CONTENTS

PROTO-KOREAN AND THE ORIGIN OF KOREAN ACCENT

S. Robert Ramsey
The University of Maryland

The earliest systematic records of the Korean language are the alphabetic materials of the fifteenth and sixteenth centuries.* The variety of the

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Linguistic forms are transliterated from the Korean alphabet according to the following conventions:

Consonants	ㄱ	ㄷ	ㅂ	ㅈ	ㅅ	ㆆ
	k	t	p	c	s	ʔ
	ㅋ	ㅌ	ㅍ	ㅊ		ㅎ
	k^h	t^h	p^h	c^h		h
	ㄲ	ㄸ	ㅃ	ㅉ	ㅆ	ㆅ
	kk	tt	pp	cc	ss	hh
	ㅇ	ㄴ	ㅁ		ㅿ	ㅇ
	ŋ	n	m		z	'
		ㄹ	ㅸ			∞
		l	β			''

Vowels	ㅏ	ㅑ	ㅓ	ㅕ	ㅗ	ㅛ	ㅜ	ㅠ	ㅡ	ㅣ	ㆍ	ㆎ	ㅐ	ㅒ	ㅚ	ㅟ	ㅢ
Middle Korean:	a	ya	e	ye	o	yo	u	yu	ɨ	i	ʌ	ʌy	ay	ey	oy	uy	iy
Modern Korean (Seoul Dialect):	a	ya	ə	yə	o	yo	u	yu	ɨ	i			ɛ	e		wi	iy

Accent
Middle Korean:
no dots (low pitch): grave accent over vowel (ˋ)
one dot (high pitch): acute accent over vowel (ˊ)
two dots (rising pitch): both accents together (ˇ)

For the modern accenting dialect of South Hamgyŏng, the accented syllable will be indicated with an acute accent mark over the vowel.

language reflected in these materials is usually known as Middle Korean.[1]

Within the Middle Korean phonological system there were a number of irregularities. By applying the method of internal reconstruction to these irregularities, and by supplementing and corroborating the results with comparative and structural evidence from the modern dialects, it is possible to recover a stage of the language significantly earlier than Middle Korean. This reconstructed stage of the language will be referred to here as Proto-Korean.

The role of accent in the reconstruction

Accent provides an important key to the reconstruction of Proto-Korean. Pitch was distinctive in the phonological system of Middle Korean, and it is still used distinctively in a number of modern dialects.

Dialect accent. Although lexical pitch distinctions disappeared centuries ago in the Seoul dialect, systems of pitch accent are still found in Kyŏngsang in the Southeast and in Hamgyŏng in the Northeast[2]. The dialect spoken in Pukch'ŏng, South Hamgyŏng Province, is typical of the latter group.[3] In this dialect, just as in the familiar Tokyo-type dialects of Japanese, distinctive pitch shapes can be accounted for by an accent marking the location of the last high-pitched syllable in the phrase. As can be seen

[1] In their phonological and morphological detail, the Korean alphabetic materials of the fifteenth and sixteenth centuries are equal to, if not superior to, any other pre-modern body of works in the world. The records of the Korean language that predate the invention of the alphabet, on the other hand, are poor and scanty. Chinese characters were occasionally employed as phonograms to transcribe native words and grammatical elements. Few of these pre-alphabetic transcriptions survive, and those that do are fragmentary, difficult to interpret, and in the best of cases little more than hints as to what words might have sounded like before Middle Korean. What is called Old Korean consists of a few linguistic forms reconstructed from such pre-alphabetic transcriptions.

[2] A few varieties of Korean dialect accent have yet to be reported upon. In particular, little is known about pitch distinctions in some Chŏlla dialects in the Southwest, and the prosodic features of dialects in the extreme northeastern corner of the peninsula have, to the best of my knowledge, never been described in any published source.

[3] The accenting dialects of Kyŏngsang attest to the same accentual distinctions, but the pitch patterns in those dialects have been complicated by historical changes: see Ramsey 1978a: 78–81.

from the examples given in Table I, the locus can occur on any, or no, syllable of the stem. Oxytonic nouns are distinguished from atonic nouns morphophonemically, by the pitch of an enclitic particle.

Middle Korean accent. The Middle Korean pitch system is quite well documented. In texts of the period, each syllable was consistently marked as low, high, or rising in pitch.[4] No vowel length was transcribed as such, but from philological sources we know that syllables with rising pitch were pronounced long. Morphophonemic evidence indicates that these rising-pitched syllables were composed of one low-pitched mora plus one high-pitched mora.[5] Table II provides examples of all possible pitch contrasts for nouns one, two, and three syllables long. Forms with variable pitch are given both in isolation and followed by a particle.

The pitches in these forms are often referred to in the literature as tones, but the system was clearly accentual. The locus of the accent was the first high-pitched syllable, or mora, in the word. After that point pitch differences were variable and non-distinctive. Rising-pitched syllables (which were composed of a low-pitched mora plus a high-pitched mora) were accented on the second mora.

Reconstructing earlier accentual distinctions. When the Middle Korean accent classes are compared to those of the modern dialects, certain problems become apparent. The most troublesome problem is with accents that fall on the first syllable of a word. Although the correspondences for Middle Korean atonic (òò) and oxytonic (òó) nouns are almost exceptionless, the correspondences for protonic (óo) nouns are extremely poor. More than 30% of the reflexes of Middle Korean protonic dissyllabic nouns have a different type of accent (either atonic or oxytonic) in the accenting dialects of Hamgyŏng and Kyŏngsang. The correspondences are even worse for

[4] In the transliterations of Middle Korean given here low pitch is represented with a grave accent, a high pitch with an acute accent mark, and a rising pitch with both accent marks placed together (ˇ) over the vowel. The same conventions will be used to represent Proto-Korean pitches even though it is claimed these pitches were not distinctive. When stems with variable pitch are cited in isolation, accent marks are omitted. Also, in complex lists of Middle Korean verb forms, only the pitch of the distinctive accent locus is marked (cf. fn. 17).

