English Loanwords and Syllable Structures

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Cho, Hyeonkwan. 1998. English Loanwords and Syllable Structures. *Studies in Phonetics, Phonology, and Morphology* 4, 273-289. The purpose of this paper is to show that loanword phonology can differ from native phonology. I focus on syllable structures of English loans adopted in Korean and compare them with those of native words. English loans change some CVC and CGV- source forms to less marked forms like CVCV and CVGV- by vowel epenthesis. I note that CVC forms with a stop coda undergo epenthesis while CVC forms with a sonorant coda surface with no change. I argue that this is a case of the emergence of the unmarked in loanword phonology. In addition, the preference for vowel epenthesis to consonant deletion as a repair strategy is another case of the emergence of the unmarked. Thus, under a constraint-based theory, loanwords and native words have different constraint hierarchies. Further, I argue that loanwords themselves must be categorized into several groups which bear different constraint rankings. **(Korea University)**

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1. Introduction

I will show that, within the framework of Optimality Theory, English loanwords differ from native words. English loanwords can have less marked syllable structure than native words, so loanword phonology and native language have different constraint hierarchies. It has been argued by Yip (1993) that loanword phonology does not exist as a separate component of the grammar as the result of subjecting non-native inputs to the constraints that define well-formed native words. Although English loans adopted in Korean tend to abide by most constraints found in native Korean words, the exact constraint ranking for loans are not the same as the one for native words. I will show, against Yip's argument, that loanword phonology must be independent of native phonology to some extent. Interesting is that the unmarked syllable structures emerge in loanword phonology. What that means is that we may need an unmarked constraint ranking for loanwords separate from the ranking for native words.[1] Further, I note that a single constraint ranking is not able to account for most loanwords. I argue that independent loanword phonology itself must have internal categorization of lexical items into several groups.

The paper is organized as follows. In Section 2, I briefly review the constraint-based Optimality Theory. In Section 3, three patterns are discussed that show the cases of the emergence of the unmarked in English loanwords. First, I argue that loanwords bear the less marked syllable structure with CVC types. Second, onset consonant clusters that must be allowed in native language simplify to unmarked syllable types. Third, coda consonant clusters that are not possible in native language undergo simplification by vowel epenthesis. I argue that vowel epenthesis is the unmarked phonological phenomenon in loanword phonology in that the constraint ranking for vowel epenthesis is more frequent and general. In Section 4, I discuss the internal organization of the loanword phonology. Loanword phonology should have multiple constraint rankings rather than a single constraint ranking, so as to account for the wide variety of the English loanwords. Finally I give a conclusion in Section 5.

2. Optimality Theory

In the development of phonological theory, there has been a shift from process-based approaches to constraint-based approaches. In a purely process-based approaches the burden of explanation for phonological phenomena has been on phonological rules and underlying representations. However, the problem is that process-based theories are goal-oriented and thus phonological rules are arbitrary. Further, they

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[1] Traditionally, we have been saying that a certain ouput form is marked or unmarked in terms of some phonological criteria. Since an output is a result of a specific constraint ranking in OT, I view that a constraint ranking itself can be said marked or unmarked.

cannot capture significant regularities on output structures which derive from well-formedness constraints on output structures.

In Optimality Theory, as proposed by Prince and Smolensky (1993) and developed by McCarthy and Prince (1995), well-formedness constraints are universal. They claim that Universal Grammar consists of a set of universal constraints on representational well-formedness. Constraints are often conflicting and such conflicts are resolved by the ranking of these constraints. The satisfaction of higher ranked constraints forces the violation of lower ranked constraints. Languages differ primarily in how they resolve the conflicts of constraints. The general architecture of Optimality Theory is composed of Input, Output, the function Gen (generator), and the function H-Eval (harmony-evaluator). Gen generates a set of candidate outputs from an input, and then the candidates are assessed by H-eval. Among output candidates, the candidate that best-satisfies the constraint system is the optimal output. The optimal output which best-satisfies is the most harmonic candidate. H-eval is a function that selects an optimal candidate out of a set of output candidates. The function H-eval is illustrated in following constraint tableau.

