

# Contrasts, Mergers, and Acquisitions in Kyungsang Accent\*

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In this note we report the results of a study of the similarities and differences in the phonological and phonetic reflexes of the Middle Korean pitch accents in the speech of two Kyungsang speakers: one from the southern Pusan region and the other from the northern Taegu region.

## 1. Background

The research of Robert Ramsey (1975) and Cha-Gyun Gim (1999, 2002) among others has documented and analyzed an intricate set of accentual correspondences among the Modern Korean dialects and Middle Korean. We briefly review these developments in order to place our study in context.

Middle Korean (15th-16th century) was a tonal language contrasting high, low, and rising tones on both monosyllabic and disyllabic stems (1). The figures in parentheses indicate the number of examples of noun stems documented in Ramsey (1975). Our transcriptions of MK follow Ramsey (1975) while the Kyungsang data are transcribed according to the Yale Romanization.

- (1) High: mŭl 'water', nwŭn 'eye', nŭph 'leaf', kwŭp 'hoof', káps 'price' (132)  
Low: nŏch 'face', cŭp 'house', mŏl 'horse', swŭl 'wine' (38)  
Rise: twŏn 'money', mǎl 'speech', kwŏm 'bear', twŏlh 'stone', swŏk 'inside' (41)

High-Low: kwŭlwŭm 'cloud', tánti 'jar', káci 'branch', sómà 'sleeve' (40)  
Low-Low: káci 'eggplant', nŏmŏlh 'vegetable', pŏlŏm 'wind', pwŏli 'barley' (60)  
Low-High: kámca 'potato', nàpŏy 'butterfly', àtŏl 'son', hànólh 'sky' (134)

Rise-Low: sǎlŏm 'person', wŭsàn 'umbrella', nŭmcàh 'master', nŭmkŭm 'king' (22)<sup>1</sup>  
Low-Rise: mwŏkswŭm 'breath' (3)

The pitch contrasts were reflected in the orthography (Hangul side dots) making it one of the few naturally developed (i.e. not invented by a linguist) writing systems in which tonal distinctions are systematically represented. We see that High tone predominates in the monosyllables and Low-High in disyllables leading to the generalization of stem-final High as the default accent. See Ramsey (2001) for further discussion of deviations from this system.

The major innovation shared by both the Kyungsang dialects of the southeast and the Hamkyung dialects of the northeast was the elimination of the L and LL classes. This

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<sup>1</sup> The final syllable of Rise-Low class can be replaced by H depending on the following inflection.

arguably reflects the culmination of the evolution to a pitch accent system in which each word carried one and only one pitch rise. For the formerly L and LL words, a H was inserted on the final syllable--the syllable that most frequently carried the peak in the remaining vocabulary of (1). This occasioned potential neutralization of the monosyllabic L and H and the disyllabic LL and LH classes. In the Hamkyung dialect the neutralization was accepted for the isolation forms for both the monosyllables and the disyllables. But an accentual distinction emerges when an inflection is added. In the Kyungsang dialects merger occurred in the monosyllables as well (see below). But neutralization was avoided in the disyllables by retracting the peak of the original MK H tone (the Kyungsang accent shift). Thus, LH words such as MK *melí* became HL *méli* in Kyungsang. Additional examples appear in (2b).

(2) a.	<u>MK</u>	<u>Hamkyung</u>	<u>Kyungsang</u>	
	pòy	páy	páy	'pear'
		pay-ká	páy-ka	
	póy	páy	páy	'boat'
		páy-ka	páy-ká	
	pwòlì	polí	polí	'barley'
		polí-ká	polí-ka	
	mèlí	melí	méli	'hair'
		méli-ka	méli-ka	
b.	àtól	atúl	átul	'son'
	hànólh	hanúl	hánul	'sky'
	nàpóy	napí	nápi	'butterfly'
	àpí	aypí	áypi	'father'
	pànól	panúl	pánul	'needle'

The Kyungsang accent retraction threatened to merge LH with HL. Merger was avoided by shifting original HL to the so-called double-high HH--the open slot in the inventory of MK accent classes.

(4)	<u>MK</u>	<u>Hamkyung</u>	<u>Kyungsang</u>	
	mwókoy	móki	mókí	'mosquito'
	kácì	káci	káci	'branch'
	kwúlwùm	kwúlum	kwúlúm	'cloud'
	ákì	áyki	áykí	'baby'
	phílì	phíli	phílí	'flute'

Thus in the disyllabic stems there was a (push) chain shift in the evolution of the Kyungsang dialect: LL > LH > HL > HH.

