

# The adaptation of the English voiceless affricate in 1930s Korean\*

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In this paper, we examine the adaptation of English /tʃ/ in Korean loanwords in the 1930s. The overall adaptation pattern found in the 1930s data is similar to the pattern found in Contemporary Korean; the affricate was adapted as /c<sup>h</sup>/ and an epenthetic vowel (/i/) was inserted when the affricate occurred in non-prevocalic position in the English input. Also, similar to Contemporary Korean, a palatal glide (<j>) was often inserted in the transcription even though the available evidence suggests that the glide did not surface in the pronunciation. We argue that the distribution of <j> in the transcription is not arbitrary; rather, it follows the co-occurrence restrictions of <j> in the native words and the transcription is a reflection of a level of phonological representation that is somewhat more abstract than the surface pronunciation. The only crucial difference found in the data between 1930s and contemporary Korean was that <w> was frequently inserted in the 1930s data, due to the rounding gesture of the affricate in English, but the usage of <w> in transcription or pronunciation is extremely rare in contemporary Korean. This indicates that loanword adaptation was more sensitive to phonetic details in the 1930s than in contemporary Korean.

## 1. Introduction

In Contemporary Korean, English /tʃ/ is generally adapted as the aspirated affricate /c<sup>h</sup>/ (cf. Iverson and Lee 2006). Since an affricate cannot occur in coda position in Korean, when /tʃ/ occurs in non-prevocalic position, an epenthetic vowel (/i/) is inserted following the affricate. The examples in (1) illustrate the adaptation in prevocalic (1a) and non-prevocalic (1b) position.

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

- |    |                 |   |                                       |
|----|-----------------|---|---------------------------------------|
| a. | <i>chart</i>    | → | /c <sup>h</sup> at <sup>h</sup> i/    |
|    | <i>champion</i> | → | /c <sup>h</sup> æmp <sup>h</sup> iʌn/ |
|    | <i>check</i>    | → | /c <sup>h</sup> ek <sup>h</sup> i/    |

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- b. *switch* → /siwic<sup>h</sup>i/  
*match* → /mac<sup>h</sup>i/  
*hitchhike* → /hic<sup>h</sup>ihaik<sup>h</sup>i/  
*beach gown* → /pi:c<sup>h</sup>i k\*aun/

In this paper, we examine the adaptation of English /tʃ/ in 1930s Korean, as evidenced in a loanword dictionary published in 1937 (Lee 1937). Our key finding is that in the 1930s, /tʃ/ was often adapted with an extra glide as /c<sup>h</sup>j/ or /c<sup>h</sup>w/ and the distribution of these glides was actually conditioned by the quality of the following vowel, reflecting similar tendencies in native Korean words. The paper is organized as follows: Section 2 provides a brief background on the relevant aspects of 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

The phoneme inventory of Korean is provided in (2).

### (2) Phoneme inventory of Korean

i	i	u
e	ʌ	o
(ɛ) <sup>1</sup>	ɑ	

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

The exact place of articulation of the Korean affricates has been a subject of much debate in recent years. We follow Kim (1999, 2001) and assume that, contrary to traditional assumptions, the place of articulation is not palatal; it is more anterior than that of English postalveolar affricates.

The syllable template of Korean is CGVC and there are various co-occurrence restrictions on the glide and the adjacent segments. The restriction on sequences of glide and vowel is summarized in (3) (H. Kang 1997).

### (3) Co-occurrence restrictions in glide + vowel sequences

*ji	*ji	ju
je	jʌ	jo
(jæ)	ja	s

wi	*wi	*wu
we	wʌ	*wo
(wæ)	wɑ	

The high central vowel /i/ is not allowed with either of the glides —\*/ji/, \*/wi/— and in addition, /j/ cannot occur with /i/, and /w/ cannot occur with /u/ or /o/. These restrictions hold categorically both as a Morpheme Structure Constraint and as a surface level constraint. In

<sup>1</sup> In contemporary Korean, the distinction between /e/ and /ɛ/ is almost completely lost (Silva and Jin 2008) but the vowels seem to be distinguished in 1930s Korean (Han 2005).

addition to these categorical restrictions, glides are also variably deleted in the surface structure, as conditioned by the quality of the preceding consonant and that of the following vowel (Silva 1991, Hong 1994, H. Kang 1997, Kim 2003, Lee 2004). We will return to the variable deletion later in the paper.

