

NATIVE-LIKE L2 KOREAN PRONUNCIATION:
POTENTIAL EFFECTS OF HANGEUL PHONETIC INSTRUCTION

By

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Abstract

For English monolinguals, Korean consonants tend to be difficult to pronounce due to the languages using different features to distinguish them. One prominent example of this is how English distinguishes consonants by vocal cord activation, and Korean, by how much breath is expelled. There have been attempts to lighten the load for Anglophone Korean learners such as Romanization, a transliteration system based on expressing Korean sounds with English orthography. However, relying on this method can hinder the Korean learner from achieving native-like pronunciation since some Korean sounds have no equivalent in English. Often, the result of learning through Romanization is the inaccurate, and sometimes unintelligible, pronunciation of Korean words as if they were English.

In order to fill this gap of Korean pronunciation pedagogy, it is proposed in this paper that teaching Anglophones the phonetic significance of the consonants of the Korean alphabet Hangeul will help them achieve more native-like fluency. Because the various shapes of the letters themselves signify the manner and location of production in the vocal tract, it is hypothesized that the experiment participants will be able to not only learn native-like Korean pronunciation, but do so without Romanization.

However, in the beginning stages of the experiment, International Phonetic Alphabet transcriptions will be provided as an intermediary to guide the participants in their note-taking. At the end of the experiment, native Korean speakers will rate the degree of native-like pronunciation of each participant. Should this method of Korean pronunciation instruction prove successful, it could be applied in Korean language programs across the U.S., and be of use to other researchers who are also interested in alternate methods of language pronunciation pedagogy.

Introduction

Problem statement

When Hangeul was created in 1446, each letter was carefully crafted for ease of learning; the vowels are based on three strokes that represent the earth (a horizontal line), humans (a vertical line), and the heavens (a dot), while the consonants are simplified diagrams of the vocal tract when producing the sounds (You, 1997). The sounds and written representations of the Korean consonants will be the focus of this experiment. Korean consonants are distinguished by different criteria than those of English. The former depend on the degree of aspiration (how much air is expelled during their production), while the latter depend on voicing (the activation of the vocal chords) (Cho et al., 2002; Ha et al., 2009).

Since Korean does not use the Latin alphabet, beginner Anglophone students of Korean are taught how to read the Korean alphabet Hangeul by means of a transliteration system called Romanization (Lee, 2003). While Romanization could be useful in giving a rough guideline for pronunciation, the Latin letters represent English sounds to the native Anglophone student, not Korean ones (Lee, 2003; Bassetti, 2008). If a student who is unaware of Romanization's limitations learns to pronounce Romanized words as if they are English, they can only achieve an approximation of the target Korean sounds (Bassetti, 2008). This is further complicated because of the varied regional accents of English. It follows that a student from California will pronounce the same Romanized word differently from a Floridian, or someone from New Zealand.

The effects of learning inaccurate pronunciation are many: discrimination by native speakers, low confidence and low desire to interact with native speakers, reading and spelling difficulties, and inability to comprehend the spoken language are a few possible outcomes (Tsurutani, 2012; Gearing & Roger, 2018). Because of these kinds of things, students get

discouraged and give up on learning Korean, never reaching the level of fluency that they originally desired to achieve (Gearing & Roger, 2018). A lack of interest in learning Korean cannot be blamed for this. In recent years, the Korean culture's global rise in popularity has inspired a wave of young people to learn the language (Chan & Chi, 2016). There are many aspiring Korean learners, but there will be fewer successful non-native Korean speakers if changes in Korean pronunciation pedagogy are not made. This is, of course, not to imply that a language must only be spoken with native-like pronunciation in order to be successful in forming and maintaining intercultural personal and business relationships. On the contrary, the view held by the author is that any level of communication in a language has value, but that more native-like pronunciation facilitates communication between non-native and native speakers. Each student has their own goals for language learning success, but in the classroom they need to be provided the tools that can guide them on the path to native-like pronunciation and fluency, should they choose to take it. If they are not provided those necessary tools, they can lose motivation for even their least ambitious language learning goals. Therefore, the great differences between Korean and English pronunciation and grammar must be explained in an accessible and accurate way so that students can successfully achieve their desired level of Korean fluency, and decrease potential miscommunications in their personal and business relationships with native Korean speakers. Some might say that achieving more native-like pronunciation may be impossible to teach to adult learners, but in Jong-mi Kim's 2012 study on an accent reduction course for adult Korean-learning American English native speakers, it was found that accent reduction was successful (Kim, 2012).

