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The accent system and phrasal pitch features in Middle Korean —compared with the accent systems of Modern Gyeongsang dialects—*

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Abstract: The Daegu dialect in Modern Korean has a pitch accent system[1]. In this dialect, all accent patterns can be predicted by the presence or absence of an accent kernel as well as its position. In Middle Korean texts, although the tone of each syllable is marked, only the low-beginning pitch is distinctive. It is a system with a raising kernel that causes the pitch to change on the pitch from low to high. If there are sequences of low pitch, the last one should be distinctive. After the accent kernel the pitch patterns are governed by phrasal prosodic features. This means that the accent patterns of Middle Korean could be predicted by indicating whether the word has an accent kernel and, if it does, where it has the kernel.

This paper shows, furthermore, that there is an accentual correspondence between Middle Korean and the Daegu dialect of Modern Korean. What this means is that if we know the accent pattern of a word in the former system, we can predict the accent pattern of the word in the latter system, and vice versa.

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1. The phonemes of the Daegu dialect

The phonemes of the Daegu dialect are as follows[2]:

The data of the Daegu dialect shown here was provided by the author[3]. In this paper, an arbitrary syllable is represented as '○', pitch-rise as '[', and pitch-fall as']'; low pitch is abbreviated as 'L', high pitch as 'H', and falling pitch as 'F'.

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* This is revised from the paper presented at the *International Symposium on Accent and Tone* (ISAT), December 2010, National Institute for Japanese Language and Linguistics.

1 Daegu is the biggest city of the North Gyeongsang Prefecture.

2 Some of the consonant clusters and complex vowels are omitted from Table 1.

3 I was born in Chungcheong Prefecture, and soon after moved to Daegu city. I lived in Daegu city until I was 23 years old.

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Table 1. The phonemes of the Daegu dialect

Consonants																		
Korean alphabet	ㄱ	ㄴ	ㄷ	ㄹ	ㅁ	ㅂ	ㅅ	ㅇ	ㅈ	ㅊ	ㅋ	ㅌ	ㅍ	ㅎ	ㄲ	ㄸ	ㅃ	ㅆ	ㅉ
Romanizing	k	n	t	r	m	p	s	ʔ-, -ŋ	c	cʰ	kʰ	tʰ	pʰ	h	k’	t’	p’	d’	c’
Vowels																			
Korean alphabet	ㅏ	ㅑ	ㅓ	ㅕ	ㅗ	ㅛ	ㅜ	ㅠ	ㅡ	ㅐ	ㅔ	ㅣ	ㅘ	ㅚ	ㅝ	ㅟ	ㅢ		
Romanizing	a	ja	ə	jə	o	jo	u	ju	ɯ	e	e	i	wa	we	wə	wi	ɯi		

2. The accent systems of Gyeongsang dialects

The accent systems of Gyeongsang dialects are divided into two major accent types: multi-pattern accent systems and N-pattern accent systems[4].

A multi-pattern accent system is a system where accentual distinctions increase in proportion to the length of the accentual units. On the other hand, in an N-pattern accent system, only N oppositions exist irrespective of the length of the accentual units. In this paper, the Daegu dialect of the former type and the Sangju dialect of the latter type are discussed.

2.1 The accent system of the Daegu dialect[5]

The pitch patterns of the Daegu dialect are as follows (1) below.

(1) Pitch patterns of the Daegu dialect

	1		2		3		4	
HHL…	he	H	kurɯm	HH	kɯrimca	HHL	koseŋ-sari	HHLL
	he-ka[6]	H-H	kurɯm-ʔi	HH-L	kɯrimca-ka	HHL-L	koseŋ-sari-ka	HHLL-L
…H-	mar	F	namu	LF	satari	LLF	sarku-namu	LLLF
	mar-ʔi	H-L	namu-ka	LHL	satari-ka	LLH-L	sarku-namu-ka	LLLH-L
…HL-			hanɯr	HL	ʔapəci	LHL	heparaki	LLHL
			hanɯr-ʔi	HL-L	ʔapəci-ka	LHL-L	heparaki-ka	LLHL-L
…HLL-					mjənɯri	HLL	kaʔori-ʔjən	LHLL
					mjənɯri-ka	HLL-L	kaʔoriʔjən-ʔi	LHLL-L
…HLLL-							mahɯn-koke	HLLL
							mahɯn-koke-ka	HLLL-L

