

English /z/ in 1930s Korean

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1) Introduction

In Contemporary Korean, English /z/ is generally adapted as the lenis affricate /c/ in all segmental contexts (Iverson and Lee 2006). The examples in (1) below illustrate the adaptation of English /z/ to /c/ in word-initial (1a), word-medial (1b), and word-final (1c) positions. In intervocalic position, /c/ is variably voiced.

(1) Adaptation of English /z/ in Contemporary Korean

- a) zero /ceLo^l [cero]
zinc /ciŋk^{hi}/ [ciŋk^{hi}]
b) music /mjucik/ [mjucik] ~ [mjujik]
c) size /s*aici/ [s*aici] ~ [s*aiji]
cheese /c^{hi}ici/ [c^{hi}ici] ~ [c^{hi}iji]

In this paper, I examine the adaptation of English /z/ in 1930s Korean based on a loanword dictionary published in 1937 (Lee 1937). The key findings are that the adaptation pattern in the 1930s is much more variable and shows sensitivity to multiple factors present in the input language, including allophonic details, orthographic representation, and morphological structure. I discuss the implications of these findings for the debate on the nature of the input in loanword adaptation and the effects of sociolinguistic context on the pattern of adaptation. The paper is organized as follows: Section 2 provides a brief background on Korean phonology. Section 3 presents the data from 1930s Korean. Section 4 provides a discussion of the data and its implications and section 5 concludes the paper.

2) Background in Korean phonology

Korean has a well-known three-way laryngeal contrast of lenis, aspirated, and fortis in stops and affricates. Fricatives show a two-way distinction of fortis and non-fortis fricatives. Table 1 shows the consonantal inventory of Korean. The bold box marks the inventory of sibilants, which is of more immediate relevance for the current discussion.

p p ^h p*	t t ^h t*	k k ^h k*	
	c c^h c*		h
	s s*		
m	n	ŋ	
	L ([l/r])		
w	J		

Table 1: Consonant inventory of Korean

It may seem puzzling that English /z/ is adapted to the affricate /c/, which results in a gratuitous change in continuancy, rather than to one of the sibilant fricatives /s/ or /s*/, which would minimally change

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¹ /L/ represents the liquid phoneme in Korean that alternates between [l] and [r] depending on its phonological context.

voicing and preserve the continuancy feature of the English input. Here, I follow Iverson and Lee (2006) and Ito, Kang, and Kenstowicz (2006) and assume that the overall laryngeal characteristics of the Korean lenis affricate /c/ make it a better match for English /z/ than the Korean fricatives /s/ and /s*/.² In Contemporary Korean, through a tonogenesis-like sound change, the F₀ of the following vowel has become one of the primary perceptual cues distinguishing lenis vs. non-lenis categories of obstruents, particularly in Accentual Phrase (AP)-initial position (Jun 1996; Kim 2000; Cho, Jun, and Ladefoged 2002; Silva 2006; Wright 2008; Park and Iverson 2008; Kang 2008a, c). In Seoul Korean, an Accentual Phrase is marked by boundary tones and the AP-initial boundary tones are LH when the initial segment is a sonorant or a lenis obstruent, but they are HH when the initial segment of the phrase is laryngeally marked, i.e., an aspirated or fortis obstruent. /s*/ is a fortis consonant and induces a high tone on the AP-initial position. Korean /s/ is not simply voiceless, but is also aspirated phonetically and patterns with other aspirated obstruents in inducing a high tone on the following vowel in Accentual Phrase-initial position (Iverson 1983; Jun 1996; Ahn 1999; Cho, Jun, and Ladefoged 2002; Ko 2003; Chang 2008). Therefore, both of the fricatives /s/ and /s*/ are laryngeally marked and induce high tones in AP-initial position. However, no such laryngeal characteristics are present in /c/; /c/ is neither aspirated nor fortis, nor does it induce a high tone in AP-initial position. Similarly, English obstruents cause an F₀ perturbation on the following vowel; F₀ is lowered on the vowel following voiced obstruents, including /z/, whereas F₀ is raised following voiceless obstruents (Kingston and Diehl 1994). Therefore, we would expect Korean /c/ to be the only sibilant of Korean that matches the F₀ characteristics of English /z/ in being “laryngeally empty in the same way that foreign [z] is perceived to be” (Iverson & Lee, 2006). Assuming that in the English to Korean adaptation of obstruents, the laryngeal feature takes priority over the continuancy feature in determining phonetic similarity, English /z/ is expected to be mapped to the Korean lenis affricate /c/ – not the fricatives /s/ or /s*/. With this background, I turn to the adaptation pattern in the 1930s Korean in the next section.

3) Data

The data for the 1930s loanwords come from the *Modern Chosun Loanword Dictionary* (Lee 1937). This dictionary is a compilation of over 18,000 loanwords found in written sources in the 1930s. It was published before the establishment of the first systematic guidelines on foreign word transcription, “Conventions on loanword transcription” by the *Hangeul Hakhoe* [The Korean Language Society] (1940), thus the influence of normative conventions is assumed to be relatively minimal (Yu 1988; Kim 2000).

The entire dictionary was entered into a *Microsoft Excel* spreadsheet and all the loanforms whose English input word contained /z/ were identified. Many English input words had more than one Korean adaptation form listed in the dictionary – evidence of a great deal of variability. There were 1093 distinct tokens of adaptation from 530 distinct tokens of the English input /z/. Each loanform was coded for various factors, such as segmental context, the morphemic status of /z/ (i.e., whether /z/ was an independent morpheme in the English input or not), and whether the /z/ was written with a ‘z’ or ‘s’ in English orthography, among other things. The data were also coded for how the English /z/ was adapted to Korean in that particular example. Figure 1 shows a portion of the coded spreadsheet for illustration.