(1) constraint tableau: A >> B, C

candidates	A	B	C
cand1	*!		
☞ cand2		*	*

Violation of a constraint is marked by '*' whereas satisfaction is indicated by a blank cell. The sign '!' stands for a fatal violation and any candidate with '!' cannot be optimal. The symbol '☞' draws attention to the optimal candidates. A single line stands for a crucial ranking and a dotted line for no ranking. Shading emphasizes the irrelevance of the constraint to the fate of the candidate. In the given tableau, cand1 has a fatal violation because it violates the higher ranked constraint A whereas cand2 violates the lower ranked constraints, B and C. H-eval selects cand2 as the optimal output since it is more harmonic. In evaluating candidates, the number of constraint violations is not crucial. Cand1 violates one highest ranked constraint A and cand2 violates two lower ranked constraints B and C. However, the optimal output is cand2 even though it violates more constraints. It is because constraint A has absolute priority over all the constraints lower in the hierarchy.

In sum, Optimality Theory is a purely constraint-based theory and constraints are rankable and violable. To select the optimal output, the function H-eval evaluates a set of candidates generated by the function Gen, based on constraint ranking.

3. The emergence of the unmarked

3.1. Constraints on coda

There are many languages, as Itô (1986) attests, which allow only sonorants but no stops, or allow stops in restricted ways in the coda position, as in Italian, Attic Greek, Diola Fogny, Japanese, and Axininca Campa. However, languages are rare which allow only stops to the exclusion of sonorants in the coda position. This implies that CVC patterns with sonorant codas are less marked or more harmonic than ones with stop codas.

(2) Harmonic Coda : sonorant C > stop C

I define the restrictions on coda as negative coda constraints, as follows.

(3) NoCoda: Any consonant in the coda position is not allowed.
NoCoda(stop): Stop consonants in the coda position are not allowed.
NoCoda(sonorant): Sonorant consonants in the coda position are not allowed.

Based on Paninian Theorem (Prince & Smolensky, 1993), we know that the more specific constraints like the second and the third ones are invariably ranked higher than the first one, which is general. Further, for the harmonic constraint ranking on the coda, NoCoda(stop) must be ranked higher than NoCoda(sonorant), as shown below.

(4) The unmarked (or harmonic) constraint ranking for CVC types
NoCoda(stop) >> NoCoda(sonorant) >> NoCoda

Now I show that this unmarked constraint ranking is observed in English loanwords. When English words with CVC patterns are adopted into Korean, though both stops and sonorants are totally permissible coda consonants in Korean phonology, vowel epenthesis can optionally occur when a word-final CVC ends with a stop, as in (5a) or when a word-medial stop consonant is followed by a another syllable CV-, as in (5d). No vowel epenthesis almost obligatorily takes place when a word-final CVC ends with a sonorant, as in (5b) or when a sonorant coda is followed by another syllable CV-, as in (5c). Of course, English loanwords show other cases of no vowel epenthesis which differ from the words in (5a) and (5d). They will be discussed in the last section of the paper.

(5) a k^{h}əti 'cut' hip^{h}ɨ 'hip' ʃok^{h}ɨ 'shock'
b p^{h}in 'pin', keym 'game' hol 'hall'
c. sənt^{h}æn 'suntan' c^{h}æmp^{h}ion 'champion' kolp^{h}ost^{h}ɨ 'goalpost'
d næp^{h}ɨk^{h}in 'napkin' sit^{h}ɨk^{h}om 'sitcom' cuk^{h}ɨpaksɨ' 'jukebox'

For these loanwords, NoCoda(stop) which disallows stops in the coda position is ranked higher. NoCoda(sonorant) and general NoCoda do not play a crucial role, so both must be ranked lower. In order to satisfy the higher ranked NoCoda(stop), vowel epenthesis occurs. In Optimality Theory, both segment deletion and segment insertion violate faithfulness constraints which must carry inputs to outputs with no change in phonological forms. With the faithfulness constraints, as defined in McCarthy and Prince (1995), Max(segment) disallows deleting segments whereas Dep(segment) disallows inserting segments.

