

# THE INFLECTING STEMS OF PROTO-KOREAN

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The proto forms of Korean verbs are reconstructed through the method of internal reconstruction, supplemented by comparative evidence from the modern dialects.

According to the hypothesis developed in this paper, Proto-Korean had no pitch, length, or stress distinctions. Instead, the last syllable of a word or morpheme was automatically given prominence. The complex pitch system found at the Middle Korean stage of the language, as well as the pitch accent systems found in a number of modern dialects, developed as a result of changes that took place in the segmentals.

The principal change in the segmentals was vowel syncope, which produced consonant clusters. Aspirated consonants developed from clusters containing a velar obstruent. In addition, voiced obstruents lenited, and in later stages of Korean the distinctive feature of voicing was eventually lost.

There are a number of distributional irregularities in the Middle Korean phonological system. 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.

Proto-Korean, as I propose to reconstruct it, 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 phonological length since the last syllable of a stem (or morpheme) was automatically given prominence. 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<sup>1</sup> 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

<sup>1</sup> Arguments for the occurrence of apocope will not be presented here.

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 1972, Hō Ung 1965, Ramsey 1978b).
  - b. Aspirates developed from clusters containing a velar obstruent.
4. Unlike any historically attested stage of Korean, Proto-Korean had a consonant system in which stops were distinguished by voice.

This paper summarizes some of the reasons for these deductions.<sup>2</sup>

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

<i>Consonants</i>	ㄱ	ㄷ	ㅂ	ㅈ	ㅅ	ㅇ											
	k	t	p	c	s	ʔ											
	ㅋ	ㅌ	ㅍ	ㅊ		ㅎ											
	k <sup>h</sup>	t <sup>h</sup>	p <sup>h</sup>	c <sup>h</sup>		h											
	ㄲ	ㄸ	ㅃ	ㅆ	ㅆ	ㅎ											
	kk	tt	pp	cc	ss	hh											
	ㅇ	ㄴ	ㅁ		ㄹ	ㅇ											
	ŋ	n	m		z	l											
		ㄹ	ㅃ			oo											
		l	β			ʰ											
<i>Vowels</i>	ㅏ	ㅑ	ㅓ	ㅕ	ㅗ	ㅛ	ㅜ	ㅠ	ㅡ	ㅣ	ㅚ	ㅜ	ㅝ	ㅞ	ㅟ	ㅠ	
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	ɸ	wi	iy
<i>Accent</i>																	
Middle Korean :	no dots (low pitch) : grave accent over vowel (˘)																
	one dot (high pitch) : acute accent over vowel (˙)																
	two dots (rising pitch) : both accents together (˘˙)																

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

The reconstruction of Proto-Korean begins best with the stems of inflecting forms. As Martin has noted (1966 : 197), the Korean inflectional system is almost completely resistant to borrowing, a structural fact that allows the confident reconstruction of verbal and adjectival stems into the protolanguage. The same does not hold true for noun etymologies, where it is often difficult

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to separate loans from native vocabulary.

The inflecting stems of Middle Korean can be divided into classes according to accentual and segmental behavior. Stems that are sometimes, or always, one syllable long fall into eight different classes according to accentual behavior. Here are examples of those classes, together with the reflexes found in modern Seoul and in an accenting dialect of South Hamgyōng<sup>3</sup>:

### MONOSYLLABIC STEM CLASSES IN MIDDLE KOREAN

	<i>Class 1</i>	<i>Class 2</i>
	'eat'	'use'
Middle Korean	mək-	ps̥i-
South Hamgyōng	mək-	ss̥i-
Seoul	mək-	ssi-
	<i>Class 3</i>	<i>Class 4</i>
	'go'	'stand'
Middle Korean	kā- ~ ká- ~ kǎ-	syè- ~ syé- ~ syě-
South Hamgyōng	ka- ~ ká-	sə- ~ sǎ-
Seoul	ka-	sə-
	<i>Class 5</i>	<i>Class 6</i>
	'receive'	'be hot'
Middle Korean	ět-	tép- ~ tǝβ-
South Hamgyōng	ət-	tǝp- ~ tǝp-
Seoul	ət-	tǝp- ~ tǝw-
	<i>Class 7</i>	<i>Class 8</i>
	'lie down'	'flow'
Middle Korean	n̥p- ~ n̥β̥i-	h̥il̥- ~ h̥il̥i-
South Hamgyōng	nup- ~ nupi-	hil̥- ~ hili-
Seoul	nup- ~ nuw-	hill- ~ hili-

Both the pitch and the segmental shape of these classes varied widely. Here is a brief description of the morphologies:

*Class 1:* The stem is always one low-pitched syllable. This syllable is always closed by a consonant or consonant cluster or the semivowel *y*.

