress assignment, let us consider the
following example.

(35) yŏngguk shi:nsa (English gentleman)

     a, 'yŏngguk 'shi:nsa

     b, 'yŏngguk shinsa

     c, yŏngguk 'shi:nsa

The compound 'yŏngguk shi:nsa' can be pronounced as (35a)
to (35c) depending on the tempo of speech and the scope
of focus (see the next chapter for details). It follows

that the domain of stress assignment should be smaller than a word or a phrase. Hence the only possible unit which can be the domain of stress assignment is the 'morpheme'. If we assume this, the different versions of the compound in (35) can be easily explained. That is, each morpheme has a stress at underlying representation, and the realization of the underlying stresses is determined by the tempo of speech and the scope of focus.

But in the case of endings, most prefixes and suffixes, postpositions, bound nouns and bound predicates,[17] it is very difficult to assume that they have a stress. Note that both of the morphemes in (35) are accented in careful speech as in (35a) when the compound is broadly focused. However, the above-mentioned morpheme classes are never accented even in careful speech unless they are narrowly focused. Hence we shall treat these morphemes as 'clitics', which do not have a stress of their own and combine with the preceding (or following in the case of prefixes) morphemes to form a phonological unit to which the Korean Stress Rule in (36) is applied.

We can now set up the Korean Stress Rule similar to that in H.Y. Lee (1987) as follows:

(36) The Korean Stress Rule:

1) Two syllable morphemes:

Stress falls on the first syllable.

2) Three or more syllable morphemes:

If the first syllable is heavy, stress falls on that syllable. Otherwise, either on the first or on the second syllable with no important linguistic difference implied.

6. Stress Shift in Korean

There are two kinds of stress shift in English. One is that the primary stress moves back to the preceding stressed (or strong vowelled) syllable if it is followed by a stronger stress (cf. Jones 1986: 253-4). For example, the word 'thirteen' has the primary stress on the second syllable and the secondary stress on the first syllable. If this word is followed by 'men', which attracts stronger stress than those in 'thirteen' by the Nuclear Stress Rule set up by Chomsky and Halle (1968), the primary stress in 'thirteen' is shifted to the first syllable in order to avoid a stress clash of the two primary stresses.

Metrical phonologists offer an interesting explanation for this stress shift by means of the metrical grid (cf. Liberman and Prince 1977).

```
(37) a,  L3                x              b,                    x

         L2         x -- x                       x         x

         L1      x   x   x                        x   x   x

              thirteen men     ---->           thirteen men

                w  s   s                         s   w   s
                 \ /    \    /                    \   /    \   /
                  w       /                         w        /
                   \    /                            \     /
                     \ /                                \ /
```

                                    ('--' : stress clash)

(37a) shows that the metrical grids of the L2 are
adjacent and thus clashing. It triggers stress shift,
resulting in alternating rhythm as in (37b). This
approach successfully incorporates this kind of stress
shift occurring in more complicated phrases. For
example, the primary stress on the second word of the
adjective phrase 'pretty little' is shifted to the first
word if it is followed by the word 'girl', which receives
a stronger stress by the Nuclear Stress Rule.

Another kind of stress shift is that stress is
shifted to an unstressed or weakly stressed syllable when
this syllable is narrowly focused. Bolinger (1961a)
calls this stress shift 'contrastive stress',
distinguishing it from 'contrastive accent'. By
contrastive stress, he means the movement of the position
of stress, which is the potential for accent according to
his definition, within words occurring for a contrastive
purpose. For example, in the sentence 'This whiskey was

not *exported* from Ireland; it was *deported*,' (Bolinger 1961a: 101), the two phonetically similar words `exported' and `deported' are contrasted (and thus the first syllables are narrowly focused from our point of view). Since English permits, as Bolinger (1961a: 108) argues, unstressed syllables to become progressively degraded phonetically so that a stressed syllable can carry almost the whole burden of contrast between words of equal length, the stress on the second syllables of both words is shifted to the first syllables, resulting in ' 'exported' and ' 'deported' respectively, in order for these syllables to become conspicuous enough to mark the distinction.

It should be noted that the first kind of stress shift occurs because of a rhythmic reason -- guaranteeing alternating rhythm. On the other hand, the second kind of stress shift takes place for a contrastive purpose -- guaranteeing contrast by shifting stress to a contrasted (narrowly focused) syllable.

Let us consider the compound `pa:ngsong su:nsǒ a:nnae (information on broadcast programme)' in order to examine whether the first type of stress shift also occurs in Korean. This compound has the following structure (see the next chapter for details).

(38)

```
                    s
             ┌──────┴──────┐
             s             ╱╲
          ┌──┴──┐         ╱  ╲
          s     w        w
          │     │        │
       pa:ngsong su:nsŏ  a:nnae
       (broadcast)(order) (information)
```

(information on the order of programmes)
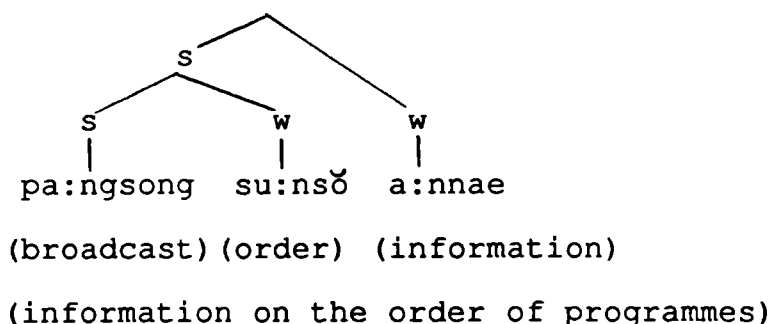
As we see above, Korean has a strong tendency for a left node to be prosodically stronger than its right sister node. It follows that a stress can never clash with a stronger stress when a word or a phrase is in broad focus. Hence the first kind of stress shift cannot take place in Korean.

On the contrary, the second type of stress shift does occur in Korean. For example, the stress on the first syllable of 'kyo:*su* (professor)' shifts to the second syllable if this word is contrasted with 'kyo:*sa* (teacher)'. This stress shift also takes place if a clitic is contrasted with another clitic and thus narrowly focused. For example, if the postposition 'man (only)' in 'haksaeng*man* (student only)' is contrasted with 'do (also)' in 'haksaeng*do* (student too)', the stress on 'hak' shifts to 'man'.

Let us consider the following example.

(39) hakkyoe? (To school?):

(school-to)

(musical notation: • · ♩ with descending slur)
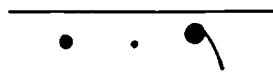
We find that the last syllable has a stronger stress than the first one. Since the above utterance is an echo question, we cannot assume that the postposition 'e (to)' is contrasted with another postposition. Note that the pitch pattern imposed on the postposition 'e' conveys the attitudinal meaning 'astonishment and/or suspicion' (see chapter 3 for details). Hence we assume that the stress shift also takes place when an attitudinal meaning is emphasized.

CHAPTER 2. RHYTHM

In Korean, a sentence may be pronounced with a number of different rhythmic patterns unless it consists of only one word. It will be seen that each rhythmic pattern is composed of one or more rhythm units, each of which has one accented syllable, and that accents tend to appear at regular intervals -- a tendency towards stress-timed rhythm. It will be also seen that possible rhythmic patterns of one sentence are determined by the interaction between the rhythmic structure of the sentence, the scope of focus, and the speech tempo and style.

1. The Rhythm Unit and Stress-Timing in Korean

1.1. The Rhythm Unit

A sentence may be said with more than one rhythmic pattern unless it consists of only one morpheme.

(1)   hakkyoe kassŏ.

(school-to) (went) : ((I) went to school.)

a, _____   b, _____   c, _____

   ● ∙ ∙ ●   ● ∙ ∙ ∙   ∙ ∙ ∙ ●

  _____   _____   _____
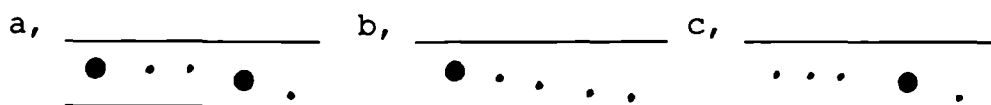
(Attention must be paid only to rhythmic patterns.)

The sentence in (1) can be said with one of the three
rhythmic patterns. We find that each pattern has a
distinct accent placement and a different number of
accents. (1a) has two accents -- one on each phrase,
whereas (1b) and (1c) have only one accent -- on the
first phrase in (1b), but on the second phrase in (1c).
We also find that each pattern conveys different
information concerning the scope of focus, the speech
tempo and style, and so on. The speaker tries to
emphasize (focus) both phrases with (1a), but only the
second one with (1c). With (1b), the speaker can
emphasize (focus) either both phrases or only the first
phrase, which can be distinguished on the part of the
hearer only by the context. The speaker usually speaks
slowly and formally to produce the rhythmic pattern in
(1a). But the speaker can speak either slowly and
formally, or fast and casually to produce the patterns in
(1b) and (1c).

The number of potential rhythmic patterns is
proportional to the number of morphemes other than
clitics a sentence has. It means that there is an
indefinite number of rhythmic patterns, since there is
also an indefinite number of sentences. Then, how do we
describe such an indefinite number of rhythmic patterns?
In order to get clues to this question, let us consider
the rhythmic patterns in (1) again. It is apparent that
the speaker's decision as to where to place accents

results in these rhythmic patterns and the information conveyed by them. If the speaker wants to emphasize both phrases and thus put accents on them, the pattern in (1a) is formed. But if the speaker places an accent only on the second phrase, the pattern in (1c) results. Hence the potential rhythmic patterns of a sentence and the information conveyed by them can be satisfactorily analysed, if we find the mechanisms governing accent placement. We shall turn to the discussion about these mechanisms in the next section.

Note that a slight pause is normally inserted just before the second accented syllable in the rhythmic pattern in (1a). The string of syllables from the first accented syllable up to, not including, the second accented syllable forms a rhythmically close-knit unit. And the rest of the syllables form another close-knit unit. Note also that there is a significant step-down in pitch on the second accented syllable, and that each unit has a different pitch pattern (phrasal tone, cf. chapter 3). These facts lead us to establish a phonological unit which is the same as or smaller than the utterance. The unit is apparently essential for a better description of Korean rhythm and intonation. The 'Rhythm unit', the 'foot' and the 'stress foot' are candidates which may be used for the unit in question.

The 'rhythm unit' is a string of syllables which consists of an optional anacrusis, which is a string of

unstressed syllables preceding a rhythmic beat (stress), one obligatory stressed syllable, and one or more optional unstressed syllables.

    (2) Rhythm Unit

        = (Anacrusis) Stressed Syll. (Unstressed syll.)

The rhythm unit was adopted as 'malt'omak (piece of speech)' by H.B. Lee (1974, 1982) and has been used for the description of Korean rhythm and relevant phonological processes.

    The 'foot' is a string of syllables which is composed of one stressed syllable, one or more optional unstressed syllables and optional clitics (cf. Abercrombie 1964).

    (3) Foot = Stressed Syll. (Unstressed Syll.) (Clitics)

    Note that in the discussion of English stress and rhythm, the anacrusis used for the definition of the rhythm unit corresponds to the clitics in (3) above. Even though the clitics are morphologically or syntactically closer to the following rhythmic beat (stress), they are regarded as a part of the preceding unit (foot), on the ground that they are often pronounced as a part of the preceding pitch pattern and rhythmically closer to the preceding stress as in (4) below[1].

(4) I went to school.

The 'stress foot' is a string of one metrically strong syllable and zero or more metrically weak syllables. It has been used by metrical phonologists for the discussion of word-internal prosodic structure and its use in stress assignment (cf. Selkirk 1980).

(5) Stress Foot = Strong Syll. (Weak Syll(s).)

One word may be analysed as consisting of more than one stress foot depending on the make-up of the word.

In Korean, the term 'stress foot' is unnecessary, because (phonological) stress is assigned in a more straightforward way, as discussed in the preceding chapter. In the case of the 'foot', the anacrusis in Korean is pronounced rhythmically closer to the following rhythmic beat (stress) and hardly pronounced as a part of the preceding pitch pattern.

(6) hakkyoe chadongch'aro kanda.
    (school-to)(car-by)   (go)
    ((I) go to school by car.)
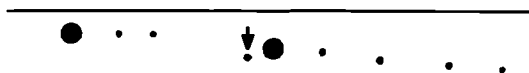
Therefore, we shall use the term 'rhythm unit' throughout this thesis. (We shall establish in chapter 3 another phonological unit 'intonation group', which may be the same as or longer than the rhythm unit.)

1.2. Cues for Rhythm Unit Boundaries

Many Korean scholars (W. Huh 1985 for example) have adopted the term 'open juncture' of taxonomic phonemics. They often regard it as a phoneme in that it distinguishes a compound from a phrase (see (5) to (7) in chapter 1), or one sentence from another.

(7) a, abŏjiga + pange tŭrŏgashinda.

   (My father is entering a room.)

   b, abŏji + kabange tŭrŏgashinda.

   (My father is entering a bag.)

   (* '+' : open juncture)

However, the difference in meaning between (7a) and (7b) can also be cued by 1) different accent placements alone, 2) the lengthened vowels preceding the open junctures alone, 3) different intonation patterns alone.

(8) a, By different accent placements alone

abŏjiga / pange tŭrŏgashinda.

```
┌─────────────────────────────────────┐
  ●  ·  ·  ·   ●  ·   ·   ·   ·   ·  ·
               ↑
└─────────────────────────────────────┘
```
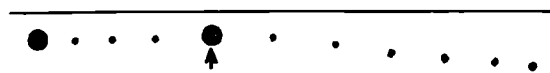
abŏji / kabange tŭrŏgashinda.

```
┌─────────────────────────────────────┐
  ●  ·  ·  ●  ·   ·   ·   ·   ·   ·   ·
           ↑
└─────────────────────────────────────┘
```
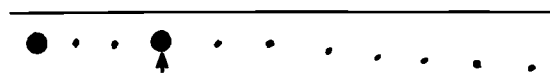
b, By different vowel lengths alone

abŏjiga / pange tŭrŏgashinda.

```
┌─────────────────────────────────────┐
  ·  ·  ·  ▔  ·   ·   ·   ·   ·   ·  ·
           ↑
└─────────────────────────────────────┘
```
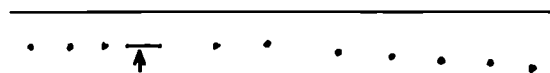
abŏji / kabange tŭrŏgashinda.

```
┌─────────────────────────────────────┐
  ·  ·  ▔  ·   ·   ·   ·   ·   ·  ·  ·
        ↑
└─────────────────────────────────────┘
```
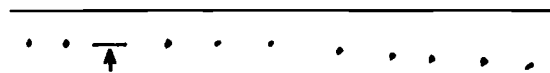
c, By different intonation patterns alone

abŏjiga / pange tŭrŏgashinda.

```
┌─────────────────────────────────────┐
  ·  ·  ·  ∙  ·   ·   ·   ·   ·   ·  ·
           ↑
└─────────────────────────────────────┘
```
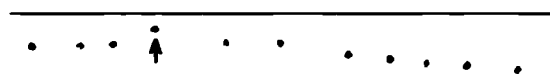
abŏji / kabange tŭrŏgashinda.

```
┌─────────────────────────────────────┐
  ·  ·  ∙  ·   ·   ·   ·   ·   ·   ·  ·
        ↑
└─────────────────────────────────────┘
```
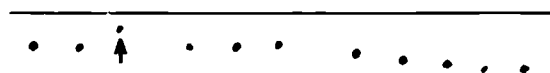
The two versions of (8a) are distinguished by the accents
on the first syllables of the second units, and those of
(8b) by the lenghtened vowels of the first units (this

lengthening can be called `Rhythm Unit Final Lengthening'), and lastly those of (8c) by the high pitched syllables of the first units. It follows that the open juncture, whose auditory cue is silence (pause) between the two (rhythm) units, cannot be the only cue for distinguishing the two different sentences. Furthermore, the above-mentioned cues normally occur together. Hence we regard all of them as the cues for rhythm unit boundaries. It follows that the two sentences are distinguished by different rhythmic and intonation patterns imposed on them.

1.3. **Stress-Timing in Korean**

Whether Korean has stress-timed rhythm or syllable-timed rhythm has long been a controversial issue. But the following set of examples clearly shows that Korean rhythm has a strong tendency towards stress-timing.

> (9) a, 'hakkyo 'kassta. ((I) went (to) school.)
>   (school) (went)
>   b, 'hakkyoe 'kassta. ((I) went to school.)
>   c, 'hakkyoesŏ 'kassta. ((I) went from school.)
>   d, 'hakkyoesŏdo 'kassta.((I) went also from school.)
>   e, 'hakkyoesŏbut'ŏ 'kassta. ((I) went from school.)

The time normally taken for the individual first rhythm
units is almost constant even though the number of
syllables increases by one. And the first syllable of
each rhythm unit has a rhythmic beat and is therefore
pronounced longer than the other syllables, which implies
that Korean rhythm is not syllable-timed.

Stress-timing is also apparent syntagmatically if an
utterance has more than two accents.

(10) a, 'hakkyoesŏbut'ŏ 'chipkkaji 'kŏrŏssta.

(school-from)   (home-to)   (walked)

((I) walked from school to home.)

b, 'hakkyoesŏbut'ŏ 'chipkkaji 'ppalli 'kŏrŏssta.

(school-from)   (home-to) (quickly) (walked)

((I) walked quickly from school to home.)

In each of these examples, accents tend to occur at
regular intervals even though each rhythm unit has a
different number of syllables. It is to be pointed out
that such stress-timing is normally found in lively and
rhythmical speech, but rarely in boring speech.

The tendency towards stress-timed rhythm in Korean
has important effects on 1) syllable length and 2) vowel
quality.

Every segment has its own inherent length. Hence
the length of a syllable can be regarded as the sum of
the lengths of its components. People seem to have

intuition, which can be called the 'norm', concerning the length of segments and that of syllables. But the inherent length of a syllable is realized differently depending on at least three factors.

The first factor is the degree of accent imposed on a syllable. Let us consider the following examples.

(11) hakkyoesŏ kongbuhaessta. ((I) studied at school.)
    (school-at) (studied)

a, _____ b, _____
   ● · · ·   ·   ·   ·   ·   ● · · ·   ● ·   ·   ·
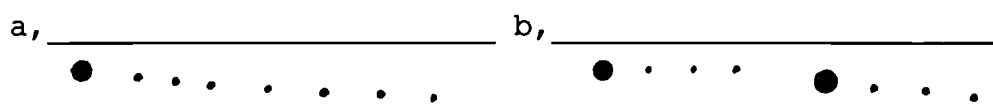
When the word 'kongbuhaess$ta' is unaccented as in (11a) above, each syllable tends to retain its inherent length, the first and the third syllables being longer than the other syllables. On the other hand, if this word is accented as in (11b), the first syllable 'kong' takes proportionately more than the norm within the word whereas each of the other syllables takes proportionately less than the norm. Recall that the rhythmic beat is characterized by a syllable's increased duration and loudness as compared with the norm. The proportion the accented syllable takes within a word increases as the word receives a stronger accent within the utterance where it belongs.

The second factor is the number of syllables a rhythm unit has. As the number of syllables of a rhythm

unit increases as in (9a) to (9e), the actual length of each syllable decreases even though the length of the rhythm unit remains constant. This tendency is a strong argument for the 'stress-timing' hypothesis in Korean, as discussed earlier.

The third factor is the speech tempo and style. The length of each syllable tends to increase as an utterance is slowly and formally spoken, but decrease as the utterance is quickly and casually spoken. It should be noted that an utterance is said with more accents in slow and formal speech than in fast and casual speech.

On the other hand, a vowel in unaccented syllables has a different quality from that in accented syllables. Vowels in accented syllables are tenser and more peripheral, and mostly closer, than those in unaccented syllables (cf. H.B. Lee 1971).

2. Accent Placement and Prosodic Structure

As already mentioned, the potential rhythmic patterns of a sentence and the information conveyed by them can be satisfactorily analysed, if we find the mechanisms governing accent placement. It will be seen that accent placement is determined by the interaction between the prosodic structures of sentences, which are predictable by several prosodic phrase structure rules we are going to set up, the scope of focus, and the speech

tempo and style. It will be also seen that accent placement sometimes functions distinctively, and that certain distinctive accent placements, which are caused by structural ambiguity, can be explained by assuming two different underlying prosodic structures for individual relevant sentences.

2.1. Distinctive Accent Placement

We have seen in the preceding chapter that there are several compound-phrase pairs which are distinguished by different accent placements in actual speech. There are also ambiguous phrases and sentences whose ambiguity results in distinctive accent placements. There are two types of ambiguity which cause the distinctive accent placements -- 1) lexical ambiguity and 2) structural ambiguity. Let us discuss these types one by one.

2.1.1. Lexical Ambiguity

Let us consider the following examples.

(12) a, naega 'cha:l a:nŭn chul a:ni?

(I)   (well) (know) (suppose)

(Do you suppose I know it well?

: I don't know it well.)
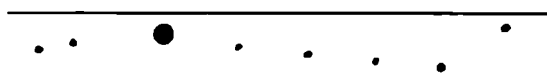
b, naega 'cha:l a:nŭn chul 'a:ni?

(I)   (well) (know) (fact) (know)

(Do you know the fact that I know it well?

: I know it well.)

In (12a), 'chul a:ni' is used as an idiom meaning 'suppose'. But in (12b), 'chul' is used as a bound noun meaning 'fact', and 'a:ni' as a verb meaning 'know'. Hence it is apparent that these differences result in the different accent placements in (12a) and (12b).

Wh-words[2] in Korean are used either as interrogative or as indefinite pronouns (cf. Chang 1973). If they function as interrogative pronouns, sentences containing them become wh-questions. But if they function as indefinite pronouns, sentences containing them become yes-no questions (see section 3 chapter 3 for details).

(13)   mwŏl   kŭ:rishimnikka?

(what or something) (draw)

a,
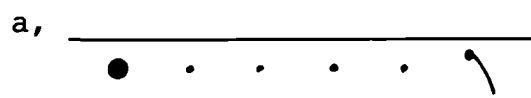
What are you drawing? (wh-question)

b,
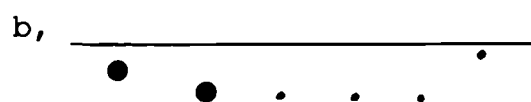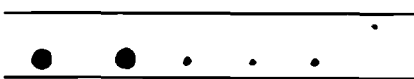
Are you drawing something? (yes-no question)

S.H. Lee (1984) points out that the two different uses of wh-words are marked by intonation -- a falling intonation as in (13a) as opposed to a rising one as in (13b). But it is to be noted that there is also a difference in accent placement as we can find in (13a) and (13b). In (13a), only the wh-word 'mwŏl' is accented because it is more important than the predicate 'kŭ:rishimnikka', which is 'given' information rather than 'new'. In (13b), however, the predicate is accented because it is 'new' information and prosodically stronger than the wh-word 'mwŏl'.

The different accent placements function distinctively in echo questions where the difference in intonation pattern disappears.[3]

(14)   mwŏl   kŭ:rishimnikka?

a,

Did you ask what I'm drawing?

b,[4]

Did you ask if I'm drawing something?

2.1.2. Structural Ambiguity

Structural ambiguity is often caused when a phrase with multiple heads is preceded by a modifying phrase or

clause.   Structurally ambiguous sentences are auditorily distinguished by different accent placements.

(15) a, ['nŭlgŭn ['namjawa 'jŏja]]

         (old)   (man-and) (wcman)

         (an old man and an old woman)

     b, ['nŭlgŭn namjawa] ['jŏja]

         (an old man and a woman of age unspecified)

Note that the prosodic bracketings in (15a) and (15b) are identical to the corresponding syntactic bracketings. Grammarians assume that the structural ambiguity of this type results because phrases like that in (15) have two different underlying syntactic structures. By the same token, we assume that structurally ambiguous phrases and sentences have two different prosodic structures, which are assigned to the corresponding underlying syntactic structures. (see sub-section 2.4. for details).

2.2. Prosodic Structure vs. Syntactic Structure

Prosodic structure is bound to be closely related to syntactic structure. But we believe that prosodic constituency and prosodic strength must be empirically established by autonomous prosodic criteria -- prosodic intimacy and degree of accentability existing among constituents.   By prosodic intimacy, we mean the

possibility of being pronounced as one rhythm unit.   And
by degree of accentability, we mean the degree of
likelihood of being accented at different speech tempos
and styles. Let us try to assign an adequate prosodic
structure to the following phrase, based on these two
prosodic criteria.

(16) ma:ri ma:nŭn sa:ram (a person who speaks much)
     (speech-subj) (much) (person)

When the above phrase is broadly focused, 'ma:nŭn' and
'sa:ram' are more likely to be said with a single rhythm
unit than 'ma:ri' and 'ma:nŭn'. Hence we assume that
'ma:nŭn' is prosodically more intimate with 'sa:ram' than
with 'ma:ri'. All the three elements may be said with a
single rhythm unit in fast speech. Hence we assume that
they form a constituent at a higher prosodic level. We
can set up a tentative prosodic structure of the phrase
in (16) as follows:

(17)

           ma:ri   ma:nŭn   sa:ram
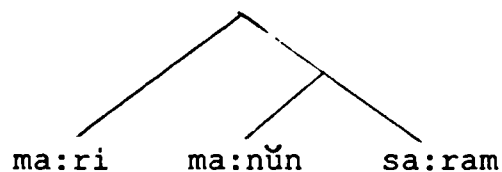
We also find that between 'ma:nŭn' and 'sa:ram', the
former is more likely to be accented in fast speech.
Hence we assume that 'ma:nŭn' is prosodically stronger

than `sa:ram'. By the same token, `ma:ri' is more likely
to be accented than the others in fast speech. It
follows that `ma:ri' is prosodically stronger than the
others. Based on these facts, we establish the complete
prosodic structure of the phrase in (16) as follows:

(18)

```
                       _____ \
                    __/          w
                 __/           __/ \__
                s            s        w
                |            |        |
              ma:ri       ma:nŭn    sa:ram
```
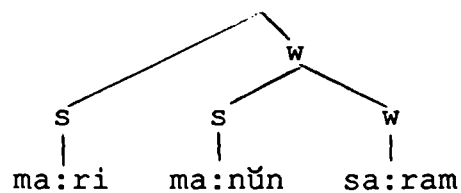
The above prosodic structure represents prosodic
constituency and prosodic strength relations (different
degrees of stress) existing among constituents. It also
shows a strong tendency towards binary branching and a
preference for left-strong nodes.

Note that the prosodic structure in (18) has a
different constituent structure from its corresponding
syntactic structure.

(19)

```
                        NP
                      _/  \__
                   AP        N
                   |         |
                   S         |
                 _/ \_       |
               NP    VP      |
               |     |       |
             ma:ri ma:nŭn  sa:ram
```
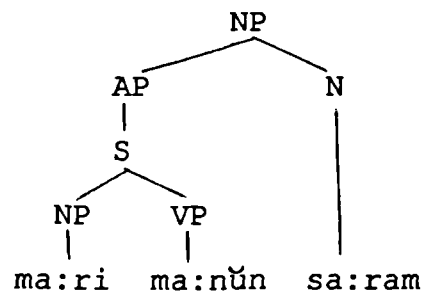
Note also that 'sa:ram' is syntactically strongest because it is the head of the phrase, but that it is prosodically weakest as in (18).

Even though a phrase or a sentence normally has a prosodic structure different from its syntactic structure, most prosodic phrase structure rules apply within, not across, relevant syntactic categories (see sub-section 2.4. for details).

2.3. Prosodic Structure vs. Semantic Structure

The prosodic structure in (18) seems to be assigned to most noun phrases which have an adnominal (adjectival) phrase or clause[5] consisting of two elements. But the following phrase has a different prosodic structure.

(20)

```
                        S
              _____/  \
         S /       \        \
        S           W         W
        |           |         |
      k'oga        ki:n      k'okkiri
    (nose-subj) (long)   (elephant)
    (an elephant whose nose is long)
```
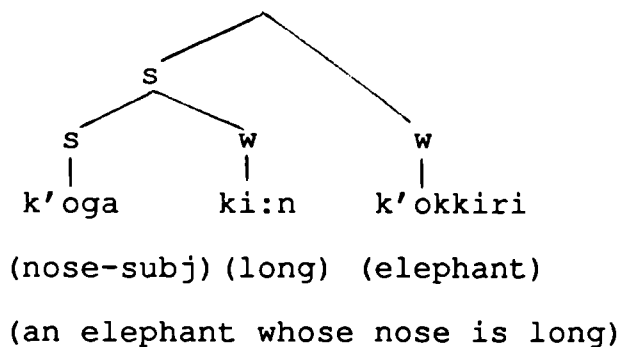
The above prosodic structure rightly shows that 'k'oga' and 'ki:n' are more likely to be said with one rhythm unit than 'ki:n' and 'k'okkiri' in broad focus, and that

`k'oga'` is more likely to be accented than the others, and `k'okkiri'` than `ki:n'`.

The prosodic difference between (18) and (20) seems to be caused by a difference in semantic relationship between the head nouns and the adnominal (adjectival) clauses. The adnominal clause in (18) conveys a specific chracteristic of the head noun whereas that in (20) carries a general characteristic of the head noun. That is, the `sa:ram (person)'` described by the phrase in (18) has a characteristic of speaking much, which is not shared by all people. On the contrary, all `k'okkiri (elephants)'` have a long nose as a general characteristic of the species. This observation is well supported by the following example, which has the same adnominal clause as that in (18) but has the same prosodic structure as that in (20).

(21)

```
                        _____
                   ____S'____        \
                  S'        w          w
                  |         |          |
                ma:ri     ma:nŭn    su:dajangi
            (speech-subj) (much)   (talkative person)
            (a talkative person who speaks much)
```
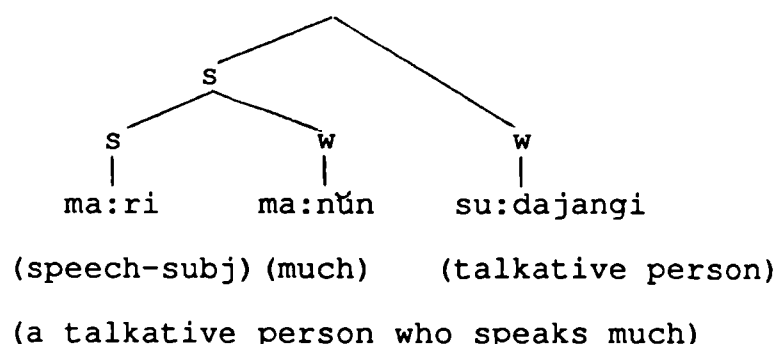
Since all `su:dajangi (talkative people)'` have a general characteristic of speaking much, the above phrase has the

same semantic structure as that of the phrase in (18) and thus has the above prosodic structure.

2.4. **Prosodic Phrase Structure Rules in Korean**

In this sub-section, we shall establish several prosodic phrase structure rules by which we can assign appropriate prosodic structures to most compounds and sentences in broad focus. It will be seen that the prosodic phrase structure rules often refer to syntactic categories and sometimes to semantic relationships, but that they are empirically set up on the basis of the autonomous prosodic criteria mentioned earlier. It will be also seen that every node except terminal ones is in most cases binary-branching and left-strong unless they govern multiple heads.

2.4.1. **The Compound Rule**

If a compound consists of only two morphemes, the first morpheme is prosodically stronger than the second one.

(22) a,

        S   W

pa:ngsong su:nsŏ

(broadcast) (order)

(order of programmes)

b,

        S   W

ya:gu kyŏ:nggijang

(baseball) (stadium)

(baseball stadium)
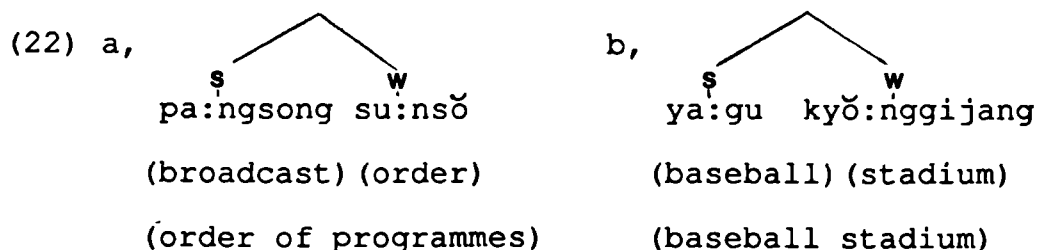
If a compound consists of more than two morphemes, its prosodic constituency is identical to its internal morphological constituency.

(23) a,

```
                    S
              ┌─────┴──────┐
            S    W         W
            │    │         │
        pa:ngsong su:nsǒ  a:nnae
```

(broadcast)(order) (information)

(information on the order of programmes)

b,

```
                    W
             ┌──────┴───┐
         ┌───┴───┐      │
         S       S      W
         │       │      │
     Chamshil  ya:gu  kyǒ:nggijang
```

(Chamshil)(baseball)(stadium)

(Chamshil baseball stadium)
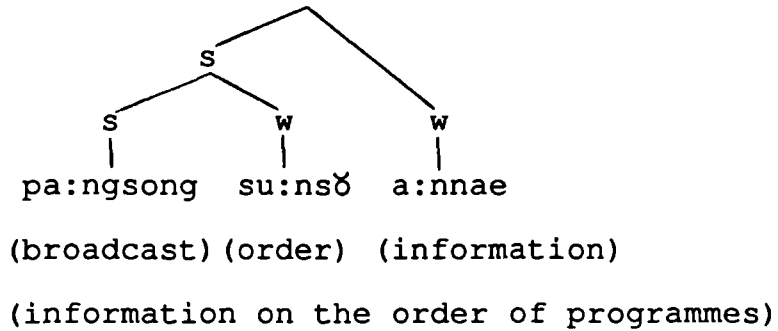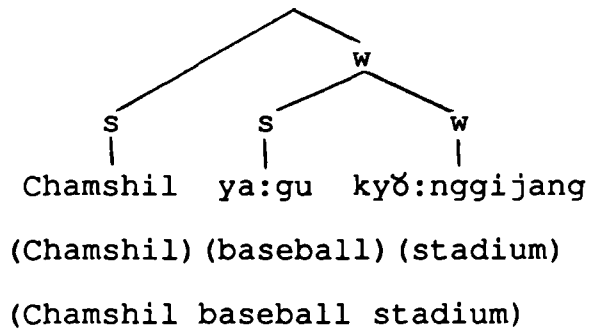
2.4.2. The Multiple Head Rule

If a noun phrase has multiple heads, every head noun is accented. In this case, all the heads bear the same prosodic strength. The noun phrase in (24) below has three heads and has the following prosodic structure.

(24)

```
              ┌──────┼──────┐
            S        S       S
            │        │       │
       haksaenggwa kyo:sawa pumo
```

(students-and) (teachers-and) (parents)
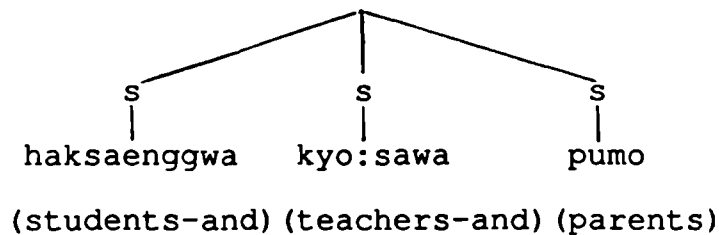
An intonation group boundary may be placed after each head in careful speech.

When an adverb phrase has multiple heads, every head adverb receives an accent and has the same prosodic strength, just as happens with noun phrases with multiple heads.