	C	E	I	K	L	N	P	R	S	T	U
1	korean form	English source	Contains z	Position	Preceding	Following	Plural suffix	Korean adaptation (manner)	Korean adaptation (Lar)	Korean adaptation	orthography
2	에부솔류티즘	absolutism	y	Medial	√	N		affricate	lax	c	s
3	아부솔벤트	absorbent	y	Medial	T	√		fricative	lax	s	s
4	액쇼니즘	actionism	y	Medial	√	N		affricate	lax	c	s
5	액티비즘	activism	y	Medial	√	N		affricate	lax	c	s
6	아드버타이시즈먼트	advertisement	y	Medial	√	N		fricative	lax	s	z
7	아드버타이자	advertiser	y	Medial	√	√		affricate	lax	c	z
8	아드버타이저	advertiser	y	Medial	√	√		affricate	lax	c	z
9	아드버타이저	advertiser	y	Medial	√	√		affricate	lax	c	z

Figure 1: A screen shot of the Microsoft Excel spreadsheet used to analyze the /z/ adaptation data

² Kim and Duanmu (2004) propose that Korean lenis obstruents are underlyingly [+voice]. Their main argument is based on how lenis obstruents lower the F₀ of the following vowel. Thus, in essence, their view has the same empirical consequences as that described in this paper.

In the statistics reported below, the data was normalized for lexical frequency by calculating the proportion of a particular adaptation pattern for the English input words to avoid having a small number of English words with a high number of variant forms skew the overall results. In other words, for any given English word, if there were 10 variants and /z/ was adapted as Korean /c/ in nine of them and as Korean /s/ in only one of them, that English word was counted as having a 0.9 (9 out of 10) rate of adaptation to /c/,, rather than counting the ten variants for that English input as separate items.

Overall, adaptation to /c/ was the majority pattern, occurring 68% of the time, in agreement with the pattern found in Contemporary Korean (see (1)). However, adaptation to the fricatives /s/ and /s*/ was also very frequent, occurring 22% and 9% of the time respectively, as summarized in Table 2. The examples in (2) illustrate the variety of patterns attested for the adaptation of English /z/ in 1930s Korean.

/c/	/s/	/s*/	others
68%	22%	9%	1%

Table 2: Adaptation of English /z/ in 1930s Korean

(2) Examples of English /z/ adaptation in 1930s Korean

	<u>1930s Korean</u>	<u>Contemporary Korean</u>
<i>zone</i>	/c̣on/ ~ /ṣon/	/c̣on/
<i>daisy</i>	/teic̣i/ ~ /te:c̣i/ ~ /teiṣi/	/teic̣i/
<i>jazz</i>	/c*æc̣i/ ~ /c*ac̣i/ ~ /c*jac̣i/ ~ /c*aṣi/ ~ /c*æsi/ ~ /c*jasi/	/cæc̣i/

The morphemic status of English /z/ turned out to have a systematic effect on the adaptation pattern. When English /z/ was morphemic, i.e., a plural marker or a possessive marker, it was almost never adapted as /c/ in Korean; rather, it was adapted as /s/ or /s*/, as summarized in Table 3.

/c/	/s/	/s*/
1%	65%	34%

Table 3: Adaptation of English morphemic /z/ in 1930s Korean

There were a total of 38 distinct English input forms containing a morphemic /z/ in the dictionary data, and only one example exhibited an adaptation to /c/ (*shoes* → /sju:ci/). Even this was only attested as one of two variants for the English input; the dictionary lists two variants for *shoes*, /sju:s*i/ and /sju:ci/. All other cases of English morphemic /z/ in the dictionary were adapted as /s/ or /s*/, but never as /c/. Some examples of morphemic /z/ adaptation are shown in (3a). Non-morphemic /z/ in word-final position, on the other hand, was variably adapted as /c/, /s/ or /s*/, as the examples in (3b) show.³

³ In fact, the morphological status effect seems largely to persist in Contemporary Korean, contrary to the general assumption that English /z/ is uniformly adapted as /c/ in Contemporary Korean. A Google search of loanforms for some common English words with plural /z/ shows that the adaptation to /s/ is the majority pattern in many cases, as shown in a) below. For non-morphemic word-final /z/, on the other hand, /c/ is the overwhelming majority in most cases, as shown in b) below. Oh (1996) observes another effect of English morphological structure in Contemporary loans: the plural suffix /s/ ~ /z/ is often deleted in adaptation to Korean, unlike non-morphemic /s/ or /z/.

(3) a) Examples of English morphemic /z/ adaptation in 1930s Korean

beans /pɪnsi/ ~ /p*ɪnsi/ ~ /p*ɪns*i/
General Motors /cɛnɛLaL mo^hɑsi/ ~ /cɛnɛLaL mo:t^hɑsi/
New York Yankees /nju: jɔk^h jɑŋk^hi:si/

b) Examples of English word-final non-morphemic /z/ adaptation in 1930s Korean

bronze /p*uLɔnci/
pose /p*o:ci/ ~ /p^ho:ci/ ~ /p^ho:si/
rose /Lo(:)ci/ ~ /Lo(:)s*i/

