

A NOTE ON TERMINOLOGY: In this description we distinguish two types of “atonic” nouns of one or two syllables: *atonic L*, which historically come from Middle Korean L(L) words and *atonic R*, which historically come from Middle Korean R(H ~ L). Ongoing analysis has revealed that the *atonic R* is allied to the *preaccent* class, i.e. the *atonic R* perhaps should be labeled “preaccent R” or the like. However, until we work out a definitive analysis and settle on a comprehensive terminology, we have kept the “atonic R” label.

TONE AND ACCENT IN SOUTH KYENGSANG KOREAN NOUNS¹

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1. Introduction

Middle Korean (MK) was a tone language. Accurate documentation of Korean pronunciation dates from Late Middle Korean of the 15th century thanks to the *hankul* writing system, created under the direction of King Sejong. Remarkably, the form of *hankul* used to write middle Korean marked not only segmental phonemes but also tones. Tones were marked in MK by “side dots”. MK had three tones:² low tone (L), which was unmarked; high tone (H), which was marked by a single dot to the left of the syllable; and rising tone (R), which was marked by double dots (resembling a colon) to the left of the syllable. Though the modern use of *hankul* has changed little from the way it was used in MK, tones are no longer marked, even in dialects that retain lexical pitch distinctions. The table below gives examples of MK words in *hankul* with a Yale transliteration³ and the modern *hankul* spelling and Yale transliteration, with accents added marking tones of the modern South Kyengsang reflexes. Here and elsewhere in the paper, we will mark L with a grave accent (*à*), H with an acute accent (*á*), R with a hacek (*ǎ*), and, where useful, a Mid (M = a lowered H) with a macron (*ā*).

MK <i>hankul</i>	MK Yale + tone		Modern <i>hankul</i>	Modern Yale + tone
가·지	<i>kàci</i>	‘eggplant’	가지	<i>kàci</i>
·가·지	<i>káci</i>	‘branch’	가지	<i>káci</i>
가·:지	<i>kàci</i>	‘kind’	가지	<i>kàci</i> (or <i>kāci</i>)
:가·:치	<i>kǎchi</i>	‘magpie’	까치	<i>kkàchi</i>

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² There is a considerable literature attempting to interpret the description of the tones as presented by King Sejong. Modern Korean specialists are now in essential agreement about the pitch distinctions that the “side dots” indicated, but there is still some question as to whether MK had lexical TONE, as in most African languages, or whether tone in MK should be interpreted in terms of a PITCH-ACCENT system (Ramsey (1975), esp. §3.4).

³ The Yale transliteration is the system used in most academic works on Korean, at least where a narrow phonetic transcription is not called for. It is essentially a character-for-character Romanized transliteration of *hankul* and hence does not mark automatic phonological processes such as intervocalic voicing of lax stops, palatalization of dentals before [i], etc. The main features to note where Yale differs from pronunciations that might be expected from typical uses of Roman characters are the following: doubled consonants = tense consonants; a consonant followed by *h* = aspirated consonant; *c* = IPA [t͡ɕ] → [d͡ʒ] between vowels; *y* = IPA [j]; *wu* = [u]; *u* = [u] except after a labial consonant, where *u* = [u], since the /u/ ~ /u/ distinction is neutralized to [u] after labials; *e* = [ɔ], though this vowel is usually transcribed as “ə” by linguists using a “phonetic” transcription of Korean.

Most dialects of modern Korean do not preserve tones, though some non-tonal dialects preserve a reflex of MK tones in the form of a vowel length distinction, to be discussed below. Along the eastern side of the Korean peninsula, however, the Hamkyeng and Kyongsang regions still retain lexical pitch distinctions that are systematically related to the tones of MK. Sohn (1999:200) says,

“Lexical tones, which do not exist in standard speech, occur in the Kyongsang and Hamkyeng dialects as a reflex of Middle Korean, a tonal language. The Hamkyeng dialect has lexical tones due to the massive migration of speakers of the Kyongsang dialect to that province during the early Cosen dynasty period (in the fifteenth century).”

This quote is followed by a useful list of works dating from the 1960’s which have documented the tonal systems of the Kyongsang and/or Hamkyeng dialects. The implication of the quoted passage is that tone in all modern dialects of Korean is ultimately traceable to the Kyongsang regions of southeastern Korea. But the *hankul* writing system, which marked tone, was created in the 15th century primarily for a region which is now the “central” dialect area. It is therefore difficult to reconcile the claim that Middle Korean as spoken in the 15th century was a tone language with the claim that tone in the Hamkyeng dialects results specifically from the influx of speakers of the Kyongsang dialect in the 15th century. It seems more likely that these two, now geographically separated dialect areas represent independent retention of an aspect of Korean phonology that held for the language as a whole.

The purpose of this paper is to describe nominal tones in the South Kyongsang (SKS) dialect of Korean, spoken on the southeast corner of the Korean peninsula, where Pusan is the largest city. The description will include tones of nouns in isolation and constructions of which nouns are the head, including nouns with affixed particles, noun-noun compounds, and a few other similar constructions. The tonal structure of verbs and constructions incorporating verbs is complex and will be the subject of later research.

We first describe the phonetic facts related to the use of pitch in SKS, including a partial comparison to the North Kyongsang (NKS) dialect area. This discussion includes the issue of vowel length, which is related to tone. Following Ramsey (1975),⁴ we then discuss the KYONGSANG ACCENT SHIFT, whereby MK tones have shifted one syllable leftward (assuming a left-to-right written representation) in the Kyongsang region. An understanding of this accent shift is crucial for the synchronic analysis that we propose for SKS tone and accent. Following the presentation of our own analysis, we summarize previous literature on Korean tone and accent and compare other analyses to the one that we propose for Kyongsang tones. These deal mostly with NKS rather than SKS, but the dialects are alike in most crucial respects, and it hence seems fair to evaluate other analysis on the basis of what we are proposing for SKS.

2. Tone and intonation

2.1. Inventory of basic nominal tone patterns. Nouns in SKS Korean have a limited set of possible pitch patterns. These have regular correspondences with the tones of Middle Korean (Ramsey 1975). In the table below, we present all the possible pitch patterns in SKS for nouns of one, two, three, and four syllables. Nouns longer than four syllables are rare, if they exist at all, and even many three syllable nouns and perhaps all four syllable nouns could be analyzed, at least historically, into compounds or bases with affixes. Here, we illustrate only nouns that behave as lexical units in modern SKS. The pitch patterns represented here are exhaustive for such nouns. For each noun, we give the

⁴ Some sources on Korean tone cite a published version, Ramsey (1978). We have not been able to locate a copy of this work, but given the fact that the titles of Ramsey (1975) and Ramsey (1978) are identical and the works were published at such close intervals, we assume that the content of the two is identical in crucial respects.

MK tones, the pitch pattern of SKS, and our proposed lexical accentual analysis for modern SKS. We explain the tone correspondences between MK and SKS tones in §3, and we describe and justify our accentual analysis for SKS in §4 and later sections.

MK tone	SKS tone	SKS lexical accent	Hankul	Yale + tone	
One syllable					
L	H	atonic L	말	mál	‘horse’
			배	páy	‘pear’
			초	chó	‘vinegar’
H	H	preaccent	눈	nwún	‘eye’
			배	páy	‘belly’
			비	pí	‘rain’
R	R	atonic R	말	mǎ:l	‘speech’
			눈	nwǔ:n	‘snow’
			새	sǎy:	‘bird’
Two syllable					
LL	LH	atonic L	가지	kàcí	‘eggplant’
			바람	pálám	‘wind’
RT	LH	atonic R	안개	ànkáy	‘fog’
			사람	sálám	‘person’
LH	HL	initial accent	가지	káci	‘kind’
			바늘	pánùl	‘needle’
HT	MH/HH	preaccent	가지	kācí	‘branch’
			바람	pālám	‘wish’
Three syllable					
LLL	LHH	atonic	사다리	sátá lí	‘ladder’
			호라이	hólángí	‘tiger’
LLH	LHL	medial accent	비둘기	pítwúlki	‘pigeon’
			망아지	màngáci	‘colt’
LHT	HLL	initial accent	가물지	kámùlchì	‘mullet’
			며느리	myénùli	‘daughter-in-law’
HTT	MHL/HHL	preaccent	코끼리	khókkíli	‘elephant’
			무지개	mūcíkà y	‘rainbow’
RTT	LHH	atonic	사투리	sàthwúlí	‘dialect’
			마누라	mànwúlá	‘wife’
Four syllable					
LLLL	LHHL	medial accent	딱따구리	ttàkttákwùli	‘woodpecker’
			미꾸라지	mikkwúláci	‘mudfish’

One syllable nouns: MK had monosyllabic nouns with all the possible tone patterns—L, H, R—each of which has a counterpart in SKS. Note that minimal sets for tone can be found among these classes.

Two syllable nouns: Tonal distinctions on syllables following the first H or R of a MK word have been neutralized. The MK HH ~ HL and RH ~ RL patterns are thus represented as HT and RT respectively, where T = either H or L. Moreover, the distribution of R in MK was (entirely?, generally?) restricted to the initial syllable of monomorphemic words.⁵ In citation, the MK LL and RT patterns have fallen together in

⁵ Ramsey (1975:158) lists only three examples of LR, all of which look to be compounds, at least historically, e.g. *yès-wŭn* ‘60’ (cf. *yese* ‘6’). This word is pronounced with HL tones in modern SKS, the pattern that would correspond to MK LH. A preliminary look through a MK dictionary seems to confirm the distribution of R to initial syllables of monomorphemic words. Words with R after the first syllable are all or nearly all compound verbs, compound nouns such as *길: 7/入 kils-kǎs* ‘road-side’ (modern Korean

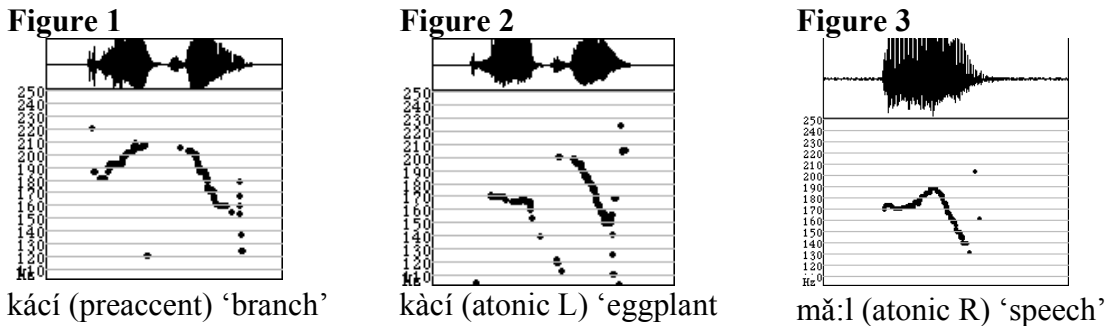
SKS as a LH citation form, but as we will show below, they remain distinct in terms of alternations in larger accent groups.⁶ Nouns from the MK HL pattern are realized as MH or HH in SKS. HH, or even ¹HH, is the normal realization if the first consonant is tense or aspirated (§2.2.2). MH ~ HH seem to be in free variation for other initial consonants.