(25)

```
                         /|\
                        / | \
                       S  S  S
                       |  |  ˘|
                     ppalli nop'i mŏ:lli
                     (fast) (high) (far)
                   (fast, high and far)
```
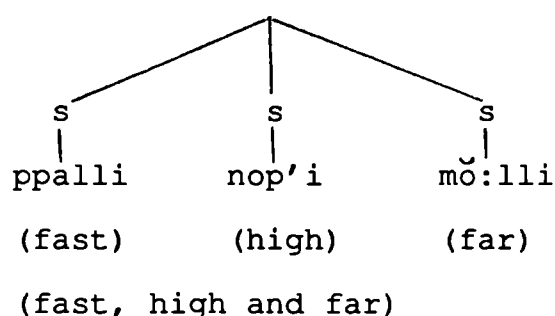
An intonation group boundary may be placed after each head in careful speech.

Hence we can define the 'Multiple Head Rule' as a process by which every head of noun phrases and adverb phrases with multiple heads is accented and bears the same prosodic strength.

It is to be noted that when more than one predicate occurs in sequence, linked by conjunctive endings, the closely coordinated predicates behave like noun phrases and adverb phrases with multiple heads.

(26) a, Coordinated predicates in a subordinate clause

```
              _____|_____
             /        |        \
            S         S         S
            |         |         |
          shigo     talgo     maeun    (ŭmshik)
```

((a food which is) sour, sweet and spicy)

b, Coordinated predicates in the main clause

```
                   _____|_____
                  /        |        \
                 S         S         S
                 |         |         |
       (nanŭn) kongbuhago undonghago yŏhaenghaessta
```

((I) studied, exercised and travelled.)
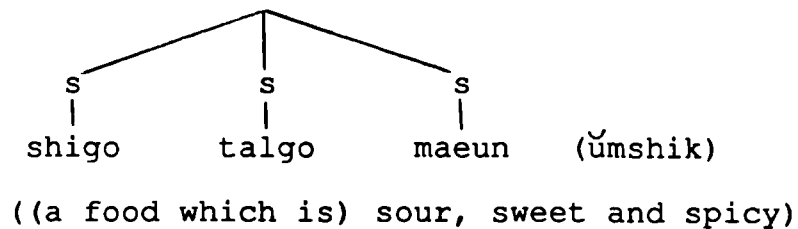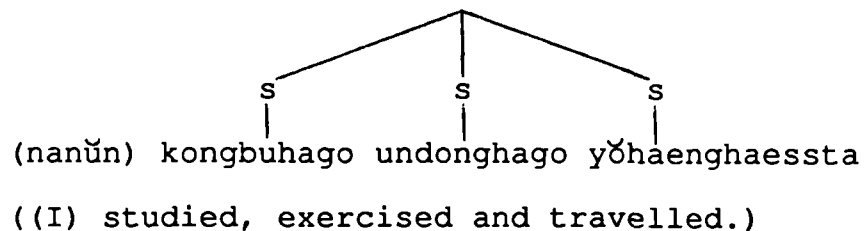
The above examples show that all the closely coordinated predicates are accented and have the same prosodic strength. Hence we assume that closely coordinated predicates, whether they occur in a subordinate clause or in the main clause, are also subject to the Multiple Head Rule.

2.4.3. The Noun Phrase Rule

There are two classes of adnominal modifiers in Korean. One class consists of predicates (verbs and adjectives), which conjugate to modify the following noun. The members of the other class do not conjugate and are called 'kwanhyŏngsa' in Korean. Kwanhyŏngsas are used only as modifiers whereas predicates are also used sentence-finally as main predicates. Both predicates and

kwanhyŏngsas may be modified by adverbs, but only the former can appear with their subjects within the noun phrases where they belong.

When a noun phrase has a single modifier and is in broad focus, the head noun may or may not be accented depending on the speech tempo and style. But the modifier is usually accented even in fast speech. Hence we assume that the modifier is prosodically stronger than the head noun.

```
(27)  a,        /\
               S    W
               |    |
            ye:pŭn  haksaeng   (a student who is pretty)
            (pretty)  (student)

      b,         /\
                S    W
                |    |
               sae  ch'aek   (a new book)
               (new)  (book)

          (* 'ye:ppŭn' : adjective, 'sae' : kwanhyŏngsa)

                    /\
      cf.      w      s
               |      |
             a pretty student
```
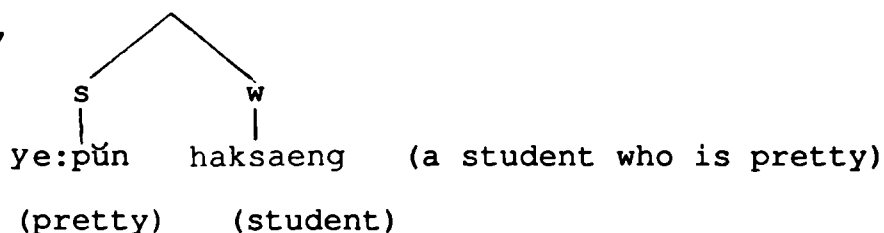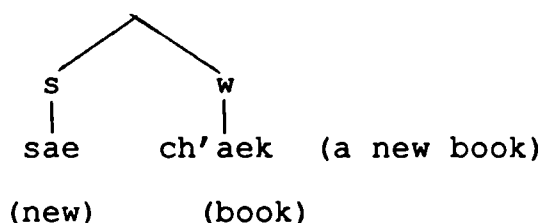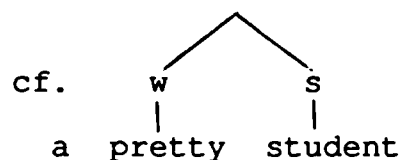
If a noun phrase has an adnominal clause consisting of two elements, the semantic relationship between the head noun and the clause must be taken into account, as discussed in sub-section 2.3.. If the adnominal clause

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describes a special characteristic of the head noun, the second element of the clause forms a constituent with the following head noun first. And then this constituent combines with the first element to form another constituent. Noun phrases of this type have the prosodic structure in (18). On the other hand, if the clause describes a general characteristic of all the members of the head noun, the two elements in the adnominal clause combine first to form a constituent. And this constituent combines with the following head noun to form another constituent at the next stage. Noun phrases of this type have the prosodic structure in (20) and (21).

Note that the adnominal clauses in (18), (20) and (21) consist of one subject and one predicate. If a noun phrase contains an adverb-predicate clause, a predicate-kwanhyŏngsa clause, or an adverb-kwanhyŏngsa phrase, it takes the prosodic structure of the former type because these adnominal phrases and clauses normally describe a special characteristic of the head noun.

(28) a, An NP with adverb-predicate/kwanhyŏngsa


```
              /\
             /  \
            /    w
           /    /\
          s    s  w
          |    |  |
         aju  ye:ppŭn/sae  ch'aek
        (very) (pretty/new) (book)
```

(a book which is very pretty/a very new book)
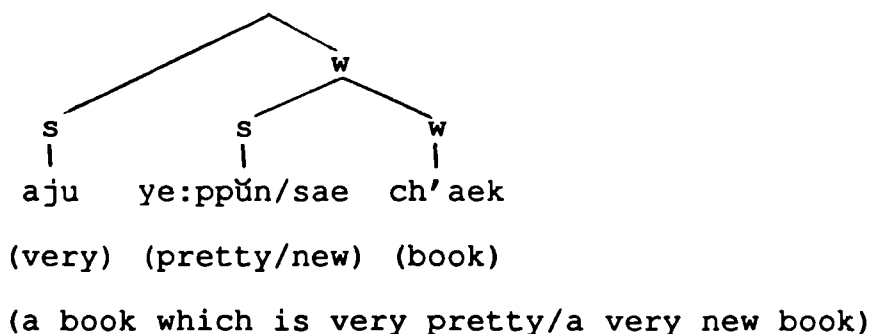
b, An NP with predicate-kwanhyŏngsa

```
                    /\
                   /  \ w
                  /    \
                 /    /\
                s    s  w
                |    |  |
             ye:ppŭn sae ch'aek

            (pretty) (new) (book)
```
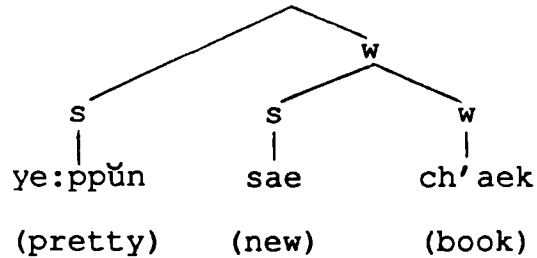
' (a new book which is pretty)

(`ye:ppŭn': adjective, `sae': kwanhyŏngsa)

The prosodic structures in (18), (20), (21) and (28)
are retained even if these noun phrases are preceded by
another element.

(29)   a,

```
                    /\
                   /  \ w
                  /   /\
                 /   /  \ w
                /   /   /\
               s   s   s  w
               |   |   |  |
              aju ma:ri ma:nŭn sa:ram
```

(a person who speaks very much)

b,

```
                    /\
                   /  \ w
                  /   /\
                 /   s  \
                /  /\    \
               s  s  w    w
               |  |  |    |
             aju k'oga ki:n k'okkiri
```

(an elephant whose nose is very long)

c,

```
                    /\
                   /  \
                  /    W
                 /    / \
                /    /   W
               /    /   / \
              S    S   S   w
              |    |   |   |
            aju ye:ppŭn sae ch'aek
```
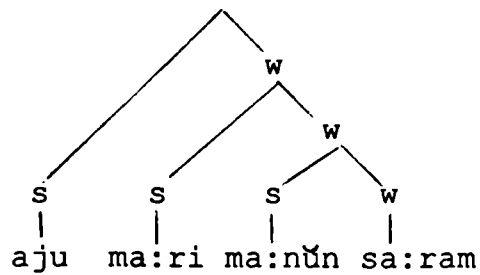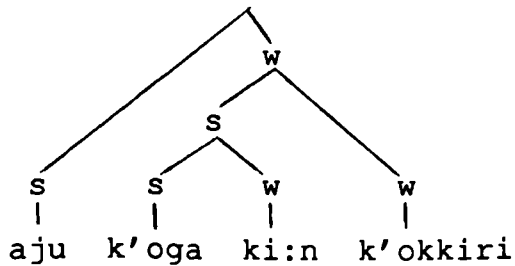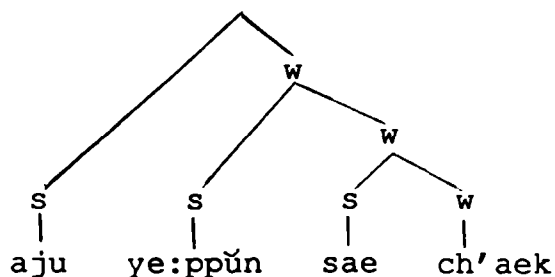
(a very pretty new book)

It is to be noted that the first two elements of the noun phrase in (29c) may become a constituent if the kwanhyŏngsa 'sae' is narrowly focused. However, the first two elements of the phrases in (29a) and (29b) cannot become a constituent even if the adjectives, 'ma:nŭn' and 'ki:n' respectively, are narrowly focused. It is also to be noted that kwanhyŏngsas form a constituent only with the following noun, but never with the preceding adjective nor with the preceding adverb.

If a noun phrase with multiple heads as in (24) is preceded by a modifier, the noun phrase becomes syntactically and prosodically ambiguous. Hence we assign two prosodic structures to the phrase, as we discussed in sub-section 2.1.2.

(30) a,

```
                      /‾‾‾‾‾‾\
                     /        W
                    /        /|\
                   /        / | \
              S        S   S   S
              |        |   |   |
         kŭ:nmyŏnhan haksaenggwa kyo:sawa  pumo
```
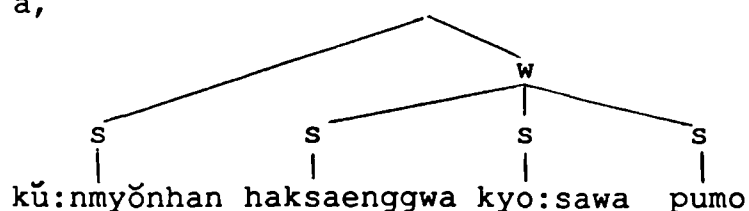
(students, teachers and parents, who are diligent.)

b,

```
                              ^
            S
      S           W         S         S
      |           |         |         |
  kŭ:nmyŏnhan haksaenggwa kyo:sawa  pumo
```
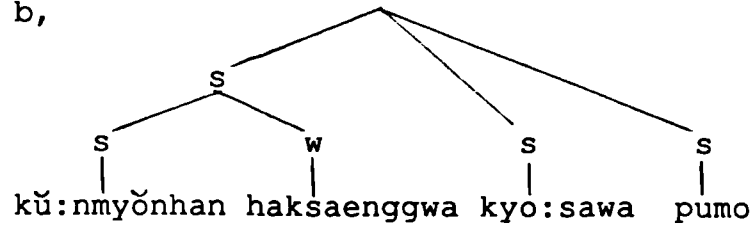
(students, who are diligent, teachers and parents)

The above noun phrase is ambiguous in that the meaning of the phrase varies depending on what the adjective 'kŭ:nmyŏnhan' modifies. In (30a), the adjective modifies all the heads, causing the phrase to mean 'all students, teachers, and parents are diligent'. But in (30b), the adjective modifies only the first head 'haksaeng', so that the phrase means 'students are diligent, but whether teachers and parents are also diligent is not the main concern'.

The same is true even if the noun phrase in (24) is modified by an adnominal clause consisting of more than one element.

(31) a,

```
                                        W
              S
          S     W                S    S    S
          |   /   \              |    |    |
      S   S   W
      |   |   |
    aju yŏlshimhi i:lhanŭn haksaenggwa kyo:sawa pumo
```
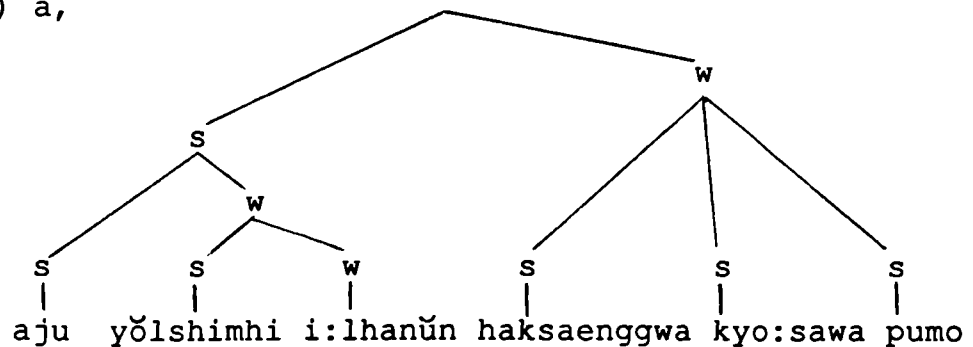
(very) (eagerly) (work) (student-&) (teacher-&) (patents)

(students, teachers and parents, who work very eagerly)

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b,

```
                          S
                 _____/|_____
                S          \    \    \
              __/\__        \    \    \
             /      W        \    \    \
            /     __/\        \    \    \
           /     S    \        \    \    \
          /   __/\     \        \    \    \
         s   s    w     w        s    s
         |   |    |     |        |    |
        aju yŏlshimhi i:lhanŭn haksaenggwa kyo:sawa pumo
```

(students, who work very eagerly, teachers and parents)
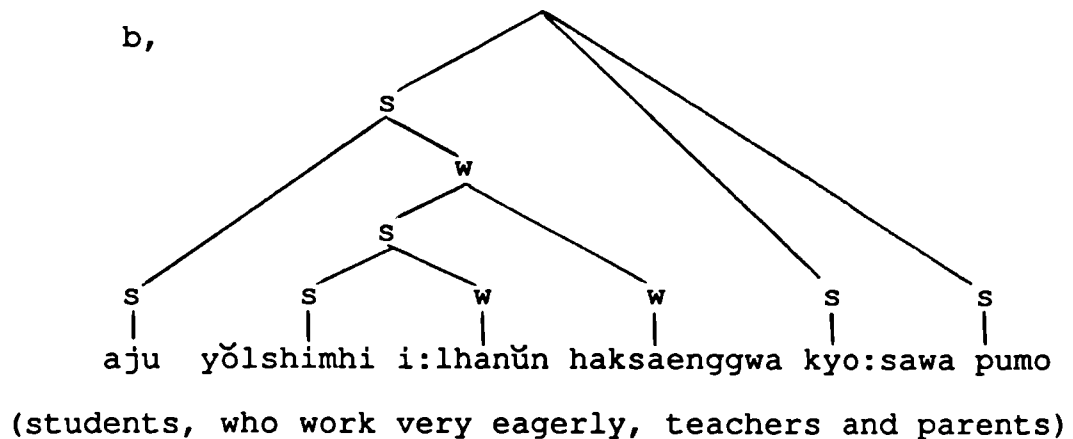
If a noun phrase contains closely coordinated predicates as in (26a), only the last predicate combines with the following head noun as a strong constituent to form a sister constituent of the other predicates.

(32)

```
                        _____/|_____
                       /       /        S
                      /       /       __/\__
                     /       /       /      \
                    s       s       s        w
                    |       |       |        |
                  shigo   talgo   maeun    ŭmshik
                 (sour-and)(sweet-and)(spicy)   (food)
```

(a food which is sour, sweet and spicy)
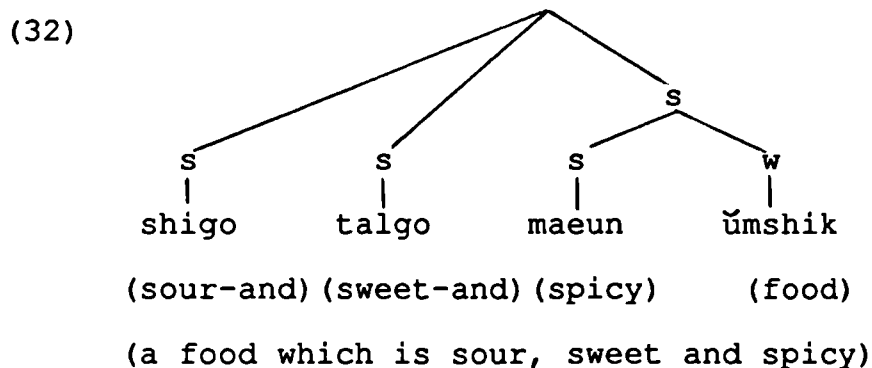
If the noun phrase in (32) above is preceded by a modifier, the whole phrase also becomes syntactically and prosodically ambiguous. Hence we assign two prosodic structures to the phrase.

(33) a,

```
                                    w
                                  /  \
                           _____/    s
                          /   ____/   / \
                         /   /    \   /   \
              _____/___/     \   /     \
            /      /    /      \  /       \
           S      S      S      S          W
           |      |      |      |          |
          aju   shigo  talgo  maeun      ŭmshik
```

(a food which is very sour, sweet and spicy)

b,

```
                      /      |      \
              S       |       S
            /   \     |      /   \
           S     W    S     S     S
           |     |    |     |     |
          aju  shigo talgo maeun ŭmshik
```

(a food which is sweet, spicy and very soup)
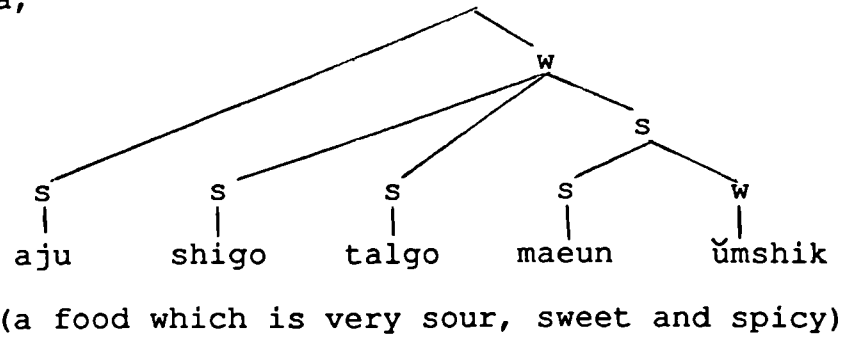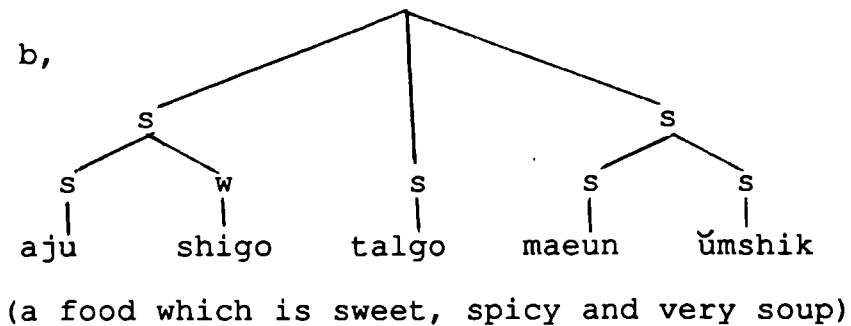
2.4.4. The Prosodic Reanalysis

There are exceptions to the Noun Phrase Rule.

(34)

```
            S
          /   \
        S      \
       / \      \
      S   W      W
      |   |      |
    ma:l ma:nŭn sa:ram
```
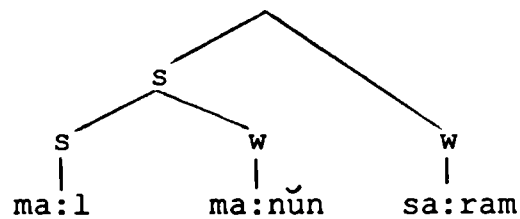
The above phrase is the same as that in (16) except that
the subject marker 'i' is deleted. It is apparent that
the deletion of the subject marker causes the two
elements in the embedded clause to become prosodically
close enough to form a prosodic constituent of their own,
contrary to the prosodic structure predicted by the Noun

Phrase Rule (compare (18)). Hence we assume that the prosodic structure in (18) changes to that in (34) by the 'Prosodic Reanalysis', which we want to define as a process by which two prosodically distant elements (according to the Noun Phrase Rule) are combined together to form a constituent of their own.

The Prosodic Reanalysis also applies to object-predicate sequences in which the object marker '(r)ŭl' is deleted.

(35) a, With the object marker

```
              /\
             /  w
            /  / \
           s  s   w
           |  |    |
        murŭl ttarŭnŭn sa:ram
```

(water-obj) (is pouring) (person)

(a person who is pouring water)
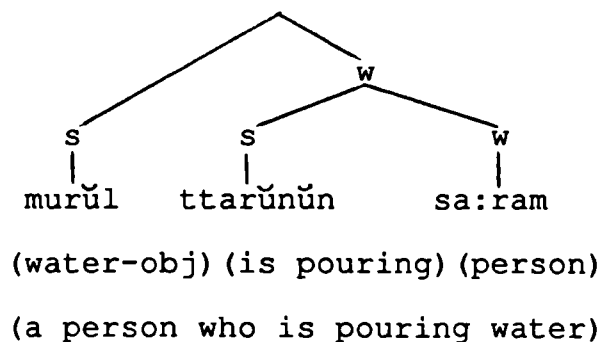
b, Without the object marker

```
            __s__
           /  |  \
          s   w   w
          |   |    |
         mul ttarŭnŭn sa:ram
```
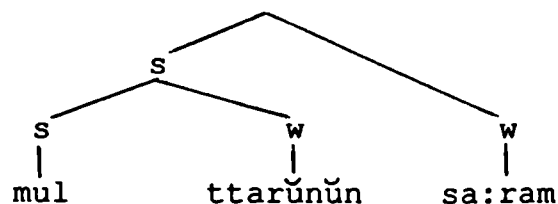

This process also applies to a limited number of adverb-predicate sequences.

(36)

```
                          S
              _____/ _____
             /                         \
            S                           \
      _____/ \_____                      \
     /             \                      \
    S               W                      W
    |               |                      |
  ttuk          ttŏrŏjin              pispangul
```

(suddenly) (is fallen) (a drop of rain)

(a drop of rain which has suddenly fallen)
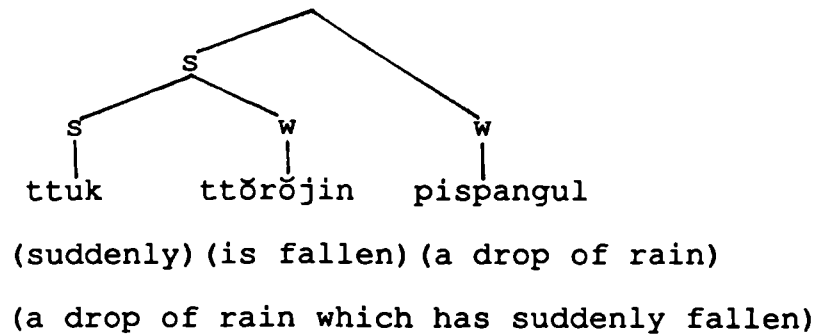
Note that the above phrase has the same syntactic
structure as that in (28a), but has a different prosodic
structure because of the Prosodic Reanalysis process.
Whether an adverb-predicate sequence undergoes the
Prosodic Reanalysis process or not seems to depend on the
type of the adverb. Adverbs like 'ttuk, cha:l (well),
ppalli (quickly), etc.' normally trigger the Prosodic
Reanalysis and thus should be lexically marked.

It should be noted that many noun-predicate and
adverb-predicate sequences are treated as compounds (e.g.
nunnaerida (snow-fall: to snow), mult'ada (water-mix: to
dilute with water), ttokkat'ta (exactly-be same: be
exactly the same), etc.). Hence we can assume that these
compounds, which were originally phrases, have undergone
the Prosodic Reanalysis.

2.4.5. The Adverb Phrase Rule

The prosodic structures of adverb phrases are
similar to, but simpler than those of noun phrases. If
an adverb is modified by another adverb, an adverb phrase

being formed, this adverb phrase takes the following prosodic structure.

(37)

```
        /\
       /  \
      S    W
      |    |
      tŏ   palli
   (more)  (fast) : (faster)
```
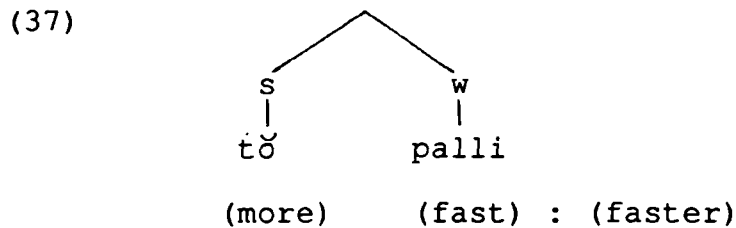
If an adverb phrase consists of three adverbs, it has the following structure.

(38)

```
            /\
           /  \
          /    W
         /    /|\
        S    S  W
        |    |  |
   hwŏlshshin tŏ ppalli
   (even)   (more) (fast) : (even faster)
```
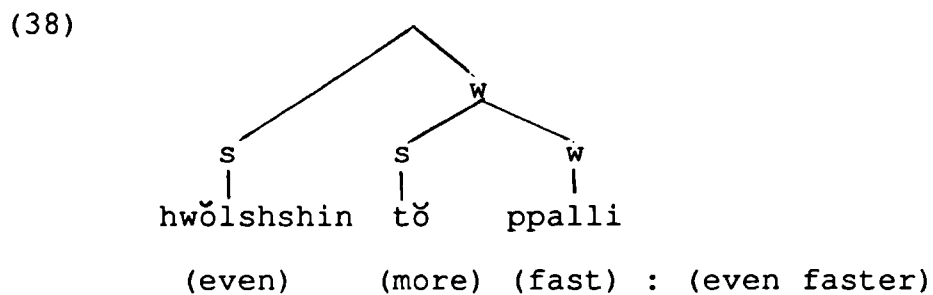
If an adverb phrase with multiple heads as in (25) is modified by another adverb, the phrase becomes syntactically and prosodically ambiguous. Hence we assign two prosodic structures to the phrase.

(39) a,

```
              /\
             /  \
            /    W
           /    /|\
          /   / | \
         S   S  S  S
         |   |  |  |
         tŏ ppalli nop'i mŏ:lli
      (faster, higher, and farther)
```

b,

```
                        s
              s      \      s       s
           s    w      \     |       |
           |    |       \    |       |
           tŏ  ppalli   nop'i  mŏ:lli
```
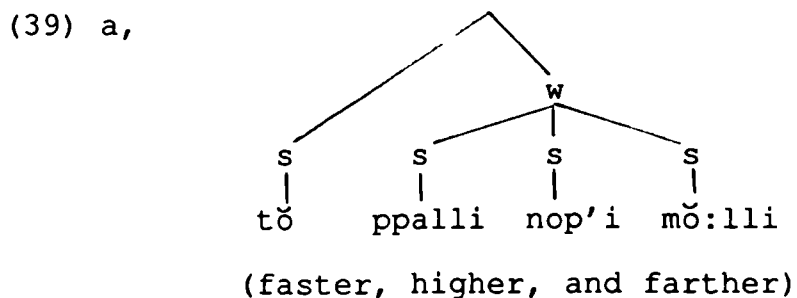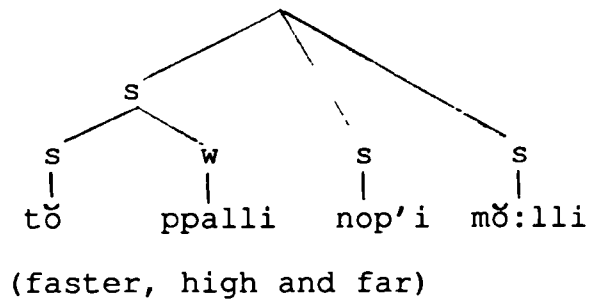
(faster, high and far)

In (39a), the adverb 'tŏ' modifies all the heads, resulting in the meaning 'faster, higher and farther'. On the contrary, this adverb modifies only the first adverb in (39b), causing the phrase to mean 'faster, high and far'.

The same is true even if the adverb phrase is modified by more than one adverb.

(40) a.

```
                                    w
              s
           s      w           s     s       s
           |      |           |     |       |
        hwŏlsh'in tŏ       ppalli  nop'i  mŏ:lli
```

(even faster, higher and farther)

b,

```
             s
                 w
           s    s    w        s       s
           |    |    |        |       |
        hwŏlsh'in tŏ ppalli  nop'i  mŏ:lli
```

(even faster, high and far)
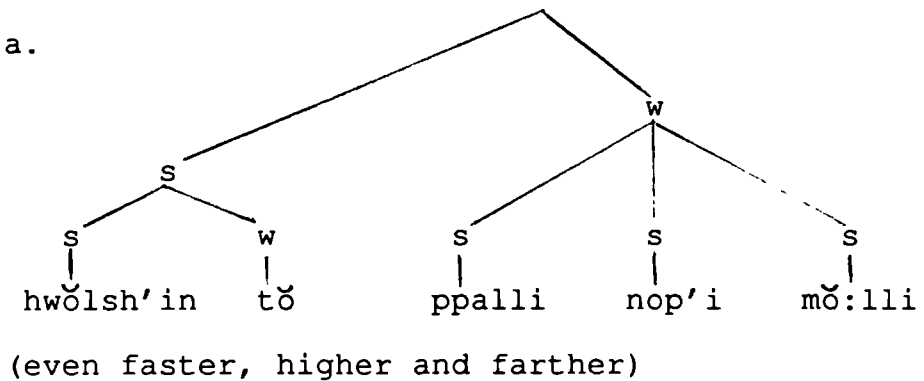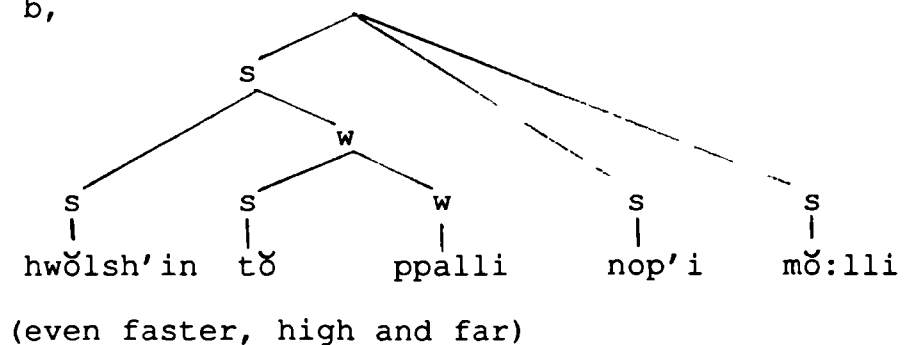
2.4.6. The Predicate Rule

Predicates in main clauses show different prosodic behaviour from those in subordinate clauses. Let us consider the following examples.

(41) a,

```
                           ___----___
                  ___---        s
         ___---         _____/ \
      (w)            s              w
       |             |              |
      nanŭn        hakkyoe        kassta
```

(I)   (school-to)   (went)

(I went to school.)   ·

b,

```
                                ___s
                           ___/   \
                      ___s'    \      \___
              ___/         / \        \      \___
          (w)        s       w             w
           |         |        |             |
         nanŭn    ch'akhan  hakssaengŭl   a:nda
```

(I)   (nice)   (student)   (know)

(I know a student who is nice.)
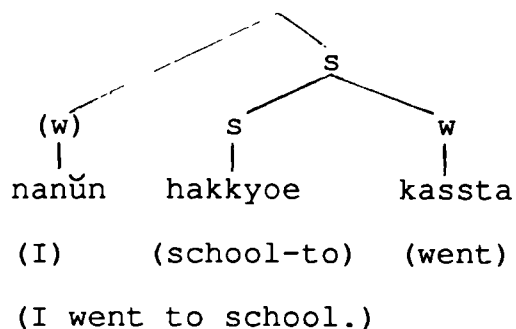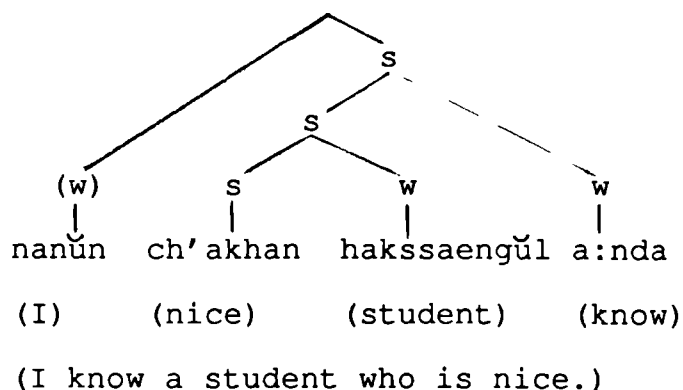
Predicates in subordinate clauses like 'ch'akhan' in (41b) always combine with the following head nouns and are prosodically stronger than the head nouns. By contrast, predicates in main clauses like 'kassta' in (41a) and 'a:nda' in (41b) always combine with the preceding elements if there is one, and are prosodically weaker than these elements.

