Pre-modern Korean Mid Front Vowel for Japanese/Okinawan [e]: A Corpus-based Approach

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1   Introduction

This paper investigates how Okinawan mid front vowel [e] in the fifteenth century and Japanese mid front vowel [e] in the eighteenth century were transcribed by Korean Hangul. Pre-modern Korean before the nineteenth century consisted of seven vowels in the phonemic inventory (Lee and Ramsey 2011, Sohn 2012, 2015), as shown in (1).[1]

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[1] The phonetic values of the seven vowels in (1) are based on Lee and Ramsey (2011: 156). In Sohn (2015: 44), the seven vowels are interpreted differently: ㅣ [i], ㅡ [ɯ], ㅜ [u], ㅓ [ʌ], ㅗ [o], ㅏ [a], and ㆍ [ɔ].

(1)

Front	Central	Back
ㅣ [i]	ㅡ [ɨ]	ㅜ [u]
	ㅓ [ə]	ㅗ [o]
	ㅏ [a]	ㆍ [ʌ]

The vocalic system in (1) is asymmetrical. There are three central vowels and three back vowels, but there is only one front vowel. Other front vowels such as [e] and [ɛ] do not appear in (1). The two vowels are attested in modern Korean, and they emerged from the monophthongization of vowels /ə/ and /i/ and that of vowels /a/ and /i/ after the eighteenth century: [e] (< /əi/) and [ɛ] (< /ai/) (Kim and Kurita 2003, Lee and Ramsey 2011, Sohn 2012, 2015, among others).

Hangul has been adapted to transcribe Chinese, Japanese, Manchu, Mongolian, and Ryukyuan before Modern Korean (Osterkamp 2012). The fact that there is no mid front vowel in (1) leads to a difficulty in accurately transcribing mid front vowels in other languages. For example, Old Okinawan and Middle Japanese contain a mid front vowel [e] in their vocalic systems. Old Okinawan in the fifteenth century was recorded by using Hangul in *Haedong chegukki: eoeum peonyeok* 'The Records of Countries to the East of the Sea: a phonetic translation' (henceforth HDCGK); pre-modern Japanese in the eighteenth century was also recorded by using Hangul in *Waeeo yuhae* 'Classifying and Understanding Japanese' (henceforth WEYH). Given that there was no mid front vowel [e] in Korean before the monophthongization of /ə/ and /i/, it is not clear how mid front vowels in the two historical resources are transcribed in Hangul in pre-modern Korean era. Thus, this paper aims to answer the following questions: Are Old Okinawan mid front vowels and Middle Japanese mid front vowels replaced by other monophthongs in the transcriptions? Are the middle front vowels in the two languages presented by other vowel combinations in the transcriptions?

To statistically understand how Okinawan and Japanese mid front vowels before the nineteenth century are transcribed in Hangul, this paper adopts a corpus-based approach by examining Okinawan mid front vowel [e] in HDCGK and Japanese mid front vowel [e] in WEYH. Section 2 discusses the establishment of the corpus and data selection criteria. This paper focuses on the types of tokens, instead of the frequencies of tokens. Section 3 reports the distributions of mid front vowels in the two historical resources. The data are presented broken down into onsets and rhymes. In Section 4, this paper suggests that the mid front vowels in the Japonic languages do not simply correspond to monophthongs in Korean. Mid front

vowels in the two languages are transcribed by Korean vowel combinations. The results also suggest that there are different vowel heights for Okinawan and Japanese mid front vowels in the transcriptions. The Okinawan mid front vowel is a higher [e] (more exactly, [ẹ]), and the Japanese mid front vowel is perceived with more frication before the vowel. Besides, the onset interacts with the vowel: Korean palatalization in the eighteenth century is represented by the onsets only. Section 5 concludes this paper.

2   Corpus and Data Selection Criteria

The corpus is based on two historical sources in which the Japonic languages are transcribed in Hangul before the nineteenth century. The two sources are *Haedong chegukki: eoeum peonyeok* 'The Records of Countries to the East of the Sea: a phonetic translation' published in the fifteenth century for Okinawan, and *Waeeo yuhae* 'Classifying and Understanding Japanese' published in the eighteenth century for Japanese. As Okinawan and Japanese at that time contained a mid front vowel [e] in their vocalisms (Vovin 2003, Ding 2008), this paper analyzes entries with mid front vowels in the two languages.

The selection of entries with mid front vowels in HDCGK, which has 169 entries in total, is based on Iha's (1934) interpretation of HDCGK. The data in HDCGK are initially presented in Chinese and then in the corresponding Okinawan transcribed in Hangul. For example, the word 'wind' is recorded as 風 간즤 [kʰan.tsɨi]. The Chinese meaning and the Hangul transcription suggest that this entry should be [kaⁿ.se] (or [ka.ze]). Thus, the second syllable in this example was included in the corpus. According to Iha's (1934) analysis, all the 169 entries were sorted, and the syllables with mid front vowels were collected for analysis.

