

The Phonetics of Korean

Korean is the official language of both North Korea, where it has about 24 million speakers, and South Korea, where it has about 45 million speakers. There are also sizable Korean-speaking populations in China, the United States, and Japan. The history of Korean is not well known before the twelfth century. Only a few Old Korean poems and place names survive from this period. Middle Korean, spoken from the twelfth through eighteenth centuries, is much better known. Until the fifteenth century, it was written using a system called Idu, in which Chinese characters had phonetic rather than ideological values.

In the fifteenth century, King Sejong invented the Hangeul alphabet, a simple, elegant script consisting of twenty-four symbols in its modern form. The characters were based on Chinese pictographs representing parts of the vocal organs and heavenly bodies (Cho 1967). The alphabet is highly phonemic and reflects phonetic contrasts such as those between front and back vowels and aspirated and unaspirated consonants. Due to centuries of Chinese influence, Korean contains a very large number of Chinese loanwords in addition to the native vocabulary. These loanwords make up more than half of the lexicon, based on the etymologies given in the dictionary. Korean is probably genetically related to Japanese and the Altaic language family, but this is not agreed on.

My subject, Nina Won, is a native speaker of Korean. She is eighteen years old and was born in Guam, where her father was stationed in the military. She lived in Korea for a few years when she was very young, then moved to Los Angeles, California, where she lived until coming to Cornell this year. She mainly speaks Korean at home with her

parents, who both are originally from Seoul, South Korea. Nina did not know how to write Korean until this year but has now learned it in a class at Cornell.

Nina's dialect has a standard inventory of 21 consonant phonemes. Korean has stops at four places of articulation: bilabial, alveolar, postalveolar affricate, and velar. It is unusual in having three phonation types for every place of articulation. All of these phonation types are considered to be voiceless in most environments (Lee 1999). The stops are illustrated in the first 12 entries of the word list. First, there are the voiceless unaspirated stops /p t tʃ k/, similar to the French voiceless stops. Next are the glottalized stops /p' t' tʃ' k'/, which are somewhat similar to ejectives in that they are accompanied by glottal tension and increased intensity. Finally, the aspirated stops /p^h t^h tʃ^h k^h/ are much more strongly aspirated than their English counterparts.

In contrast to its large number of stops, Korean has only three fricatives (words 13-15): /s/, which is similar to the English sound, /s'/, which is glottalized and similar to the glottalized stops, and /h/, which is strongly aspirated. Next are the three nasal consonants /m n ŋ/, in words 16-18. As in English, /ŋ/ does not occur in syllable initial position. Last, Korean has three approximants, words 19-21, including two glides /w j/, and one liquid /l/. The glides only occur before vowels, and are sometimes considered to be components of diphthongs. /l/ is quite different from its English counterpart, as is explained below.

Nina has a somewhat reduced vowel inventory in that she has only seven contrastive vowel qualities, /i ε a o u ʌ ʊ/, instead of the traditional nine, which also

include /e ø/. The vowels are illustrated in both their short and long forms in words 22 through 39. Like many other speakers of the Seoul dialect (Lee 1999), Nina pronounces the mid front rounded vowel /ø/ as the diphthong [wɛ]. She also pronounces both /ɛ/ and /e/ as [ɛ], even in diphthongs. As Eisenberg (2000) explains, “the distinction in pronunciation between ㅓ [ɛ] and ㅕ [e] is being lost in casual Korean speech among people who are under age 40.” For some reason, Nina pronounced the /e/ vowel in words 24 and 25 as [i] during the recording, but in all other cases she pronounced it as [ɛ] (e.g. words 41 and 55). Note that the short vowels tend to be more central than the long vowels, with the exception of /ʌ/, for which the long version is more central than the short version (compare words 34 and 35).

After meeting with Nina the first time, and making a broad transcription of the word list, I was quite convinced that she totally neutralized all vowel length differences, which are normally contrastive in Korean. Therefore, I carelessly decided not to include vowel length when I copied phonemic transcriptions out of the dictionary. When I made the narrow transcription of the word list based on the recording, I wrote down vowel length as best as I could perceive it. Afterwards, I noticed that vowel length did not follow any sort of pattern, and I started to wonder if my original conclusion might have been wrong. I went back to the dictionary and looked up the vowel length for all of the words in the list. I was surprised to find that my narrow transcriptions of vowel length agreed with the dictionary for 62 out of 69 words. The exceptions were numbers 15, 17, 21, 25, 29, 42, and 55. Since her vowel length pattern is unpredictable but also conforms to the standard, I now believe that Nina does use vowel length contrastively.

