

Tongguk chŏngun and the phonological system of Middle Korean

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1. Introduction

It is well known that the invention of the Korean alphabet, *Hunmin chŏngŭm*, was accompanied by the reformation of the system of Sino-Korean. Needless to say, Sino-Korean morphemes form an important part of the Korean lexicon in the 15th century as it is in Modern Korean. But it was sometimes difficult to find a regular correspondence between the pronunciations of traditional Sino-Korean and the classical or any other varieties of Chinese, so that the inventor of the new alphabet made great effort to “correct” the pronunciations of Chinese characters systematically. According to Kōno (1940/1979: 191, 1959/1979: 274), this task was initially started as the translation of ‘*Yŭnhuì* (韻會)’ in 1444. Although this ‘translation’ was never completed, the task was carried on by some

members of the Chiphyŏnjŏn and resulted in the compilation of *Tongguk chŏngun* in 1447¹.

The phonological system of *Tongguk chŏngun* can be summarized as consisting of 23 initials, 91 rhymes and 4 tones, and it has been pointed out that the classification and arrangement of the character was deeply influenced by ‘Yŏnhui’. And it has been also pointed out that its phonological framework exactly followed the phonological system of native Korean language described and explained in the *Hunmin chŏngŭm haerye*, so that some authors even believe that the new alphabet was primarily devised in order to transcribe Sino-Korean correctly.

The purpose of the present paper is to discuss the relationship between the system of *Tongguk chŏngun* and the Middle Korean phonological system. Although there have been many studies on the system of *Tongguk chŏngun* itself, questions still remain as to how it was accommodated into the phonological system of Middle Korean.

2. On the artificialness and reality of *Tongguk chŏngun*

When we talk about *Tongguk chŏngun*, it is almost always the case that its pronunciations are *artificial* in that they were nothing but a theoretical reconstruction from Chinese rhyme dictionaries, having nothing to do with the actual, i.e. traditional Sino-Korean pronunciations. Also, their phonetic shapes are sometimes regarded as *artificial*, because they sometimes show such combinations of sounds that were not used for native Korean words.

¹ Other authors do not necessarily agree with this view. Some authors (Kang (2000) and Endo (2010), for example) seem to believe that the translation of ‘Yŏnhui’ and the compilation of *Tongguk chŏngun* was the same thing or directly linked.

These two usages of *artificialness* are abundant in the literature. For example, Kōno (1968/1979: 329) states as follows:

“In this way the sounds of *Tongguk chŏngun* look apparently systematic but this is the result of an artificial arrangement, making it much less useful as a rhyme dictionary.” (translation mine)

Lee and Ramsey (2011: 126) also states:

“The character readings in the *Tongguk chŏngun* dictionary of 1447 were certainly artificial.”

Because of such artificialness, the character readings of *Tongguk chŏngun* have been regarded as far less important than the traditional Sino-Korean readings. The author of the present paper agrees with these opinions regarding the historical study of Sino-Korean.

However I would like to point out that it is equally important to realize that the *Tongguk chŏngun* readings were actually pronounced and expected to be learned by everyone who would like to study the newly created alphabet. This learning must have been practical, rather than theoretical, because the alphabet and the reformed system of Sino-Korean were intended not only for learned people but also for ordinary people. This aspect will be hereafter referred to as the *reality* of *Tongguk chŏngun*.

Recently I have reported an interesting case in which the reality of the system of *Tongguk chŏngun* became more tangible than before (Fukui 2010a, 2010b). During the same period when King Sejong was trying to make a new system of alphabet, he was also engaged in devising a new system of musical notation and composed a few pieces of music. One piece of such music, called *Ch'ihwapyŏng* (致和平), used *Yongbi ŏch'ŏn ka* as its text and was recorded in the *Sejong Sillok* using the new system of musical notation he devised. And by comparing the tones recorded in the text of *Yongbi*

öch'ön ka and the melodies of the musical score of *Ch'ihwapyöng*, it was found that the tones were regularly reflected in the melodies of it. As is well known, Sino-Korean words used in the text of *Yongbi öch'ön ka* appear without sound notations unlike other documents of the same period so that we can only guess at the exact reading of these words. In answering this question, Lee (1962) has concluded that they must have been read by *Tongguk chöngun*, not by the traditional Sino-Korean based on some phonetic evidence. I have reconfirmed this by showing that the melodies associated with these words show regular correspondences with the tones of *Tongguk chöngun* rather than traditional Sino-Korean.