With regard to the data in WEYH, the entries were thoroughly examined, and the syllables with mid front vowels were gleaned.[2] The data in WEYH are in the following format. The first part is the meaning in Chinese characters. There are two Hangul transcriptions below each Chinese character. The one on the right is the native Korean or Sino-Korean, and the one on the left is Sino-Japanese in the eighteenth century. Beneath the Chinese meaning is the Hangul transcription for the native Japanese. In this paper, I use the transcriptions for the native Japanese. In the word 'rain', for instance, the meaning in Chinese character is 雨, and its transcription for Japanese is 아몌 [a.miəi], which corresponds to あめ [a.me]. Therefore, the second syllable in this word 'rain' was extracted and then included in the corpus.

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[2] WEYH consists of two volumes, divided into fifty-six categories. There are thousands of entries in WEYH.

In this paper, I pay attention to the types of tokens, not the frequencies. There are no multiple calculations of tokens of the same occurring in multiple entries. In addition to an individual entry in WEYH, the word 'rain' also appears in a phrase, such as 霖雨 'long-continued heavy rain' 나°가아몌 [na.ga.a.mjəi] (= Japanese ながあめ [na.ga.a.me]).[3] Although the words 'rain' and 'long-continued heavy rain' are individual entries in WEYH, they were classified as one type, 아몌 [a.miəi], in the corpus. The collected data from HDCGK and WEYH are reported in Section 3.

3 Results

The results are divided into two parts: Section 3.1 for the tokens in HDCGK and Section 3.2 for the tokens in WEYH. The data are broken down into combinations of onsets and rhymes.

3.1 Mid Front Vowel [e] in HDCGK

In the corpus, there are forty-three tokens for mid front vowel [e] in HDCGK. Table 1 shows the distribution across four vowel combinations. The majority is a combination of [ɨ] and [i], ㅢ [ɨi] (twenty-six tokens). There are twelve tokens for ㅖ [iəi], four tokens for ㅕ [iə], and one token for ㅟ [ui] (coda nasal N omitted here).

Onsets \ Rhymes	-ɨi	-iəi	-iə	-ui
k-	13			
m-	4	1		1
p-	4			
pʰ-	1			
r-	3	1		
ts-	1	5		
t-		5		
tsʰ-			1	
tʰ-			3	
Total	26	12	4	1

Table 1: Okinawan mid front vowel [e] transcribed in HDCGK

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[3] In WEYH, the voiced stops are presented by a preceding circle. For example, 가 is [ka], and °가 is [ga].

The four combinations are not randomly used. The combination, ᅴ [ɨi], appears after grave consonants, *k* and *p*. For instance, the word 'wine' in Old Okinawan is *sake*, and its transcription is 사긔 [sa.kɨi]. The two combinations, ᅨ [iəi] and ᅧ [iə], appear after acute consonants, *t* and *ts*, as in the word *kumo-te* 'cloudy-INF' in Old Okinawan.[4] The transcription of this example is 구모뎨 [ku.mo.tiəi]. The data in Table 1 also reveal that the combinations, ᅨ [iəi] and ᅧ [iə], can be distinguished by the aspiration of the onset. The former goes with unaspirated consonants, as in the word 'cloudy-INF' 구모뎨 [ku.mo.tiəi]; the latter only appears after aspirated consonants, the word 'sky' 텬 [tʰiən], for example. The corpus has one token that shows a combination of [u] and [i], as in the word 'eye' 뮈 [mui]. This should be due to labiality spreading from the onset labial nasal to the vowel.

3.2 Mid Front Vowel [e] in WEYH

There are 652 tokens for mid front vowel [e] in WEYH. Table 2 gives the distribution across three Korean vowel combinations and one monophthong. There are 521 tokens for the combination, ᅨ [iəi], 127 tokens for ᅦ [əi], and one token for ᅧ [iə]. The monophthong, ᅥ [ə], has four tokens.

Onsets \ Rhymes	-əi	-iəi	-ə	-iə
t-	60			
d-	10			
n-	57		4	
b-		12		
g-		36		
h-		14		
k-		92		
m-		11		1
p-		64		
r-		68		
s-		14		
z-		100		
	127	521	4	1

Table 2: Japanese mid front vowel [e] transcribed in WEYH

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[4] INF=infinitive

In Table 2, the two combinations ㅔ [əi] and ㅖ [iəi] are in complementary distribution. The combination ㅔ [əi] only appears after alveolar stops and nasal, as in the word 'bone' ほね [ho.ne], which is transcribed as 호네 [ho.nəi]. On the other hand, the combination ㅖ [iəi] appears elsewhere, as in the word 'wine' さけ [sa.ke], which is transcribed as 사계 [sa.kiəi]. The combination ㅕ [iə] is attested in one token in the corpus. The example is the word 시면 [si.miən] 'four directions', and its corresponding Japanese is しめん [si.men]. This example should be a transcription error.[5] In Table 2, the monophthong is ㅓ [ə], but it only follows an alveolar nasal, as in the word 'root' ね [ne], which is transcribed as 너 [nə].