We now turn to the reflexes of the MK rising tone as reported in Ramsey (1975). This is where the Kyungsang dialects most clearly diverge into northern and southern varieties. In the North Kyungsang (NK) dialect the vowels with a rising tone were lengthened. This is the major source of vowel length in the dialect. It makes sense as a

maneuver to accommodate the sluggish articulation involved in achieving a pitch rise (Sundberg 1979). Subsequently the Low portion of the Rise was lost leading to a merger with the initial H(L) class. The fact that the words in the MK Rise class regularly show the H tone doubling is good evidence that they lost the Low and merged with H(L).<sup>2</sup> The presumed development is shown in (5a). More examples are given in (5b)

(5) a.	nwŭn	sǎlom	MK
	nwŭ:n	sǎ:lam	lengthening of vowel under rising tone
	nwú:n	sá:lam	loss of Low portion of Rise
	nwú:n(-í)	sá:lám	extension of peak (High doubling)

b.	<u>MK</u>	<u>NK</u>	<u>Seoul</u>	
	twŏn	tó:n	to:n	'money'
	kwŏm	kó:m	ko:m	'bear'
	nwŭn	nwú:n	nwu:n	'snow'
	twŏlh	tó:l	to:l	'stone'
	sǎy	sá:y	sa:y	'bird'
	sǎlom	sá:lám	sa:lam	'person'
	ǎnkay	á:nkáy	a:nkay	'fog'
	pwŏpoy	pó:páy	po:pay	'treasure'

The simplification of the Rise to High with retention of the vowel quantity indicates a phonologization of the length which consequently must not have been a mere phonetic reflex of rise realization. The loss of a direct connection between length and accent would also help to explain why the Rise joined the HH class. If HL became HH to avoid merger with the output of the LH > HL change, then the length in *sǎ:lom* > *sá:lam* might have sufficed to keep it distinct from the output of the LH > HL change. But if length is excluded from the calculation of accentual class identity then *sá:lam* would be equivalent to *kwŭlum* accentually.

This lengthening of rising tones also occurred in the Seoul dialect and is the source of long vowels in the standard language, which subsequently lost all lexical tone/pitch accent differences starting in the 17th century.<sup>3</sup> The Middle Korean texts that form the basis for the standard language do not show accent retraction (Chiyuki Ito pers. com). Thus the NK dialect appears to straddle a dialect boundary: it shares the general Rise -> long vowel change with Seoul but shares accent retraction with SK.

<sup>2</sup> The words from the MK rising tone class also behave parallel to the HH class (from MK HL) for the morphophonemic rule that places the phrasal accent on the final syllable of a LH noun such as *tongséng: tongséng ton* 'younger sibling's money' (MK *twŏn*, NK *tó:n*) and *tongséng mul* 'younger sibling's water' (MK *múl*, NK *múl*, *múl-í*).

<sup>3</sup> The vowel length itself is now rapidly disappearing from the standard language, eliminating the last vestige of the MK tonal distinctions.

In the South Kyungsang (SK) dialect of Pusan the rising tone is preserved in monosyllables: MK *nwŭn* > SK *nwŭ:n*. In spite of the fact that almost all of the words in this class have sonorant codas which could carry the peak, the vowel is lengthened to accommodate the rise (see below). For disyllables like MK *sǎlom* the rise decomposed to LH with the peak realized in the following syllable: *sǎlám* > *salám*. Decomposition is another response to the marked rising tone. It was not available for monosyllables due to an overriding ban on floating tones. The result is a pitch contour that appears indistinguishable from the LH class of *palám* (< MK *pòlòm*). (6a) shows the presumed sound changes involved and (6b) the cognates to the data in (4).

(6) a.	<i>nwŭn</i>	<i>sǎlom</i>	MK
	----	<i>sǎlám</i>	decomposition of Rise
	<i>nwŭ:n</i>	-----	lengthening of Rise
b.	<u>MK</u>	<u>SK</u>	
	<i>twŏn</i>	<i>tŏ:n</i>	'money'
	<i>kwŏm</i>	<i>kŏ:m</i>	'bear'
	<i>nwŭn</i>	<i>nwŭ:n</i>	'snow'
	<i>twŏlh</i>	<i>tŏ:l</i>	'stone'
	<i>sǎy</i>	<i>sǎy</i>	'bird'
	<i>sǎlom</i>	<i>salám</i>	'person'
	<i>ǎnkay</i>	<i>ankáy</i>	'fog'
	<i>pwŏpoy</i>	<i>popáy</i>	'treasure'

While the pitch contours of the *salám* < *sǎlom* and *palám* classes have merged in the isolation form they are distinguished morphophonemically: *salám-í* vs. *palám-i*.