After the illustrations of the phoneme inventory, the word list demonstrates several important phonological alternations in Korean. Words 40 through 49 show the intervocalic voicing of the voiceless unaspirated obstruents /p t tʃ k s/. Basically, these obstruents are voiced when they are in intervocalic position:

[−sonorant, −glottal tension, −spread glottis] → [+voice] / V ___ V

The stops /p t tʃ k/ are completely voiced intervocalically, pronounced as [b d dʒ g], while the fricative /s/ is only partially voiced, like [z̥]. /h/ also becomes voiced /f/ in intervocalic position, as in words 38 and 68.

Words 50 through 53 show the pattern of liquid centralization in Korean. The liquid /l/ is normally an alveolar lateral in word-initial position, although it is quite rare in this position in native Korean words and is mainly found in recent borrowings (words 50 and 51 are two obvious English loanwords). In intervocalic position, it becomes an alveolar tap, [ɾ], which is quite distinct from intervocalic [d] (compare words 30 and 31):

[+approximant, +consonantal] → [−lateral, +tap] / V ___ V

While listening to the recording, I noticed that /l/ seemed to have another variant in syllable-final position, as in words 12, 35, 41, and 48. I initially thought that this was a velarized lateral [ɫ], but then decided that this allophone was a retroflex lateral [ɭ]:

[+approximant, +consonantal] → [−anterior, −distributed] / V ___ V

Lee (1999) makes the same conclusion, and also suggests that /l/ is pronounced as /ɭ/ before the vowel /i/, but I did not observe this in Nina's speech (see words 51 through 53).

Words 54 through 57 illustrate Korean sibilant palatalization. The sibilant /s/ becomes /ʃ/ when it precedes the high front vowel /i/:

[+sibilant] → [-anterior] / ____ [+syllabic, +high, -back]

This rule might also operate vacuously on the phonemes /tʃ tʃʰ tʃʰ/, but they probably should not be considered sibilant in Korean since they pattern with stops. Sibilant palatalization is a common assimilation rule and is also found in Japanese. This rule can interact with the intervocalic voicing rule to produce the sound /ʒ/, as in word 62.

The next set of words, 58 through 61, illustrates syllable final coronal neutralization. At the end of a syllable, all simple coronal consonants are pronounced as the unreleased voiceless stop [t̚]:

[+coronal] → [-continuant, -distributed, +anterior, -released] / ____]_{syllable}

Korean has a similar rule that neutralizes bilabial consonants to unreleased [p̚] in the same environment, but this is much less common. Velar consonants are also pronounced as unreleased [k̚] in this environment in standard Korean (Lee 1999). In Nina's pronunciation, however, they are clearly pronounced as preglottalized [ʔk], and not as [k̚], as can be heard in words 16, 27, 36, 37, 56, and 65.

One nonstandard aspect of Nina's speech is her use of stress. Lee (1999) clearly indicates that, in standard Korean, stress is determined by syllable weight: the first syllable of a word is stressed if it is heavy, while the second is stressed otherwise. However, Nina clearly stresses the first syllable of all polysyllabic words in the word list! (This is part of the reason that I originally thought that she did not distinguish between

long and short vowels.) Words 62 through 67 show the environments in which stress normally occurs on the first syllable, and 68 and 69 show the environment in which the stress normally occurs on the second syllable.

The totally simplified stress in Nina's speech is puzzling, but it should not affect her ability to make herself understood, since stress is not a contrastive feature in any variety of Korean. It is possible that her speech is actually normal, since Park (1968) writes that Korean stress is "on the consonants ... It is most powerfully expressed on the aspirated sound series." Thus I have two contradictory sources, but I am inclined to believe Lee since his article is newer and since he describes the rest of the phonology more accurately.

Korean has a large number of other phonological rules which I was not able to illustrate here. Many of these are assimilation rules that limit consonant clusters, and mainly occur in morphologically complex words and phrases. For example, obstruents followed by sonorants are reduced to clusters of nasals (Park 1968): /pm/ becomes [mm], /tm/ becomes [nm], and /kl/ becomes [ɲn]. This is consistent with the cross-linguistic tendency to disallow clusters of sounds with low sonorance. Korean also has the strong propensity to "syllabise a word by pronouncing a consonant and vowel as a unit" (Park 1968). Basically, syllables are CV whenever possible. This frequently causes coda consonants to join the onset of the following syllable, a process similar to liaison in French.