Three syllable nouns: As with disyllabic nouns, tonal distinctions after the first H or R of MK have been neutralized in modern Korean. Thus, all MK HTT patterns (TT = any combination of H or L) have all neutralized to MHL/HHL in SKS. As with disyllabic nouns, nouns beginning with a tense or aspirated consonant take the HHL (or even ¹HHL) pattern, nouns beginning with other consonants have MHL ~ HHL in free variation. These may, at times, even be pronounced LHL, but they are distinct from “true” LHL nouns like 비둘기 *pitwŭlki* ‘pigeon’ in terms of tonal behavior in larger collocations. MK RTT has neutralized with other tone patterns in SKS.⁷ The most common reflex seems to be phonetic LHH, i.e. neutralization in SKS with the regular reflex of MK LLL. However, there are cases where SKS has LHL and HHL tone patterns in nouns that are reflexes of MK RTT.

Four syllable nouns: Ramsey (1975) does not discuss nouns longer than three syllables, and indeed, non-compound, non-derived nouns of more than three syllables are rare in Korean. Nonetheless, there are a number of four syllable nouns that cannot be broken down into readily analyzable, independently occurring words or morphemes. In SKS, all four syllable nouns have a LHHL tone pattern. Those for which we have been able to find MK etymons have all L tones.

2.2. Intonation and tone-segmental interaction

2.2.1. H → F phrase final. The SKS tone patterns listed in §2.1 are something of an abstraction. On hearing the words pronounced, the most striking fact is that all those ending in ...H actually end with a distinct falling pitch. This includes monosyllabic words like 말 *mǎ:l* ‘speech’, which are pronounced Rise-Fall. This falling pitch pattern is a completely predictable effect on H at an intonational phrase boundary.



2.2.2. Pitch raising by tense and aspirated consonants. Jun (1993) documents the fact that in the Chonnam dialect, which does not have lexical tone/accnt, the canonical

길가 *kilka*), and Sino-Korean words, such as 겸양 *kyèm-yáng* ‘humbleness’, which may have been recognized as compounds at the time.

⁶ The distinction between MK RL vs. RH seems not to be reflected in any modern Korean dialect. Ramsey (1975:157-158) does not mark tone on the second syllable of his disyllabic examples with initial R, but the modern tonal outcome is the same for all of them, regardless of what the second tone might have been. The LL vs. RL/RH patterns remain distinct in NKS (see below).

⁷ In NKS, as with the reflex of disyllabic RT which remains distinct from other disyllabic patterns, the reflex of MK RTT remains distinct from reflexes of other trisyllabic patterns (see below).

accentual phrase has the pitch pattern LHL⁸ except where the phrase begins with a tense or aspirated consonant, in which case it has the pitch pattern HHL. Kenstowicz and Park (2006) document similar effects for these consonants in disyllabic nouns in both NKS and SKS. We have also found that these consonants, including ʌ *s*⁹ and ㅎ *h*, have a pitch-raising effect at the beginning of a word (or, better, at the beginning of an accent group). L tends to be raised to M or even H and H tends to be pronounced on a higher pitch than with comparable words starting with other consonants.

In order to document these effects, we recorded seven sets of nouns. The sets were atonic L 2 (e.g. 꼬치 *kkòchi* ‘pepper’), atonic R 2 (e.g. 까치 *kkàchi* ‘magpie’), atonic 3 (e.g. 사다리 *sàtali* ‘ladder’), preaccent 2 (e.g. 딸기 *ttálki* ‘strawberry’), preaccent 3 (e.g. 찡배기 *ccéngpáyki* ‘crown of head’), initial 2 (e.g. 꼬치 *kkóchi* ‘cocoon’), and medial 3 (e.g. 까마귀 *kkámákwi* ‘raven’).¹⁰ For each set we had one item each with initial tensed stop, initial aspirated stop, initial *s*, initial *h*, initial lax stop, initial nasal, and initial vowel.¹¹ Pitch tracks are given in Figures 4-6 for preaccented trisyllables, medial accented trisyllables, and initial accented disyllables.

Figure 4. Preaccented trisyllables

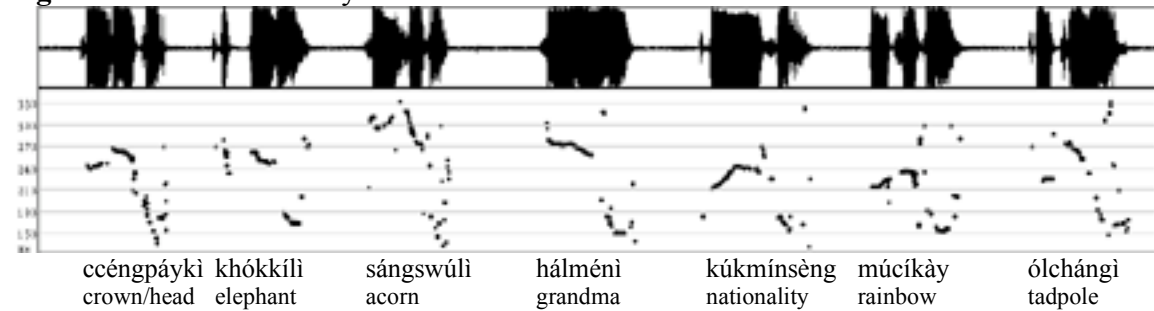
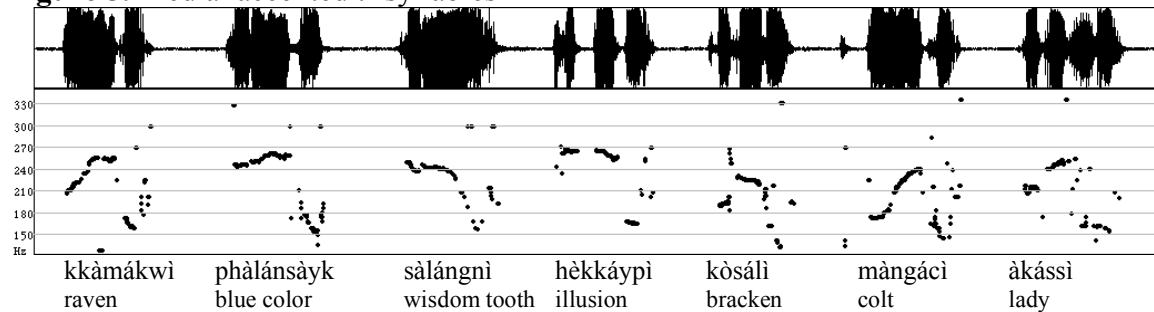


Figure 5. Medial accented trisyllables



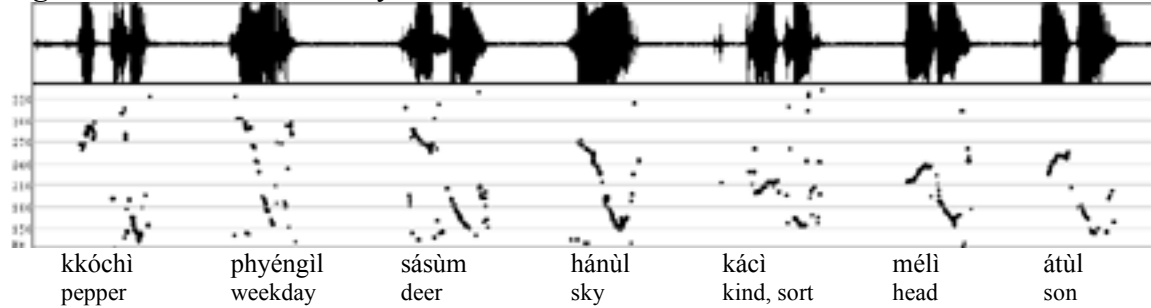
⁸ Since Chonnam does not have lexical tone, the notation “LHL” has a somewhat different meaning from that of a tonal dialect like SKS. LHL as an intonation pattern can be interpreted roughly as “begin on a low pitch, rise to high pitch at about the second syllable, and fall in pitch to the end of the phrase”.

⁹ See Jun (1993:##) for the phonetic reasons that cause ʌ *s* to pattern with the aspirated stops.

¹⁰ We made the recordings with a Sony TRV70 MiniDV camera using a Sony WCS-999R monaural wireless microphone. This provided both a video and audio record. For making pitch tracks, we extracted the audio as AIFF files sampling at 48 Khz (the standard rate for digital video). In order to avoid priming by having all the words of one accent pattern together, we randomized the words by sorting them alphabetically by English glosses. RGS read the English glosses and JEK said the Korean without looking at the list. This technique avoided list intonation, priming of pitch pattern by the preceding item, and possible interference from visual cues from the written Korean. The pitch tracks here were made using Pitchworks software, which is very sensitive to effects not perceptible as part of the F0. This accounts for “stray” dots in the pitch tracks.

¹¹ The example with initial tensed stop chosen for the atonic trisyllable group turned out to be preaccented. Our sample thus currently lacks an atonic trisyllable with tensed initial.

Figure 6. Initial accented disyllables



“Ideally”, the preaccented (= “double accent” in some accounts) words in Figure 4 would have HHL tones. The words *khókkili* and *hálmeni* come close to this, but all the other rise from the first to the second syllable. As a group, however, those with pitch-raising initial consonants begin on a higher pitch than those with lax or sonorant initials. Again, ideally, the medial accented words would have LHL tones, but the words *sálangi* and *hèkkáypi* have essentially level pitches on the first two syllables, and the word *phálánsayk* starts relatively high and rises only slightly. Only those with lax or sonorant initials follow the ideal LHL pattern. Comparing the items in Figures 4-5, considerable phonetic neutralization appears to take place between the phonologically distinct patterns, esp. among words beginning with pitch-raising consonants. Those with lax or sonorant initials have similar pitch curves, but the medial accent group has a lower pitch contour overall, probably because the initial syllable is actually L and the H following it is pulled down by an effect familiar as *downdrift* in African languages. Kenstowicz and Park (2006) also note this effect on the second syllable of LH disyllables. The initial accented disyllables in Figure 6 all have the expected HL pitch pattern, but those beginning with pitch-raising consonants, as a group, begin at a higher pitch than those with lax or sonorant initials.

2.2.3. Vowel length. A number of Korean dialects have distinctive vowel length, including standard Korean for older, more conservative speakers, though it has essentially disappeared as an active feature in the speech of younger standard Korean speakers. Phonetic vowel length distinctions covary with tone in SKS: long vowels are found only in monosyllabic words with R tone and in apparently free variation with short vowels in disyllabic words with LH tones when those words are not part of a larger accentual group. Otherwise, there is no consistent distinction between long and short vowels.