The following table summarizes the different developments of the Low-High/Rise in the two Kyungsang dialects.

(7)	<u>SK</u>	<u>NK</u>	
	<i>nwŭ:n</i>	<i>nwú:n</i>	'snow'
	<i>nwùn-í</i>	<i>nwú:n-í</i>	
	<i>sǎlám</i>	<i>sá:lám</i>	'person'
	<i>sǎlám-í</i>	<i>sá:lám-i</i>	
	<i>palám</i>	<i>palám</i>	'wind'
	<i>palám-i</i>	<i>palám-i</i>	

These paradigms imply different distributions of length and pitch contours as well as several neutralizations in the isolation form of distinctions that emerge when a case suffix is added. We were interested in documenting these prosodic mergers and contrasts phonetically in the two dialects.

## 2. Experiment

Two Kyungsang speakers in their mid-twenties recorded a list of monosyllabic and disyllabic words drawn from the various accent classes discussed above. The recordings were made in a sound-proof booth and analyzed with Praat. Several measures were made for the syllable including rime duration as well as maximum, minimum, and average F0 values.

### 2.1 South Kyungsang

For the monosyllables 20 words from each of the three tonal classes were recorded (two repetitions) in both the isolation form and with the nominative case suffix added.

(8)	<u>HL</u>	<u>HH</u>	<u>LH</u>
	chó 'vinegar'	thúm 'gap'	kăm 'persimmon'
	phál 'arm'	són 'hand'	kôm 'bear'
	cháng 'window'	kkwúm 'dream'	nwŭn 'snow'
	ttóng 'dung'	só 'cow'	tôn 'money'
	khóng 'soybeans'	kkún 'string'	păm 'chestnut'
	kkóng 'pheasant'	pís 'comb'	swŭm 'breath'
	són 'guest'	mó 'way'	săym 'spring'
	sóth 'kettle'	kwúp 'hoof'	ĩm 'esteemed person'
	swúl 'wine'	póm 'spring'	pēm 'tiger'
	áph 'front'	íp 'mouth'	cǒng 'servant'
	túng 'back'	íph 'leaf'	kěy 'crab'
	píc 'debt'	ttáng 'earth'	kă 'edge'
	wú 'top'	nwún 'eye'	săy 'bird'
	cíp 'house'	í 'tooth'	sěi 'three'
	pí 'stele'	nón 'paddy'	măy 'hawk'
	páy 'pear'	pí 'rain'	kǒl 'valley'
	páth 'field'	káps 'price'	sők 'inside'
	pyéng 'bottle'	pám 'night'	căs 'pine nuts'
	nó 'cord'	tám 'wall'	cıs 'appearance'
	mál 'horse'	táy 'bamboo'	pět 'friend'

First, we show the results for the isolation form for HL and HH nouns.

(9)	<u>class</u>	<u>F0-max</u>	<u>F0-min</u>	<u>F0-av</u>	<u>Rime-dur</u>
	HL	245 Hz/24	167/11	214/9	200 ms. /55
	HH	233/16	168/9	209/7	212/49

There is a fall from an early peak in both classes to essentially the same minimum F0 value marking an utterance final (L%) boundary tone. The average peak in the HL class is 12 Hz higher. But this is a function of the greater proportion of tense and aspirated onsets in this group, which boost the F0 peak (see Kenstowicz & Park 2006 for recent discussion of this phenomenon). When these forms are separated out, the peak values are