4 Discussion

This section discusses two aspects of the data in Section 3: different vowel heights of Okinawan and Japanese mid front vowels and palatalization of the onsets in Korean. The results in Section 3 show that the mid front vowels in the Japonic languages are largely transcribed by Korean vowel combinations rather than monophthongs. The Korean vowel combinations for Okinawan and Japanese mid front vowels are similar in the choice of vowels. The dominantly preferred combination in their transcriptions is that of a central vowel and a high front vowel. The two languages, nevertheless, differ in the height of the combinations. There are two vowel combinations in Old Okinawan: [ɨi] for high vowel and [iəi] for mid vowel. Japanese, on the other hand, only has mid vowel combinations: [əi]/[iəi].

The vowel combinations in the two languages reflect that the Old Okinawan mid front vowel should be higher than the Japanese one, as shown in (2).

(2)

Front   Central

ㅣ [i]   ㅡ [ɨ]   ← For Okinawan [e]

ㅓ [ə]   ← For Japanese [e]
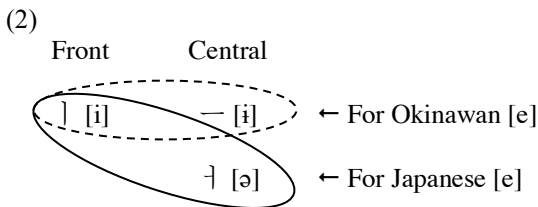
The high vowel combination for the Okinawan mid vowel in the nineteenth century also supports (2). Lin (2017) reports that the Okinawan mid front vowel in the nineteenth century is also transcribed as ㅢ [ɨi], as in the word 'wind' 간의 [kan.ɨi] in another historical source, *Ryukyu Luzong hyokairoku*

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[5] It seems that this transcription is a mixture of Sino-Japanese in the first syllable [si] and Sino-Korean in the second syllable [miən].

琉球·呂宋漂海錄 (1802). As the combination ᅴ [ɨi] is consistently used for the Okinawan mid front vowel, this paper suggests that instead of a general mid front vowel [e], the Okinawan mid front vowel should be raised in HDCGK, and the phonetic value is more like [ẹ].[6]

Table 2 reveals that there is a complementary distribution in the vowel combinations for mid front vowels in WEYH. The combination, [əi], appears after three alveolar consonants, *t*, *d*, and *n*, and [iəi] after other consonants. This phenomenon is due to palatalization in Korean phonology (Doi, Hamada and Yasuda 1959, Lee 2003). The palatalization is pervasive after *t*, *d*, and *n* in Korean so that when Japanese is transcribed by Hangul, the vowel /i/ that precedes vowel /ə/ has merged into the onset consonants, and therefore the high front vowel [i] can be omitted in the transcription. In other words, the WEYH transcriptions like [təi] actually represent [cəi]; other WEYH trasncriptions like [kiəi] are still [kiəi].

When the palatalization after consonants, *t*, *d,* and *n*, is taken into account, 99% of the corpus instances for Japanese mid front vowels in Table 2 are [iəi]. Thus, a question arises as to why the Japanese mid front vowel [e] is transcribed as [iəi]. This paper suggests that the Korean transcription ᅨ [iəi] should correspond to the Japanese [ʲe]. In other words, the data in WEYH indicate that the Japanese mid front vowel in the eighteenth century was not as simple as [e]. Instead, the Japanese mid front vowel should have stronger frication before vowel [e] and therefore the compilers turned the frication into glide, perceptually more like [ʲe].

5   Conclusion

The transcriptions of the Japonic languages in the fifteenth and eighteenth centuries suggest that mid front vowels in pre-modern Korean era be presented by vowel combinations, not monophthongs. From the perspective of the Japonic languages, the combinations vary in height in the two languages: the Okinawan mid front vowel being higher than the Japanese mid front vowel. The interaction of onsets and rhymes is also observed in the corpus. In particular, alveolar onsets interact with rhymes with a high front vowel that functions as a prevocalic palatal glide. In addition, the Japanese mid front vowel might be phonetically produced with more frication as [ʲe].

From the perspective of Korean historical phonology, although premodern Korean lacks a mid front vowel as a phoneme, the vowel combinations, ᅴ [ɨi] for Okinawan and ᅦ [əi] for Japanese, indicate that before the

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[6] This can be related to mid vowel raising in Okinawan. According to Ding (2008) and Lin (2017), mid vowels were raised to high vowels in Okinawan, and this process took place between the sixteenth and the nineteenth centuries. In *Ryukyu Luzong hyokairoku*, only a few examples are still transcribed by ᅴ [ɨi]. Mid vowel raising was largely completed in the nineteenth century.

monophthongization of [ə] and [i], the combination of a central vowel and a high front vowel had been predominantly used.

Finally, more data are needed to provide a complete picture of how Korean compilers transcribe mid front vowels in other languages. In addition to Okinawan and Japanese, Chinese is largely recorded by Korean (Chae 1978, 1986). For instance, another historical source, *Yeokeo yuhae* 譯語類解 역어유해 'Classifying and Explaining Chinese' (1690 AD), which is similar to WEYH, was published in the seventeenth century. As Chinese contains a mid front vowel in its phonemic system, including the Chinese data in the corpus would be a great help in seeing if the Chinese data conform to the results obtained from the Okinawan and Japanese data.

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