

Adaptation of English postvocalic word-final stops to Korean loanwords

[Introduction] English voiced and voiceless stops are adapted into Korean as plain and aspirated stops, respectively [1]. When English postvocalic word-final stops are adapted to Korean, an epenthetic vowel is inserted after the stop for some words [2], but not for others [3]. Here, epenthesis is motivated neither by a constraint against complex syllable margins as in [4] nor by one against sonority rise across syllable boundary as in [5]. Is there any systematic pattern to this seemingly random phenomenon? If so, what explains the pattern?

[Proposal] In this paper, I provide a statistical survey of vowel epenthesis pattern after postvocalic word-final stops. Based on the findings, I propose an OT account whereby the variability of epenthesis is derived from the variable ranking (in the sense of [A]) of three constraints, IDENT (RELEASE)—“preserve the release pattern of input”—IDENT (VOICE)—“preserve the voicing feature of input”—and UniformExponence_{NOUN}—“minimize the differences in the realization of a noun” (UE henceforth). Especially, I demonstrate that to capture the complexity of the data, fairly sophisticated phonetic knowledge of both the source language and the borrowing language is necessary, such as relative frequency of word-final stop release in English and intervocalic plain stop voicing rule in Korean. This is contrary to [B]’s claim that in loanword adaptation, information regarding phonetic variations is unimportant.

[Data and analysis] Adapted forms of 449 English words that end in a vowel plus a single stop are gathered from [C]. I found three factors that have statistically significant effects on the rate of epenthesis. Epenthesis is (a) more likely when the prefinal vowel is tense (90 %) than when it is lax (28 %), (b) more likely when the final stop is voiced (88 %) than voiceless (40 %) and (c) most likely when the final stop is coronal (71%), less likely when it is dorsal (35 %) and least likely when it is labial (23 %) [6].

(a) Tenseness : In Korean, a nonprevocalic consonant is absolutely unreleased. Adopting [D]’s suggestion, I propose that an epenthetic vowel is inserted to mimic the phonetic characteristics of a word-final released stop in English. Ranking of IDENT (REL) » DEP (V) will produce final epenthesis for an input with a released stop [7a] but no epenthesis for an input with an unreleased stop [7b]. [E] found a higher rate of release in English word-final stops when they are preceded by a tense vowel (83%) than by a lax vowel (25%). They define a tense vowel as one that can occur word-finally in English and these are exactly the vowels that show an epenthesis rate higher than 80% in my data [8] (with a sole exception of /aw/, where all 6 nonepenthesized words contain the morpheme ‘out’). Thus, my hypothesis that epenthesis applies to preserve a stop release in the English input to Korean output, correctly predicts more epenthesis after a tense vowel than after a lax vowel. **(b) Voicing** : [F] and [G]’s data show, however, that the higher rate of epenthesis after a voiced stop as opposed to after a voiceless stop cannot be explained by the rate of stop release in English, contrary to [D]’s claim. Rather, I propose that epenthesis is more frequent after voiced stops because epenthesis puts the Korean plain stops which are correspondents of English voiced stops, in an intervocalic position and these plain stops are realized as phonetically voiced due to a phonetic rule of intervocalic plain stop voicing in Korean (See candidate b. in [9]). A variable ranking of IDENT (VOI) and IDENT (REL) captures the relative frequency of epenthesis with respect to stop voicing. When IDENT (REL) » IDENT (VOI), epenthesis does not apply to an unreleased stop even though an epenthesis after a voiced stop will better satisfy IDENT (VOI) [9a]. This explains why epenthesis still does not apply to some 12% of words ending in a voiced stop. When the ranking is reversed, epenthesis applies after a voiced stop even when it is unreleased because it better satisfies IDENT (VOI) [9b], thus increasing the relative rate of epenthesis after voiced stops. **(c) Place** : I propose that the higher rate of epenthesis for coronal stops is due to a constraint requiring the uniform exponence of a nominal morpheme across paradigm, UE_N ([H]). In Korean, there is a peculiar “anticorrespondence constraint” (in the sense of [I]), $t \rightarrow s / _]_{\text{noun}} + V_{\text{suffix}}$. (T→S, henceforth), which requires a noun-final [t] in isolation form to change to [s] when it is followed by a vowel-initial suffix. This constraint crucially overrides UE_N [10]. When an English t/d-final word gets no epenthesis, the isolation form of the word is t-final and is subject to T→S constraint inevitably violating UE (See candidate b. in [11]). On the other hand, if a t/d-final word gets epenthesis, the isolation form is not t-final anymore (See candidate c. in [11]) and T→S and UE are both satisfied. Again, a variable ranking between UE and IDENT (REL) captures the pattern. When IDENT (REL) » UE, epenthesis does not apply after an unreleased stop, even if it is coronal, at the cost of UE violation [11]. This is why some 29% of words ending in a coronal stop still gets no epenthesis. When UE » IDENT (REL), on the other hand, epenthesis applies even to an unreleased coronal stop to keep the morpheme realization uniform across the paradigm [12], thus increasing the rate of epenthesis after voiced stops. The slight but statistically significant difference in epenthesis rate between dorsal and labial stops may be attributed to the higher rate of release for dorsal stops in English ([F], [G]).