Cit. tone	Hankul	Yale + length		Tone w. suffix	Hankul	Yale	
H	말	mál	‘horse’	HL	말도	mál-tò	‘horse also’
R	말	mǎ:l	‘speech’	LH	말도	màl-tó	‘speech also’
H/MH	바람	pálám	‘wish’	H/MHL	바라미	pálám-i	‘wish-NOM’
LH	바람	pà:lám	‘wind’	LHL	바라미	pàlám-i	‘wind-NOM’

Sohn (1999:60) states the following historical relationship between tone and vowel length.¹²

“While Middle Korean was a tone language with high, rising, and low tones, tonemes have since disappeared in the Central (standard) and other dialects, except mainly in the Kyengsang and Hamkyeng dialectal zones. Instead, the Central and other dialects RETAIN VOWEL LENGTH IN THE PLACES WHERE A RISING TONE OCCURRED, except in the Ceycwu and some other dialects where neither tones nor vowel length occur.”¹³ (our emphasis—JEK/RGS)

Sohn does not mention that the Kyengsang dialects not only have tone, but also a distinction between long and short vowels. In fact, long vowels in Kyengsang correspond exactly to MK R tone, but phonetic R tone no longer exists in these dialects except in monosyllables. In both NKS and SKS, monosyllables that had R tone in MK are pronounced even today with R tone and a long vowel (see monosyllabic words in the table in §2.1 and the one immediately above, where the NKS forms would be essentially identical to the SKS forms). In both NKS and SKS, words of two or more syllables that had a R in MK have fallen together TONALLY with other patterns, but unlike SKS, NKS retains a reflex of the earlier R tone as a vowel length contrast in words with HH(L) tones. The table below compares the dialects for disyllabic and trisyllabic nouns.¹⁴

Hankul		MK tone	NKS tone	Yale + length	SKS tone	Yale + length
사람	‘person’	RT	HH	sá:lám	LH	sà(:)lám
도끼	‘axe’			tó:kkí		tò(:)kkí
바람	‘wish’	HT	HH	pálám	HH	pálám
구름	‘cloud’			kwúlúm		kwúlúm
바람	‘wind’	LL	LH	pàlám	LH	pà(:)lám
무릎	‘knee’			mwùlúph		mù(:)lúph
가슴	‘chest’	LH	HL	kásùm	HL	kásùm
머리	‘head’			méli		méli
사투리	‘dialect’	RTT	HHL	sá:thwúli	LHH	sàthwúli
마누라	‘wife’			má:nwúlà		mànwúlá
무지개	‘rainbow’	HTT	HHL	múcíkàỳ	M/HHL	múcíkàỳ
코끼리	‘elephant’			khókkíli		khókkíli

The historical source of vowel length in R tone explains a number of facts. First, in the Kyengsang dialects, which retain distinctive tone, there is a direct correlation between the tone classes that words belong to and whether or not words may have long vowels. In both dialects, there are three tone classes of monosyllabic words, but only one tone class has long vowels, namely the class that is a reflex of MK R, like 말 *mǎ:l* ‘speech’, and moreover, all the words of that class have long vowels. Since we know that tone is a contrastive feature of words of two and three syllables, we would like to predict vowel

¹² Lee and Ramsey (2000:344) say, “In the original orthography designed for the alphabet by King Sejong, PITCH AND VOWEL LENGTH WERE INDICATED by ‘side dots’ placed beside the syllable.” (our emphasis—JEK/RGS) The implication of this quote seems to be that MK had both distinctive tone and distinctive vowel length, but descriptions of MK virtually all associate the “side dots” only with tones. A seemingly clearer statement of the relationship of side dots to length is Ramsey (1975:139), who says, “...philological evidence [shows] that MK syllables marked with a ‘rising tone’ were PRONOUNCED LONG with rising pitch.” (our emphasis—JEK/RGS) That is, lengthened vowels were directly associated with R tone. There is no evidence that syllables bearing other tones every had long vowel nuclei.

¹³ One must add the qualification, noted in Sohn (1999:157), that vowel length in those dialects that have it is contrastive only in the initial syllable of a phrase. No words have long vowels in syllables other than the first, and even those words shorten the vowel if they are not initial in a phonological phrase.

¹⁴ Most NKS forms come from recordings made with Young-Hee Chung, to whom we are grateful. The NKS forms corresponding to MK RTT come from N-J Kim (1997:110).

length in monosyllabic words on the basis of tone, not vice-versa. This may indeed be possible, but as we will see below, it must be done at a rather abstract level. That is, in SKS, although a long vowel and R on monosyllables are not independent variables in citation form, when these words appear in larger accent groups, the tonal/accental properties of these words are evident in the tonal properties of the phrases that they appear in, not the tones of the words themselves.

In disyllabic and trisyllabic words, NKS has a vowel length distinction only in words with HH(L) tones, e.g. disyllabic nouns like 사람 *sá:lám* ‘person’ (< MK RT) vs. 바람 *pálám* ‘wish’ (< MK HT) and trisyllabic nouns like 마님 *má:nwúlà* ‘wife’ (< MK RTT) vs. 무지개 *mú:cíkà:y* ‘rainbow’ (< MK HTT). In SKS, all disyllabic words with a LH pattern can be pronounced with a long or short vowel, regardless of tonal etymology, e.g. 사람 *sà(:)lám* ‘person’ (< MK RL) and 바람 *pà(:)lám* ‘wind’ (< MK LL).

MK R as the source of vowel length explains the odd distribution of long vowels in modern non-tonal dialects. In languages with distinctive vowel length, such as Arabic, Hausa, German, Hungarian, Japanese, and many others, the length of vowels is generally a relatively stable property of lexical items (subject to shortening in environments related to syllable weight, such as shortening in closed syllables as a way to avoid “extra-heavy” syllables and the like), and moreover, the syllabic distribution of long and short vowels is generally free within a word. In Korean, long vowels are restricted to the initial syllable of a word and there, only if the word is initial in a phrase (see footnote 13). In tone languages, on the other hand, it is relatively common to find skewings in tonal distributions, esp. contour tones such as rising or falling. The limited distribution of long/lengthened vowels in Korean is therefore more like that of tones in tone languages than of long vowels in languages with distinctive vowel length for the simple reason that it is, in effect, the historical the reflex of a contour tone, not of a phonemic vowel distinction.

3. The History of Tone and Accent

3.1. The KYENGSANG ACCENT SHIFT. We have, a number of times, mentioned that particular tone patterns in modern Korean tonal dialects are reflexes of particular MK tone patterns, but we have not given a systematic account of the correspondences. Ramsey (1975:95-98) elegantly lays out the correspondences between the tones of MK and modern Kyengsang dialects as the

KYENGSANG ACCENT SHIFT (KAS): “Shift the [MK] accent one syllable to the left.”

Ramsey states the shift in terms of *accent*, but for our purposes at this point, it could be stated in terms of *tone*, where “accent” = “the first high tone of a word in MK”. Part of the tone/accent evolution of Korean from MK to modern tonal dialects has been the neutralization of all tonal distinctions following the first H or R (= LH on one syllable), i.e. once the position of the first H (or the “accent”) has been determined, tones on all syllables following that H are predictable, regardless of what tones they bore in MK. The table below, which partly repeats information from the table in §2.1, shows how the KAS relates MK nominal tones OTHER THAN R to modern SKS tones—we return to MK R tone immediately below. *Atonic* words, i.e. words that had all L tones in MK, had no H tone/accent to shift and hence remain atonic in modern SKS. In the KAS column, we show correspondents to MK L as having no tone marking. If H was on the first syllable in MK, the KAS shifts it to the left of the first syllable, and it becomes what Ramsey calls *preaccent*, shown as an acute accent preceding the word. We account for the actual phonetic realization in SKS in the next section. In this table, we give only the Yale transliteration, which makes it easier to mark tones using accent marks. Middle Korean

had a vowel that has merged with other vowels in all dialects and has disappeared from the orthography,¹⁵ having usually become /a/ in initial syllables and /u/ in non-initial syllables. Korean specialists disagree about the phonetic quality of this vowel in MK. We write it as “A”.

MK tone ¹⁶	MK example	KAS and neutralization after first H/R		SKS phonetic	Gloss
L	màl	> /mal/	→	[mál]	‘horse’
H	sál	> /'sal/	→	[sál]	‘cooked rice’
LL	kàcì	> /kaci/	→	[kàcí]	‘eggplant’
LH	mèlí	> /méli/	→	[méli]	‘head’
HH	kÁnÁlh	> /' kunul/	→	[kúnúl]	‘shadow’
HL	kwúlùm	> /' kwulum/	→	[kwúlúm]	‘cloud’
LLL	sàtÀlì	> /satali/	→	[sàtálì]	‘ladder’
LLH	mÀyàcì	> /mangáci/	→	[màngáci]	‘colt’
LHL	kámóthì	> /kámulchi/	→	[kámùlchì]	‘mullet’
LHH	àhÁláy	> /áhuley/	→	[áhùlèy]	‘nine days’
HHH	twúlwúmí	> /' twulwumi/	→	[twúlwúmi]	‘crane’
HHL	tyéngpáki	> /' ccengpayki/	→	[ccéngpáyki]	‘crown of head’
HLH	kókhilí	> /' khokkili/	→	[khókkíli]	‘elephant’
HLL	(need to find)				

The way that MK words that began with a R tone fit into the KAS picture requires special discussion. Ramsey (1975:139ff.) surveys arguments for considering MK R to be a combination of L+H on a bimoraic syllable. For example, a monosyllabic word ending in a vowel, contracted with the H subject marker ◌◌ -i¹⁷ gives a R (◌◌+◌◌) → :◌◌ kù+i → kŭy ‘that (thing)-nom.’). The KAS shifted H one *syllable* to the left, and we would thus expect the H part of the R to become a *preaccent* since the H was on (part of) the first syllable in MK. In NKS, this is exactly what happened in disyllabic and trisyllabic nouns (we return to a discussion of monosyllables below).

MK tone	MK example	KAS		NKS	SKS	
R	mǎl	/' mal/		[mǎ:l]	[mǎ:l]	‘speech’
RL	sǎlám	/' salam/	→	[sá:lám]	[sà(:)lám]	‘person’
RH	ŭsán	/' usan/	→	[ú:sán]	[ù(:)sán]	‘umbrella’
RLH	mǎnòlí	/' manwula/	→	[má:nwúlà]	[mànwúlá]	‘wife’
RHL	(need to find)					

In NKS, both the HT(T) and RT(T) patterns of MK now have a citation HH(L) tone pattern, i.e. the *preaccent* pattern. The original MK distinction in tone is reflected as a vowel length distinction. In SKS, the two MK tone patterns have a citation LH(H) pattern, i.e. the pattern associated with *atonic* nouns. Three syllable nouns like 만누라 *mànwúlá* ‘wife’ have become completely neutralized with the LHH pattern from MK LLL—no three syllable nouns in SKS have long vowels, and all nouns with the LHH citation pattern behave the same way in larger accent groups.

¹⁵The dialect of Cejwu island has a vowel transcribed phonetically [ʌ]. It is not clear, however, that this is a reflex of MK “A”.

¹⁶Our source for MK tones is Yu (1964).

¹⁷In modern Korean, there are two suppletive subject markers, ◌◌ -i after consonants, ㄱᄃ -ka after vowels. In MK, the former was used in all contexts.

In terms of citation tone and vowel length in SKS, two syllable nouns from MK RT have fallen together with reflexes of MK LL nouns. Nouns from both sources in SKS have a citation LH pattern and free variation in pronunciation of the vowel in the first syllable as long or short. We will argue below, however, that words like *sàlám* ‘person’ (< MK RT) behave as if they have a preaccent whereas words like *pàlám* ‘wind’ (< MK LL) are truly atonic, an analysis suggested by Ramsey (1975:154). The preaccent in reflexes of MK RT words can be detected only by its effect in larger accent groups, as in *sàlám-mán* ‘only a person’ (< MK RT) vs. *pàlám-màn* ‘only wind’ (< MK LL), where the particle *-man* ‘only’ bears H after the reflex of MK RT but L after the reflex of MK LL. We provide an account of these these patterns below.