Others may devote their research on the best way to teach Korean grammar, but this experiment focuses on pronunciation instruction without using Romanization. If the problems

arising from insufficient and inaccurate pronunciation instruction are not solved, the potential diplomats, businesspeople, artists, etc. of the future who could make great strides in bridging the gap between American and Korean culture might never reach their goals due to discouragement and miscommunication.

Purpose of study

Since Romanization causes problems for pronunciation and written Korean consonants are in themselves guides for pronunciation, it would seem that in order to learn more native-like pronunciation, one should learn from Hangeul directly. The purpose of this proposed experiment is to discover the effect that teaching the phonetic significance of Hangeul consonants has on the pronunciation of beginner Korean learners.

Research Question

What effect does teaching the phonetic significance of the shapes of the Hangeul consonants have on the pronunciation of beginner Korean learners?

Hypothesis

Teaching the phonetic significance of the shapes of the Hangeul consonants by means of illustrations and IPA (International Phonetic Alphabet) transcriptions will yield more native-like pronunciation by beginner Korean learners than that of those who are taught Korean Romanization.

Materials

Slides: These are 3 Google Slides presentations. The first explains plain consonants (7 slides), the second explains the difference between tense and aspirated consonants (6 slides), and the third (8 slides) explains batchim and “quick tips” for assimilations.

Reference sheet: This is 3 pages of condensed explanations of the Hangeul consonants, their phonetic significance, and their transcriptions into IPA. It is a reference tool for the experiment participants once they are taught how to read and pronounce Hangeul consonants.

Quizlet: This is a collection of virtual flashcards with Hangeul consonants, IPA transcriptions, illustrations, and an audio sample of each consonant. With these, the participants will review and self-test their knowledge in the between the time of initial instruction and the testing period.

Word list: This is the list of "words" that will be used to test the participants' reading and pronunciation of the instructed content. Each "word" contains an environment that may affect the pronunciation of the target consonant.

Methodology

Content of Instruction

With the reference being an image of the vocal tract in a leftward facing sagittal section, the Hangeul consonants are simplified depictions of the articulators specific to producing each sound (Lee, 2019; You, 1997). There are 19 consonants in total: 9 plain, 5 tense, and 5 aspirated (Lee, 2019). During consonant production, if barely any air is expelled from the mouth, the consonant is “tense”. If some air is expelled, it is “plain”. If a lot of air is expelled, it is “aspirated” (Cho et al., 2002).

Table 1: All consonants in Hangul with their IPA equivalents.

Hangul (dark cells)										IPA (light cells)									
ㅁ	m	ㅂ	p	ㄴ	n	ㄷ	t	ㄹ	l/r	ㄱ	s	ㅈ	tʃ	ㅋ	k	ㅇ	ㅇ		
		ㅃ	p ^h			ㅌ	t ^h					ㅊ	tʃ ^h	ㅋ	k ^h			ㅎ	h
		ㅍ	p̥			ㅍ	t̥			ㅅ	s̥	ㅆ	tʃ̥	ㅋ	k̥				

When these consonants are first introduced to the participants, their IPA transcriptions will be provided as a reference like in the table above. Unlike Romanization which can have many interpretations of pronunciation due to regional accent variations, IPA is composed of a collection of symbols that represent one sound each (Lee, 2003). This enables one who knows what the symbols stand for to understand the precise pronunciation of the target word without much ambiguity, regardless of one’s native language. Using IPA in the instruction instead of Romanization, therefore, is likely to result in more accurate pronunciation. Furthermore, since the experiment participants will most likely be taking notes, these IPA transcriptions will be provided as a guide in order that they will not devise their own method of Romanization in an attempt to memorize which sounds are represented by which Hangeul letters. Of course, the

participants will be encouraged to reference the IPA as little as possible since the danger of relying solely on the transcriptions instead of achieving literacy is still present. Some IPA transcriptions of the consonants do overlap with those of Romanization, but certain diacritics are added to the IPA symbols to indicate variations of the basic sound. This is contrasted by some forms of Romanization that rely on doubling Latin letters to stand for a tense Korean consonant, or using an unvoiced consonant instead of a voiced one to represent an aspirated Korean consonant (Lee, 2003). As explained before, this is insufficient because Korean consonants are not distinguished by voicing.

Because the participants will not be trained as linguists, specific references to English will be provided for three consonants. These three consonants have IPA symbols that will be unfamiliar to the participants. And so to minimize the amount of new symbols they will have to learn, these references to English sounds and spellings are given.

ㅈ is represented by the IPA as /tɕ/. This is a combination of the separate symbols /t/ and /ɕ/. The symbol ɕ represents a sound similar to the English “sh” sound but it is produced with the tongue tip behind the bottom front teeth. In English, “sh” is typically produced with the tongue touching the alveolar ridge which is the bump behind the top front teeth.