(6) Faithfulness constraints

Max(segment): Every segment in the input should correspond to a segment in the output.

Dep(segment): Every segment in the output should correspond to a segment in the input.

As in the following constraint tableau (7), Max(segment) must be ranked over Dep(segment) since loanwords undergo vowel epenthesis rather than deletion of the coda consonants.

(7)

/kət/	NoCoda(stop)	Max(seg)	Dep(seg)	NoCoda(son)	NoCoda
k^{h}ət	*!				*
k^{h}ə		*!			
☞ k^{h}ət^{h}i			*		
/næpkin/					
næp.k^{h}in	*!			*	**
næ.k^{h}in		*!		*	*
næ.p^{h}in		*!		*	*
næ.p^{h}ɨ.k^{h}i.ni			**!		
☞ næ.p^{h}ɨ.k^{h}in			*	*	*

For the input /kət/, the first candidate which is true to the input form violates the higher ranked NoCoda(stop) and the second candidate which undergoes consonant deletion violates the other higher ranked Max(segment). Both candidates lose out to the final candidate which violates the lower ranked constraint Dep(segment). So the final candidate which undergoes vowel epenthesis is selected as the optimal output. In the same vein, in the case of the input /næpkin/, the first three candidates lose out to the optimal output, which is shown as the last candidate. It is worth noting that the fourth candidate cannot be optimal. Although open syllables generally are more unmarked than closed syllables, the fourth candidate [næp^{h}ik^{h}ini] is worse than the optimal output [næp^{h}ik^{h}in] which has the sonorant coda. This results from the crucial ranking between Dep(segment) and NoCoda(sonorant). The fourth candidate violates the higher ranked Dep(segment) in order to satisfy the lower ranked NoCoda(sonorant). Thus, it is worse than the last candidate which just tolerates the violation of the lower ranked NoCoda(sonorant). So, it is now evident why sonorant consonants in the coda position are allowed, as shown the following constraint tableau. Any attempt to remedy the violation of the constraint NoCoda(sonorant) will inevitably result in worse candidates whether it is by deletion or insertion. It is because of the violation of Max(segment) or Dep(segment), which are ranked higher than NoCoda(sonorant). Thus, the optimal outputs are the ones true to the input forms, [pʰin] and [sənʰtæn]

(8)

/pin/	NoCoda(stop)	Max(seg)	Dep(seg)	NoCoda(son)	NoCoda
☞ pʰin				*	*
pʰi		*!			
pʰini			*!		
/səntæn/					
☞ sən.tʰæn				**	*
sə.tʰæn		*!		*	*
sə.næn		*!		*	*
sə.ni.tʰæ.ni			*!*		
sə.ni.tʰæn			*!	*	*

So far, I have shown that English loanwords can bear the less marked CVC type and this unmarkedness can be captured by the unmarked ranking of the NoCoda(stop), NoCoda(sonorant), and NoCoda and their interactions with faithfulness constraints like Max and Dep.

However, we may not apply the unmarked constraint ranking to native Korean. As I have mentioned earlier, native Korean allows both stops and sonorants in the coda position, as follows.

(9) native Korean

hyək.t'æ 'belt' mut.k'i 'asking' hap.k'yək 'pass'

In order for stop consonants to be allowed in the coda position, native language needs reranking of the constraints. Faithfulness constrains like Max(segment) and Dep(segment) promote to the position in which they outrank NoCoda(stop). So, the violation of NoCoda(stop) is tolerated because either deletion or insertion would result in the fatal violation of the higher ranked Faithfulness constraints.

(10)

/hyəktæ/	Max(seg)	Dep(seg)	NoCoda(stop)	NoCoda(son)	NoCoda
☞ hyək.t'æ			*		*
hyə.t'æ	*!				
hyə.kɨ.t'æ		*!			

