Accentual Adaptation in North Kyungsang Korean* July 1998

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North Kyungsang (NK) Korean is a pitch accent system in which one or in certain cases two syllables in every free-standing lexical item is the locus of a pitch peak. The location of the accent is in general unpredictable: cf. the minimal triple *káci* 'kind', *kací* 'eggplant', *ká:cí* 'branch'. When foreign words are adapted into this dialect of Korean they must be assigned a pitch peak. Since any syllable of the word can be accented in the native lexicon one might expect the accent of the donor language (typically English) to be copied more or less faithfully. It therefore comes as a surprise that this is not what happens. Instead accent is assigned to one of three locations (initial, penultimate, or final) according to general principles. We have collected a corpus of some 600 words; the vast majority have predictable accent. We are aware of one other study of a comparable state of affairs in another language. Shinohara (1997a,b) investigated the locus of accent in Japanese adaptations of words from English and French. As is well known, nouns (as opposed to verbs) in Japanese contrast the locus of accent: for an n-syllable word, there are n+1 patterns as witnessed by the series *i'noti* 'life', *koko'ro* 'heart', *atama'* 'head', *miyako'* 'capital city' (cf. *miyako-ga'*) from McCawley (1968). Shinohara finds that when a word is adapted from English the locus of English accent is by and large respected; but words adapted from French follow a quite different path. Their accent is assigned according to the Latin stress rule: the final syllable is disregarded and a bimoraic foot is assigned at the right edge of the remainder so that the antepenult is accented if the penult is light; otherwise the penult is accented. This "default" accent pattern is also regularly applied to limited sectors of the native vocabulary such as certain compounds and proper names. Our findings for NK are similar to Shinohara's for Japanese: a bimoraic foot is assigned at the right edge of the word (with no extrametricality). But this generalization is overlaid by another NK specific pattern. Shinohara's study and comparable results from our investigation pose an interesting theoretical problem: given that the native words the NK child hears in first-language acquisition have unpredictable accent, why is the right-edge oriented bimoraic foot analysis chosen in the adaptation situation? What evidence could lead the child to discover penultimate accent as the default accent so that this is the accentuation that emerges in the adaptation process? Are native words with penultimate accent assigned their accent in the course of mapping from input to output while other accents are lexically stored?   Or is what happens in adaptation largely independent of the native system and a more direct reflection of Universal Grammar? If so, are there other factors about NK (and Japanese) that cue a trochaic foot at the right edge of the word as the "default" accentuation? These are some of the questions that our results lead us to pose for future research.

This paper is organized as follows. In the first section we outline the accent patterns of the native NK lexicon. We then review Kim's (1997) arguments that penultimate accent should be singled out as predictable. In the following section we present the results of our study and the principles that govern the location of accent in the adaptation data. We then discuss three aspects of the segmental phonology of NK that impinge on the analysis in various ways. In the final section we see that adaptations corroborate a constraint on input items. The paper concludes with a summary of the results.

1. NK Accent Patterns

In (1) we list noun stems of one to three syllables to demonstrate the point that accent falls unpredictably on any syllable of the stem. The data is tabulated in terms of "doubled" vs. "single" accent words. Items in the former category have a pitch peak (high tone) over their first two syllables while words in the latter category have just a single syllable as peak. The doubled vs. single accent contrast even exists for monosyllables: it

shows up when a suffix such as the nominative *-i* is added. In the transcriptions that follow, *N* stands for the velar nasal, *U* for the high central vowel and *A* for the mid central vowel. For most NK speakers the contrast between [U] and [A] is neutralized phonetically. Our transcriptions do not indicate the automatic voicing of intersonorant plain stops.

(1)

s	múl	'water'(cf. múr-í nom.)		
	súl	'wine' (cf. súr-i nom.)		

ss	cákí	'self'	ká:má	'palanquin'
	kUrím	'picture'	sá:rám	'person'
	káci	'kind'	kací	'eggplant'
	mánUl	'garlic'	namúl	'vegetable'
	kúksi	'noodle'	nempí	'pot'
	yÁNcun	name	toNséN	'younger brother'

sss	múcíke	'rainbow'	hó:ráNi	'tiger'
	hárépi	'grandfather'	kó:kúma	'sweet potato'

	kámani	'rice bag'	kurúma	'cart'	satarí	'ladder'
	tóksuli	'eagle'	camcári	'dragonfly'	mintUllé	'dandellion'
			pitúlki	'dove'	pUsirÁm	'abscess'
			halmáNku	'old woman'	pilump'ák	'wall'