*Class 2:* The stem is always one high-pitched syllable. The syllable is usually open, and the vowel is almost always *i̇* or *ʌ*. The great majority of the stems in this class begin with a consonant cluster or an aspirate.

*Class 3:* The pitch is extremely variable. Before some verbal endings, it is high; before others, it is low. In some cases the stem is marked with a rising pitch. The segmental shape of the stem is maximally simple: (C)V, where V is *a*, *o*, *u*, or *ʌ*.

<sup>3</sup> The particular South Hamgyōng dialect represented here is that of Pukchōng (cf. Ramsey 1978).

*Class 4*: The classification of these stems into a separate class is based upon accentual behavior in the modern dialects; in Middle Korean, the pitch variation is like that of Class 3 stems. The segmental shape is a simple (C)(y)V, where V is *e* or *i*.

*Class 5*: The stem is a rising-pitched syllable. It can therefore be thought of as not monosyllabic, but instead, as composed of two short syllables, low + high; e.g., what is transcribed as *et-* can be analyzed as *eet-*.

*Class 6*: The pitch of the first syllable in these verb forms is low or rising, depending on the ending to which the stem is attached. If the ending begins with a vowel, the stem begins with a low pitch; if the ending begins with a consonant, the stem has a rising pitch. Morphophonemically (and thus historically) these stems are two syllables long, the vowel of the second syllable being a high pitched  $\Lambda$  or *i*; e.g., *t̃βt̃-* 'be hot'.

*Class 7*: The pitch of the stem is always low. Like Class 6 stems, these stems are also morphophonemically two syllables long, except that the vowel of the second syllable is low pitched; e.g., *ñββt̃-* 'lie down'.

*Class 8*: These stems were always low pitched. In most environments they were composed of two syllables, but before certain endings they had only one syllable. From morphophonemic alternations it has been shown that these stems must be reconstructed with two low pitched syllables, the second of which had the vowel  $\Lambda$  or *i*, and was closed by the voiced consonant *l* or \* $\gamma$ ; e.g., \**h̃t̃l̃t̃l-* 'flow' (cf. Lee Ki-Moon 1962, Ramsey 1978a: 225).

Only the first four of these eight classes were truly monosyllabic at the Middle Korean stage of the language, because the others--Classes 5 through 8--were morphophonemically composed of two syllables. (For details of this analysis, see Ramsey 1975, 1978a: 200 ff.)

The stems that belong to Classes 1 through 4 deserve scrutiny. Classes 3 and 4 will be examined first since they appear to have always been monosyllabic.

#### *Monosyllabic Stems*

Class 3 and Class 4 comprise a small number of basic morphemes.

There are thirteen stems in Class 3: *ca-* 'sleep', *ca-* '(the wind) dies down'<sup>4</sup>, *cu-* 'give', *ha-* 'do', *ha-* 'be big, many', *ka-* 'go', *na-* 'grow; emerge; become; etc.', *nu-* 'evacuate (urine, feces)', *nu-* 'maintain'<sup>5</sup>, *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'<sup>6</sup> *i-* 'carry on the head'<sup>7</sup>, (*-ni-* 'continue'<sup>8</sup>) *nye-* 'go

<sup>4</sup> This stem is not well attested; it probably represents metaphoric use of another Class 3 stem, *ca-* 'sleep'.

<sup>5</sup> A late hapax.

<sup>6</sup> This stem is perhaps to be identified etymologically with the previous stem meaning 'pull'. Modern dialect forms are *k<sup>h</sup>i-* and *k<sup>h</sup>ỹə-*.

<sup>7</sup> Also attested as *ni-*, but the initial *n* is probably not etymologically genuine.

<sup>8</sup> This stem apparently only occurs before the retrospective marker *-ke-*.

about<sup>9</sup>, *p<sup>h</sup>ye-* 'spread out'<sup>10</sup>, *si-* 'exist'<sup>11</sup>, *sye-* 'stand', *ti-* 'lose ; fall ; turn upside down ; die', *ti-* 'be cheap'<sup>12</sup>(-*ti-* 'form, become'<sup>13</sup>).