The point is that this music was not only written but *played*, using the reformed system of *Tongguk chöngun*. Also, the extensive use of tone marks indicating different meanings for the same character found in *Yongbi öch'ön ka* can be taken as evidence that they were seriously trying to read documents written in Chinese by using *Tongguk chöngun*, as will be discussed in the section 5 of this paper.

3. Problems in the consonant system

3.1 The ending *-rq*

As is well known, the endings of the Chinese entering tones *-p*, *-t*, *-k* appear as *-p*, *-r*, *-k* in the traditional Sino-Korean. In *Tongguk chöngun*, the ending *-r* was rendered as *-rq* and this has been often regarded as an example of the artificialness of *Tongguk chöngun*.

The aim of this section is to discuss how the ending *-rq* was actually pronounced. First, when a character having this ending was uttered in isolation, it must have been pronounced as [...l?] in principle. But this is apparently an unnatural pronunciation because there are no words ending

in a glottal stop in the native vocabulary of Korean so that we are not sure whether such a pronunciation was easy for an average learner at that time. Secondly, when a Sino-Korean morpheme ending in *-rq* is followed by another Sino-Korean morpheme, the situation is quite different. If the following consonant is a plain obstruent, it seems obvious that the syllable final glottal stop *q* makes the following consonant a reinforced one, as it is always the case with the words having a Sino-Korean morpheme ending in *-r* followed by another Sino-Korean morpheme beginning with either /t/, /s/ or /c/ in Modern Korean. For example, just like the word ‘決斷’ (*kyertan* 결단, ‘decision’) is pronounced as ‘*kyerttan* 결판’ in Modern Korean, the equivalent Middle Korean form of the word ‘*kyuyerqtwan* 결판’ in the *Tongguk chǒngun* reading must have been pronounced as ‘*kyuyerttwan* 결판’. (We will discuss the equivalence of ‘*-rq t-*’ and ‘*-r tt-*’ in a more general form in the next section.) The only difference between the modern version of the reinforcement of plain obstruents following a syllable final *-r* and that of *Tongguk chǒngun* is that the application of this rule is confined to the three consonants mentioned above in the former case while it is expanded to include all plain obstruents in the case of the latter. Although we are not sure about the origin of the modern version of the reinforcement rule, it seems fairly easy for an average learner of *Tongguk chǒngun* at that time to get used to this kind of reinforcement for all plain obstruents because the rule ‘*-rq C- = -r CC-*’, where C stands for a plain obstruent, is so widespread in the phonology of Middle Korean as will be discussed in the next section.

Finally, there is one more thing that should be taken into account when we consider about the ending *-rq* in *Tongguk chǒngun*. This particular combination of consonants found in *-rq* was by no means novel in the phonology of Middle Korean, since *-rq* was used very frequently as a form of transcribing prospective modifiers. And the above mentioned formula

applies in this case too, so that we have two kinds of transcriptions for exactly the same expression as shown in the following pair of examples:

佛道 求ᄃᆞᄃᆞ 사ᄃᆞ미 (月釋 18:60a)
 ppurqttow kkuw-hΛ-rq sarΛm-i “The one who seeks Buddha’s way ...”
 佛道 求ᄃᆞᄃᆞ 싸ᄃᆞ미 (法華 1:242a)
 ppurqttow kkuw-hΛ-r ssarΛm-i (ditto)

It is also interesting to note that when this ending is followed by a consonant other than a plain obstruent, or a vowel, it was written either as *-rq* or simply *-r*, suggesting that in such an environment, where the reinforcement was impossible, the glottal stop *q* had no effect on the following consonant. In such a case the transcription *-r* seems adequate and *-rq* was nothing but a redundant transcription. And in my opinion the same thing can apply in the case of the ending *-rq* in *Tongguk chǒngun*, that is to say, it seems possible that the glottal stop *q* had its effect only when followed by a plain obstruent. Of course it cannot be denied that those who wished to pronounce literally could do so, it seems also likely that a simpler way of pronunciation was available for ordinary people.