It is quite clear that whether a word belongs to the doubled class or not and if not then which syllable of the word is accented is in general unpredictable. However, this statement must be qualified by the fact that words in which the first syllable contains a long vowel are consistently assigned to the doubled class (Chung 1991:99). Furthermore, aside from a handful of cases in which a long vowel appears on the final syllable of the stem, long vowels are restricted to the word initial syllable in the NK native lexicon--a property that is true for the Seoul dialect as well. But the doubling class also contains many words with an initial short vowel: *sé* 'tongue' (cf. *sé-ká* nom.), *cákí* 'self'. For words in the single accent class accent falls unpredictably on the first, second, or third syllable. However, Kim (1997) presents several arguments that penultimate accent is the regular pattern for this class. We review them here. First, he cites a sample of 34 loanwords, 30 of which have penultimate accent; the remaining four have a final syllable with a long vowel which takes the accent (2). These data are consistent with an analysis that assigns a bimoraic foot at the right edge of the word.[1]

(2)   khítha 'guitar', théksi 'taxi', thókhAn 'token coin'
       puráca 'brassiere', wasíNthon 'Washington', thenísU 'tennis'
       ameríkha 'America', hirosíma 'Hiroshima'
       khelliphonía 'California', parUsellóna 'Barcelona'
       utó:N 'Japanese noodle', oté:N 'Japanese-style sausage'

Our more extensive corpus of adaptations (see below) show that this analysis, while essentially correct, is an oversimplification. Second, as observed in Chung (1991:74), native NK stems greater than three syllables in length consistently have penultimate accent. Most of these terminate in the vowel *-i* (*mikkuráci* 'mudfish', *ttakttakúri* 'woodpecker', *heparáki* 'sunflower') but not all do so (*isusíke* ' tooth-pick', *acupánim* 'elder brother-in-

law'). Chung refers to a similar state of affairs in Kimatuumbe (Odden 1996) where the number of accent patterns for words with four or greater syllables is severely restricted in comparison to shorter words. Perhaps the reason for this phenomenon is that as words get longer segmental distinctions suffice to keep them apart; while for the more densely populated mono- and disyllabic regions of the lexicon, accent plays a more distinctive role. Third, as also observed by Chung (1991:85), when words vacillate in accent pattern, one variant is always penultimate: *tóksuri ~ toksúri* 'eagle', *therepí ~ therépi* 'TV' (Japanese), *múcíke ~ mucíke* 'rainbow'. In other words, penultimate accent is a magnet that attracts lexical items from the initial, final, and doubled classes. Fourth, stems with final accent shift accent to the right under suffixation: the shifted accent is realized on the penultimate syllable of the entire word unless the final syllable contains a long vowel: cf. *kací* 'eggplant' but *kaci-meNkúro* 'like an eggplant', *kaci-potá:* 'than an eggplant'. This alternation requires the active computation of a bimoraic foot at the right edge of the word: it cannot plausibly be the product of listing in the lexicon. Finally, penultimate accent is the most frequent type in the shorter stems: out of 218 polysyllabic nouns in Kim's sample, 133 (61%) have penultimate accent; for 107 polysyllabic verbs, 52 (49%) are in the penultimate class. These results are comparable to our own: in our corpus of adaptations 60% of the items belong to the penultimate class; the remaining 40% is divided almost equally between the doubled and final accent classes.

2. The Corpus

Our corpus consists of some 600 items--almost all nouns. Shinohara (1997b) distinguishes between "adaptations" and "loanwords". The former are more or less spontaneous renderings of a foreign word in the target language--for example when an interpreter must pronounce a foreign word such as a name for a monolingual client. Our data for the most part fall between a fully integrated loanword and a novelly rendered foreign word: the corpus consists of words which the second author has heard used by other NK speakers either in Korea or in the United States.

We begin with several preliminary observations. First, the adapted word almost always falls into one of the three NK accent classes: doubled, final, penultimate. There are cases of antepenultimate accent but these are limited to situations where a final cluster is broken by two epenthetic vowels. Second, assignment to the three accent classes is done on a principled basis according to the weight of the relevant syllables. The basic generalization can be stated in terms of the disjunctions in (3)

(3)   i. if the initial syllable of the output is heavy then the word falls into the
            doubled-accent class;
        ii. otherwise, if the final syllable is heavy, the word goes into the
            final-accent class;
        iii. otherwise, the word enters the penultimate class.