MK monosyllables with R have the same phonetic outcome in both Kyengsang dialects, viz. R: (rising tone and a long vowel). It appears that words of this type have been pronounced without change since MK! Ramsey’s (1975:152) description of these words in citation form does not correspond to ours. He says, “The South Kyengsang correspondences of the ‘rising tone’ are short and distinctively low in pitch.” In our SKS data, however, the correspondences are neither short nor low. However, Ramsey’s (1975:154) observations of the tonal effects of these words in accent groups are identical to what we have found and seem best accounted for by assuming that the reflex of MK R is a preaccent.

3.2. Why do NKS and SKS have different tones? We can summarize modern Kyengsang tonal reflexes of Middle Korean disyllabic and trisyllabic nouns as follows:

	Middle Korean	North Kyengsang	South Kyengsang
Disyllabic	LL	LH	L(:)H
	LH	HL	HL
	HT	HH	HH
	RT	H:H	L(:)H
Trisyllabic	LLL	LHH	LHH
	LLH	LHL	LHL
	LHT	HLL	HLL
	HTT	HHL	HHL
	RTT	H:HL	LHH

Boldface marks the tonal classes that the MK RT(T) patterns have fallen together with. The differences between the dialects seems to revolve around the ambiguity of the tone of the first syllable of words that had initial H or R in MK, all of which are now *preaccent* in Kyengsang. In both NKS and SKS, reflexes of MK HT(T) invariably have their highest pitch peak on the second syllable. The initial syllable varies in pitch, ranging between M and H. As we have shown in Figure 4-5, words beginning with a phonological L also show a range of phonetic pitches, primarily associated with consonant types. The result is that there is considerable neutralization of phonological distinctions¹⁸ in the initial syllables of #TH... configurations. After the KAS, reflexes of MK RT(T) words remained distinct from other classes because of vowel length. However, their first syllable no long bore a distinctive R tone, but rather bore a tone that was ambiguous between phonological L and M. NKS allied this “ambiguous” tone with reflexes of MK HT(T), SKS allied it with reflexes of MK LL(L), which are pronounced LH(H) in both dialects, with variation in the actual pitch of the initial “L”. SKS lost distinctive vowel length as part of a broader trend in Korean, and as a result, reflexes of

¹⁸ The distinctions in question are not really “phonological” in the normal sense of “lexical”, since they are assigned by rule (see analysis below). However, the rules involved would assign different tonal configurations.

both MK LL(L) and RT(T) now allow long or short vowels in free variation, though as noted above and as the analysis below will show, the two classes remain distinct in their effects in accent groups. SKS reflexes of MK trisyllabic RTT have fallen together with other classes in all respects. The most common reflex is the LHH *atonic* class, i.e. the same class as for disyllabic nouns. It seems that in SKS, once a word is perceived as beginning with phonological L, the atonic class is the default class for both two and three syllable nouns.

3.3. Tone vs. Accent. Ramsey (1975) states the KAS in terms of “accent”, not “tone”, and from the perspective of modern Korean, this is certainly correct. Modern Korean “tonal” dialects have *pitch-accent* systems, not true tone systems such as those typical of most African languages and some of the languages of Meso-America. Korean *accent* is marked by H pitch, the basic principle being that, in an accent group (an utterance with no more than one accent), the accent is always located at the last H. Any syllables following the accent must be L, and in a string of two or more H’s, only the last one bears accent. The result of this principle is that the possible tone patterns of an accent group are constrained: an utterance can start L or H, but once the pattern drops from H to L, it cannot rise to H again. To do so would be to introduce a second accent in an accent group.

This is quite a different picture from the lexical pitch system of MK, where it appears that any combination of H, L, and perhaps R were possible within a word. Ramsey (1975:99-115) discusses the nature of the MK system. He seems to favor an interpretation of the MK as having had a pitch-accent system as well, where the first H was the realization of accent and tones written on subsequent syllables were “not distinctive”, being subject to poorly understood alternations, or perhaps not indicating phonetic pitches, but rather the transcribers’ attempts to mark “underlying” representations of some sort.

Whatever the actual phonological system in MK was, several things are clear: modern dialects have pitch-accent systems rather than being purely tonal; “tones” in modern dialects can be related to MK with reference to just the first H or R of MK; and the location of accent in Kyengsang dialects can be systematically related by the KYENGSANG ACCENT SHIFT to the location of the first H in MK. Armed with these facts, we turn to our analysis of accent and tone in SKS Korean.

4. Accent and Tone in South Kyengsang

Our analysis of accent and tone in South Kyengsang Korean is essentially a formalization of that of Ramsey (1975), modified in minor ways.¹⁹ Fundamental is the separation of accent from tone, much like a system proposed for Bantu languages [CHECK GOLDSMITH REF. AND CITE], formalized by placing a star (= accent) on a syllable that will be linked to a H. We will speak of *accent groups*. Minimally, an accent group comprises a single word, but it may be larger. In the present paper, we confine our discussion to accent groups consisting of a single noun and a noun plus one other item in an accent group. Our most detailed discussion involves a noun plus a *particle* (a loosely defined class of morphemes that are suffixed to nouns) and noun+noun compounds. Ramsey (1975:81ff.) uses the term “phonological phrase” for what we are calling “accent group”, but in modern phonology, “phonological phrase” is used to describe relations between syntactic constituents and phonology that could differ in important ways from our “accent group”. We have also avoided the term “accentual

¹⁹ Ramsey (1975) has been fundamental for our understanding accent and tone in Korean. From both historical and descriptive perspectives this work is exceptionally detailed and incisive. Though most recent generative works on Korean tone do mention Ramsey (1975) and/or Ramsey (1978), we find it strange that no one has adopted, or at least adapted some aspects of it, as the basis of their analyses.

phrase”, used by Jun (1993) to refer to an intonational unit. Jun’s accentual phrase can vary in its scope in an utterance depending on factors of pragmatics, speech tempo, and the like. Our accent group is constrained by the lexical accentual properties of individual lexical items and their possibilities of collocation.

At least three major constraints govern accent and tone in an accent group:

- (1) An accent group has at most one accent, which will be associated with a H tone.
- (2) Every accent group must have one and only one H tone, though this H may be associated with several consecutive syllables.
- (3) An accent group of more than one mora whose accent is not on the first syllable rises in pitch from the first to the second mora.

Though an accent group has *at most* one accent, an accent group may be *atonic*, i.e. there may be no accent. Although the presence of an accent in an accent group will always be marked in pronunciation by the presence of a H tone somewhere in the accent group, (2) requires that even atonic accent groups include a H tone. The presence of H tone alone is therefore not *prima facie* evidence of the presence of an accent. Constraint (3) may be phonetically countervailed by accent groups beginning in aspirated or tense consonants, which have a pitch raising effect. With these global constraints and the preceding sections as background, we proceed to analysis of the pitch patterns of SKS nouns. Here are nouns representing all the pitch patterns of SKS Korean seen in the table in §2.1. One or more σ ’s in parentheses following the accent pattern indicates the number of syllables.

Lexical accent	Underlying	Phonetic citation	Hankul	
atonic (σ) L	/mal/	H [mal]	말	‘horse’
atonic (σ) R	+ / nwu:n/	LH + [nwu:n]	눈	‘snow’
preaccent (σ)	* / nwun/	H * [nwun]	눈	‘eye’
atonic ($\sigma\sigma$) L	/kaci/	L H [kaci]	가지	‘eggplant’
atonic ($\sigma\sigma$) R	+ / salam/	L H + [salam]	사람	‘person’
preaccent ($\sigma\sigma$)	* / kaci/	L H / * [kaci]	가지	‘branch’
initial ($\sigma\sigma$)	* /kaci/	H L * [kaci]	가지	‘kind’
atonic ($\sigma\sigma\sigma$)	/satali/	L HH [satali]	사다리	‘ladder’

preaccent (σσσ)	* / khokkili/	L H L / *	코끼리	‘elephant’
initial (σσσ)	* /kamulchi/	H L \ *	가물치	‘mullet’
medial (σσσ)	* /pitwulki/	L H L *	비둘기	‘pigeon’
medial (σσσσ)	* /ttakttakuli/	L H L / *	딱따구리	‘woodpecker’

Most of the phonetic pitch patterns can be derived from the underlying forms with accent specified by two “Pitch Assignment” rules formulated by Ramsey. His PITCH ASSIGNMENT RULE 1 (PAR 1) applies to all modern tonal dialects, both of the Hamkyeng region and the Kyengsang region. His PAR 2 is specific to Kyengsang and is allied to the KYENGSANG ACCENT SHIFT (KAS), which created *preaccent* by shifting original initial accent to a floating position before its original host.²⁰ Here are the Pitch Assignment rules as formulated by Ramsey (1975:85, 94):

PAR 1: Within a phonological phrase [= accent group], the initial mora is low pitched, unless it is accented, and all the moras following an accented mora are also low pitched. All the remaining moras are high pitched.²¹

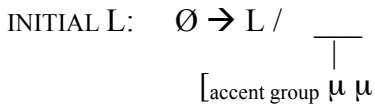
PAR 2: Within a phonological phrase [= accent group], if there is an accent in front of the first mora, the first two moras are high pitched, and all succeeding moras are low pitched.

Ramsey states his PARs in terms of *moras*. In SKS, *mora* = *syllable* with the exception of monosyllabic words pronounced in isolation with a R tone and a long vowel, such as *말* *mǎ:l* ‘speech’. These words consist of a bimoraic syllable. With this understood, we will formulate rules in terms of moras rather than syllables as a simplifying measure.

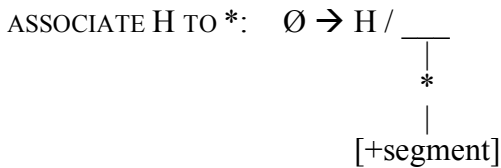
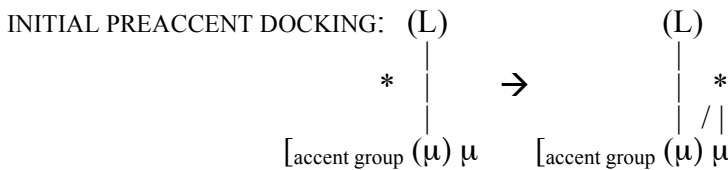
Ramsey’s “rules” are really prose statements of several distinct aspects of pitch assignment. We formalize these as separate rules using autosegmental formalism. We assume that the position of accent (or the absence of accent) is lexically specified. Quadrisyllabic words all have accent, and the accent is always on the penultimate syllable, which would make it possible to specify accent for these words by rule or some other accent assignment convention. The exposition of rules here assumes that accent in quadrisyllabic words is pre-specified as input to the rules.

²⁰ Note that the KAS is NOT part of the phonology of Kyengsang dialects. This is a historical change that has run its course. Ramsey’s and our rules assume the forms with shifted accents as the lexical forms.

²¹ Ramsey (1975) later in his book (page 184) modifies the last sentence to read, “The first accented mora is high pitched, and all the remaining moras are non-low pitched.” That is, the moras that have not been assigned L by rule and are not accented may vary in pitch. In short utterances such as single words, this is particularly evident in *preaccent* words of two or three syllables, where the first syllable often bears a mid tone if it begins in a lax or sonorant sound (see Figures 4 and 5). In longer phrases, there is considerable variability in the realization of “high” (= non-low) tones on unaccented syllables.



Associate L to an initial unaccented mora in a word of two or more moras. This provides the L on the initial syllable of words like 비둘기 *p̄itwũlki* ‘pigeon’ and the initial part of the rise on words like 말 *m̄ǎ:l* ‘speech’. Moreover, it associates L with the initial mora of a preaccented word of more than one syllable, such as 가지 *kāci* ‘branch’. This will have an important effect, to which we return in discussion the next rule. The two mora requirement is to prevent associating L with monomoraic atonic words like 말 *m̄al* ‘horse’, which ends up H.