3.2 Transcriptions for ‘wholly muddy’ sounds

One of the characteristics of the *Tongguk chǒngun* initial consonants is the use of geminate consonants for the ‘wholly muddy’ (全濁) sounds of Classical Chinese, as shown in the following table.

ㄱᄃᆞ kk	ㄷᄃᆞ tt	ㅍᄃᆞ pp	ㅅᄃᆞ ss	ㅈᄃᆞ cc	ㅎᄃᆞ hh
蚪	覃	步	邪	慈	洪
(群)	(定)	(並)	(邪)	(從)	(匣)

There have been various views regarding how these geminate consonants were pronounced but now most researchers seem to agree that

these notations represent ‘reinforced’ consonants, which are frequently found as an initial consonant in Modern Korean except for *hh*. However, in Middle Korean, only *ss* and *hh* appeared word-initially and all others could not appear word-initially and used only marginally, as shown in the following table.

ㄱ	kk	-ㄱ까 (-rkka), -ㄱ꼬 (-rkko) interrogative ending
ㄷ	tt	-ㄷ따 (-rtta) interrogative ending (for 2 nd person)
ㅍ	pp	홀ㅍㅍ (hɒɾppa < hɒɾq + pa) ‘the place to do ...’ (<i>Mencius ŏnhae</i> 4:10a)
ㅅ	ss	쓰- (ssi-) ‘to write’, 쑈- (ssa-) ‘to be worth’; -ㄱ씨 (-rssai) ‘because’
ㅈ	cc	살찌- (sarcci-) ‘wrinkle’, 눈썹 (nunccaʒa) ‘the pupil of the eye’ (<i>Nŭngŏm kyŏng ŏnhae</i> 2:109a)
ㅎ	hh	헉- (hhye-) ‘to pull’

As can be seen in the above examples, *kk* and *tt* mainly appear as part of a grammatical morpheme, and *cc* appears only as the result of compounding. In the case of *pp*, its examples are even more restricted and found only in the syntactic construction such as the prospective modifier *-rq* plus a noun beginning with *p*. This type of gemination occurred frequently when this ending was followed by a noun beginning with a plain obstruent so that it was often the case that two ways of transcription coexisted for the same expression, one retaining *q* and the other omitting *q*, using a geminate instead. This can be summarized in the following way:

$$-rq\ k- = -r\ kk-, -rq\ t- = -r\ tt-, -rq\ p- = -r\ pp-, -rq\ s- = -r\ ss-, -rq\ c- = -r\ cc-$$

It is interesting to note in passing that we can find two ways of analysis for transcribing the reinforced consonants in Modern Korean: Some authors transcribe such consonants using a glottal element, and others represent them as geminates. Therefore the above formula shows that the people engaged in the invention of the new alphabet made

phonetic observation and phonological analysis in much the same way as modern linguists.

To sum up the observation made so far, geminate consonants *do occur* in the native language of Korean but their distribution is so limited that four out of the six geminate consonants do not appear word-initially. Returning to the original topic, the use of geminates for the ‘wholly muddy’ sounds was made possible in the following way: First, the phonetic material was already available within the native language. Secondly, constraints on the possible position of sounds within a word were changed so that they could appear in other positions.

3.3 Other consonants

The same principle discussed in the last section applies in several other cases. For example, the glottal stop *q* was also used as an initial consonant corresponding to the Classical Chinese initial *yǐng* (影) in *Tongguk chǒngun*, and this can be explained in the following way: the sound in question existed in the phonological system of Middle Korean, and its possible position within a word was changed so as to be able to appear word-initially. Another case of seemingly artificial sound is the use of ㅍ (*w*) for the vocalic ending of certain groups of characters, and this too can be explained as the result of the transposition of an already existing phoneme *w*.