This adaptation pattern of morphemic /z/ mirrors the adaptation pattern of English /s/ in the same dictionary data (Kang 2008a,b). English /s/ in word-final position was adapted as /s/ 74% of the time and as /s*/ 26% of the time. Some examples of word-final /s/ adaptation are provided in (4a). As for English morphemic /s/, it was transcribed as /s*/ 94% of the time in the dictionary data. Morphemic /s/ was adapted as /s*/ at such a high percentage because morphemic /s/ is only found following a voiceless obstruent in English, which is the environment for Post-Obstruent Tensing in Korean. Some examples are provided in (4b).

a) English plural /z/ in Contemporary Korean (Google search, Dec. 19, 2008)

	/c/ adaptation	/s/ adaptation	/c/ adaptation rate ³
<i>news</i>	뉴스 695	뉴스 42,100,000	0.0%
<i>blues</i>	블루즈 290	블루스 148,000	0.2%
<i>General Motors</i>	제너럴 모터즈 234	제너럴 모터스 28,000	0.8%
<i>beans</i>	빈즈 5,150	빈스 16,700	23.6%
<i>New York Yankees</i>	뉴욕 양키즈 1,620	뉴욕 양키스 1,800	47.4%
<i>times</i>	타임즈 310,000	타임스 165,000	65.3%
<i>shoes</i>	슈즈 1,150,000	슈스 191	100.0%

b) English word-final non-morphemic /z/ in Contemporary Korean (Google search, Dec. 19, 2008)

	/c/ adaptation	/s/ adaptation	/c/ adaptation rate
<i>hose</i>	호즈 157	호스 20,600	0.8%
<i>lose</i>	루즈 16,600	루스 5,730	74.3%
<i>pose</i>	포즈 15,900	포스 4,320	78.6%
<i>noise</i>	노이즈 23,100	노이스 3,710	86.2%
<i>mayonnaise</i>	마요네즈 4,830	마요네스 165	96.7%
<i>fuse</i>	퓨즈 13,700	퓨스 48	99.7%
<i>enterprise</i>	엔터프라이즈 181,000	엔터프라이스 423	99.8%
<i>lens</i>	렌즈 272,000	렌스 492	99.8%
<i>cheese</i>	치즈 113,000	치스 136	99.9%
<i>jazz</i>	재즈 828,000	재스 852	99.9%
<i>bronze</i>	브론즈 11,400	브론스 4	100.0%
<i>series</i>	시리즈 1,200,000	시리스 303	100.0%
<i>size</i>	사이즈 1,800,000	사이스 400	100.0%

(4) a) Examples of English word-final non-morphemic /s/ adaptation in 1930s Korean

choice /c^hoisi/ ~ /c^hjois*i/

pass /p^hasi/ ~ /p^hæs*i/

Miss /misi/ ~ /mis*i/

b) Examples of English word-final morphemic /s/ in 1930s Korean

politics /p^haLLit^hiks*i/ ~ /p^hoLLit^hiks*i/

drops /t*iLop^hs*i/

The English plural suffix was treated as English /s/ uniformly, even in contexts where it was realized as /z/ in the English input. In contexts where the morpheme was indeed realized as /s/ in English, the Korean phonological process of post-obstruent tensing transformed the /s/ into /s*./

For non-morphemic /z/, the majority pattern was the adaptation to /c/ (74%) but a substantial proportion (26%) was adapted to /s/ or /s*./ This study identified two important factors affecting the adaptation pattern of non-morphemic /z/ in the 1930s data: English orthography and segmental context. With respect to the orthography effect, all else being equal, English /z/ was more likely to be adapted as /c/ if the English /z/ was written with a ‘z’ rather than ‘s’. As for the context effect, the /c/ adaptation was less likely in contexts where English /z/ was frequently devoiced, and therefore phonetically more similar to English /s/, in the English input (Haggard 1978; Docherty 1992; Stevens et al. 1992; Smith 1997).

First, we examine the adaptation of /z/ when it was written with a ‘z’ in English. Figure 2 summarizes the rate of adaptation to Korean /c/ for English non-morphemic /z/ written with a ‘z’ in different preceding and following segmental contexts, as represented by the x-axis and the different coloured bars, respectively. /z/ written with a ‘z’ was not attested in all combinations of preceding and following segmental contexts and thus there are gaps in the graph. The horizontal dotted line marks the 50% rate of adaptation and in all contexts where /z/ written with a ‘z’ was attested, /c/ adaptation was the majority pattern. In general there was no noticeable segmental context effect, except that the /c/ adaptation rate was significantly lower in post-vocalic word-final position (V_#), as indicated by the solid arrow, than in word-initial prevocalic (#_V) or intervocalic (V_V) positions, as indicated by the dotted arrows.