ㄹ is pronounced similarly to the dark English “l” as in the word “all” everywhere except in between vowels. There, it is pronounced /ɾ/ which is the same sound as the “dd” in American English “ladder” and the “r” in Spanish “pero” (Kim, 2005; Ha et al., 2009).

When written at the bottom of a syllable block, ㅇ is pronounced as the last sound in a syllable, which is /ŋ/ (Ha et al., 2009).

The written consonants were originally divided by what part of the vocal tract they are modeled after: the lips, the tongue, and the throat. These places of articulation are mostly accurate to the actual locations of production, with the exception of \circ , which is not articulated by the throat. The table below shows the Hangeul consonants organized by place of articulation and degree of aspiration.

Table 2: Korean consonants organized by place of articulation and degree of aspiration.

	Lips		Tongue tip behind top teeth			Tongue tip behind bottom teeth		Back of tongue with roof of mouth		Throat
Plain	ㅁ	ㅂ	ㄴ	ㄷ	ㄹ	ㄱ	ㅋ	ㆁ		
Aspirated		ㅃ		ㅌ			ㆁ		ㅎ	
Tense		ㅍ		ㅈ		ㅊ	ㅍ			

Some of the consonants not only depict the place of articulation but also the manner of articulation, or, the way that the consonant is produced. Of the 9 plain consonants, 6 only show the place of articulation: \uparrow , \downarrow , ㄹ , ㅁ , ㄱ , and \circ . As for ㄷ , ㅂ , and ㅋ , these depict the manner of articulation in addition to the place. The aspirated consonants ㅋ , ㅌ , ㅃ , ㅊ , and ㅎ , as well as the tense consonants ㅍ , ㅈ , ㅍ , ㅊ , ㅊ , all indicate the manner of articulation in their written forms. ㅎ is not a plain consonant, but since it is unique in lacking a plain consonant equivalent in regards to pronunciation, it is taught along with the plain consonants for this experiment.

Plain Consonants (ㄱ, ㄴ, ㄷ, ㄹ, ㅁ, ㅂ, ㅅ, ㅇ, ㅈ, ㅊ)

The plain consonants based on lips are ㅁ and ㅂ. ㅁ is designed to recall the image of two lips being closed like a box to make /m/. With the box of ㅁ as a baseline, ㅂ shows two vertical lines rising from the top corners, symbolizing air escaping from the lips to produce /p/. By showing that there is air release, ㅂ contains instructions for the manner of articulation.

The shape of tongue is the inspiration for the majority of the plain consonants. To make the /k/ of ㄱ, the back of the tongue rises up to make contact with the velum. This contact is represented by the right angle. Similarly, ㄴ reflects the tip of tongue rising up to make contact with the alveolar ridge when producing /n/. Adding onto the base tongue position is ㄷ, with a line on top of ㄴ to illustrate the manner of articulation, which consists of firm contact with the roof of mouth and then expelling a little air to create /t/. ㄹ is more difficult to interpret at a glance, but it is meant to be the tongue curling to hover under alveolar ridge for the production of either /l/ or /r/. The shape of ㄷ originally was intended to be the tip of the tongue meeting the base of the incisors, but from the results of this experiment's preparation research, it seems the place of articulation has changed since the 15th century: The research survey shows that the native Korean participants tend to pronounce the /s/ of ㄷ with their tongue tip behind the bottom front teeth. To encourage a modern native-like pronunciation, the phonetic symbolism of ㄷ that

will be taught for this experiment is that its shape is similar to that of the tongue tip behind the bottom front teeth with the blade of the tongue raised toward the alveolar ridge. Like ㄴ becoming ㄷ, ㅌ also represents firm contact with the roof of mouth while maintaining the same tongue position as ㄴ in order to produce /tɛ/.

The last place of articulation is the throat. While ㅍ is not produced in the throat, its sound /ɸ/ is pronounced so far back against the velum that it can be said to almost be the “throat sound” it was originally claimed to be. The circle shape of ㅍ is meant to reflect an open throat. Likewise, the aspirated consonant ㅑ also has that circle, with the addition of two lines (either both horizontal or only the lower one) to indicate the burst of air from the throat that results in the glottal sound /h/.