4. Problems in the vowel system

The vowel system of *Tongguk chǒngun* lies basically within the framework of the one described in the *Hunmin chǒngŭm haerye*. But if we consider the vowel system of native Korean words, two cases, namely ㅟ *yuye* and ㅢ

yuyei, seem exceptional in that no such combinations of vowels are found in the native vocabulary. These two vowels are made up by combining the vowels *yu*, *ye*, and *yu*, *ye*, *i*, respectively, so that they are literally transcribed as *yuye* and *yuyei*, but it is obvious that these are not disyllabic. Since the first element *yu* was treated as a single vowel in *Hunmin chǒngŭm haerye*, it can be regarded as a single medial sound contrasting with *y* and *w*. And it can be easily shown that the group of characters having *yu* as its medial sound corresponds to the ones called ‘*cuōkǒuhū*’ (撮口呼) in terms of the Chinese phonology. It is possible to assume that these two vowels have a rounded palatal approximant (semivowel) *ɥ* in front of the main vowel, as shown in the following table.

y	ㅟ : ye [jə]	ㅟㅣ : yei [jəi] or [jei]
w	ㅠ : we [wə]	ㅠㅣ : wei [wəi]
ɥ	ㅡ : ɥe [ɥə]	ㅡㅣ : ɥei [ɥəi] or [ɥei]

If we look at the two vowels in question in this way, we can have a systematic and phonetically plausible three-way contrast among the medial sounds. But one question arises in this analysis: we usually don’t mention the existence of the sound *ɥ* in the phonological inventory, or even in the description of allophones, in Middle Korean. If so, this sound makes a counter-example to the hypothesis raised in the last few sections that the system of *Tongguk chǒngun* uses only those sounds that are already existing in the native Korean vocabulary.

However, in fact one of the seemingly exceptional vowels, *yuyei* (or *ɥei*) is found in the readings of certain groups of traditional Sino-Korean. The following examples, mainly taken from Itō (2007) with a few more examples added by the author, all have the same reading *c^hyuyei* in the traditional Sino-Korean system.

	TrSK	ModSK	gloss	sources
毳	c ^h yuyei	c ^h ui	‘down’	(<i>Chinŏn kwon’gong</i> 20a)
贅	c ^h yuyei	c ^h wei	‘wen’	(<i>Hunmong chahoe</i> 2:16b)
嘴	c ^h yuyei	c ^h ui	‘bill, beak’	(<i>Hunmong chahoe</i> 3:3b)
箠	c ^h yuyei	c ^h u	‘whip’	(<i>Hunmong chahoe</i> 2:13b)
捶	c ^h yuyei	c ^h u	‘thrash’	(<i>Hunmong chahoe</i> 3:13a)
惴	c ^h yuyei	c ^h wei	‘to fear’	(<i>Pönyŏk sohak</i> , <i>Sohak ŏnhae</i>)
揣	c ^h yuyei	c ^h wei	‘to estimate’	(<i>Sinjŭng yuhap</i>)
悴	c ^h yuyei	c ^h wei	‘to be haggard’	(<i>Hunmong chahoe</i> 2:16a)
萃	c ^h yuyei	c ^h wei	‘to collect’	(<i>Pönyŏk sohak</i> , <i>Sohak ŏnhae</i> , <i>Yuhap</i>)

(TrSK: traditional Sino-Korean reading, ModSK: Modern Sino-Korean reading)

As is shown in this table, many of the characters having this reading appear in *Hunmong chahoe* (1527). However, it is also important to note that they are not confined to dictionaries of Chinese characters. We can also find them in the literature concerning Buddhism such as *Chinŏn kwon’gong* (1496) and Confucianism such as *Pönyŏk sohak* (1518) and *Sohak ŏnhae* (1588) so that we can conclude that the syllable c^hyuyei found in the above mentioned characters was generally used, and were by no means peculiar to dictionaries.

By confirming the existence of the vowel *yuyei* (and therefore the existence of the sound *ɥ*) in the traditional system of Middle Korean, it is now possible to maintain the claim that the system of *Tongguk chŏngun* used only such phonetic material that was already there in the traditional system. But several questions still remain: why the occurrence of the vowel *yuyei* is confined to a particular syllable c^hyuyei? Are there any other cases including the sound *ɥ*? For now I have no answer to the first question. As to the second question, there are several interesting examples both in modern speech and in historical data that might be related to the seeming isolated sound.