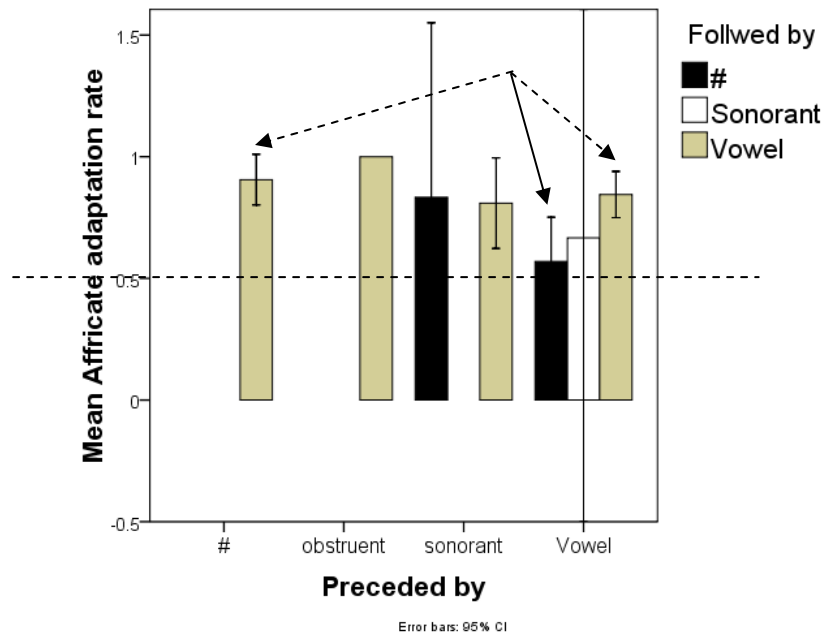


Figure 2: Rate of adaptation to Korean /c/ for English non-morphemic /z/ written with a ‘z’ in different segmental contexts in 1930s Korean

Figure 3 summarizes the rate of adaptation to Korean /c/ for English non-morphemic /z/ written with an ‘s’ in different preceding and following segmental contexts. The overall pattern in Figure 3 is strikingly different from that of Figure 2; with /z/ written with a ‘z’ (Figure 2), /c/ adaptation was the majority adaptation pattern across the board, whereas for /z/ written with an ‘s’ (Figure 3), /c/ was not the majority pattern in most contexts. The only two contexts where /c/ adaptation was the majority pattern were in the post-vocalic pre-sonorant (V_S) and intervocalic (V_V) contexts, as indicated by the solid arrows.

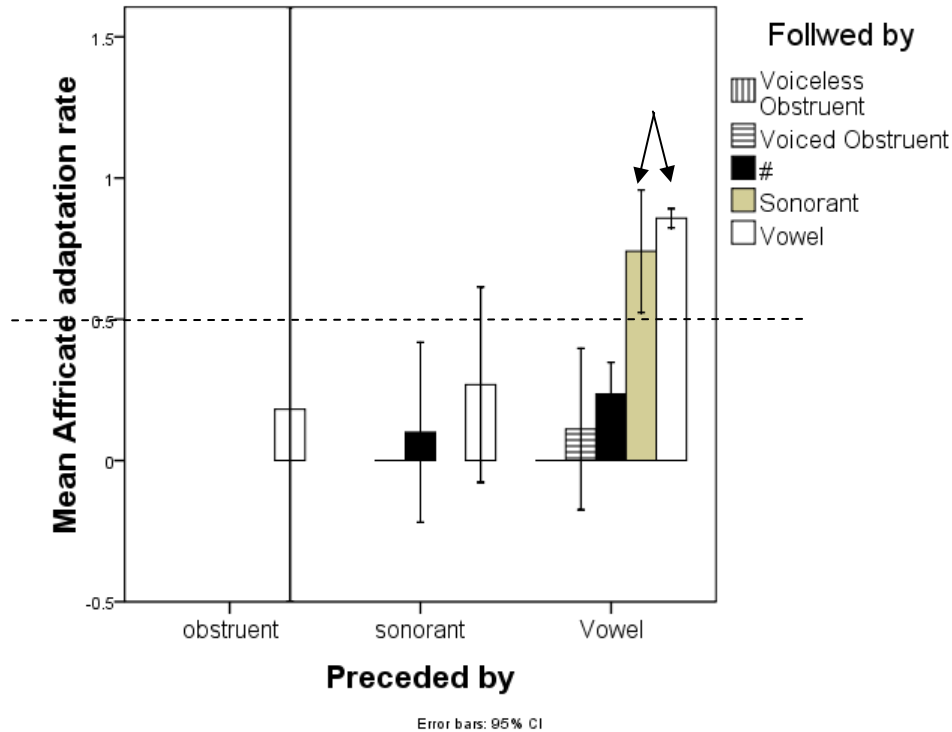


Figure 3: Rate of adaptation to Korean /c/ for English non-morphemic /z/ written with an ‘s’ in different segmental contexts in 1930s Korean

To recapitulate, a comparison of Figures 2 and 3 shows that English orthography had a systematic effect on the adaptation pattern of /z/—namely, /z/ was fairly consistently adapted as /c/, the default adaptation pattern for /z/, when English /z/ was written with a ‘z’. When English /z/ was written with an ‘s’, on the other hand, the adaptation to /z/ was only reliably found in contexts where /z/ was not likely to be devoiced in the English input. In other contexts, where English /z/ was frequently devoiced, and hence phonetically similar to English /s/, it was more likely to be adapted as /s/ or /s*/ of Korean, similar to how English /s/ was adapted. The segmental context effect was also found for English /z/ written with a ‘z’, albeit marginally.

4) Discussion

A question that has been a central issue of loanword phonology research in recent years is the nature of the input to loanword adaptation. Some argue that loanword adaptation is fundamentally phonetic and thus sensitive to sub-phonemic phonetic details of the lending language, as they pertain to the perception of categories in the borrowing language (Silverman 1992; Herd 2005; Iverson and Lee 2006; Peperkamp, Vendelin, and Nakamura 2008). Others argue that the adaptation is carried out by fully competent bilinguals and that the input to loanword adaptation is primarily phonological, such that adaptation essentially occurs on a phoneme-to-phoneme basis. As a result, different allophonic variants of a source language phoneme are adapted uniformly into the borrowing language (Paradis and Lacharité 1997, 2008;

LaCharité and Paradis 2005; Jacobs and Gussenhoven 2000). This approximately decade-long debate has uncovered numerous cases involving both types of adaptation, which casts significant doubt on any claim that only one type of adaptation or the other can occur. This has led some to suggest that loanword adaptation cannot be all phonological or all phonetic, particularly given the fact that adaptation can take a different shape depending on the nature of the linguistic contact under which borrowing took place, even for the two same input and borrowing languages (Kang 2008; Heffernan 2007; Smith 2006). Moreover, Chang (to appear) shows that in Burmese, phonological and phonetic adaptations can co-occur even within a single loanword, which reinforces the idea that loanword adaptation cannot be all phonological or all phonetic. The picture that emerges from the quantitative study of /z/ adaptation in 1930s Korean is similarly complex.