Class 3 and Class 4 stems are in complementary distribution by vocalism. The vowel of a Class 3 stem is *a*, *o*, *u*, or *ɛ*, while the vocalism of a Class 4 stem is *ye* or *i*. Otherwise, the two classes have the same segmental shape : one open syllable with a simple (C)V-structure. Because the complementarity is so complete, the two classes must have formed a single class of monosyllabic stems in Proto-Korean.

In the modern dialects, Class 3 and Class 4 are distinct accentually. In Hamgyōng dialect, for example, Class 4 stems are usually atonic, becoming tonic only before a very small number of endings, most notably the infinitive ending *-ā/ɔ*: *səə* 'stand and then ...' In Middle Korean, however, the irregularities of the two classes were much the same. There were a few marginal contrasts, but perhaps these may be attributed to scribal errors. It is not clear what caused the split into two different accent classes in the modern dialects, but the canonical shapes of the two classes are so clearly the same except for the vocalism, the differences in accent must have been arisen because of the difference in the vowels. A detailed explanation of the conditioning awaits future research.

In Middle Korean, the accentual behavior of these monosyllabic stems is extremely complex. Before some inflectional endings, the pitch is high ; before other endings, it is low.<sup>14</sup> In Proto-Korean, however, the stems appear to have been uniformly high pitched. Evidence for this hypothesis comes from compounding phenomena.

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

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

The compound is always accented on the first syllable. In compounds made up of monosyllabic nouns, such a prototonic accent indicates that the constituent

<sup>9</sup> Probably related, at least etymologically, with the previous stem *ni-*, which also seems to be used in the sense of 'go'.

<sup>10</sup> The stem is related to, or derived from, *p<sup>h</sup>ɛ-* 'spread ; bloom' (a Class 2 stem.).

<sup>11</sup> This stem may not belong in this class ; it is derived by apocope from the much better attested form *isɛ*, which has the same meaning and function.

<sup>12</sup> There are only sixteenth-century attestations ; the form is probably a semantic variant of the preceding stem.

<sup>13</sup> A postverb.

<sup>14</sup> Kim 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, however, 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 facts are substantiated in detail by the accentual behavior of the stems in the modern dialects (cf Ramsey 1978a : 192 ff).

morphemes are both tonic :

kóh 'nose' + mǐl 'water' → kósmil 'snivel'

If either member of the noun compound is atonic, the first syllable of the compound will not be accented (cf. Kim Wanjin 1973 : 73-74) :

kòc 'flower' + nǐp<sup>h</sup> 'leaf' → kòsnǐp<sup>h</sup> 'flower petal'

kúy 'ear' + mǐt<sup>h</sup> 'bottom' → kùmǐt<sup>h</sup> 'base of the ear'

són 'hand' + t<sup>h</sup>òp 'unguis' → sònt<sup>h</sup>òp 'fingernail'

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

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 are - in a morphophonemic sense at least - accented in Middle Korean. The stems, then, must have been high pitched in Proto-Korean.

### *Reconstructing Dissyllabic Stems*

The two remaining monosyllabic classes, Class 1 and Class 2, have stable stem shapes in Middle Korean. They have no morphological variation and are always low pitched and high pitched, respectively. However, for earlier stages of the language it is possible to reconstruct dissyllabic stems for both classes.

1. *Class 1.*

The stems in this class have a unique canonical shape in Middle Korean. Not only the accent, but the last segment of the stem is also different from that of the other classes.

The following chart shows the distribution of 472 verbal and adjectival stems according to the last segment of the stem. For the sake of comparison, the morphophonemic, second-syllable vowels of classes 6, 7, and 8 are 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 1978a : 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 -'i-. Here are a few examples :<sup>15</sup>

psá- 'wrap' + -'i- → psá-y- 'be wrapped'

ptǐ- 'float' + -'i- → ptǐ-y- 'make float'

chǐ- 'remove' + -'i- → chǐ-y- 'have (someone) get rid of'

<sup>15</sup> It should be noted, however, that the accent rules involved in the derivations are problematic, as can be seen from the following examples :

p<sup>h</sup>á- 'dig' + -'i- → p<sup>h</sup>á-y- 'be dug'

sy- 'stand' + -'i- → syë-y- 'stand (something) up'

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 <sup>h</sup>	7							
-t <sup>h</sup>	10							
-c <sup>h</sup>	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

Other *y*-stems seems to be contractions of longer stems; e.g., the Middle Korean Class 1 stem *ūy*- 'poke, scrape' has as its modern Seoul dialect reflex the form *upi*- 'id.'. The accent of still other Class 1 stems, such as *p̄ly*- '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 that of Class 6 stems. Leaving aside the accent alternations of the latter class for a moment, it can be seen that the difference between the two shapes is the last consonant. Here is an example of how the two classes contrast :

*Class 1*  
kùpíni 'since it's bent'

*Class 6*  
kùβíni 'since/when ( I ) bake it'

The last consonant in Class 6 stems is *l*, *β*, *t/l*, *z*, *m*, *n* (or the semivowel *y*). I believe that these consonants reflects 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.<sup>16</sup> Here are some proposed reconstructions :

<i>Middle Korean</i>	<i>Proto-Korean</i>
β	*b
t/l	*d
z	*s
( <sup>1</sup> ) <sup>17</sup>	*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)VCV̄-.