In terms of weight, the hierarchy of syllable rimes in (4) is relevant:

(4) $V: > VC_{son} > VC_{obstr} > V > V_{epen}$

2.1 Doubled vs. Final Accent

Let us examine the first disjunction in (3)--competition between doubled vs. final accent--in terms of the weight hierarchy in (4). In (5) we show cases from the corpus where the initial vowel is long--all fall into the doubled accent class. This is an invariable generalization: if the initial syllable contains a long vowel then it always has the doubled accent. It accords with the generalization mentioned above that holds over the native lexicon.

(5) a. pí:nÁsU   'Venus'
         ó:thó   'auto'
         pyú:thí   'beauty
         ró:má   'Rome'
         yú:thóphia   'utopia'

     b. phéjphÁ   'paper'
         péjpí   'baby'

     c. pá:kén   'bargain'
         thá:két   'target'
         phá:khíN   'parking'
         má:málleitU   'marmalade'
         ká:tÚn   'garden'

The source of the long vowel can be a tense vowel (5a), a diphthong (5b), or a long vowel arising from loss of preconsonantal [r] (5c). Since in general final long vowels are avoided in our corpus (see below), there is no conflict between the doubled and final accent classes with respect to a long vowel.

     A second, smaller subclass of doubled accent words is comprised of items whose initial syllable is closed by a consonant--usually a sonorant. We sample these items in (6)--arranged in terms of the weight of the final syllable. In (6a) the final syllable is closed by a sonorant; in (6b) it is closed by an obstruent; in (6c) the final syllable terminates in a vowel; and in (6d) in an epenthetic vowel.

(6) a. rÁndÁn   'London'   amsUtherUdám 'Amsterdam'
         syámphéin   'champagne'   piltíN   'building'
         éncín   'engine'   khonthUról   'control'
         cénthÚlmen   'gentleman'
         héntÚl   'handle'
         hÁnthíN   'hunting'
         réNkhíN   'ranking'
         sántál   'sandal'
         phéntíum   'Pentium'
         ménsyÁn   'mansion'

     b. ínthÁnet   'internet'
         mémpÁsip   'membership'

     c. ántánthe   'andante'
         khóntó   'condo'
         ínphÚlle   'inflation'
         símphóni   'symphony'

     d. khÁmphékthU   'compact'
         áNkhórU   'encore'

     e. khépthín   'captain'   nepkhín   'napkin'
         phápsóN   'popsong'   khakthéil   'cocktail'
         syópphíN   'shopping'   syókkhíN   'shocking'

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Here competition with the final accent class is possible. When a tie occurs and both the initial and the final syllables are closed by a sonorant, initial accent predominates: our corpus has just the three items listed in (6a) ('Amsterdam', 'building', and 'control') where accent falls on the final syllable.

When the initial syllable is closed by an obstruent (6e) then competition with final accent is greater (though the number of examples in our corpus is so small that it is unclear how much stock can be placed in this particular case): 'captain' and 'popsong' have doubled accent while 'cocktail' and 'napkin' have final accent. Lastly, when the initial syllable is open CV or epenthetic, then the word never falls in the doubled class.