Dock a preaccent to the first mora of a monomoraic word like 눈 *nwun* ‘eye’ and to the second mora of a longer word, like 가지 *kāci* ‘branch’, then associate H to any accent that is associated to segmental material. This account assumes that words with initial or medial accent, like 가지 *kāci* ‘kind’ or 비둘기 *p̄itwũlki* ‘pigeon’ have lexically preassociated accents.

If INITIAL PREACCENT DOCKING docks the accent to the second mora, it spreads left to the first mora. These two rules equate to Ramsey’s PAR 2. Ramsey treats the two initial syllables of words like 가지 *kāci* ‘branch’ and 무지개 *mūčikāy* ‘rainbow’ as beginning with two undifferentiated H tones. Some more recent generative treatments refer to such words as having “double accent” (Chung 1991, Kenstowicz and Sohn 1996). Ramsey (1975:103) notes that “...phonetically, what is called ‘high pitch’ can have a wide range of actual realizations, particularly IN POSITIONS WHERE IT IS NON-DISTINCTIVE,” (our emphasis—JEK, RGS), and he gives some diagrams from the South Hamkyeng dialect showing that “high pitches” PRECEDING THE SYLLABLE THAT BEARS ACCENT may vary, being lower or at the same pitch as the syllable bearing accent. We contend that Ramsey’s PAR 2, which associates undifferentiated H to the first two syllables, as well as analyses that refer to “double accent” have ignored a non-trivial phonetic fact that relates pitch and accent, namely that the syllable bearing accent ALWAYS has the highest pitch in an accent group, and though other syllables may have “H” tone, this tone is supplied by rule, not as a function of accent. In particular, words like 가지 *kāci* ‘branch’ and 무지개 *mūčikāy* ‘rainbow’ that start with a lax or sonorant segment typically have a lower pitch on the first syllable than on the second (Figures 4 and 5).

Our formulation follows J-E Kim (2006) by first associating L with an unaccented initial syllable by INITIAL L, then associating the floating preaccent with the first syllable without an associated tone and spreading it leftward, e.g. /*kaci/ → *k̄aci → K̄ACI → [k̄āCÍ] ‘eggplant’ (capitals = domain of the accent, diacritics = tones). This accounts for why preaccent goes to the SECOND syllable (the first already having an associated L tone, which resists accent). ASSOCIATE H TO * associates a H to the domain of the accent, and the resulting LH that is associated with the first syllable levels to Mid (which may be raised to H by the effect of an aspirated or tense consonant). One anomaly in our analysis

is that the doubly associated accent looks like the “double accent” that we have suggested does not exist. For formal purposes, however, the only accent that counts is the one on the rightmost syllable, since this is the one that will trigger the rule POST ACCENT L below.

Alternatively, one could implement Ramsey’s observation about “non-distinctive” H’s as a rule that (optionally) lowers the pitch of a H that is not associated with an accent. Whatever the solution, however, we claim that any analysis should account for the fact that an unaccented syllable associated with H may behave differently from a syllable bearing accent. This not only is true to the phonetic facts, but also obviates any reason for proposing an anomalous “double accent”.

In §3.1, we suggested that words like 말 *mǎ:l* ‘speech’ and 사람 *sàlám* ‘person’, which had initial R tone in MK have a preaccent. However, if INITIAL PREACCENT DOCKING were applied to these classes of words, they would end up with the phonetic tone patterns of words like 눈 *nún* ‘eye’ and 가지 *kācǐ* ‘branch’. We propose that these words bear an exception feature [-INITIAL PREACCENT DOCKING], i.e. their preaccent remains undocked (as a shorthand for this exception feature, we mark the preaccent on such words with a “+” rather than a “*” an refer to the “preaccent type” rather than to this exception feature). We show this exceptional behavior in the sample derivations for individual words, but the motivation for this account becomes clear only when we consider larger accent groups in later sections.

POST ACCENT L: $\emptyset \rightarrow L /$

$$\begin{array}{c} \text{---} \\ | \\ * \mu_1 \text{]}_{\text{accent group}} \end{array}$$

Associate L with all moras following the accented mora within an accent group. For nouns cited in isolation, the longest possible string of L resulting from this rule will be trisyllabic nouns with initial accent, like 가물치 *kámùlchǐ* ‘mullet’, but longer strings result when accent groups include additional members (see §5).

DEFAULT H: $\emptyset \rightarrow H /$

$$\begin{array}{c} \text{---} \\ | \\ [\dots \mu_1 \dots]_{\text{accent group}} \end{array}$$

Associate H with any moras in an accent group that remain unassociated with a tone after other rules have applied. This associates H with all moras in atonic words other than the first mora (which has been associated with L by INITIAL L), for example 말 *mǎ:l* ‘speech’, 사다리 *sàtáli* ‘ladder’, as well as any syllables (= moras) between the initial syllable and the syllable bearing accent, such as 딱따구리 *ttàkttákwúli* ‘woodpecker’.

A TABLE SHOWING DERIVATIONS FOR NOUNS OF SYLLABIC AND ACCENTUAL PATTERNS IS ON THE NEXT PAGE.

Sample derivations of nouns:

Accent type	atonic L	atonic R	preaccent	atonic L	atonic R	preaccent	initial	atonic	preaccent	initial	medial	medial
Phonetic and meaning	[mál] 'horse'	[nú:n] 'snow'	[nú:n] 'eye'	[káci] 'eggplant'	[sálám] 'person'	[káci] 'branch'	[káci] 'kind'	[sátáí] 'ladder'	[khókkíli] 'elephant'	[kámùlci] 'mullet'	[pítwúlki] 'pigeon'	[ttaktákúli] 'woodpecker'
Underlying	/mal/	/+nun/	/*nun/	/kaci/	/+salam/	/*kaci/	*/kaci/	/satali/	/*khokkili/	/kamulci/	/pitwulki/	/ttaktakwuli/
INITIAL L	---	L +nu:n	---	L kaci	L +salam	L *kaci	---	L satali	L *khokkili	---	L * pitwulki	L * ttaktakwuli
INITIAL PREACCENT DOCKING	---	(marked to not undergo)	* nun	---	(marked to not undergo)	L * / kaci	---	---	L * / khokkili	---	---	---
ASSOCIATE H TO *	---	---	H * nun	---	---	L H * / kaci	H kaci	---	L H * / khokkili	H kamulci	L H * pitwulki	L H * ttaktakwuli
POST-ACCENT L	---	---	---	---	---	---	H L kaci	---	L HL * / khokkili	H L kamulci	L HL * pitwulki	L HL * ttaktakwuli
DEFAULT H	H mal	LH nu:n	---	LH kaci	L H salam	---	H L kaci	L H satali	---	---	---	L H HL * ttaktakwuli
Phonetic adjustments*	[mál]	[nú:n]	[nú:n]	[káci]	[sálám]	[káci]	[káci]	[sátáí]	[khókkíli]	[kámùlci]	[pítwúlki]	[ttaktákúli]

*Phonetic adjustments will be levelling the LH on the initial syllable of two and three syllable preaccent words to Mid and the raising of pitch of initial syllables that begin with a tensed or aspirated consonant (L → M or H, M → H, H → raised register). One might also include a rule realizing a phrase final H as Falling if this is taken to be a phonological rule.

As a sidebar, we note that not only do these rules work together to produce pitch contours consistent with the three global constraints listed above, but also pitch contours of *accent groups* in Kyengsang tonal dialects closely match the LHL pitch contour of *accentual phrases* described by Jun (1993) for the non-tonal Chonnam dialect. This even applies to multi-syllabic atonic accent groups, to which the phonological rules here would give a L...H pattern. Recall that a phrase final H in Kyengsang is always pronounced with a falling pitch (Figures 1-3). Thus although 사다리 *sàtáli* ‘ladder’ is phonologically LHH, its phrase final pitch contour is [- - \]. One may speculate that the intonation patterns of Jun’s *accentual phrases* reflect in a rather direct way the pitch contours of earlier pitch accent systems, the difference being that the accent systems associate accent (marked by H pitch in pronunciation) with specific syllables of lexical items and rules work with reference to position of accent to produce certain pitch patterns, whereas modern dialects that lack pitch accent treat the pitch pattern itself as prosodic entity to be mapped, based on pragmatic factors and the like, over strings that may vary in constituency and length.

5. Accent Groups with Post-nominal Particles

Korean has a large number of post-nominal particles which, when suffixed to nouns in tonal dialects, become part of the accent group. These particles have their own accent specifications. The behavior of accent groups that incorporate particles not only provides further examples of the application of the rules presented in the preceding section, but is also diagnostic for certain aspects of accent that are not immediately evident from nouns cited in isolation. In particular (1) the presence of particles provides clear evidence for the claim that words can be *atonic* and (2) tonal behavior of particles differentiate *atonic L* and *atonic R* as different classes even though they are tonally alike in citation.

We confine the discussion to two particles, 만 *man* ‘only’ and 만큼 *mankhum* ‘as much as’. The former has *preaccent* in SKS, the latter has *initial accent*.²² In order to account for the pitch patterns of accent groups consisting of nouns plus post-nominal particles, we need the following two rules, which prepare accent group input to the rules presented in §4.

ACCENT DELETION: * → Ø / [...*...____...]_{accent group}

Delete an accent that follows another accent in an accent group. For the constructions being discussed here, this will delete the accent associated with a particle if the noun has an accent.

NOTE: This rule and the next rule apply to both the preaccent that we mark as “*” and the preaccent that we mark as “+”, the latter just being a shorthand for being associated with a word which does not undergo INITIAL PREACCENT DOCKING, which docks phrase initial preaccents to the right.

²² One would like evidence for the accentual specification of particles independent of their behavior in accent groups. Monosyllabic particles, such as 만 *man* ‘only’, 이 *i* ‘nominative’, 도 *to* ‘also’, cannot be cited alone, but those listed here and a number of others bore H in MK and are treated as accented in the Hamkyeng dialect, which has not undergone accent shift (Ramsey 1975:§3.1). Working under the assumption that particles have undergone the KAS in the same way that substantive items have, their behavior in accent groups is exactly that predicted by the rules here. Many longer particles, such as 만큼 *mankhum* ‘as much as’ can be cited in isolation, providing direct evidence for their accent pattern. For historical reasons that go beyond our current knowledge, we cannot find recognizable etymons of some particles in a MK dictionary, and others that are in the dictionary do not show expected tonal correspondences. For example, MK had -만치 *-manchi* (LL), given as equivalent to modern Korean 만큼 *mankhum* (HL) ‘as much as’, but LL > HL is not a regular tone change.

MEDIAL PREACCENT DOCKING: \rightarrow $*$
 $[[\dots\mu]^*\dots]_{\text{accent group}}$ $[[\dots\mu]\dots]_{\text{accent group}}$

Dock a “floating” accent in the middle of an accent group (= *preaccent* lexically associated with a particle) to the first mora to the left. For example, atonic *거사* *kaci* ‘eggplant’ + *만* **man* ‘only’ becomes *kaCI-man* (upper case = accented mora).