\*kùpí- 'be bent'

\*kùβí- '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) :  $\Lambda, i > \phi / C_1 \_ C_2$ , where  $C_1$  and  $C_2$  are voiceless obstruents. That is, the minimal vowels  $\Lambda$  and  $i$  were lost by syncope between voiceless obstruents. Here are examples :

<sup>16</sup> 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, since the consonants in Class 6 stems were followed by a vowel, \*VpV > VβV; \*VsV > VzV; 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 earliest reconstructable stage of Korean were all unvoiced.

The hypothesis had a serious problem, however : it gave no way to explain why Class 1 stems never end in *m* or *n*, while there are so many occurrences of these nasals 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* and *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. This problem is, I believe, a fatal weakness.

<sup>17</sup> This consonant does not appear in Class 6 stems.



- \*kũpĩtá > kũptá 'it's bent'  
 \*sòsálkó > sòskó 'it spurts out, and ...'  
 \*pātálkēy > pātkey 'so that (he) receives (it)'

The stems that underwent this change formed Class 1. Notice that if C<sub>2</sub> was any consonant besides a voiceless obstruent, syncope did not occur; for example: \*kũpĩmyēn 'if it's bent'; \*kũbĩmyēn 'if (I) bake (it)'.

If C<sub>1</sub> 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.

- \*kũbĩtá > \*kũúbtá → kũúptá<sup>18</sup> '(I) bake it'  
 \*kēdĩkó > \*kēédkó → kēétkó '(I) walk, and...'  
 \*còzálkēy > \*còózkēy → còóskēy 'so that (it) pecks'  
 \*kāmálkēy > kāmámkēy 'so that (it) winds'

The stems where this change occurred formed Class 6. After syncope had taken place, there was consonant lenition, a process by which \*b and \*d weakened into β and l ([r])<sup>19</sup>; other stem consonants remained unchanged. Here are examples:

- \*kũbĩnĩ > kũβĩnĩ 'since it's bent,'  
 \*kēdĩmyēn > kēlĩmyēn [kəĩmyə̃n] 'if (I) walk'

Here, then, is a summary of the processes proposed to explain the development of Class 1 and Class 6 stems:

<i>Proto-Korean</i>	<i>Syncope Devoicing Lenition</i>	<i>Middle Korean</i>	
*kũpĩ-	{ *kũpĩtá } kũptá	kũptá 'be bent'	} class 1
	{ *kũpĩnĩ }	kũpĩnĩ	
*pātł-	{ *pātłtá } pātá	pātá 'receive'	
	{ *pātłnĩ }	pātłnĩ	
*pēsĩ-	{ *pēsĩtá } pěstá	pěstá 'take off'	}
	{ *pēsĩnĩ }	pēsĩnĩ	
*mēkĩ-	{ *mēkĩtá } mēktá	mēktá 'eat'	}
	{ *mēkĩnĩ }	mēkĩnĩ	

<sup>18</sup> The long-vowel forms are of course transcribed in Middle Korean as *kũúptá*, *kēétkó*, *còóskēy*, and *kāmámkēy*. (See the brief description of Class 5 stems, above.)

<sup>19</sup> It should be remembered that /l/ is a phonemic transcription; the symbol *r* would of course serve equally well.

*kũbí-	{ *kũbí́tá > *kũúb́tá > kũúptá *kũbí́nǐ	>kũβí́nǐ	kũptá kũβí́nǐ	'bake'	} class 6
*kědí-	{ *kědí́tá > *kěéd́tá > kěéttá *kědí́nǐ	>kělí́nǐ	kěttá kělí́nǐ	'walk'	
*nāzǎ-	{ *nāzǎ́tá > *nāáźtá > nāástá *nāzǎ́nǐ		nāstá nāzǎ́nǐ	'improve'	
*kāmǎ-	{ *kāmǎ́tá > kǎáḿtá *kāmǎ́nǐ		káḿtá kāmǎ́nǐ	'wind'	

## 2. Class 2.

The last class of stems with a stable, monosyllabic shape is Class 2. 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*; <sup>20</sup> e.g., *kǎl*- 'grind', *sũm*- 'hide'.