In addition, there is a morpheme structure constraint against a sequence of a coronal obstruent and /j/ (Kim 1994); in other words, no morphemes contain a sequence of /t, t<sup>h</sup>, t', c, c<sup>h</sup>, c', s, s'/ and /j/. Such sequences can arise, however, through derivation. When the coronal consonant is a stop or a fricative, the derived Cj sequence is retained in the output, as shown in (4a-b) but when the coronal consonant is an affricate, the /j/ is deleted, as shown in (4c). Han (2005) also reports that the post-affricate /j/ deleted in 1930s Korean, based on an impressionistic analysis of a recording of a Korean language textbook from 1935.

- (4) Derived sequences of coronal obstruents and /j/
- |    |                        |  |                |
|----|------------------------|--|----------------|
| a. | /pAt <sup>h</sup> i-Λ/ | → [pAt <sup>h</sup> jΛ]                        | 'to withstand' |
| b. | /masi-Λ/               | → [masjΛ] (→ [maʃΛ]) <sup>2</sup>              | 'to drink'     |
| c. | /kaci-Λ/               | → [kaɕjΛ] → [kaɕΛ]                             | 'to have'      |
|    | /taɕ <sup>h</sup> i-Λ/ | → [taɕ <sup>h</sup> jΛ] → [taɕ <sup>h</sup> Λ] | 'to get hurt'  |

In loanwords, a sequence of a coronal obstruent and /j/ is allowed even in underived contexts.<sup>3</sup> Some examples are given in (5). A sequence of coronal stop and /j/ of English is adapted as such without simplification in Korean, as shown in (5a) and the voiceless postalveolar fricative /ʃ/ of English is adapted as a sequence of a fricative and /j/—which on the surface, is realized as a posterior fricative, as with native Korean words, as in (4b)—as shown in (5b).

- (5) Sequences of coronal stops/fricatives and /j/ in loanwords
- |    |              |   |                       |
|----|--------------|---|-----------------------|
| a. | <i>tuna</i>  | → | /t <sup>h</sup> juna/ |
|    | <i>duo</i>   | → | /tjuo/                |
| b. | <i>show</i>  | → | /s'jo/ [ʃ'o]          |
|    | <i>issue</i> | → | /is'ju/ [iʃ'u]        |

It is less clear, however, whether a sequence of an affricate and [j] is allowed in loanwords. Despite the normative convention on foreign word transcription (Ministry of Education 1988) which dictates that English affricates /dʒ/ and /tʃ/ be transcribed as the simple affricates /c/ and /c<sup>h</sup>/, respectively, in pre-vocalic position, these affricates are frequently transcribed with a palatal glide, i.e., <cj> and <c<sup>h</sup>j>, as in *juice* → <cjusi> or <cusi>, *chocolate* → <c<sup>h</sup>ok<sup>h</sup>oLLes> or <c<sup>h</sup>jok<sup>h</sup>oLLes>.<sup>4</sup> There are no systematic studies on the phonetic realization of these loanwords that investigate whether the palatal glide in these forms are actually produced distinctively from affricates without the glide. The only study on this issue that we are aware of is K. Kang (2006) and the results indicate that the affricate and the affricate+glide spelling does not signal an actual *surface* contrast in

<sup>2</sup> The sequence of an anterior fricative and [j] is realized as a posterior fricative.

<sup>3</sup> This is in line with the view that the periphery of the lexicon, such as loanword stratum, allows structures that are prohibited in the core of the lexicon (Ito and Mester 1995, 1999, 2001).

<sup>4</sup> We use < > to represent orthographic representations. There are additional variant spellings for these particular English words, but here we only show two representative forms relevant for the purposes of our discussion.

Contemporary Korean.<sup>5</sup> In K. Kang’s study, three native speakers produced various loanwords containing coronal affricates spelled with, or without, a palatal glide, which were embedded in sentences. The produced stimuli were subjected to a perception test, whereby 55 native speakers of Korean were asked to listen to each stimulus and choose between two orthographic representations of the word, one with a palatal glide and the other without. The results showed that the rate of correct identification—i.e., the percentage of responses that matched the spelling from which the speakers produced the form—was only 54 % for the aspirated affricate (from the English voiceless affricate) and 55% for the lenis affricate (from the English voiced affricate). Responses tended to reflect the frequency of the spelling of the words in actual usage, as indicated by the results of an internet search. In other words, the subjects were more likely to choose orthographic representations that were frequently used for that item, regardless of whether the particular stimulus they heard were read from glide-ful vs. glide-less orthographic representations. With this background in mind, we will turn to the data of the present study.