The predicate 'kassta' in (41a) combines with the preceding phrase 'hakkyoe' as a weak constituent. And the predicate 'a:nda' in (41b) combines with the whole preceding noun phrase, which consists of two elements. Hence we can tentatively define the 'Predicate Rule' as a process by which a predicate in the main clause combines with the whole preceding phrase -- not merely a word -- to form a constituent. Note that this rule implies that the Noun Phrase Rule applies before the Predicate Ru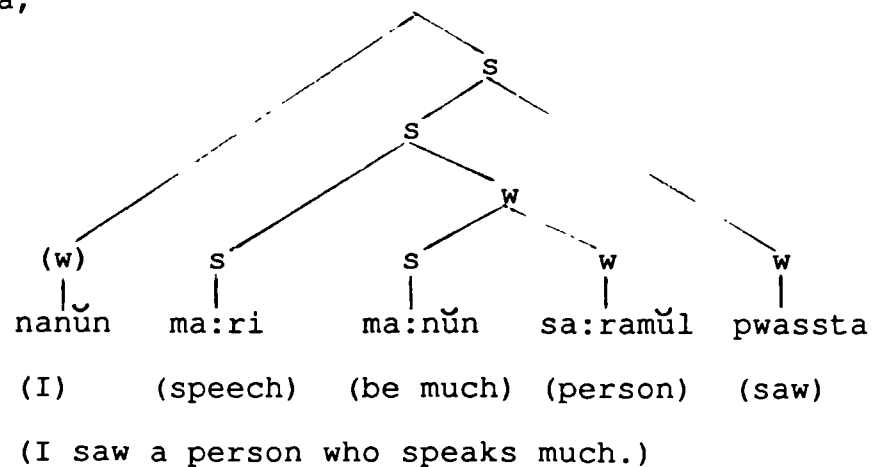le. Note also that the subject 'nanŭn' both in (41a) and (41b) combines with the rest of the sentences as a weak constituent, because this usually conveys 'given' information and thus is unaccented.

Our present Predicate Rule seems to correctly apply to most predicates which are preceded by a more complicated noun phrase.

(42) a,

nanŭn	ma:ri	ma:nŭn	sa:ramŭl	pwassta
(I)	(speech)	(be much)	(person)	(saw)

(I saw a person who speaks much.)

b,

nanŭn   k'oga   ki:n   k'okkirirŭl   pwassta

(I saw an elephant whose nose is long.)

c,

nanŭn   ttuk   ttŏrŏjin   pitppangurŭl   pwassta
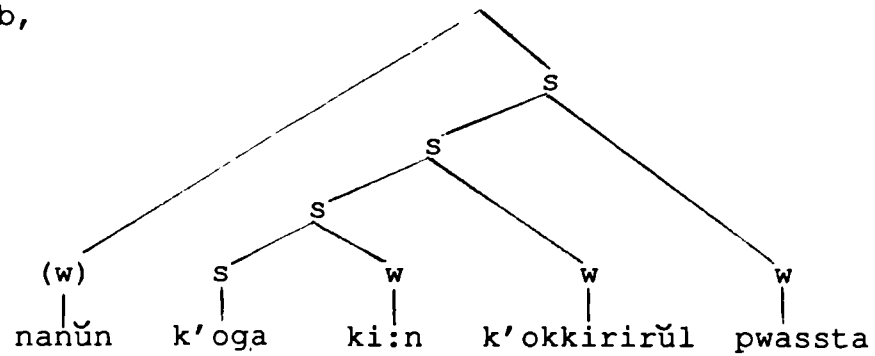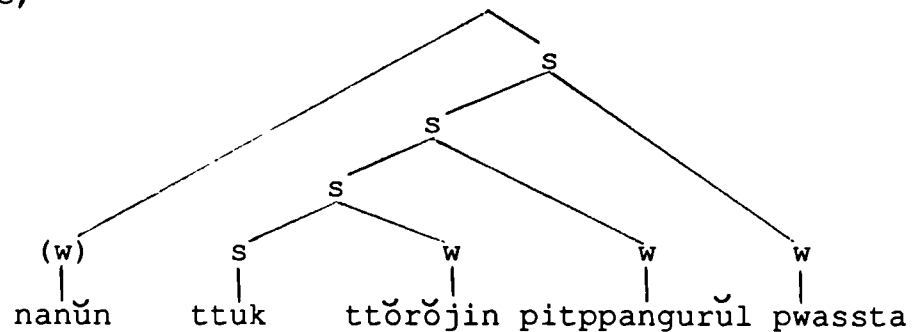
(I saw a drop of rain which had suddenly fallen.)

d,

nanŭn   ye:ppŭn   sae   ch'aegŭl   pwassta
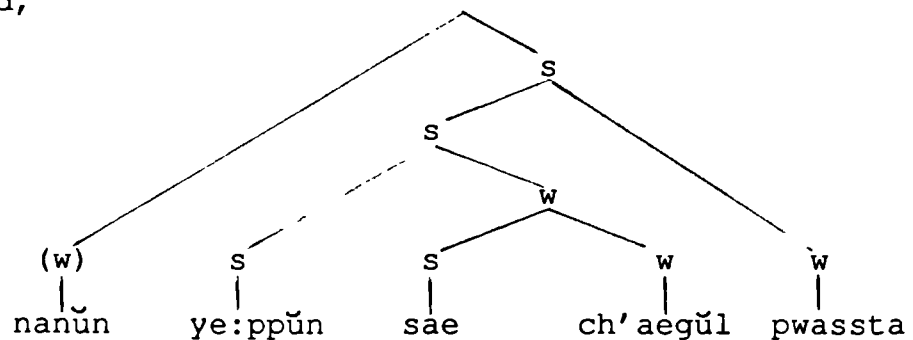
(I)   (pretty)   (new)   (book)   (saw)

(I saw a new pretty book.)

However, if an adverb precedes the noun phrases in (42a), (42b) and (42c) above, each predicate combines with the whole preceding noun phrase except the adverb to form a constituent.

(43) a,
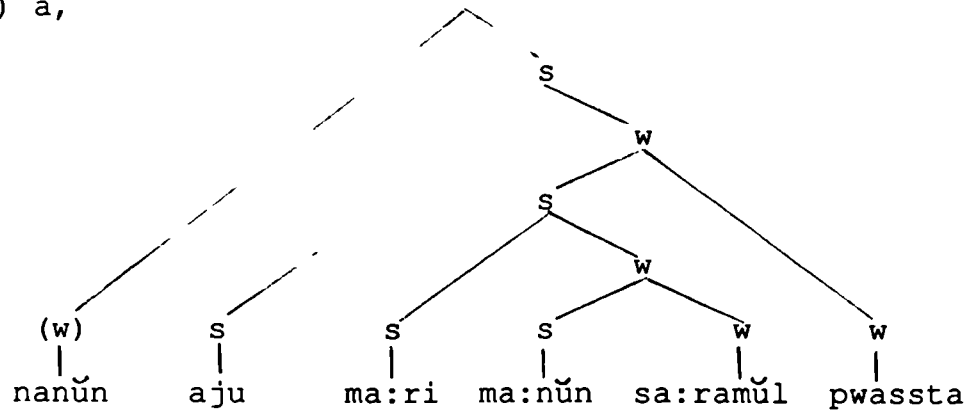
```
                                    s
                                 ‾‾‾‾
                                      w
                                   s
                                      w
   (w)     s       s     s      w      w
    |      |       |     |      |      |
  nanŭn   aju    ma:ri ma:nŭn sa:ramŭl pwassta
```

(I saw a person who speaks very much.)

b,

```
                                  s
                                    w
                                  s
                               s
   (w)     s      s      w       w       w
    |      |      |      |       |       |
  nanŭn   aju   k'oga   kin  k'okkirirŭl pwassta
```

(I saw an elephant whose nose is very long.)

c,

```
                                s
                                  w
                              s
                                w
   (w)    s      s       s     w      w
    |     |      |       |     |      |
  nanŭn  aju  ye:ppŭn   sae ch'aegŭl pwassta
```
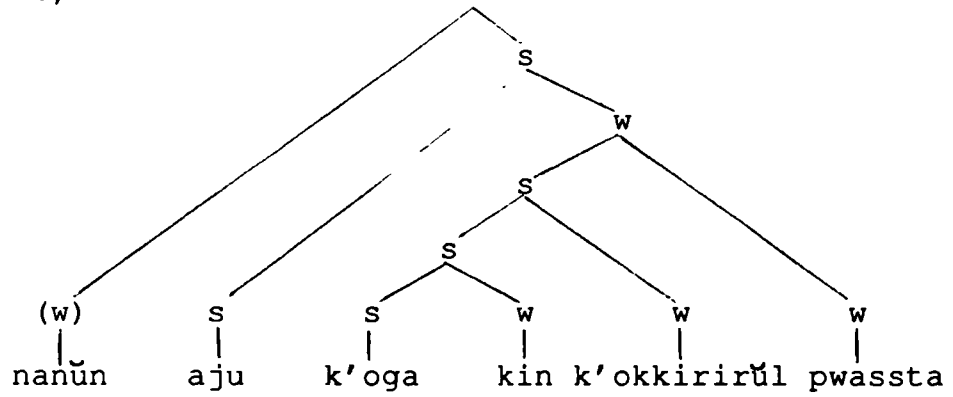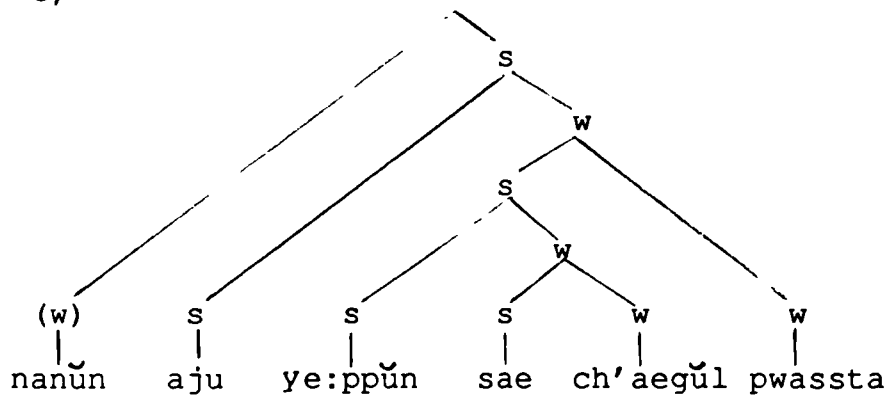
(I saw a very pretty new book.)

If the adverb 'aju' is inserted before the predicates of the adnominal clauses in (42a) and (42b) (it cannot be

inserted into the adnominal clauses in (42c) and (42d)),
the predicate in the main clauses combines with the whole
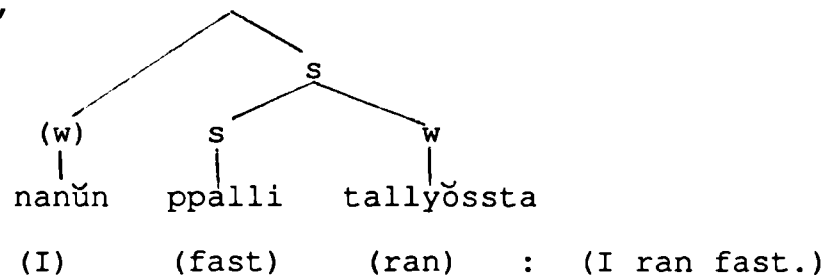preceding noun phrases except the first elements.

These facts lead us to redefine the Predicate Rule,
which we have tentatively defined above, as a process by
which a predicate in the main clause combines with the
whole preceding noun phrase if this phrase has less than
four elements, otherwise with the whole preceding noun
phrase except the first element.

On the other hand, the Predicate Rule applies
differently if a predicate in the main clause is preceded
by an adverb phrase.

(44) a,

```
                        S
        (w)        S          w
         |         |          |
       nanŭn     ppalli    tallyŏssta
        (I)      (fast)      (ran)    :  (I ran fast.)
```

b,

```
                            S
           (w)       S       S      w
            |        |       |      |
          nanŭn     tŏ     ppalli  tallyŏssta
           (I)    (more)  (fast)   (ran)  :  (I ran faster.)
```
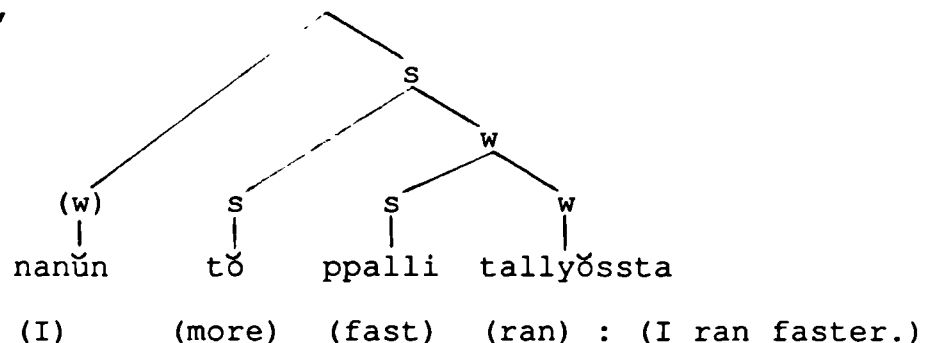
The predicate in (44a) above combines with the whole
preceding adverb phrase, which consists of only one

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adverb. But the predicate in (44b) combines only with the preceding adverb, not with the whole adverb phrase (Compare (41a) and (41b)).

If an adverb phrase preceding a predicate consists of three elements, this predicate combines with the whole adverb phrase except the first adverb. (The maximum number of adverbs an adverb phrase can have seems to be three unless it has multiple heads.)

(45)

```
                                        /\
                                       /  \
                                      /    S
                          /          /    / \
                        /           /    /   W
                       /           /    S   / \
                      /           /   / \  /   \
                    (w)          S   S   W W     W
                     |           |   |   | |     |
                   nanŭn  hwŏlsh'in  tŏ  ppalli tallyŏssta
```

(I ran even faster.)

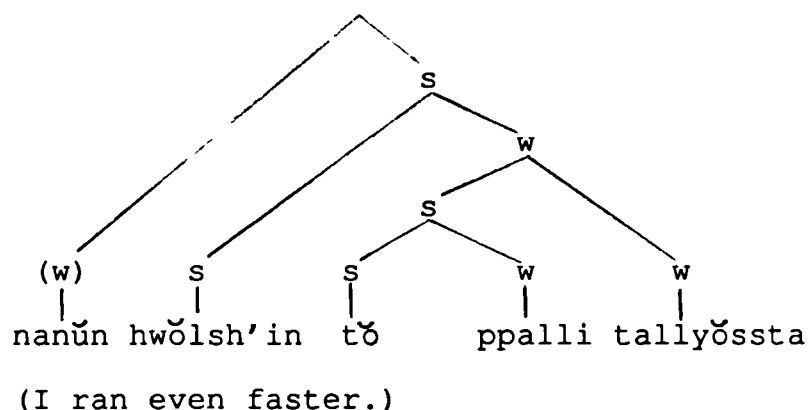The examples in (44) and (45) lead us to assume that a predicate in the main clause combines with the whole preceding adverb phrase if this phrase has only one adverb, but with the preceding adverb phrase except the first adverb if the phrase has more than one adverb. It must be added to the Predicate Rule we have established above.

Let us consider what happens if a predicate is preceded by the noun phrase with multiple heads in (24).

(46)

```
                                    S
                         _____/_____
                        /          /  |        \
                       /          /   |          S
                      /          /    |         /\
                     /          /     |        /  \
                  (w)         S      S       S     W
                   |          |      |       |     |
                 nanŭn   haksaenggwa kyo:sawa pumorŭl mannassta
```
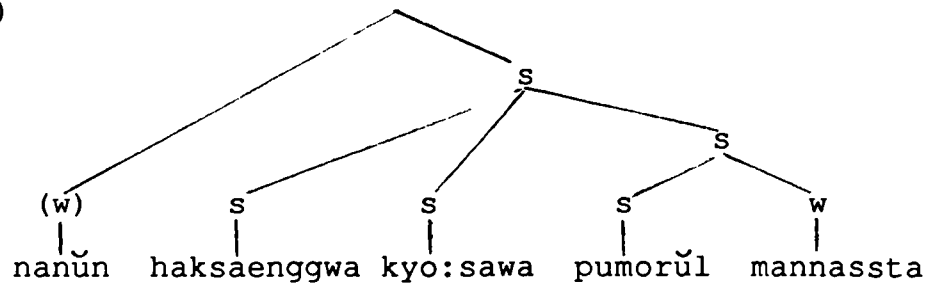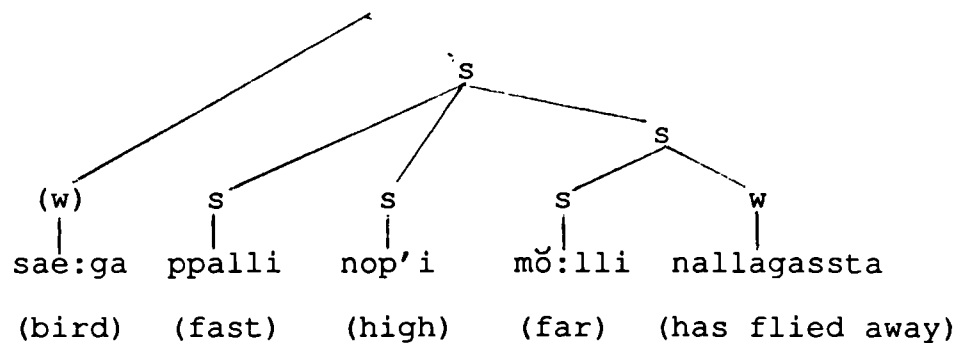
(I) (students-and) (teachers-and) (parents) (met)

(I met students, teachers and parents.)

As we see above, the predicate combines only with the last head noun to form a constituent.

Even when a predicate follows the adverb phrase with multiple heads in (25), the predicate combines only with the last head adverb to form a constituent.

(47)

```
                                    S
                         _____/_____
                        /         / |        \
                       /         /  |          S
                      /         /   |         /\
                    (w)        S    S       S    W
                     |         |    |       |    |
                   sae:ga   ppalli nop'i  mŏ:lli nallagassta
```

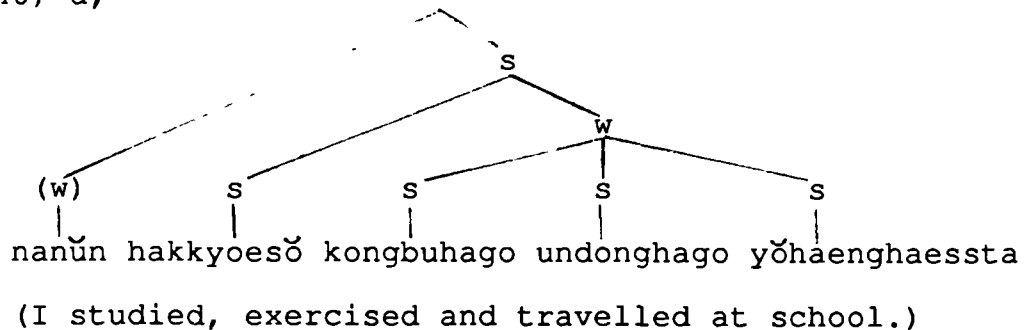(bird) (fast)   (high)   (far)   (has flied away)

(A bird has flied away fast, high and far.)

Hence the fact that the predicate in the main clause combines only with the last head if the preceding phrase has multiple heads must also be added to the Predicate Rule we are formulating. Note that the nodes governing
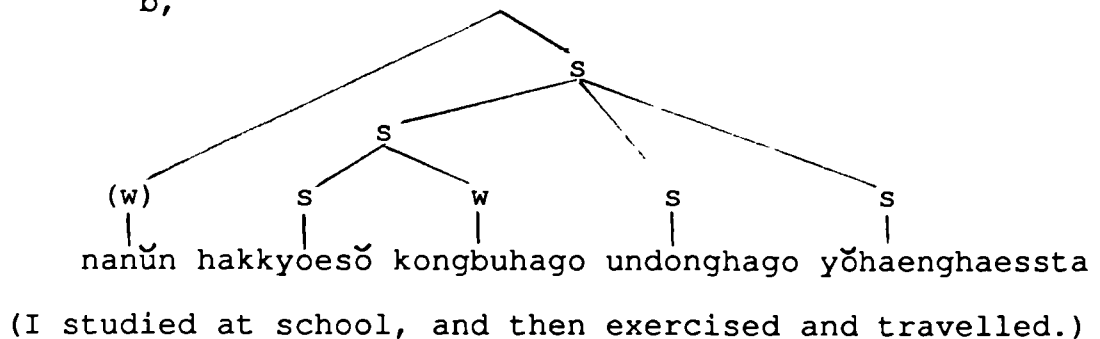
the predicates and the last heads in (46) and (47) become sister nodes of the ones governing the other heads.

If the closely coordinated predicates in the main clause in (26b) are preceded by either a noun phrase or an adverb phrase, this sentence becomes ambiguous. Hence we assign two prosodic structures to this sentence.

(48) a,

nanŭn hakkyoesŏ kongbuhago undonghago yŏhaenghaessta

(I studied, exercised and travelled at school.)

b,

nanŭn hakkyoesŏ kongbuhago undonghago yŏhaenghaessta

(I studied at school, and then exercised and travelled.)

This fact must also be included in the Predicate Rule.

Therefore we can formulate the Predicate Rule as follows:

(49) The Predicate Rule

a, The predicate in the main clause combines with the whole preceding noun phrase except the first

element to form a constituent if the phrase consists of more than three elements. Otherwise, with the whole preceding noun phrase.

b, The predicate in the main clause combines with the whole preceding adverb phrase except the first adverb to form a constituent if the phrase consists of more than one adverb. Otherwise, with the whole preceding adverb phrase.

c, If the predicate in the main clause is preceded by a phrase with multiple heads, this predicate combines only with the last head.

d, If closely coordinated predicates are preceded by a phrase, either all the predicates or only the first predicate combine with the phrase.

2.4.7. **The Verb Phrase Rule and the Sentence Rule**

We have so far established six prosodic phrase structure rules -- the Compound Rule, the Multiple Head Rule, the Noun Phrase Rule, the Prosodic Reanalysis, the Adverb Phrase Rule, and the Predicate Rule. Based on these rules, let us assign an adequate prosodic structure to the following sentence.

(50) nanŭn ma:l ma:nŭn sa:ramege sŏ:nmurŭl chwŏssta.

    (I) (speech) (much) (person-to) (gift)   (gave)

    (I gave a gift to a person who speaks much.)

Note that 'nanŭn' and 'ma:l' cannot form an immediate constituent, nor can 'sa:ramege' and 'sŏ:nmurŭl'. It follows that the Noun Phrase Rule applies within, not beyond, the noun phrase in question. Hence the application of the Noun Phrase Rule to the above sentence leads to the following prosodic structure.
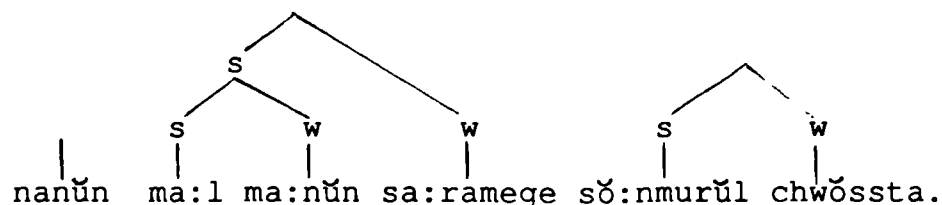
(51)

```
                    _____
                 __/      w
               _/  \      /\
              s'    s    w
              |     |    |        |
     |  ﾍ     |     |ﾍ   |        |
   nanŭn   ma:l ma:nŭn  sa:ramege sŏ:nmurŭl chwŏssta.
```
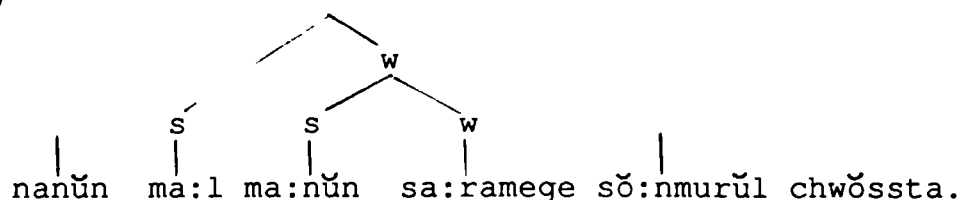
Note that the Noun Phrase Rule also applies to the noun phrases 'nanŭn' and 'sŏ:nmurŭl'.
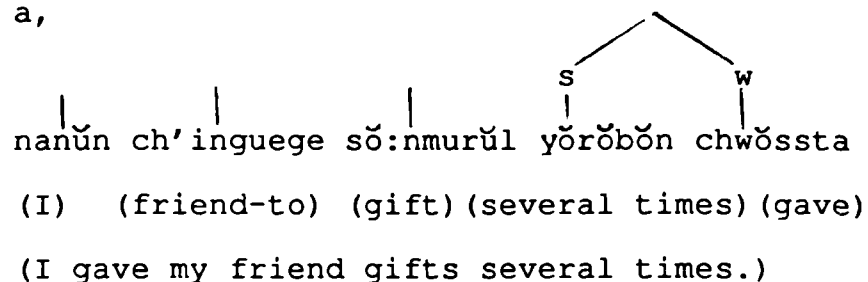
At the next stage, the Prosodic Reanalysis applies to the second noun phrase. And the Predicate Rule lets the predicate 'chwŏssta' combine with the preceding noun phrase 'sŏ:nmurŭl'. The applications of these two rules are not ordered.

(52)

```
                   _____
                  /       s
               s /\          \
              /\ /  \          \       /\
             s  w    w          s      w
             |  |    |          |      |
    |        |  |ﾍ   |          |      |ﾍ
  nanŭn   ma:l ma:nŭn sa:ramege sŏ:nmurŭl chwŏssta.
```
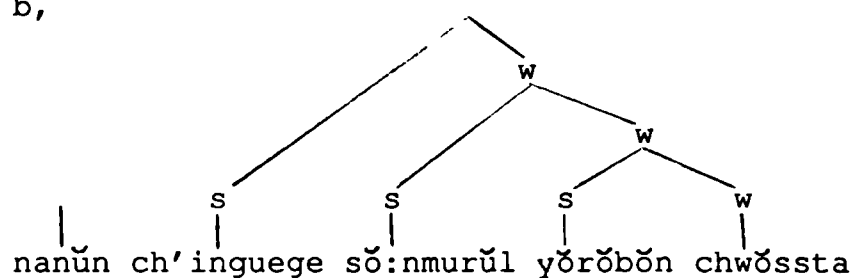
Note that we still have three nodes which are not linked in the above prosodic structure. It follows that we need

probably two more rules to link them. Note that `ma:l
ma:nŭn sa:ramege' is more likely to combine with
`sŏ:nmurŭl chwŏssta' than with `nanŭn'. This observation
conforms to the fact that both `ma:l ma:nŭn sa:ramege'
and `sŏ:nmurŭl chwŏssta' constitute a verb (predicate)
phrase. Hence we assume that unlinked output structures
of the six prosodic phrase structure rules within a verb
(predicate) phrase are linked by a rule, which we want to
call the `Verb Phrase Rule'.

(53)

```
                                    /\
                                   /  \
                                  S    \
                                 /\     \
                                S  \     \
                               /\   \     \
                              S  W   W     W
                                              /\
                                             S  W
                              S   W    W   S    W
                              |   |    |   |    |
                           nanŭn ma:l ma:nŭn sa:ramege sŏ:nmurŭl chwŏssta
```

Note that `ma:l ma:nŭn sa:ramege' is prosodically
stronger than `sŏ:nmurŭl chwŏssta'.

If a verb phrase has three unlinked output
structures which are derived by relevant prosodic phrase
structure rules, the last two output structures combine
together to form a constituent first. And then this
constituent combines with the first output structure.

(54) a,

nanŭn ch'inguege sŏ:nmurŭl yŏrŏbŏn chwŏssta

(I) (friend-to) (gift)(several times)(gave)

(I gave my friend gifts several times.)
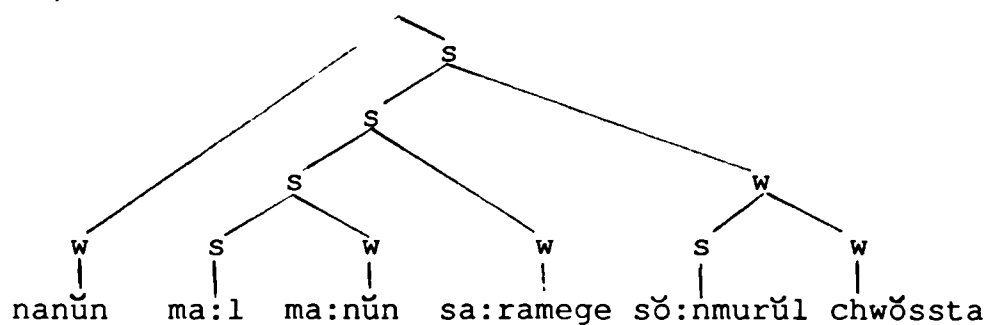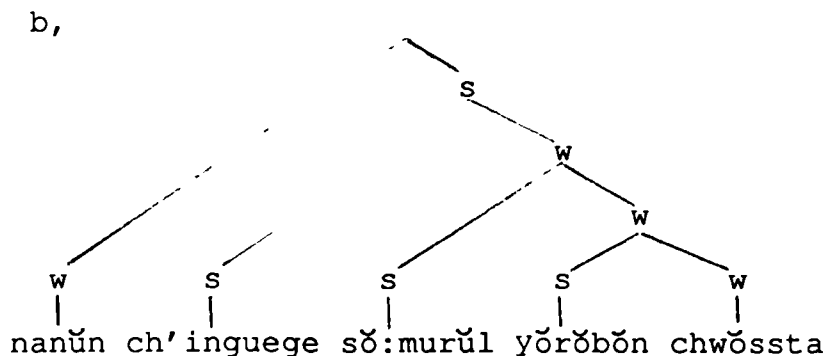
b,

nanŭn ch'inguege sŏ:nmurŭl yŏrŏbŏn chwŏssta

Finally we establish another rule, which we want to call the 'Sentence Rule', by which the subject of a sentence combines with the following verb phrase, normally as a weak constituent, to form a constituent. Hence the subjects and the corresponding verb phrases in (53) and (54) are linked by the Sentence Rule as follows:

(55) a,

nanŭn ma:l ma:nŭn sa:ramege sŏ:nmurŭl chwŏssta

b,

```
                                    .
                                     \
                                      S
                                    /   \
                               .  /      \.
                                /          W
                             /           /  \
                          /           .´    \
                       /            /         \
                    /             /            W
                 /             /            /    \
              /             /            /        \
           W             S          S          S        W
           |             |          |          |        |
        nanŭn    ch'inguege    sŏ:murŭl   yŏrŏbŏn   chwŏssta
```

2.5. Broad/Narrow Focus and Given/New Information

We have been using the terms `broad/narrow focus,
given/new information' without defining them. In this
sub-section, we shall define these terms and investigate
how they are related to accent placement.

`Information focus' is the means by which the
speaker marks the main burden of the message for
highlighting (cf. Halliday 1967b). If the whole sentence
is focused, it is said to be in `broad' focus. A
sentence in broad focus is often one which can be said in
respond to `What happened?'. But if only a part of a
sentence is focused, it is said to be in `narrow' focus.

`Given' information can be defined as the
information `which is previously mentioned in discourse
or physically present, and which is therefore not in need
of highlighting' (cf. Cruttenden 1986). On the contrary,
`new' information can be defined as the one `which is
neither previously mentioned in discourse nor physically
present, and which is therefore in need of highlighting'.

It is to be noted that Halliday (1967b) defines 'new' information more broadly. He defines 'new' information as 'what is focal', in the sense that the speaker chooses to present it as new. Hence previously mentioned or physically present information, which is regarded as 'given' according to our definition, may be treated as 'new', if the speaker decides to focus it. We have defined 'new' information narrowly in order to distinguish 'accented new, and thus focused, information' from 'accented given, but focused, information', 'habitually accented given and unfocused information', 'unaccented new and focused information', and 'unaccented given and unfocused information' (cf. (56b) below).

Let us investigate how given/new information and the scope of focus influence accent placement.

(56) a, In response to 'nŏ ŏje mwŏ haenni?':

                       (What did you do yesterday?)

�ˈhakkyoesŏ (ˈ)kongbuhaessŏ.

(school-at)   (studied)

(I studied at school.)

b, In response to 'nŏ hakkyoesŏ mwŏ haenni?':

                       (What did you do at school?)

(ˈ)hakkyoesŏ ˈkongbuhaessŏ.

c, In response to 'nŏ ŏdiesŏ kongbuhaenni?'

(Where did you study?)

Ihakkyoesŏ kongbuhaessŏ.

In (56a), which is all new and in broad focus, the first phrase 'hakkyoesŏ' must be accented because it is prosodically stronger than the second phrase 'kongbuhaessŏ'. The second phrase may or may not be accented depending on the speech tempo and style. That is, it is accented in careful and formal speech, but may not be accented in fast and casual speech. In the case of (56b), since the first phrase is 'given' information whereas the second phrase is 'new' information, only the second phrase is narrowly focused and therefore must be accented. The first phrase may be accented habitually if the speaker thinks it is still important. However, the first phrase is normally unaccented and may even be deleted if the speaker believes it to be unnecessary. Lastly in (56c), the first phrase must be accented because only this phrase is 'new' information. The second phrase is even less likely to be accented than the first phrase in (56b), which is also 'given' information. It may be deleted if the speaker regards it as being unnecessary.

It should be noted that when only the prosodically strongest item of a sentence is accented, it is almost

impossible to judge whether the sentence is in broad focus or in narrow focus. For example, if only the first phrase in (56a) is accented in fast and casual speech, this utterance is almost identical to that in (56c), where only the first phrase is narrowly focused. In this case, whether the sentence in (56) is in broad focus or in narrow focus can be judged only by the context. But interestingly, a sentence can be easily judged to be in narrow focus, if a prosodically weaker node is accented whereas a stronger node is unaccented as in (56b).

It should also be noted that only the focused part of a sentence, irrespective of whether it is in broad or narrow focus, may be accented. When a sentence is in broad focus as in (56a), the number of accents is determined by the speech tempo and style, and accent placements are constrained by the prosodic structure of the sentence. That is, both phrases in (56a) are likely to be accented in careful and formal speech. But in fast and casual speech, the second phrase is likely to be unaccented because it is prosodically weaker than the first phrase. These observations are also true in longer sentences.

(57)
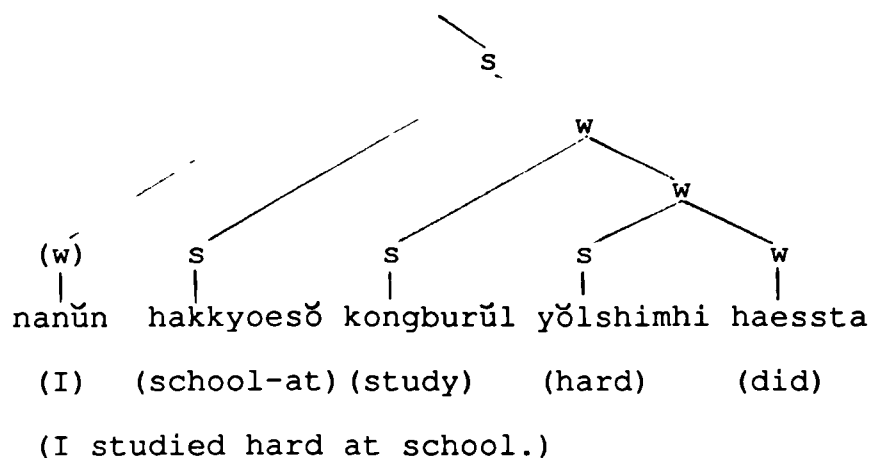
```
                              \
                               S
                          /      \
                     /         /    \  W
                /        /        /     \
          /          /        /       /   \ W
        /          /        /       /     / \
     (w)        s         s        s       w
      |         |         |        |       |
   nanŭn   hakkyoesŏ  kongburŭl  yŏlshimhi haessta
   (I)    (school-at) (study)   (hard)    (did)
```

(I studied hard at school.)

a, nanŭn 'hakkyoesŏ 'kongburŭl 'yŏlshimhi 'haessta.

b, nanŭn 'hakkyoesŏ 'kongburŭl 'yŏlshimhi haessta.

c, nanŭn 'hakkyoesŏ 'kŏngburul yŏlshimhi haessta.

d, nanŭn 'hakkyoesŏ kongburŭl yŏlshimhi haessta.