[5] Kōno Rokurō (1944) was the first to show that the "rising tone" was a complex phonological unit, but a number of Korean scholars have also helped document the evidence. See Ramsey 1978a: 113–30 for details.

mal 'horse'	*mál* 'measure'; 'speech'		
mal I	*MAL i*		
poli 'barley'	*móki* 'mosquito'	*məlí* 'hair'	
poLI KA	*MOki ka*	*məLI ka*	
kalakci 'ring'	*múcikɛ* 'rainbow'	*kalméki* 'seagull'	*kkamakwí* 'raven'
kaLAKCI KA	*MUcikɛ ka*	*kalMɛki ka*	*kkaMAKWI ka*

Table I. Accent Distinctions in a Northeastern Korean Dialect
NOTE: Pitch shapes are given with an enclitic particle.

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mʌ̀l 'horse'	*mál* 'measure'	*măl* 'speech, language'	
pòlì 'barley'	*émí* 'mother'	*mèlí* 'hair'	*sălʌ́m* 'human being'
	émì nín		*sălʌ̀m ʌ́n*
sònskàlʌk 'finger'	*tóskàpí* 'devil'	*kʌ̀lmyékí* 'seagull'	*kàmàkóy* 'raven'
		kʌ̀lmyékì nín	
			sămàkóy 'mole'

Table II. Pitch Distinctions in Middle Korean

protonic trisyllabic nouns (óoo), where about half of the dialect reflexes fall into a different accent class. Moreover, there is little agreement between the modern dialects as to which words are exceptional. There is obviously something aberrant about the historical development of accent on an initial syllable. Unless it can be shown how and why protonic classes decayed, it will be very difficult to find a non-arbitrary way to reconstruct this kind of accent into the lexicon of earlier Korean.

An even more pervasive problem with Korean accent is the overall lexical distribution among the various classes. The following chart is a display of the statistics for 398 Middle Korean nouns:[6]

The Accentual Distribution of 398 Middle Korean Nouns

				Totals
Accent class:	1.0	1.1		
Example:	*màl* 'horse'	*mál* 'measure'		
Class size:	35 (22%)	127 (78%)		162
Accent class:	2.0	2.1	2.2	
Example:	*pòlì* 'barley'	*mókʌy* 'mosquito'	*mèlí* 'hair'	
Class size:	46 (19%)	30 (13%)	160* (68%)	236
				398

* A total of 39 rising-pitched nouns are included in this number. (Cf. fn 6.)

As can be seen from this chart, the classes in which the accent falls on the last syllable of the morpheme—that is, oxytonic—nouns are far larger than the other classes. In the case of monosyllables, there are more than three times as many (oxy)tonic nouns as atonic nouns; for dissyllables, there are more than twice as many oxytonic nouns as atonic and protonic nouns combined.

I believe that this faulty distribution was caused by the fact that Proto-Korean did not have pitch distinctions, and that the oxytonic classes—1.1 and 2.2—represent the pitch pattern originally carried by all Korean morphemes. In other words, I believe that proto-Korean was characterized by a non-distinctive prosodic system in which the last (or only) syllable of a morpheme was automatically given prominence. If this hypothesis is correct, pitch shapes different from the canonical, oxytonic pattern must have been the result of phonological change, compounding, and borrowing.

[6] In this display nouns longer than two syllables are omitted since almost all were morphemically complex. Middle Korean rising pitches are treated as dissyllables.

Much of the atonic vocabulary looks as if pitch may have been phonologically conditioned. For example, few Middle Korean nouns end in *-ng*, but those that do are normally characterized by a low-pitched final syllable; e.g., *skwèng* 'pheasant', *stòng* 'dung', *tìng* 'back', *kʰòng* 'soybeans', *kòlàng* 'furrow'. In almost 30% of the dissyllabic, atonic nouns, the vocalism of both syllables is of a peculiar[7] type, the minimal vowel ʌ/*i*; e.g., *kʌ̀zʌ̀l* 'autumn', *kìtìy* 'thou', *mʌ̀tʌ̀y* 'joint', *mʌ̀zʌ̀m* 'heart', *pʌ̀lʌ̀m* 'wind'. Even more suggestive is the fact that almost half of the atonic dissyllables have the shape CVC_1VC_2,[8] where C_1 and C_2 are voiced consonants; examples (besides those given above that fit this description) include **kùmìy* 'hole', **nàmʌ̀y* 'wood', **nòlʌ̀y* '(a kind of) deer', **mùzìy* 'daikon', **sìlìy* 'steamer', **àzʌ̀y* 'younger brother', **yèzìy* 'fox', **cyàlʌ̀y* 'sack', **kʌ̀lʌ̀l* 'powder', and many more. In time, as our understanding of Korea's linguistic prehistory grows, the phonological processes through which these forms were created will surely be brought to light.

Many protonic nouns are morphemically complex. For example, *yémso* 'goat' is said to have the etymological meaning 'bearded ox' (Martin, et al. 1967: 1183); *úl.ey* 'thunder' is a nominalization of the verb 'to cry, roar'; *áki* 'baby', *émi* 'mother', and *pʰʌ́li* 'fly' contain the suffix *-í* (*pʰʌ́l* is attested).

Other nouns in aberrant pitch classes are loans, usually from Chinese. Such atonic forms include *pyèng* 'bottle', *pì* 'monument, stele', *cʰàng* 'window', *cʰàng* 'spear', *cʰò* 'vinegar', *kàcì* 'eggplant', *kòcʰyò* 'pepper', *tòcʌ́k* 'thief', *lòktù* 'green peas', *syàkòng* 'boatman', *cyèksàm* 'jacket',[9] *cyùngsʌ́yng* 'animal', *pʰyèngpʰùng* 'folding screen', and many, many more. An equally large number of atonic nouns may be borrowings of some kind,

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[7] Peculiar because it is the minimal vowel that, in Middle Korean at least, appeared most commonly in non-initial syllables. The choice of ʌ or *i* was one of vowel harmony and depended upon the identity of the vowel in the first syllable of the word.

[8] A significant (though lesser) number of nouns with this segmental shape have the otherwise expected oxytonic accent. I have found twelve such examples: *kʌ̀lím* 'oil', *kyèzʌ́l* 'winter', *nyèlím* 'summer', *màzʌ́n* 'forty', *pànʌ́l* 'needle', *pàlʌ́l (~ pàtáh)* 'sea', *pìnʌ́l* '(fish) scale', *èlím* 'ice', *yèlím* 'fruit', *ònʌ́l* 'today', *ùmʌ́l* 'well', *hèmʌ́l* 'misdeed'. Many of these nouns are morphemically complex: 'forty', 'today', and 'well' are compounds; 'ice', 'fruit', and possibly 'summer' as well, are nominalizations derived from verb stems. 'Oil', 'winter', 'needle', 'scale', and 'misdeed' are more difficult to explain.