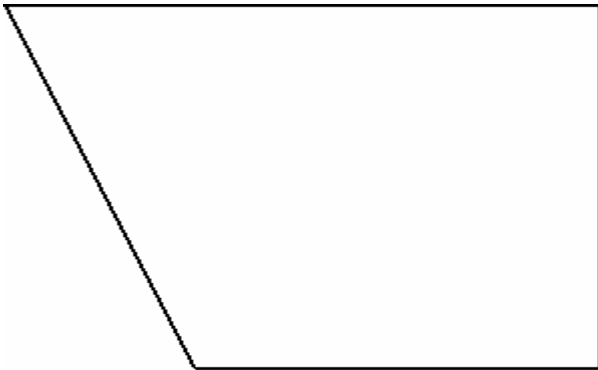
Phoneme Charts

Consonants

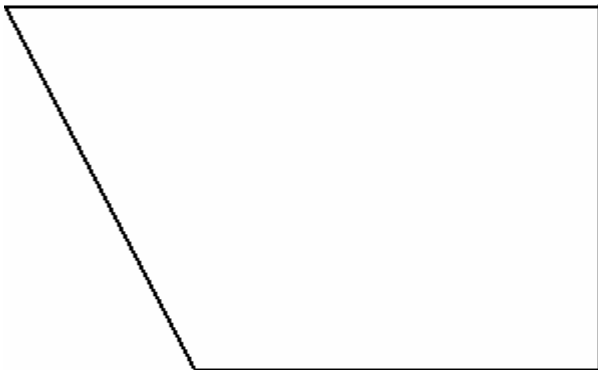
	Bilabial	Alveolar	Post-alveolar	Palatal	Velar	Glottal
Plosive	p' p ^h p	t' t ^h t			k' k ^h k	
Nasal	m	n			ŋ	
Fricative		s' s				h
Affricate			tʃ' tʃ ^h tʃ			
Approximant	w			j	w	
Lateral approximant		l				

Vowels

Long Vowels



Short Vowels



(These two vowel charts are based on those in Lee 1999.)

Word List

Procedure

Almost all of these words were elicited from the subject by asking her if she knew words with certain sounds. A few were taken from Lee (1999). I tried to pick words that were at least near-minimal pairs, especially for the illustrations of vowel length contrast.

I made the broad transcriptions as I heard each word for the first time, then asked the subject to show me the Korean orthography for each word. I confused the three different obstruent phonation types very frequently, and corrected these errors in the broad transcriptions.

Afterwards, I looked up all of the words in a dictionary (Martin et al. 1967) in order to confirm the orthography and also to find out the canonical phonemic representations for these words. Since the Hangeul alphabet is almost totally phonemic, the phonemic transcriptions given below are basically just romanizations of the Hangeul orthography.

Finally, I made the narrow transcriptions based on the tape recording. I made the narrow transcriptions without looking at any of the other transcriptions, so that my perception of the sounds on tape would not be biased by other information. I had more or less memorized the word list by then, however, so it is likely that I was slightly influenced by the “standard” forms of the words.

Phoneme Inventory

Consonants

Stops

	ORTHOGR.	PHONEMIC	BROAD	NARROW	GLOSS
1)	바보	/pa:.'po/	pabo	'pa:bo	'stupid'
2)	빨간	/'p'al.kan/	p'algan	'p'al.gãn	'red'
3)	파	/p ^h a/	p ^h a	'p ^h a	'green onion'
4)	다	/ta:/	ta	'ta:	'all'
5)	따다	/t'a.'ta/	t'ada	't'a.da	'to pick'
6)	타다	/t ^h a.'ta/	t ^h ada	't ^h a.da	'to burn'
7)	자다	/tʃa.'ta/	tʃada	'tʃa.da	'to sleep'
8)	짜다	/tʃ'a.'ta/	tʃ'ada	'tʃ'a.da	'to squeeze'
9)	차	/tʃ ^h a/	tʃ ^h a	'tʃ ^h a	'tea'
10)	가발	/'ka:.pa /	kabal	'ka:.ba	'toupee'
11)	까다	/'k'a.'ta/	k'ada	'k'a.da	'to peel'
12)	칼	/'k ^h a /	k ^h a	'k ^h a	'knife'

Fricatives

13)	사다	/sa.'ta/	sada	'sa.da	'cheap'
14)	싸다	/s'a.'ta/	s'ada	's'a.da	'to pack'
15)	하얀	/'ha:.jan/	hajan	'ha.jãn	'white'

Nasals

16)	마약	/ma.'jak/	majak	'ma.ja ² k	'cocaine'
17)	나	/na/	na	'nã:	'me'
18)	앙심	/aŋ.'sim/	'aŋsim	'ãŋ.ŋĩm	'grudge'

Approximants

19)	와다	/wa.'ta/	wada	'wa.da	'to come'
20)	라틴	/la.t ^h in/	lat ^h in	'la.t ^h ĩn	'Latin'
21)	야채	/'ja:tʃ ^h ε/	jatʃ ^h ε	'ja.tʃ ^h ε	'vegetable'