To summarize: the rule that words with an initial-syllable long vowel take the doubled accent is automatically extended to the adaptation data. The doubled accent pattern is never applied to words with an initial light open syllable even though words with this accentuation form a substantial part of the NK native lexicon. For example, Kim (1997:108-109) lists 80 monosyllabic words belonging to the doubled accent class. Sixty of these contain a short vowel (e.g. *kí* , *kí-ká* 'ear', *kót*, *kós-í* 'place') while only 20 have a long vowel (e.g. *mé:*, *mé:-ká* 'falcon', *pé:m, pé:m-í* 'snake'). Thus, in terms of frequency there are many more instantiations of the doubled accent in words with a short vowel. But this accent pattern is never extended to the adaptation data: only the numerically smaller class of long vowel stems is. Why this discrepancy? The answer presumably is that accent is predictable for the long-vowel words. Given that the lexicon only records unpredictable, distinctive information, the language learner is forced to posit a rule (or constraint ranking in Optimality Theory) that will assign an accent to long vowel words. On the other hand, short vowel words in the doubled accent pattern will have to be indicated lexically (the tonal analyses of Chung (1991) and Kim (1997) posit a floating high tone while the accentual analysis of Idsardi & Kim (1997) proposes a metrical bracket) since they contrast in accent with other short vowel words: *múl*, *múl-í* 'water' vs. *súl*, *súl-i* 'wine'. There is however one aspect of the doubled accent pattern that does not directly reflect the grammar of NK. The rule assigning heavy initial syllables to the doubled class is extended down the weight hierarchy to include syllables closed by a sonorant (and some but not all cases of closure by an obstruent). In the native lexicon there is no evidence that such CVR syllables are targeted by the doubled accent pattern. For example, disyllables with an initial CVR seem to be equally distributed across the three accent types: initial (*páNku* 'rock', *kímchi* 'pickled cabbage', *kúksi* 'noodle'), final (*tanchú* 'button', *nempí* 'pot', *kamcá* 'potato'), doubled (*táncí* 'jug', *cáNnán* 'joke', *nálké* 'wing). The extension of the doubled accent to CVR syllables is thus an "emergent" phenomenon. Perhaps it indicates that the default UG setting for the weight of CVC syllables counts them as heavy. See Rosenthall & van der Hulst (1998) for a recent OT proposal on how to represent the weight of CVC syllables.

2.2 Final vs. penultimate accent

We now pass on to the competition between final vs. penultimate accent. Languages in which accent is located in a two-syllable window at the right edge of the word are quite common. They fall into two principal types: those languages such as Chukchee (Kenstowicz 1997) and Uyghur (Comrie 1997) where the final syllable is accented unless it is light and the penult is heavy (L'L, L'H, 'HL, H'H) vs. languages such as Tahitian (Bickmore 1995) in which the penult is stressed unless the final syllable is heavy: 'LL, L'H, 'HL, H'H. Let us examine the four possible combinations of light and heavy syllables in the NK adaptation corpus to see which type better matches our data.

The vast majority of items in the final-accent class have a penultimate light and a final closed syllable (as well as a light initial syllable that exempts them from the doubled accent pattern). We cite a few examples in (7a). The number of words of this syllabic structure with penultimate accent is much smaller. We list all those we have found in (7b).

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(7) a. allatín   'Aladdin'   b. eArópik   'aerobic'
     pUracíl   'Brazil'   éphUl   'apple'
     khepinét   'cabinet'   otísyAn   'audition'
     kharamél   'caramel'   kháthon   'cotton'
     ticithál   'digital'   phesUthípal 'festival'
     chenÁl   'channel'   mécik   'magic'
     khUllarinét   'clarinet'
     khecháp   'ketchup'

Final long vowels are quite unusual in our corpus and may reflect a constraint of the language (*papekhyú:* 'barbecue' is an isolated example and has the alternant *pá:pékhyu*). The compensatory lengthening from loss of coda [r] is blocked word-finally: *apsó:pa* 'absorber', *kharénta* 'calendar'. But the constraint against final long vowels may itself be trumped by minimality: monosyllables seem to systematically lengthen: *sUphá:* 'spa', *sUkhí:* 'ski', sUthá: 'star'. If true, this lengthening would be an "emergence of the unmarked" phenomenon (McCarthy & Prince 1994) since words of the form CV are not uncommon in the native lexicon: *cí* 'rat', *pé* 'boat', *khó* 'nose'. More study of this point is required.

       When the penult is heavy and the final syllable is light, penultimate accent is regular.

(8)   orénci   'orange'   hellikhóptha   'hellicopter'
     théksi   'taxi'   kharénta   'calendar'
     thémpho   'tempo'   anaúnsA   'announcer'
     inphulluénca   'influenza'   apsó:pa   'absorber'

       We now turn to cases where final and penult have the same weight. The number of items in our corpus in which the final two syllables are heavy is limited. Both the final as well as the penultimate accent pattern are represented.

(9)   <u>final</u>   <u>penultimate</u>
     khakthéjl   'cocktail'   ollímphik   'Olympic'
     nepkhín   'napkin'   wasíNthon   'Washington'
     khAmpék   'comeback'   éksyAn   'action'
                              khonéksyAn   'connection'
                              sUkhéntal   'scandal'

When both the final and the penult are light CV, penultimate accent predominates. Some cases with final accent may be loanwords from French (10b). In opposition to these handful of LL# adaptations with final accent, we have some thirty cases with penultimate accent (10a).