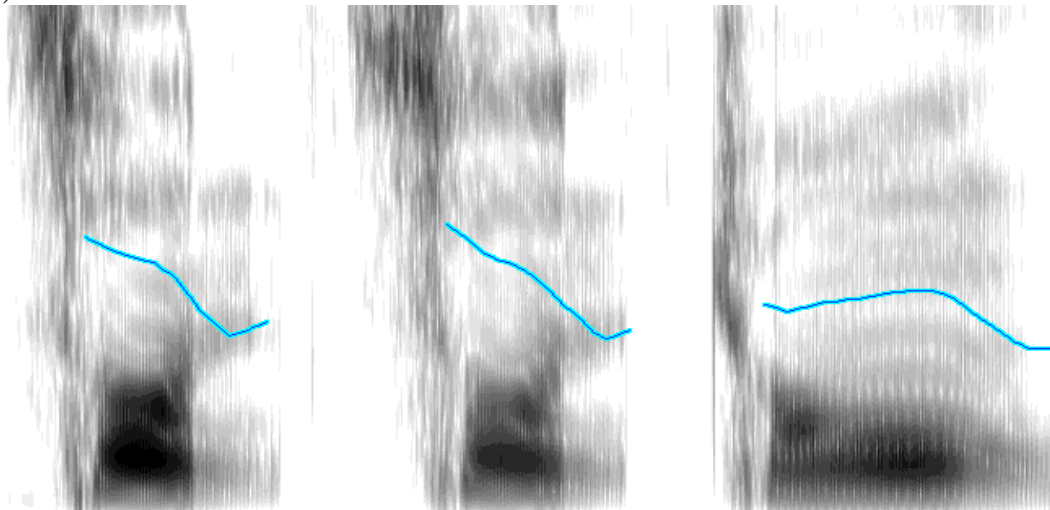
the same (226 Hz) for the HL and HH groups. Nor was any difference in the timing of the peak with respect to the onset consonant discernable--in most cases the peak occurred at or shortly after the release of the onset consonant. Finally, the rime durations for both syllables exhibit a fair amount of variability ( $\sigma = 55$  ms. (HL) vs. 49 ms. (HH)). But no consistent difference between the two accent classes emerged. We conclude that indeed the HL and HH tonal classes have merged in the isolation form. But they are consistently distinguished when an inflectional suffix is added: *són-i* 'guest' vs. *són-í* 'hand'.

We now turn to the monosyllables in the Rise class.<sup>4</sup>

(10)	<u>class</u>	<u>F0-max</u>	<u>F0-min</u>	<u>F0-av</u>	<u>Rise</u>	<u>Rime-dur</u>
	LH	210/5	162/5	194/4	19/5	342/42

These words show a quite different F0 shape with a clear rise followed by a fall to the boundary low tone in the isolation form. The rise is on the average 15 Hz--not large but still quite perceptible.

(11)



*són* 'guest'

*són* 'hand'

*tõn* 'money'

The other major difference between this class and the HL and HH classes in (9) is in the rime duration: 342 vs. 200/212. The increased duration is concentrated primarily in the vowel. As noted earlier, this is a natural response to a rising tone allowing the speaker adequate time to realize both the beginning and end points of the contour. The length difference is comparable in magnitude to what is found in the NK dialect and in Seoul. But in SK it is restricted to the monosyllables. For when an inflection follows then the L and H components of the Rise are realized on separate syllables and the duration difference largely vanishes. The data in (12) report the duration differences in the stem

<sup>4</sup> It was discovered that the last six items in the Rise class listed in (8) actually belong to the HH or HL classes for our speaker. These items have been excluded in the calculations below.

vowel when the nominative suffix (-*ka* for vowel-final and -*i* for consonant-final) is added.

(12)	<u>HL</u>	<u>HH</u>	<u>R/LH</u>
	109/28	104/27	117/15 ms.
	(són-i 'guest')	(són-í 'hand')	(ton-í 'money')

We thus have strong evidence for the autosegmental nature of the Kyungsang Rise as composed of two tones--a Low followed by a High. For our SK subject the stems appearing in this class either lack a coda or restrict it to a sonorant (nasal or liquid). There is thus ample room for the realization of the boundary L%. Its value is slightly lower (162 Hz) than in the monosyllabic HL and HH classes. We assume the greater duration in the Rise class allows the speaker to more closely approximate the target L% at the bottom of her pitch range.

We now turn to the reflex of the disyllabic Rise class typified by MK *sǎlom*. The literature reports that this class has decomposed the rise into LH components, merging with the LH (<LL) *palám* 'wind' class. The words in (13) were recorded and analyzed to test this assumption. The first group derive from MK initial Rise and the second from MK LL

(13)	salám	'person'	palám	'wind'
	imcá	'owner'	talí	'bridge'
	imkúm	'king'	koláy	'whale'
	popáy	'treasure'	kasíl	'autumn'
	wusán	'umbrella'	namú	'tree'
	ceypí	'swallow'	mencí	'dust'
	nongtám	'joke'	sokúm	'salt'
	swukén	'towel'	pinyé	'hairpin'
	psychwú	'cabbage'	polí	'barley'
	tokkí	'axe'	namúl	'vegetable'

We were curious to see if there was any trace of a length or a pitch difference on the initial syllable of these two classes. The results are summarized below.