We now illustrate how rules proposed so far assign pitch to accent groups containing particles for all nominal accentual classes. To make it easier to type and save vertical space, we specify preaccent with a * or + preceding the formative, we capitalize a syllable bearing accent, and we mark tones with diacritics.²³

Monosyllabic nouns (atonic L, preaccent)

Meaning	‘horse’	‘horse’	‘eye’	‘eye’
Accent type	atonic L	atonic L	preaccent	preaccent
Surface	MÁL-màn	màl-MÁNkhùm	nūn-MÁN	nwún-MÁNkhùm
Lexical	/mal-*man/	/mal-MANkhum/	/*nwun-*man/	/*nwun-MANkhum/
ACCENT DELETION	---	---	*nwun-man	*nwun-mankhum
MED. PREACC. DOCKING	MAL-man	---	---	---
INITIAL L	---	màl-MANkhùm	*nwùn-man	*nwùn-mankhum
INIT. PREACC. DOCKING	---	---	nwùn-MAN	nwùn-MANkhùm
ASSOCIATE H TO *	MÁL-man	mal-MÁNkhùm	nwún-MÁN	nwún-MÁNkhùm
POST ACCENT L	MÁL-màn	màl-MÁNkhùm	---	nwún-MÁNkhùm
DEFAULT H	---	---	---	---

Disyllabic nouns (atonic L, preaccent)

Meaning	‘eggplant’	‘eggplant’	‘branch’	‘branch’
Accent type	atonic L	atonic	preaccent	preaccent
Surface	kàCÍ-màn	kàci-MÁNkhùm	káCÍ-màn	káCÍ-mànkhùm
Lexical	/kaci-*man/	/kaci-MANkhum/	/*kaci-*man/	/*kaci-MANkhum/
ACCENT DELETION	---	---	*kaci-man	*kaci-mankhum
MED. PREACC. DOCKING	kaCI-man	---	---	---
INITIAL L	kàCI-man	kàci-MANkhùm	*kàci-man	*kàci-mankhum
INIT. PREACC. DOCKING	---	---	kàCI-man	kàCI-mankhum
ASSOCIATE H TO *	kàCÍ-man	kàci-MÁNkhùm	káCÍ-man	káCÍ-mankhum
POST ACCENT L	kàCÍ-màn	kàci-MÁNkhùm	káCÍ-màn	káCÍ-mànkhùm
DEFAULT H	---	kàci-MÁNkhùm	---	---

²³ We do not include a derivation for quadrisyllabic nouns. All quadrisyllabic nouns have accent associated with the penultimate syllable and would have derivations like *pìTWÚLki-* ‘pigeon’ (trisyllabic with medial accent) plus application of DEFAULT H to the syllable preceding the accented syllable, e.g. *ttàktáKWÚli-màn* ‘only a woodpecker’, *ttàktáKWÚli-mànkhùm* ‘as much as a woodpecker’

Monosyllabic and disyllabic nouns < MK R(T) (atonic R)

Meaning	‘speech’ atonic 1 R	‘speech’ atonic 1 R	‘person’ atonic 2 R	‘person’ atonic 2 R
Accent type	màl-mán	màl-mánkhùm	sàlám-mán	sàlám-mánkhùm
Surface				
Lexical	/+mal-*man/	/+mal-MANkhùm/	/+salam-*man/	/+salam-MANkhùm/
ACCENT DELETION	+mal-man	+mal-mankhùm	+salam-man	(does not apply)
MED. PREACC. DOCKING	---	---	---	---
INITIAL L	+màl-man	+màl-mankhùm	+sàlám-man	+sàlám-MANkhùm
INIT. PREACC. DOCKING	(marked to not undergo)	(marked to not undergo)	(marked to not undergo)	(marked to not undergo)
ASSOCIATE H TO *	---	---	---	+sàlám-MÁkhùm
POST ACCENT L	---	---	---	+sàlám-MÁkhùm
DEFAULT H	+màl-mán	+màl-mánkhùm	+sàlám-mán	+sàlám-MÁkhùm

The disyllabic atonic R does not delete the initial accent on a disyllabic particle. This is the result of a subregularity having to do with nouns having the “+” preaccent. If such nouns are initial in an accent group AND the accent group is more than three syllables in length, ACCENT DELETION does not apply. It is hard to demonstrate this as a generalization using particles because particles comprise an essentially closed class with a limited number of tonal configurations. However, N+N compounds provide an unlimited number of configurations. In a compound comprising an atonic R 1 with an initial accented disyllabic second member, the result is like *màl-mánkhùm* above, e.g. 반-거름 /+pan-KElum/ → *pàn-kélúm* ‘half-stride’. However, when atonic R 1 is compounded with an initial accented trisyllabic second member, the second member retains its accent, e.g. 섬-아지매 /+sem-Acimay/ → *sèm-ácìmày* ‘island wife’.

Disyllabic nouns (initial accent)

Meaning	‘kind’ initial	‘kind’ initial
Accent type	KÁci-màn	KÁci-mánkhùm
Surface		
Lexical	/KAci-*man/	/KAci-MANkhùm/
ACCENT DELETION	KAci-man	KAci-mankhùm
MED. PREACC. DOCKING	---	---
INITIAL L	---	---
INIT. PREACC. DOCKING	---	---
ASSOCIATE H TO *	KÁci-man	KÁci-mankhùm
POST ACCENT L	KÁci-màn	KÁci-mánkhùm
DEFAULT H	---	---

Trisyllabic nouns (atonic, preaccent)

Meaning	‘ladder’ atonic	‘ladder’ atonic	‘elephant’ preaccent	‘elephant’ preaccent
Accent type	sàtáLÍ-màn	sàtáLÍ-MÁNkhùm	khóKKÍli-màn	khóKKÍli-mánkhùm
Surface				
Lexical	/satali-*man/	/satali-MANkhùm/	/*khokkili-*man/	/*khokkili-MANkhùm/
ACCENT DELETION	---	---	*khokkili-man	*khokkili-mankhùm
MED. PREACC. DOCKING	sataLI-man	---	---	---
INITIAL L	sataLI-man	satali-MANkhùm	*khòkkili-man	*khòkkili-mankhùm
INIT. PREACC. DOCKING	---	---	khòKKIli-man	khòKKIli-mankhùm
ASSOCIATE H TO *	sàtáLÍ-man	sàtáLÍ-MÁNkhùm	khóKKÍli-man	khóKKÍli-mankhùm
POST ACCENT L	sàtáLÍ-màn	sàtáLÍ-MÁNkhùm	khóKKÍli-màn	khóKKÍli-mánkhùm
DEFAULT H	sàtáLÍ-màn	sàtáLÍ-MÁNkhùm	---	---

Trisyllabic nouns (initial accent, medial accent)

Meaning	‘mullet’	‘mullet’	‘pigeon’	‘pigeon’
Accent type	initial	initial	medial	medial
Surface	KÁmùlchi-màn	KÁmùlchi-mankhùm	piTWÚLki-màn	piTWÚLki-mànkhùm
Lexical	/KAmulchi-*man/	/KAmulchi-MANkhum/	/piTWULki-*man/	/piTWULki-MANkhum/
ACCENT DELETION	KAmulchi-man	KAmulchi-mankhum	piTWULki-man	piTWULki-mankhum
MED. PREACC. DOCKING	---	---	---	---
INITIAL L	---	---	piTWULki-man	piTWULki-mankhum
INIT. PREACC. DOCKING	---	---	---	---
ASSOCIATE H TO *	KÁmùlchi-man	KÁmùlchi-mankhum	piTWÚLki-man	piTWÚLki-mankhum
POST ACCENT L	KÁmùlchi-màn	KÁmùlchi-mànkhùm	piTWÚLki-màn	piTWÚLki-mànkhùm
DEFAULT H	---	---	---	---

6. Compounds

All accent groups in SKS Korean follow the same basic rules as exemplified with nouns cited in isolation and NOUN+PARTICLE. Another type of accent group is NOUN+NOUN compounds. These are of interest because they provide the broadest possible range of accent class combinations. All particles are tonic (Ramsey 1975:200), either with “*” preaccent or with preassociated accent. Nouns, on the other hand, can have any tonal configuration, and thus allow us to test what happens when combining nouns of various types as the first member with atonic as well as tonic second members. Attached as an appendix is a spreadsheet with compounds illustrating every possible combination of monosyllabic and disyllabic first members combined with monosyllabic, disyllabic, and trisyllabic second members. We present selected examples in the text.

6.1. Compounds with tonic nouns as N1. By “tonic nouns”, refer to nouns with accents preassociated to segmental material and nouns with the “*” preaccent. Compounds with tonic nouns as N1 behave like NOUN+PARTICLE constructions: the accent on the first member conditions accent deletion on the second and other rules apply as for NOUN+PARTICLE. Here are a few examples showing underlying form and outcome prior to phonetic adjustment rules that raise or lower initial syllables because of consonant types of two tones associated with the same syllable. Upper case indicates a syllable with preassociated accent.

Tonic N1 + any N2

initial	initial	남편머느리	/NAMphyen-MYEnuli/	[NÁMphyènmyènùli]	husband’s daughter-in-law
initial	medial	여름소나기	/YElum-soNAki/	[YÉlùmsònàki]	
medial	initial	망아지머리	/mangAci-MELi/	[màngÁcimèli]	colt’s head
preaccent	initial	할머니이불	/*halmeni-Ipul/	[HÁIMÉniipùl]	grandma’s blanket
preaccent	medial	물미나리	/*mul-miNAlI/	[mùlMÍnàli]	water parsley

6.2. Compound with atonic L or atonic R as N1. When an atonic noun is N1 of a compound, the situation becomes more complex. Atonic L nouns (those from MK L...) never have an effect on N2. When N2 has a preassociated accent, that accent remains associated with its original syllable and other rules apply to give the surface tonal configuration.

Atonic L N1 + preassociated accent N2

atonic L	initial	앞머느리	/aph-MYEnuli/	[àphMYÉnùli]	previous daughter-in-law
atonic L	medial	네가아저씨	/neke-aCEssi/	[nèkéáCÉssi]	our uncle

Atonic L and atonic R behave identically when N2 has three syllables and does not have a preassociated accent, i.e. it is either atonic or has a preaccent. In such cases the compound takes penultimate accent and other rules apply to give a LHL pattern (= penultimate accent pattern), where the initial and final L's are associated with the peripheral syllables and the H is associated with the remaining internal syllables.

Atonic L and atonic R N1 + atonic or preaccent trisyllable

atonic L	atonic 3	말안덩이	/mal-entengi/	[màlénTÉngi]	horse's hindquarters
atonic R	atonic 3	서울복숭아	/+sewul-pokswunga	[sèwúlpókSWÚngà]	Seoul peach
atonic L	preaccent 3	가을무비개	/kaul-*mucikay/	[kàúlmúCÍkày]	autumn rainbow
atonic R	preaccent 3	실무지개	/+sil-*mucikay/	[silmúCÍkày]	thread-like rainbow

We can build this outcome into our present account by modifying the environment for MEDIAL PREACCENT DOCKING to read $[[\dots\mu][*\sigma(\sigma)]]_{\text{accent group}}$, that is, the environment specifies that preaccent docking to a preceding mora in an accent group applies only when the second member of the accent group has no more than two syllables. An accent that is not docked to segmental material is ignored when tones are assigned. Above, we formulated the original rule to account for accent and tone where the second member of the accent group is a particle. As far as we know, there are no preaccented trisyllabic particles (there may not even be any disyllabic preaccented particles), so the restriction on syllable count does not arise with particles.