(10)   a.   aphUríkha   'Africa'   b.   pallé   'ballet'
            ameríkha   'America'   pananá   'banana'
            khelliphonía   'California'   khamerá   'camera'
            sikháko   'Chicago'   opherá   'opera'
            kholloráto   'Colorado'   khometí   'comedy'
            phUlloríta   'Florida'   phianó   'piano'
            micupísi   'Mitsubishi'   saikhó   'psycho'
            aksesári   'accessory'
            sinéma   'cinema'
            khokhóa   'cocoa'
            khúkhi   'cookie'

hwemíri	'family'
héphi	'happy'
hisUthéri	'hystery'
airóni	'irony'
masUkhára	'mascara'
míni	'mini'
misUthéri	'mystery'
phophúri	'potpourri'
phothétho	'potato'
sophUráno	'soprano'
sUphakéthi	'spaghetti'
thUróphi	'trophy'
thAksíto	'tuxedo'
enÁci	'energy'
purápo	'bravo'\

This imbalance in the accentuation of LL# cases argues that NK has the bimoraic parse of languages like Tahitian. This agrees with the default status accorded to the penultimate accent class in the native lexicon by Kim (1997).

To summarize, when an adapted word does not fall under the doubled accent for lack of an initial heavy syllable, it is assigned a bimoraic foot at its right edge. The rule or constraint ranking introducing this accent is independently motivated in NK grammar by accentual alternations that arise when a polysyllabic suffix is added to a noun stem with final accent. In addition, as observed earlier penultimate accentuation is invariably assigned to longer stems--stems of four or greater syllables--where accent ceases to play a distinctive role. Although it may be nondistinctive here, for reasons of culminativity every lexical item is required to bear an accent. The default accentuation thus emerges in such longer words which step out from under the control of a distinctive lexical accent.

It is well known that "Tip of the tongue" and other psycholinguistic phenomena suggest that accent plays a role in lexical storage and retrieval (Cutler 1989). If experiments can be designed to detect lexical accent, it would be exceedingly interesting to bring them to bear on the accentuation of such "long words" as well as the penultimate accent of shorter words like *káci* 'kind, sort' which contrast with *kací* 'eggplant' and *ká:cí* 'branch'. Kim (1997) derives the penultimate accents of both long and short words from inputs that lack an accent. But given that accent helps to distinguish short words (cf. *káci* 'sort, kind' vs. *kací* 'eggplant'), we would not be surprised if this accent is recorded in the lexicon.

3. Additional Complications

In this section we examine three factors that impinge on the basic accent principles that apply to NK adaptations: the behavior of liquids, the treatment of diphthongs, and epenthetic vowels.

3.1 Liquids

Korean has only one liquid phoneme realized as a lateral in the coda and as a rhotic elsewhere; this gives rise to regular alternations between [l] and [r]: *mál* 'horse', *már-i* nom. These phonotactic constraints are respected in adaptations (11).

(11)					
	rénthU	'rent'		rémphU	'lamp'
	airóni	'irony'		pélthU	'belt'
	pá:kén	'bargain'		ticithál	'Digital'
	ré:cÁ	'leisure'		céri	'jelly'

<div align="center">phaillóthU   'pilot'</div>

Initial [l] is systematically realized as [r]: cf. [rémphU] 'lamp' and [ré:cÁ] 'leisure'. The adaptations make one maneuver in order to remain faithful to the source language but still respect NK phonotactics: intervocalic [l] is often preserved by gemination: cf. *phaillóthU* 'pilot', *pUllaínthU* 'blind', *kUllÁpU* 'glove' vs. *céri* 'jelly', *pUraúsU* 'blouse', *kUrásU* 'glass'. It is interesting that the closed syllable resulting from liquid gemination does not contribute to weight. There are no cases in our corpus in which a word is assigned to the doubled accent class in virtue of the initial syllable being closed by a geminate [l]. All words of this structure have final (*khallÁm* 'column', *hallokén* 'halogen', *sillikhón* 'silicon', *allatín* 'Aladdin') or penultimate (*ollímphik*"Olympic', *kholloráto* 'Colorado) accent. On the other hand, coda [l] counts as heavy for the final accent class, as expected: *ticithál* 'digital', *isUraél* 'Israel', *pUracíl* 'Brazil', *phisUthól* 'pistol'. We thus have a case of opacity: the closed syllable arising from gemination of the intervocalic lateral does not count for weight. In rule ordering terms, the gemination process must apply after weight determination--the heavy syllable rule.