(14) initial syllable

<u>class</u>	<u>F0-max</u>	<u>F0-min</u>	<u>F0-av</u>	<u>Rime-dur</u>
R	188/8	174/8	182/7	90/30
LH	191/14	177/10	183/11	118/26

The initial syllable F0 values are essentially identical. There is a small difference in rime duration but it goes in the opposite direction from what might be expected in that the initial syllable of the former Rise (*sǎlom*) class is actually slightly shorter. The 28 ms. difference is within one standard deviation and hence not significant.

The table below reports the measures for the second syllable of the two classes. They are virtually identical.

(15) second syllable

<u>class</u>	<u>F0-max</u>	<u>F0-min</u>	<u>F0-av</u>	<u>Rime-dur</u>
R	216/9	162/5	192/5	218/33
LH	213/7	160/4	194/6	196/31ms.

We conclude that the *salám* (Rise) class has indeed merged with the LH *palám* class in the isolation form in SK. They are consistently distinguished morphophonemically when a suffix is added: *salám-i* vs. *palám-i*.

## 2.2 North Kyungsang

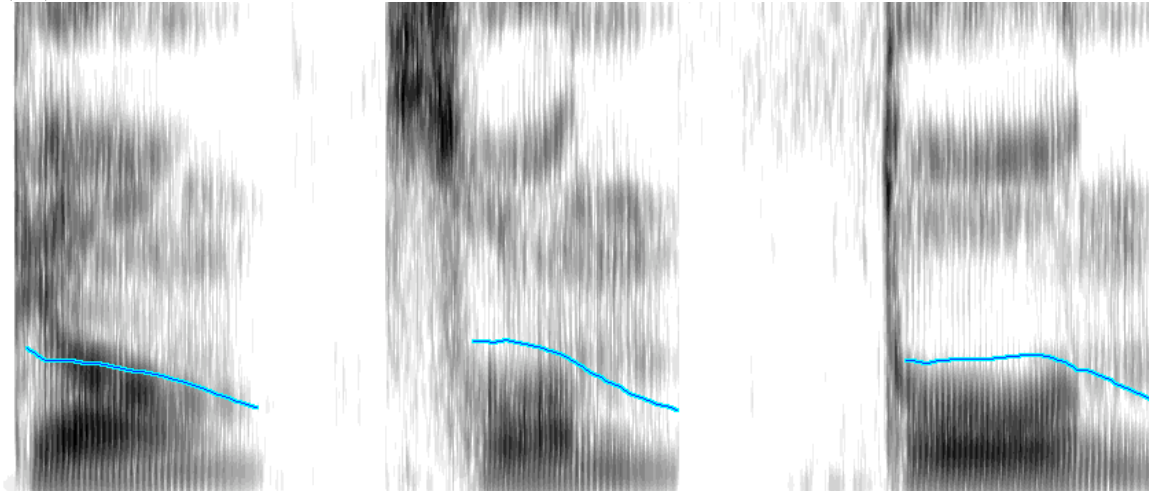
For the North Kyungsang subject we had a smaller corpus of data (ten words from each set).

(16)	<u>HL</u>		<u>HH</u>		<u>Rise</u>	
	páth	'field'	káps	'price'	tó:n	'money'
	cíp	'house'	nác	'day'	nwú:n	'snow'
	kkwéng	'pheasant'	són	'hand'	ká:m	'persimmon'
	sóth	'pot'	íph	'leaf'	tó:l	'stone'
	mók	'neck'	móm	'body'	kó:m	'bear'
	nách	'face'	pám	'night'	sé:ym	'island'
	pyéng	'bottle'	cám	'sleep'	pá:m	'chestnut'
	táلك	'chicken'	cán	'wine cup'	pé:ym	'tiger'
	túng	'back of hand'	tám	'wall'	pyé:ng	'disease'
	míth	'bottom'	kúp	'hoof'	sá:ym	'spring, fountain'

We break them down into obstruent vs. sonorant coda, as this has a difference on the F0 min and duration measures. All of the reflexes of the Rise (*tó:n*) class have a sonorant coda. The most important generalization is that they consistently have a sustained, slightly rising contour across a lengthened vowel that contrasts with the shorter, more steeply descending contour of the HL and HH stems (17). The shape is rather similar to that found in the South Kyungsang dialect except that the extent of the rise is smaller (c. 8 Hz on average) and there is greater variability. Our findings here agree with those reported in Kim (1994) who also found a small rise of c. 9 Hz ( $\sigma=8$ ).