First of all, the adaptation was sensitive to the allophonic variation of English /z/. The adaptation to /c/, which is the canonical pattern for English /z/, was more likely in contexts where English /z/ was reliably voiced, and adaptation to /c/ was less likely in contexts where English /z/ was frequently devoiced and more similar to English /s/. This variable adaptation of a single phoneme is direct counterevidence to the view that a given phoneme of the input language should be adapted uniformly, regardless of its allophonic variation, which would be predicted if loanword adaptation were carried out by competent bilinguals and the input to loanword adaptation were the phonological representation.

However, sensitivity to the allophonic variation of the English input does not necessarily support the purely phonetic view of adaptation either. A phonetic approximation view would predict the frequent /s/-/s*/ adaptation of /z/ in frequent devoicing contexts to be the result of Korean adapters perceiving those devoiced instances of /z/ as being similar to Korean /s/ or /s*/ rather than /c/. However, there is a possible alternative interpretation of the context effect. The adaptation may still have been fundamentally phonological, in the sense that there was a tendency for a single phoneme of the input language to be adapted uniformly (**phonemic uniformity**). However, in the 1930s, the Korean adapters were less-than-fully-competent bilinguals who were prone to miscategorizing the input language phoneme. In other words, although Korean adapters of the 1930s were aware that English had a contrast of /z/ vs. /s/ and that /z/ corresponded to /c/ of Korean and /s/ corresponded to /s/ or /s*/, they may not always have been fully certain as to whether a given /z/ in the input was actually a /z/ or /s/, due to its variable phonetic realization. As a result, in contexts where /z/ was frequently devoiced, it was often adapted as if it were English /s/. This “miscategorization” was even more rampant when /z/ was written with an ‘s’, since the orthography failed to disambiguate between /z/ and /s/ and even contributed to the confusion. In other words, the adaptation could have been carried out on a phoneme-to-phoneme basis, except that the adapters with some knowledge of the input language, who were not fully proficient, may have miscategorized the phonemes of the input words when neither the phonetic signal nor the orthography provided clear cues.⁴

Orthography has often been considered an extra-linguistic influence in loanword adaptation that should be factored out in order to reveal the true linguistic principles underlying loanword adaptation (Paradis and Lacharité 2008; Vendelin and Peperkamp 2006). However, given the fact that orthography often systematically, albeit imperfectly, correlates with aspects of linguistic structure, such as phonemes, the fact that the adapters relied on the input language orthography in adaptation reveals what type of linguistic structure the adapters were paying attention to (Oh and Steriade 2005). They resorted to orthographic cues when they are not certain about the phonemic identity of the input sounds and in contexts where other correlations between the orthography and the relevant linguistic structure were often ambiguous, orthography could have led the adapters to a “wrong” adaptation. In this respect, the orthography effect is not a factor to be ignored, but rather it provides valuable evidence about the nature of the adaptation itself. The adaptation was sensitive to the phonemic identity of the input sounds and since the adapters were not

⁴ The adaptation pattern of English voiced stops in 1930s Korean contrasts with that of the English /z/ under discussion. English voiced stops are subject to devoicing, similar to English /z/, but they do not show the type of contextual variability in adaptation found in the adaptation of /z/. In the 1930s data, voiced stops were adapted as lenis or tense stops, depending on their position, and voiceless stops were adapted as aspirated stops (Kim 2003; Kang 2008). Unlike /z/, which was often adapted as if it were /s/, i.e., as Korean /s/ or /s*/, when it occurred in a devoicing context, English voiced stops were rarely adapted as if they were English voiceless stops, i.e., as aspirated stops of Korean, regardless of their segmental context. The difference seems to lie in the fact that for voiced stops, both phonetic and orthographic cues were still reliable enough to ward off miscategorization; phonetically, a salient aspiration cue was often available to distinguish between voiced and voiceless stops even in devoicing contexts, and there was no orthographic ambiguity between the voiced and voiceless series of stops, unlike the variable orthographic representation of /z/ as ‘s’ or ‘z’.

necessarily fully competent bilinguals, they may have relied on orthography as a cue to phonemic identity, even though this often led to wrong conclusions.

I just illustrated an interpretation of context sensitivity as a case of misguided phonological adaptation. However, can we attribute *all* instances of context sensitivity in the data to misguided phonological adaptation, rather than to perceptual adaptation à la Peperkamp, Vendelin, and Nakamura (2008)? Misguided phonological adaptation is certainly a reasonable interpretation for the context effect of /z/ written with ‘s’ and the striking difference in adaptation between /z/ written with a ‘z’ vs. ‘s’. However, the context sensitivity found for /z/ written with a ‘z’ is harder to attribute to misguided phonological adaptation. Recall from Figure 2 that even for /z/ written with a ‘z’ there was a context effect and /c/ adaptation was less likely in frequent devoicing contexts. This is despite the fact that in English, ‘z’ almost never represents /s/ and the orthography thus provides a reliable cue for the phonemic identity of /z/. This indicates that perceptual similarity is partially overriding the phonemic uniformity effect, leading to the frequent adaptation of /z/ as /s/~/s*/ in devoicing contexts.