[9] The morpheme *cyèk* is problematic, but *sàm* is clearly from Chinese.

but definite sources have not yet been identified. These words include such culture-bound terms as *tàk* 'paper mulberry', *tòt^h* 'swine', *màl* 'horse',[10] *pʌ̀y* 'pear', *pàt^h* 'field', *òs* 'lacquer', *pòlì* 'barley', *pìt^{h}ye* 'Buddha',[11] *pìnhyè* 'hairpin', *sòkòm* 'salt', and *sòòm* 'cotton'. (Could words like *sòn* 'guest', *nòh* 'cord', *tòk* 'crock', *pìt* 'debt', *sòt^h* 'kettle', *hwàl* 'bow', *pòsyèn* '(Korean) socks', and *stàpò* 'weederplow' be added to this list?) There remain many cases where it is extremely difficult to separate loanwords from the etymologies of native Korean nouns.

Verbs. Accounting for accentual distinctions in the Korean verbs is a more straightforward task. It is here that internal reconstruction yields the clearest results. As Martin has noted (1966: 197), the Korean inflectional system is almost completely resistant to borrowing. Verb forms are composed entirely of native elements, and the method of internal reconstruction can be applied to them with confidence. The same does not hold true for nouns, where, as we have seen, it is often difficult to separate loans from native vocabulary.

The stem of a Korean verb cannot occur in isolation. In every environment it is followed by an inflectional ending.[12] By phonological (including accentual) behavior, these endings fall generally into two groups: those that begin with the minimal vowel *i* (or, in Middle Korean, *ʌ*) and those that do not. The difference is illustrated by the following forms of the Middle Korean verb 'to be bent':

(a)		(b)	
kùptá	'it's bent'	*kùpíní*	'since it's bent,'
kùpkó	'it's bent, and...'	*kùpímyén*	'if it's bent,'
kùpkéy	'so that it's bent'	*kùpílilá*	'it will be bent'
kùptí (mót...)	'it's (not) bent'	*kùpín*	'the bent (one)'
kùpsólá	'what with being bent'	*kùpílq*	'the (one) that will be bent'

Notice that the minimal vowel consistently appears before sonorants (i.e., *l*, *m*, and *n*)[13] and is not generally found before endings that begin

[10] The languages in which variant forms of this word appear are of course legion.

[11] The first syllable is almost surely from some variety of Chinese, but the rest of the word is not so easy to explain. The Korean form was in any case the most probable source of the Japanese word for 'Buddha', *hotoké*.

[12] In modern Korean, the total number of paradigmatic endings is well over 400 (Martin 1974: 354); and in Middle Korean the number was almost certainly comparable.

[13] There are a small number of exceptions—most notably before the

with an obstruent.[14] This difference figures prominently in my reconstruction of earlier verb forms.

Korean verbs fall into inflecting classes by segmental and accentual behavior. A comparison of Middle Korean and the modern accenting dialects shows that verbs whose stems are sometimes, or always, one syllable long, can be divided into eight classes.[15] Here are Middle Korean examples, together with the reflexes found in Seoul and in an accenting dialect of South Hamgyŏng:

Verb Classes in Middle Korean

	Class 1 'eat'	Class 2 'use'
Middle Korean	*mèktá, mèkíní*	*psítá, psíní*
South Hamgyŏng	*məktá, məkíni*	*ssíta, ssíni*
Seoul	*məkta, məkini*	*ssita, ssini*

	Class 3 'see'	Class 4 'stand'
MK	*pòkó, pòmyén, pókèná, póá*	*syèkó, syèmyén, syèkèná, syéá*
SH	*pokú, pomún, pókəna, páa*	*səkú, səmún, səkə́na, sə́ə́*
Seoul	*poko, pomyən, pokəna, pwa*	*səko, səmyən, səkəna, səə*

	Class 5 'be many'	Class 6 'be hot'
MK	*tyŏt^{h}a, tyŏhʌ̀nyé*	*tĕpta, tèβímyén, tèβé*
SH	*cót^{h}a, cóini*	*tə́pta, təpúmyən, təpə*
Seoul	*cot^{h}a, coini*	*təpta, təumyən, təwə*

	Class 7 'lie down'	Class 8 'flow'
MK	*nùpkócyé, nùβìmyé, nùβé*	*hìlìkéy, hìllé*
SH	*nupkú, nupumyə́, nupə́*	*hiliké, hillə́*
Seoul	*nupko, nuumyə, nuwə*	*hilike, hillə*

The largest verb class is Class 1.

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processive marker *-nʌ̀-*, which appears directly after a stem-final obstruent; e.g., *mèknʌ̀tá* '(he) is eating'. I believe that this marker may be derived from an independent verb stem.

[14] The minimal vowel is also not found before vowels; e.g., *kùpé* 'it's bent, and so...', *kùpéstá* 'it was bent'.

[15] Longer stems, far fewer in number and in general morphemically complex, will not be discussed here.

Class 1 verbs. The stem of a Middle Korean Class 1 verb is always one low-pitched syllable, and the syllable is always closed by a consonant or consonant cluster or the semivowel *y*. Both the accent and the last segment of the stem are different from those of the other classes.

Table III shows the distribution of 472 verbal stems according to the last segment of the stem. (For the sake of comparison, the morphophonemic, second-syllable vowel in classes 6, 7, and 8 is omitted.)

The complementarity is almost perfect: Class 1 stems are closed by voiceless obstruents; the stems of the other classes are not.

The only significant exceptions to this rule are the stems that end in *-y* or *-l*. The *l*-stem forms will be set aside; they present special problems that will not be discussed here. (But see Ramsey 1978: 224 ff.) The *y*-stem forms are exceptional in a more demonstrable way. Many are morphemically complex; among them, for example, are stems that incorporate the causative/passive morpheme *-.í-*. Here are a few examples:[16]

psʌ́- 'wrap'	+ *-.í-* →	*psʌ̀y-* 'be wrapped'
ptí- 'float'	+ *-.í-* →	*ptìy-* 'make float'
cʰí- 'remove'	+ *-.í-* →	*cʰìy-* 'have (someone) get rid of'

Other *y*-stems seem to be contractions of longer stems; e.g., the Middle Korean Class 1 stem *ùy-* 'poke, scrape' has as its modern Seoul dialect reflex the form *upi-* 'id.'. The accent of still other Class 1 stems, such as *pʌ̀y-* 'soak into', is suspect because the modern reflexes have vowel length, a suprasegmental that normally corresponds to rising pitch in Middle Korean. The *y*-stems will also be excluded from the discussion.