[1] *tennis* → t^he.ni.si, *dancer* → ten.sə

[2] Epenthesis : *diet* → ta.i.ə.t̪i, *pad* → p^hæ.t̪i (*shock, smog, hip, knob, light, grade, brake, league, slope, tube*)

[3] No epenthesis : *truck* → t^hi.rʌk, *drug* → t̪i.rʌk (*hot, step, club, out, technique, group*)

[4] *train* → t^hi.re.in, *dry* → t̪i.ra.i [5] *approach* → ə.p^hi.ro.c^hi, *əp.ro.c^hi, *əp^h.ro.c^hi

[6]		Voiceless stops			Voiced stops		
		Coronal	Dorsal	Labial	Coronal	Dorsal	Labial
After a lax vowel	% of epenthesized words	38%	16%	7%	96%	71%	38%
	epenthesized words /total	33/87	16/99	4/60	23/24	15/21	3/8
After a tense vowel	% of epenthesized words	87%	84%	75%	100%	100%	100%
	epenthesized words /total	62/71	16/19	12/16	29/29	2/2	2/2

Note: ~ denotes release, ˀ denotes nonrelease and ˁ denotes voicing.

[7a]	pyramid ^ˀ	IDENT (REL)	DEP (V)	[7b]	pyramid ^ˀ	IDENT (REL)	DEP (V)
	p ^h i.ra.mit ^ˀ	*!			p ^h i.ra.mit ^ˀ		
	p ^h i.ra.mi.t̪i		*		p ^h i.ra.mi.t̪i	*!	*

[8] Percentage of epenthesis by English vowel contexts.

o	oy	ɔ	ay	e	ɪ	u	ε	ʊ	ə	ʌ	a	æ	ɪ	aw
100	100	100	97	92	91	81	63	38	33	32	32	28	16	13

[9a]	pyramid ^ˀ	ID (REL)	ID (VOI)	DEP	[9b]	pyramid ^ˀ	ID (VOI)	ID (REL)	DEP
	a. p ^h i.ra.mit ^ˀ		*			a. p ^h i.ra.mit ^ˀ	*!		
	b. p ^h i.ra.mi.t̪i	*!		*		b. p ^h i.ra.mi.t̪i		*	*

[10]	'place'	T→S	UE _N
	a. kot, kot + e	*!	
	b. kot, kos + e		*

[11]	pyramid ^ˀ	T→S	ID (REL)	UE _N	DEP
	a. p ^h i.ra.mit ^ˀ , p ^h i.ra.mit + e	*!			
	b. p ^h i.ra.mit ^ˀ , p ^h i.ra.mis + e			*	
	c. p ^h i.ra.mi.t̪i, p ^h i.ra.mi.t̪i + e		*!		*

[12]	pyramid ^ˀ	T→S	UE _N	ID (REL)	DEP
	a. p ^h i.ra.mit ^ˀ , p ^h i.ra.mit + e	*!			
	b. p ^h i.ra.mit ^ˀ , p ^h i.ra.mis + e		*!		
	c. p ^h i.ra.mi.t̪i, p ^h i.ra.mi.t̪i + e			*	*

[A] Boersma, P. and Bruce H. 2001. Empirical tests of the gradual learning algorithm. *LI* 32.

[B] LaCharité, D. and Carole P. 2001. Phonological evidence for the bilingualism of borrowers. To appear in the CLA 2000 Annual Conference Proceedings.

[C] National Korean Language Research Institute. 1991. Survey of loanword usage: 1990. [In Korean].

[D] Kang, O.-M. 1996. An Optimality Theoretic analysis of Korean loanword phonology. [In Korean]. *Kwukehak* 28.

[E] Parker, F. and Thomas W. 1981. Voicing cues as a function of the tense/lax distinction in vowels. *Jphon* 9.

[F] Byrd, D. 1992. A note on English sentence-final stops. *UCLAWPP* 82.

[G] Crystal, T. and A. House. 1988. The duration of American-English stop consonants : an overview. *Jphon* 16.

[H] Kenstowicz, M. 1995. Base-identity and Uniform Exponence: alternatives to cyclicity. *In Current trends in phonology: models and methods*.

[I] Hayes, Bruce. 1997. Anticorrespondence in Yidin.