      When the English source word has a rhotic in a closed syllable, it is realized as lengthening of the preceding vowel. This length normally counts for weight in the assignment of the doubled accent: *pá:kén* 'bargain', *khá:tÚ* 'card', *ká:tÚn* 'garden', *há:móni* 'harmony', *má:kárin* 'margarine' vs.*pÁ:ti* 'birdie' (golf). A few items have doublets: 'mark' belongs to either the doubled (*má:khÚ*) or the penultimate (*má:khU*) class; in 'carpet' when the /r/ is realized as length the accent is doubled (*khá:pét*), if not then as penultimate *khaphéthU* 'carpet'. Finally, there are a few cases in which preconsonantal [r] is preserved by epenthesis: *arUpaíthU* 'arbeit', *rarÚko* 'largo, *perUsaíyU* 'Versailles', *korUpachóphU* 'Gorbachev'. Given the nonEnglish source of these words, it is possible that the rhotic was more phonetically salient and hence spared deletion.

      In NK a long vowel only occurs under accent; in cases where coda [r] deletes but accent falls elsewhere, the syllable is realized with a short vowel. Thus, in *khalliphonía* 'California' there is no lengthening by /r/ since it appears in neither the initial syllable nor inside the disyllabic window at the right edge of the word; cf. the length in *sUkhá:phU* 'scarf' and *sUkhÁ:thU* 'skirt' where penultimate accent may reach the syllable with an underlying /r/.

3.2 Diphthongs

Korean lacks falling sonority diphthongs with an off-glide (except for [Uj]). In general, English diphthongs of this structure are realized as two separate syllabic nuclei. The normal accent assignment then takes place. We illustrate first with [ai], [au], and [oi] diphthongs.

(12)	a.i.ró.ni	'irony'	ma.í.khU	'mike'
	ma.i.ná.sU	'minus'	ma.ú.sU	'mouse'
	ra.i.ón	'lion'	o.íl	'oil'

An exception is the diphthong [ej]. In many cases this is realized as a diphthong in our data (in which case it counts as a long vowel for the doubled accent pattern); in other cases it is treated heterosyllabically.

(13)	péj.pí	'baby'	théj.pÚl	'table'	che.ín.ci	'change'
	khéj.pÚl/	'cable'	phéj.phÁ	'paper'	te.í.thU	'date'
	khe.í.pUl					

3.3 Epenthetic Vowel

Next, we turn to the epenthetic vowel. It is well known that epenthetic vowels often shun accent (Broselow 1982) but may count for defining a disyllabic window (Alderete 1995, Shinohara 1997a,b). Let us survey the NK adaptation data with this phenomenon in mind. First, the maximal syllable template in Korean is CVC--the language scrupulously avoids complex onsets or codas. Initial and final clusters are broken with epenthetic vowels. Furthermore, there are rigid restrictions on codas: in the adaptation process these coda conditions may force a preconsonantal or word-final consonant that would otherwise enter the coda to be placed in the onset by epenthesis where it can be pronounced. For example, coda consonants are unreleased and exclude a [+continuant]. Thus, underlying /s/ is realized as a stop [t]: cf /nas/: *nát* 'sickle', but *nás-Úl* acc. In order to preserve the [+continuant] of the source word, foreign words ending in [s] are systematically adapted with an epenthetic vowel: *cú:sÚ* 'juice', *kUrásU* 'glass', *pósU* 'boss.

An epenthetic vowel occupying the initial syllable never takes the accent. But in order to know whether it is actively avoided by the accent we need to make it the target of penultimate accent. (It can't be the target of the doubled accent since it is not long.) But to make this test, the final syllable must be light. Unfortunately, due to the minimality phenomenon, words such as 'ski', 'spa', and 'star' have a final long vowel that takes the accent: *sUkhí:*, *sUphá:*, *sUthá:*. Thus, we cannot tell if initial syllable epenthetic vowels avoid the accent on purpose. In any case they do count for determination of the doubled accent in the sense that a long vowel that would otherwise willingly enter the doubled class cannot do so when it is displaced from the left edge of the word by epenthesis: cf. *kUrí:sU* 'Greece' vs. *ré:cÁ* 'leisure'.

