

Linguistic Input to Loanword Phonology

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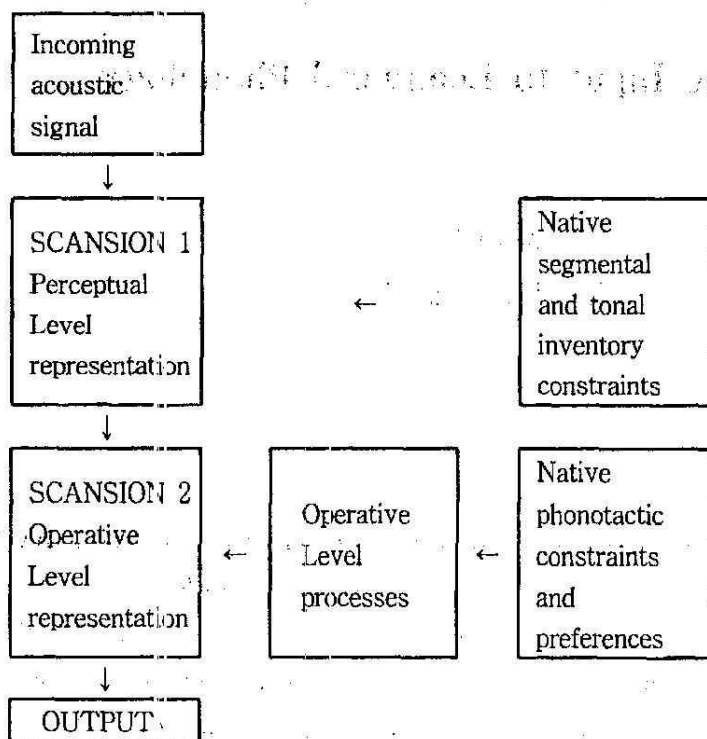
1. Introduction

This article is concerned with the loanword input to the phonology of the borrowing language (L1), focusing on the adaptation of English loanwords into Korean. Silverman (1992) contends that the input to loanword phonology is merely a superficial nonlinguistic acoustic signal lacking all phonological representation. In contrast, Paradis et al. (1995) argue that borrowers access L2 phonological structure in loanword adaptation. I argue in this article that the input to loanword phonology contains the phonological structure of the source language and that the linguistic input affects loanword phonology in light of Korean loanword phonology.

2. Silverman's Loanword Phonology Model

Silverman (1992) argues that loanword phonology is separate from native phonology and proposes two distinct levels, the Perceptual Level (also referred to as Scansion 1) and the Operative Level (Scansion 2).

(1) Silverman's model of loanword phonology (adopted from Paradis et al. 1995)



At the Perceptual Level, the native segment inventories constrain the representation of perceived segments, whereas it is only as the Operative Level of loanword phonology proceeds that perceived segments may undergo true phonological operations, triggered by native phonotactic constraints. This two-scansion model of loanword adaptation rests crucially on the assumption that "loanwords do not come equipped with their own phonological representation" (p. 289).

3. Linguistic Input to Loanword phonology

3.1. Input sensitive to the phonological representation

Silverman (1992:307) assumes that "at the Perceptual Level, the acoustic signal is parsed into segment-sized chunks, whose representation is constrained by the segment

inventory of the host language and by the Perceptual Uniformity Hypothesis, which states that input perceived as acoustically identical is uniformly provided with identical matrices, regardless of string position." There is, however, evidence from Korean loanword phonology to suggest that the input perceived as acoustically same may be adopted with different matrices. For example, the alveolar stops in (2) are perceived as [D] acoustically, but they are adopted as /t^h/ and /t/ depending on the underlying segment in the source language, e.g., English.