This comparison of loanwords with native words makes it evident that the loanword phonology can be independent of native Korean since they must bear different constraint rankings. The independent status of loanword phonology is supported in the following two more cases of the emergence of the unmarked in loanwords.

3.2. Onset cluster simplification

The maximal syllable structure of Korean is CGVC. Consonant clusters are allowed as onset clusters in a restricted way. The second member of the onset clusters should be glides like /w/ or /y/, as follows

(11) t^hwinta 'bounce' myənto 'shave'
kwemul 'monster' kyosa 'teacher'
swekoraŋ 'handcuffs' pyəl 'star'

If we assume that loanword phonology is just the same as native phonology, we would expect that loanwords must always allow CG-types as onset clusters. However, in loanowords, it is not the case that all CG- clusters are realized as onset clusters. When the source words include onset clusters that have a glide as a second member of the consonant, vowel epenthesis takes place to break up the CG- clusters, as shown the following examples. Although some loanwords allow CG-clusters, they are rare: [swet^{h}ə] or [sɨwet^{h}ə] 'sweater'. Most CG-clusters undergo vowel epenthesis when the glide is /w/.[2]

(12) t^{h}ɨwin 'twin' sɨwan 'swan' net^{h}ɨwək 'network'

Since a syllable with a single consonant as an onset is more unmarked that the one with onset clusters, the change of the CGV-type to the CVGV- type must be understood as another case of the emergence of the unmarked in loanword phonology. Thus, in loanword phonology favoring simplex onsets, complex onsets undergo vowel epenthesis. In other words, the constraint NoComplex that disallows Cw- clusters is ranked higher than faithfulness constraints whereas the ranking is reversed in native language. I view NoComplex as a family of constraints that has its members, just as the above NoCoda does.

(13) NoComplex: Any consonant clusters are not allowed in the onset/coda.
NoComplex(CG-): The CG- clusters are not allowed in the onset.
NoComplex(Cw-): The Cw- clusters are not allowed in the onset.
NoComplex(Cy-): The Cy- clusters are not allowed in the onset.

The following constraint tableau shows how the unmarked syllable structure is selected as the optimal output.

(14)

/twin/	NoComplex(Cw-)	Max(seg)	Dep(seg)	NoComplex
t^{h}win	*!			*
t^{h}in		*!		
win		*!		
☞ t^{h}ɨ.win			*	

[2] However, we notice that there are also many words which do not undergo vowel epenthesis: [k^{h}win] 'queen', [k^{h}west] 'quest', etc. As Young-mee Yu Cho pointed out to me, vowel epenthesis may occur only when the place of the first consonant is alveolar. Thus, we may need a further detailed analysis to capture this fact

The first candidate true to the input violates the higher ranked NoComplex(Cw-). The second and third candidates resolve the violation of NoComplex(Cw-) by violating another higher ranked Max(segment). The final candidate is the optimal output since it resolves the violation of the NoComplex(Cw-) by violating the lower ranked Dep(segment).

For the asymmetrical behabior of CG- clusters, I suggest the following constraint ranking. It accounts for why vowel epenthesis does not apply when the glide is /y/: [t^hyun] 'tune', [myucik] 'music', etc.

(15) NoComplex(Cw-), Max(seg) >> Dep(seg) >> NoComplex(Cy-) >> NoComplex

This ranking means that the violation of the lower ranked NoComplex(Cy-) can be tolerated since any attempt to repair the violation will result in the worse violation of the higher ranked faithfulness constraints.

3.3. Coda cluster simplification

Korean stem-final consonant clusters are fully realized when they are followed by vowel-initial suffixes. If they stand alone or they are followed by consonant-initial suffixes, one member of the clusters must be deleted, as shown in the following examples.

(16)	/palp + a/	[pal.pa]	'tread on'
	/palp + ta/	[pal.t'a] / [pap.t'a]	
	/salm + i/	[sal.mi]	'life'
	/salm/	[sam]	
	/salm + to/	[sam.to]	
	/kaps + i/	[kap.si]	'price'
	/kaps/	[kap]	
	/kaps + to/	[kapt'o]	

/saks + i/ [sak.si] 'wage'
/saks/ [sak]
/saks + to/ [sak.t'o]

However, when source words contain the same kind of clusters, vowel epenthesis takes place to repair the impermissible complex codas, as shown in (17). Thus, native Korean words and English loanwords employ different ways of resolution in simplifying consonant clusters in the coda position.