### 3. Data

The data for the 1930s loanwords comes 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 *Chosun-Eo 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 /tʃ/ 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 554 distinct loanforms from 281 distinct English words containing /tʃ/. Each loanform was coded for its segmental context, as well as various other features in the Korean adaptation.

Overall, adaptation to an aspirated affricate (with or without a glide) was the overwhelming majority pattern, in agreement with the pattern found in Contemporary Korean (See (1)). The data in (6) also illustrates the high variability in the data. A few exceptions were found, but the words showing those exceptional variants also had other variants where the affricate was adapted with <c<sup>h</sup>>, following the majority pattern, as shown in (6b).

(6) Adaptation of the English voiceless affricate in 1930s Korean

- a. <c<sup>h</sup>(G)>: majority pattern
- |                |   |   |
|----------------|---|---|
| <i>speech</i>  | → | <si <sup>h</sup> i:c <sup>h</sup> i> ~ <si <sup>h</sup> i:c <sup>h</sup> i> ~ <si <sup>h</sup> i:c <sup>h</sup> wi> ~ <si <sup>h</sup> i:c <sup>h</sup> wi> |
| <i>teacher</i> | → | <t <sup>h</sup> ij:c <sup>h</sup> wΛ> ~ <t <sup>h</sup> ic <sup>h</sup> wΛL>  |
| <i>chart</i>   | → | <c <sup>h</sup> wa:t <sup>h</sup> i> ~ <c <sup>h</sup> ja:t <sup>h</sup> i>   |
| <i>picture</i> | → | <p <sup>h</sup> ik <sup>h</sup> c <sup>h</sup> uΛ> ~ <p <sup>h</sup> ik <sup>h</sup> c <sup>h</sup> wΛ>   |
| <i>chess</i>   | → | <c <sup>h</sup> esi> ~ <c <sup>h</sup> wesi> ~ <c <sup>h</sup> wes* <sup>h</sup> i>   |

<sup>5</sup> It seems that the contrast can be produced in very artificially exaggerated careful speech, but not in naturalistic casual speech.

b. Exceptions

- actuary* → <æk<sup>h</sup>t<sup>h</sup>juΛLi> (~ <æk<sup>h</sup>c<sup>h</sup>uaLi>)  
*chewing-gum* → <c\*uiŋk\*Λm> (~ <c<sup>h</sup>uiŋk\*Λm> ~ <c<sup>h</sup>juiŋk\*Λm>)

As mentioned above, Korean does not allow an affricate in coda position or in non-prevocalic position. When an English affricate in non-prevocalic position is adapted, an epenthetic vowel is inserted. The default epenthetic vowel in Korean is /i/, but following English postalveolar consonants, /i/ is found as the epenthetic vowel (Kim 1999, K. Kang 2006, Kim and Kochetov 2008 among others). This generalization is true of the 1930s data as well, and the epenthetic vowel was /i/ following English postalveolar consonants in 98.5 % of the cases (197 out of 200). The 1930s data diverges from the contemporary pattern in that the glide <w> was also added preceding an epenthetic vowel 63% of the time (126 cases out of 200). <w> is likely a reflection of the lip rounding found in postalveolar consonants in English. Examples are provided in (7).

(7) Adaptation of the English voiceless affricate in non-prevocalic position in 1930s Korean

- peach* → <p<sup>h</sup>iç<sup>h</sup>wi>  
*stitch* → <siç<sup>h</sup>it<sup>h</sup>c<sup>h</sup>wi>  
*sandwich* → <sandowic<sup>h</sup>i> ~ <sendiw<sup>h</sup>iç<sup>h</sup>i> ~ <s\*endiwic<sup>h</sup>i>  
*beach gown* → <pi:c<sup>h</sup>ik\*aun>  
*lunch* → <lanc<sup>h</sup>i> ~ <lanc<sup>h</sup>wi> ~ <lenc<sup>h</sup>wi>  
*march* → <ma:c<sup>h</sup>i> ~ <ma:c<sup>h</sup>wi> ~ <mac<sup>h</sup>wi>

In contemporary usage, <w> is rarely inserted in this position, both in written forms and actual pronunciation. The table in (8) shows the result of a Google search of two commonly used loanwords ending in English /tʃ/.