- | | | | |
|-----|---------------|------------------------|---------------------|
| (2) | English | Korean | |
| | a. [layD θ r] | [rai.t ^h a] | *[rai.ra] 'lighter' |
| | b. [reyC θ r] | [re.i.da] | *[re.i.ra] 'radar' |

/d/ in English is adopted as /t/ in (2b), which surfaces as [d] after intervocalic voicing since there is no /d/ underlyingly in Korean. On the other hand, there is a case where speakers have their native sound essentially identical to the foreign sound, and yet they make an entirely different substitution. For example, all voiceless stops are aspirated but unaspirated after [s] in English (Kahn 1976). According to Kim (1973), voiceless fortis stops in Korean are closer to the English unaspirated voiceless ones. That is to say, based on Korean aural perception of English segments, stops after tautosyllabic /s/ are perceived as voiceless fortis stops /p',t',k'/ rather than voiceless aspirated stops /p^h, t^h, k^h/. However, as shown in (3), voiceless aspirated stops as opposed to fortis ones are substituted for English stops regardless of their position within the syllable.

- | | | | |
|-----|----------------------|-------------------------------------|---------|
| (3) | English | Korean | |
| | [spay] | [sip ^h ai] | 'spy' |
| | [stayl] | [sit ^h ail] | 'style' |
| | [skiy] | [sik ^h i] | 'ski' |
| | [p ^h ay] | [p ^h ai] | 'pie' |
| | [k ^h eyk] | [k ^h eik ^h i] | 'cake' |

Both cases cannot be explained by Silverman's claim that the input to loanword

phonology is just a nonlinguistic acoustic signal without phonological representation. They rather suggest that the perceptual operation proceeds on the lexical representation as opposed to postlexical representation of L1.

Further evidence against the Perceptual Uniformity Hypothesis is available from the palatal sound adaptation in Korean loanword phonology. Alveopalatal sounds in syllable-final position in L2 are all perceived as alveopalatal. However, Korean only allows [m,n,ŋ,p,t,k,l] in coda. Then the unacceptable syllable structure would be fixed via epenthesis at the Operative Level under Silverman's two-scansion model as shown in (4):

- (4) Perceptual Level Operative Level
 'bench' → [benc^h] → [benc^hi]

That is to say, [c^h] does not surface as coda but it can do as onset. Then the syllable-final alveopalatal sound perceived as Korean alveopalatal is later subject to Korean phonotactic constraint that disallows alveopalatal in coda. Then it is rescued by epenthesis [i].¹

Silverman's position predicts that once some sounds are perceived as the same, they will behave phonologically in the same way at the Operative Level, since host language speakers are expected to have no access to the phonological representation of incoming loanwords. Then it implies that [i] will be epenthesis after all segments perceived as alveopalatal. However, the epenthesis vowel is realized in three different forms: [i], [ɪ], and [u] as shown in (5).

- | | | | |
|--------------|------------------------------------|-----------|--------------------------------------|
| (5) a. bench | [penc ^h i] | b. shirts | [sac ^h ɪ] |
| coach | [k ^h oc ^h i] | boots | [puc ^h ɪ] |
| page | [p ^h eiji] | sports | [sip ^h oc ^h ɪ] |
| massage | [mas'aji] | | |

¹ Sohn (1987) claims that the vowel /ɪ/ is a totally unspecified vowel in Korean. Thus, it is epenthesis to adjust the illicit consonant sequences in loanword phonology. However, it undergoes another process which turns /ɪ/ into /i/ after palatal consonants (Oh 1992).

c. tree	[c ^h uri] ~ [t ^h iri]	*[c ^h iri]
country	[k ^h ə nc ^h uri] ~ [k ə nt ^h iri]	*[k ^h ə nc ^h iri]
shrimp	[ʃurimp ^h i]	*[ʃirimp ^h i]
Slazenger	[ʃullejinj ə]	*[ʃillejinj ə]
Einstein	[ainfut ^h ain]	*[ainʃit ^h ain]

([c^h] surfaces as [j] intervocalically.) Notice that epenthetic vowels surface differently depending on the position of the sound perceived as alveopalatal within the syllable in L2. Furthermore, if the segment is alveopalatal in L2, /i/ is epenthesized as in (5a). If it is alveolar in L2, /ɪ/ is instead epenthesized as in (5b).² These examples suggest that the identically perceived segment alone cannot determine the quality of the epenthetic vowel. Contrary to Silverman's contention, the phonological structure, e.g. the syllable structure, should also be made reference to. The sound perceived as alveopalatal attracts an additional epenthetic vowel, [u], when the alveopalatal sound originates from onset as opposed to coda in the source language (Oh 1992). Some might speculate that the labiality of the following segment, e.g. [r] in (5c), influences the quality of the epenthetic vowel. However, notice that 'Sri Lanka' is adopted as [sirirəŋka] although /s/ is followed by /r/ in the source language. Notice also that /u/ is epenthesized when /s/ is followed by /t/ as in the adaptation of 'Einstein'.