Glosses:
he ‘sun’, mar ‘horse’, kurɯm ‘cloud’, namu ‘tree’, hanɯl ‘sky’,
kɯrimca ‘shadow’, satari ‘ladder’, ʔapəci ‘father’, mjənɯri ‘wife of one’s sun’,
koseŋsari ‘poverty life’, sarkunamu ‘tree of apricot’, heparaki ‘sun flower’,

4 See Uwano (1984).
5 See Lee (2002)
6 Both ‘-ka’ and ‘-ʔi’ are nominative case-markers.

kaorijən 'kite shaped as a ray', mahɯnkoke 'turning point of the age of 40'

Let us consider the data in (1). It is possible to divide the pitch patterns into two groups. One group includes pitch patterns like H (-H), HH, HHL, and HHLL at the top of (1). As you notice already, all of these patterns have a sequence of H in the beginning. This sequence of H means that there is not a distinctive pitch-fall, which will be discussed later. The other group includes all the other pitch patterns like H (-L), LH (-L), HL, LLH (-L), LHL, HLL, etc. All of these have one H and one pitch-fall, HL. Thus we know that the presence or absence of pitch-fall is distinctive, and if pitch-fall occurs, the locus of the pitch-fall is distinctive. It is assumed that there is a lowering accent kernel that makes the pitch of the next syllable 'L'. For example, the accent kernel is on the first syllable in [ha]nɯr 'sky', on the second syllable in na [mu] 'tree' and ʔa[pə]ci 'father', and so on. On the other hand, [kuɾim! 'cloud' and [kɨrim!ca 'shadow' are kernelless ('!' represents phonetic pitch-fall in this paper). You may wonder why these examples are regarded as kernelless although having a pitch-fall. It can be explained that the sequence of the high pitch in the word-beginning 'HH-' means the absence of a lowering accent kernel. Falling pitch after the sequence of the word-beginning high pitch is not a distinctive feature but a phonetic one.

Table 2 shows the accent system, namely the phonological forms, whereas the data (1) shown above are the phonetic forms. In this paper, kernelless is represented as '0', and the accented patterns are numbered as 'b-1', 'b-2', 'b-3' etc., counting from the end of the words. Kernelless is represented as '=', and ']' represent the locus of the lowering kernel.

Table 2. The accent system of the Daegu dialect

	1	2	3	4
0	○=	○○=	○○○=	○○○○=
b-1	○]	○○]	○○○]	○○○○]
b-2		○]○	○○]○	○○○]○
b-3			○]○○	○○]○○
b-4				○]○○○

As shown in Table 2, one-syllable words have two oppositions, two-syllable words have three oppositions, and so on. The number of the oppositions is the number of syllables plus 1.

2.2 The Sangju dialect

The Sangju[7] dialect is one of the Gyeongsang dialects. It has a different type of accent system from that of Daegu. The accent system of the Sangju dialect is as follows.[8]

7 Sangju is located on the boundary between Gyeongsang and Chungcheong Prefectures.

8 See Lee (2006)

Table 3. The accent system of the Sangju dialect

	1	2	3	4
0	○=	○○=	○○○=	○○○○=
1		○]○	○]○○	○]○○○
b-2	○] ○]-○ ○-○]○ ○-○○]○	○○] ○○]-○ ○○-○]○ ○○-○○]○	○○]○ ○○○]-○ ○○-○]○ ○○○-○○]○	○○○]○ ○○○○]-○ ○○○○-○]○ ○○○○-○○]○

(2) Data

	1	2	3	4
0:	[ʔip	[kurɯm!	[koku!ma	[siʔə!məni
1:		[ka]sɯm	[jə]tɯre	[taŋ]ʔirc^{h}iki
b-2:	[mok]	na[mu]	kə[pu]ki	sokɯm[ku]ʔi