(8) Google search results of variants of *match* and *touch*, with or without <w> (October 7, 2008)

	Without <w>	With <w>
<i>match</i>	<mæç <sup>h</sup> i> 168,000 (99.7 %)	<mæç <sup>h</sup> wi> 544 (0.3%)
<i>touch</i>	<t <sup>h</sup> Λç <sup>h</sup> i> 1,500,000 (99.9%)	<t <sup>h</sup> Λç <sup>h</sup> wi> 1330 (0.1%)

The lack of <w> in contemporary written data is not an artefact of orthography; <w> is in fact rarely found in actual pronunciation. Choi (2001) elicited the pronunciation of 170 common loanwords from over 367 Seoul Korean speakers. The only word in the study that contained a non-prevocalic English /tʃ/ was *beach parasol*, and out of 367 respondents, no one adapted the final consonant in *beach* with [w]. Similarly, in the same study, the voiceless affricate in pre-vocalic position was almost never pronounced with [w]: *cheese* (0 cases out of 367), *chart* (3 out of 367), and *chance* (1 out of 367).

When the affricate occurred in prevocalic position in the English input, both <w> and <j> were frequently variably attested in the 1930s data; <w> occurred in 36% (91 out of 247) of the cases where <w> was not prohibited by co-occurrence restrictions in (3) above, and <j> occurred in 28.7%

(82 out of 286) of the cases. The appearance of the palatal glide <j> is also frequently attested in contemporary Korean, as mentioned above, but <w> is much rarer in contemporary data, as in the non-prevocalic position. The two glides cannot co-occur, because Korean allows only one glide and the distribution of the glide is also constrained by the quality of the following vowel, as discussed in (3) above. Examples are provided in (9).

- (9) Adaptation of the English voiceless affricate in prevocalic position in 1930s Korean
- a. without glide *Manchester* → <man<sup>h</sup>c<sup>h</sup>esit<sup>h</sup>Λ>  
*merchandise* → <mΛ<sup>h</sup>c<sup>h</sup>entajsi>  
*lecture* → <Lek<sup>h</sup>uΛ>
  - b. with [w] *bachelor* → <pεc<sup>h</sup>wεLLa> ~ <pεc<sup>h</sup>wεLLΛ>  
*catcher* → <k<sup>h</sup>εt<sup>h</sup>c<sup>h</sup>wΛ>
  - c. with [j] *choke* → <c<sup>h</sup>jo:k<sup>h</sup>i> ~ <c<sup>h</sup>jok<sup>h</sup>>  
*charcoal* → <c<sup>h</sup>ja:k<sup>h</sup>oL>
  - d. variable *chess* → <c<sup>h</sup>esi> ~ <c<sup>h</sup>wesi> ~ <c<sup>h</sup>wes\*i>  
*virtue* → <pΛL<sup>h</sup>u> ~ <pΛ:c<sup>h</sup>ju>  
*ketchup* → <k<sup>h</sup>ec<sup>h</sup>wΛp<sup>h</sup>> ~ <kec<sup>h</sup>jap<sup>h</sup>>

A closer examination of the data reveals that the distribution of the glides follow additional co-occurrence restrictions between the glide and the vowel beyond the categorical ban in (3). The table in (10) summarizes the occurrence of glides in the adaptation of English /tʃ/ in prevocalic position. The shaded cells represent cases that are prohibited by the categorical co-occurrence restrictions of the language (e.g., \*/ji/, \*/wo/, \*/wu) (cf. (3)).

(10) Occurrence of glides in the adaptation of English /tʃ/ in prevocalic position in 1930 Korean

Following vowel in the Korean output		No <j> or <w>	<j>	<w>	Total
Front vowels	<i>	36	0	14	50
	<e>	30	0	30	60
	<ε>	19	0	0	19
Back vowels	<Λ>	2	0	14	16
	<u>	49	9	0	58
	<o>	13	18	0	31
	<a>	20	49	26	95
Total		169	76	84	329

First, let's examine the distribution of <j>. Since it is impossible for both glides to occur at the same time, to calculate the rate of <j> occurrence in a given vowel context, we excluded the cases where <w> was inserted, since the occurrence of <j> would be impossible. The results are summarized in (11). Note that <j> was unattested not only before <i>, but also before all other front vowels (i.e., <e> and <ε>). <j> was also unattested before <Λ>, but there were only two relevant cases and we cannot be sure if the gap was accidental or a reflection of a systematic avoidance.