The majority of the stems in this subclass seem to have been closed by a sonorant ever since the Proto-Korean stage.<sup>21</sup>

Class 2b: Open-syllable stems. Here are a few examples: *stí*- 'scoop', *ssí*- 'write', *ptí*- 'open (eyes)', *psí*- 'use', *pcǎ*- 'squeeze', *p<sup>h</sup>í*- 'spread', *t<sup>h</sup>ǎ*- 'burn', *c<sup>h</sup>ǎ*- 'kick', *k<sup>h</sup>í*- 'be big'.

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 *i*.

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 \**i*, was lost by syncope. Here are the proposed reconstructions for some of the examples given above:

<sup>20</sup> There are five exceptions with voiceless obstruent finals: *pt<sup>h</sup>í*- 'pluck', *sí*s-~*sí*c- 'wash' (these two forms are apparently variants of *sís*- 'id.', a Class 1 stem with the expected low pitch), *chǎc*- 'search for', *pcí*- 'tear', *kǎl<sup>h</sup>*- 'be alike'. This last exceptional stem meaning 'be alike' has a variant from *kǎl<sup>h</sup>ǎ*- 'id.' which is equally well attested; the variant shows that the stem is derived from the noun *kǎl*- 'like' (attested only in compounds) + the verb *hǎ*- 'do, be'.

There are also *ólh*- 'be correct' < \**ól* + *hǎ* 'be, do'; *cóh*- 'be clean' < \**có* + *hǎ*- 'be, do'; and *sí*lh- (*sí*lhǎ-) 'dislike' < \**sí*l + *hǎ*- 'be, do' (the accentual behavior shows that these three stems have the structure Noun + *hǎ*).

Finally, the common stem *c<sup>h</sup>í*p-~*c<sup>h</sup>í*β- '(the weather) feels cold' is derived from \**chí*, which is probably a variant of *chǎ*- 'be cold (to the touch)', + *-βí*-, a postverb used to derive adjectives (cf Ramsey 1978a: 222-23).

<sup>21</sup> Note, however, that I would derive stems with complex initials, such as *p<sup>h</sup>ǎl*- 'sell' and *c<sup>h</sup>ǎm*- 'endure', from dissyllabic stems: e.g., \**pǎHǎl*- and \**cǎHǎm*-.

- \*s<sup>h</sup>tí- > stí- 'scoop'  
 \*s<sup>h</sup>ísí- > ssí- 'write'  
 \*p<sup>h</sup>tí- > ptí- 'open (eyes)'  
 \*p<sup>h</sup>sí- > psí- 'use'  
 \*p<sup>h</sup>ál- > pál- '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.<sup>22</sup> Nevertheless, it seems clear that the source of aspiration in these clusters had to have been some sort of voiceless velar obstruent.<sup>23</sup> 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:

- \*p<sup>h</sup>Hí- > p<sup>h</sup>í- 'spread'  
 \*t<sup>h</sup>Hál- > t<sup>h</sup>ál- 'burn'  
 \*c<sup>h</sup>Hál- > c<sup>h</sup>ál- 'kick'  
 \*k<sup>h</sup>Hí- > k<sup>h</sup>í- '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: *ps<sup>h</sup>tá* (<\*p<sup>h</sup>t<sup>h</sup>s<sup>h</sup>tá) > \**ps<sup>h</sup>tá*. 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.

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

<i>Proto-Korean</i>	<i>Middle Korean</i>	
*pó-	po- 'see'	(Class 3)
*cí-	ci- 'shoulder'	(Class 4)
*kál-	kál- 'grind'	(Class 2a)

<sup>22</sup> 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 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.

<sup>23</sup> 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(\*<sup>h</sup>) in Middle Korean! Thus *k*-clusters and aspiration are in complementary distribution. Comparative evidence for \*k as the source of aspiration is presented in Ramsey 1977.

*kùpí-	*kùpítá > kùptá	kùp-	'be bent'	(Class 1)
	*kùpíni > kùpíni			
*pìsì-	*pìsítá > psítá	pšì-	'use'	(Class 2)
	*pìsini > psini			
*kùbí-	*kùbíta > kùúptá	küp- ~ kùβ-	'bake'	(Class 6)
	*kùbíni > kùβíni			

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