(17)



pjéng 'bottle'

són 'hand'

tó:n 'money'

Also, the vowel duration differences (132 ms. vs. 151 ms. and 197 ms) are not as large as those found for the SK speaker. (As in the standard Seoul dialect, vowel duration differences seem to be diminished for younger speakers). Otherwise the F0 minima, maxima, and averages are comparable for the three classes.

(18) **Monosyllables**

class	F0-max	F0-min	F0-av	V-dur	Coda	rime-dur
HL	145/11	90/4	122/6	132/33	173/41	306/28
HH	138/9	91/5	121/3	151/24	179/28	330/38
R	140/6	94/3	124/2	197/40	148/19	345/28

We conclude that the pitch contours for the three classes have indeed merged to a High in NK monosyllables (in contrast to the partial merger in SK). The Rise class has a longer vowel, comparable to the SK dialect. This permits a full realization of the tone as flat to slightly rising H followed by the fall in the coda consonant to the L% boundary tone. In the HL and HH classes with a shorter vowel the drop towards the L% begins much earlier.

For disyllables, the words below were recorded and measured.

Rise		LH		HH	
sá:lám	'person'	palám	'wind'	kácí	'branch'
í:mkúm	'king'	meyncí	'dust'	kwúlúm	'cloud'
í:mcá	'owner'	eyndéyk	'hill'	kúmúl	'net'
nó:ngtám	'joke'	namúl	'herbs'	mókí	'mosquito'
há:nté	'outdoors'	sokúm	'salt'	sómáy	'sleeve'
pó:páy	'treasure'	sakóng	'boatman'	ákí	'baby'
wú:sán	'umbrella'	polí	'barley'	éymí	'mother'
mú:táng	'shaman'	totwúk	'thief'	úléy	'thunder'
cé:pí	'swallow'	koláng	'furrow'	súmúl	'twenty'

swú:kéyn 'towel'

táncí 'jar'

We find a significant difference of F0-max in the first syllable with the *sá:lám* class being about 20 Hz. higher and having greater rime duration than the *palám* class (20). However, there is a fair amount of variation--especially for the duration measure. For the second syllable the peaks and duration measures obtained in the two classes are comparable.

(20) **Disyllables**

first syllable

<u>class</u>	<u>F0-max</u>	<u>F0-min</u>	<u>F0-av</u>	<u>rime-dur</u>
R	159/8	133/14	148/9	183/72
LH	141/12	130/9	135/10	116/48
HH	155/12	140/15	147/13	107/31

second syllable

<u>class</u>	<u>F0-max</u>	<u>F0-min</u>	<u>F0-av</u>	<u>rime-dur</u>
R	161/8	97/8	131/6	212/33
LH	161/7	99/6	138/6	207/38
HH	162/8	99/4	135/6	187/23

We conclude that for NK the *sá:lám* Rise class has indeed merged with the *kwúlúm* HH class in F0. But there is still some difference in duration though not as great as might be expected--perhaps reflecting the gradual loss of duration distinctions among speakers of the younger generation.

**3. Correspondences**

In this section we summarize our findings regarding the correspondences among the cognate words listed in Ramsey's (1975) study as reflected in the speech of our two subjects. In the recent generative literature there has been much discussion of the segmental levelings that have occurred in the paradigm of nouns based on the isolation form (Kenstowicz 1996 and many subsequent studies). Since the evolution of the MK accent classes has resulted in the neutralization of contrasts that only emerge when a suffix is added, we were interested to see if there have been any changes in population among the three contrasting tonal classes. If so, is there a consistent direction to the changes? What role if any does frequency play? Is there any tendency for consolidation of stems with regard to change. i.e. are stems with segmental change in the syllable coda more likely to also show accentual reclassification (expected if the nominative serves as the base for the induction of all morphophonemic changes, as suggested in Albright 2002).

The table below summarizes the correspondences among the MK L and H classes for monosyllabic stems.