Before back vowels other than <ʌ>, we see a substantial proportion of cases showing <j>, with the higher the rate of <j> occurrence, the lower the vowel. A pair-wise comparison of vowel contexts using a chi-square test showed the following statistically significant groupings ( $p < 0.1$ ) from the context of the lowest rate of <j> occurrence to the highest: Front vowels (e ε) < High back vowel (u) < Non-high back vowels (o a).

(11) Occurrence of <j> in the adaptation of English /tʃ/ in prevocalic position in 1930s Korean

Following vowel in the Korean output		With <j>	Total (excluding cases with <w>)
Front vowels	<i>	NA	36
	<e>	0.0%	30
	<ε>	0.0%	19
Back vowels	<ʌ>	0.0%	2
	<u>	15.5%	58
	<o>	58.1%	31
	<a>	71.0%	69
Total		31.5%	245

As for the distribution of <w>, we can similarly calculate the rate of occurrence of <w>, excluding the cases where <j> was found. The results are summarized in (12). Setting aside the round vowel contexts (e.g., <u o>), where <w> is categorically banned, we find a tendency for <w> to occur more often before a front vowel than a back vowel. The statistically significant groups (Chi square test:  $p < 0.05$ ) were <ε>, <i>, <e, a>, and <ʌ>, as contexts for the lowest rate of <w> occurrence to the highest.

(12) Occurrence of <w> in the adaptation of English /tʃ/ in prevocalic position in 1930s Korean

Following vowel in the Korean output		With <w>	Total (excluding the cases with <j>)
Front vowels	<ε>	0.0%	19
	<i>	28.0%	50
	<e>	50.0%	60
Back vowels	<a>	56.5%	46
	<ʌ>	87.5%	16
	<u>	NA	49
	<o>	NA	13
Total		33.2%	253

To compare the glide distribution of the 1930s data with that of contemporary Korean, we performed a Google search of some commonly used English loanwords with /tʃ/ in prevocalic position with various following vowel contexts. The results are summarized in (13).

- (13) Occurrence of glides in the adaptation of English /tʃ/ in prevocalic position in Contemporary Korean (October 7, 2008)

Following vowel in the Korean output		No <j> or <w>	<j>	<w>	Total
Front vowels	<i> <i>cheese</i>	<c <sup>h</sup> ici> 100.0%	NA	<c <sup>h</sup> wici> <b>0.0%</b> (N=10)	203,010
	<e> <i>check</i>	<c <sup>h</sup> ek <sup>h</sup> i> 99.9%	<c <sup>h</sup> jek <sup>h</sup> i> <b>0.0%</b> (N=88)	<c <sup>h</sup> wek <sup>h</sup> i> <b>0.0%</b> (N=950)	2,061,038
	<ɛ> <i>chapter</i>	<c <sup>h</sup> ɛpt <sup>h</sup> ʌ> 100.0%	<c <sup>h</sup> jɛpt <sup>h</sup> ʌ> <b>0.0%</b> (N=0)	<c <sup>h</sup> wɛpt <sup>h</sup> ʌ> <b>0.0%</b> (N=1)	32,101
Back vowels	<ʌ> <i>church</i>	<c <sup>h</sup> ʌci> 98.4%	<c <sup>h</sup> jʌci> <b>1.6%</b> (N=648)	<c <sup>h</sup> wʌci> <b>0.0%</b> (N=4)	340,252
	<o> <i>chocolate</i>	<c <sup>h</sup> ok <sup>h</sup> oLlet> 85.5%	<c <sup>h</sup> jok <sup>h</sup> oLlet> 14.5%	NA	1,293
	<a> <i>chart</i>	<c <sup>h</sup> at <sup>h</sup> i> 53.7%	<c <sup>h</sup> jat <sup>h</sup> i> 46.3%	<c <sup>h</sup> wat <sup>h</sup> i> <b>0.0%</b> (N=7)	1,067,007
	<u> <i>chewing (gum)</i>	<c <sup>h</sup> uiŋ> 21.9%	<c <sup>h</sup> juŋ> 78.1%	NA	697,000

The numbers in (13) are based on a single word for each vowel context and therefore we cannot draw any conclusions about the general pattern, but we can make some interesting observations. First of all, unlike in the 1930s data, in Contemporary data, <w> is rarely inserted. Recall that we found a similar divergence for /tʃ/ adaptation in non-prevocalic contexts in (8). Secondly, the restriction against <j> before front vowels and <ʌ> observed in the 1930s data is also found in the contemporary Google search. A more comprehensive study of the distribution of <j> in Contemporary Korean is in order. We leave this topic for future research.