The above example may be said as (57a) to (57d), depending on the speech tempo and style. (57a) represents the slowest and the most formal speech whereas (57d) the fastest and the most casual speech. We find that the number of accents varies as the speech tempo and style change, and that the degree of the prosodic strength of an element is directly related to the degree of accentability.

On the other hand, if a part of the sentence in (57) is in narrow focus, only the focused part can be accented, and possible accent placements are determined by the interaction between the prosodic structure of the narrowly focused part and the speech tempo and style. The unfocused part is not accented unless it receives a

habitual accent. Even if it has a habitual accent, this accent is weaker than those in the focused part.

(58)

```
                    ┌                              ┐
                    │         /S
                    │       /    \
                   /│     /        W
                 /  │   /        /   \
               /    │ /        /       W
             /      │        /       /   \
         (w)       s        s       s      w
          │        │        │       │      │
       nanŭn hakkyoesŏ kongburŭl yŏlshimhi haessta
```

a, nanŭn hakkyoesŏ 'kongburŭl 'jŏlshimhi 'haessta.

b, nanŭn hakkyoesŏ 'kongburŭl 'jŏlshimhi haessta.

c, nanŭn hakkyoesŏ 'kongburŭl jŏlshimhi haessta.

(* `[ ]' : narrowly focused part)

The sentence in (58) above can be pronounced as (58a) to (58c), depending on the interaction between the prosodic structure of the focused part and the speech tempo and style. Since the phrase `kongburŭl' is prosodically strongest within the focused part, it must always be accented, whatever the speech tempo and style. In contrast, the predicate `haessta' is most likely to be unaccented in fast and casual speech, for it is prosodically weakest within the focused part.

So far, we have seen that `new' information is focused for highlighting, and that accent placement is the phonological manifestation of information focus. It should be noted that there are also lexical and

grammatical means of focussing, and that both of them are closely related to accent placement. Lexical focussing in Korean involves the use of postpositions like 'to (also)', 'man (only)', 'choch'a (even)' and so on.

(59) a, 'nado   hakkyoe   kassŏ.

(I-too)(school-to)(went)

(I went to school, too.)

na'do   hakkyoe   kassŏ.

b, 'najoch'a   hakkyoe   kassŏ.

(I-even)(school-to)(went)

(Even I went to school.)

najo'ch'a   hakkyoe   kassŏ.

Subjects in Korean are often unaccented, especially if they are personal pronouns. It is because subjects often convey 'given' information. But if a postposition which is used for lexical focussing is attached to a subject, the subject is narrowly focused even if it conveys 'given' information. In this case, either the subject or the postposition is accented, as we can see above. If the postposition consists of more than one syllable, accent falls on the last syllable as in (59b).

Grammatical focussing in Korean involves the use of a kind of cleft construction.

(60)   naega ˈchoːahanŭn (ˈ)kwamogŭn ˈŭmsŏnghagida.

      (I)   (like)   (subject)   (Phonetics-be)

      (The subject I like is Phonetics.)

Korean cleft sentences consist of a subject, which
contains an adnominal clause, a focused noun phrase and
the copula. These sentences have two information foci by
nature -- one on the subject and the other on the focused
noun phrase. Hence these sentences must be treated like
phrases with multiple heads as follows.

(61)
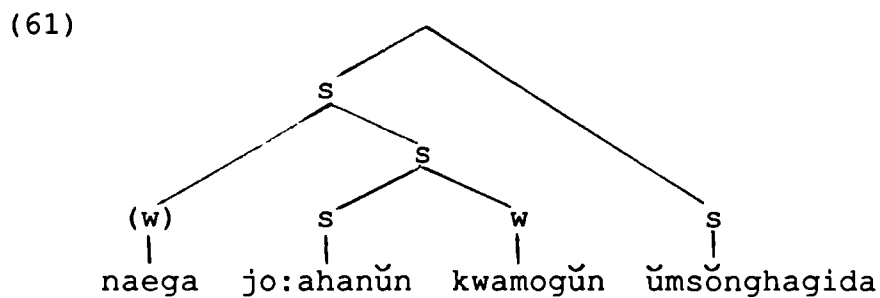
The above prosodic structure shows that both the subject
and the focused noun phrase must have at least one
accent.

CHAPTER 3. INTONATION

Intonation is pitch contours overlaid on utterances. Since intonation is used to convey the so-called intonational meanings (functions) -- accentual, attitudinal, grammatical and so on -- intonation constitutes an important object of the linguistic research of any language. It follows that the research into intonation must provide a theoretical framework within which the forms and meanings (functions) of intonation can be best described and explained. Hence we shall establish the intonation system of Korean in section 1. In section 2, we shall discuss where an intonation group boundary is likely to be placed within an utterance ('tonality' in Halliday (1967a)'s terms). And in section 3, we shall investigate the correlation between intonation (especially boundary tones) and grammatical, pragmatic and attitudinal functions.

1. The Intonation System of Korean

1.1. The Intonation Group and the Tune

It is apparent that we cannot set up the intonation system of Korean only with the category 'utterance', since there is an indefinite number of utterances and

thus an indefinite number of possible intonation patterns imposed on them. The following long utterance containing an indefinite number of coordinated clauses clearly supports this view.

(1) hakkyoe kasŏ,chŏmshimŭl mŏkko,ch'ingurŭl mannasŏ...

    (school-to)(went)(lunch) (ate) (friend)   (met)

    ((I) went to school, had lunch, met a friend ...)

cf. I ʼwent to ˌschool, ʼhad ˌlunch, and ʼmet a ˌfriend...

Note that the same pattern recurs several times in the above utterance. Hence if we assume that an utterance may be composed of more than one smaller prosodic category, which is bigger than the rhythm unit, we can set up a definite number of pitch patterns occurring in Korean and other languages. Such a category is called the 'intonation group' (see sub-section 1.7. for cues for intonation group boundaries). The pitch pattern of an intonation group is called the 'tune'.

    According to Armstrong and Ward (1931)'s approach, the tune is the smallest unit in the description of English intonation. But an approach of this kind misses

the important generalization that the greater part of the information conveyed by a tune is concentrated on the last part of a tune, at least in Korean and English. Hence it has been argued that a tune should be analysed into one or more smaller units in English, the unit which has been called the 'tone' (see below for details). We shall argue in sub-section 1.3 that Korean tunes should also be analysed into one or more tones.

1.2. The Make-Up of English Tunes

Before investigating how Korean tunes are organized, we shall review the main ideas of the English intonation system set up by O'Connor and Arnold (1973), which represents one well-known British approach towards English intonation. We shall also review Halliday (1967a,b)'s influential view on nucleus placement ('tonicity' in his terms) in English. These reviews will obviate the need to start the description of Korean intonation from the very beginning, which inevitably involves unnecessary time and effort. We shall examine in the following sub-sections which of their views also apply to Korean and which are specific to English.

O'Connor and Arnold (1973)'s system is designed to describe both the forms and functions of English intonation (and also designed for a pedagogic purpose), which conforms to our purpose. According to their

system, a tune consists of an optional pre-head followed by an optional head and one obligatory nuclear tone (two nuclear tones in the case of the compound tune). They define the 'nucleus' as the last accented syllable in an intonation group, and the 'nuclear tone' as the pitch treatment of the nucleus or both the nucleus and the tail (cf. p 15, 286). They establish seven nuclear tones -- Low Fall, High Fall, Rise-Fall, Low Rise, High Rise, Fall-Rise and Mid Level. They claim that the nucleus is 'a landmark of the highest importance' and 'the whole tune centres' on it (p 14), and that 'the last accented word is made to stand out by a combination of stress and the pitch features of the nuclear tones' (p 15). They define the 'head' as either the string of syllables beginning with the first accented syllable and ending with the syllable immediately preceding the nucleus, or the pitch pattern associated with that part of an intonation group (cf. p 286). Seven different heads -- Low, High, Falling, Rising, Stepping, Sliding and Climbing -- are set up. And they define the 'pre-head' as either the syllable(s) occurring before the first accented syllable, or the pitch pattern associated with these syllables (cf. p 286). There are two types of pre-head -- Low and High.

Based on the above discussion, we can schematize O'Connor and Arnold's system as follows:

(2) The Intonation System of English

(O'Connor & Arnold 1973):

Let us consider the following example to examine this system.

(3)   You might win a fortune.

a,

High Fall

b,

Low Fall

c,

Low Rise

d,

Rise-Fall
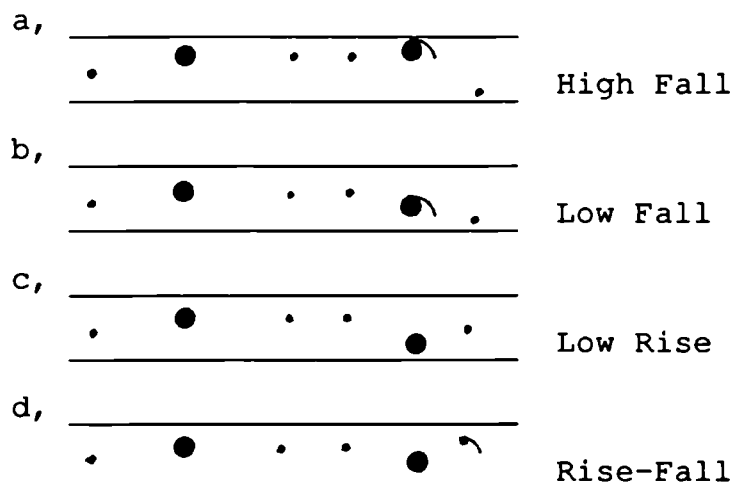
In the above example, (3a) sounds 'involved, lively', (3b) 'cool, serious', (3c) 'soothing, patronizing', and (3d) 'impressed'. It is apparent that the differences in intonational meaning are caused by the different nuclear tones.

On the other hand, similar intonational meanings -- completeness, involvement, liveliness and so on -- are conveyed by the High Fall nuclear tone in the example in (4) below, even though each version has a different head.

(4)   He's the stupidest man I know.

a,
 High Head

b,
 Stepping Head

c,
 Rising Head

d,
 Climbing Head
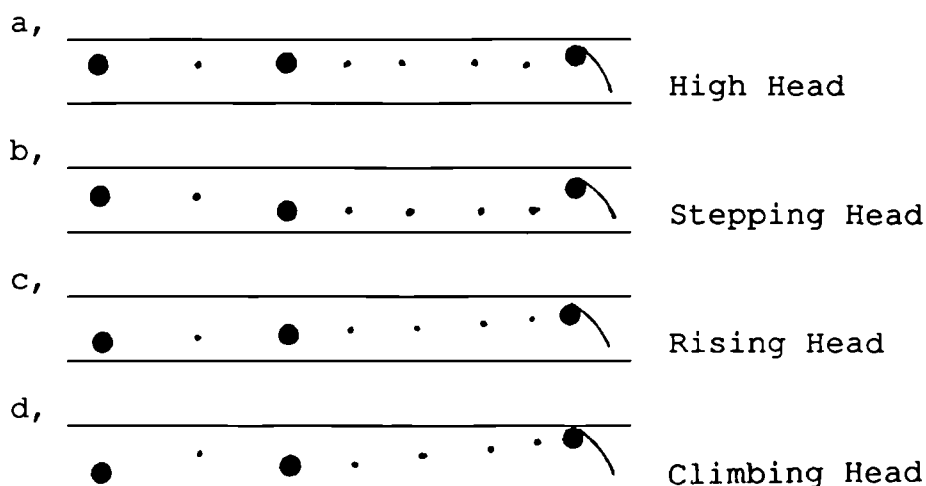
(4b) sounds more emphatic than (4a) because of the Stepping head. By the Rising head in (4c), a 'surprising' or 'protesting' meaning is added. (4d) sounds more emphatic than (4c) due to the Climbing head. Hence it is apparent that the nuclear tone conveys the greater part of the intonational meaning (function) of a tune, and the head modifies or adds certain meanings to

those conveyed by the nuclear tone. It follows that an analysis of English intonation purely in terms of whole tunes (cf. Armstrong and Ward 1931) fails because it misses this important generalization, as mentioned earlier.

Let us turn our attention to whether the nucleus is always the most prominent in an intonation group. The nuclei in (3a) and (4) (and possibly (3d)) obviously sound the most prominent in each version because they bear a high and gliding pitch, a long vowel and a stress. But if the nucleus is short and has a level tone pronounced lower than another accented syllable as in (5) below (and also (3b) and (3c)), it may not be heard as the most prominent.

(5)   'Are you ⸍coming?
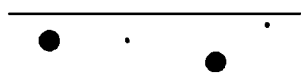
Hence the nucleus does not necessarily sound the most prominent in an intonation group, even though it is prosodically the strongest.

According to Halliday (1967a,b), any text is organized into one or more information units. An information unit is coextensive with an intonation group, and has either one primary point of information focus or one primary followed by one secondary. The choice of

information focus is realized by the assignment of the tonic (= nucleus) in an intonation group.[2] (He calls nucleus placement 'tonicity', which constitutes, in his framework, one of the three aspects or components of intonation together with 'tonality' and 'tone'.) Information focus is believed to convey the main burden of a message. It is dubious, however, whether words containing the nucleus always convey the main burden of a message. It seems to be the case if only one word of an intonation group is narrowly focused.

(6)   *John* painted the ₀shed ₀yesterday.

                    * italics: focused part

But it is not always the case if an intonation group is broadly focused.

(7) a,   'white and \\blue

    b,   'Why did you do ⸝that?

In (7a), the semantic weight of the two accented words is the same. Furthermore, the first accented word carries more semantic information than the last one in (7b).

Although the last accented word of an intonation group does not always convey the main burden of a message, it certainly constitutes the rightmost boundary of information focus, as in (7a) and (7b) -- but note

several kinds of exceptions (cf. Gussenhoven 1983, 1985).
(Remember that the nuclear tone has the `accentual
function' discussed in section 2 chapter 1, as it is
imposed on the last focused and thus accented word.)
Hence if only the first word of (7a) and (7b) is narrowly
focused, the potential accents on `blue' and `that' are
not realized.

(8) a, `white and blue

b, /Why did you do that?

On the other hand, the head often constitutes the
leftmost boundary of each information focus as in (7a)
and (7b). But if the first focused word is preceded by
several words, one or more habitual accents may be
assigned to unfocused words in order to avoid a long
sequence of unaccented syllables.

(9) *John has °never °been to the* `Moon.

John has 'never been to *the* `sun, `either.

* italics: focused part

In summary, the main motivation for distinguishing
the nuclear tone from the head is that the former conveys
the greater part of the intonational meaning (function)
of a tune, and the latter modifies and adds certain
meanings to those conveyed by the former. Since the

nuclear tone falls on or starts from the last focused and thus accented word (recall that the nucleus constitutes the rightmost boundary of the information focus within an intonation group and the head possibly the leftmost boundary), it functions to signal that the speaker wants the hearer to pay attention to this word (=accentual function). In addition, the nucleus is often, but not always, perceptually the most prominent syllable in an intonation group due to the stress and the nuclear tone overlaid on it, especially if it has a long vowel and a kinetic tone.

1.3. The Make-Up of Korean Tunes

Let us start investigating how Korean tunes are organized by considering simple utterances containing only one accent.

(10) hakkyoe kassŏ.

(school-to)(went) : ((I) went to school.)

a, _____ b, _____ c, _____

(11) hakkyoe kassŏ?

(Did you say, "Did you go to school?")

a, _____ b, _____ c, _____

d, _____   e, _____

● . . . ✓   ● . . . ⌢
_____   _____
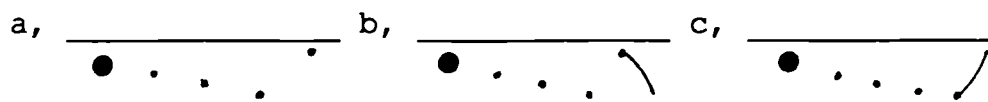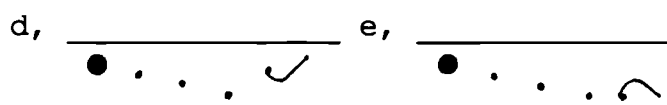
Although the sentences in both (10) and (11) have the same string of phonemes, the versions in (10) are heard as statements whereas those in (11) as echo questions ((11a), (11b) and (11c) may also be perceived as yes-no questions), depending on the tune patterns imposed on them (see section 3 of this chapter for details). Furthermore, each version in both (10) and (11) conveys a different attitudinal meaning (see section 3 for details). (10a) sounds 'definitive' and 'cool'. (10c) also sounds 'definitive' but 'friendly'. (10b) sounds 'blunt' or 'humble'. On the other hand, (11a) and (11b) convey 'interest' and 'surprise', the latter sounding more interested and surprised. (11c) sounds 'astonished' and/or 'suspicious'. And (11d) and (11e) convey 'anger' and 'contempt/sarcasm' respectively.

Note that all the versions in (10) and (11) have the same tune pattern if we disregard the pitch patterns imposed on the last syllable. This fact leads us to suspect that the different intonational meanings mentioned above are conveyed by the different pitch patterns of the last syllable. In order to prove this, let us consider the following example.

(12)　　hakkyoe kassŏ.

((I) went to school.)

a, _____　　b, _____
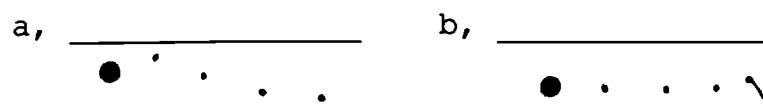
These two versions must be transcribed with the same
tonetic mark -- the Rise-Fall (^), and must convey the
same intonational meaning if we adopt the framework of
the O'Connor and Arnold system. But (12a) delivers
almost the same intonational meaning as (10a), whereas
(12b) is comparable to (10c). Hence it is apparent that
the whole intonational meaning of a tune is concentrated
on the pitch pattern of the final syllable of an
intonation group.

Could we, then, analyse the last syllable of an
intonation group as the nucleus and its pitch pattern as
the nuclear tone? Even if it might be possible, we shall
not adopt this position. The pitch pattern of the last
syllable of an intonation group in Korean is similar to
the English nuclear tone in that it conveys the greater
part of the intonational meaning of a tune, and that it
is often realized as a kinetic tone and thus often heard
as the most prominent. But this pitch pattern is
different from the English nuclear tone in that it falls
on the last syllable of content words and clitics like
postpositions and endings, the syllable which is normally
unstressed, whereas the English nuclear tone falls on or

starts from the stressed syllable of the last accented word. That is, unlike the English nucleus and nuclear tone, the last syllable of an intonation group and its pitch pattern in Korean does not have the accentual function mentioned earlier. Hence we want to reserve the terms 'nucleus' and 'nuclear tone' for languages like English, in which the nuclear tone falls on, or starts from a stressed and accented syllable. We shall call the pitch pattern of the final syllable of an intonation group the 'boundary tone' instead, since it occurs at an intonation group boundary. And we shall call the pitch pattern of the string of syllables preceding the boundary tone the 'phrasal tone'. (This definition will be revised in sub-section 1.5.)

1.4. The Taxonomy of Korean Boundary Tones

Let us set up the inventory of Korean boundary tones, with which we can describe all important functions and meanings conveyed by them. The major principle of singling out a minimum number of boundary tones from an indefinite number of possible pitch contours overlaid on the last syllable of each intonation group is that they have to be contrastive ('all-or-none' in Bolinger (1961b)'s terms)with each other. The contrastiveness is established in terms of sentence type, illocution and possibly attitudinal meanings. For example, the Low

Level in (10a) marks this sentence as a declarative sentence, but the High Level in (11a) may mark it as an interrogative sentence (i.e. yes-no question). The former is used to convey a statement, but the latter a question (either a yes-no or echo question). These two tones convey contrastive attitudinal meanings. The Low Level sounds 'definitive' and 'cool' whereas the High Level 'interested' and/or 'surprised'.

It should be noted that it is difficult to set up contrastive relationships between two closely related boundary tones only in terms of attitudinal meaning. It is because many of the so-called attitudinal meanings are 'gradient' (cf. Bolinger 1961b and Ladd 1980) or 'cline' (cf. Halliday et al 1964). For example, although we have assigned different attitudinal meanings to the Full Rise in (11c) and the Fall-Rise in (11d) earlier, these meanings may be regarded as being gradient, rather than contrastive. Hence these two tones are actually established on the basis of different grammatical and illocutionary functions (cf. section 3). It should also be noted that the differently pronounced pitch heights of each boundary tone convey different degrees, not different kinds, of an attitudinal meaning. For example, the High Level in (11a) sounds more involved and even surprised, as it is pronounced closer to the top end of the voice range.

We shall return to the detailed discussion of the functions of Korean boundary tones in section 3 of this chapter. We shall describe below only the form of each boundary tone, compared with corresponding English nuclear tones.

1.4.1. **The Low Level**

The boundary tone in (10a) is the Low Level which is said on the bottom pitch range of the speaker's voice range. It is usually pronounced slightly lower than the preceding syllable unless this syllable has already reached the bottom pitch. We transcribe it by using ' �é ' to the bottom left of the last syllable. It corresponds to the ending point of English Low Fall nuclear tone.

1.4.2. **The Mid Level**

The boundary tone in (10b) is the Mid Level which is usually said on a pitch slightly lower than the middle of the voice range. It is always pronounced a little higher than the preceding syllable. We transcribe it with ' ➔ ' to the middle left of the last syllable. It corresponds to the Mid Level tone in English but is usually pronounced lower than the English one.

1.4.3. **The High Level**

The boundary tone in (11a) is the High Level which is usually said on a fairly higher pitch than the middle

of the voice range. It is always pronounced slightly higher than the preceding syllable. We transcribe it with ` ➔ ' to the top left of the last syllable. The meaning `astonishment' is added as it reaches the top end of the voice range and is sometimes said with the falsetto voice. It corresponds to the ending point of the English High Rise.

1.4.4. **The Low Fall**

The boundary tone in (10c) is the Low Fall which falls from the middle (or slightly lower than this) to the bottom of the voice range. There is always a slight step-up in pitch, in the beginning, from the preceding syllable. We transcribe it with `↘' to the bottom left of the syllable. It corresponds in pitch to the English Low Fall.

1.4.5. **The High Fall**

The boundary tone in (11b) is the High Fall which begins with a pitch higher than the middle of the voice range and ends in a pitch lower than the middle pitch, but never reaches the bottom. There is always a step-up in pitch from the preceding syllable. We transcribe it with `↘' to the top left of the syllable. It corresponds in pitch to the English High Fall. But the ending point of the Korean High Fall is higher than the English one. The degree of surprise increases as the

starting point comes closer to the top of the voice range.

1.4.6. The Full Rise

The boundary tone in (11c) is the Full Rise which begins within the wide range between the near bottom pitch and a slightly high pitch above the middle of the voice range, depending on the pitch level of the preceding syllable, and ends at a pitch close to the top of the voice range. It is pronounced with the same pitch as or a slightly higher pitch than the preceding syllable. We transcribe it with '╱' to the left of the syllable. The degree of surprise increases as the starting point comes closer to the bottom of the voice range and thus the pitch range of the rise becomes greater. It corresponds in pitch to the English Full Rise, which is often treated as a variety of the High Rise.

1.4.7. The Low Rise

The Low Rise often occurs in imperative sentences, conveying less authoritative commands (=requests) as compared to those with the Low Level and the Low Fall.

> (13)   hakkyoe isso.
>
>   (school-at) (stay) : (Please stay at school.)
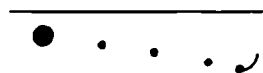
It begins from the near bottom pitch and rises to a pitch close to the middle of the voice range. It is pronounced the same as or slightly lower than the preceding syllable. We transcribe it with ' ⸓ ' to the bottom left of the syllable. It corresponds to some extent to the English Low Rise. It can also be used for listing like English Low Rise but cannot be used for a question.

(14)   ⎮ha⸓na, ⸓tul, ⸓ses, ...   (one, two, three,...)

● ◡   ◕ ◕

---
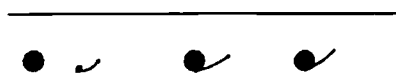
cf. ⸓one, ⸓two, ⸓three,...

1.4.8. The Fall-Rise

The boundary tone in (11d) is the Fall-Rise which begins from the range between a fairly high and a fairly low pitch, depending on the pitch of the preceding syllable, and falls slightly, and then rises to the top of the voice range. There is usually a step-up in pitch from the preceding syllable. We transcribe it with ' ✔ ' to the top left of the syllable. It corresponds to the English Fall-Rise, but falls less and rises to a higher pitch.

1.4.9. The Rise-Fall

The boundary tone in (11e) is the Rise-Fall which begins from the range between the middle pitch and a

fairly low pitch, and rises slightly, and then falls to
the near bottom pitch. The starting point is usually on
the same pitch as the preceding syllable. We transcribe
it with ` ^ ` to the top left of the syllable. It
corresponds to the English Rise-Fall, but rises less than
the English one.

1.5. Phrasal Tones

We have defined, in sub-section 1.3., the 'phrasal
tone' as the pitch pattern of the string of syllables
preceding the boundary tone (see below for the revision
of this definition). In order to set up the inventory of
phrasal tones occurring in Korean, let us consider the
following example used in (11).

(15)   hakkyoe   kassŏ?

(Did you go to school?)

a, _____   b, _____

c, _____   d, _____

e, _____
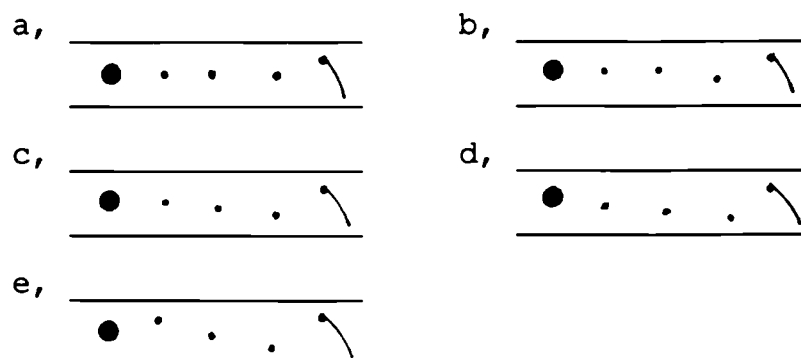
As we see above, the phrasal tone may be realized as a
Level tone as in (15a), or as a Falling tone as in (15b),

-128-

(15c) and (15d), or as a Rise-Falling tone as in (15e).
The Rise-Falling phrasal tone sounds 'weighty' and
'emphatic', and the Falling tone 'relaxed' and
'uninvolved'. The Level tone sounds less weightier and
emphatic than the Rise-Falling tone, but less relaxed and
more involved than the Falling tone. It should be noted
that these phrasal tones convey limited attitudinal and
stylistic information compared with boundary tones.
Furthermore, unlike boundary tones, they do not have
grammatical and pragmatic functions. These facts conform
to our earlier claim that boundary tones convey the
greater part of the intonational meaning of a tune than
phrasal tones.

We shall transcribe the Level tone with '|' to the
left of the accented syllable, the Falling tone (all
these variants) with '\', and the Rise-Falling tone with
'^'. Hence the version in (15a) can be transcribed as
'|hakkyoe ka ʼssŏ?', those in (15b), (15c) and (15d) as
'\hakkyoe ka ʼssŏ?', and that in (15e) as '^hakkyoe
ka ʼssŏ?'. The three phrasal tones can occur with any of
the nine boundary tones set up in the preceding
sub-section, except for the combination of two successive
Rise-Fall tones.

Let us consider how to transcribe the following
versions.

(16)   hakkyoe kassŏ. ((I) went to school.)

a, _____   b, _____

c, _____
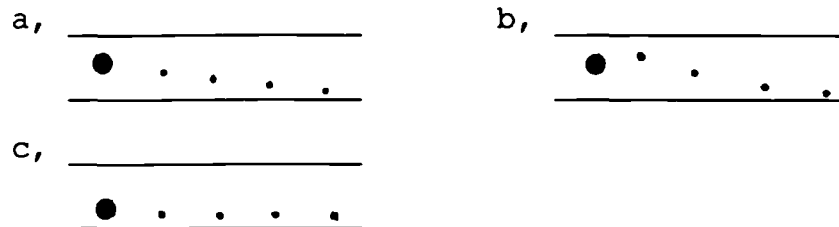
According to our convention discussed so far, (16a) must be transcribed as '`hakkyoe ka_ssŏ.', (16b) as '^hakkyoe ka_ssŏ.', and (16c) as '¹hakkyoe ka_ssŏ.'[3]. These transcriptions obviously involve redundancy, since the Low Level boundary tone constitutes part of the continuous pitch trend starting from the accented syllable. Accordingly, we shall not specify the Low Level boundary tone if it follows the Falling, the Level, or the Rise-Falling phrasal tone. Hence the versions in (16) are transcribed, by our modified convention, as ' `hakkyoe kassŏ.', '^hakkyoe kassŏ.' and '¹hakkyoe kassŏ.' respectively.

Let us consider tune patterns which have more than one accent and thus more than one rhythm unit. (Hence the intonation group is a higher category than the rhythm unit.)

(17)   hakkyoesŏ kongbuhaessŏ.

    (school-at) (studied) : ((I) studied at school.)

a, _____

b,

c,

d,
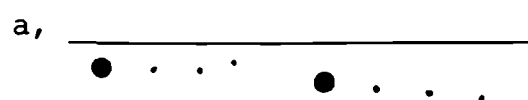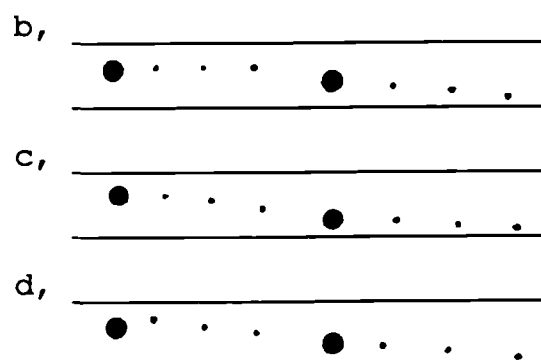
Note that each version has a break in pitch, which corresponds to the rhythm unit boundary. Note also that each version conveys a slightly different intonational meaning because of the different pitch patterns imposed on the first rhythm unit. That is, (17a) sounds 'lively' and 'light' whereas (17c) sounds 'uninvolved' and 'relaxed'. (17b) is neutral in that it sounds less lively and lighter than (17a) but more involved and less relaxed than (17c). And (17d) sounds 'emphatic' and 'weighty'. Hence the pitch patterns of the first rhythm unit must be separated from those of the second rhythm unit.

The differences in meaning between the pitch patterns of the first rhythm unit in (17) above seem to be mainly conveyed by the pitch pattern of the last syllable, just as the greater part of the intonational meaning is concentrated on the boundary tone. Hence we may regard the pitch patterns of the last syllable as boundary tones. But we want to analyse the pitch patterns of the first rhythm unit as holistic phrasal tones, for the following reasons.

First, the pitch of the last syllable of the first rhythm unit is realized only as a level tone whereas boundary tones are often realized as kinetic tones. If a kinetic tone is imposed on this syllable, we perceive the first rhythm unit as constituting a separate intonation group.

Second, the differences in meaning described above actually result from the pitch movement from the accented syllable, not from the absolute pitch of the last syllable alone. That is, the level pitch on the last syllable of the first rhythm unit alone cannot convey any important meaning except for limited attitudinal meanings like the degree of involvement (for example, a high pitch conveys a more involved attitude than a lower pitch). In contrast, level boundary tones convey not only various attitudinal meanings, but also information on sentence type and illocution (see section 3 for details).

Furthermore, the pitch pattern of the first rhythm unit in (17b) conveys similar meanings to the phrasal tone in (15a), that in (17c) to the phrasal tone in (15b), (15c) and (15d), and that in (17d) to the phrasal tone in (15e).

Hence it is apparent that the pitch of the last syllable does not play as significant a role as the boundary tone in the formation and function (meaning) of the pitch pattern of the first rhythm unit. Therefore, the description of Korean intonation becomes much simpler

and more plausible if we regard the pitch of the last syllable of a non-final rhythm unit as part of a phrasal tone. It leads us to redefine the phrasal tone as the pitch pattern overlaid on each rhythm unit excluding the last syllable of an intonation group. Hence the versions in (17) above are analysed as consisting of two phrasal tones and one boundary tone.

We mark the phrasal tone of the first rhythm unit in (17a) by '⁄' to the top left of the accented syllable, that in (17b) by '|', that in (17c) by '\', and that in (17d) by '^'. Thus we establish one more phrasal tone '⁄' in addition to the three phrasal tones -- '|', '\' and '^', which we have set up above. The phrasal tone '⁄' is imposed only on non-final rhythm units.

According to our system discussed so far, a tune is composed of zero or more phrasal tones followed by one obligatory boundary tone. If the last rhythm unit consists of only one syllable, this syllable bears both accent and a boundary tone.

     (18)   hakkyoe   ka.

          (school-to) (go) : (Go to school please.)
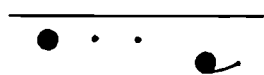
It follows that the number of phrasal tones of an intonation group is identical to the number of rhythm

units if the last rhythm unit consists of more than one syllable, but is one less than the number of rhythm units otherwise.

1.6. Tone Concord and Declination

Let us consider longer utterances which have more than two accents.

(19)   nanŭn ch'inguege sŏnmurŭl chwŏssta.

(I)   (friend-to) (gift)   (gave)

(I gave a gift to a friend.)

a,

b,
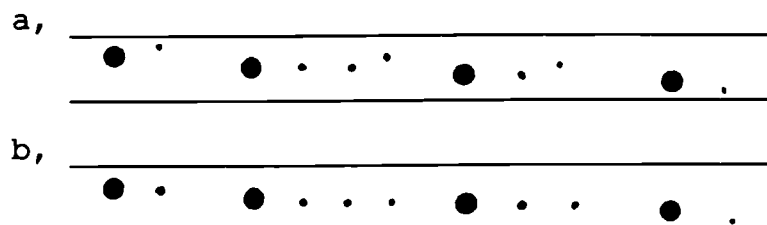
As in the example above, each element can bear an accent in careful speech if all the elements are thought to be important by the speaker. We find that the phrasal tones except the last ones are the same in each version. We can call this phenomenon 'tone concord'. We also find that the pitch of accented syllables of each version declines. Not only the accented syllables but also the last syllables of each rhythm unit declines. This type of phenomenon is called 'declination' or 'downdrift'. Interestingly, declining utterances sound normal in

Korean whereas corresponding English utterances, those with the 'Stepping head', sound emphatic.

Even when the sentence in (19) is said with only two accents, the declination occurs.