The remaining Class 1 stems have a shape comparable to Class 6 stems. The verbs in these two classes contrast in the following way:[17]

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[16] It should be noted, however, that the accent rules involved in derivations are problematic, as can be seen from the following examples:

pʰʌ́- 'dig'	+ *-í-* →	*pʰʌ́y-* 'be dug'
sye- 'stand'	+ *-.í-* →	*syěy-* 'stand (something) up'

[17] Accent marks, except those marking the distinctive locus, are omitted in order to simplify the display. The rising tones that appear in Class 6 forms such as *kŭptá* are transcribed here as dissyllables; e.g., *kuúpta*.

Stem-final segment(s)	Class	1	2	3	4	5	6	7	8
-p		10							
-t		16	1			1			
-s		7							
-c		15	2						
-k		17				1			
-sk		12							
-st		1							
-ps						1			
-p^h		7							
-t^h		10							
-c^h		9							
-l		17	16			2	38		
-lh		7	1						
-lk		10				1			
-lβ						1	8		
-lm							5		
-h						1		14	
-β			1			2	7	3	
-t/l							10	2	
-z							15	3	
-m			8			1	9		
-n			1				3	1	
-nc								2	
-nh						1			
-l.									21
-z.									5
-m.									1
-ll									8
-y		14	16			26	1		
-V			50	15	13	1			
Totals:		152	96	15	13	40	96	25	35

Table III. Distribution of verbal stems according to last segment of stem.

	Verb Class 1			Verb Class 6	
a.	*kuptá*	'it's bent'	a.	*kuúpta*	'(I) bake it'
	kupkó	'it's bent, and...'		*kuúpko*	'(I) bake it, and...'
	kupkéy	'so that it's bent'		*kuúpkey*	'so that (I) bake it'
b.	*kupíni*	'since it's bent'	b.	*kuβíni*	'since (I) bake it'
	kupímyen	'if it's bent'		*kuβímyen*	'if (I) bake it'
	kupílila	'it will be bent'		*kuβílila*	'(I) will bake it'

Here are examples of stem shapes found in these two classes:

	Class 1			Class 6	
	a	b		a	b
'carry on back'	*eptá*	*epíni*	'be hot'	*teépta*	*teβíni*
'be bent'	*kuptá*	*kupíni*	'bake'	*kuúpta*	*kuβíni*
'be narrow'	*coptá*	*copʌ́ni*	'help'	*toópta*	*toβʌ́ni*
'gather'	*kettá*	*ketíni*	'walk'	*keétta*	*kelíni*
'believe'	*mittá*	*mitíni*	'pump'	*kiítta*	*kilíni*
'receive'	*pattá*	*patʌ́ni*			
'take off'	*pestá*	*pesíni*	'laugh'	*uústa*	*uzíni*
'comb'	*pistá*	*pisíni*	'pick up'	*cuústa*	*cuzíni*
'spurt out'	*sostá*	*sosʌ́ni*	'peck'	*coósta*	*cozʌ́ni*
'be wet'	*cestá*	*cecíni*	'exceed'	*neémta*	*neníni*
'meet'	*mastá*	*macʌ́ni*	'wind'	*kaámta*	*kamʌ́ni*
'die'	*cuktá*	*cukíni*	'wear (shoes)'	*siínta*	*siníni*
'eat'	*mektá*	*mekíni*	'embrace'	*aánta*	*anʌ́ni*
'stop'	*maktá*	*makʌ́ni*			
'rejoice'	*kistá*	*kiskíni*			
'be deep'	*kiptá*	*kip^{h}íni*			
'be, grow old'	*nilktá*	*nilkíni*			
'be worn out'	*nʌlktá*	*nʌlkʌ́ni*			

The last consonant in Class 6 stems is *β*, *t/l*, *z*, *m*, *n*, (*l*, or the semivowel *y*). I believe that these consonants reflect original contrasts with the voiceless obstruents of Class 1. If this original contrast was one of voicing, it follows naturally that the nasals *m* and *n* would pattern with

the voiced consonants.[18] Here are some proposed reconstructions:

[18] In 1975 I suggested that the stems of Class 1 had always been monosyllabic and closed by a consonant since I could find no direct evidence (such as historical attestations) to prove otherwise. From this assumption I then argued that the voiced consonants in the Class 6 stems had originally been identical to the unvoiced phonemes found in Class 1, and that they had lenited because of their intervocalic position. That is to say, the consonants in Class 6 stems weakened because they were followed by a vowel, *V*p*V > V*β*V; *V*s*V > V*z*V; and so on. This solution implies that all the Middle Korean voiced obstruents were historically derived from unvoiced consonants, and that the only obstruents in the earlier reconstructable stage of Korean were all unvoiced. The hypothesis had several problems. One is that it gave no way to explain why Class 1 stems never end in *m* (or *n*), while there are so many occurrences of the nasal *m* in Class 6 stems. This distribution is peculiar. If Class 1 stems could be closed by other consonants that existed at the Proto-Korean stage, why not by *m* (or *n*)? The nasals must surely be reconstructed for Proto-Korean: they cannot be explained as the products of lenition—after all, there are no unvoiced nasals or any other consonants from which they could have lenited. An even more troublesome aspect of lenition is the phonological condition necessary for the application of the rule. Under the lenition hypothesis, the **p* in **kùpímyén* meaning 'if I bake' (< **kùpí-* + ending) would have had to lenite, while the identical **p* in **kùpímyén* meaning 'if it's bent' (< **kùp-* + ending) could not have. Rules can of course be written so that lenition occurred sometime in the derivation before arriving at these surface forms, but what such rules boil down to is a claim that speakers of earlier Korean could somehow tell the difference between a stem-final vowel and an ending-initial vowel. In the kinds of Korean we know from first-hand experience, native speakers are not very adept at this kind of segmentation. Since a verb stem never occurs in isolation, speakers of the language are only dimly, if at all, aware of this part of the verb as a separate entity. Another derivational problem is the concatenation of minimal vowels. For example, the vowel /i/ appears twice in **kùpí- + -ímyén*, an underlying form that is suspicious since no more than one vowel ever appears on the surface, in any environment. In the case of Middle Korean Class 7 stems, such as *nùβi-* 'lie down', the concatenation requires the following derivation: *nùβi- + -ímyén → nùβimyén*, with elision of the second, high-pitched occurrence of the minimal vowel. This derivation is *ad hoc*. It runs counter to the following morhophonemic rule of Middle Korean: v̀ + v́ → v̌. In other words, the high-pitched mora,