The sensitivity to the morphological status of /z/ adds another layer of complexity. The effect of the morphemic status of /z/ indicates that the adapters were aware of the morphological structure of English and this provides evidence against the strict phonetic adaptation view, which assumes that the input to loanword adaptation is the unstructured acoustic signal of the input language. The morphological effect also provides evidence against the strict phonological adaptation view, which assumes that the adaptation is purely phonological and is carried out by fully competent bilinguals. In fact, the adapters seemed misguided about the phonemic identity of morphemic /z/—that is, they miscategorized it as /s/. This is likely due to a combination of factors; the morphemic /z/ is almost always found in word-final position, where devoicing is frequent, and morphemic /z/ is written with an ‘s’ consistently. In addition, the plural and possessive morphemes alternate between /z/ and /s/ in English, adding to the confusion. Given this combination of factors militating against the correct identification of morphemic /z/, the Korean adapters were categorizing the morphemes as having uniform exponence, namely /s/, in all contexts, leveling out the alternation in their analysis of the English input.

In sum, the adaptation of English /z/ in 1930s Korean showed sensitivity to various types of input representation—phonetic, phonological, orthographic, and morphological, with different factors regulating the mapping competing with one another. Phonetic similarity promoted mapping of /z/ to /c/ in voiced contexts, but to /s/ or /s*/ in frequent devoicing contexts. Phonemic uniformity promoted the adaptation to /c/, regardless of allophonic variation, but the adapters were often misguided about the phonemic identity of the English input sounds and in those cases of uncertainty, they resorted to orthographic information, which did not always lead them to the “correct” outcome. Finally, morphological structure exerted its own uniformity constraint, forcing all instances of morphemic /z/ to be adapted as if they were /s/, especially since morphemic /z/ was written with an ‘s’ and occurred in word-final position.

In the context of the recent discussion on the influence of sociolinguistic context and the degree of bilingualism on the mode of loanword adaptation (Chang, to appear; Paradis and Lacharité 2008; Heffernan 2007; Smith 2006), the changes in the adaptation pattern of /z/ from the 1930s Korean to Contemporary Korean and the concurrent changes in the nature of the contact between English and Korean provide an interesting case study. Compared to the variable and complex pattern of the adaptation of /z/ in the 1930s, in Contemporary Korean, the adaptation of /z/ is fairly categorical (Iverson and Lee 2006).⁵ The most striking difference between 1930s and Contemporary Korean is the high rate of adaptation to /s/ ~ /s*/ in the 1930s data that is rarely attested for non-morphemic /z/ in Contemporary Korean. Can changes in the sociolinguistic context of the language contact between English and Korean account for this change in the adaptation pattern over the past several decades?

The sociolinguistic literature indicates that bilinguals—i.e., those individuals who have “some minimum of bilingual mastery of the two languages” (Haugen 1950)—act as a conduit in the introduction of new borrowings (Haugen 1950; Grosjean 1982; Poplack, Sankoff, and Miller 1988). At the same time, the sociolinguistic literature recognizes the diversity of the language contact situation, ranging from “casual” to “intense”, from “distant” to “intimate” and from “pre-bilingualism” to “adult bilingualism” and “childhood bilingualism” (Haugen 1950; Grosjean 1982; Thomason and Kaufman 1988; Loveday 1996). In particular, distant contact, where there is no daily face-to-face interaction between speakers of the two languages and where contact mainly occurs through written channels, should be distinguished from

⁵ However, there is no thorough quantitative study of /z/ adaptation in Contemporary Korean and such a study may very well reveal more variability than has been described in the literature.

bilingualism proper, which involves closer contact, typically found in multilingual countries or in the context of colonization or migration (Grosjean 1982; Thomason and Kaufman 1988). Heffernan (2007), Smith (2006), and Haugen (1950) have proposed that diachronic changes in the loanword adaptation pattern are attributable to changes in the nature of contact. For example, Haugen (1950) observes that in an earlier stage of language contact (“pre-bilingualism”), adaptation tends to be more variable, reflecting the less-than-full competence of the adapters in the source language, and as the language contact matures, the adaptation pattern becomes more stable.

The change we observe in the adaptation of English /z/ in Korean may have a similar explanation. The 1930s was a relatively early stage in the history of contact between English and Korean. Korea’s contact with English for the most part of its history, and particularly in the first half of the 20th century, can be described as distant, and a lot of the borrowings were likely introduced by intellectuals with reading knowledge of English, but not necessarily a corresponding oral proficiency. Also, the contact may not have lasted long enough to lead to the establishment of “standards”. However, the situation has been rapidly changing in the past couple of decades, to the extent where some suggest that Korea is in a state of bilingualism (Baik and Shim 1998; Baik 1994; Shim 1994). Recent years have seen a drastic increase in foreign travel and the influx of foreign nationals. Under the motto of globalization, top universities in Korea are offering courses taught in English intended not only for foreigners, but also for Korean students as well. Most importantly, with the introduction of English to the elementary school curriculum in 1996, there has been an upsurge in early childhood English education from native speakers of North American English. Therefore, we can surmise that the younger generation of contemporary Korean speakers (in their late teens to early twenties) went through their formative years with more direct contact with English and are likely more proficient in English. In other words, just as Haugen (1950) observed for English loanwords in American Norwegian, in the early stage of the contact, there was substantial variation with much apparent phonetic adaptation, but as the level of bilingualism was elevated over time, the pattern stabilized into one of phonological adaptation⁶.