As shown in Table 3 and in (2) above, there are only three accent patterns, irrespective of the length of the accentual units. That is, the Sangju dialect shows an N-Pattern accent system and 'N' is three. One of the accent patterns is kernelless, the other two have the lowering kernel. In the kernelless pattern, the beginning two syllables are high and after that all the syllables are low (HHL…). In the second pattern, only the first syllable is high (HLL…). Finally, in the third pattern, only the penultimate syllable of the accent unit is always high (…LHL). In this pattern, the accent kernel is not fixed on the word itself. The locus of the kernel is on the entire accent unit. In other words, the locus of the kernel may move to the suffixes from the stems in inflected forms, e.g. [mok]-i, mok-[po]ta, mok-po[ta]to: in these forms, -i, -pota, and -potato are suffixes.

There are some peculiar features in N-Pattern accent systems, but I would like to refer to these on another occasion, since in this paper I would like to focus on the correspondence between the Daegu dialect and Middle Korean.

3. The accent system of Middle Korean

3.1 Introduction

The vocabulary discussed in this paper is attested in Middle Korean (abbr. MK) texts published in the 15th and 16th centuries[9]. In MK texts, the pitches of all syllables were recorded using side dots. There are 3 pitch types: the *Even Tone* (平声), the *Departing Tone* (去声), and the *Rising Tone* (上声). The Even Tone has a low pitch, and the Departing Tone has a high pitch. The Rising Tone has a rising pitch occurring only in an initial syllable. For convenience, we will not mention these names; instead we will call them just 'low pitch', 'high pitch', and 'rising pitch'. The side dots were transcribed only on the Korean alphabet. Here, you may wonder, how could they transcribe Sino-Korean? There was no problem because Sino-Korean was transcribed using the Korean alphabet also, after the Chinese letters.

9 e.g. Hunmincəŋɯm-ənhepon (1446) and Hunmoŋcahwe (1527).

Table 4. The phonological system of MK[10]

Consonants																								
Korean alphabet	ㄱ	ㄴ	ㄷ	ㄹ	ㅁ	ㅱ	ㅂ	ㅸ	ㅅ	ㅿ	ㅇ	ㆁ	ㅈ	ㅊ	ㅋ	ㅌ	ㅍ	ㆆ	ㅎ	ㅺ	ㅽ	ㅼ	ㆅ	
Romanizing	k	n	t	r	m	ɱ	p	v	s	z	ɸ	ŋ	c	c^h	k^h	t^h	p^h	ʔ	h	sk	sp	pt	hh	
Vowels																								
Korean alphabet	ㆍ	ㅏ	ㅐ	ㅑ	ㅓ	ㅔ	ㅗ	ㅛ	ㅜ	ㅠ	ㅡ	ㅣ	ㅘ	ㅙ	ㅝ	ㅞ	ㅚ		ET	DT	RT			
Romanizing	ɒ	a	ai	ja	ɔ	jɘ	o	jo	u	ju	ɯ	i	wa	we	wə	wi	ɯi		L	H	R			

3.2 The phonological system of MK

The phonological system of MK is as follows.

3.3 Correspondence sets in the Sino-Korean accent patterns

It is suggested that it is possible to predict the accent pattern of Sino-Korean by means of the *accent rules in word formation*[11]. In this paper, compounding, declensions, and conjugations are all regarded as word formation. The accent rules in word formation in the Daegu dialect are as follows.

Table 5. The accent rules in word formation in the Daegu dialect

rules	first element (X)	second element (Y)	entire (Z)
1	Kernelless	ANY	Kernelless determined by X
2	Kernel on any syllable except the final	ANY	Determined by X
3	Kernel on the final syllable	Kernelless	Determined by X
4	Kernel on the final syllable	Kernel on any syllable	Determined by Y

As shown in Table 5, Z is determined by X in rule 1, rule 2, and rule 3. It means that the accent pattern of Z reveals the accent pattern of the first element. That is to say both of them have the same accent pattern. Only in the case of rule 4 does Y determine the accent pattern of Z.