Another example from Korean loanword phonology also illustrates that the phonological structure of the source language should be referred to in loanword adaptation. English /θ/ sound in word-final position is invariantly adopted as [s'], while it is adopted as [t'], [s'], [s], or [t] elsewhere as shown in (6).

(6) English	Korean	
a. [θæŋk ^t yu]	[t'æŋk ^h yu] or [s'æŋk ^h yu]	'thank you'
[θril]	[siril]	'thrill'
b. [helθ]	[hels'i]	'health'
[nɔ:rθ]	[nos'i]	'North'

² English consonant clusters are normally salvaged through epenthesizing a vowel but the cluster, /ts/, is treated differently in that it is adopted as a single alveopalatal affricate.

I hereby claim that the input to loanword phonology contains the phonological structure of L2. In other words, place and syllable structures of the source language determine the quality of the epenthetic vowel, although the unsyllabifiable segment is perceived as the same. Silverman's Perceptual Uniformity Hypothesis cannot account for such dependency on prosodic structure of the source language in perception.

As in Cantonese loanword adoption (Silverman 1992:297), coda /r/ is normally not represented in Korean loanwords as shown in (7).

(7)	English	Korean loanword
	car	[k ^h a]
	mark	[mak ^h i]
	card	[k ^h adi]

Silverman (1992:297) and Yip (1993:265) account for such an adaptation by assuming that Cantonese forms are based upon British pronunciation and /r/ is not present in input in the first place. However, some English loanwords which obviously originate from American English like 'computer', 'elevator', 'watergate scandal' are adopted in Korean without coda /r/. Then it can be said that only coda /r/ in the source language cannot be perceived. That is, at the Perceptual Level, phonological information of the source language should be made reference to.

Lastly, the coda condition in loanword phonology is also sensitive to the phonological structure of the source language. The coda condition in Korean only licenses [+son] or [Place] feature (Oh 1994). In loanword phonology, off-glide from the source language is adopted as two separate syllables. For example, [t^hay] is adopted as [t^ha.i] 'tie' in Korean. Here stands for the syllable boundary. Sonorants and obstruents after an off-glide of the source language are perceived differently in loanword adaptation as in (8).

(8) a. time	[t ^h a.im]	b. type	[t ^h a.i.p ^h i]
sign	[s'a.in]	pipe	[p ^h a.i.p ^h i]
sale	[s'e.il]	cake	[k ^h e.i.k ^h i]
line	[la.in]	five	[p ^h a.i.bi]

c. cat	[k ^h æt]
cup	[k ^h əp]
book	[puk]

Sonorants are always licensed as coda when preceded by an off-glide in the source language, whereas obstruents are in general perceived as onset.

3.2. Input sensitive to the morphological representation

Silverman (1982: 292, 305) admits that Cantonese speakers can and do access a knowledge of English morphological structure, although he does not accept that borrowers access L2 phonological structure in loanword adaptation. His analysis of tone assignment to English compounds and bisyllabic words with the same stress pattern requires that they not only have a knowledge of English morphological structure, but that they exploit it in the process of adapting an English word to Cantonese, e.g., 'dockyard' vs. 'import'. Likewise, it is observed that the morphological structure of the source language can affect Korean loanword adaptation and interlanguage, since only plural morpheme /z/ may not be perceived as opposed to tautomorpheme: final /s/ as given in (9).

(9)	/c ^h ips/	[c ^h ip=]	'chips'
	/jiynz/	[cin]	'jeans'
	/gilovz/	[killobu]	'gloves'
	/stakiŋz/	[sit ^h ak ^h iŋ]	'stockings'
	/songlæsiz/	[songillasi]	'sunglasses'
Cf.	/ays/	[a.i.s'i]	*[a.i] 'ice'
	/bəðs/	[bəð.s'i]	*[bəð] 'bus'
	/seks/	[s'ek.s'i]	*[s'ek] 'sex'

In this paper I argue that the prosodic and morphological structure of the source language affects the perception of loanwords contrary to Silverman's contention that host language speakers have no access to the phonological representation of incoming loanwords.