(20)   nanŭn ch'inguege sŏnmurŭl chwŏssta.

a,

b,

c,

d,
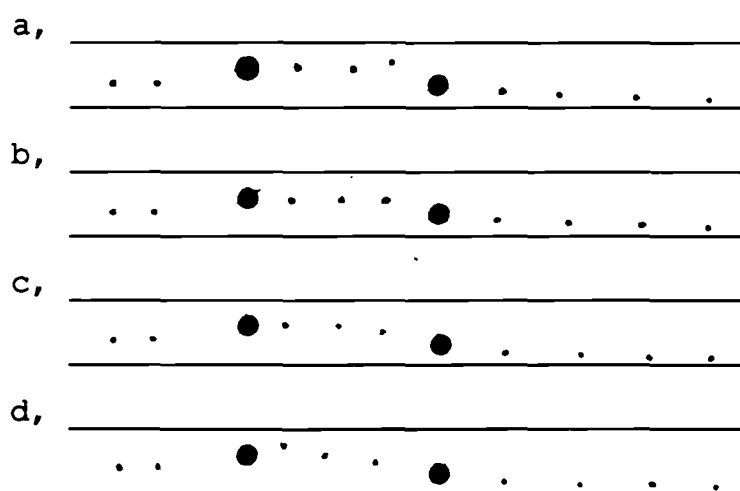
If an accented syllable is pronounced higher in pitch than the preceding syllable within an intonation group, the word or the phrase containing that syllable is perceived as being narrowly focused.

(21)   nanŭn ch'inguege sŏnmurŭl chwŏssta.
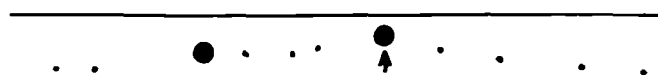
In the above example, 'sŏnmurŭl', which is prosodically weaker than 'ch'inguege', is heard as being narrowly focused.

1.7. Cues for Intonation Group Boundaries

The placement of an intonation group boundary may function distinctively, so that one sentence is interpreted differently because of different boundary placements.

(22) nanŭn Junhowa (/) ch'inguin Sunhorŭl mannassta.

(I) (Junho-and) (who is a friend) (Sunho) (met)

a,

(I met Junho's friend, Sunho.)

b,
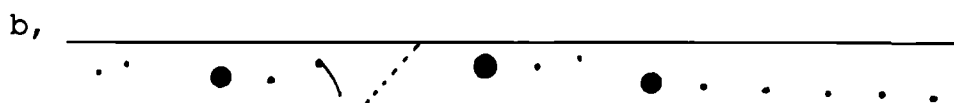
(I met Junho and my friend, Sunho.)

The above two versions are distinguished by the presence and absence of an intonation group boundary between 'Junhowa' and 'ch'inguin' ((22b) and (22a) respectively). We find in (22b) that the pitch pattern of each intonation group (=tune) is heard as an independent tune due to the use of the boundary tones, the lengthening of the final syllable of each intonation group, and the pause at each intonation group boundary. The last two cues are also found at rhythm unit boundaries. But those for intonation group boundaries are observed more clearly by greater final syllable lengthening and a longer pause.

Not only the High Fall as in (22b) but also the Low
Level, the Low Fall, the Low Rise and the Fall-Rise
boundary tones (but no others) can occur
utterance-internally.

(23)   nanŭn Junhowa / ch'inguin Sunhorŭl mannassŏ.

        (I met Junho and my friend, Sunho.)
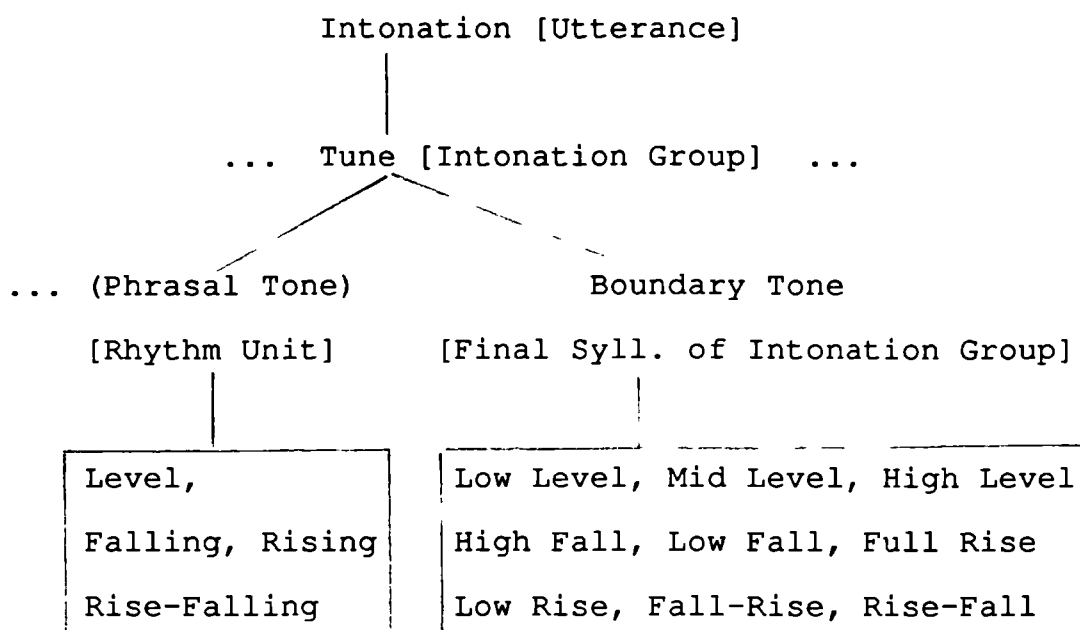
a,

b,

c,

d,
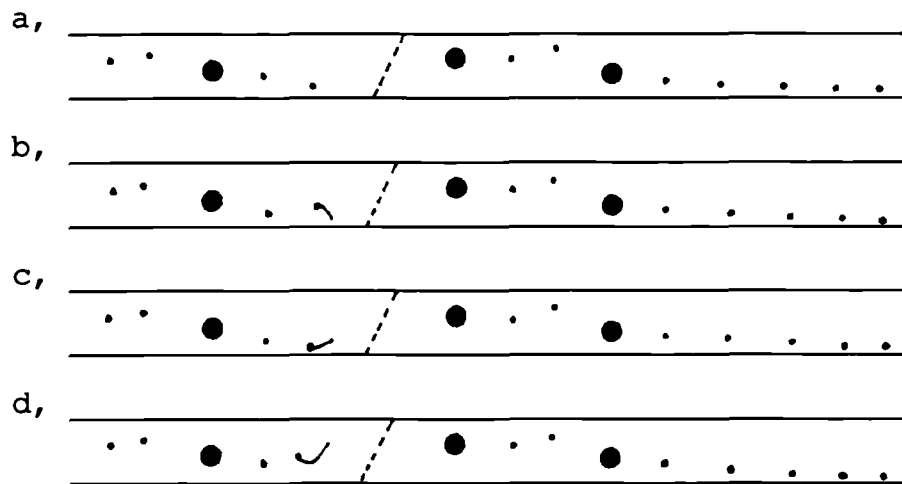
The utterance-internal boundary tones do not have
grammatical or pragmatic functions, but convey limited
attitudinal (and possibly stylistic) meanings. The High
Fall in (22b) conveys a `lively' and `involved' attitude.
On the other hand, the Low Level in (23a) and the Low
Fall in (23b) sound `uninvolved, cool' and `uninvolved
but friendly' respectively. And the Low Rise in (23c)
and the Fall-Rise in (23d) sound `patronizing', the
latter being more patronizing.

1.8. **Summary**

In this section, we have postulated one more important prosodic unit, the 'intonation group', which is the same as or smaller than the utterance, but the same as or bigger than the rhythm unit, and defined the 'tune' as the pitch pattern of an intonation group. We have argued that a tune consists of zero or more 'phrasal tones' followed by one obligatory 'boundary tone', on the ground that the boundary tone conveys the greater part of the information carried by the tune. We have defined the boundary tone as the pitch pattern of the final syllable of an intonation group and the phrasal tone as the pitch pattern of a rhythm unit excluding the boundary tone (if there is one). We have set up nine boundary tones and four phrasal tones.

Therefore, the intonation system of Korean can be schematized as follows:

(24) The Intonation System of Korean:

                      Intonation [Utterance]
                           |
                           |
                           |
              ... Tune [Intonation Group] ...

          ... (Phrasal Tone)   Boundary Tone
              [Rhythm Unit]   [Final Syll. of Intonation Group]
                     | |

          ┌─────────────────────┐ ┌──────────────────────────────────────┐
          │ Level,   │ │ Low Level, Mid Level, High Level   │
          │   │ │   │
          │ Falling, Rising   │ │ High Fall, Low Fall, Full Rise   │
          │   │ │   │
          │ Rise-Falling   │ │ Low Rise, Fall-Rise, Rise-Fall   │
          └─────────────────────┘ └──────────────────────────────────────┘

                  * `[ ]' : corresponding prosodic category

                     `...'  :  zero or more,  `( )' : optional

We have seen that Korean boundary tones convey the
greater part of the information carried by a tune and
often sound the most prominent in the tune (like English
nuclear tones), but do not have an accentual function
(unlike the English ones).

We have found two interesting tendencies in Korean
intonation -- 1) `tone concord', by which non-final
phrasal   tones take the same tone pattern, and 2)
`declination' or `downdrift', by which the pitch height
of not only accented syllables but also the last syllable
of each rhythm unit in a tune declines.   We have noted

that declining utterances sound normal whereas corresponding English utterances, those with the 'Stepping head', sound emphatic.

Finally, we have seen that the placement of an intonation group boundary may function distinctively, and that an intonation group boundary is cued by the use of a boundary tone, the lengthening of the final syllable, and a pause. We have also seen that utterance-internal boundary tones do not have grammatical or pragmatic functions, but convey limited attitudinal meanings.

2. Intonation Group Boundary Placement

In this section, we shall investigate intonation group boundary placement in Korean. The study of intonation group boundary placement has the following importance in phonetic (linguistic) research.

First of all, the placement of an intonation group boundary may function distinctively, as discussed in the preceding section.[4]

(25)   somunttaemune (/) hakkyoe kajin anassta.

        (because of the rumour) (school-to) (go) (didn't)

        a, _____

            ● · · · ˙   ● · · · ˙   ● · ˌ
           _____

        (I went to school, but not because of the rumour.)

b,
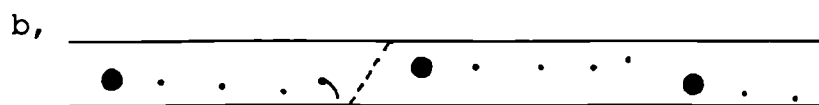
(I didn't go to school, because of the rumour.)

This sentence is understood as (25b) if a boundary is placed between 'somunttaemune' and 'hakkyoe', but as (25a) otherwise.

Secondly, as an utterance gets longer, one or more intonation group boundaries are necessarily called for. If we put a boundary at an unlikely place, the utterance sounds bizarre. It is therefore important to work out where a boundary is likely to be placed within an utterance, and to try to generalize the tendencies towards intonation group boundary placements.

Thirdly, as will be seen below, intonation group boundary placement is closely related to grammatical structure. That is, this is generalizable in terms of grammatical structure. Hence we can understand one aspect of the relationship between intonation and grammar in the course of this study.

The framework used for this study is based on Crystal (1975). And the grammatical framework of Korean adopted in this study is that of W. Huh (1983).

We shall discuss intonation group boundary placement in Korean from complex sentences, each of which is composed of more than one clause. It should be noted that the intonation group boundaries predicted by the

following rules are not obligatory, since the boundary placement largely depends on the speech tempo and style, the number of accents and the length of an utterance.

2.1. Complex Sentences

In English, when a clause is coordinated or subordinated to another clause to form a complex sentence, a conjunction is used at the beginning of that clause.

(26) a, I study, *and* my friend works. (Coordination)

b, *When* I was a boy, I was shy. (Subordination)

In Korean, on the other hand, coordination and subordination are marked by terminal endings, which are attached to predicate stems.

(27) a, nanŭn kongbuha*go*, nae ch'ingunŭn ilhan*da*.

(I) (study-and) (my) (friend) (works)

(I study, *and* my friend works.)

b, piga o*dŭshi*, nunmuri hŭrŭn*da*.

(rain)(fall-as if)(tears)(falling)

(*As if* it's raining, tears are falling.)

c, naega choahan*ŭn* undongŭn ch'ukku*da*.

(I)   (like)   (sports)(is football)

(The sports that I like is football.)

The number of terminal endings in Korean is over 400. They are analysed into three classes on the basis of their function. The endings belonging to the first class are used to complete a sentence and thus occur at the end of a sentence (e.g. `-da'` as in (27) above). Those belonging to the second class are used to link two coordinated clauses[5] (e.g. `-go'` as in (27) above). And those belonging to the last class are used in order to embed a clause in the main clause, as a nominal clause, as an adnominal (adjectival) clause (e.g. `-(n)ŭn'` as in (27) above), or as an adverbial clause (e.g. `-dŭshi'` as in (27) above). The predicate in an embedded clause functions as two elements -- as a predicate in the subordinate clause, and as a nominal, an adverbial or a modifier in the main clause.

2.1.1. Coordination

When two clauses are coordinated, an intonation group boundary is likely to be placed after the first predicate.

(28) a, nanŭn hakkyoe ka*go* / Sunhonŭn yŏhaenggassta.

(I) (school-to) (go-and) (Sunho) (went on a trip)

(I went to school, *and* Sunho went on a trip.)

b, ŭmsŏnghagŭn ŏryŏu*na* / t'ongsaronŭn swipta.

(Phonetics) (difficult-but) (Syntax) (easy)

(Phonetics is difficult, *but* Syntax is easy.)

But an intonation group boundary rarely occurs after the first predicate if the two clauses are short and said with less than four accents.

(29) a, 'sando choaha*go*, ()[6] 'muldo choahanda.

      (mountains-also) (like-and) (rivers-also) (like)

      ((I) like mountains, *and* also like rivers.)

   b, 'ŭmsŏnghagŭn 'ŏryŏu*na*, () 'chaemiissta.

      (Phonetics) (difficult-but) (interesting)

      (Phonetics is difficult, *but* interesting.)

Hence it is apparent that the likelihood of occurrence of an intonation group boundary rises as the length of the two clauses increases. The likelihood of occurrence also depends on the number of accents, which is determined by the speech tempo and style, and the scope of focus, as discussed in chapter 2.

In many coordination constructions, repeated items are often deleted. When a subject and/or a predicate are/is omitted, an intonation group boundary tends to be retained.

(30) a, saramŭn tonmanŭro sal su ŏps*ko*,/ saramŭn

      (people) (money-only with) (can't live) (people)

      chŏngshinmanŭro sal su ŏpsta.

      (spirit-only with) (can't live)

(People can't live only with money, and people can't live only with spirit.)

b, saramŭn tonmanŭro sal su ŏps*ko*,/ chŏngshinmanŭro sal su ŏpsta.

(People can't live only with money and can't live only with spirit.)

c, saramŭn tonmanŭro,/ chŏngshinmanŭro sal su ŏpsta.

(People can't live only with money, nor only with spirit.)

d, Sunhonŭn sanŭl,/ Junhonŭn kangŭl choahanda.[7]

(Sunho) (mountain)(Junho) (river) (like)

(Sunho likes mountains, and Junho rivers.)

But the boundary does not occur if the element(s) preceding the predicate in the second clause is (are) deleted and thus two predicates are linked consecutively.

(31) ׀saramŭn ׀tonmanŭro / ׀salsudo ŏps*ko*, () ׀nolsudo

(people) (money-only with) (can't live) (can't enjoy)

ŏpsta.

(People can neither live nor enjoy themselves only with money.)

As discussed in chapter 2, these coordinated predicates behave like multiple heads, so that each predicate

attracts an accent. An intonation group boundary is more likely to be placed after 'tonmanŭro'.

2.1.2. **Subordination**

2.1.2.1. **Nominal Clauses**

A nominal clause is normally marked by one of the two endings -- '-ki' and '-(ŭ)m'. The latter is not commonly used in colloquial speech. A postposition may be attached to these endings.

(32) a, ¹i ch'aegŭn ¹ihaehagiga () ¹ŏryŏpta.

(this) (book) (understanding) (difficult)

(Understanding this book is difficult.)

b, ¹kŭ iyagiga ¹sashirimi () ¹punmyŏnghada.

(that) (story) (being truth) (be apparent)

(It is apparent that the story is true.)

An intonation group boundary is likely to be placed after a nominal clause if both this clause and the rest of the sentence are long enough and said with more than three accents.

(33) a, ¹kyŏure ¹yŏnggŭesŏ salgiga / ¹hangugesŏboda ¹ŏryŏpta.

(Living in Britain in winter is more difficult than in Korea.)

But if both a nominal clause and the rest of the sentence are short and said with less than four accents, a boundary is unlikely to be placed after this nominal clause as in (32).

2.1.2.2. Adnominal (Adjectival) Clauses

An adnominal (adjectival) clause is marked by one of the three endings -- '-nŭn', '-(ŭ)n' and '-(ŭ)l'.

(34) a, ˈyŏngguges̆ kongbuhanŭn ˈoegugini () ˈmantʼa.

(Britain-in) (studying) (foreigner) (be many)

(There are many foreigners studying in Britain.)

b, ˈkŭ soshigŭl ˈtŭrŭn sarami () ˈŏps̆ssta.

(that) (news) (heard) (person) (there was no)

(There was no one who had heard that news.)

c, ˈhakkyoe kal shigani () ˈchinassta.

(school-to) (go) (time) (has passed)

(The time to leave for school has passed.)

An intonation group boundary is never placed after an adnominal clause. A boundary is more likely to be put after the noun modified by an adnominal clause if this clause and the rest of the sentence are long enough and said with more than three accents.

(35) a, ˈyŏngguges̆ kongbuhanun ˈoegugini /

ˈnollapkedo ˈmaeu mantʼa.

-147-

(There are surprisingly many foreigners who
are studying in Britain.)

b, 'ŏje 'kŭ soshigŭl tŭrŭn sarami / 'nollapkedo
'amudo ŏpsŏssta.

(There was surprisingly no one who had heard
that news yesterday.)

c, 'hakkyoe 'kaya ha*l* shigani / 'ajikto 'manhi
namassta.

(I still have lots of time until I leave for
school.)

But a boundary is unlikely to be placed if an
adnominal clause and the rest of the sentence are short
and said with less than four accents as in (34).

2.1.2.3. Adverbial Clauses

An adverbial clause is marked by one of a few
endings like '-tŭs(i)', '-ke' and '-torok'.

(36) a, 'kkoch'i 'arŭmdap*ke* () 'p'iŏssta.

(flowers) (beautifully) (have bloomed)

(Flowers have bloomed beautifully.)

b, 'pami nŭch*torok* () 'kongburŭl handa.

(night) (late-until) (study) (do)

((I) study until late night.)

As we can see above, an intonation group boundary is unlikely to be placed if the main clause following an adverbial clause is short and has less than two accents.

But a boundary is likely to be put after an adverbial clause if both this clause and the main clause are long enough and said with more than three accents.

 (37) a, ˈkurŭm ˈhan chogagi ˈsarajidŭs / ˈsaramŭi

    (cloud) (one) (piece) (disappear) (people-of)

    ˈmoksumdo ˈsarajinda.

    (lives-too) (disappear)

    (Just as a (piece of) cloud disappears, so do

    people's lives.)

   b, ˈilchŏnggwanŭn ˈtarŭge / ˈurinŭn ˈhangugŭl

    (schedule-from) (differently) (we) (Korea)

    ˈpangmunhaessta.

    (visited)

    (Differently from our schedule, we visited

    Korea.)

2.1.3. Parenthetical Clauses

If a parenthetical clause and the rest of the sentence are long enough and the latter has more than one accent, an intonation group boundary is placed both at the beginning and at the end of this clause.

(38) a, ˈkŭ saramŭn,/ ˈnaega algironŭn,/ ˈyŏngguges ŏ

   (the)(man)   (I)(know-as far as)(Britain-in)

   ˈkongbuhago issŏ.

   (is studying)

   (The man is, as far as I know, studying in

   Britain.)

b, ˈŭmsŏnghagŭn,/ ˈcharŭn morŭjiman,/

   (Phonetics)   (well)(don't know-though)

   ˈmalsorirŭl ˈyŏnguhanŭn hangmuniya.

   (speech sounds)(investigating)(subject)

   (Phonetics, although I'm not sure, is the study

   of speech sounds.)

But if the rest of the sentence following a
parenthetical clause is short and has less than two
accents, a boundary is placed only at the beginning of
this clause.

(39) a, ˈkŭ saramŭn,/ ˈnaega algironŭn, ˈkŏnganghae.

   (the)(man)   (I)(know-as far as)(healthy)

   (The man is, as far as I know, healthy.)

b, ˈŭmsŏnghagŭn,/ ˈcharŭn morŭjiman, ˈŏryŏulkkŏya.

   (Phonetics)   (well)(not know-though)(difficult)

   (Perhaps phonetics is, although I'm not sure,

   difficult.)

2.2. Simple Sentences

A simple sentence (or a clause) consists of one or more elements. These elements are set up on the basis of the relationships (functions) they have in sentence in relation to other elements, especially the predicate. There have been many controversies over how many elements should be distinguished in Korean, especially in the case of nominals[8] We shall assume in this sub-section seven elements -- subject, object, local, instrumental, comparative, adverbial and predicate -- following W. Huh (1983).

If several elements occur in a sentence, one or more intonation group boundaries are likely to be placed, depending on the number of accents and the length, tempo and style of speech.

As discussed in chapter 2, the first element in a sentence normally constitutes theme and is often unaccented. Hence an intonation group boundary cannot be placed after this. But if the first element constitutes 'marked theme' (see Taglicht 1984 for the definition), this element attracts an accent and an intonation group boundary is placed after this.

(40) a, ˈonŭrŭn / ˈSunhoga ˈchŏmshimŭl sassta.

   (today)   (Sunho) (lunch)   (treated)

   (Today, Sunho treated to lunch.)

b, 'hakkyoesŏ / 'Sunhonŭn 'yagurŭl haessta.

(school-at)   (Sunho)   (baseball) (play)

(At school, Sunho played baseball.)

A boundary is likely to be put after the second element in normal speech if a clause is said with more than three accents (cf. chapter 2).

(41) 'nanŭn 'Sunhohago / 'hakkyoe 'kanda.

(I)   (Sunho-with) (school-to) (go)

(I go to school with Sunho.)

The boundary is not placed only after certain elements, because Korean has relatively free word order for constituents other than predicates.

(42) a, 'nanŭn 'hakkyoe / 'Sunhowa 'kanda.

b, 'Sunhowa 'nanŭn / 'hakkyoe 'kanda.

c, 'nanŭn 'naeil / 'hakkyoe 'kanda.

(I) (tomorrow) (school-to) (go)

(I'll go to school tomorrow.)

Interjections, vocatives and conjunctions normally occur at the beginning of a sentence. A boundary is likely to be put after them.

(43) a, ach'a! (/) ch'aegǔl irǒbǒryǒsskuna.

   (alas)   (book)   (have lost)

   (Alas! I've lost the book.)

   b, Sunhoya, (/) ppalliwa.

   (Sunho)   (come quickly)

   (Sunho, come quickly.)

   c, ... kǔrigo (/) chamcharie tǔrǒssta.

   (and)   (bed-to)   (went)

   (And (I) went to bed.)

3. The Functions of Korean Boundary Tones

In this section, we shall discuss various functions of Korean boundary tones. As briefly mentioned in section 1, we assume that Korean boundary tones have 1) grammatical, 2) pragmatic (illocutionary), and 3) attitudinal functions.[9] After we further discuss these functions separately, we shall systematically investigate the correlation between them.

3.1. Grammatical Function

3.1.1. The Relationship with the Sentence Type

In Korean, sentence types are generally marked by terminal endings. Most of the endings are exclusively

used for one sentence type. Yet a few, but frequently used, endings like '-chi(yo)' and 'ŏ/a(yo)' are used with any sentence type. The following table shows very commonly used endings.

(44) Korean Terminal Endings:

Declarative	Interrogative	Imperative	Propositive
-ta	-kka	-shio	-shida
-ne	-na	-ke	-se
-kun	-ni	-ŏ/ara	-cha
	-ŏ/a(yo), -chi(yo)		

It has been widely believed that intonation patterns are determined by the sentence type. That is, yes-no questions take a 'rising intonation' whereas declarative sentences, wh-questions, imperative sentences and propositive sentences take a 'falling intonation'[10](see W. Huh 1985, for example), which is indeed true in the majority of cases[11].

(45) a, Declarative sentences

hakkyoe kane. ((I) am going to school.)

● LL   ● . . . . ⌐LF   ● . . . . ⌐R-F
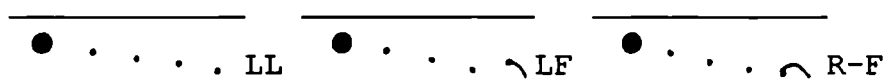
b, Yes-no questions

hakkyoe kana?　(Are you going to school?)

$$\bullet\ \cdot\ \cdot\ \cdot\ \ \text{HL} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \diagup\ \text{FR}[12]$$

c, Wh-questions

ŏdie kana?　(Where are you going?)

$$\bullet\ \cdot\ \cdot\ \cdot\ \cdot\ \text{LL} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \text{LF} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \text{R-F}$$
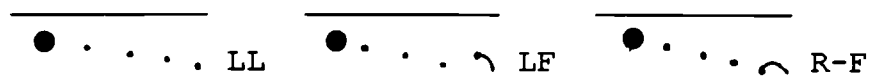
d, Imperative sentences

hakkyoe kage.　(Do go to school.)

$$\bullet\ \cdot\ \cdot\ \cdot\ \cdot\ \text{LL} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \text{LF} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \text{R-F}$$
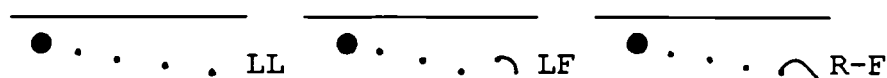
e, Propositive sentences

hakkyoe kaja.　(Let's go to school.)

$$\bullet\ \cdot\ \cdot\ \cdot\ \cdot\ \text{LL} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \text{LF} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \text{R-F}$$
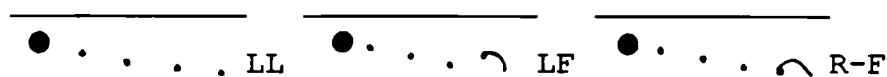
But we find that a yes-no question can readily take a falling intonation and the other sentence types can take a rising intonation,[13] as in (46) below.

(46) a, hakkyoe kane.

$$\bullet\ \cdot\ \cdot\ \cdot\ \ \text{HL} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \diagup\ \text{FR} \qquad \bullet\ \cdot\ \cdot\ \cdot\ \text{F-R}$$

b, hakkyoe ka*na*?

$$\underline{\bullet\ \cdot\ \cdot\ \cdot\ \cdot}\ \text{LL} \qquad \underline{\bullet\ \cdot\ \cdot\ \cdot\ \diagdown}\ \text{LF}$$

c, ŏdie ka*na*?

$$\underline{\bullet\ \cdot\ \cdot\ \cdot\ \cdot}\ \text{HL} \qquad \underline{\bullet\ \cdot\ \cdot\ \diagup}\ \text{FR} \qquad \underline{\bullet\ \cdot\ \cdot\ \cdot\ \checkmark}\ \text{F-R}$$

d, hakkyoe ka*ge*.

$$\underline{\bullet\cdot\ \cdot\ \cdot\ \cdot}\ \text{HL} \qquad \underline{\bullet\ \cdot\ \cdot\ \cdot\ \diagup}\ \text{FR} \qquad \underline{\bullet\ \cdot\ \cdot\ \cdot\ \checkmark}\ \text{F-R}$$

e, hakkyoe ka*ja*.

$$\underline{\bullet\ \cdot\ \cdot\ \cdot\ \cdot}\ \text{HL} \qquad \underline{\bullet\ \cdot\ \cdot\ \cdot\ \diagup}\ \text{FR} \qquad \underline{\bullet\ \cdot\ \cdot\ \cdot\ \checkmark}\ \text{F-R}$$
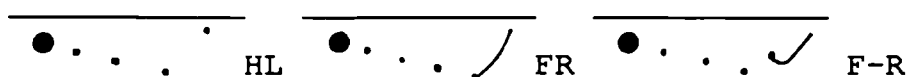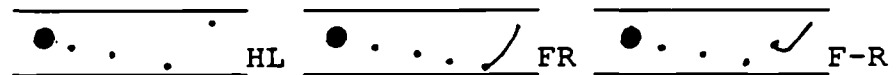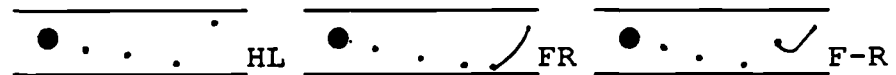
Note that the versions in (46b) are still yes-no questions but those in (46a), (46c), (46d) and (46e) are perceived as echo questions. It seems that illocution (i.e. question, statement, command and so on) plays a greater role than the sentence type in the choice of the boundary tone. Hence we might conclude that declaratives, wh-questions, imperatives and propositives take a rising intonation if they are used as echo questions, but a falling intonation otherwise (see below for yes-no questions).

However, this generalization also has exceptions. An echo question can also take a falling intonation (the first versions in (47) below) and a non-echo question a

rising intonation (the last two versions of each sentence in (47) below).

(47) a, hakkyoe ka*ne*.
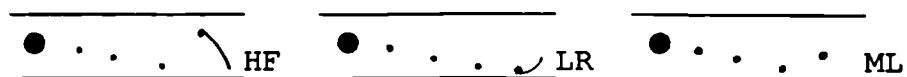
b, ŏdie ka*na*?
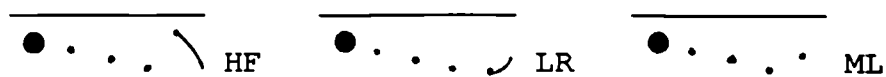
c, hakkyoe ka*ge*.
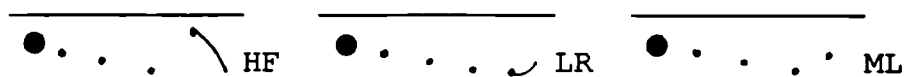
d, kakkyoe ka*ja*.
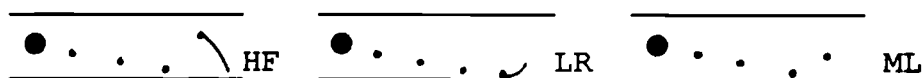
It should be noted that the Fall-Rise in (46) and the Rise-Fall in (45) can be used in both echo and non-echo questions. The Fall-Rise and the Rise-Fall sound `angry' and `sarcastic/ contemptuous' respectively in echo questions, but `patronizing' and `impatient/ being annoyed' respectively in non-echo questions. The Fall-Rise usually ends in a higher pitch and the Rise-Fall rises to a higher pitch in echo questions than in non-echo questions.

A yes-no question can also be used as an echo question. In this case, this sentence can take the High

Level, the High Fall, the Full Rise, the Fall-Rise and the Rise-Fall like other echo questions.

(48) Echo yes-no questions

hakkyoe kana?
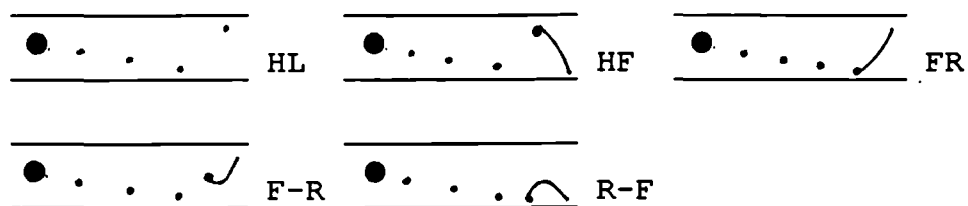
The High Level in (48) above is usually pronounced higher than that in (45b).

Note that the terms 'rising intonation' and 'falling intonation' have been used in tune-based intonation analysis among Korean scholars. Within our tone-based intonation analysis, the 'rising intonation' should be interpreted as the intonation pattern containing the High Level, the Full Rise, the Low Rise, the Fall-Rise or the Mid Level, and the 'falling intonation' as that with the Low Level, the High Fall, the Low Fall or the Rise-Fall. Apparently, this dichotomy does not capture any significant generalization, as we can see from the above discussion. However, we can set up other important natural classes on the basis of the sentence type, endings, illocution, attitudinal meanings or the correlation between all or at least some of these. For example, the High Level, the High Fall, the Full Rise,

the Fall-Rise and the Rise-Fall constitute a natural class in that they are used for echo questions. (Note that this class contains falling boundary tones like the Rise-Fall and the High Fall). Similarly, the Low Level, the Low Fall, the Rise-Fall, the Mid Level, the Low Rise and the Fall-Rise constitute another natural class for statements. This issue will be further discussed throughout this section.

No less importantly, it is apparent from the above discussion that there is no combination of a sentence type and a boundary tone which is actually ill-formed.

Does the boundary tone, then, have no relationship with the sentence type? The answer is that it does have at least three relationships.

First of all, the boundary tone occasionally offers the major perceptual cue for the sentence type of the sentences containing the ending '-ŏ/a(yo)', as briefly discussed in section 1.

(49)   hakkyoe *ka*.

    a, As a declarative (I'm going to school.)
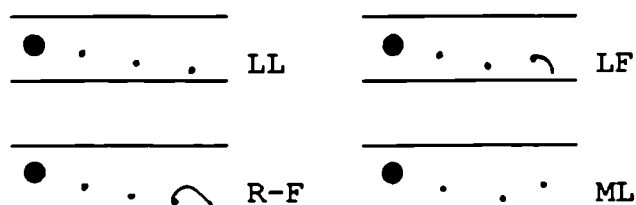
b, As a yes-no question (Are you going to school?)

$$\bullet \quad \cdot \quad \cdot \quad ' \quad \text{HL} \qquad \bullet \quad \cdot \quad \cdot \quad / \quad \text{FR} \qquad \bullet \quad \cdot \quad \cdot \quad \backslash \quad \text{HF}$$
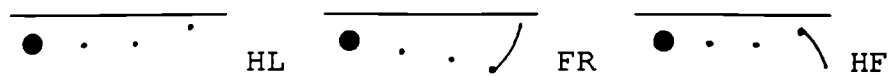
c, As an imperative ((Please) go to school.)

$$\bullet \quad \cdot \quad \cdot \quad \bullet \quad \text{LL} \qquad \bullet \quad \cdot \quad \cdot \quad \text{LF} \qquad \bullet \quad \cdot \quad \cdot \quad \text{R-F}$$

$$\bullet \quad \cdot \quad \cdot \quad \text{LR} \qquad \bullet \quad \cdot \quad \cdot \quad \text{F-R}$$
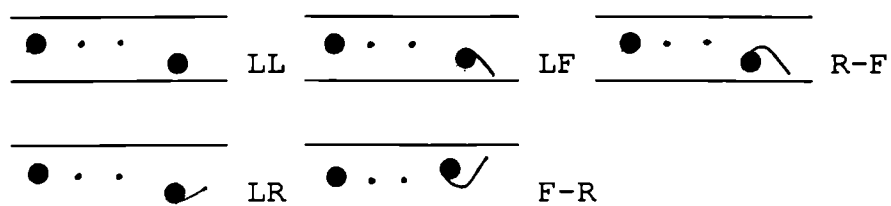
Note that both declarative and imperative sentences can take the Low Level, the Low Fall and the Rise-Fall as in (49a) and (49c). In this case, these two sentence types can be distinguished by different accent placements. That is, the predicate of a declarative sentence is normally unaccented unless otherwise narrowly focused, since it is prosodically the weakest element in the sentence. In contrast, the predicate of an imperative sentence is often (though not always) accented because it contains the major information about the speaker's command.