Now let us consider how the accent patterns of Sino-Korean are predicted by means of the above accent rules shown in Table 5. As you know already, all of the monosyllabic Chinese characters in Korean are, at the same time, single morphemes and almost all of them are bound morphemes. Therefore, I regarded two-syllable Sino-Korean words as compound nouns. This means that each Sino-Korean monosyllabic character can be an element of word formation. Let us recall the accent system of the Daegu dialect. There are just two accent patterns (one kernelless and one with kernel) for monosyllabic words. This means that all Sino-Korean morphemes are either kernelless or with a kernel. Rule 1, rule 3, and rule 4 are used for the analysis. In the following analysis, two-syllable Sino-Korean words are taken into considera-

10 Some of the consonant clusters and complex vowels are omitted from Table 4.

11 See Lee (2004)

tion. Two-syllable Sino-Korean vocabulary is quite common in Korean. There are three accent patterns for two-syllable words, i.e. ○○= (HH), ○]○ (HL) and ○○] (LH).

First of all, by rule 1, we can predict the accent of the first element.

(3) Rule 1: If 'Z' is kernelless, the first element 'X' can be assumed to be kernelless.

Z		X		Y
○○=	→	○=	+	ANY
HH				

(4)

he?we (海外 'overseas')	→	he (海 'sea')	+	?we (外 'outside')
HH	→	○=	+	not predicted yet

Actually, all two-syllable Sino-Korean words with beginning 'he' (海 'sea') are accented kernelless (HH), e.g., 'henjə' (海女 'woman diver'), 'hepal' (海抜 'above sea level'), 'hejaŋ' (海洋 'ocean'), etc.

By rule 3, we can predict the accent patterns of both elements.

(5) Rule 3: If 'Z' has a kernel on the first syllable of the word (HL), the first element 'X' can be assumed to have a kernel accent pattern and the second element 'Y' can be assumed to be kernelless.

Z		X		Y
○]○	→	○]	+	○=
HL				

(6)

namkuk (南国 'south country')	→	nam (南 'south')	+	kuk (国 'country')
HL	→	○]	+	○=

As a consequence, the first element 'nam' (南 'south') has a kernel accent pattern, whereas the second element 'kuk' (国 'country') is kernelless.

Finally, by rule 4, the accent patterns of both elements are predictable.

(7) Rule 4: If 'Z' has a kernel on the second syllable of the word, i.e. the word-final syllable, both 'X' and 'Y' are assumed to have a kernel accent pattern.

Z		X		Y
○○]	→	○]	+	○]
LH				

(8)

namsan (南山 'south mountain')	→	nam (南 'south')	+	san (山 'mountain')
LH	→	○]	+	○]

Consequently, we can assume that both elements 'nam' (南 'south') and 'san' (山 'mountain') have a kernel accent pattern. Actually, other words which include 'nam' (南 'south') or 'san' (山 'mountain') are accented as having kernel accent patterns: this confirms that our assumption is true.

(9) a. namhe-○]○ (南海 'south sea'), nampuk- ○]○ (南北 'south and north'), namhan- ○○] (南韓 'south Korea'), kaŋnam- ○○] (江南 south of a river)
b. sanse - ○]○ (山勢 'physical aspect of a mountain'), sanc^{h}on- ○]○ (山村 'mountain village'), sancaŋ- ○○] (山莊 'mountain retreat'), kaŋsan- ○○] (江山 'river and mountain')

The accent patterns of monosyllabic Sino-Korean morphemes are traditionally regarded as unpredictable since almost all of them are bound morphemes, not appearing in the colloquial speech. But now, the accent patterns of all Sino-Korean characters are predictable by means of the accent rules shown above. Further, this observation enables us to suggest the correspondence sets between the Sino-Korean accent patterns in the Daegu dialect and MK[12].