(17) hel.pʰɨ *hel / *hep 'help'
filim *fil / *fim 'film'
kʰap.sɨ *kʰap / *kʰas 'cops'
paksɨ *pak / *pas 'box'

In loanword phonology, Dep(segment) preventing insertion is outranked by Max(segment) preventing deletion. Thus, vowel epenthesis, rather than consonant deletion, applies to repair complex codas in loanwords. In contrast, in native language, the constraint ranking is reversed, so consonant deletion occurs to repair complex codas. The following two constraint tableaux show the interaction of the different constraint rankings of native words and loanwords.

(18)

/palpʰ/	NoComplex	Dep(seg)	Max(seg)	NoCoda
palp	*!			*
pal.pʰɨ		*!		*
☞ pal/pap			*	*

(19)

/help/	NoComplex	Max(seg)	Dep(seg)	NoCoda
help	*!			*
☞ hel.pʰɨ			*	*
hel/hep		*!		*

The constraint ranking in (19) is consistent with the analysis that I have given in Section 3.1 and Section 3.2 in accounting for the emergence of the unmarked in loanwords. In the previous sections, I have argued that loanwords show more unmarked syllable structures than the native words. However, in the cases of consonant simplification in the coda position, both loanwords and native words produce the unmarked syllable structure by vowel insertion or consonant deletion. When we compare both optimal outputs, as in (20), we cannot know which output is more unmarked than the other.

(20)

	NoComplex	Dep(seg) / Max(seg)	NoCoda
☞ hel.p^hɨ		*	*
☞ pal / pap		*	*

According to Oller (1974) who compares the process of consonant simplification used in first language acquisition and second language acquisition, vowel epenthesis is a characteristic strategy of second language acquisition, for instance, [təri] 'tree'. However, young children learning their native language usually simplify consonant clusters by deleting difficult sounds, for instance, [bu] 'blue'. What that means is that vowel insertion is more unmarked strategy in second language acquisition while consonant deletion is more unmarked strategy in first language acquisition. Thus, their relative unmarkedness can be accounted for by the different constraint rankings of faithfulness constraints, as follows.

(21) a. First language acquisition
harmonic/unmarked strategy: deletion > epenthesis
unmarked constraint ranking: Dep(segment) >> Max(segment)
b. Second language acquisition
harmonic/unmarked strategy: epenthesis > deletion
unmarked constraint ranking: Max(segment) >> Dep(segment)

If we assume that adopting loanwords is similar to learning English as second language, the preference for vowel epenthesis to consonant deletion for cluster simplification is the unmarked phenomenon. On this ground, I argue that cluster simplification by epenthesis in loanwords shows another case of the emergence of the unmarked.

4. Internal categorization of loanwords

Itô and Mester (1995) argue that the lexicon of a grammar has internal stratification that categorizes the total set of lexical items into distinct subsets such as native vocabulary, assimilated loans, foreign vocabulary and unassimilated foreign vocabulary. The subsets have their own constraint rankings that differ from each other. They, of course, share similarity in constraint ranking. Previous Optimality Theoretic analyses given by Lee (1995) and Kang (1996) on loanword phonology are similar to this perspective in that they propose a single constraint ranking for loanwords, which differs from the constraint ranking for native words. However, I note that even loanwords do not show a single pattern and also each individual native speaker does not seem to stick with one specific pattern in pronouncing loanwords. Loanword phonology should have multiple constraint rankings rather than a single constraint ranking so as to account for the wide variety of the English loanwords. To exemplify multiple constraint rankings, let us return to data mentioned in the beginning of the paper. Word-medial stop consonant in the coda position can be pronounced by native speakers, for instance, [næp^{h}ik^{h}in] 'napkin' is optionally pronounced as [næpk^{h}in] with no change. Further, younger generations who have more knowledge of English tend to even produce word-final coda consonants, for instance, [k^{h}ət^{h}i] 'cut' can be pronounced as [k^{h}ət]. Now, those optional pronunciations may be categorized in three groups, as follows.[3)]