To summarize this section, we uncovered some intriguing generalizations about the adaptation of /tʃ/ in 1930s Korean; (i) just as in contemporary Korean, /tʃ/ was adapted as an aspirated affricate /c<sup>h</sup>/, and when the affricate occurred in non-prevocalic position in the English input, the epenthetic vowel /i/ was inserted following the affricate; (ii) the labial-velar glide <w> was frequently inserted, presumably reflecting the rounding characteristics of post-alveolar consonants in the English input, but <w> insertion is almost categorically absent in the contemporary data; (iii) the palatal glide <j> is also frequently inserted in the 1930s data and this pattern persists into the contemporary Korean, even though, in contemporary Korean, the <j> glide does not seem to be actually pronounced; (iv) the distribution of glides show certain restrictions; namely, <j> was avoided before all front vowels and <w> was more likely to occur before back vowels than front vowels. In the next section, we present the implications of the findings.

#### 4. Discussion

The generalizations from the 1930s adaptation data pose a couple of puzzles. First, why is the <w> insertion frequently found in the 1930s data but not in the contemporary data? Second, how do we account for the occurrence of <j> both in the 1930s and in present day Korean, especially if it is

not actually realized in the surface representation? Third, how do we account for the distributional asymmetries of the glides? We turn to each of these three questions in turn below.

#### 4.1 Preservation of lip rounding and the role of non-contrastive features in adaptation

The labial-velar glide <w> found in the adaptation of English /tʃ/ is likely a reflection of the lip rounding gesture found in post-alveolar consonants in English (Rogers 2000, Collins and Mees 2008). The rounding gesture in these English consonants is considered to be a non-contrastive feature that is not present in the abstract phonological representation and no phonological description of the English consonant inventory, as far as we know, considers these consonants as phonologically labialized (e.g., /tʃ<sup>w</sup>/).<sup>6</sup> The fact that the rounding is preserved in the 1930s adaptation, but not in the contemporary data, has an interesting implication in terms of the debate on the level of input language representation that serves as an input to adaptation. While some argue that the input to adaptation is phonological, devoid of any non-contrastive sub-phonemic phonetic details of the input language (Paradis and LaCharite 1997, LaCharite and Paradis 2005, among others), others argue that the input contains detailed phonetic information of the input language sounds (Silverman 1992, Herd 2005, Peperkamp et al. 2008, among others). Still others argue that both levels of representation may be accessed in adaptation, given the fact that both types of adaptation are found, sometimes even within the same language contact situation (Kenstowicz and Suchato 2006, Chang 2008, Y. Kang forthcoming, among others).

The (non)occurrence of <w> we observed in the Korean data also suggests that the adaptation process can access both types of representation, but the weight of the effects of the two representations can differ, giving rise to a “phonetic” adaptation in one case and a “phonological” adaptation in another. Then now the question is why did the adaptation of /tʃ/ in Korean changed from a “phonetic” adaptation to a “phonological” one over the past several decades?

One possible explanation is that there is a correlation between the choice of the mode of adaptation (i.e., phonetic vs. phonological adaptation) and the nature and the maturity of the language contact situation (cf. Haugen 1950). In other words, in the 1930s, when direct contact between Korean and English was relatively new, the adaptation was more variable and more likely to be “phonetic”, while in contemporary Korean, the contact between the language has matured enough for the variation to become stable and norms have been established based on “phonological” adaptation forms, as carried out by competent bilinguals (cf. Paradis and LaCharite 1997). We saw a similar shift from a phonetic and variable adaptation in the 1930s to a phonological and less variable adaptation of contemporary Korean in the adaptation of English /z/ in Korean (Y. Kang forthcoming). But, we are not claiming that the nature of the contact is the sole factor determining the choice between phonetic vs. phonological modes of adaptation, since there is evidence that even within the same contact situation, both types of adaptation can coexist (Kenstowicz and Suchato 2006, Chang 2008, Y. Kang forthcoming, among others).