A final epenthetic vowel never takes the accent; but it may serve as the second member of the doubled accent when the first syllable is long (14a); a medial epenthetic vowel behaves the same way (14b).

(14)　a.　cú:sÚ　　'juice'　　　　b.　sÁNkÚrasU　'sunglasses'
　　　　　kó:lthÚ　'gold'　　　　　　ó:sÚthUria　'Austria'
　　　　　khá:tÚ　'card'
　　　　　wÁ:ltÚ　'world'

Consequently, if the doubled accent is the product of a rule or constraint spreading high tone from an initial (long) syllable, then epenthesis must apply prior to this rule for two reasons: it displaces a long vowel from the left edge of the word (*kUrí:sU* 'Greece') and it supplies a vowel that may carry the spreading high tone (*cú:sÚ* 'juice').

Finally, there are cases of a medial cluster where the penultimate vowel is epenthetic. Here we find mixed behavior. In some cases the accent fails to land on the epenthetic vowel and targets the final vowel instead (15a); but in others the epenthetic vowel is accented (15b). We suspect that many of the latter are older loanwords which have been more fully integrated into the system; their vowel may no longer be treated as inserted and hence they naturally take penultimate accent.

(15)　a.　nigUró　'negro'　　　　b.　allekÚro　　'allegro'
　　　　　methUró　'metro'　　　　　kharisÚma　'charisma'
　　　　　　　　　　　　　　　　　　pakÚna　　　'Wagner'
　　　　　　　　　　　　　　　　　　kUrisÚto　　'Christ'

If more cases like (15a) can be identified then we would appear to have the phenomenon identified by Shinohara (1997a,b) for Japanese adaptations where an epenthetic vowel counts for defining the disyllabic window necessary for accent but itself repels the pitch peak. Further study of this point is clearly necessary.

An additional complication is presented by cases in which the foreign source terminates in an /st/ or /ft/ cluster (16). Here two vowels are inserted--one to realize the fricative in an onset and the other to realize the following stop. In this case the accent rejects both epenthetic vowels and shifts leftwards outside the disyllabic window in order to find an underlying vowel. This suggests that while epenthetic vowels count for determining the window in which accent is realized they are avoided as bearers of accent in favor of underlying vowels.

(16) thósUthU   'toast'   théksUthU   'text'
      phésUthU   'best'   kíphUthU   'gift'
      réphUthU   'left'   phÁsUthU   'first'

4. A Surprising Lexical Gap

So far we have looked at adaptations that operate in the transformation of the input to the output. Most of these replicate the rules or constraint rankings of the synchronic NK grammar. A few such as the systematic contribution of CVC syllables to weight (and possibly the lengthening of final vowels in monosyllables) arguably reflect emergent properties of Universal Grammar rather than aspects of NK grammar itself. One might wonder whether constraints on the native lexicon play any role in adaptation. This aspect of the adaptation process is not well attested in the literature. Korean presents a striking instance of the phenomenon which we now proceed to document.

Like the standard Seoul dialect, NK contrasts coronal stops and affricates for glottalization and aspiration. Coda consonants in Korean are unreleased (Kim 1970); this leads to neutralization of laryngeal distinctions as well as change of the continuant [s] to [t].

(17)   isolation form   accusative
     /nac/   nát   nác-Úl   'daylight'
     /nach/   nát   nách-Ul   'face'
     /nas/   nát   nás-Úl   'sickle'
     /muth/   mút   múth-Ul   'earth'

There is an interesting gap in the lexicon with respect to this neutralization: while verbal and adjectival stems ending in /-t/ abound (*mit-* 'believe, *tot-* 'rise', *kut-* 'harden'), there are no noun stems that terminate in /-t/ in their input form. Stated differently, we know of no Korean noun that ends in [t] in the isolation form and that remains unchanged (except for allophonic voicing) before a vowel-initial inflection such as the nominative *-i* or the dative *-e*. The difference between nouns vs. verbs and adjectives can be traced to the fact that a noun stem can stand in isolation without a case marker while a verb or adjective always requires an inflection--typically vowel initial. Thus, in its citation form the final consonant of a noun is subject to the closure requirement seen in (17); if it is a coronal obstruent, it will surface as an unreleased [t].