Penultimate accent seems to be the default pattern for accent groups of four or more syllables (recall that all quadrisyllabic nouns have this pattern). We may therefore wish to conventionally associate accent to the penultimate syllable of an accent group of a certain length and constituency. We cannot, however, simply dock accent to the penultimate syllable of an accent group of four or more syllables without an otherwise associated accent because there are compounds like 소철-나무 *sòchél-námú* 'pine tree' with four syllables and a LH (= atonic) tone pattern.

When N1 is atonic L and N2 is monosyllabic or disyllabic with a “*” preaccent, MEDIAL PREACCENT DOCKING applies as with particles. Additionally, if N1 is monosyllabic atonic L and N2 is monosyllabic atonic R, the phonetic outcome is HL. We account for this if we claim that atonic R has a preaccent, a claim that has support in the fact that atonic R words in the initial position of an accent group cause deletion of an accent on the second member of the group (see examples of atonic R words + PARTICLE above and in compounds below). However, when N2 is atonic R and either N1 or N2 is disyllabic, N2 behaves like atonic L. We have no way to account for this other than an ad hoc rule deleting a “+” preaccent in an accent group of more than two syllables. Examples illustrating this restriction on number of syllables are in a heavy box.

Atonic L N1 + preaccent N2

atonic L	preaccent 1	꽃물	/kkoch-*mul/	[KKÓCHmùl]	flower water
atonic L	preaccent 2	술단지	/swul-*tanci/	[SWÚLtànci]	wine jug
atonic L	preaccent 1	도둑놈	/totuk-*nom/	[tòTÚknòm]	thief bastard
atonic L	preaccent 2	머가자식	/néké-*casik/	[nèKÉcásik]	your children
atonic L 1	atonic R 1	꽃말	/kkoch-+mal/	[KKÓCHmàl]	flower meaning
atonic L 1	atonic R 2	집굴뚝	/cip-+kwulttuk/	[cipkwúlttúk]	house chimney
atonic L 2	atonic R 1	나무속	/namu-+sok/	[nàmúsók]	tree interior

We should note that the combination atonic L 2 + preaccent 2 seems to have an alternate pronunciation as the LH atonic pattern, e.g. 너거자식 /neke-*casik/ 'your children' in the table above can be pronounced [nèkécásík]. Another example of this pattern is 나무가지 /namu-*kaci/ → [nàmúkáci] 'tree branch'. This is the same pattern that we will see below for atonic R 2 + preaccent 2. We explain the latter outcome by

claiming that atonic R nouns have a preaccent which causes deletion of the preaccent N2, but such an explanation is not possible with N1 is atonic L. One possible explanation is that in the LH... pattern, the nouns are not phrased as a single accent group. This and various other issues involving compounds need further research.

The final configuration where N1 is atonic L is compounds where N2 is atonic L of one or two syllables. Not surprisingly, the outcome is atonic (LH tone pattern).

Atonic L N1 + atonic L N2

atonic L	atonic L	꽃병	/kkoch-pyeng/	[kkòchpyéng]	flower vase
atonic L	atonic L	사과나무	/sakwa-namu/	[sàkwánámú]	apple tree

Above we illustrated compounds where N1 is atonic L or atonic R and N2 is trisyllabic preaccent or atonic (all such compounds have penultimate accent). When N1 is atonic R and N2 is monosyllabic or disyllabic, the outcome is as might be expected from parallel NOUN+PARTICLE accent groups. We assign atonic R nouns a “+” preaccent. This “+” preaccent, which, unlike “*” preaccent, does not dock on its host, conditions deletion of accent on N2, which may be a “*” preaccent, a “+” preaccent, or an initial accent. The latter case is subject to the restriction noted in the discussion of NOUN+PARTICLE constructions that if the construction totals more than three syllables, an initial accent is not deleted.²⁴ Of course if N2 is atonic L, there is no accent to start with. Since the “+” preaccent does not dock to the second syllable, the phonetic form of all such compounds is the LH tone pattern characteristic of atonic accent groups. The example illustrating this restriction on number of syllables is in a heavy box.

Atonic R N1 + N2 of one or two syllables

atonic R 1	initial 2	반걸름	/+pan-KElum/	[pànkélúm]	half-stride
atonic R 2	initial 2	사람머리	/+salam-MEli	[sàlámMÉli]	human head
atonic R	preaccent	사람촉추	/+salam- <i>*chokchwu</i> /	[sàlámchókchwú]	human spine
atonic R 1	atonic R 1	반말	/+pan-+mal/	[pànmál] /+panmal/ ²⁵	low speech style
atonic R 2	atonic R 2	사람방구	/+salam-+pangkwu/	[sàlám pángkwú]	human fart
atonic R	atonic L	소철나무	/+sochel-namu/	[sòchélnámú]	pine tree

6.3. 사이 ㅅ *sai sios* ‘linking s’. Many compounds in Korean incorporate a “linking *s*”, called 사이 ㅅ *sai sios* ‘between *s*’ in Korean. The linking *s* was a productive genitive marker in Middle Korean and probably carried a particular meaning. Today it is largely lexicalized with certain compounds but not others, though in some cases its presence or absence does seem to have some poorly defined functionality. The Korean writing system arranges the segmental symbols such that each syllable forms a group. If the syllable is closed, the closing consonant is at the bottom of the group. If the syllable is open, leaving a “space” for the linking *s*, it is written; if the syllable is closed, there is no

²⁴ The tones of the resultant quadrisyllabic accent groups are ambiguous. Thus, 사람-머리 /+salam-MEli/ → [sàlám méli] ‘human head’ could be interpreted as either retaining the accent on the first syllable of /MEli/ or as giving the entire accent group default penultimate accent (in either case, the second syllable of *sàlám* would get H tone by DEFAULT H). Under either interpretation, the result must be interpreted as involving a special property of the initial atonic R noun. If /MEli/ is viewed as retaining its lexical accent, then we must say that accent deletion does not take place in quadrisyllabic constructions; if we say that the disyllabic atonic R noun conditions deletion of initial accent on a disyllabic N2, then we must have a special condition giving penultimate accent, rather than the LH atonic pattern found when N2 has a preaccent.

²⁵ Atonic R 1 + atonic R 1 becomes atonic R 2. This can be seen when a particle is suffixed to the compound, e.g. 반말이 *pànmáli* ‘familiar speech style-nominative’. The particle is preaccented, but when suffixed to this compound, the accent is deleted, leaving the particle to take H by DEFAULT H. This follows from rules already given, i.e. the “+” preaccent of /+pan/ deletes the preaccent of /+mal/, but it remains to also delete the preaccent of /**i*/ when it is suffixed to the entire compound.

“space” for the *s*, and it is not written. In either case, however, it is realized as tensification of the following consonant rather than being pronounced as [s].²⁶

We raise the issue of the linking *s* because it seems to carry an accentual effect that overrides the accentual pattern expected based on the rules presented here. One can find alternative versions of compounds that illustrate this:

대추물 *tàychwímùl* = 대춧물 *tàychwúsmùl* [tàychwúmmùl]
 ‘jujube water’ (water in which jujubes have been boiled)’

The word 대추 /+tàychwu/ → [tàychwú] ‘jujube’ is atonic R, and 물 /*mul/ → [mùl] ‘water’ is preaccent. The outcome predicted by our rules is the one on the left: the “+” preaccent triggers deletion of the “*” preaccent and the compound takes the atonic LHH tone pattern. The righthand version, with linking *s* looks as if the preaccent of N2 has transferred to N1, but no rules so far proposed would predict this. We have found other cases where compounds with linking *s* have accentual patterns at variance with those predicted by the otherwise general rules presented here.

We have also found compounds without overt evidence of a linking *s* but which have unexpected tone patterns. One such example is 집사람 *cipsálàm* /cip-+salam/ → [cipssálàm] ‘wife’ (“house person”). N1 is atonic L, N2 is disyllabic atonic R, which should leave its preaccent unassociated and give a surface atonic tone pattern LHH (see the compound 집굴뚝 *cipkwúlttwúk* ‘house chimney’ in the “atonic L N1 + preaccent N2” table above). The LHL tone pattern of *cipsálàm* is not predicted by any of our rules (if the “+” preaccent were associated to the atonic N1 by MEDIAL PREACCENT DOCKING, the result would be **cipsàlàm*, and if N1 and N2 were not phrased as an accent group, the result would be **cíp sàlám* or maybe **cíp sálám* because of the raising effect of *s*). Note that phonetically this compound has a tensed *ss*, viz. [cipssálàm]. Korean automatically tensifies all obstruents when immediately preceded by an obstruent in an accent group. For example, the compound ‘house chimney’ is phonetically [cipkkwúlttúk]. Therefore, compounds with medial ...obstruent#obstruent... sequences would neutralize the presence of linking *s* both in writing and in pronunciation. Though we have not considered enough data to make a precise statement about the accentual effect of linking *s*, we suggest that the presence of a latent linking *s* may explain the unexpected accentual behavior of compounds like *cipsálàm*.

7. Number + Counter

Like nearly all East Asian languages, Korean groups nouns into classes which become evident in various kinds of constructions when nouns have modifying adjuncts where the adjunct must be accompanied by a “classifier” appropriate to the noun’s class. The only construction where noun classification shows up in Korean is with numbers, and for this reason, the class-marking words in Korean are usually called “counters” rather than the more general “classifiers”. Korean quantifying expressions involving a number and a noun have the following structure:²⁷

(NOUN +) NUMBER + COUNTER

²⁶ The source of the Korean tensed series of consonants is the coalescence of consonant clusters, which were generally written and presumably pronounced as clusters in Middle Korean. For example, 꽃 *kkoch* ‘flower’ was written 𑏎𑏓 *skoc* in Middle Korean. Tensification of the second member of compounds that incorporate “linking *s*” is a subcase of this. Middle Korean writing did not have the restriction that there must be a “space” to write the linking *s*, and many compounds were written in Middle Korean with a linking *s* that does not appear in Modern Korean spelling, e.g. Middle Korean 𑏎𑏓𑏎 *pálskàlak* ‘toe’ (foot “stick”) now written 발가락 *palkalak* but pronounced [palkkalak].

²⁷ Korean also allows NUMBER+NOUN with some nouns, particularly animates and words that themselves have a classifier function, such as words expressing distances, weights, and the like.

NUMBER+COUNTER invariably forms an accent group and hence is governed by the rules we have proposed. The NOUN can be phrase with the the NUMBER+COUNTER group or not to produce different focal effects. At this point we will concentrate only on NUMBER+COUNTER, leaving the larger group for later discussion.

Korean uses two sets of numbers: native Korean numbers and Sino-Korean numbers. By and large, the native numbers are used only with native counters and the Sino-Korean numbers only with counters of Chinese or other foreign origin. At present we have only investigated the native numbers with counters.

The native numbers fall into four accent types:

- atonic L: 하나 *hàná* ‘1’ (→ 한 *han* with a counter)
- atonic R: 둘 *tũ:l* ‘2’ (→ 두 *twu* with a counter)
- 셋 *sěy:s* ‘3’ (→ 세 *sey* with a counter)
- 넷 *ně:s* ‘4’ (→ 네 *ney* with a counter)
- initial accent: 다섯 *tásès* ‘5’, 여섯 *yésès* ‘6’, 일곱 *ilkòp* ‘7’, 여덟 *yétèl(p)* ‘8’,
아홉 *áhòp* ‘9’²⁸
- preaccent: 열 */*yel/* → *yél* ‘10’, 스물 *súmúl* ‘20’ (→ *súmú* with a counter)

Here is a table showing a number from each accent type with a counter from each accent type. For counters with preassociated accents, we include only a disyllabic initial. Few if any counters have more than two syllables.