Another possibility we may entertain (but will reject) is the role of normative conventions on foreign word transcription. As mentioned above, the normative convention established by the Ministry of Education (1988) dictate that the English voiceless affricate be adapted simply as an aspirated affricate in prevocalic position and as an aspirated affricate with epenthetic /i/ in non-prevocalic position. One can hypothesize that the influence of normative conventions discouraged the

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<sup>6</sup> For the post-alveolar fricatives, the rounding has an enhancement function (Keyser and Stevens 2006) whereby the place contrast between /s z/ and /ʃ z/ is enhanced by the rounding on the latter set and this can make the rounding functionally related to the underlying contrast. For the affricates, however, there is no minimal underlying contrast between the alveolar and post-alveolar affricate and the rounding does not serve a similar function.

insertion of <w> in orthography, which in turn affected the pronunciation of the words. However, there is little evidence that normative transcriptions bring about a genuine change in the actual pronunciation of loanwords, or even in the transcription itself, at least in Korean. A case in point is the persistent occurrence of <j> in the adaptation of English /tʃ/ discussed earlier. Unlike <w>, <j> is still frequently used in transcription in this context in contemporary Korean, as was shown in (13).

The final possibility is that the phonetics of the English input may have changed from the 1930s to contemporary Korean, whether as a historical change or a dialectal change (from RP to General American). In other words, the English that served as the input for adaptation in the 1930s had a more notable degree of lip rounding for /tʃ/ than the English that serves as an input for the contemporary adaptation. We do not have any evidence to evaluate this hypothesis and we leave this question for future research.

#### 4.2 The occurrence of palatal glide and the place of articulation of Korean affricate

Now we turn to the palatal glide found in the adaptation of /tʃ/. The presence of palatal glide transcription in this position is puzzling given the fact that the glide is neither realized in the surface pronunciation (K. Kang 2006), nor is the transcription of glide in this position promoted by normative conventions. Here, we propose that the palatal glide is a reflection of the posterior place of articulation in the English input. A full exposition of our analysis takes us to the debate on the place of articulation of Korean affricates and the quality of epenthetic vowels in post-affricate position.

The Korean affricate has traditionally been considered to be “palatal”, but a series of phonetic and phonological studies by Hyunsoon Kim (Kim 1999, 2001, Kim et al. 2005) has demonstrated that the Korean affricate is more appropriately described as laminal alveolars. From this perspective, the epenthetic vowel /i/ found in post-affricate contexts (cf. (8)) is not a spreading of the palatal articulation from the Korean affricate, as suggested by Oh (1992) and Tak (1996), among others; rather, the glide is a reflection of the posterior articulation of the English input (Kim 1999). This latter view finds support from the fact that the /i/ epenthesis is found only when the English affricate is indeed posterior (i.e., post-alveolar); when the English affricate is anterior, the default epenthetic vowel /i/ is inserted, as in *sports* [ts] → [sɪp<sup>h</sup>oc<sup>h</sup>i], \*[sɪp<sup>h</sup>oc<sup>h</sup>i].

So, we will assume that the English posterior affricate is in fact adapted as the bi-segmental sequence /c<sup>h</sup>j/, which then merges with the epenthetic vowel /i/ to produce [c<sup>h</sup>i]. When the affricate occurs in prevocalic position, despite the fact that [j] cannot survive in the surface representation, we conjecture that a tendency for *phonemic uniformity*—a tendency for a single phoneme of the input language to be adapted uniformly (cf. Y. Kang forthcoming)—promotes the occurrence of <j>.<sup>7</sup> Under this view, the orthographic representation is reflecting a level of Korean phonology that is slightly more abstract than the surface representation. In the next section, we demonstrate that the <j> transcription is not a blind hypercorrective spelling, but there is evidence of a psychological reality, by showing that the distributional gaps of <j> is not random; it is phonologically conditioned.

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<sup>7</sup> A parallel analysis can be made for the adaptation of voiceless post-alveolar fricatives. In other words, /ʃ/ is adapted as /sʃ/, which is realized as [si], and this merges with an epenthetic /i/, but is realized as [ʃ] in prevocalic contexts, an allophone of /s/ which occurs before a high vocoid in Korean.

### 4.3 Distribution of glides and the native restrictions on glide plus vowel sequences

As mentioned in (3) above, the distribution of glides is restricted by co-occurrence restrictions in Korean: \*[ji], \*[jɨ], \*[wi], \*[wu], and \*[wo]. These restrictions are strictly enforced in native Korean, as well as in loanwords.<sup>8</sup> In addition to these categorical bans, in contemporary Korean, glides are frequently deleted in casual speech in post-consonantal position (Silva 1991, Lee 1993, Hong 1994, H. Kang 1997, Kim 2003, Lee 2004). Particularly relevant to our discussion, the deletion of the palatal glide is conditioned by the quality of the following vowel and the general pattern in the native glide deletion closely parallels the distribution of glides observed in the loanword data.