The absence of nonalternating [t]-final noun stems is unusual for two reasons: first, [t] is the unmarked coronal obstruent and hence should be selected before a marked one is. Second, in conditions of neutralization when the inflected form is not known or remembered, the surface form is normally taken at face value and becomes the basis for the underlying representation (Kiparsky 1968). One might conclude that the absence of noun stems ending in /t/ reflects an accident of the history of the language that is of no synchronic linguistic significance. If this is so, then we have every reason to expect that when nouns are adapted into Korean, stems terminating in [t] should readily fill this lexical gap. The surprise is that this is not what happens. Adapted forms respect this restriction on the lexicon too. Let us see some examples.

Faced with an English word ending in a stop, the Korean speaker has two options. The [±voice] opposition can be preserved and expressed as [±aspiration] by placing the stop in the onset of an epenthetic syllable. Alternatively, the gross syllabic structure can be maintained at the cost of neutralizing the voicing distinction.

(18)   <u>isolation form</u>   <u>nominative</u>
        khe.í.khU   khe.í.khU-ka, *khe.í.kU-ka   'cake'
        khe.ík   khe.í.k-i, *khe.í.kh-i   'cake'
        tók   tó.k-i, *tó.kh-i   'dog'
        mÁ.kU   mÁ.kU-.ka, *mÁ.kh-i   'mug'

In adaptation the isolation form has a special status, serving as the base for the addition of inflectional affixes. This explains the illformedness of *khe.í.kU-.ka* and *khe.í.kh-i* where the laryngeal features of the inflected form are incompatibile with the isolation form. See Kenstowicz (1996) for other examples from Korean in which the bare form has a special status. Consider now the data in (19).

(19)   <u>isolation form</u>   <u>nominative</u>
        khéthU, khét   khéthU-ka, khés-i   'cat'
        thikhéthU, thikhét   thikhéthU-ka, thikhés-i   'ticket'
        phUllóthU, phUllót   phUllóthU-ka, phUllós-i   'plot'
        sínpátU, sínpát   sínpátU-ka, sinpás-i   'Sinbad'

For our purposes here, the important point is that when the bare form ends in a consonant *-t* the corresponding inflected form must end in [s]: *khét*, *khét-i*, *khét-e* is rejected as a possible noun inflection. The peculiar but systematic change of [t] to [s] that we see in the adaptation of foreign words ending in [t] and [d] in (19) now makes sense if the gap in the native lexicon noted above (no noun stems ending in /t/) is also imposed on adapted forms. Given that /t/ is barred from the input, the closest related sound is substituted: evidently, /s/ is chosen over the affricate /c/ or aspirated /th/ on grounds of markedness.

5. Summary

In this paper we have examined adaptations that foreign words (principally of English origin) experience when they are integrated into the lexicon of North Kyungsang Korean. Our discussion concentrated on changes in accentuation. Two major patterns were distinguished: adaptations in which the initial syllable of the output is heavy (long vowel or closed syllable) are assigned the doubled accent pattern in which the first two syllables carry a pitch peak. The long vowel cases conform to a systematic generalization of NK grammar while the extension to closed syllables is an emergent property that may reflect the UG default status of closed syllables as heavy. Remaining words are assigned a bimoraic trochaic foot at their right edge. Here as well closed syllables count as heavy (in contrast to NK grammar). As in Japanese, the bimoraic foot at the right edge of the word is the default accent assigned in NK grammar when the word lacks a lexical accent. This occurs in stems of four or greater syllables and in final accent stems that lose their accent in inflection. The discussion then shifted to several factors that impinge on the accent of adapted words: the treatment of liquids, diphthongs, and epenthetic vowels. The paper concluded with the documentation of a constraint on the inventory of noun stems in the synchronic grammar that is imposed in the adaptation process. Thus, the changes revealed in the adaptation process are primarily the product of the rules and constraints that determine the input-output transformation of the native grammar. But aspects of UG as well as constraints on the input may play a role. Finally, a word of caution. Our results here are very preliminary: the study is based on a corpus of just 600 items. Further data

collection is needed to corroborate our findings and to tie up various loose ends. We hope this study will encourage other phonologists to take up the study of adaptations as they provide a potentially rich source of evidence on the language specific and universal grammatical determinants of phonological form.

Footnotes

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[1]The second author of this paper assigns 'guitar' and 'token' to the doubled class: *khí:thá*, *thó:khÁn*.

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