Hankul	# tone	Counter	# + counter	
한 시	atonic 1 L	atonic L-1	<i>hàn sí</i>	one o'clock
한 숨		atonic R 1	<i>hán swùm</i>	one breath
한 자루		atonic L 2	<i>hàn cálwù</i>	one brush
한 사람		atonic R 2	<i>hàn sálám</i>	one person
한 말		preaccent 1	<i>hán màl</i>	one 18 ltr. container
한 가마		preaccent 2	<i>hàn kámà</i>	one 8 kg. bag
한 마리		initial 2	<i>hàn máli</i>	one animal
두 시	atonic 1 R	atonic L-1	<i>tù sí</i>	two o'clock
두 숨		atonic R 1	<i>tù swúm</i>	two breaths
두 자루		atonic L 2	<i>tù cálwú</i>	two brushes
두 사람		atonic R 2	<i>tù sálám</i>	two persons
두 말		preaccent 1	<i>tù mál</i>	two 18 ltr. containers
두 가마		preaccent 2	<i>tù kámá</i>	two 8 kg. bags
두 마리		initial 2	<i>tù máli</i>	two animals

²⁸ The tens form ‘30-90’ also have the initial accent pattern.

다섯 시	initial	atonic L-1	tásès sì	five o'clock
다섯 숨		atonic R 1	tásès swùm	five breaths
다섯 자루		atonic L 2	tásès càlwù	five brushes
다섯 사람		atonic R 2	tásès sàlà̀m	five persons
다섯 말		preaccent 1	tásès màl	five 18 ltr. containers
다섯 가마		preaccent 2	tásès kàmà	five 8 kg. bags
다섯 마리		initial 2	tásès màli	five animals
열 시	preaccent 1	atonic L-1	yél sí	ten o'clock
열 숨		atonic R 1	yél swùm	ten breaths
열 자루		atonic L 2	yél càlwù	ten brushes
열 사람		atonic R 2	yél sàlà̀m	ten persons
열 말		preaccent 1	yél màl	ten 18 ltr. containers
열 가마		preaccent 2	yél kàmà	ten 8 kg. bags
열 머리		initial 2	yél màli	ten animals
스무 시	preaccen 2	atonic L-1	súmú sì	20 o'clock
스무 숨		atonic R 1	súmú swùm	20 breaths
스무 자루		atonic L 2	súmú càlwù	20 brushes
스무 사람		atonic R 2	súmú sàlà̀m	20 persons
스무 말		preaccent 1	súmú màl	20 18 ltr. containers
스무 가마		preaccent 2	súmú kàmà	20 8 kg. bags
스무 마리		initial 2	súmú màli	20 animals

For all NUMBER+COUNTER combination except *han(a)* ‘1’ the results are those predicted by the rules we have proposed. We leave it to the reader to verify this. With monosyllabic counters, *han(a)* ‘1’, which is reduced to *han*, behaves as expected for an atonic-L-1: with an atonic L counter, the pattern is atonic LH; with an atonic R or preaccent counter, the preaccent (+ or * type preaccent) of the counter is assigned to the number to give a HL pattern. However, with all disyllabic counters, the overall pattern of the NUMBER+COUNTER accent group is LHL. This is reminiscent of the accent pattern of compounds with linking *s* described in section 6.3, and indeed, in Middle Korean, this number was written ㅎ/나ㅎ *hAnàh* with a final *h*. Though this *h* has disappeared in Modern Korean in both writing and pronunciation and the number is contracted to a monosyllable with a counter follows, the accentual pattern with disyllabic counters may somehow be a historical reflex of this more elaborate word structure. Unlike linking *s*, however, the possibly latent *h* has only a tonal/accental effect. If a counter begins with a lax obstruent, it is not tensed as would be the case after linking *s*, but rather it is voiced following a regular alternation of Korean of lax stops between sonorants. Thus, ‘one brush’ is pronounced [hànjàlwù] (“j” = IPA [dʒ]), not *[hànccàlwù].

8. Prenoun + Noun

Forthcoming!

9. Domains of phrase and focus

Forthcoming! The idea will be that “unstable boundaries” (Ramsey 1975:179) allow for alternative phrasings; as a preliminary assessment, it seems that phrasing across such a

boundary puts focus on the initial constituent, phrasing separately puts focus on the final constituent, e.g. phrasings involving NOUN ± NOUN+COUNTER, PRENOUN ± NOUN.

10. Comparison with Other Accounts

Forthcoming! We first wanted to explore the data and come up with a comprehensive account before summarizing/comparing/critiquing other accounts.

- Hō Ung 1985 [1954]
- Y-H Chung 1991
- N-J Kim 1997
- Kenstowicz & Sohn 1996, 2001
- D-M Lee 2005
- Jun et al. (NKS phonetics) to appear

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APPENDIX: NOMINAL COMPOUNDS

Item_1_type	Item_2_type	Hankul	Yale	Meaning
atonic 1 L	atonic 1 L	꽃병	kkòchpyéng(i)	flower vase
atonic 1 L	atonic 1 R	꽃말	kkóchmàl	flower meaning
atonic 1 L	atonic 2 L	배나무	pàynámú	pear tree
atonic 1 L	atonic 2 R	지바굴뚝	cipkwúlttwúk	house chimney
atonic 1 L	atonic 3	말엉덩이	màléngténgi	horse hindquarters
atonic 1 L	preaccent 1	꽃물	kkóchmùl	flower water
atonic 1 L	preaccent 2	술단지	swúltànci	wine jug
atonic 1 L	preaccent 3	앞정배기	àphcéngpáyki	front part of the head
atonic 1 L	initial 2	꽃가시	kkòchkási	flower thorn
atonic 1 L	initial 3	앞며느리	àphmyénùli	previous daughter-in-law
atonic 1 L	medial 3	산미나리	sànmínàli	mountain parsley
atonic 1 R	atonic 1 L	개똥	kàyttóng(i)	dogshit
atonic 1 R	atonic 1 R	반말	pànmál(i)	familiar speech style
atonic 1 R	atonic 2 L	개두둑	kàytútók	dog thief
atonic 1 R	atonic 2 R	눈사람	nùnsálám	snowman
atonic 1 R	atonic 3	곰마느라	kwümmánùlà	bear-like wife
atonic 1 R	preaccent 1	반달	pàntál(i)	halfmoon
atonic 1 R	preaccent 2	돈단지	tòntàncí	money jar
atonic 1 R	preaccent 3	실무지개	silmúcikày	thread-like rainbow
atonic 1 R	initial 2	반거음	pànkélúm	half-stride
atonic 1 R	initial 3	섬아지매	sèmácimày	island wife
atonic 1 R	medial 3	돈주머니	tòncwúmóni	money pocket
atonic 2 L	atonic 1 L	나무꾼	nàmúkkwún	woodcutter
atonic 2 L	atonic 1 R	나무속	nàmúsók	tree interior
atonic 2 L	atonic 2 L	사과나무	sàkwánnámú	apple tree
atonic 2 L	atonic 2 R	나무우산	nàmúwúsán	wood umbrella
atonic 2 L	atonic 3	나무굿경꾼	nàmúkwúkyéngkkwún	tree sightseer
atonic 2 L	preaccent 1	도둑놈	tòtúknòm	thief bastard
atonic 2 L	preaccent 2	너거자식	nèkéçásík/nèkéçàsik	your children
atonic 2 L	preaccent 3	가을무지개	kàúlmúcikày	autumn rainbow
atonic 2 L	initial 2	나무토막	nàmúthómàk	woodchip
atonic 2 L	initial 3	너거며느리	nèkémyénùli	your daughter-in-law
atonic 2 L	medial 3	너거아저씨	nèkéácéçsi	your uncle
atonic 2 R	atonic 1 L	사람똥	sàlámттóng	human excrement
atonic 2 R	atonic 1 R	서울말	sèwúlmál	Seoul speech
atonic 2 R	atonic 2 L	소철나무	sòchélnámú	pine tree
atonic 2 R	atonic 2 R	사람방구	sàlámpángkwú	human fart
atonic 2 R	atonic 3	서울복숭아	sèwúlpókswúngà	Seoul peach
atonic 2 R	preaccent 1	대추물	tàychwúmùl	jujube water
atonic 2 R	preaccent 2	사람척추	sàlámchókchwú	human spine
atonic 2 R	preaccent 3	서울하래비	sèwúlhálaypì	Seoul grandfather
atonic 2 R	initial 2	사람머리	sàlámméli	human head
atonic 2 R	initial 3	서울며느리	sèwúlmyénùli	Seoul daughter-in-law
atonic 2 R	medial 3	서울아저씨	sèwúlácéçsi	Seoul uncle

preaccent 1	atonic 1 L	밥집	pápcíp	local restaurant
preaccent 1	atonic 1 R			
preaccent 1	atonic 2 L	통나무	thóngnámù	a whole log
preaccent 1	atonic 2 R			
preaccent 1	atonic 3			
preaccent 1	preaccent 1	귀안	kwíán	ear interior
preaccent 1	preaccent 2	발냄새	pálnáymsày	foot odor
preaccent 1	preaccent 3			
preaccent 1	initial 2	밥그릇	pápkúlük	rice bowl
preaccent 1	initial 3			
preaccent 1	medial 3	물미나리	múlminàli	water parsley
preaccent 2~3	atonic 1 L			
preaccent 2~3	atonic 1 R	표준말	phyécwúnmal	standard speech
preaccent 2~3	atonic 2 L	솔주나물	swúkcwúnàmùl	beansprout salad
preaccent 2~3	atonic 2 R			
preaccent 2~3	atonic 3			
preaccent 2~3	preaccent 1			
preaccent 2~3	preaccent 2	할머니나이	hálméninài	grandma's age
preaccent 2~3	preaccent 3			
preaccent 2~3	initial 2	할머니이불	hálménìipùl	grandma's blanket
preaccent 2~3	initial 3			
preaccent 2~3	medial 3	할머니저고리	hálménicèkòli	grandma's blouse
initial 2~3	atonic 1 L	도박꾼	tópàkkkwùn	gambler
initial 2~3	atonic 1 R	한국말	hánkùkmàl	Korean language
initial 2~3	atonic 2 L	은행나무	únhàynghnámù	ginkgonut tree
initial 2~3	atonic 2 R			
initial 2~3	atonic 3			
initial 2~3	preaccent 1			
initial 2~3	preaccent 2			
initial 2~3	preaccent 3	여름무지개	yélümmùcikày	summer rainbow
initial 2~3	initial 2	구리반지	kwúlìpàncì	copper ring
initial 2~3	initial 3			
initial 2~3	medial 3	여름소나기	yélümsònàki	summer rain shower
medial 3	atonic 1 L			
medial 3	atonic 1 R			
medial 3	atonic 2 L			
medial 3	atonic 2 R			
medial 3	atonic 3			
medial 3	preaccent 1			
medial 3	preaccent 2	사랑니발치	sàlángnipàlchì	wisdom tooth extraction
medial 3	preaccent 3			
medial 3	initial 2	노리개장식	nòlìkàycàngsik	decoration
medial 3	initial 3			
medial 3	medial 3	도깨비방망이	tòkkáyìpàngmàngì	bat (ghost bat)