Vowels

22)	시뻘	/si.'p'al/	ʃip'al	'ʃi.p'al	'damn!'
23)	시장	/'si:tʃaŋ/	ʃidʒaŋ	'ʃi:dʒãŋ	'market'
24)	베개	/pe.'kε/	pige	'pi.gε	'pillow'
25)	베다	/'pe:.ta/	pida	'pi.da	'to cut'
26)	태우다	/t ^h ε.'u.ta/	t ^h εuda	't ^h ε.wu.da	'to burn'
27)	태극기	/'t ^h ε:.kuuk.i/	t ^h εguki	't ^h ε.gu ² k.i	'Korean flag'
28)	말	/'mal/	mal	'maɭ	'horse'
29)	말	/'ma:l/	mal	'maɭ	'speech'
30)	보랏	/po.'las/	polat	'po.rat ⁷	'purple'
31)	보다	/'po:.ta/	poda	'po:.da	'to look at'
32)	구두	/ku.'tu/	kudu	'ku.du	'dressy shoes'
33)	구름	/'ku:.lum/	kurum	'ku:.rũm	'cloud'
34)	버섯	/pʌ.'sʌs/	pʌʒʌt	'pʌ.ʒʌt ⁷	'mushroom'
35)	벌	/'pʌ:l/	pʌɭ	'pʌ:l	'bee'
36)	음악	/u.'m.ak/	uumak	'ũ.ma ² k	'music'
37)	음식	/'u:m.sik/	uumʃik	'ũ:m.ʃi ² k	'food'
38)	교회	/'kjo:.hø/	kjohe	'kjo.f ^w ε	'church'
39)	외손	/'ø:.son/	weson	'wε:.zõn	'with one hand'

Alternations

Obstruent Voicing

40)	발	/ˈpaɭ/	pal	ˈpaɭ	‘foot’
41)	텔레비	/ˈtʰel.le.pi/	tʰɛɾɛbi	ˈtʰɛˀ.rɛbi	‘TV’
42)	둘	/ˈtu:l/	tul	ˈtuɭ	‘two’
43)	가다	/ka.ˈta/	kada	ˈka.da	‘to go’
44)	쥐	/ˈtʃwi/	tʃwi	ˈtʃwi	‘mouse’
45)	수저	/su.ˈtʃʌ/	sudʒʌ	ˈsudʒʌ	‘spoon’
46)	기	/ˈki:/	ki	ˈki:	‘ear’
47)	아기	/a.ˈki/	agi	ˈagi	‘baby’
48)	스물	/suw.ˈmuɯɭ/	sumuɯɭ	ˈsũmuɯɭ	‘twenty’
49)	어서	/ʌ.ˈsʌ/	ʌzʌ	ˈʌz̥ʌ	‘quickly’

Liquid Centralization

50)	라디오	/la.ˈti.o/	ladio	ˈla.di.o	‘radio’
51)	리본	/li.ˈbon/	libon	ˈli.bõn	‘ribbon’
52)	머리	/mʌ.ˈli/	mʌɾi	ˈmʌ.ri	‘hair’
53)	사리	/sa.ˈli/	sari	ˈsa:ri	‘side dish’

Sibilant Palatalization

54)	생어	/ˈsɛŋ.ʌ/	sɛŋʌ	ˈsẽŋ.ã	‘fish’
55)	세	/ˈse:/	sɛ	ˈsɛ	‘three’
56)	시작	/ˈsi:tʃak/	ʃidʒak	ˈʃi:.dʒaˀk	‘to start’
57)	신발	/ˈsin.paɭ/	ʃimbal	ˈʃĩn.baɭ	‘shoe’

Coronal Neutralization

58)	맛	/ˈmas/	mat	ˈmatˀ	‘taste’
59)	듣다	/ˈtut.ta/	tutda	ˈtutˀ.da	‘to hear’
60)	바깥	/pa.ˈkʰatʰ/	pakʰat	ˈpa.kʰatˀ	‘outside’
61)	찾다	/ˈtʃʰatʃ.ta/	tʃʰatda	ˈtʃʰatˀ.da	‘to look for’

Simplified Stress

Heavy Syllable: Long Vowel

62)	개신	/'kɛ:.sin/	kɛʃin	'kɛ:ʒ̃.ĩn	'renewal'
63)	사절	/'sa:.tʃʌl/	sadzʌl	'sa:.dʒʌl	'denial'

Heavy Syllable: Closed

64)	공담	/'koŋ.tam/	koŋdam	'kõŋ.dãm	'gossip'
65)	묵다	/'muk.ta/	mukda	'mu ² k.ða	'to lodge'

Heavy Syllable: Long Vowel and Closed

66)	심판	/'si:m.p ^h an/	ʃimp ^h an	'ʃĩ:m.p ^h ãn	'trial'
67)	인상	/'in.siŋ/	uŋʃiŋ	'ĩn.ʃĩŋ	'increase'

Light Syllable

68)	기회	/'ki'hø/	kihɛ	'ki.f ^w ɛ	'opportunity'
69)	합의	/'ha'p.ɯi/	habe	'ha.bɯɛ	'agreement'

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