(21)	<u>MK</u>	<u>Ky</u>		<u>MK</u>	<u>SK</u>	
	L	H(L)	26	swùl	swúl-i	'wine'
				kwòc	kkóch-i	'flower'
				mòl	mál-i	'horse'
				pàth	páth-i	'field'
				swòn	són-i	'guest'
	L	H(H)	6	mwòk	mók-í	'neck'
				pàsk	pákk-í	'outside'
				wòs	óch-í	'lacquer, sumac'
				nèks	néks-í	'spirit, soul'
				wùh	wú-ká	'top, above'
	L	R	0	pyèng	pyéng-í	'bottle'
<hr/>						
	H	H(H)	118	swón	són-í	'hand'
				nwún	nwún-í	'eye'
				tám	tám-í	'wall'
				múl	múl-í	'water'
				púl	púl-í	'fire'
	H	H(L)	6	kwót	kós-i	'place'
				syém	sém-i	'straw sack'
				ánh	án-i	'inside'
				wós	ós-i	'clothes'
				phí	phí-ka	'millet'
	H	R	0	phá	phá-ka	'scallion'

The correspondences are remarkably regular. For the ambiguous H class we find a small number of deviations in both directions from the etymologically justified accentual pattern. Six nouns with MK L that should place them in the HL class instead inflect as HH while six nouns that correspond to MK H that should place them in the HH class instead inflect as HL. There are no examples of stems changing into the Rise class. This is expected since this class is marked by the telltale rising pitch (SK) or long vowel (NK) in their surface realization.

(22) shows the reflexes of the monosyllabic rise among the two dialects.

(22)	<u>MK</u>	<u>SK</u>	<u>NK</u>		<u>MK</u>	<u>SK</u>	<u>NK</u>	
	R	R:	V:	32	kwǒm	kǒ:m	kó:m	'bear'
					twǒn	tǒ:n	tó:n	'money'
					mǎl	mǎ:l	má:l	'speech'
					nwǔn	nwǔ:n	nwú:n	'snow'
					swǒk	sǒ:k	só:k	'inside'

R	H(H) (H)H	5	mǎy	máy	má:y	'hawk'
			nǐm	ím	ím	'esteemed person'
			twǒy	ttéy	ttéy	'Chink' vulgar
			cǎs	cás-í	cás	'pine nuts'
			cǔz	cís-í	cís	'appearance, manner'
R	H(L)	1	pět	pés-i	pés	'friend'

The regular reflex of the rise has been retained for the large majority of words. Five have changed into the HH class and one to the HL class. The forms *ím* and *ttéy* only appear in compounds. The remaining three end in an obstruent. It was mentioned above that the vast majority of stems in the Rising class ended in a sonorant consonant or vocoid in MK. An obstruent coda would be inhospitable to the realization of the rise. There is thus phonetic as well as phonotactic motivation for a change in the accentual affiliation of the few stems with obstruent codas in this class.<sup>5</sup> For the four such stems listed by Ramsey MK *kǒz* 'edge' appears as either *kasí* or *ká:* through independent elimination of the coda \*z; *cǎs* 'pine nuts' and *cǔz* 'appearance' pass into the doubled-H class in SK (*cás-í*, *cís-í*), while *pět* 'friend' appears as H-L (*pés-i*). Just *swǒk* 'inside' remains in the rising class: *sǒk*, *sok-í*. As observed earlier, for the monosyllables the doubled H is the most frequent pattern. If a noun leaves the Rise class then frequency would attract it to the HH class rather than to HL. This generalization holds for five of the six such words which have changed.

For disyllables we have the reflexes in (23) for the MK LL class which regularly becomes LH(L) in Kyungsang. One form has passed into the LH(H) class. Three appear as HL. Perhaps their original LH (<LL) was reclassified as final accent LH (<LH) before the Kyungsang accent retraction. The remaining four cases of HH are more difficult to explain, showing a reflex of initial HL accent that has doubled.

(23)	<u>MK</u>	<u>Ky</u>	<u>MK</u>	<u>SK</u>	
	LL	LH(L) 47	pòlòm	palám-i	'wind'
			kòzòlh	kaúl-i	'autumn'
			nòmòlh	namúl-i	'vegetable'
			tòlì	talí-ka	'bridge'
			pwòlì	polí-ka	'barley'
	LH(H) 1	phèynphwùng	pyengphwúng-í		'folding screen'
	HL 3	mòtòy	máti		'joint'
		kùtùy	kútay		'thou'
		mwòmìl	méymil		'buckwheat'
		àzò	áu		'younger brother'

<sup>5</sup> A change in the segmental structure to a sonorant coda is unexpected because it seems that when there is a conflict between tonal and segmental structure it is the former that invariably changes. The influence between tone and segmental features seems unidirectional.