Middle Korean	Proto-Korean
β	**b*
t/l	**d*
z	**z*
(.)	**g*
m	**m*
n	**n*

In the framework proposed here, Class 6 stems were originally distinguished from Class 1 stems only by this voicing contrast. Both classes were two syllables long in Proto-Korean and belonged to a single class of inflecting stems with the shape (C)VCV-.

**kùpí-* 'be bent' **kùbí-* 'bake'

Then, sometime after the Proto-Korean stage, stem-final vowels elided under certain conditions. The change can be roughly formulated as follows (it will be emended later): *ʌ,i* > ∅ C_1___C_2, where C_1 and C_2 are voiceless obstruents. That is, the minimal vowels *ʌ* and *i* were lost by syncope between voiceless obstruents. Here are examples:

**kùpítá* > *kùptá* 'it's bent'
**sòsʌ́kó* > *sòskó* 'it spurts out, and ...'
**pàtʌ́kéy* > *pàtkéy* 'so that (he) receives (it)'

The stems that underwent this change formed Class 1. Notice that if C_2 was any consonant besides a voiceless obstruent, syncope did not occur; for example: **kùpímyén* 'if it's bent'; **kùbímyén* 'if (I) bake (it)'.

If C_1 was voiced, the final vowel of the stem was also subject to syncope. But, in this case, syncope left a trace of the elided vowel in compensatory lengthening of the vowel in the preceding syllable. The accent, or high pitch, of the elided vowel also moved across the voiced consonant. Now the first syllable had a long vowel with a high pitch on its second mora. Voiced obstruents were then devoiced in the presence of the voiceless obstruent that followed.

**kubíta* > **kuúbta* → *kuúpta*[20] '(I) bake it'

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the carrier of the accent locus in Middle Korean, should be preserved in the surface form. Why should we believe that the high-pitched mora was ever there in the first place?

Problems such as these, I believe, represent fatal weaknesses of the lenition hypothesis.

[19] This consonant does not appear in Class 6 stems.

[20] The long-vowel forms are of course transcribed in Middle Korean as

**kedíko* > **keédko* → *keétko* '(I) walk, and...'
**cozʌ́key* > **coózkey* → *coóskey* 'so that (it) pecks'
**kamʌ́key* > *kaámkey* 'so that (it) winds'

The stems where this change occurred formed Class 6. After syncope had taken place, certain intervocalic consonants lenited, a process by which **b* and **d* weakened into *β* and *l* ([r])[21]; other stem consonants remained unchanged. Here are examples:

**kùbíní* > *kùβíní* 'since it's bent,'
**kèdímyén* > *kèlímyén* [kərimyən] 'if (I) walk'

Table IV presents a summary of the processes proposed to explain the development of Class 1 and Class 6 stems.

Class 2 verbs. The second class of verbs with a stable stem shape is Class 2. In Middle Korean, these stems are always high pitched. They are subdivided into two subclasses by segmental structure:

Class 2a: The syllable of these stems is closed by a sonorant, *l* or *m*, or by *y*:[22] e.g., *kʌ́l-* 'grind', *súm-* 'hide'.

The majority of the stems in this subclass seem to have been closed by a sonorant ever since the Proto-Korean stage.[23]

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kŭptá, *kĕtkó*, *cŏskéy*, and *kămkéy*. (See the brief description of Class 5 stems, above.)

[21] It should be remembered that /l/ is a phonemic transcription; the symbol *r* would of course serve equally well.

[22] There are five exceptions with obstruent finals: *pt^{h}ít-* 'pluck', *sís-* ~ *síc-* 'wash' (these two forms are apparently variants of *sis-* 'id.', a Class 1 stem with the expected low pitch), *c^{h}ʌ́c-* 'search for', *pcíc-* 'tear', *kʌ́t^h-* 'be alike'. This last exceptional stem meaning 'be alike' has a variant form *kʌ́thʌ-* 'id.' which is equally well attested; the variant shows that the stem is derived from the noun *kʌ́t-* '-like' (attested only in compounds) + the verb *hʌ-* 'do, be'. There are also *ólh-* 'be correct < **ól* + *hʌ-* 'be, do'; *cóh-* 'be clean' < **có* + *hʌ-* 'be, do'; and *sílh-* (*sílhʌ-*) 'dislike' < **sil* + *hʌ-* 'be, do' (the accentual behavior shows that these three stems have the structure Noun + *hʌ-*). Finally, the common stem *c^{h}íp-* ~ *c^{h}íβ* - '(the weather) feels cold' is derived from **c^{h}í-*, which is probably a variant of *c^{h}ʌ́-* 'be cold (to the touch)', + *-βi-*, a postverb used to derive adjectivals (cf. Ramsey 1978a: 223–23).

[23] But note that I would derive stems with complex initials, such as *p^{h}ʌ́l-* 'sell' and *c^{h}ʌ́m-* 'endure', from dissyllabic stems: e.g., **pʌ̀Hʌ́l-* and **cʌ̀Hʌ́m-*.