This sentence can also take the Low Rise and the Fall-Rise when used as a declarative sentence, if an overt first person subject is present and the speaker (this subject) calls the hearer's attention to his/her act or a fact so that the hearer may become a witness of this (cf. (55b))[14]

To a certain extent, the boundary tone may also offer a perceptual cue for the sentence type of the sentences with the ending '-chi(yo)'. But these sentences take very different sets of boundary tones as compared with sentences containing '-ŏ/a(yo)', although the ending '-chi(yo)' can also be combined with any sentence type like '-ŏ/a(yo)'.
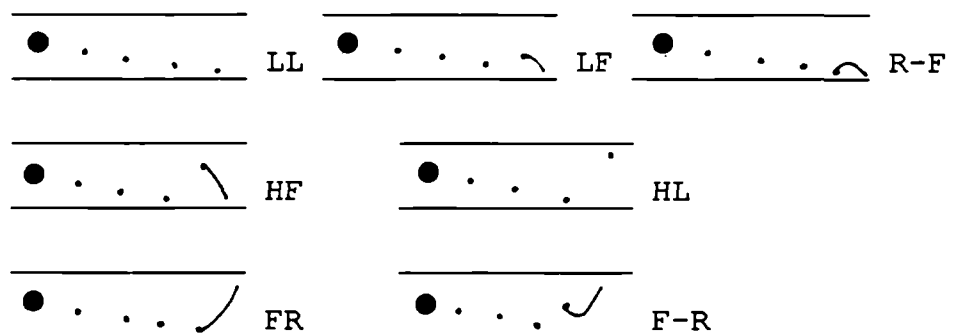

(50)　hakkyoe kaji.

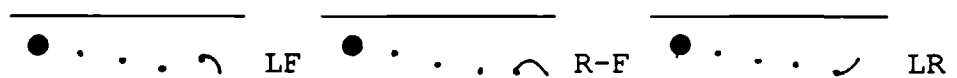　　　a, As a declarative　(I'm going to school.)

　　　　LL　　　LF　　　R-F

　　　　ML　　　LR　　　F-R
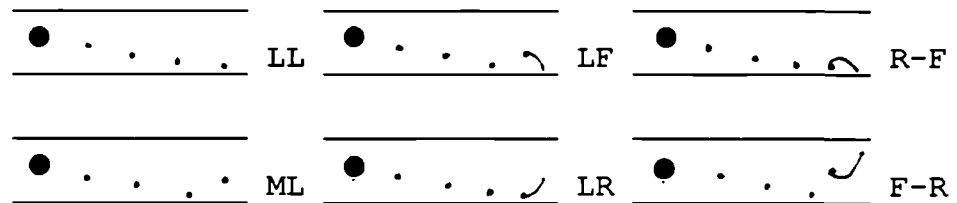
　　　b, As a yes-no question

　　　　(You're going to school, are'nt you?)

　　　　LL　　　LF　　　R-F

　　　　HF　　　HL

　　　　FR　　　F-R

　　　c, As an imperative (Why don't you go to school?)

　　　　LF　　　R-F　　　LR

The above sentence takes the six boundary tones as in
(50a) when used as a declarative, like other declarative
sentences. When this sentence is used as a yes-no
question, this takes the seven boundary tones as in (50b)
unlike other yes-no questions. When used as an
imperative sentence, this sentence conveys the illocution
'suggestion' due to the inherent meaning of the ending
'-chi(yo)' and takes only the Low Fall, the Rise-Fall and
the Low Rise. Note that the Low Fall and the Rise-Fall
can be used throughout the sentence type, and the Low
Level, the Low Rise and the Fall-Rise in two sentence
types. In this case, the context seems to offer the
major cue for the distinction.

On the other hand, the boundary tone which falls on
an ending other than '-ŏ/a(yo)' and '-chi(yo)' does not
play as important a role as the one which falls on
'-ŏ/a(yo)' and '-chi(yo)' in distinguishing the sentence
type auditorily. It is because the sentence type is
already marked by the ending. For example, the sentence
'hakkyoe ka*ne*' in (45a), (46a) and (47a) can take any
boundary tone. Whatever the boundary tone this sentence
takes, the fact that the grammatical mood of this
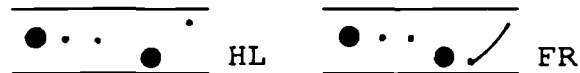sentence is declarative does not change.

Secondly, whether a sentence with a wh-word is used
as a wh-question, a yes-no question, or an echo question
is distinguished by the boundary tone (and accent
placement) (cf. sub-section 2.1. chapter 2).

(51)   Ŏdie kani?
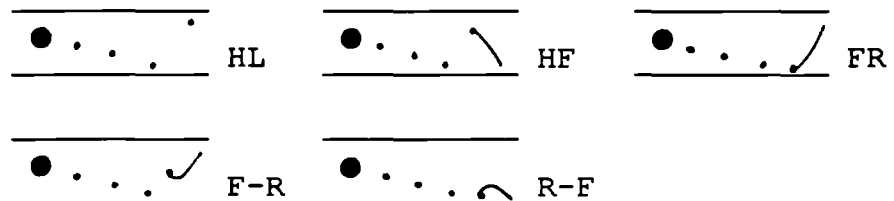
a, As a wh-question   (Where are you going?)
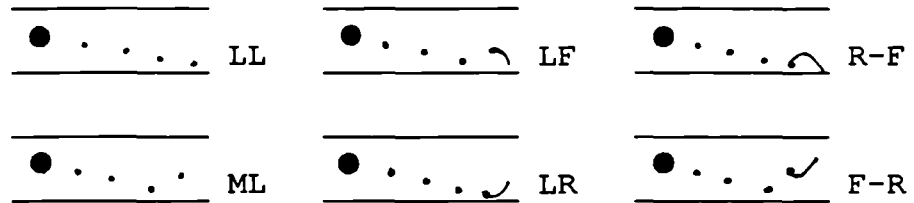
b, As a yes-no question (Are you going somewhere?)

c, As an echo question[15]

(Did you say, "Where are you going?")

Like other wh-questions and corresponding echo questions, this sentence takes one of the six boundary tones when used as a wh-question and one of the five boundary tones when used as an echo question. But when this sentence is used as a yes-no question, it can take only the High Level and the Full Rise, but not others, unlike other yes-no questions.

Interestingly, a wh-question with the ending '-chi(yo)' takes different boundary tones except when

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used as an echo question, compared with other
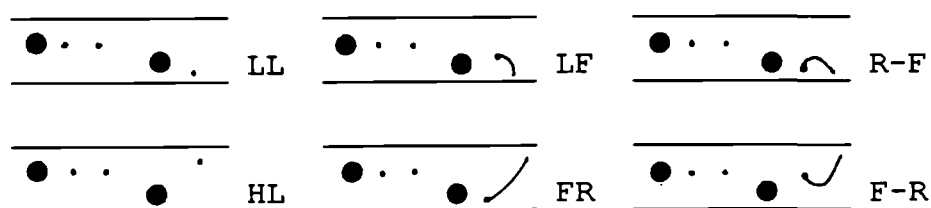wh-questions like the one in (51a) above.

(52)   ŏdie kaji?[16]

   a, As a wh-question (Where are you going?)

   [● · · · ˙] HL   [● · · · ↙] LR   [● · · · ✓] F-R
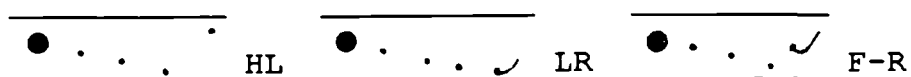
   b, As a yes-no question
       (You're going somewhere, aren't you?)

   [● · · ● ·] LL   [● · · ● ↘] LF   [● · · ● ⌒] R-F

   [● · · ● ˙] HL   [● · · ● ╱] FR   [● · · ● ✓] F-R

It should be noted that the Low Rise and the
Fall-Rise in (52a) are used only when the speaker
questions himself or herself (see the 'deliberative'
question in the next sub-section).

Thirdly, the choice among possible boundary tones
for an illocution is often constrained by the sentence
type and the terminal ending.   For example,   the
illocution 'request' can be realized by more than one
sentence type and its possible boundary tones   are
constrained by the sentence type and the ending.

(53) Request

    a, By an imperative sentence

      mul chom chuseyo. (Please give me some water.)

        ● ·   ·   · · LL   ● · · · ↘ LF

        ● · · · ⌒ R-F

      hakkyoe ka. (Please go to school.)

        ● · · ●⁄ LR   ● · · ●⁄ F-R

    b, By an interrogative sentence

      mul chom chushigessŭmnikka?

      (Could you give me some water please?)

        ● ·   ·   · · · ↘ LF

        ● ·   · · · · · HL

    c, By a declarative sentence

      mul chom mashigoship'ŏyo.

      (I'd like to drink some water.)

        ● ·   · · · · · LL

        ● · · · · · · ↘ LF

        ● · · · · · ⌒ R-F

As we can see above, a request can take the Low Level, the Low Fall, the Low Rise, the Rise-Fall, the Fall-Rise and the High Level, but takes different sets of boundary tones depending on the sentence type and the ending. Hence if the sentences in (53a) and (53c) take the High Level, these sentences are not perceived as requests, but as echo questions. By the same token, if the sentence 'hakkyoe ka.' takes the Low Level or the Low Fall, this is perceived as a command (cf. section 1).

3.1.2. The Relationship with the Ending

Terminal endings are bound to have a close relationship with the boundary tone, since most of them are used exclusively for one sentence type and the sentence type is related to the choice of the boundary tone in at least three ways, as discussed above. We have also seen that certain endings like '-ŏ/a(yo)' and '-chi(yo)' (and also several others) take different sets of boundary tones depending on the sentence type to which they are related, compared with other relevant endings.

Certain terminal endings have another interesting and important relationship with the boundary tone. That is, certain endings have more than one meaning (or function), and their different meanings (or functions) are sometimes distinguished by the boundary tone. For example, the ending '-na' is used 1) when a superior

person[17] formally asks a question of an inferior person, 2) when an inferior person informally asks a question of a superior person, or 3) when the speaker anxiously questions himself or herself (see the 'deliberative' question in the next sub-section for this). A sentence with this ending takes different boundary tones depending on these functions. This sentence takes the Low Level, the Low Fall, the High Level and the Full Rise in order to convey the first meaning (function), and the High Level and the Full Rise for the second function. For the last function, this sentence takes only the Low Rise and the Fall-Rise.

    (54)   hakkyoe ka*na*?

        a, When a superior person formally asks a question of an inferior person:

        (Are you going to school?)
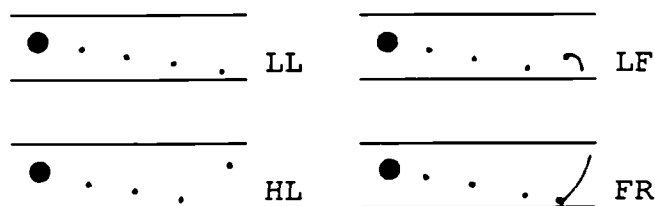
        b, When an inferior person informally asks a question of a superior person:

        (Are you going to school?)

c, When   the   speaker   anxiously   questions
    him/herself:

    (Shall I go to school?)

    • . . . ⌣ LR   • . . . ⌣ F-R

The High Level and the Full Rise usually rises to a
higher pitch in (54b) than in (54a).

Another interesting ending which has a similar
relationship with the boundary tone is '-ne'. This
ending is used 1) when a superior person formally states
something to an inferior person, 2) when a superior
person calls the hearer's attention to his/her act or a
fact so that the hearer may become a witness of this, or
3) when the speaker exclaims. A sentence with this
ending takes the Low Level, the Low Fall and the Mid
Level for the first meaning (function), and the Low Rise
and the Fall-Rise for the second and the last function.

(55) hakkyoe ka*ne*.

    a, When a superior person formally states sth to an
        inferior person:
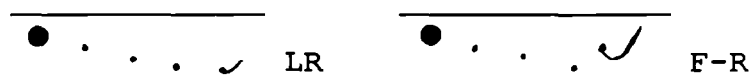
        (I'm going to school.)

        • LL   • . . . ⌐ LF   • . . . · ML

b, When a superior person formally calls the hearer's attention to his/her act or a fact:

(Do remember that I'm going to school.)

● . . . ⌣ LR   ● . . , ⌣ F-R

c, When the speaker exclaims:

((Someone) is going to school!)

● . . , ⌣ LR   ● . . , ⌣ F-R

Note that all other declarative endings except '-chi(yo)' have the second function when used for a statement (cf. (63)), but not other illocutions. Note also that the same boundary tones are used in (55b) and (55c). These are distinguished by voice quality and the context (whether the speaker talks to him/herself or to the hearer).

3.2. Pragmatic Function

A sentence may carry more than one illocution. The different illocutions which a sentence can convey are occasionally distinguished by the boundary tone. For example, if the declarative sentence 'hakkyoe kane.' takes the Low Fall as in (45a), this sentence is perceived as a statement. But if this sentence takes the

High Level as in (46a), this is perceived as a(n echo) question. By the same token, the imperative sentence `hakkyoe kage.' is perceived as a command if this sentence takes the Low Fall as in (45d), but as advice if this takes the Low Rise (cf. (72b)), or as an echo question if this takes the High Level as in (46d). Hence we assume that the boundary tone has the pragmatic (illocutionary) function.

We have seen in the preceding sub-section that a sentence can take all or at least most of the nine boundary tones and thus the sentence type alone cannot affect the choice of the boundary tone. In contrast, most illocutions take a limited set of boundary tones. For example, the illocution `request' can take only the Low Level, the Low Fall, the Rise-Fall, the Low Rise, the Fall-Rise, and the High Level as in (53). As noted earlier, the choice among the possible boundary tones for a request is constrained by the sentence type and the ending. It follows that the pragmatic (illocutionary) function of the boundary tone must be investigated with reference to the sentence type and the ending.

The illocution `question' seems to be the only one which can take all the nine boundary tones. To a certain extent, the choice among them can be accounted for in terms of the sentence type and the ending (see the preceding sub-section). But we shall argue below that we

can explain more if we distiguish several types of question on the basis of different felicity conditions.

S.J. Chang (1973) distinguishes two types of interrogative sentences based on illocution. One is a class of questions by which the speaker attempts to elicit information from the hearer. The other is a class of questions by which the speaker asserts the view opposite to their literal meaning. The sentences of the latter type are called 'rhetorical questions' or 'queclaratives (Sadock 1974)' and their illocutionary force is actually a statement, rather than a question.

S.H. Lee (1984) claims that rhetorical questions normally take a falling intonation whereas non-rhetorical yes-no questions take a rising intonation.

(56) a, nŏ hakkyoe kaya hal kkŏ anini?
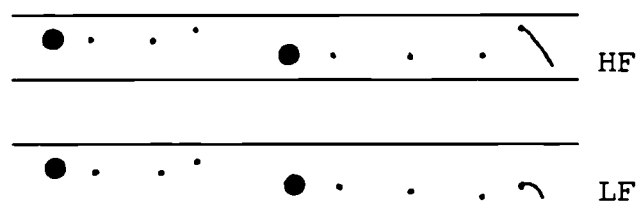
(Literally: Don't you have to go to school?

Actually: You must go to school.)

LL

LF

R-F
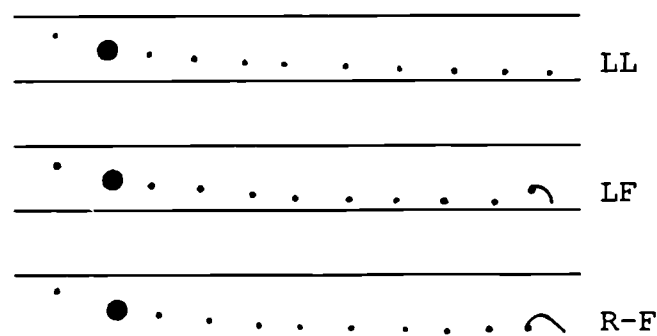
b, yagйl mŏgŏdo musŭn soyongi inni?

(Literally: Even if you take medicine, what's

the use of it?

Actually: Even if you take medicine, it's useless.)

LL

LF

R-F
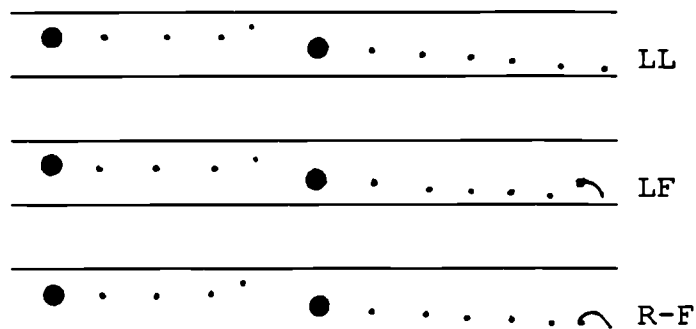
c, naega nŏrйl mannal chul algu?

(Literally: Do you think I will meet you?

Actually: I won't meet you.)

HF

LF

As we can see above, rhetorical questions normally take a falling intonation (falling boundary tone) -- the Low Level, the Low Fall, the Rise-Fall or the High Fall -- as S.H. Lee (1984) claims. The High Fall in (56c) seems to be used only when a rhetorical question contains the ending '-gu'.

Contrary to S.H. Lee (1984)'s claim, however, non-rhetorical yes-no questions often take a falling

intonation (falling boundary tone). For example, the sentence 'hakkyoe ka*na*?' can take the Low Level and the Low Fall as in (46b), even though this sentence is obviously a non-rhetorical yes-no question. In order to explain this, we need to distinguish 'straightforward' from 'conducive' yes-no questions (cf. Hudson 1975). By a straightforward yes-no question, the speaker attempts to elicit information which he or she does not have from the hearer. By a conducive yes-no question, on the other hand, the speaker tries to have the hearer agree with something he or she suspects or knows to be the case. Hence the answer to a conducive question is very likely to be 'yes' rather than 'no'. Straightforward yes-no questions normally take the High Level whereas conducive yes-no questions except those with '-ŏ/a(yo)' or '-chi(yo)' take the Low Level, the Low Fall and the Full Rise as well as the High Level as in (45b), (46b) and (54a,b). Whether the High Level is used for a straightforward or conducive yes-no question is distinguished by the context.

Interestingly, among the four possible boundary tones for conducive yes-no questions, the Low Level and the Low Fall are used if the speaker is sure of his or her opinion (e.g. (46b) and (54a)) and therefore expects only 'yes', but not 'no', as the hearer's answer. But the High Level and the Full Rise are used if the speaker does not rule out the possibility of hearing 'no' as an

answer irrespective of whether he or she merely suspects or is sure of something to be the case.

Sentences containing the ending '-ŏ/a(yo)' takes the High Level, the Full Rise and the High Fall when used as yes-no questions (see (49b)). The High Fall is used for the conducive questions of the first type, and the High Level and the Full Rise for those of the second type.

The ending '-chi(yo)' is always used conducively in a yes-no question (but not in a wh-question) because of its inherent meaning. Recall that this ending can take the High Fall, the Fall-Rise and the Rise-Fall as well as the four tones mentioned above (see (50b)). Among these, the Low Level, the Low Fall, the High Fall, the Rise-Fall and the Full Rise are used for the conducive questions of the first type while the High Level and the Fall-Rise are used for those of the second type.

Rhetorical questions turn into conducive yes-no questions if they take the High Level.

(57) nŏ hakkyoe kayahal kkŏ anini? (cf. (56a))


    HL
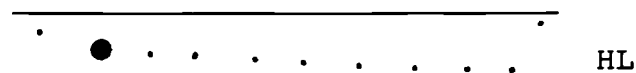
Echo questions can also be analysed into straightforward and conducive questions. Remember that there are two kinds of echo question -- 1) those with the ending '-ta/-nya/-ra/-cha gu' as in (58) below, and 2)

those with other endings as in those in (46), (47) and
(48). The former are used when the speaker wants to have
the hearer confirm the content of his or her previous
remark while the latter are used when the speaker wants
to have the hearer confirm the expression which the
hearer used previously. Each type of echo questions can
be used either as straightforward or as conducive echo
questions. Hence by straightforward echo questions, the
speaker tries to have the hearer confirm whether the
content or the expression he or she has heard is right or
not. By conducive echo questions, on the other hand, the
speaker tries to express his or her annoyance concerning
the expression or the content of what the hearer said
previously. Straightforward echo questions usually take
the High Level whereas conducive echo questions take the
High Fall, the Full Rise, the Fall-Rise and the Rise-Fall
as well as the High Level. The High Level is said with
an extra high pitch and emotional colouring when used in
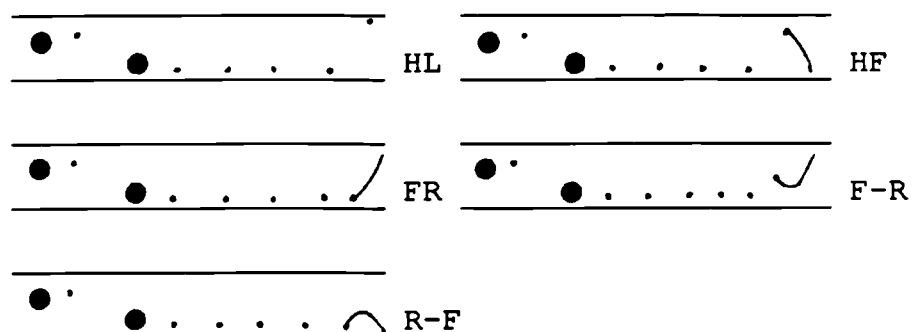conducive echo questions.

(58)   ŏje hakkyoe kass*tagu*?

(Did you say that you had studied yesterday?)

a, As a straightforward echo question


HL
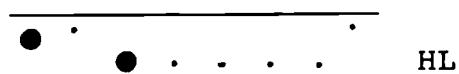
b, As a conducive echo question

There are also questions by which the speaker questions something but expects no answer. This type of question can be called the 'unidirectional' question. Unidirectional questions are similar to rhetorical questions in that the speaker expects no answer, but different from rhetorical questions in that their illocutionary force is not a statement. They are typically used in formal speech (by comperes, public speakers and so on) and take the Low Level and the Low Fall.

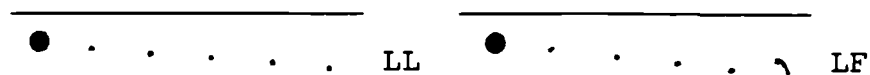(59)   (In a sports programme)

       i kyŏnggirŭl chaemiisske poshyŏssŭmnikka?

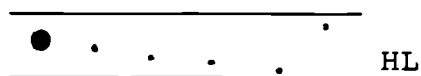   (Have you enjoyed watching this game?)
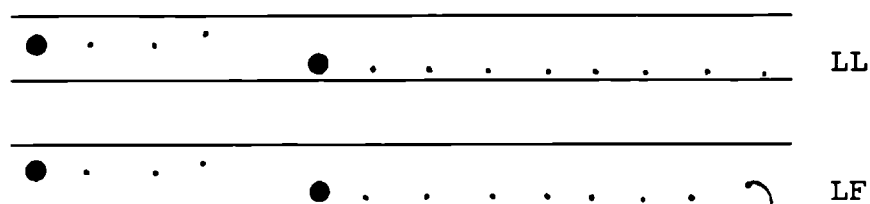
Greetings can be regarded as unidirectional questions because the speaker does not expect any answer and usually take the Low Level and the Low Fall.

(60)   annyŏnghashimni*kka*? (How are you?)[18]

● · · · · · LL   ● · · · · ↘ LF

Greetings turn into yes-no questions if they take the High Level.

(61)   annyŏnghashimni*kka*? (Are you all right?)

● · · · · · HL

Another characteristic type of question is the 'deliberative' question by which the speaker questions himself or herself. Deliberative questions usually convey 'bewilderment' and 'indecision', and take the Low Rise and the Fall-Rise.

(62) a,   Deliberative yes-no questions

       hakkyoe   kal*kka*?   (Shall I go to school?)
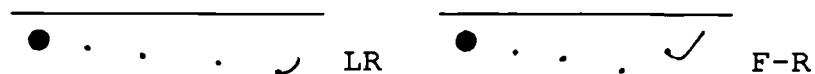
● · · · ↗ LR   ● · · · ✓ F-R

b, Deliberative wh-questions

ŏt'ŏk'e   hana?   (What should I do?)

‾‾‾‾‾‾‾‾‾‾‾‾   ‾‾‾‾‾‾‾‾‾‾‾‾
● . . . ╯ LR   ● . . . ╱ F-R
‾‾‾‾‾‾‾‾‾‾‾‾   ‾‾‾‾‾‾‾‾‾‾‾‾

ŏt'ŏk'e   haji?   (What should I do?)

‾‾‾‾‾‾‾‾‾‾‾‾   ‾‾‾‾‾‾‾‾‾‾‾‾
● . . . ╯ LR   ● . . . ╱ F-R
‾‾‾‾‾‾‾‾‾‾‾‾   ‾‾‾‾‾‾‾‾‾‾‾‾

Note that a yes-no question only with the ending '-na' and a wh-question only with '-na' or '-chi' can be used as a deliberative question (see also (52a)).

3.3. Attitudinal Function

So far we have seen that we have to consider sentence types, endings and illocutions to deal with the functions of the Korean boundary tone properly. Note that the combination of one sentence type (with a specific ending) and one illocution (or one question type like the 'conducive' question) may take more than one boundary tone. The choice among the possible boundary tones for such a combination seems to be accounted for in terms of attitudinal meanings. But the problem is how to deal with attitudinal meanings.

One possible way is to assume that each boundary tone conveys a certain attitude in relation to the combination of one illocution and one sentence type, as

O'Connor and Arnold (1973) did. Concerning the five boundary tones used for echo questions as in (58b) above, for example, we assume that the High Level and the High Fall convey 'interest' and 'surprise', the latter sounding more interested and surprised, and that the Full Rise conveys 'astonishment' and/or 'suspicion', and that the Fall-Rise and the Rise-Fall convey 'anger' and 'contempt/ sarcasm' respectively.

However, each boundary tone can deliver virtually any attitudinal meaning and conversely each attitudinal meaning can be conveyed by any boundary tone, if the speaker uses appropriate voice quality and kinesic information like facial expression and gestures. For example, the Full-Rise in (58b) can also convey 'anger' (otherwise assumed to be delivered by the Fall-Rise in normal speech), if the speaker uses appropriate voice quality and kinesic information. Hence it is theoretically unacceptable to assume that each tone conveys only one or a few specified attitudinal meanings.

Irrespective of this problem, we cannot deny the fact that there is a tendency for one boundary tone to convey one or a few specific attitudinal meanings more frequently than others in normal (friendly) conversation. Therefore, we shall try in the next sub-section to assign one or a few more representative attitudinal meanings to each boundary tone.[19]

3.4. Correlations of the Three Functions

So far, we have discussed the three major functions
-- grammatical, pragmatic (illocutionary) and attitudinal
-- of the Korean bounary tone. It should be noted that
we have investigated these functions largely from the
point of view of the hearer. Hence our main concern was
how the hearer decodes the information conveyed by a
boundary tone. If we examine these functions from the
point of view of the speaker, we find that these
functions are closely related to the mechanism involved
in the choice of the boundary tone. That is, the speaker
has to choose appropriate words, a sentence type with a
specific ending, an illocution, an attitude and so on to
convey certain information. For example, if the speaker
impatiently wants to have the hearer go to school, he or
she has to choose an appropriate expression and
intonation pattern. Given that the sentence `hakkyoe ka.
(Go to school.)' is selected, the speaker has to choose
an appropriate boundary tone (and also an appropriate
phrasal tone). Since this sentence is an imperative
sentence and is intended to carry the illoction
`command', possible candidates are the Low Level, the Low
Fall and the Rise-Fall. Among these, the speaker has to
choose the Rise-Fall in order to convey the impatient
attitude. In this way, we can investigate the

correlation between the three functions and the mechanism involved in choosing one out of the nine boundary tones.

In order to deal with these systematically, we shall, first of all, classify sentences into four sentence types -- declarative, interrogative, imperative and propositive -- following W. Huh (1983). Interrogative sentences will be further analysed into 'yes-no questions', 'wh-questions', 'echo questions' and 'selective questions'. All echo questions will be dealt with under the sub-section heading 'interrogative' in order to avoid repetition of the same description, even if they take another sentence type. Secondly, we shall discuss only a few commonly used illocutions, since there are too many illocutions and most of them seem to take the same set of boundary tones as one (or two) of those illocutions. Thirdly, the illocution 'question' which is carried by interrogative sentences will be further classified into several question types on the basis of different felicity conditions. Fourthly, we shall assign one or more representative attitudinal meanings to each boundary tone which is used for a combination of one sentence type with a specific ending and one illocution (and also a question type in the case of a question). Lastly, certain endings, which take different boundary tones as compared with other relevant endings will be noted.

3.4.1. Declarative

Most declarative sentences can take one of the six boundary tones -- the Low Level, the Low Fall, the Rise-Fall, the Mid Level, the Low Rise and the Fall-Rise -- unless they are used as echo questions.
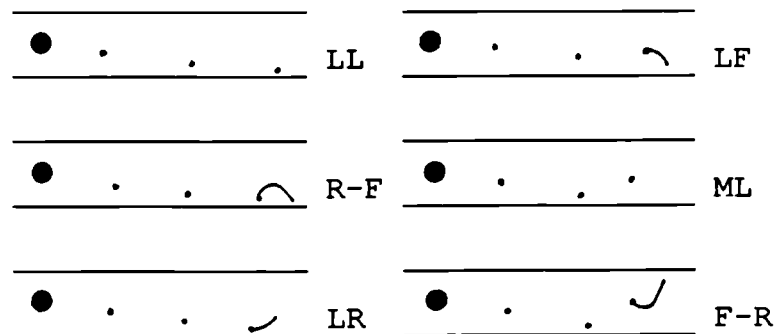
(63) a, Statement

igosŭn ch'aegimnida. (This is a book.)
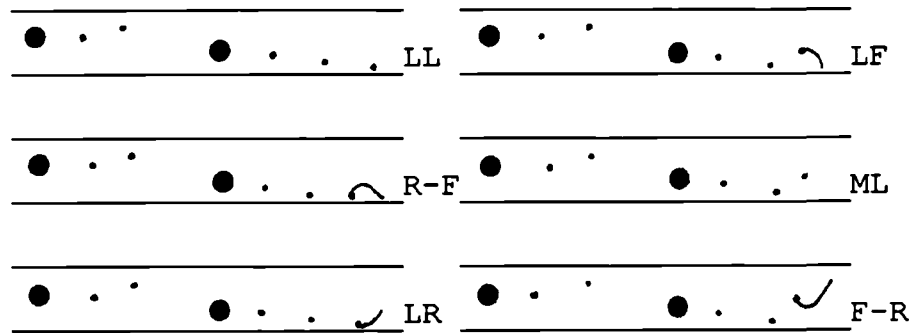
b, Promise

ch'aek sajulkke. (I'll buy you a book.)

The Low Level conveys `definitiveness' and `coolness'. The Low Fall also sounds `definitive' but `friendly'. The Rise-Fall sounds `impatient' or `being

annoyed' and the Mid Level 'blunt' or 'humble'. The Low Rise and the Fall-Rise conveys a 'patronizing' attitude, the latter sounding more patronizing.

Recall that all declarative endings except '-chi(yo)' can be used to call the hearer's attention to a fact or the speaker's act when used for a statement (but not a promise), and that the Low Rise and the Fall-Rise are used for this function (cf. (55b)). Recall also that the ending '-ne' takes these two tones when used for an exclamation (see (55c)).

A statement with the ending '-ŏ/a(yo)' normally takes the Low Level, the Low Fall, the Rise-Fall and the Mid Level (cf. (49a)). This statement can take the Low Rise and the Fall-Rise only when this has an overt first person subject and is used to call the hearer's attention to a fact or the speaker's act, as mentioned earlier.

On the other hand, the illocution 'question' takes only the following four boundary tones.

(64) irŭm chom algoship'ŏyo.

(I'd like to know your name.)
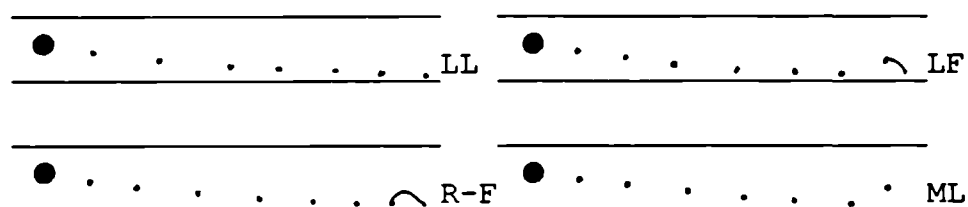
Interestingly, the ending '-(ŭn)de(yo)', which is used to report a fact or an act in response to the hearer's previous question or remark, can take the High Level, the High Fall as well as the six boundary tones.

(65) Sunhonŭn chanŭndeyo. (Sunho is sleeping.)

   (In response to "What is Sunho doing?")
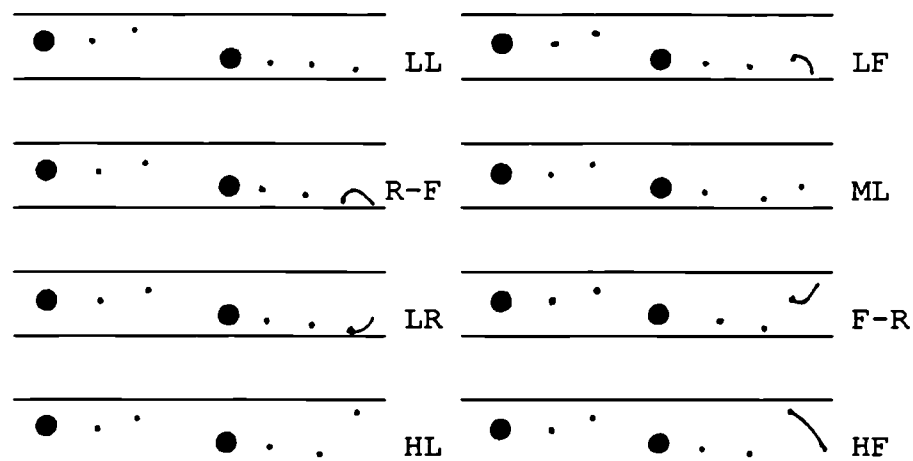
The Low Rise and the Fall-Rise convey a 'protesting' attitude while the High Level and the High Fall convey 'surprise'. The Fall-Rise and the High Fall sound more 'protesting' and 'surprised' respectively than the Low Rise and the High Level.

3.4.2. Interrogative

An interrogative sentence can take all the nine boundary tones. But the choice among them is usually constrained by 1) the type of question, 2) the terminal ending, 3) illocution, and 4) the attitudinal meaning.
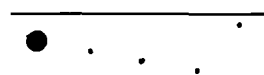
3.4.2.1. Question

3.4.2.1.1. Straightforward Question

Yes-no questions and echo questions take the High Level whereas wh-questions take the Low Level, the Low Fall, the Rise-Fall, the Mid Level, the Low Rise and the Fall-Rise. The first alternative of a selective question typically takes the Mid Level or the Low Rise while the second alternative takes the Low Fall or the Low Level.
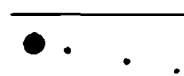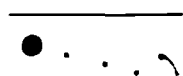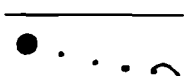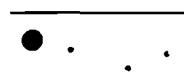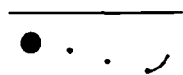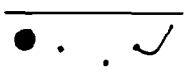
(66) a, Yes-no question

hakkyoe kani? (Are you going to school?)