(10) Data

Sino-Korean	Daegu Dialect	MK
ʔɯm (音 'sound'), səŋ (声 'voice'), cuŋ (中 'middle'):	accented pattern	⇔ L
cəm (点 'dot'), ʔə (語 'word'):	kernelless	⇔ R
ca (字 'letter'), kuk (国 'country'):	kernelless	⇔ H

(11) a. Kernelless pattern in the Daegu dialect ⇔ H∼R in MK
b. Accented pattern in the Daegu dialect ⇔ L in MK

3.4 Previous studies

Traditionally MK is considered to be a ***tonal*** language by Korean researchers, whereas Japanese researchers regard it as an ***accentual*** language[13]. Among them, Fukui (1985) proposes not only an accent kernel but also phrasal prosodic rules in MK. In this paper, I will reconsider the type of accent kernel and the phrasal prosodic features, comparing this with the Fukui's proposals. There are the oppositions in (12) in the pitch patterns of MK nouns. The elements after '-' are suffixes.

(12)

	1	2	3
a. H- or R- beginning	nom-i	sɯmɯr	ɸorhɐnniək-ɯi
	H-H	HH	HLL-H
	ptɯt-ira	cəzəm-i	ɸəms'ori-ni

12 See Lee (2004)
13 See Hayata (1974), Kadowaki (1976), and Fukui (1985)

	H -LH	HL- H	RLH-H
	turh-imjən	mars'ʁm-ira	
	R-LH	RH-LH	
	ɸəm-ira	sarʁm-ira	
	R-LH	RH-LH	
b. L-beginning and L to the final syllable	mok-ira	hʁnah-ira	əzɯrɯm-
	L-HH	LL-HH	LLL-
		stʁrʁm-ira	cintʁrɸui-
		LL-HH	LLL-
c. L- beginning and L to the penultimate syllable		sori-ni	moksori-ni
		LH- H	LLH-H
		məri-jəi	ɸipsiɸur-ira
		LH- H	LLH-LH
			hʁnkaci-ra
			LLH-H
d. L-beginning and L to the antepenultimate syllable			kaɸontʁi-
			LHH-

Glosses:
nom 'person', ptɯt 'meaning', turh 'two', ɸəm 'fang', mok 'throat', sɯmɯr 'twenty', cə zəm 'beginning', mars'ʁm 'speech', sarʁm 'human being', sori 'sound', məri 'head', ɸorhʁnniək 'right side', ɸəms' ori 'sound of fang=velar', əzɯrɯm 'dusk', cintʁrɸui 'azalea', moksori 'sound of throat', ɸipsiɸur 'lip', hʁnkaci 'equal', kaɸontʁi 'center'

Fukui proposed two alternative analyses as in (13) below. There are two types of kernels. One is the rising kernel represented as '⌜' in (13A), and the other is the low-pitch kernel represented as '⌟' in (13B).

(13) Fukui's analyses

(13A)

n-o	○ (L)	○○ (LL)	○○○ (LLL)
n-1	⌜○(H)	⌜○○(H□)	⌜○○○(H□□)
n-2		○⌜○(LH)	○⌜○○(LH□)
n-3			○○⌜○(LLH)

(13B)

n-o	○ (H)	○○ (H□)	○○○ (H□□)
n-1	○⌟(L)	○⌟○(LH)	○⌟○○(LH□)
n-2		○○⌟ (LL)	○○⌟○(LLH)
n-3			○○○⌟(LLL)

In Fukui (1985), (13A) with a *rising kernel* assumes that the first H is distinctive; (13B) with *low-pitch kernel* assumes that the last L (of the row of 'Ls') is distinctive. In conclusion, he

adopted (13A), rather than (13B), indicating several problems in both of them. Further, Fukui (1985) suggests the phrasal prosodies which automatically determine the phrasal pitch patterns after the first high-pitch, the rising kernel.

(14) The phrasal prosody patterns proposed by Fukui (1985)

Pattern 1: {…H}{…HH}{…HLH}{…HHLH}……
Pattern 2: {…H}{…HL}{…HHL}{…HLHL}……

However, there are some examples which do not coincide with either of the two patterns shown in (14) above. This seems that they need to be explained by other rules. I suggest a new analysis of the phrasal prosodic features as well as the accent system of MK.

3.5 The accent system of MK

My analysis on the accent system of MK is as in (15) below.