As for the palatal glide, it is frequently deleted post-consonantly before a front vowel, but deletion before a back vowel is rare in the Seoul dialect (Hong 1994, H. Kang 1997, Kim 2003). Deletion of a post-consonantal palatal glide before a front vowel is also reported for 1930s Korean. Some examples are given in (14).

(14)	Variable deletion of /j/ before front vowels in native Korean words			
a.	Contemporary Korean	/kjecip/	[kecip]	‘girl (pejor.)’
		/hjet <sup>h</sup> ɛk/	[het <sup>h</sup> ɛk]	‘benefit’
		/kjɛ/	[kɛ]	‘that kid’
b.	1930s Korean	/kjesitaka/	[kesitaka]	‘stay (hon.)-while’
		/hesikje/	[hesike]	‘sundial’

Interestingly, there is evidence that a sequence of palatal glide and /ʌ/ is also avoided through monophthongization (Hong 1994), although at least in the Seoul dialect, this process is not as productive as palatal glide deletion before a front vowel. Recall that /ʌ/ is another context where <j> was never attested in the 1930s data, although the low number of relevant cases makes it difficult to draw any conclusions. Some examples are provided in (15).

(15)	Variable monophthongization of /jʌ/	
	[mjʌc <sup>h</sup> il] ~ [mec <sup>h</sup> il]	‘a few days’
	[pjʌ] ~ [pe]	‘rice plant’
	[hjʌtp <sup>h</sup> atak] ~ [hetp <sup>h</sup> atak]	‘tongue’

In sum, the context where <j> is unattested in the 1930s loanword data—i.e., before front vowels and /ʌ/—is exactly the context where the glide is avoided in native words as well.

The labial-velar glide /w/ is also deleted more frequently in post-consonantal position before front vowels than before back vowels (Silva 1991, Lee 2004)<sup>9</sup>. The table in (16) (from Lee 2004) shows the rate of /w/ retention in different contexts. The numbers reported are based on the production of 50 Korean words containing post-consonantal /w/ by six native speakers. Interestingly, the deletion pattern is also replicated in Korean speakers’ pronunciation of English words with Cw clusters.

<sup>8</sup> Ahn (1998) proposes that [jɨ] and [wi] sequences are possible in sound symbolic words. However, native orthography does not have a symbol for these sequences.

<sup>9</sup> Kang (1997) did not find any significant effect of a following vowel on /w/ deletion.

(16) Rate of /w/ retention in native Korean

Preceding consonants	/wi/	/we/	/wΛ/	/wa/
Bilabial	NA	67%	33%	60%
Alveolar	39%	83%	100%	100%
Palatal (=affricates)	44%	94%	100%	100%
Velar	41%	83%	100%	100%
Glottal	83%	100%	100%	100%

Cf. rate of <w> occurrence in the 1930s loan data      28%      50%      88%      57%

We do not have any evidence for similar tendencies in 1930s Korean. Nevertheless, it is interesting to observe a similar preference for <w> before a back vowel in the loanword data from the 1930s. It is plausible that the variable deletion of /w/ may very well have been taking place in 1930s Korean and the <w> distribution in the loanwords is following the general trend of the native words.

To summarize, we have argued that the variable transcription of <j> and <w> found in the 1930s data is not random; rather, it follows the distributional tendencies of glides in native words. Therefore, we propose that the orthographic transcription of the loanwords reflects aspects of the speakers' phonological knowledge, even when it does not directly reflect the actual surface pronunciation of the words, as in the case with <j>.

5. Conclusion

In this paper, we examined the adaptation of English /tʃ/ in Korean loanwords in the 1930s. The adaptation pattern found in the 1930s data is similar to the pattern found in Contemporary Korean for the most part; the affricate was adapted as /c<sup>h</sup>/ and an epenthetic vowel (/i/) was inserted when the affricate occurred in non-prevocalic position in the English input. Also, similar to Contemporary Korean, a palatal glide <j> was often inserted in the transcription even though available evidence suggests that the glide did not surface in the pronunciation. We argue that the distribution of <j> in the transcription is not arbitrary; rather, it follows the co-occurrence restrictions of <j> in native words and the transcription reflects a phonological representation somewhat more abstract than the surface pronunciation. The only crucial difference between the 1930s and contemporary Korean found in the data was that <w> was frequently inserted in the 1930s data, reflecting the rounding gesture of the affricate in English, but the transcription or pronunciation of <w> is extremely rare in contemporary Korean. This indicates that the adaptation was more sensitive to phonetic details in the 1930s than in contemporary Korean.

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