• . .   ˙
     . .   HL

b, Wh-question
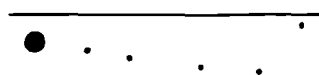
ŏdi kani? (Where are you going?)

• .   . . LL   • . . , ＼ LF   • . . , ⌒ R-F

• .   . ˙ ML   • . . ⌣ LR   • . . ⌣ F-R

c, Echo question

hakkyoe kandagu?

(Did you say you're going to school?)

• . .   ˙
     . .   HL

d, Selective question

ige sur*ini* mur*ini*? (Is this liquor or water?)
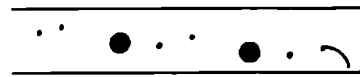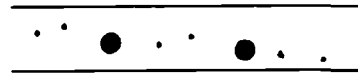
ML(LR) LF   ML(LR) LL

The High Level in (66a) and (66c) usually sounds 'lively' and 'interested'. The Low Level in (66b) and (66d) sounds 'cool' and even 'hostile', but the Low Fall in (66b) and (66d) sounds 'friendly'. The Rise-Fall and the Mid Level in (66b) sound 'impatient/ being annoyed' and 'blunt' respectively. The Low Rise and the Fall-Rise in (66b) sound 'patronizing', the latter being more patronizing.

Recall that a wh-question with the ending '-chi(yo)' takes only the High Level when used as a straightforward wh-question, contrary to other wh-questions (cf. (52a)).

3.4.2.1.2. Conducive Question

A conducive question can be combined with a yes-no question and an echo question, but not with a wh-question or a selective question.

Most conducive yes-no questions seem to take only the High Level and the Full Rise, the Low Level and the Low Fall.

(67)   hakkyoe kattawan*ni*?   (Have you been to school?)
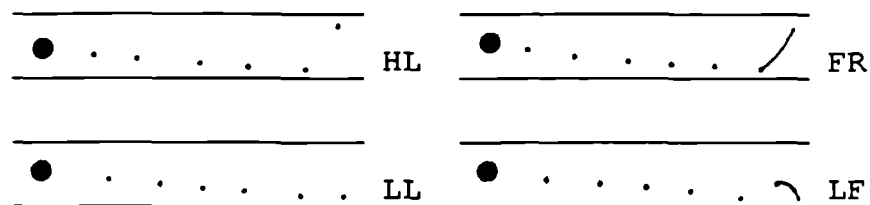
The High Level sounds `interested' and `friendly', and the Full Rise `astonished'. The Low Level conveys a `cool' and even `hostile' attitude, but the Low Fall conveys a `warm' and `friendly' attitude. As mentioned earlier, the Low Level and the Low Fall are used when the speaker expects only `yes' and does not want to allow `no' as an answer.

Recall that a yes-no question containing the ending `-ŏ/a(yo)' as in (49b) normally takes only the High Level, the Full Rise and the High Fall, but one with the ending `-chi(yo)' as in (50b) takes the High Fall, the Fall-Rise and the Rise-Fall as well as the four tones in (67) above. The Fall-Rise and the Rise-Fall in (50b) sound `patronizing' and `impatient/ being annoyed' respectively. Recall also that the sentence in (49b) takes only the High Fall and that in (50b) takes the Low Level, the Low Fall, the High Fall, the Rise-Fall and the Full Rise when the speaker expects only `yes' and does not want to allow `no' as an answer.

If a wh-question containing any interrogative ending except `-chi(yo)' is used as a conducive yes-no question,

this takes only the High Level and the Full Rise (see (51b). But if a wh-question has '-chi(yo)' and is used as a conducive yes-no question, this takes the Low Level, the Low Fall, the Full Rise, the High Level, the Fall-Rise and the Rise-Fall (see (52b)).

A conducive echo question generally takes the High Fall, the Fall-Rise and the Full Rise, the High Level and the Rise-Fall (cf. (58b)).

(68)   hakkyoe kattawan*ni*?

(Did you say, "Have you been to school?")
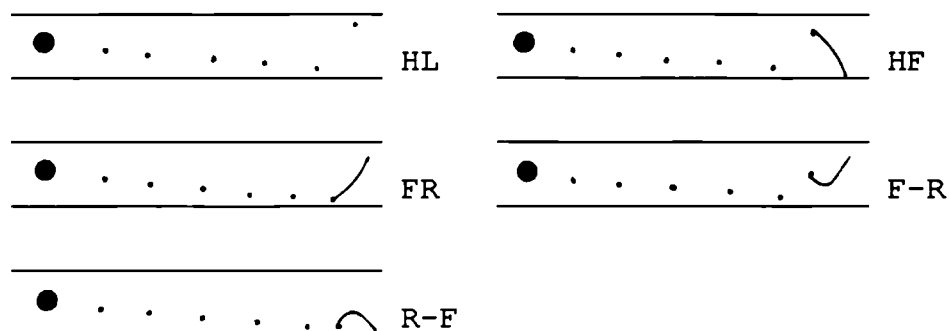
As discusssed earlier, the High Level and the High Fall sound 'interested' and 'surprised', the latter conveying more interested and surprised attitude. The Full Rise sounds 'astonished' and/or 'suspicious'. The Fall-Rise conveys 'anger' and the Rise-Fall 'contempt' or 'sarcasm'. Conducive echo questions often conveys 'protesting' or even 'hostile' attitude because of the speaker's annoyance caused by the hearer's previous remark.

A conducive echo question with the ending
'-ta/-nya/-ra/-cha gu' also takes the five boudnary
tones as in (58b). As mentioned earlier, echo questions
of this type are used when the content of the hearer's
previous remark matters while those of the other type
(i.e. the one in (68) above) are used when the expression
of the hearer's remark matters. Hence the Fall-Rise, for
example, in (58b) is interpreted as 'I'm angry because
you told me you had been to school yesterday.', but that
in (68) as 'I'm angry because you used the wrong
expression.'.

3.4.2.1.3. Rhetorical Question

A rhetorical question, whose illocutionary force is
'statement', can be combined with a yes-no question (cf.
(56a) and (56c)), a wh-question (cf. (56b)) and a
selective question, but not with an echo question.

(69) naega i naie jagurŭl hagenni ch'ukkurŭl hagenni?

(Can I play baseball or football at this age?

: I can play neither of these because of my age.)

LR   LF
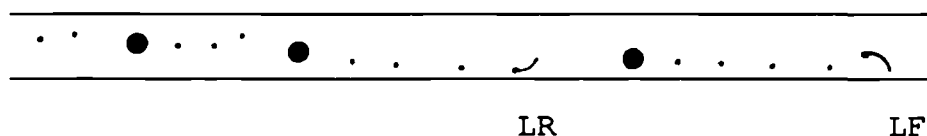
As we can see above, the first alternative of a
selective question typically takes the Low Rise and the

second alternative takes the Low Fall when this question is used as a rhetorical question.

A rhetorical question can take the Low Level, the Low Fall, the Rise-Fall and the High Fall (see (56) and (69)). The Low Level in (56) and (69) sounds 'definitive' and 'cool'. The Low Fall and the Rise-Fall in (56) are 'assertive', the latter being more assertive and even 'contemptuous'. And the High Fall in (56c) sounds 'lively'.

3.4.2.1.4. Unidirectional Question

A unidirectional question can be combined with a yes-no question (cf. (59)) and a wh-question, but not with an echo question or a selective question. It is usually used in formal speech and typically takes the Low Level and the Low Fall.

(70) (In a quiz programme)

onǔrǔn onǔ puni usǔnghalkkayo?

(Who will win in today's competition?)
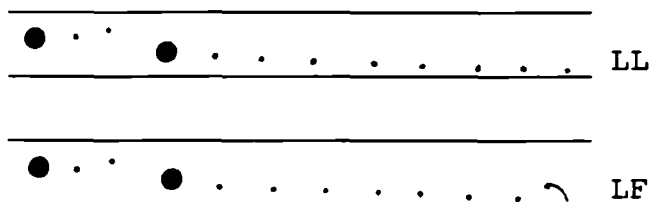
Both the Low Level and the Low Fall conveys
'uninvolved' and 'formal' attitude, but the latter sounds
softer than the former.

As mentioned earlier, greetings can also be regarded
as unidirectional questions (cf. (60)).

3.4.2.1.5. Deliberative Question

A deliberative question can be combined with a
yes-no question (cf. (62a)), a wh-question (cf. (62b))
and a selective question.

(71) Selective question

ige suril*kka* muril*kka*?

(Is this liquor or water?)

LR   LF
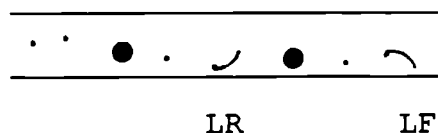
When a selective question is used as a deliberative
question as in (71) above, the first alternative normally
takes the Low Rise and the second alternative the Low
Fall. Note that the above selective question takes the
same boundary tones as that in (69). In this case, the
context offers the major cue for the distinction between
these two types of selective question (i.e. whether the
speaker asks a question of the hearer(s) or questions
himself or herself). Note also that a yes-no question

only with the ending '-ne' and a wh-question only with '-ne' or '-chi(yo)' can be used as a deliberative question, and take the Low Rise and the Fall-Rise when used as such.

The Low Rise and the Fall-Rise in (62) sound 'serious' or 'anxious', the latter sounding more serious or anxious. The Low Rise and the Low Fall in (71) sound 'serious'.

3.4.2.2. Request

The illocution 'request' can be combined only with a yes-no question and take the High Level and the Low Fall (cf. (53b)).

The High Level is used for a 'formal' and 'polite' request whereas the Low Fall is used for a 'friendly' request.

3.4.3. Imperative

Imperative sentences generally take the Low Level, the Low Fall and the Rise-Fall when used as a command. The illocution 'advice' takes the Low Rise, the Fall-Rise and the Mid Level and 'suggestion' the Low Fall, the Rise-Fall and the Low Rise. A request can take the Low Level, the Low Fall, the Rise-Fall, the Low Rise and the Fall-Rise depending on the ending.

(72) a, Command

hakkyoe ka*ge*. (Do go to school.)

● LL   ● . . . ⟍ LF   ● . . . ⌢R-F

b, Advice

hakkyoe ka*ge*. ((I advise you to) go to school.)

● . . . ⤴ LR   ● . . . ⤵ F-R   ● . . . ˙ ML

c, Suggestion

hakkyoe ka*ji*. (Why don't you go to school.)

● . . . ⟍ LF   ● . . . ⌢R-F   ● . . . ⤴ LR

d, Request (cf. (53))

mul chom chus*eyo*. (Please give me water.)

● LL   ● . . . ⟍ LF

● . . . ⌢ R-F

hakkyoe k*a*. (Please go to school.)

● . . ⤴ LR   ● . . ⤶ F-R

As we can see above, one imperative sentence can be
used for more than one illocution and these illocutions

-193-

are distinguished by the boundary tone. For example, an imperative sentence with the ending '-ǒ/a(yo)' as in (72d) is perceived as a command if this takes the Low Level, the Low Fall or the Rise-Fall (cf. (49c)), but as a request if this takes the Low Rise or the Fall-Rise (cf. (72d) above). Similarly, a sentence with the ending '-ke' as in (72a) and (72b) is perceived as a command if this takes the Low Level, the Low Fall or the Rise-Fall (cf. (72a)), but as advice if this takes the Low Rise, the Fall-Rise or the Mid Level (cf. (72b)). On the other hand, an imperative sentence with the ending '-chi(yo)' is used only as a suggestion because of its inherent meaning and takes the Low Fall, the Rise-Fall and the Low Rise (see (72c)).

The Low Level in (72a) and (72d) sounds 'cool' and 'definitive'. The Low Fall and the Rise-Fall in (72a), (72c) and (72d) sounds 'friendly' and 'impatient/ being annoyed' respectively. The Low Rise in (72b), (72c) and (72d) sounds 'patronizing' or 'deliberate'. The Fall-Rise in (72b) and (72d) sounds more patronizing than the Low Rise. And the Mid Level in (72b) conveys a 'blunt' attitude.

3.4.4. Propositive

A propositive sentence can take the Low Level, the Low Fall, the Rise-Fall, the Mid Level, the Low Rise and the Fall-Rise.

(73) Proposal

hakkyoe kaja. (Let's go to school.)

● LL	● . . . ⌐ LF
● . . . ⌒ R-F	● . . . · ML
● . . . ⌣ LR	● . . . ✓ F-R
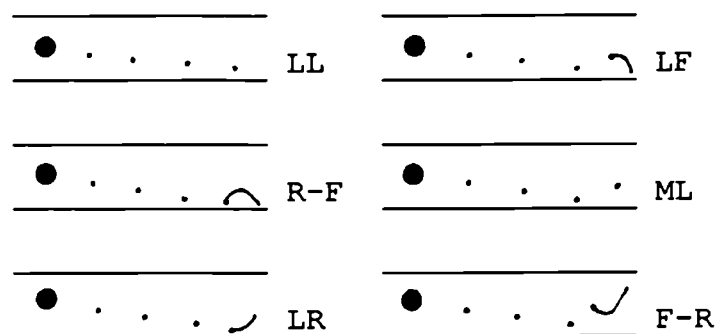
The Low Level is 'cool' and 'uninvolved'. The Low Fall sounds 'friendly', but the Rise-Fall 'impatient/ pressing' or 'being annoyed'. The Mid Level sounds 'blunt'. Both the Low Rise and the Fall-Rise sound 'patronizing', the latter being more patronizing.

CHAPTER 4. VOWEL LENGTH

1. Introduction

Vowel length in Korean functions as a distinctive feature. We find many minimal pairs which are established on the basis of the vowel length feature.

(1) pa:m (chestnut)   vs. pam (night)

     nu:n (snow)   vs. nun (eye)

     i:l (work)   vs. il (one)

There are also many words which contain one or more long vowels but do not have proper counterparts to constitute such minimal pairs.

(2) sa:ram (human being), ŭmshik (food)

     to:pta (help), mae:ng yŏ:nsŭp (hard-training)

Hence vowel length is assumed to be specified at underlying representations[1]. Yet vowel length is not always realized as specified at underlying representations. An underlying long vowel may on occasion be pronounced short while an underlying short vowel may be pronounced long. The former process is called 'vowel shortening', and the latter 'compensatory

lengthening' because it involves compensation for the loss of syllabicity of a vowel. The vowel shortening process can be analysed into two distinct subrules: 1) the Morphophonemic Vowel Shortening Rule (MVSR) in the sense that this rule refers to morphological, syntactic and lexical information, and 2) the Phonetic Vowel Shortening Rule (PVSR) in the sense that this rule contains only phonetic information[2].

We shall discuss these processes in the following sections, paying special attention to the phonetic vowel shortening process in order to show how this process can be best formulated and explained within the overall structure of Korean prosody, which we have established in the preceding chapters.

In addition, we shall investigate in the last section how the phonetic, rather than phonological, duration of a vowel varies in different phonetic contexts.

2. Morphophonemic Vowel Shortening[3]

In this section, we shall briefly review three separately formulated vowel shortening rules, based on B.G. Lee (1975), and combine them into a single rule -- the Morphophonemic Vowel Shortening Rule (MVSR). We shall also discuss S.G. Kim (1987)'s view of this morphophonemic vowel shortening process.

If a monosyllabic predicate stem which has an underlying long vowel is followed by an ending beginning with a vowel, the stem vowel is shortened.

(3) ŏ:l + ŏ --> ŏrŏ,   ŏ:l + ko --> ŏ:lgo
     (freeze)
     u:s + ŏ --> usŏ,   u:s + ko --> u:sko
     (laugh)

This process does not apply to a class of predicate stems, which must be specified in the lexicon as not subject to this rule.

(4) kkŭ:l + ŏ --> kkŭ:rŏ,   pŏ:l + ŏ --> pŏ:rŏ
     (pull)   (earn)
     cho:l + a --> cho:ra
     (doze)

Interestingly, this process does not apply to nominals. Hence an underlying long vowel in a nominal is retained even when it is followed by a postposition beginning with a vowel.

(5) pa:m   +   i   --> pa:mi
     (chestnut)(subject marker)
     ch'ŏ:n + ŭl --> ch'ŏ:nŭl
     (cloth)   (object marker)

This process does not take place within a (lexicalized) morpheme, either.

(6)　kŏ:in (giant), sa:ŏp (business)

　　　to:ip (adopting sth.), pi:usta (deride)

Based on the above observation, we need to specify the following information when we formulate this process: 1) phonetic information -- this process takes place only before a vowel, 2) morphological information -- only a class of predicate stems, which we shall call `pred. A' for convenience, undergo this process, and 3) syntactic information -- this process occurs only at a morpheme boundary. In addition to these items of information, morphological information concerning the type of morphemes attached to the class A predicate stems (i.e. ending, suffix [nominalization], or suffix [passivization, causativization]) must be specified in the rule as in (7) below (and also (10), (13) and (15)). This will be justified later in this section.

Therefore we can tentatively formulate this process as follows, specifying all the information discussed above:

(7)　V --> [-long]/ ## X__X]pred.A + VX]ending[4]

Vowel shortening also takes place in the derivation
of nouns from predicates. A long vowel in a monosyllabic
predicate stem is shortened if a suffix beginning with a
vowel is attached to the stem to form a derived noun.

(8) ŏ:l + ŭm --> ŏrŭm,   u:s + ŭm --> usŭm
      (freeze)   (ice)   (laugh)   (smile)

cf.) mi:l + kae --> mi:lgae, ppae: + ki --> ppae:gi
      (plane: verb) (plane: noun) (subtract) (subtraction)

Interestingly, this process also applies only to the
pred. A.

(9) pŏ:l + i --> pŏ:ri,   cho:l + ŭm --> cho:rŭm
      (earn)   (earnings) (doze)   (nap)

Hence we can formulate this process as follows:

(10) V --> [-long]/ ## X __ X]pred.A + VX]suff.[nom][5]

A very similar process also occurs in the derivation
of passives and causatives. This derivation takes place
by attaching one of several suffixes like 'i, hi, li, ki'
to predicate stems. This derivation is associated with a
syntactic transformation.

(11) kŏ:l + li + ta ---> kŏllida

    (tackle)   (be tackled)

    u:s + ki + ta ---> uskida

    (laugh)   (cause to laugh)

    pe: + i + ta ---> peida

    (cut)   (be cut)

Note that the underlying long vowels in (11) get shortened even when a suffix beginning with a consonant follows.

This process also applies only to the pred. A.

(12) pŏ:l + li + ta ---> pŏ:llida

    (earn)   (be earned)

    ssŏ:l + li + ta ---> ssŏ:llida

    (shred)   (be shredded)

Hence we formulate this process as follows:

(13) V --> [-long]/ ## X __ X]pred.A + X]suffix[6]

                                [pass, caus]

Interestingly enough, this process does not take place in the derivation of adverbs from predicates even when a suffix beginning with a vowel is attached to a predicate stem which has a long vowel.

(14)   ki:l + i ---> ki:ri

     (long)   (forever)

     ma:nh + i ---> ma:nhi

     (many, plentiful) (much)

This fact, together with the fact that an underlying long vowel of a monosyllabic predicate stem belonging to the pred. A is shortened if an ending or a nominalization suffix beginning with a vowel, or any passivization or causativization suffix follows, has led us to specify this morphological information in rule (7), (10) and (13).

So far, we have discussed three separately formulated vowel shortening rules. If we examine these rules carefully, we find that they are closely related and thus can be combined into a single rule, which we want to call the 'Morphophonemic Vowel Shortening Rule (MVSR)'. This rule can be formulated as follows:

(15) MVSR:

V -> [-long]/## X__X]pred.A + <V>X]<ending>

                                            <suff.[nom]>

                                          suff.[pass, caus]

On the other hand, S.G. Kim (1987) admits only rule (7), neglecting rule (10) and (13), because in his view, the derivatives which undergo the vowel shortening

process are already lexicalized and thus they must be ignored in synchronic description. But many speakers of Korean seem to have linguistic competence regarding the relationship between the predicate stems and the derivatives derived from them. Therefore, we should establish a method to relate the stems to the derivatives, even if we accept his view. One solution would be to set up a via-rule which is identical to rule (15) without '<ending>' (see Hooper 1976 for details).

3. Compensatory Lengthening

There are two kinds of compensatory lengthening in Korean. One occurs within a morpheme and the other takes place across a morpheme boundary. Hence the former process can be called the 'Morpheme Internal Compensatory Lengthening (MICL)' and the latter process the 'Inter-Morpheme Compensatory Lengthening' (ICL). In this section, we shall briefly discuss these two lengthening processes, based on B.G. Lee (1975, 1978). We shall argue that the mysterious lengthening of the stem vowels of the so-called 's' irregular predicates and those of the predicates whose stems end in 'h', a process which occurs when these vowels are immediately followed by an ending vowel, can be well explained in terms of the Morpheme Internal Compensatory Lengthening rule.

3.1. **Morpheme Internal Compensatory Lengthening**

When two vowels are in sequence within a morpheme, the second vowel being high (close), this vowel is optionally deleted and the first vowel is lengthened to compensate for the loss of the following vowel. Hence this process, which we call the 'Morpheme Internal Compensatory Lengthening (MICL)', can be formulated as follows:

(16) MICL (cf. B.G. Lee 1975):[7]

    V [V, +high]   --->   [+long] ø
    1   2   1   2

    ssoida --> ssoe:da (be stung)

    nuida --> nwi:da (cause sbdy to lie down)

    taŭm --> ta:m (next time), kaŭl --> ka:l (autumn)

    muu --> mu: (raddish), naeil --> nae:l (tomorrow)

Note that an Umlaut process takes place before the MICL if the first vowel is a front vowel and the second vowel is 'i', as in 'ssoida --> ssoe:da' and 'nuida --> nwi:da'. (Remember that 'oe' and 'wi' are monophthongs (i.e. front half-close rounded vowel and front close rounded vowel respectively) in the romanization system of Korean. They may be pronounced as [we] and [ɥi] respectively in certain environments.) Note also that this compensatory lengthening process applies only to a

limited set of Korean original morphemes (cf. ssauda
(fight) --> *ssa:da, sŏul (Seoul) --> *sŏ:l etc.). Hence
these morphemes must be specified in the lexicon.

3.2. Inter-Morpheme Compensatory Lengthening

When two vowels abut at a morpheme boundary, causing
a hiatus, there are three ways of avoiding it, depending
on the first vowel. One possibility is that the first
vowel becomes a semi-vowel (Glide Formation). The second
possibility is that one of the two vowels is deleted
(Vowel Deletion). Or, the last possibility is that a
semi-vowel is inserted between the two vowels (Glide
Insertion). Let us investigate what happens to vowel
length in the first two cases.

If a monosyllabic predicate stem ends in `i, o, u'
and is followed by the ending `ŏ/a', the stem vowel
optionally becomes a semi-vowel (i --> y and o, u --> w)[8].
And the second vowel is lengthened simultaneously.

(17)   p'i + ŏssta ---> p'iŏssta / p'yŏ:ssta

       (bloom)

       po + assta ---> poassta / pwa:ssta

       (see)

       chu + ŏssta ---> chuŏssta / chwŏ:ssta

       (give)

If the stem vowel is underlyingly long, this vowel undergoes the morphophonemic vowel shortening process first, and then optionally undergoes the glide formation and the lengthening processes with the following vowel.

(18) pi: + ŏssta ---> piŏssta / pyŏ:ssta

      (be empty)

      sso: + assta ---> ssoassta / sswa:ssta

      (shoot)

      kku: + ŏssta --> kkuŏssta / kkwŏ:ssta

      (borrow (money))

As we see in (17) and (18), this process is also a kind of compensatory lengthening because this results in compensation for the loss of syllabicity of the preceding vowel.

This process does not take place if the preceding morpheme is a nominal.

(19) toshi + e ---> toshie / *toshye:

      (city) (at)

      namu + e ---> namue / *namwe:

      (tree) (at)

This process does not occur within a (lexicalized) morpheme, either.

(20) kiŏp ---> *kyŏ:p,   toan ---> *twa:n

   (company)   (design)

   puŏk' ---> *pwŏ:k'

   (kitchen)

Hence when we formulate the inter-morpheme compensatory lengthening process, we need to specify the following information: 1) phonological information -- only 'i, u, o' undergo this process before 'ŏ/a', but not before 'ŭ', 2) syntactic information -- only predicate stems undergo this process when immediately followed by the ending 'ŏ/a', and 3) the glide formation and the vowel lengthening take place simultaneously. It follows that this process is also morphologically conditioned (morphophonemic).

Based on the above discussion, we can formulate the Inter-Morpheme Compensatory Lengthening (ICL) as follows:

(21) ICL:

        [i, o/u]stem + ŏ/a   --->   [y, w] [+long][9]
            1   2   1   2

However, we cannot find any lengthened vowel predicted by rule (21) in the following examples.

(22) chŭlgi + ŏssta   --->   chŭlgiŏssta / chŭlgyŏssta

     (enjoy)

nanu + ŏssta ---> nanuŏssta / nanwŏssta

(divide)

We assume that the bisyllabic stems actually undergo rule (21) with the following vowel, but the lengthened vowels get shortened by the Phonetic Vowel Shortening Rule (PVSR), which will be discussed in the next section.

(23) chŭlgiŏ --ICL--> chŭlgyŏ: --PVSR--> chŭlgyŏ

Thus we can establish the following rule ordering.

(24) MVSR (15) ---> ICL (22) ---> PVSR (42)

On the other hand, the Inter-Morpheme Compensatory Lengthening process does not take place if one of the two abutting vowels at a morpheme boundary is deleted. This vowel deletion falls into one of the following four cases, three of them being related to predicates and the other one to nominals.

First, if the second vowel, which belongs to the ending, is 'ŭ', this vowel is obligatorily elided.

(25) ŭ ---> ø / V + _____[10]

   ka + ŭmyŏn --> kamyŏn,   se: + ŭmyŏn --> se:myŏn

   (go)   (count)

kku + ŭmyŏn --> kkumyŏn, kku: + ŭmyŏn --> kku:myŏn

(dream)   (borrow)

ssŭ + ŭmyŏn --> ssŭmyŏn, k'ŭ + ŭmyŏn --> k'ŭmyŏn

(write)   (grow up)

Note that the second 'ŭ' is deleted in 'ssŭ + ŭmyŏn' and 'k'ŭ + ŭmyŏn'.

Second, if the first vowel is 'ŭ' and the second vowel 'ŏ', 'ŭ' is deleted even though this is a stem vowel.

(26)   ssŭ + ŏsŏ --> ssŏsŏ,   k'ŭ + ŏsŏ --> k'ŏsŏ

       (write)   (grow up)

The elision of the stem vowel 'ŭ' before 'ŏ' occurs because 'ŭ' is the weakest vowel (cf. J.W. Yu 1985).

Third, if the first vowel is 'e, ae' and the second vowel is 'ŏ/a', the second vowel is optionally elided. But if the two vowels are identical (i.e. 'ŏ-ŏ', 'a-a' and 'ŭ-ŭ'), the second vowel belonging to an ending is obligatorily deleted (see (25) for the 'ŭ-ŭ' sequence).[11]

(27)   tte: + ŏsŏ   ---> tteŏsŏ / tte:sŏ

       (detach)

       p'ae + ŏsŏ   ---> p'aeŏsŏ / p'aesŏ

       (beat)

k'yŏ + ŏsŏ   --->   k'yŏsŏ / *k'yŏŏsŏ

(switch on)

na + asŏ   --->   nasŏ / *naasŏ

(be born)

Fourth, if a nominal-final vowel is immediately followed by a postposition or a copula beginning with a vowel, this second vowel is deleted.

(28)   pae + ŭn   --->   paen

(pear)(postp.)

pae + ida   --->   paeda

(pear) (be)

na + ŭl   --->   nal

(I)   (obj. marker)

Hence it is apparent that the vowel deletion does not affect the underlying length of the remaining vowel.

It is to be noted that the vowel deletion takes place before the morphophonemic vowel shortening process.

(29)   # tte: + ŏsŏ #   # tte: + ŏsŏ #

V-Deletion   tte: sŏ   MVSR   tte ŏsŏ

MVSR   ----   V-Deletion   tte sŏ

P-Form   tte:sŏ   P-Form   *ttesŏ

Let us turn our attention to the so-called 's' irregular predicates and the predicates whose stems end in 'h'.

(30) a, nah + asŏ ---> nahasŏ [naasʌ] / na:sŏ
          (give birth to)
     b, nas + asŏ ---> naasŏ / na:sŏ
          (be better)

Interestingly, a lengthening process occurs when the ending vowel is deleted as in the above examples (compare 'na (be born) + asŏ --> nasŏ' in (27)). Hence B.G. Lee (1978) suspects that the lengthening process is triggered by the consonant deletion. But this explanation is not natural. We can offer a more plausible and natural explanation for this lengthening process by assuming that these two classes of predicates (and the other so-called irregular predicates) have two underlying forms -- one with 's' or 'h' and the other with 'ŭ' instead of 's' or 'h'[12] -- and that the underlying forms of the latter type optionally undergo the morpheme internal compensatory lengthening process. For example, the word in (30a) can be analysed as having two underlying forms -- /nah/ and /naŭ/. The former form is combined with endings beginning with a consonant and the latter form with endings beginning with a vowel. If an ending like 'asŏ' follows the stem as in (30a), either the stem vowel 'ŭ'

is deleted (cf. (26)), resulting in 'naasŏ', or the stem /naŭ/ becomes /na:/ by the MICL first and then the ending vowel 'a' is elided (cf. (27)), resulting in 'na:sŏ'.

(31) a,   # naŭ + asŏ #   b,   # naŭ + asŏ #

    V-Deletion na   asŏ   MICL   na: asŏ

                        V-Deletion na: sŏ

    P-Form   naasŏ   P-Form   na:sŏ

It should be noted that the vowel shortening process takes place only once. Hence the output of the Vowel Deletion in (31a) (i.e. # na asŏ #) does not undergo the same process again, avoiding the phonetic form 'nasŏ [nasʌ]'. It should also be noted that the lengthened stem /na:/ does not undergo the morphophonemic vowel shortening process, like 'kkŭ:l- (pull)', 'pŏ:l- (earn)' and 'cho:l- (doze)' in (4).

4. Phonetic Vowel Shortening

B.G. Lee (1986) is the first major work in which the phonetic vowel shortening process is comprehensively investigated. In this work, he distinguishes vowel shortening in complex words from that in utterances which are the same as or bigger than words, on the ground that the former takes place in the course of word formation processes whereas the latter takes place in actual

utterances[13]   And he claims that an underlying long vowel
is shortened in non-initial syllables of a breath group
(as a phonological phrase).   In putting forward this
rule, he notes and discusses the possibility that a
sentence can be said with different numbers of breath
groups.

We shall claim in this section that the alleged two
different vowel shortening processes are in fact one and
that this can be best described and explained by adopting
the term 'accent'.   And we shall also argue that the
degree of possibility for an underlying long vowel to be
shortened in various speech tempos and styles can be
predicted by referring to the prosodic structure of the
sentence to which this vowel belongs.

4.1. Vowel Shortening in Complex Words

A Korean original morpheme can have a long vowel
only in the first syllable (except in the case of certain
exceptional words, such as onomatopoeic words).

(32) sa:ram (human being),   sŏ:t'urŭda (be clumsy)
     kŭ:rim (picture),   to:pta (help)

Let us consider Chinese loan words in which the
same Chinese morpheme appears first in an initial
syllable, then in a non-initial one.

(33) *ko:*guk (故國) vs. sa*:go* (事故)

(home country)   (accident)

*sŏ:ng*kyŏk (性格) vs. nam*sŏng* (男性)

(character)   (male)

In the above examples, we find that the underlying length of each vowel can be detected, and that underlying long vowels are retained only in the first syllables. But since long vowels of the non-initial syllables are never realized and these words are semantically lexicalized, we can assume that a vowel shortening process which applied at the lexical domain took place in the past and the loan words have experienced restructuring (or lexicalization)[14]. It follows that these words, which were originally phrases or sentences in Chinese, must be treated as single morphemes, at least as far as vowel shortening is concerned. Note that there are also Chinese loan words which must be regarded as compounds (see below).

Let us consider the following Korean original compounds in which the second morphemes have a long vowel when not compounded.

(34) a, mok + su:m   ---> moksum

(neck) (breath)   (life)

cha(:)l + mo:s ---> cha(:)lmos

(well)   (cannot)   (mistake)

b, ka:m + to:l + ta ---> ka:mdolda

                (to wind)(turn) (ending) (eddy)

                ttwi + no:l + ta ---> ttwinolda

                (run)   (play)   (gambol)

We find in the above examples that the underlying long
vowels of the second morphemes are pronounced short.   In
order to describe this vowel shortening process, W.J. Kim
(1972) claims that an underlying long vowel[15] is realized
as long only in the first syllable of a 'phonological
word'. And B.G. Lee (1975) claims that an underlying
long vowel is valid only in the first syllable of a
'breath group as a phonological phrase', that is, after a
pause.   On the other hand, S.G. Kim (1987) claims that
the words in (34) are lexicalized and thus must be
treated as single morphemes[16] Hence he ignores the vowel
shortening in lexicalized complex words in synchronic
description.

    Their descriptions do not include complex words
which can have a long vowel in a non-initial morpheme in
actual speech. They seem to use the terms 'phonological
word' and 'breath group' to accommodate a vowel
shortening process occurring in simple phrases like the
following examples.   (Note that B.G. Lee (1986)
successfully expands his rule to longer phrases and
utterances).

(35) han + sa:ram ---> han saram

      (one)   (person)   (one person)

      sae + kŭ:rim ---> sae gŭrim

      (new)   (picture)   (a new picture)

However,   for   some   conservative   speakers,
` ˈka:mdolda' and ` ˈttwinolda' in (34b) may also be
pronounced as ` ˈka:m ˈto:lda'  and  ` ˈttwi ˈno:lda'
respectively in careful speech. (In this respect, the
words in (34a) are more fossilized than these words.)
There are also many compounds of both Korean and Chinese
origin which have a long vowel in the second morpheme in
careful speech. (cf. H.B. Lee 1979)

(36) ˈkajŏng (home) + ˈpa:ngmun (visit)

  --> ˈkajŏng ˈpa:ngmun / ˈkajŏngbangmun (home visit)

     ˈkajuk (leather) + ˈka:bang (bag)

  --> ˈkajuk ˈka:bang / ˈkajukkabang (leather bag)

     ˈkkoch' (flower) + ˈku:gyŏng (sightseeing)

  --> ˈkkoch' ˈku:gyŏng/ ˈkkoch'kugyŏng (flower viewing)

Furthermore, not only compounds but also derivatives
can have more than one long vowel.

(37) a, ˈchis +ˈpa:lpta --> ˈchis ˈpa:lpta / ˈchispalpta
       (firmly) (tread)   (tread firmly)

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'hwi + 'chŏ:sta --> 'hwi 'chŏ:sta / 'hwijŏsta

(strongly) (stir)   (stir strongly)

b, 'pul + 'shi:nim --> 'pul 'shi:nim / 'pulshinim

(non) (confidence) (non confidence)

'pu: + 'kyo:su --> 'pu: 'kyo:su / 'pu:gyosu

(associate) (professor) (associate professor)

c, 'kyŏul + 'nae: --> 'kyŏu 'nae: / 'kyŏunae

(winter) (throughout) (throughout winter)

'mŏgŏ + 'tae:da --> 'mŏgŏ 'tae:da / 'mŏgŏdaeda

(eat) (do sth. eagerly) (gluttonize)

As we see above, underlying long vowels following prefixes of both Korean and Chinese origin (e.g. (37a) and (37b)) may or may not retain their length (depending on the tempo and style of speech and the scope of focus). Quite a few suffixes of Korean origin, not of Chinese origin, may have a long vowel (e.g. (37c)).