Proto-Korean	Syncope	Devoicing	Lenition	Middle Korean	
**kùpí-* 'be bent'					
**kùpítá* >	*kùptá*			*kùptá*	
**kùpíní*				*kùpíní*	
**pàtʌ́-* 'receive'					
**pàtʌ́tá* >	*pàttá*			*pàttá*	
**pàtʌ́ní*				*pàtʌ́ní*	
**pèsí-* 'take off'					Class 1
**pèsítá* >	*pèstá*			*pèstá*	
**pèsíní*				*pèsíní*	
**mèkí-* 'eat'					
**mèkítá* >	*mèktá*			*mèktá*	
**mèkíní*				*mèkíní*	
**kùbí-* 'bake'					
kùbítá >	**kùúbtá* >	*kùúptá*		*kŭptá*	
**kùbíní* >			*kùβíní*	*kùβíní*	
**kèdí-* 'walk'					
**kèdítá* >	**kèédtá* >	*kèéttá*		*kĕttá*	
**kèdíní* >			*kèlíní*	*kèlíní*	
**nàzʌ́-* 'improve'					Class 6
**nàzʌ́tá* >	**nàáztá* >	*nàástá*		*nàstá*	
**nàzʌ́ní*				*nàzʌ́ní*	
**kàmʌ́-* 'wind'					
**kàmʌ́tá* >	*kàámtá*			*kàmtá*	
**kàmʌ́ní*				*kàmʌ́ní*	

Table IV. Summary of development of Class 1 and Class 6 verb stems.

Class 2b: Open-syllable stems. Here are a few examples:

	a	b
'scoop'	*stíta*	*stíni*
'write'	*ssíta*	*ssíni*
'open (eyes)'	*ptíta*	*ptíni*
'use'	*psíta*	*psíni*
'squeeze'	*pcʌ́ta*	*pcʌ́ni*
'spread'	*p^{h}íta*	*p^{h}íni*
'burn'	*t^{h}ʌ́ta*	*t^{h}ʌ́ni*
'kick'	*c^{h}ʌ́ta*	*c^{h}ʌ́ni*
'be big'	*k^{h}íta*	*k^{h}íni*
'steam'	*ptíta*	*ptíni*
'hit, strike'	*t^{h}íta*	*t^{h}íni*

These stems were originally two syllables long, as is indicated by their unique canonical shape in Middle Korean. They have four characteristics:

(1) the pitch is high;

(2) the syllable is open;

(3) the initial consonant is a cluster or an aspirate;

(4) the vowel is a minimal vowel, *ʌ* or *i*, or *ɨ*.

In Proto-Korean, the consonants in the initial clusters were separated by a vowel. This vowel, which can be reconstructed as one of the minimal vowels, **ʌ* or **ɨ*, was lost by syncope. Here are the proposed reconstructions for some of the examples given above:

**sɨtítá*	>	*stítá*	'scoop'
**sɨsítá*	>	*ssítá*	'write'
**pɨtítá*	>	*ptítá*	'open (eyes)'
**pɨsítá*	>	*psítá*	'use'
**pʌcʌ́tá*	>	*pcʌ́tá*	'squeeze'

In a morphophonemic sense, the aspirates can be considered clusters of C + *h*, in the modern Korean dialects as well as in Middle Korean, and an intervening minimal vowel can thus be postulated for the proto forms. A voiceless fricative **h* may not be reconstructable for Proto-Korean.[24] Nevertheless, it seems clear that the source of aspiration in these clusters

[24] The origin of Middle Korean *h* has often been a subject of question. There are suspiciously few morpheme-initial occurrences of this consonant; at the end of Middle Korean nouns, there seem to be too many. Comparativists such as Ramstedt and Poppe would derive it from Altaic **s*. In

had to have been some sort of voiceless velar obstruent.[25] For this reason, the identity of the consonant will be left an open question and the Proto-Korean obstruent written with the symbol **H*. Here are the reconstructions for the above examples with initial aspirates:

**pìHítá*	>	p^h*ítá*	'spread'
**tʌ̀Hʌ́tá*	>	t^h*ʌ́tá*	'burn'
**cʌ̀Hʌ́tá*	>	c^h*ʌ́tá*	'kick'
**kìHítá*	>	k^h*ítá*	'be big'

The minimal vowel at the end of Class 2b stems was not subject to syncope. Thus, for example, the following change did not take place: *psítá* (< **pìsítá*) > **pstá*. Since the Syncope Rule proposed for Class 1 stems should apply here, the rule will have to be emended by adding the condition that the vowel not be the only vowel of the stem. Presumably, at least one vowel in the morpheme needed to be preserved for stem identity.

Under this hypothesis, the phonological difference between Class 2 stems and Class 1 stems at the Proto-Korean stage would have been, instead of accent, the quality of the vowel in the first syllable; compare:

Class 1	Class 2
**pèsí-* 'take off'	**pìsí-* 'use'

Vowel syncope would have had to apply in the following way:

Proto-Korean		Middle Korean	
**pèsítá* 'take off'	>	*pèstá*	(Class 1)
**pìsítá* 'use'	>	*psítá*	(Class 2)

The application of this rule would explain why there are so few occurrences of the minimal vowel *ʌ*/*i* in Class 1 verb stems. But there are

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addition, there are (non-initial) reflexes in many modern dialects with a *k* corresponding to *h* in Middle Korean (or in modern Seoul dialect). Cf. Ramsey 1977.

[25] I believe that this Proto-Korean consonant may well have been the simple velar stop *k*, but there is not yet sufficient evidence for a convincing reconstruction. Some distributional evidence can be derived from the fact that no clusters with *k* exist in Middle Korean except *sk* and *psk*—recall that there is no aspirated *s* (**s*^{h}) in Middle Korean! Thus *k*-clusters and aspiration are in complementary distribution. Comparative evidence for a **k* as the source of aspiration is presented in Ramsey 1977.

exceptions. Here are ten Class 1 stems that I have found with this kind of vocalism:[26]

Class 1 stems with exceptional vocalism

nʌ̀c-	'be low'
nìc-	'be late'
kʌ̀c-	'be endowed with'
cʌ̀c-	'be frequent'
cìc-	'bark'
kʌ̀sk-	'make efforts' Probably derived from *kʌ̀c-* 'endowed with'
pìt^h-	'stick; depend'
pìt^h-	'start a fire'
kìc^h-	'end' Probably related to the noun *kít^h* 'end'
mʌ̀c^h-	'stop'

Notice that these stems all end in *c* or complex dental obstruents. Perhaps, for whatever reason, syncope did not occur before /c/. If this was the case, the fact might also be used to explain why there is no **sc* cluster in the Middle Korean obstruent series *sp*, *st*, *ss*, *sk*.

In any event, there are approximately fifty Class 1 verb stems ending in /p, t, s, k/, and none of them has *ʌ* or *i* as its vocalism.

Classes 3 and 4: Monosyllabic Stems. Class 3 and Class 4 comprise a small number of basic verbs with extremely irregular accent. The stems appear to have always been monosyllabic.