(15) The accent system of MK

	1		2		3	
0:	○=	(H)	○○=	(H□)	○○○=	(H□□)
0′:	○=	(R)	○○=	(R□)	○○○=	(R□□)
b-1:	○˩	(L)	○○˩	(LL)	○○○˩	(LLL)
b-2:			○˩○	(LH)	○○˩○	(LLH)
b-3:					○˩○○	(LH□)

As shown in (15), only the low-beginning pitch is distinctive. It is a system with a raising kernel, represented by '˩' in (15), which makes the pitch of the next syllable 'H'. If there is a sequence of low pitches, the last 'L' is distinctive. In kernelless forms, the first syllable must be 'H', but the pitch of the second syllable is arbitrary. After the word accent, the phrasal pitch patterns are governed automatically by phonetic features of phrasal prosodic features. This means that the accent patterns of MK can be predicted by indicating (i) whether the word has an accent kernel and, (ii) if it does, where the kernel is.

My analysis resembles (13B) of Fukui (1985), which Fukui (1985) does not adopt. In (13B), the symbol '˩' marks a low-pitch kernel. However, I mean a raising kernel by the same symbol '˩'.

3.6 Phonetic features of phrasal prosodic patterns

In this paper, I propose the phonetic features of phrasal prosodic patterns which govern the phrasal pitch patterns, which are not determined by the word accent.

(16) The phonetic features of the phrasal prosodic patterns:

Feature 1: Basically, all of the phrases finish with a 'H' tone.

mok-ira,	ɸorhɐn-nəik-ira,	hɐnah-ira
L-HH	HL-L-HH	LL-HH
mars'ɐm-ira,	mɐc^{h}ɐm-ira	
RH-LH	LH-LH	

Feature 2: Phrases tends to end in '…LH'.

mars'ɐm-ira,	mɐc^{h}ɐm-ira
RH-LH	LH-LH

If the word accent rule designates the tone of the penultimate syllable as 'H', the final of the phrasal pitch pattern '…LH', of course, does not appear. That is, the word accent takes precedence over the phrasal pitch pattern. See the data below.

mok-ira,	ɸorhɐn-nəik-ira,	hɐnah-ira
L-HH	HL-L-HH	LL-HH

There are three cases of exceptions to (16) above.

(17) Exceptions to the phrasal pitch features:
Exception 1: Bare nouns, e.g., hɐnah (LL), stɐrɐm (LL)
Exception 2: Adverbs, e.g., sərɯ (LL) 'each other', mɯrɸɯi (LL) 'approximately'
Exception 3: Adnominal forms of verbs, e.g., hɐ-non (HL)+noun, psɯ-nɯn (HL+noun, irən (HL)+noun

The data in (17) do not exhibit the phrasal pitch pattern ending in H or LH, and have only word pitch patterns.

3.7 The correspondence of the accent system between the Daegu dialect and MK

In conclusion, the correspondence sets of the accent system between the Daegu dialect and MK are suggested as in Table 6 below.

Table 6. Correspondence of the accent system between the Daegu dialect and MK

Daegu Dialect					MK		
1	2	3	4		1	2	3
○=	○○=	○○○=	○○○○=	0 0'	○= ○=	○○= ○○=	○○○= ○○○=
○]	○○] ○]○	○○○] ○○]○ ○]○○	○○○○] ○○○]○ ○○]○○ ○]○○○	b-1 b-2 b-3 b-4	○˩	○○˩ ○˩○	○○○˩ ○○˩○ ○˩○○

As is shown in Table 6, there is parallel relation in the accent system between Daegu dialect and MK. It is interesting that the correspondence is found not only in the system but also in the lexicon groups for each accent pattern. It is also necessary to take notice of the differences between both systems. First, MK has a raising kernel, whereas the Daegu dialect has a lowering kernel. Second, MK has not only word accent rules but also pitch patterns governed by phrasal prosodic features, whereas the Daegu dialect has only word accent rules.

4. Conclusions

This paper analyzed the accent system of MK, regarding it as a system with the raising accent kernel. We also demonstrated the correspondence of the accent system between the Daegu dialect and MK. This means that if we know the accent pattern of a word in the Daegu dialect, we can predict the accent pattern of the word in MK, and vice versa.

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