However, it is notable that even in Contemporary Korean loans, there are adaptation patterns that do not obey phonemic uniformity. The case of /s/ adaptation has received a lot of attention as a case of adaptation showing sensitivity to subphonemic phonetic information of the input language (Kang 2008a; Kim 2000; Iverson and Lee 2006). English /s/ is systematically adapted as Korean lenis /s/ in pre-consonantal position, but as fortis /s*/ in all other contexts, and this contextual variation persists in Contemporary Korean. Thus, just as with Burmese loanwords (Chang, to appear), the choice of phonological vs. phonetic mode of adaptation is not a parametric choice that is uniformly determined by the nature of language contact; rather, both types of adaptation can be present in the same language contact situation, often in competition with each other. Now, the question still remains as to why in some adaptation cases the phonemic uniformity effect overrides phonetic similarity, whereas the opposite occurs in others, and whether there are any principles that can help us predict which type of adaptation is more likely to prevail in any given situation. Answers to these questions may emerge as more and more careful case studies of loanword adaptation in diverse phonological and sociolinguistic contexts accumulate.

5) Conclusion

In this paper, I presented the results of a quantitative study on the adaptation of English /z/ in 1930s Korean, based on a loanword dictionary published in 1937 (Lee 1937). The key findings are that the adaptation pattern in the 1930s was much more variable than in Contemporary Korean and showed sensitivity to multiple factors present in the input language (i.e., English), such as allophonic details, orthographic representation, and morphological structure. This illustrates the complex nature of loanword adaptation, where multiple competing factors interact in determining the mapping pattern. In Contemporary Korean, the adaptation pattern has stabilized into a fairly uniform phoneme-to-phoneme adaptation, which may be a reflection of the change and maturation in the nature of the language contact; over time, the quality and the level of bilingualism has increased and norms obeying phonemic uniformity have been established in the adaptation pattern. At the same time, it is pointed out that even in Contemporary Korean, adaptation

⁶ Alternatively, it may just have been the length of time, not necessarily the change in the overall quality of bilingualism, that was responsible for the transformation of the adaptation pattern in the Korean case. Over time, “incorrect” adaptations have been weeded out, with norms being established, and the adaptation pattern has stabilized into one that obeys phonemic uniformity (with the exception of morphemic /z/, as discussed in footnote 3).

patterns showing sensitivity to allophonic variation persist, which indicates that the mode of adaptation (i.e., phonetic vs. phonological) is not a parametric choice, but rather both types of adaptation patterns can coexist within the same language contact situation.

References

- Ahn, Hyunkee. 1999. An acoustic investigation of the phonation types of post-fricative vowels in Korean. *Harvard Studies in Korean Linguistics* 8: 57–72.
- Baik, Martin Jonghak. 1994. Syntactic features of Englishization in Korean. *World Englishes* 13: 155–166.
- Baik, Martin Jonghak and Rosa Jinyoung Shim. 1998. Martin Jonghak Baik and Rosa Jinyoung Shim: Reply. *World Englishes* 17: 273–279.
- Chang, Charles B. To appear. Phonetics vs. phonology in loanword adaptation: Revisiting the role of the bilingual. *Proceedings of the 34th Annual Meeting of the Berkeley Linguistics Society: General Session and Parasession on Information Structure*.
- Chang, Charles B. 2008. The acoustics of Korean fricatives revisited. *Harvard Studies in Korean Linguistics* 12: 137–150.
- Cho, Taehong, Sun-Ah Jun, and Peter Ladefoged. 2002. Acoustic and aerodynamic correlates of Korean stops and fricatives. *Journal of Phonetics* 30: 193–228.
- Docherty, Gerard J. 1992. *The Timing of Voicing in British English Obstruents*. New York: Foris Publications.
- Grosjean, François. 1982. *Life with Two Languages : An Introduction to Bilingualism*. Cambridge, MA: Harvard University Press.
- Haggard, Mark. 1978. The devoicing of voiced fricatives. *Journal of Phonetics* 6: 95–102.
- Haugen, Einar. 1950. The analysis of linguistic borrowing. *Language* 26: 210–231.
- Heffernan, Kevin. 2007. The role of phonemic contrast in the formation of Sino-Japanese. *Journal of East Asian Linguistics* 16: 61–86.
- Herd, Jonathon. 2005. Loanword adaptation and the evaluation of similarity. *Toronto Working Papers in Linguistics* 24: 65–116.
- Ito, Chiyuki, Yoonjung Kang, and Michael Kenstowicz. 2006. The adaptation of Japanese loanwords into Korean. *MIT Working Papers in Linguistics* 52: 65–104.
- Iverson, Gregory K. 1983. Korean *s*. *Journal of Phonetics* 11: 191–200.
- Iverson, Gregory K., and Ahrong Lee. 2006a. Perception of contrast in Korean loanword adaptation. *Korean Linguistics* 13: 49–87.
- Iverson, Gregory K., and Ahrong Lee. 2006b. Variation in the Korean integration of English word-final /s/. *Ohak Yon'gu [Language Research]* 42: 239–251.
- Jacobs, Haike, and Carlos Gussenhoven. 2000. Loan phonology: Saliency, the lexicon and optimality theory. In *Optimality Theory: Phonology, Syntax, and Acquisition*, eds. J. Dekkers, F. van der Leeuw, and J. van de Weijer, 193–210. Oxford: Oxford University Press.
- Jun, Sun-Ah. 1996a. Influence of microprosody on macroprosody: A case of phrase initial strengthening. *UCLA Working Papers in Phonetics* 92: 97–116.
- Jun, Sun-Ah. 1996b. *The Phonetics and Phonology of Korean Prosody: Intonational Phonology and Prosodic Structure*. New York: Garland.
- Kang, Yoonjung. 2008a. The adaptation of English /s/ in Korean. *Inquiries into Korean Linguistics*, 3: 1–14.
- Kang, Yoonjung. 2008b. The adaptation of English /s/ in Korean. Handout from the 16th meeting of the International Circle of Korean Linguistics, June 26–28, 2008, Binghamton University/Cornell University.
- Kang, Yoonjung. 2008c. Interlanguage segmental mapping as evidence for the nature of lexical representation. *Language and Linguistics Compass* 2: 85–100.
- Kang, Yoonjung. 2008d. Tensification of voiced stops in English loanwords in Korean. *Harvard Studies in Korean Linguistics* 12: 179–192.
- Kim, Mi-Ryeng. 2000. The changes in foreign word transcription convention in Contemporary Korean [In Korean]. In *The formation and changes of Contemporary Korean*, ed. Jong-Sun Hong, 339–380. Seoul: Pakiceng.
- Kim, Mi-Ryoung, and San Duanmu. 2004. "Tense" and "lax" stops in Korean. *Journal of East Asian Linguistics* 13: 59–104.