There are thirteen stems in Class 3: *ca-* 'sleep', *ca-* '(the wind) dies down',[27] *cu-* 'give', *hʌ-* 'do', *ha-* 'be big, many', *ka-* 'go', *na-* 'grow; emerge; become; etc.', *nu-* 'evacuate (urine, feces)', *nu-* 'maintain',[28] *o-* 'come', *po-* 'see', *sa-* 'buy', *tu-* 'put'.

There are thirteen stems in Class 4: *ci-* 'fatten', *ci-* 'carry on the back', *hye-* ~ *hhye-* 'pull', *hye-* ~ *hhye-* 'kindle',[29] *i-* 'carry on the head',[30]

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[26] There were also a significant number of *y*-stems with this vocalism; these will not be discussed here.

[27] This stem is not well attested; it probably represents metaphoric use of Another Class 3 stem, *ca-* 'sleep'.

[28] A late hapax.

[29] This stem is perhaps to be identified etymologically with the previous stem meaning 'pull'. Modern dialect forms are *k^{h}i-* and *k^{h}yə-*.

[30] Also attested as *ni-*, but the initial *n* is probably not etymologically genuine.

(*-ni-* 'continue',[31]) *nye-* 'go about',[32] *p^hye-* 'spread out',[33] *si-* 'exist',[34] *sye-* 'stand', *ti-* 'lose; fall; turn upside down; die', *ti-* 'be cheap'[35] (*-ti-* 'form, become'[36]).

The division of these verbs into two classes is based principally upon accentual behavior in the modern accenting dialects. In Middle Korean there is little evidence for an accentual contrast between the two. Here are Middle Korean examples of these verbs:

Class 3			Class 4		
po- 'to see'			*sye-* 'to stand'		
pokó	*pónonka*	*poóyesinʌl*	*syetá*	*syézʌβʌmye*	*syeélq*
pol	*pósikoza*	*poómila*	*syekó*	*syée*	*syeemi*
polóta	*pózʌβʌlila*		*syemyén*	*syéa*	
pomyé	*pókena*		*syekená*	*syésya*	
	pósya				
hʌ- 'to do'			*ti-* 'fall; lose; die'		
hʌníngita	*hʌ́sini*	*hʌ́yyʌlila*	*tiníngita*	*tínʌta*	*tiío*
hʌtá	*hʌ́sya*			*tíkenʌl*	
hʌtós	*hʌ́zʌβʌni*				
hʌkéy	*hʌ́ya*				
hʌkó	*hʌ́teni*				
hʌní	*hʌ́nʌn*				
hʌlílato					
hʌmyé					
hʌn					
hʌl					

[31] This stem apparently only occurs before the retrospective marker *-kè-*.

[32] Probably related, at least etymologically, with the previous stem *ni-*, which also seems to be used in the sense of 'go'.

[33] The stem is related to, or derived from, *p^hí-* 'spread, bloom' (a Class 2 stem).

[34] This stem may not belong in this class; it is derived by apocope from the much better attested form *ìsì-*, which has the same meaning and function.

[35] There are only sixteenth-century attestations; the form is probably a semantic variant of the preceding stem.

[36] A postverb.

In the modern dialects, Class 3 and Class 4 are quite distinct accentually. In Hamgyŏng, for example, Class 4 stems are almost always atonic, becoming tonic only before a handful of endings, most notably the infinitive ending *-á/ə́*: *syə́ə* 'stand and then ...' In Middle Korean, however, the irregularities in the two classes were the same. A few marginal contrasts can be found; for example, *syèkènà* 'stand, or ...' is recorded in *Sokpo sangcel* 9:5 with a low-pitched first syllable, alongside Class 3 *pókènà* 'see, or ...' (*Sokpo sangcel* 9:24). This contrast is curious. In most Middle Korean texts Class 4 stems are attested as high before the retrospective marker *-kè-*; e.g., *tíkènʌ́l*, *nyékètín* (*nye-* 'to go').

The most important fact about Class 3 and Class 4 stems is that they were in complete complementary distribution by vocalism. The vowel of a Class 3 stem was *a*, *o*, *u*, or *ʌ*, while the vocalism of a Class 4 stem was *ye* or *i*. Otherwise, the two classes had the same segmental shape: one open syllable with a simple (C)V- structure.

Because the complementarity was so perfect, the two classes must have formed a single class of monosyllabic stems in Proto-Korean.

In Middle Korean, the accentual behavior of Class 3 and Class 4 stems was extremely complex. Before some inflectional endings, the pitch was high; before other endings, it was low.[37]

Although it is not clear how these irregularities in pitch arose historically, the stems appear to have been uniformly high pitched at the Proto-Korean stage of the language. Evidence for this surmise comes from compounding phenomena.

The only place in Middle Korean the stem of an inflecting form appeared bare of its inflectional endings—and thus of the accentual influence of those endings—was in compounds. Compounds made up of Class 3 stems behaved accentually as follows:

na- 'emerge' + *ka-* 'go' → *náka-* 'go out'

The compound was always accented on the first syllable. In compounds made up of monosyllabic nouns, such a protonic accent indicated that the constituent morphemes were both tonic:

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[37] Kam Wanjin (1973: 58) divides the Middle Korean inflectional endings into two classes according to how they affect the accent of Class 4 verb stems. As far as I know, no one has proposed an explanation for how the variation arose historically. In any case, we are not dealing with an artifact of Middle Korean texts; the variation is substantiated in detail by the accentual behavior of the stems in the modern dialects (cf. Ramsey 1978a: 192ff.)

kóh 'nose' + *mír* 'water' → *kósmir* 'snivel'

If either member of the noun compound was atonic, the first syllable of the compound was not accented (cf Kim Wanjin 1973: 73–74):

kòc 'flower'	+	*níp^h* 'leaf'	→	*kòsníp^h* 'flower petal'
kúy 'ear'	+	*mìt^h* 'bottom'	→	*kùmìt^h* 'base of the ear'
són 'hand'	+	*t^{h}òp* 'unguis'	→	*sònt^{h}òp* 'fingernail'

The compounding rules in the modern accenting dialects of South Hamgyŏng are the same in these cases (cf. Ramsey 1978b: 133ff.).