4. A Reanalysis of Cantonese Loanword Phonology

I argued that the syllable structure of the source language can be referred to in loanword adaptation. Then, Silverman's (1992:317) liquid syllabification can be accounted for in a simpler way: In Cantonese loanword phonology, in monosyllabic English forms, the liquid in onset consonant-liquid-clusters is preserved and a vowel is epenthesized. Otherwise, the liquid is deleted in polysyllabic English forms.

- (10) a. break → [pik lik]
 cream → [key lim]
 fluke → [fu luk]
 b. broker → [puk k'a]
 freezer → [fi sa]

Thus, in both cases the output is bisyllabic. Silverman claims that these data suggest that the binary foot exerts an influence in Cantonese in that a segment which normally undergoes deletion in loanwords is preserved just in case the resulting form is bisyllabic, i.e. consists of one binary foot. That is, according to Silverman, syllable nodes are provided on scansion one, perceptual level, and it is counted as one, then epenthesis applies, but when it is polysyllabic on scansion one, liquid-deletion applies. Then, under Silverman's analysis, l-salvaged forms such as clutch → [kik lik tsi] and spring → [si pit liŋ] must be regarded as exceptional, as they retain [l] despite the fact that the output exceeds bisyllabicity (Silverman 1992:318). However, under the analysis presented here, they are no more exceptional: 'clutch' and 'spring' are monosyllabic in the source language. Therefore, the liquid is preserved and a vowel is epenthesized regardless of its resulting form. What matters here is the number of syllable in the source language. Thus, I contend that the liquid in onset consonant-l-clusters in English monosyllabic forms is perceived, whereas the liquid in polysyllabic English words is not.

Silverman (1992:324) himself also provides another example which goes against the binary foot hypothesis. English consonant clusters are treated differently depending on where they fall in the syllable:

(11) Onset cluster	Coda cluster
pleat → [p'i lit]	band → [pen]
fluke → [fu luk]	friend → [fen]
flea → [fu li]	lift → [lip]

The data in (11) show that plosive-sonorant and fricative-sonorant onset clusters undergo epenthesis, whereas sonorant-plosive, and sonorant-fricative coda clusters are simplified. Fricative-plosive coda clusters are also simplified.

Notice that obstruent-final coda clusters in monosyllabic inputs are deleted although their salvation through epenthesis would result in the preferred bisyllabic form. Silverman accounts for this fact in terms of phonetic theory: as native Cantonese phonotactics do not permit vowel-consonant-obstruent strings, the Cantonese speaker is ill-equipped to discern obstruents in this environment, and the segment is rendered unanalyzable. To illustrate, when the form 'band' is encountered, the postvocalic /n/ is represented without difficulty. However, the /d/ cannot be analyzed, as Cantonese speakers have no experience with formant transitions between nasals and obstruents. As no vocalic segment exists to the obstruent's right, Cantonese speakers have no opportunity to analyze its formant transitions. The /d/ is consequently unanalyzable, and thus is not incorporated into the Cantonese representation. However, it is not reasonable to account for this in terms of general phonetic theory. Onset clusters are still perceived and a vowel is epenthesized, although Cantonese does not allow onset clusters either. Korean syllable structure is also of (C)V(C), but coda clusters are salvaged through epenthesis: e.g., band → [bændi]. Therefore, it can be argued that the perception has nothing to do with general phonetic theory but it is rather dependent upon host language speaker's language particular sensitivity to the phonological structure of the source language.

5. Conclusion

This paper has been devoted to demonstrating that the borrowers have an access to the phonological as well as morphological structure of the source language mainly in

light of Korean loanword phonology. Contrary to Silverman's (1992:289) claim that the input to loanword phonology is merely a superficial nonlinguistic acoustic signal lacking all phonological representation of a source language, it is argued that the input to loanword phonology contains the phonological structure of the source language.

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