Discussion: *Tongguk chǒngun* and the phonological system of Middle Korean

First, let us take a look at the following pronunciation found in modern colloquial speech of Seoul speakers.

- (a) 위: wi [wi] ‘the stomach’
- (b) 귀: kwi [kɰi] ‘the ear’, 뒤: twi [tɰi] ‘back’, 쉬다: swita [ʃɰida] ‘to rest’,
쥐: cwi [tʃɰi] ‘a rat, a mouse’

The vowel ㅟ *wi* is pronounced as [wi] when there is no initial consonant but is pronounced as [ɰi] when preceded by an initial consonant. However, this [ɰ] has apparently nothing to do with the one we observed in certain group of Sino-Korean readings, since this vowel was a diphthong like [ui] at that time.

Secondly, in Middle Korean as well as in Early Modern Korean there existed a syllable structure *Cyui*, where *C* stands for any consonant, which later merged with the syllable *Cui* and disappeared. Although there are virtually no examples of a single morpheme containing the syllable **Cyui* in the native vocabulary, examples of morphologically or syntactically constructed syllables of this type can be easily made by adding the nominative case marker *-i* or copula *-i-* to syllables of the type *Cyu* which are very frequent in Sino-Korean morphemes.

To my knowledge, the following is the sole example containing the syllable ㅟ이 *syui* in the native Korean vocabulary.

여췌(LR) *yesyui*: ‘sixty’ cf. 췌(R) *suin*: ‘fifty’

It is interesting to note in passing that this word, meaning ‘sixty’, is apparently a compound of *yer* ‘ten’ and *suin* ‘fifty’ but the second morpheme *syuin* is different from *suin*. There can be two explanations for this: one is that the original shape of the morpheme is preserved in the compound, and another is that the initial consonant of the second syllable

became palatalized because of the assimilation to the first syllable consisting of only front vowels.²

No matter how rare the occurrence of the syllable *Cyui* as part of a genuine native morpheme, such a syllable structure can in fact be seen frequently in some traditional Sino-Korean morphemes and in the syntactic construction explained above. And it seems natural to assume that the vowel *u*, preceded and followed by a close front vowel (or semivowel) in the above syllable structure, was assimilated to the surrounding vowels and pronounced something like [Cyi], where [y] is the IPA symbol for a high front rounded vowel. Since this [y] is a full vowel version of the semivowel [ɥ], the apparently isolated occurrence of the latter is somewhat ameliorated if these two sounds are grouped together.

5. Tonal system of *Tongguk chŏngun*

The tonal system of *Tongguk chŏngun* was basically the same as that of the Classical Chinese, i.e. the four tones of Chinese were mechanically applied to each character in *Tongguk chŏngun*. The phonetic realization of each of the four tones must have been the same as the explanation found in the *Hunmin chŏngŭm ŏnhae*. The level tone must have been a low pitch, the departing tone a high pitch, and the rising tone beginning with a low pitch and ending in a high pitch, as were the cases of the pitch contours of native Korean words.

It is important to note that tones must have been remembered and correctly pronounced for each character even in the case of reading a

² This in fact requires a further explanation. The vowel *e* was normally pronounced as a central vowel [ə] in Middle Korean but it must have a front allophone [e] in the sequence *ye*.

document entirely written in Chinese. This is the reason why small circles, indicating the four tones, were laboriously transcribed in the texts of *Hunmin chŏngŭm haerye* (1446), *Yongbi ŏch'ŏn ka* (1447) and *Pŏphwa kyŏng ŏnhae* (1463).³ The purpose of these small circles, or tone marks, was to distinguish different meanings of a character: for example, the tone of the character '爲' is level tone when it is used with the meaning of 'to do, become', and departing tone when used with the meaning of 'for the sake of'. In this case the level tone is regarded as basic so that it is unmarked and the departing tone is marked by a small circle, and such a character is called *phaŭmja* (破音字).