Let us assume that the compounding rules for verbs parallel the compounding rules for nouns. If this assumption is correct, it follows that the monosyllabic verb stems were—in a morphophonemic sense at least—accented in Middle Korean. The stems, then, must have been high pitched in Proto-Korean.

To summarize, here are examples of the proposed reconstructions for forms in each of the Middle Korean stem classes discussed above:

Proto-Korean		Middle Korean		
**pó-*		*po-*	'see'	(Class 3)
**cí-*		*ci-*	'shoulder'	(Class 4)
**kʌ́l-*		*kʌ́l-*	'grind'	(Class 2a)
**kùpí-*	**kùpítá* > *kùptá* **kùpíní* > *kùpíní*	*kùp-*	'be bent'	(Class 1)
**pìsí-*	**pìsítá* > *psítá* **pìsíní* > *psíní*	*psí-*	'use'	(Class 2b)
**kùbí-*	**kùbítá* > *kùúptá* **kùbíní* > *kùβíní*	*kŭp-* ~ *kùβ-*	'bake'	(Class 6)

The three remaining verb stem classes were all two syllables (or moras) long in Middle Korean. The first of these is Class 5, a small class of stems with a long, rising pitch. An example of a Class 5 verb is *hŏ-* 'to sew', the stem of which was also written *hòó-*, underscoring the fact that it was indeed composed of two moras.

Class 7. This was a small class of some 25 verbs. The stems of these verbs had a morphophonemic second-syllable vowel, and the accent contrasted with that of Class 6 stems (which were discussed above together with Class 1 stems) as follows:

	Class 7			Class 6	
	a	b		a	b
'be hateful'	*miyptá*	*miyβiní*	'bake'	*kuúpta*	*kuβíni*
'bear (young)'	*nat^{h}á*	*nahʌní*			
'hear'	*tittá*	*tiliní*	'walk'	*keétta*	*kelíni*
'pour'	*pistá*	*piziní*	'laugh'	*uústa uzíni*	

Most Class 7 stems were demonstrably composed of more than one morpheme. More than half ended in *h* plus the morphophonemic vowel, and this *-hì/hʌ̀-* was a postverbal variant of the ubiquitous Middle Korean verb *hʌ-* 'to do'. The verb *nàh(ʌ̀)-* 'bear (young)', for example, was derived in this way from *na-* 'to be realized; come out'; *cìh(ì)-* 'give (a name)' was from *ci-* 'support; carry on the back' (Lee Ki-Moon 1972: 149). *Mìyp-* ~ *mìyβì-* 'be hateful' was composed of *mìy-* 'hate' plus the postverb *-βʌ̀/βì-*, a morpheme used to derive descriptive verbs from action verbs. The Class 7 verbs that cannot be explained along similar lines were very small in number.

Class 8. This irregular class of some 35 verbs had a peculiar morphology. Here are examples of three of its members:

'turn (something)'	*tolʌtá*	*tolʌnósta*	*tol.íta*	*tol.á*
'pull'	*kizitá*	*kizinʌnkó*	*kiz.úm*	*kiz.é*
'flow'	*hilitá*	*hilikéy*		*hillé*

Many, perhaps most, of these verbs were morphemically complex, particularly those with the final segments *-lʌ̀- -l.-*; for example, *tòlʌ̀tá* 'turn (something)' was a causative form of the Class 6 verb *tòó-* ~ *tòl-* 'turn'. The "*l*-doubling" verbs in this class, such as *hìli-* ~ *hìll-* 'flow' were different. They appear to have been derived from earlier dissyllabic shapes such as **hìlìl-*. How and why the pitch of the second syllable came to be low is a problem related to the complexities of the *l*-stem verbs. These will be discussed in a later paper. (But see Ramsey 1978a: 224ff.)

Conclusions. Proto-Korean, as reconstructed along lines outlined above, differed in a number of ways from later, attested varieties of the language. Some of the most important differences are as follows:

1. Proto-Korean had no pitch, length, or stress distinctions. Instead, pitch patterns were determined by the length of a word since the last syllable of a stem (or morpheme) was automatically given prominence.[38] The complex pitch distinctions found at the Middle Korean stage of the language and in many of the modern dialects resulted from changes that took place in the segmentals.

2. The most important of these segmental changes were vowel syncope and apocope, phonological processes which altered the syllable structure of Korean. Apocope[39] produced closed syllables for many morphemes, and syncope gave rise to obstruent clusters that had previously not existed.

3. The clusters produced by syncope were eventually reduced to unit phonemes, the aspirated consonants and the reinforced (*toen-sori*) consonants found in modern Korean.

(a) The clusters that became reinforced (or "tense" or "glottalized") phonemes began with the labial *p* or the dental *s*. These are the clusters attested in texts of the Middle Korean period. Their historical development into reinforced consonants has in large part already been documented (cf. Lee Ki-Moon 1977, Ho Ung 1965, Ramsey 1978b).

(b) Aspirates developed from clusters containing a velar obstruent.

4. Proto-Korean had a consonant system in which obstruents, including stops, were distinguished by voice.

This paper summarizes some of the reasons for these deductions. Omitted from discussion are issues related to vocalism and the vowel system, including that of the vowel shift believed to have taken place a century or so before the beginning of the Middle Korean period (cf. Lee Ki-Moon 1977: 101–117). The vowel harmony system to be reconstructed into Proto-Korean is another important issue. Finally, and most directly related to the hypotheses described in this paper, are questions about the origins of the "minimal vowels" *ʌ* and *ɨ*. These minimal vowels occur in non-initial position in Middle Korean verb stems almost to the complete exclusion of the other vowels (except /i/, which is the neutral vowel in the vowel harmony system). I have proposed reconstructing them in other positions as

[38] The non-distinctive prosody that I would reconstruct into proto-Korean—that is, a system in which the last syllable is automatically given a high pitch—is the kind of system found in Mongolian and many Tungus languages (cf. Poppe 1960: 144). Note, however, that this fact has not entered into the arguments summarized here; the reconstructions described in this paper are all based upon internal evidence.

[39] Arguments for the occurrence of apocope are not presented here.

well. The question that arises is, to what extent do these minimal vowels represent the neutralization of a fuller set of vocalic distinctions? Or, on the other hand, could some occurrences of these minimal vowels have been epenthetic? The study of Korean etymology has yet to produce easy answers to these questions.

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