HH	4	cyèksàm	céksám	'jacket'
		stòlòm	ttálúm	'only'
		pwùlmwù	phúlmú	'bellows'
		àzò	ásí	'younger brother'

For the MK *sǎlom* class with an initial rise three forms have passed into the *palám* class. The fact that they have the double accent with a long vowel in NK (*ké:cíp* 'girl', *pí:tán* 'silk', *á:nkáy* 'fog') indicates that this is a later SK change due to the ambiguity of the isolated form. There are no cases of a change in the opposite direction into the *salám* class. The fact that the *palám* class is almost three times larger than the *salám* class suggests that this case could also be a frequency effect. Finally, there is one case where the rise was simplified early and passed to the HL class with subsequent H doubling.

(24)	<u>MK</u>	<u>Ky</u>	<u>MK</u>	<u>SK</u>	
	R	LH(H) 18	sǎlom	salám-í	'person'
			syŭken	swukén-í	'towel'
			wŭsan	wusán-i	'umbrella'
			lwǒngtam	nongtám-í	'joke'
			mwŭtang	mutáng-í	'shaman'
	R	LH(L) 3	kyěcip	kecíp-i	'girl'
			pŭtan	pitán-i	'silk'
			ǎnkay	ankáy-ka	'fog'
	R	HH(L) 1	pǒlkcwuy	pákwi-ka	'bat'

Ramsey (1975) lists three disyllables with a final rise (25). In both Kyungsang dialects they have the reflex HL suggesting that the final rise was simplified early to LH. These forms then undergo retraction. This is supported by fact that they have retained final accent in the Hamkyung dialect.

(25)	<u>MK</u>	<u>Ky</u>	<u>MK</u>	<u>Ham</u>	<u>SK</u>	
	LR	HL 3	mwòkswŭm	mokswúm	mókswum	'breath'
			yèsŭŷn	yeyswún	yésŷun	'sixty'
			kwòktwŷyh	kkoktí	kkókti	'back of head'

#### 4. Conclusion

In this paper we reviewed the correspondences among the pitch accents in the Kyungsang dialects and Middle Korean as documented in Ramsey's (1975) landmark study. We reported the results of a phonetic study of two Kyungsang speakers representing the southern and northern varieties of this dialect. Our findings coincide with those reported in the literature concerning the reflexes of the MK rising tone. The two dialects exemplify the principal cross-linguistic responses to this marked structure: vowel lengthening, simplification, and decomposition with peak delay. We also documented

changes in the population of the various accent classes. Our chief finding here is that nouns abandon the marked Rising class for the more frequent HH class in monosyllables and the LH-L class of *palám* in disyllables. However, the number of changes is rather small and the overall set of correspondences is remarkably stable and systematic--a testimony to the regularity of sound change.

Tasks for future research include investigation of a larger data set as well as more detailed study of the various dialectal differences reported in the traditional Korean literature (Gim 1999, 2002). Particularly important will be the instrumental investigation of the pitch accents. Like the F1-F2 formant space for vowels, F0 pitch space is continuous. Traditional phonetic transcription is not adequate to the task of consistently recording the sometimes subtle but systematic differences. The research of Labov (1994) has documented significant changes across the dialects of American English that would be elusive without the aid of phonetic instrumentation. It appears that much of the disagreement over the facts in the literature on the Korean accents stems from the absence of consistent phonetic study (Kim 1994). A detailed investigation of the phonetic realization of the accent contrasts across the dialects could also be fertile ground for testing models of phonetic implementation. We close with one example where such an approach is clearly called for. The relation between the Kyungsang accent retraction and the doubled (spread) H tone is quite puzzling. These developments are clearly related. We are not aware of any Kyungsang dialect in which one change is found without some reflex of the other. If we think of retraction (LH > HL) as anticipation of the F0 peak, the HL > HH change forming the double (spread) H becomes a mystery. Why weren't the two contours confused? One possibility is that the peak of the original HL dipped to lower level and became more stretched out, ducking underneath the retracting H. In order to evaluate this hypothesis a detailed phonetic study of the implementation of the doubled High is required. In a pilot study of the implementation of the contrast between LH vs. HH in a set of disyllabic nonce words where the consonantal onset is controlled, Cho (2006) found that the HH has a slow sustained rise that is not completed until the middle of the second vowel. This looks like suggestive support for the "mid" hypothesis but further study is clearly required.<sup>6</sup> Finally even if one sees the pitch accents as marking the edges of metrical structures (Kim 1999, Hwangbo 2003), the surface phonetic F0 contours must be the chief evidence on the basis of which the abstract structure is inferred. The details of phonetic implementation are thus of relevance for this approach as well.

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<sup>6</sup> The doubled (spread) H is categorized as a mid tone by some Korean dialect specialists (Gim 2002).

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