Although it was possible to have different tones according to the meanings of a character within the traditional Sino-Korean, tones assigned to each Sino-Korean morpheme were sometimes different from those of Classical Chinese so that it seems difficult to make a systematic way of differentiating tones in the framework of the traditional Sino-Korean system. Therefore those who tried to reform the system of Sino-Korean so systematically were obliged to make explicit rules on *phaŭmja*.

To my knowledge, the first scholar who explicitly stated that the application of such tone marks had close relationship with *Tongguk chŏngun* was the late Professor Ahn Pyong Hi. He successfully demonstrated that the tone marked as departing tone in *Hunmin chŏngŭm haerye* and *Yongbi ŏch'ŏn ka* for the character '爲' appears as rising tone in the later literature published at the end of the 15th century which abandoned the system of *Tongguk chŏngun* and adopted the actual, i.e. traditional Sino-Korean readings.

³ The reason why small circles were applied only in *Pŏphwa kyŏng ŏnhae* among other sutras translated at that time is still unclear. Also, the date of publication is more than 15 years later than the other two documents so that the reason for marking tones in *Pŏphwa kyŏng ŏnhae* might have been different from the other two.

In *Yukcho pöppodan kyöng önhæ* and *Sisik kwön'gong*, which abandoned the system of *Tongguk chöngun* and adopted actual Sino-Korean readings, marked the character by two dots, i.e. rising tone. Therefore, we can know that the system of *Tongguk chöngun* lies behind the *Yongbi öch'ön ka* and *Hunmin chöngüm haerye*. (Ahn 1986/1992:191-192, translation mine)

The logic behind this is as follows: as I stated above, the character ‘爲’ was marked by an departing tone when used with the meaning of ‘for the sake of ’ in *Tongguk chöngun* but it had rising tone in the traditional Sino-Korean system so that the very fact that it was marked as departing tone indicates that the character should have to be read by the reformed system of Sino-Korean.

Finally, I would like to point out that the practice of indicating *phaümja* was in fact sometimes difficult especially at the earliest stage of the *Tongguk chöngun*, as can be seen by the confusion of tones assigned to the character ‘將’ in the *Sökpö sangjöl* (1447) and ‘將’, ‘爲’ in the music *Ch'ihwapyöng* (see Fukui (2010a) for more detail).

6. Conclusion

The relationship between the phonological system of *Tongguk chöngun* and that of native Korean, including traditional Sino-Korean, can be summarized as follows:

The phonetic material used in the system of *Tongguk chöngun* was by no means foreign or artificial to the ears of the speakers of Middle Korean. It consisted of only those sounds that can appear in some position in a word in the actual pronunciation of Middle Korean. But the constraints on the occurrence of the sounds in question were tolerated so that they could appear in positions that were otherwise impossible.

To put it differently, seemingly artificial sounds of *Tongguk chǒngun* were located somewhere at the periphery of the core of the Middle Korean phonological system, not outside of it. Whether the above mentioned principle was practical or not for an average learner of the newly created alphabet is an open question; it is certain that such a principle existed and this can be taken as a part of the linguistic background of the people engaged in the invention of the new alphabet and the reformation of Sino-Korean system.

Lastly, the following passage in the *Hunmin chǒngŭm haerye* can be interpreted as a kind of remedy for the above principle:

初聲之ㄱ與ㅇ相似，於諺可以通用也。（合字解）

“The initials *q* and *G* are alike, and interchangeable in vernacular writings.”
(translation mine)

Although the context of this statement is confined to ‘vernacular writings’, it is meaningless to consider those written only in native Korean or traditional Sino-Korean, since no distinction between *q* and *G* (or *zero*) is found syllable-initially. So the intended context of this statement should be those written in native Korean together with Sino-Korean words written or pronounced according to the *Tongguk chǒngun*. If we understand the context of the above statement in this way, it can be taken as a remedy for those who have difficulties in following every detail of the system of *Tongguk chǒngun*.