So far, we have seen that a morpheme, whether it is a simple word or a part of a complex word, tends to have an underlying long vowel only in the first syllable if it has one. We have also seen that many complex words are lexicalized and thus act like single morphemes, and that there exist different degrees of lexicalization among them as far as the vowel shortening process is concerned. What factors, then, determine the realization of underlying long vowels of non-initial morphemes of complex words?

The first factor is the speech tempo and style (cf. H.B. Lee 1979). All underlying long vowels tend to be pronounced in slow and formal speech whereas only those in the first morpheme are realized in fast and casual speech.

And the second factor is the scope of focus. If a complex word is in broad focus, the realization of underlying long vowels of non-initial morphemes is determined by the speech tempo and style as discussed above. On the other hand, if only one morpheme is narrowly focused, only the long vowel in the focused morpheme is realized in fast and casual speech. But in slow and formal speech, a long vowel in the unfocused morpheme may be pronounced as such if the morpheme precedes the focused morpheme, but is pronounced short if it follows the focused morpheme (cf. (35) in chapter 1).

(38) a, in slow and formal speech

ˈse:gye + ˈtae:jŏn --> ˈse:gye daejŏn

(world) (war) (world war)

ˈse:gye + ˈtae:jŏn --> ˈse:gye ˮtae:jŏn

ˈse:gye + ˈtae:jŏn --> ˈse:gye ˈtae:jŏn

b, in fast and casual speech

ˈse:gye + ˈtae:jŏn --> ˈse:gye daejŏn

ˈse:gye + ˈtae:jŏn --> segye ˈtae:jŏn

ˈse:gye + ˈtae:jŏn --> ˈse:gye daejŏn

* italics: focused morpheme

Hence it is apparent that underlying long vowels assigned to each morpheme in the lexicon may or may not be realized as long, depending on the speaker's decision - the speech tempo and style, and the scope of focus. It follows that the vowel shortening process in complex words is not a matter of the word level, but a matter of the utterance level.

Let us look at the examples in (38) again. We have intentionally marked accents on each version. The examples show that the underlying long vowels are realized as long only in the accented syllables. It is natural because it is accents, not the vowel length, that are actually assigned by the speech tempo and style, and the scope of focus. Thus we can state the vowel shortening rule in complex words as follows:

(39) Underlying long vowels are pronounced short
     in unaccented syllables.

We might also state this rule as follows, modifying B.G. Lee(1986)'s rule.

(40) An underlying long vowel is realized only
     in the first syllable of a rhythm unit.

But this rule fails to describe examples like 'segye ¹tae:jon' in (38b), which has a long vowel in the third

syllable of the rhythm unit. (This fact was not captured
in B.G. Lee (1986).) Hence we choose rule (39) as the
vowel shortening rule in complex words. We find, then,
that rule (39) not only describes our data correctly but
also offers a phonological explanation for the process.
It should be noted here that rule (39) is a phonetic
(phonetically conditioned) rule because it contains only
phonetic information.

4.2. Vowel Shortening in Utterances

We have seen in the previous section that long
vowels of complex words may or may not be shortened
depending on the speaker's decision and therefore they
must be specified in underlying representations. In this
section, we shall investigate how underlying long vowels
are realized in connected speech -- i.e. in utterances.

(41)   'hwa:gaga   'kŭ:rimŭl 'ye:ppŭge 'kŭ:rinda.

        (a painter) (a picture) (beautifully) (is drawing)

        (A painter is drawing a picture beautifully.)

   a, ['hwa:gaga] ['kŭ:rimŭl] ['ye:ppŭge] ['kŭ:rinda]

   b, ['hwa:gaga] ['kŭ:rimŭl] ['ye:ppŭge *gŭ*rinda]

   c, ['hwa:gaga] ['kŭ:rimŭl *y*eppŭge *gŭ*rinda]

   d, ['hwa:gaga *gŭ*rimŭl *y*eppŭge *gŭ*rinda]

The sentence in (41) above can be pronounced as (a) to (d) if it is in broad focus. The different versions are determined by the speech tempo and style in this case. But if only one element is narrowly focused, the last accent of each version, which falls on the narrowly focused element, receives the strongest accent in slow and formal speech while other accents are kept, or all accents except the last ones are suppressed in fast and casual speech. According to B.G. Lee (1986), each bracketed unit is a breath group and underlying long vowels are realized as long only in the first syllable of a breath group. But a long vowel can appear in the middle of the so-called breath group if a non-initial word of a sentence is narrowly focused in fast and casual speech and thus potential accents preceding the last one, which is placed on the focused word, are suppressed as mentioned above (see also the previous sub-section). And the term 'breath group' is not appropriate to refer to the bracketed units. In fact they are 'rhythm units', each of which contains one accent. Hence it is apparent that underlying long vowels are actually pronounced long only in accented syllables, not in the first syllable of a breath group or a rhythm unit.

Note that the vowel shortening process in utterances also takes place in unaccented syllables and that the accent placement in utterances is also determined by the speaker's decision - the speech tempo and style, and the

scope of focus. It follows that the vowel shortening process in utterances is the same process as that in complex words. Hence we want to call the rule for the vowel shortening process both in complex words and utterances 'Phonetic Vowel Shortening Rule (PVSR)', which is identical to rule (39).

(42) PVSR:

Underlying long vowels are pronounced short in unaccented syllables.

4.3. Phonetic Vowel Shortening and Prosodic Structure

We assume further, in addition to the formulation of the PVSR in (42), that we can predict the degree of likelihood for an underlying long vowel to be shortened in various scopes of focus and speech tempos and styles by considering hierarchical prosodic structures of corresponding sentences. We have argued in chapter 2 that we can assign a prosodic structure to each sentence with a small number of prosodic phrase structure rules. Let us assume that relevant prosodic structure rules are applied to the sentence in (41), resulting in the following prosodic structure.

(43)

```
                                      W
                                     / \
                                    /   \
                                   /     W
                                  /     / \
                                 /     /   \
                                /     /     \
                               S     S     S     W
                               |     |     |     |
                            hwa:gaga kŭ:rimŭl ye:ppŭge kŭ:rinda
```
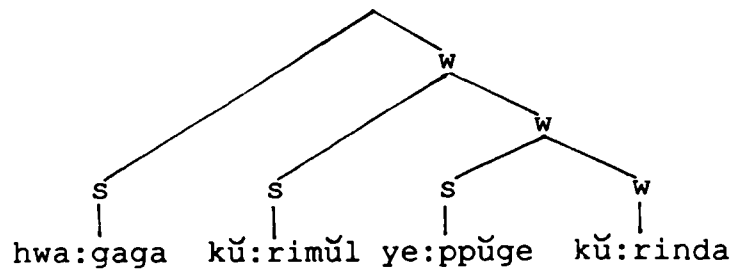
In the above prosodic structure, a weak node is meant to
be less likely to be accented than its strong sister
node.   If we compare the above structure with the actual
versions in (41), we find that the long vowel of a weak
node is more likely to be shortened than that of its
stronger sister node. It follows that our assumption
that we can predict the possibility for an underlying
long vowel to be shortened in various speech tempos and
styles is appropriate.

5. Phonetic Variations of Vowel Length

So far, we have discussed only phonological vowel
length phenomena. That is, our concern was whether a
vowel is phonologically long or short, or whether a long
vowel becomes a short one or vice-versa, based on the
binary feature [± long]. But phonetically, the actual
duration of a phonologically long or short vowel cannot
be the same in different phonetic contexts. We shall,
therefore, investigate in this section the   factors

determining the phonetic, rather than phonological, duration of vowels.

First of all, a vowel is longer in open syllables than in closed syllables, other things being equal.

(44)   sa: $ ram > sa:l $ da

(human being) (live)

po $ da > pon $ nŭng

(see)   (instinct)

Second, a vowel in an open syllable is longer in a rhythm unit final position than in other positions, other things being equal (cf. chapter 2)

(45)   cha $ dong $ ch'a,   pa $ da $ ga

(car)   (sea -- subj.)

If a rhythm unit ends in a consonant, this consonant is usually lengthened instead of the preceding vowel.

Third, a vowel is longer in a rhythm unit with fewer syllables than in one with more syllables, other things being equal.   This tendency consititutes an important argument for the stress-timing hypothesis concerning Korean rhythm, as discussed in chapter 2.

(46)   sa: $ ram > sa: $ ra $ mi $ da

(human being)   (be a human being)

sa $ rang   >   sa $ rang $ sŭ $ rŏp $ da

     (love)   (be lovely)

Fourth, a vowel is longer before a voiced consonant
than before a voiceless consonant, other things being
equal.

     (47)   so:l > so:k

            (brush) (inside)

            pam > pat'

            (night) (field)

But the difference in duration in this case is not as
drastic as that in English.

          Fifth, the duration of a vowel tends to be
proportional to the degree of accent assigned to the
vowel, other things being equal. That is, the stronger
an accent is, the longer the vowel in the accented
syllable is pronounced.

     (48) "shi:$jang 'sa:$ram > 'shi:$jang "sa:$ram

If an accented syllable ends in a consonant, this
consonant tends to be pronounced longer than that in
weakly accented syllable.

CHAPTER 1

1. The object language of this thesis is 'Standard Korean', which is spoken by educated Seoulites (of over 40 years of age).

2. It will be argued in chapter 3 that the greater part of the information conveyed by a tune is concentrated on the pitch pattern of the final syllable of an intonation group, which we shall call the 'boundary tone'. It will be seen that the choice of one out of the nine boundary tones we are going to set up is determined by grammatical, pragmatic (illocutionary) and attitudinal consideration.

3. Further motivation can be found in borrowing and language learning.

    When a foreign word is borrowed by a language, each sound is replaced by the one closest to it in the language. After this procedure is completed, the stress rule of the language, not of the original language, applies to the loan word. For example, Spaniards and Greeks put stress on the second syllable of 'Marlboro (name of a cigarette)', but Frenchmen on the last syllable. Interestingly, Koreans put stress on the first syllable as native speakers of English do. The stress assignment of this word is subject to the Korean Stress Rule (see section 5). Since this word is pronounced as '[malboɾo]' and thus the first syllable is heavy, this syllable attracts stress.

    When people learn a foreign language, they often hear and pronounce the sounds and stress patterns of the language in the wrong way because of the influence of their native language. For example, many Korean learners pronounce the English word 'police' as '[ˈphollis]', with stress on the first, rather than the second, syllable. It is because the first syllable is heavy and thus gets stress. On the other hand, I have heard an American expert on Korean (who speaks near perfect Korean) pronouncing the word 'Samguk Sagi (Three Kingdom's History)' with a stronger stress on the first syllable of 'Sagi' (like

'A_imerican 'history') than on the first syllable of
'Samguk'. This stress pattern sounded foreign in
that situation.

4. I.S. Lee (1967) uses this pair to support his tone
hypothesis. But this pair is distinguished by the
different stress (accent) placements in Standard
Korean.

5. Phonologically long vowels are marked by the symbol
':' to the right of these vowels in chapters 1, 2 and
4. But the vowel length is ignored in chapter 3, as
it is irrelevant in this chapter.

6. Within O'Connor and Arnold (1973)'s intonation
system, accented syllables do not always coincide
with stressed syllables. That is, an underlying
stress may be realized as a rhythmic beat without
being accented.

e.g. 'John has °never °been to the 'moon.

In the above example, 'John' and 'moon' are analysed
as being both stressed and accented, but 'never' and
'been' as being stressed but not accented. Stress is
responsible for timing (stress-timing) and accent for
the accentual function.

But in Korean, stress is suppressed if unaccented.
Hence an accented syllable conveys both the rhythmic
function (i.e. timing) and the accentual function.

7. Among subrules of the Tensification, we are dealing
with only the tensification of a lax obstruent caused
by the preceding plosive, which belongs to the
preceding syllable. Our view is that a
syllable-final lax plosive is tensified by 'Glottal
Reinforcement' when followed by a pause or by an
obstruent, and that the following lax obstruent is
tensified by this tensified plosive.

8. Interestingly, he analysed this process in a
different way in his first edition (1965). He
claimed that the second lax obstruent of the cluster
in question is tensified by a dissimilation process
in order to avoid the repetition of two lax
obstruent.

9. But we believe that this word is pronounced as [b̥at],
   the last plosive being tensified by Glottal
   Reinforcement.

10. Neutralization: /b̥, pʰ, p=/ are neutralized with /b̥/
    syllable-finally (when followed by another consonant
    or a pause). In the same phonetic context, /d̥, tʰ ,
    t=, d̥ʑ, tɕʰ, tɕ=, s, s=, h/ are neutralized with /d̥/
    and /g̥, kʰ, k=/ with /g̥/.

11. Between the two elements of an underlying syllable-
    final consonant cluster, the second one is normally
    elided if followed by a consonant or a pause. But if
    the first element is 'l' and the second one is a
    non-homorganic consonant, the 'l' is deleted (e.g.
    /haltʰ / + /d̥a/ --> [halt=a]).

12. The Coalescence has three subrules:

    1) The coalescence of two identical obstruents

        e.g. two bilabials: /b̥ab̥/ + /b̥od̥a/ --> [b̥ap=oda]
             two alveolars: /b̥ad̥/ + /d̥a/ --> [b̥at=a]
                            /nas/ + /so/ --> [nas=o]
             two velars: /g̥ug̥/ + /g̥a/ --> [g̥uk=a]

    An alveolar plosive is also merged with the
    following alveolo-palatal affricate.

    e.g. /b̥ad̥/ + /tɕʰida/ --> [b̥atɕʰida]

    In this case, the /d̥/ becomes alveolo-palatal
    before this process takes place.

    2) The coalescence of /h/ with the preceding or
       following lax plosive or affricate (but not with a
       fricative)

    e.g. /b̥/ + /h/: /g̥ob̥/ + /hada/ --> [g̥opʰada]
         /d̥/ + /h/: /ma:nh/ + /d̥a/ --> [ma:ntʰa]
         /g̥/ + /h/: /ma:nh/ + /g̥o/ --> [ma:nkʰo]
         /d̥ʑ/ + /h/: /ma:nh/ + /d̥ʑi/ --> [ma:ntɕʰi]

    3) The coalescence of /h/ or [h] (an aspiration
       feature) with the following semi-vowel (cf. (19))

    Coalescence takes place after Neutralization and
    Glottal Reinforcement.

13. Syllable-final obstruents are tensified by Glottal Reinforcement. This process occurs after Neutralization.

14. An alveolar plosive becomes an alveolo-palatal affricate before /i/ or /j/, which belongs to a suffix.

15. /ɥ/ combines only with /i/. /j/ and /ɥ/ are in complementary distribution. But like /h/ and /ŋ/, they are phonetically quite different and Koreans do not believe that they are allophones of the same phoneme.

16. This is also called the 'particle'.

    Postpositions fall into four classes (cf. W. Huh 1983):

    1) Case markers: These are used to mark cases like the nominative and accusative endings of Latin and Greek. These have no lexical meaning.

    2) Postpositions: These have a lexical meaning and functions like English prepositions.

    3) Linking particles: These function to link two nominals so that they can constitute a single element. These have no lexical meaning.

    4) Special particles: These are attached to a clause, not to a nominal. Most of them have a lexical meaning.

17. 'Bound nouns' and 'bound predicates' do not have a full lexical meaning and cannot be used independently. The former are always preceded by an adnominal (adjectival) clause and the latter by a main predicate.

    The term 'predicate' is used to refer to conjugating morphemes in Korean. Hence this covers 'verbs', 'adjectives', the 'copula' and the 'existential'. In section 3 chapter 3, this term will also be used to refer to 'predicate element', which corresponds to English 'verb element'.

CHAPTER 2

1. Phoneticians who prefer the 'rhythm unit' to the 'foot' believe that the clitics are rhythmically closer to the following stress even though they constitute a part of the preceding pitch pattern.

2. We shall call the Korean interrogative pronouns 'wh-words' for convenience.

3. The distinction may be neutralized if both words are emphasized and thus accented.

4. In this version, the second accent is cued only by the rhythmic beat.

5. Korean adnominal (adjectival) clauses correspond to English relative and appositive clauses.

CHAPTER 3

1. It is difficult to define the 'information unit'. Accordingly, the assumption that the information unit is coextensive with one intonation group is dubious.

   Although it is true that an utterance becomes more informative as the number of intonation groups increases, he overlooked the fact that an intonation group also becomes more informative as the number of accents increases.

   e.g. a, 'nanun 'yeppun kurimul kurigo issta. .
        b, 'nanun 'yeppun kurimul 'kurigo issta.
        c, 'nanun 'yeppun 'kurimul 'kurigo 'issta.

   In the above versions, (c) is more informative than (a) and (b).

   Hence an intonation group cannot be regarded as the only information unit. Instead, we assume that both an intonation group and a rhythm unit (accent group) are information units, the former being a higher unit.

2. Since the study of tonicity has concentrated on nucleus placement, the importance of other accents has been neglected. Accents other than the nucleus are also chosen by the speaker so that the hearer can pay attention to accented items. Hence accent placement must be taken into account in the study of intonation.

3. Phrasal tones may start from various pitch heights. The Level phrasal tone in (17c) begins with a low pitch. But we do not treat this as a Low Level tone, since the Falling and the Rise-Falling phrasal tones in (17a) and (17b) may also start from a lower pitch and the differences in meaning caused by different initial pitch heights of a phrasal tone are trivial. The different initial pitch heights convey different degrees of 'involvement', 'interest' and 'liveliness'. Hence the higher pitch a phrasal tone begins with, the more involved, interested and lively attitude it conveys.

4. The functional load of the distinctive intonation group boundary placement seems to be very low. I have found only one more example:

   e.g. ch'ingurǔl wihae (/) kyehoekhaesstǒn yǒhaengǔl
        (friend)   (for) (which (I) had planned)(trip)
        yǒngihaessta.
        (postponed)

   a, I postponed the trip which I had planned for my friend. (Without the boundary)
   b, For my friend, I postponed the trip which I had planned. (With the boundary)

   For the English examples of this type, see Couper Kuhlen (1986: 141-2).

5. Many constructions whose meanings are similar to those of adverbial clauses in English are analysed as coordination constructions in W. Huh (1983)'s framework.

6. '()' refers to the lack of the intonation group boundary.

7. Note that only the predicate of the first clause is deleted. This deletion is called 'gapping' in

transformational syntax (cf. S.J. Chang 1984 for a detailed discussion of this process in Korean).

8. W. Huh (1983) establishes five cases -- nominative, accusative, instrumental, local and comparative.

9. As discussed in section 1, Korean boundary tones do not have an accentual function, which is one of the major differences between them and English nuclear tones. There may be a discourse function. But we shall not explore this.

10. A very similar hypothesis has repeatedly been put forward for English (e.g. Armstrong and Ward (1931)).

11. Despite the lack of intonation system, S.H. Lee (1984) statistically justifies this hypothesis by analysing several radio programmes.

12. 'FR' stands for the Full Rise while 'F-R' stands for the Fall-Rise.

13. This is also true in English.

14. e.g.   **na** hakkyoe ka.
       (Remember that I'm going to school.)

LR   F-R

15. The yes-no question in (51b) may also be used as an echo question. This echo question takes the same boundary tones as those in (51c) but has another accent on the first syllable of 'kana'.

16. This sentence may also be used as a declarative meaning 'I'm going somewhere.'. In this case, this sentence takes the Low Rise and the Mid Level.

17. By a 'superior person', we mean that this person is older in age and/or higher in social status.

Korean terminal endings convey the speaker's attitude toward the hearer (Does the speaker treat the hearer as a superior person, as an inferior person, or as an equal person?), speech style (formal or informal) and grammatical mood as well as their inherent meaning(s).

When two Koreans meet for the first time, they immediately establish their social relationship and use appropriate endings and words accordingly for communication.

18. But its shortened greeting 'annyŏng?' generally takes the High Level.

     e.g.   annyŏng?

           ————— •
             ●
           —————

19. This approach seems to be pedagogically useful as well. It enables students to learn the best way to express frequently used attitudes.

CHAPTER 4

1. See B.G. Lee (1978) for example. W.J. Kim (1972) and B.G. Lee (1975) regard the feature [tense] for long vowels as primary and the feature [long] as subsidiary. But we believe the reverse of this to be true.

2. For more detailed definition of the morphophonemic and phonetic rules, see J.B. Hooper (1976).

In the framework of Lexical Phonology (cf. Mohanan 1982), the Morphophonemic Vowel Shortening process applies at the lexical domain because this process takes place in the lexicon, but the Phonetic Vowel Shortening process applies at the postlexical domain because this process occurs after every word formation process is completed. we shall not explore Lexical Phonology any further.

3. The major works for this rule are K.W. Nam (1954/5), W.J. Kim (1972), C.W. Kim (1976), B.G. Lee (1975) and S.G. Kim (1987).

4. This rule is a slightly modified version of the same rule formulated in S.G. Kim (1987). The variable 'X' denotes C, V, syllable(s) or zero.

5. This is a modified version of the rule in B.G. Lee (1975).

6. This is a modified version of the same rule in B.G. Lee (1975). We have modified the rules (7), (10) and (13) in order to combine them into a single rule.

7. Most of the versions which have undergone this process are regarded as substandard.

8 If an ending begins with a vowel, this vowel must be either 'ŭ' or 'ŏ/a'. The alternation between 'ŏ' and 'a' is determined by the preceding vowel (by Vowel Harmony). If the preceding vowel is 'a' or 'o', then 'a' follows. Otherwise 'ŏ' is chosen. 'ŭ' is always elided after any preceding vowel.

9. This is a modified version of the same rule in B.G. Lee (1978).

10. 'ŭ' is also deleted if the preceding morpheme ends in 'l' (e.g. tal (be sweet) + ŭmyŏn --> talmyŏn (cf. W.J. Kim 1972)). But we neglect this here because this is irrelevant to our present discussion.

11. The stem vowels are assumed to be deleted in B.G. Lee (1978) in these sequences, probably based on the deletion of the stem vowel 'ŭ' before 'ŏ' (i.e. ssŭ (write) + ŏsŏ --> ssŏsŏ). But as we see in the examples like 'ssŭ + ŭmyŏn --> ssŭmyŏn' and 'k'ŭ + ŭmyŏn --> k'ŭmyŏn' in (25), it is more plausible to assume that the ending vowels are elided.

12. M.O. Choi (1985, 1988) was the first to assign two underlying forms to the so-called irregular

predicates. According to his analysis, 'nas- (be better)', an s-irregular predicate, should be analysed as having /nat/ and /na/ as underlying forms.

S.G. Kim (1988) agrees with the idea of assuming two underlying forms for irregular predicates but posits slightly different underlying forms. According to his view, 'nas-' is anlaysed as having either /nat/ and /na?/, or /nat/ and /naŭ/ as underlying forms. This vowel lengthening process constitutes an argument for positing the latter pair.

Like the irregular predicates, we can also assign two underlying forms to predicates like 'nah- (give birth to)', which have been believed to undergo the 'h' deletion.

13. That is, within the framework of Lexical Phonology, the former applies lexically and the latter postlexically.

14. It seems to have taken place only a few decades ago. Dictionaries published between 1930s and 1950s show that long vowels were pronounced in non-initial syllables in a number of words. These dictionaries also show inconsistencies concerning the specification of the long vowels in the non-initial syllables. That is, an underlying long vowel is specified as long in some words, but as short in other words. We can assume from this fact that the restructuring was taking place during this period. It is interesting that this period coincides with the increasing trend to use only Korean script.

15. A tense vowel in his terms.

16. Within his framework, 'moksum' and 'cha(:)lmos' in (34a) are semantically lexicalized, and 'ka:mdolda' and 'ttwinolda' in (34b) are morphologically lexicalized.

REFERENCES

Abercrombie, D. 1964. Syllable Quantity and Enclitics in English. in *In Honour of Daniel Jones*, Abercrombie et al, eds. London: Longmans. 216-222

Armstrong, L.E. and Ward, I.C. 1931. *A Handbook of English Intonation*. Cambridge: Heffer & Sons

Bolinger, D.L. 1961a. Contrastive Accent and Contrastive Stress. *Language* 37. 83-96

Bolinger, D.L. 1961b. *Generality, Gradience, and the All-or-none*. The Hague: Mouton

Chang, S.J. 1973. *A Generative Study of Discourse: Pragmatic Aspects of Korean with Reference to English*. Language Research 9-2 (supplement).

Chang, S.J. 1984. Reference and Anaphora. *Hangŭl* 186. 115-149

Choi, M.O. 1985. The Phonological Phenomena of Irregular Verbs in Korean: p-, s-, and t-Irregular Verbs (in Korean). *Kugŏhak* 14. 149-188

Choi, M.O. 1988. The Phonological Phenomena of Irregular Verbs in Korean: lŭ-, lŏ-, ae (yŏ)- and h-Irregular Verbs (in Korean). *Ŏhakyŏngu* 24-1. 41-68

Chomsky, N. and Halle, M. 1968. *The Sound Pattern of English*. New York: Harper and Row

Couper-Kuhlen, E. 1986. *An Introduction to English Prosody*. London: Edward Arnold

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

Crystal, D. 1975. *The English Tone of Voice*. London: Enward Arnold

Gimson, A.C. 1980. *An Introduction to the Pronunciation of English*. 3rd edn. London: Edward Arnold

Gussenhoven, C. 1983. Focus, Mode, and the Nucleus. *Journal of Linguistics* 19. 377-417. Reprinted in Gussenhoven (1984)

Gussenhoven, C. 1984. *On the Grammar and Semantics of Sentence Accents*. Dortrecht: Foris Publications

Gussenhoven, C. 1985. The Intonation of George and Mildred: Post-nuclear Generalizations. Reprinted in Gussenhoven (1984).

Halliday, M.A.K., McIntosh, A. and Strevens, P. 1964. *The Linguistic Sciences and Language Teaching*. London: Longmans

Halliday, M.A.K. 1967a. *Intonation and Grammar in British English*. The Hague: Mouton

Halliday, M.A.K. 1967b. Notes on Transitivity and Theme in English. Part 2. *Journal of Linguistics* 3. 199-244

Hogg, R. And McCully, C.B. 1987. *Metrical Phonology: A Course Book*. Cambridge: Cambridge University Press

Hooper, J.B. 1976. *An Introduction to Natural Generative Phonology*. New York: Academic Press

Hudson, R.A. 1975. The Meaning of Questions. *Language* 51. 1-31

Huh, W. 1983. *Korean Linguistics* (in Korean). Seoul: Saem Munhwasa

Huh, W. 1985. *Korean Phonology* (in Korean). new edn. 1st edn (1965). Seoul: Saem Munhwasa

Hulst, H. van der and Smith, N. (eds.) 1982. *The Structure of Phonological Representations* (Part 2). Dortrecht: Foris Publications

Jones, D. 1986. *An Outline of English Phonetics*. 9th edn. 7th Repr. Cambridge: Cambridge University Press

Kim, C.W. 1976. ̆The Function of Vowel Length in Korean (in Korean). *Ŏmunyŏngu (Ch'ungnam Univ.)* 9

Kim-Renaud, Y.K. 1975. *Korean Consonantal Phonology*. Seoul: Tower Press.

Kim, S.G. 1987. Lexeme-based Phonological Processes (in Korean). *Kugŏyŏngu* 77

Kim, S.G. 1988. A Synchronic Description of Non-Automatic Alternations (in Korean). *Kwanagŏmunyŏngu* 13. 25-44

Kim, W.J. 1972. For a Phonological Solution to Morphological Issues (in Korean). *Tongamunhwa (Seoul Nat'l Univ.)* 11. 273-299

Kim, Y.S. 1981. *A Study of Korean Sounds* (in Korean). 2nd. edn. Seoul: Kwahaksa

Ladd, D.R. 1980. *The Structure of Intonational Meaning.* Bloomington: Indiana University Linguistics Club

Lee, B.G. 1975. Phonological Rules and Non-Phonological Constraints (in Korean). *Kugŏhak* 3. 17-44. Reprinted in B.G. Lee (1979)

Lee, B.G. 1978. Vowel Lengthening and its Compensatory Function in Korean (in Korean). *Kugŏhak* 3. 1-28. Reprinted in B.G. Lee (1979)

Lee, B,G. 1979. *Constraints in Phonological Rules* (in Korean). Seoul: Tower Press

Lee, B.G. 1986. Vowel Length in Utterances (in Korean). *Kugŏhak* 15. 11-39

Lee, H.B. 1971. A Phonetic Description of Korean Vowels (in Korean). *Language Research* 7-1. 37-52

Lee, H.B. 1973. A Phonetic Study of the Accent in Korean (in Korean). *Mullidaehakpo (Seoul Nat'l Univ.)* 19. 1-16

Lee, H.B. 1974. The Rhythm and Intonation of Seoul Speech (in Korean). *Language Research* 10-2. 15-25

Lee, H.B. 1979. Problems in Re-Collecting Standard Korean (in Korean). *Hangŭl* 163. 81-106

Lee, H.B. 1982. A Phonetic Study of Korean Rhythm. *Malsori* 4. 31-48

Lee, H.Y. 1987. *A Study of Korean Accent* (in Korean). MA thesis, Seoul Natioanl Univ.

Lee, I.S. 1967. An Investigation on the Accent of Modern Korean (in Korean). *Hakssulwŏnnonmunjip* 6. 131-146

Lee, S.H. 1984. *A Study on Sentence Final Intonations in Korean* (in Korean). MA Thesis, Seoul National University

Lee, S.N. 1960. A study of Accent in Modern Korean Spoken in Seoul (in Korean). in *Kugŏhak Nongo.* Seoul: Tongyang Ch'ulp'ansa

Liberman, M. and Prince, A. 1977. On Stress and Linguistic Rhythm. *Linguistic Inquiry* 8. 249-336

Mohanan, K.P. 1982. *Lexical Phonology.* Bloomington: Indiana University Linguistics Club

Nam, K.W. 1954/5. On Vowel Length (in Korean). *Kugŏgungmunhak* 12/13.

O'Connor, J.D. and Arnold, G.F. 1973. *Intonation of Colloquial English.* 2nd edn. London: Longman

O'Connor, J.D. and Trim, J.L.M. 1953. Vowel, Consonant and Syllable : a Phonological Definition. *Word* 9: 103-122

Polivanov, V.E. 1936. Zur Frage der Betonungsfunktionen. *TCLP* 6. 75-81

Pulgram, E. 1970. *Syllable, Word, Nexus, Cursus.* The Hague: Mouton

Rhee, S.J. 1987. Re-examining Korean Accent (in Korean). *Malsori* 11-14. 133-148

Sadock, J. 1974. *Towards a Linguistic Theory of Speech Acts.* New York: Academic Press

Selkirk, E. 1980. The Role of Prosodic Categories in English Word Stress. *Linguistic Inquiry* 11. 563-605

Selkirk, E. 1982. The Syllable. in van der Hulst and Smith (1982) Part 2. 337-383

Taglicht, J. 1984. *Message and Emphasis.* London: Longman

Trubetzkoy, N.S. 1939. *Grundzuge der Phonologie.* TCLP 7.

Yu, J.W. 1985. On the Hiatus Phenomenon in Modern Korean (in Korean). *Hangŭl* 189. 3-24

Yu, J.W. 1988. A Study of the Accent Placement Rules in Modern Korean (in Korean). *Sŏnggok Nonch'ong* 19. 293-322

Yu, J.W. 1989. A Study on Korean Glottalized Tense Sounds and Aspirates (in Korean). *Hangŭl* 203. 25-48

Zong, I.S. 1965. Korean Speech is a Pitch-Accented Language (in Korean). *Chungangdaehakkyo Nonmunjip* 10. 9-50.

APPENDIX

1. THE TRANSCRIPTION SYSTEM OF KOREAN

The following is the transcription system of Korean used in this thesis. This system follows the IPA principles with slight modifications. Phonetic alphabets used in the text but not listed here have identical sound qualities implied in corresponding IPA alphabets.

1. Vowels

front close unrounded vowel: /i/
front close rounded vowel: /y/
 (Its diphthongal allophone is transcribed as [ɥi]).
front half-close unrounded vowel: /e/
front half-close rounded vowel: /ø/
 (Its diphthongal allophone is transcribed as [we].)
front half-open unrounded vowel: /ɛ/
central open unrounded vowel: /a/
Mid central unrounded vowel: /ə/ (long)
 (Its short allophone is a back half-open neutral vowel
 [ʌ].)
back half-close rounded vowel: /o/
back close rounded vowel: /u/
back close unrounded vowel: /ɯ/

2. Consonants

1) Plosives

voiceless slightly aspirated lax plosives: /b̥, d̥, g̥/
voiceless strongly aspirated tense plosives: /pʰ, tʰ, kʰ/
voiceless unaspirated tense plosives: /p=, t=, k=/

/b̥, pʰ, p=/ are neutralized with /b̥/ in syllable-final position. In the same phonetic context, /d̥, tʰ, t=/ are neutralized with /d̥/ and /g̥, kʰ, k=/ with /g̥/. These neutralized plosives are unreleased and tensified by Glottal Reinforcement. We transcribe them simply as [p, t, k].

2) **Affricates (Alveolo-Palatal)**

voiceless slightly aspirated lax affricate: /dʑ/
voiceless strongly aspirated tense affricate: /tɕʰ/
voiceless unaspirated tense affricate: /tɕ=/

These affricates are neutralized with /d̥/ in syllable-final position.

3) **Fricatives**

voiceless slightly aspirated alveolar lax fricative: /s/
voiceless unaspirated alveolar tense fricative: /s=/
voiceless glottal fricative: /h/

These fricatives are neutralized with /d̥/ in syllable-final position.

4) **Nasals**

voiced bilabial nasal: /m/
voiced alveolar nasal: /n/
voiced velar nasal: /ŋ/

5) **Liquids**

voiced alveolar lateral: [l]
voiced alveolar flap: [ɾ]

These are allophones of the same phoneme, not separate phonemes. [ɾ] is used between vowels, but [l] elsewhere. When [l] occurs between vowels, it is pronounced longer than [ɾ] and thus a syllable boundary is believed to be placed in the middle. These sounds cannot occur in word-initial position except in western loan words.

6) **Semi-Vowels**

voiced unrounded palatal approximant: /j/
voiced rounded labio-velar approximant: /w/
voiced unrounded velar approximant: /ɰ/

2. THE ROMANIZATION SYSTEM OF KOREAN

The Romanization of Korean used in this thesis follows the principles of the one publicized by the Ministry of Education in 1984.

1. Vowels

1) **Simple Vowels**

   /i/: i,   /e/: e,   /ɛ/: ae,   /a/: a,   /ə(ʌ)/: ǒ,
   /o/: o,   /u/: u,   /ɯ/: ǔ,   /ø/: oe,   (/y/: wi)

2) **Diphthongs**

   /je/: ye,   /jɛ/: yae,   /ja/: ya,   /jə(ʌ)/: yǒ,
   /jo/: yo,   /ju/ yu,   /wi/: wi,   /we/: we,
   /wɛ/: wae,   /wa/: wa,   /wə(ʌ)/: wǒ,   /ɰi/: ui

2. Consonants

1) **Plosives**

   /b̥, d̥, g̥/: b, d, g between voiced sounds; p, t, k
            otherwise
   /pʰ, tʰ, kʰ/: p', t', k'
   /p=, t=, k=/: pp, tt, kk

2) **Affricates**

   /d̥ʑ, tɕʰ, tɕ=/: ch, ch', tch; j is used instead of ch
            between voiced sounds

3) **Fricatives**

   /s, s=, h/: s, ss, h; sh is used instead of s when
            followed by i

4) **Nasals**

   /m, n, ŋ/: m, n, ng

5) **Liquids**

   [ɾ], [l]: r, l