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[3] For the sake of simplicity, I do not illustrate another possible group which includes both [næp^{h}ik^{h}in] and [k^{h}ət^h]. To account for this group, we may introduce an Alignment constraint that aligns the right edge of a stem with the right edge of a syllable. This constraint must be ranked higher than other constraints.

(22) Categorization of loanwords

Group I	Group II	Group III
[næp^{h}ɨk^{h}in]	[næpk^{h}in]	[næpk^{h}in]
[k^{h}ət^{h}ɨ]	[k^{h}ət^{h}ɨ]	[k^{h}ət]
:	:	:

Loanword phonology requires three different constraint rankings to account for these three groups of loanwords.[4] A single constraint ranking accounts for one of the groups but not the other groups. For the sake of simplicity, I do not include the NoCoda(sonorant) and NoCoda. We already know the constraint ranking for Group I. Both NoCoda(stop) and Max(segment) are ranked higher than the Dep (segment). The constraint ranking for Group III puts the NoCoda(stop) in the lowest ranking since the optimal output tolerates the violation of NoCoda(stop).

However, Group II cannot be accounted for by any reranking of NoCoda(stop), Max(segment), and Dep(segment). I employ the constraint Contiguity.

(23) Contiguity: The segments in inputs must be contiguous in outputs.

Contiguity must be lower ranked for Group I since the contiguity between /p/ and /k/ is broken in [næp^{h}ɨk^{h}in] due to vowel epenthesis. For Group II, Contiguity must be ranked higher since [næpk^{h}in] maintains the contiguous segment string. Of course, the word-final epenthetic vowel in [k^{h}ət^{h}ɨ] does break up the contiguous segment string. For Group III, the ranking of Contiguity is not clear since the faithfulness constraints are already ranked higher than NoCoda(stop) and thus epenthesis is not available. I tentatively place it higher. The following contraint tableaux show such constraint rankings that account

[4] There might be a different way of looking at such categorization. A distinction between loanword pronunciation and foreign word pronunciation might be the criterion to separate those groups, rather than as pure variation of loanword pronunciation. If that is the case, we would have to adopt the perspective of Itô & Mester (1995).

for the variability of loanword pronunciation. We can see that the loanwords in Group I are less faithful to the source words than the loanwords in Group II which is also less faithful than the loanwords in Group III.

(24) Group I

		NoCoda(stop)	Max(seg)	Dep(seg)	Contiguity
	kʰət	*!			
	kʰə		*!		
☞	kʰə.tʰɨ			*	
	næp.kʰin	*!			
	næ.kʰin		*!		*
☞	næ.pʰɨ.kʰin			*	*

(25) Group II

		Contiguity	Max(seg)	NoCoda(stop)	Dep(seg)
	kʰət			*!	
	kʰə		*!		
☞	kʰə.tʰɨ				*
☞	næp.kʰin			*	
	næ.kʰin	*!	*!		
	næ.pʰɨ.kʰin	*!			*

(26) Group III

		Contiguity	Max(seg)	Dep(seg)	NoCoda(stop)
☞	kʰət				*
	kʰə		*!		
	kʰə.tʰɨ			*!	
☞	næp.kʰin				*
	næ.kʰin	*!		*!	
	næ.pʰɨ.kʰin	*!		*!	

5. Conclusion

So far, I have shown that unmarked constraint ranking emerges in adopting source words into native language though neither native language nor source language shows such ranking. I have argued that Korean loanword phonology is independent of native phonology since loanword phonology can have a separate constraint ranking by reranking the constraint ranking for the native phonology. Further, I have shown that we need to divide loanwords into multiple groups. Then the lexical categorization on a group basis is defined by different constraint rankings. Each group must have its own constraint ranking.

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