- Kim, Soohee. 2000. Sub-phonemic duration difference in English /s/ and few-to-many borrowing from English to Korean. PhD, University of Washington.
- Kim, Soo-Hyun. 2003. A[n] analysis of writing loanwords in *The Dictionary of Modern-Joseon Loanwords*. [In Korean]. *Ehwa Emun Noncip*, 249–271.
- Kingston, John, and Randy L. Diehl. 1994. Phonetic knowledge. *Language* 70: 419–454.
- Ko, Eon-Suk. 2003. The laryngeal effect in Korean: Phonology or phonetics? In *The Phonological Spectrum. Volume I: Segmental Structure*, eds. Jeroen Van de Weijer, Vincent J. Van Heuven, and Harry Van der Hulst, 171–191. Amsterdam, Netherlands: John Benjamins.
- LaCharité, Darlene, and Carole Paradis. 2005. Category preservation and proximity versus phonetic approximation in loanword adaptation. *Linguistic Inquiry* 36:223–258.
- Lee, Jong-Keuk. 1937. *Modern Chosun loanword dictionary*. Seoul: Hansung Toseo Cusikhwesa.
- Loveday, Leo. 1996. *Language Contact in Japan: A Socio-linguistic History*. Oxford: Clarendon Press.
- Oh, Mira. 1996. Linguistic input to loanword phonology. *Studies in Phonetics, Phonology, and Morphology* 2: 117–126.
- Oh, Mira, and Doca Steriade. 2005. Poster on Korean Loanword Adaptation at conference From Sound to Sense: 50+ Years of Discoveries in Speech Communication.
- Paradis, Carole, and Darlene LaCharité. 2008. Apparent phonetic approximation: English loanwords in old Quebec French. *Journal of Linguistics* 44: 87–128.
- Paradis, Carole, and Darlene LaCharité. 1997. Preservation and minimality in loanword adaptation. *Journal of Linguistics* 33: 379–274.
- Park, Haeil, and Gregory K. Iverson. 2008. First and second language patterns of brain activation in Korean laryngeal contrasts. *Korean Linguistics* 14: 1–19.
- Peperkamp, Sharon, Inga Vendelin, and Kimihiro Nakamura. 2008. On the perceptual origin of loanword adaptations: Experimental evidence from Japanese. *Phonology* 25: 129–164.
- Poplack, Shana, David Sankoff, and Christopher Miller. 1988. The social correlates and linguistic processes of lexical borrowing and assimilation. *Linguistics* 26: 47–104.
- Shim, Rosa Jinyoung. 1994. Englishized Korean: Structure, status, and attitudes. *World Englishes* 13: 225–244.
- Silva, David J. 2006. Acoustic evidence for the emergence of tonal Contrast in Contemporary Korean. *Phonology* 23: 287–308.
- Silverman, Daniel. 1992. Multiple scansions in loanword phonology: Evidence from Cantonese. *Phonology* 9: 289–328.
- Smith, Caroline L. 1997. The devoicing of /z/ in American English: Effects of local and prosodic context. *Journal of Phonetics* 25: 471–500.
- Smith, Jennifer L. 2006. Loan phonology is not all perception: Evidence from Japanese loan doublets. In *Japanese/Korean Linguistics 14*, eds. Timothy J. Vance, and Kimberly A. Jones, 63–74. Stanford: CSLI.
- Stevens, Kenneth N., et al. 1992. Acoustic and perceptual characteristics of voicing in fricatives and fricative clusters. *Journal of the Acoustical Society of America* 91: 2979–3000.
- Thomason, Sarah Grey, and Terrence Kaufman. 1988. *Language Contact, Creolization, and Genetic Linguistics*. Berkeley: University of California Press.
- Vendelin, Inga, and Sharon Peperkamp. 2006. The influence of orthography on loanword adaptations. *Lingua* 116: 996–1007.
- Wright, Jonathan D. 2008. *Laryngeal Contrast in Seoul Korean*. PhD Dissertation, University of Pennsylvania.
- Yu, Kyung-Sook. 1988. Script conversion schemes and problems of transliterating Roman scripts into Korean in library cataloging [In Korean]. *Pusan Sanep University Nonmuncip* 9: 151–173.