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Discussion: *Tongguk Chǒngun* and the phonological system of Middle Korean

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For 2 score years or so, the artificiality of *Tongguk chǒngun* has seemed to leave no room of doubt. *Tongguk chǒngun* was considered to be just an adaptation or theoretical reconstruction of *Gujin yunhui juyao* (古今韻會舉要), without any reality or practicality in the 15th century. As is well known, however, studies on different proposition have been continually performed. Kang (2000) and Cho (2011) would be referred to as one of the most important studies which address the independence of *Tongguk chǒngun*. They provided materials that can help to confirm that the phonological system of *Tongguk chǒngun* shows little correspondence to that of *Gujin yunhui juyao*. While it's initial system shows a strong influence from Chinese readings, it's rhyme system, rather, has been found to be edited on the basis of the actual Sino-Korean pronunciation.

This article by professor Fukui would add to the important and meaningful literature on this issue. Although this article generally agrees on the artificiality, it also gives an insightful interpretation with detailed analysis on the reality of *Tongguk chǒngun*.

- 1) This article asserts that *Tongguk chǒngun* readings were actually pronounced and learned by King Sejong's people. The author's previous work (Fukui 2010) on Ch'ihwapyǒng (music note) and *Yongbi ōchǒn ka* (text) are referred to as evidence. I fully agree with the author, and would like to further remind that *Chosŏn wangjo sillkok* (朝鮮王朝實錄) provides some records telling that *Tongguk chǒngun* was taken as an examination textbook from the period of King Sejong to that of Sejo.
- 2) The phonetic materials, seemingly artificial shapes or such as 'ㅇ' ('wholly clear' laryngeal or *q* as transcribed in this article), wholly muddy (各字竝書 or geminates as called by the author) 'ㅁ', 'ㅍ', and 'ㅑ', came rather from the actual pronunciation of Middle Korean. So it is not the case that the phonological system of *Tongguk chǒngun* located outside of the native Korean. Rather does it locate somewhere at the periphery of the Middle Korean.

Detailed argument and elaborate interpretation make this article worth of strong note. I cannot but confess I learned much from the author. But on minor details or peripheral topics to the main theme, I must say I would like to ask a few questions.

- 1) 'ㅁ', (light lip sounds 'ㄹ', 脣輕音 *miŭm*) is simply interpreted here as the phoneme *w* that already existed in the native Middle Korean. Although the phoneme *w* was actually existed in the native Middle Korean, it would have not been the same as 'ㅁ'.

Surely the graph 'ㅁ' must have been designed to represent the Chinese finals of 2 Rhyme groups, i.e. *Xiao she* (效攝) and *Liu she* (流攝). In the Middle Korean, final sounds *w* or *u* of Chinese readings of characters such as '鳩' (鳩), '高' (高) were not pronounced because of phonological constraints on syllabic structure in the 15th century. No

Discussion: *Tongguk chǒngun* and the phonological system of Middle Korean

falling diphthongs having *w* existed in Middle Korean. So ‘鳩’ (𪎐) and ‘高’ (𪎐) would have been pronounced just [구] and [고] respectfully.

- 2) ‘ㅇ’, in syllable ending position, seems to have a deep relevance with ‘reinforcing’ phenomena. Its functional role is thought to be glottalization. But whether it could have had a phonemic position or just a phonetic feature, is still need to be solved.
- 3) ‘ㅞ, ㅟ’ are very unique and interesting, as no such combinations of vowels are found in the native Middle Korean. It is well known that these vowel combinations strictly correspond to *Xie she* (蟹攝) *hekou* (合口) Grade III & IV, i.e., *cuōkǒuhū* (撮口呼) in Chinese Rhyming tables. This article goes further to suggest that these vowels could possibly exist in the native Middle Korean. Examples of ‘𪎐 贅, etc. (c^hyuyei, 𪎐)’ can be accepted as strong evidences.

As the author himself concedes, it is interesting that this syllabic structure is found only with the initial of *ch* (ㄷ). On the contrary, *Tongguk chǒngun* has almost all initials but labial obstruents and liquid (ㄹ). Further investigation is needed to explain this difference in distribution. But evidences from modern Korean monophthongs such as ‘귀 [ky], ㅈ [cy]’ doesn’t seem to support the explanation.

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