Aspirated Consonants (ㅋ, ㆁ, ㆁ, ㆁ, ㆁ)

There are 5 aspirated consonants: ㅋ, ㆁ, ㆁ, ㆁ, ㆁ. In non-linguist terms, aspiration refers to extra air being expelled from the lungs during the production of a sound. As can be seen from their plain consonant counterparts ㄱ, ㄴ, ㅁ, and ㅌ, the first 4 aspirated consonants were created through the addition of an extra line (or 2 lines, in the case of ㅁ to turn it into ㆁ) to denote that burst of air. The plain counterpart of ㆁ is ㅍ, but as the former represents /h/ and the latter, /ɸ/, they do not share the relationship of differing in degree of aspiration.

The IPA contains a diacritic that denotes aspiration: /^h/. Aspirated consonants are produced with much air being expelled, as compared to the plain consonants. This difference can be better illustrated with the example of the English word “park” (/p^hɑ:k/ in ipa) contrasted with “spark” (/spaɪk/). “Park” is pronounced with an aspirated /p/, but “spark” is not.

Tense Consonants (ㅌ, ㄷ, ㅃ, ㄴ, ㄸ)

The 5 tense consonants are represented by two small plain consonant counterparts: ㅌ, ㄷ, ㅃ, ㄴ, ㄸ. Tense consonants are the opposite of aspirated ones in that they are produced with very little air being expelled. This is denoted in the IPA with /_̚/ being written under the tense consonant.

On a spectrum of degree of air release, tense consonants would be at the end with very little air being released, aspirated consonants would be at the other end with much air being released, and plain consonants would be somewhere in the middle, a bit closer to the aspirated end.

Table 3: Plain, aspirated, and tense consonants in Hangul with their IPA equivalents

Airflow	Sounds in IPA with Hangul									
Plain	ㅍ	/p/	ㅊ	/t/	ㅅ	/s/	ㅈ	/tɕ/	ㅋ	/k/
Aspirated	ㅍ ^h	/p ^h /	ㅊ ^h	/t ^h /			ㅈ ^h	/tɕ ^h /	ㅋ ^h	/k ^h /
Tense	ㅍ _̚	/p _̚ /	ㅊ _̚	/t _̚ /	ㅅ _̚	/s _̚ /	ㅈ _̚	/tɕ _̚ /	ㅋ _̚	/k _̚ /

Batchim (/k̚/, /t̚/, /p̚/)

Usually Korean consonants are made by some sort of closure in the vocal tract and then releasing air after the articulatory movement. This is the case when the consonant is followed by

a vowel. The only time a consonant will not be followed by a vowel is when it is in the final, or batchim, position at the bottom of a syllable block. In this case, the vocal tract is in the position to produce the consonant, but no air is expelled, and the consonant remains unreleased (Cho, 2016; Kim & Jongman, 1996; Ha et al., 2009). The IPA denotes an unreleased consonant with /̚/ above the IPA symbol.

Since air release is a distinguishing feature for Korean consonants, some consonants sound the same when they are in the batchim position (Cho, 2016). These are divided into three groups based on the place of articulation. ㄱ, ㅋ, and ㆁ are produced with the back of the tongue touching the soft palate, so /k̚/ is their batchim pronunciation. ㄷ, ㅌ, ㄴ, ㄹ, ㄺ, ㄻ, ㄼ, and ㄽ are produced with either the blade or the tip of the tongue touching the alveolar ridge, so /t̚/ is their batchim pronunciation. ㅁ, ㅂ, and ㅃ are produced with closed lips, so /p̚/ is their batchim pronunciation. For the English speaker unfamiliar to consciously producing unreleased consonants, saying the three words “tacks, tats, taps” and then stopping as if interrupted right before saying the final “s” will result in sounds similar to the Korean /k̚/, /t̚/, /p̚/.

When there is a vowel starting the syllable immediately following one with batchim, then batchim consonants are pronounced as they are originally written. For example, ㄱㅏ is pronounced as /kaka/, ㅋㅏ as /k^hak^ha/, and ㆁㅏ as /kaŋa/. However, to the English speaker’s ear, ㆁㅏ sounds less like /kaka/ and more like /kaga/ because the surrounding vowels influence the unvoiced /k/ to become a bit voiced (Cho et al., 2002; Cho, 2016; Ha et al., 2009). In order to make it easier for the experiment participants to hear and produce inter-vocalic batchim

consonants clearly, they will be instructed to pronounce inter-vocalic ㄱ, ㄷ, ㅂ, and ㅈ as their voiced counterparts /g/, /d/, /b/, and /dʒ/.

Assimilations (Palatalization, Aspiration, Nasalization)

Assimilation is a sound change caused by a sound being influenced by another sound in its environment. There are various instances of assimilation in Korean but only three will be instructed for this experiment in order to avoid overwhelming the participants with new information: palatalization, aspiration, and nasalization (Cho, 2016).

Palatalization occurs when an iotized vowel comes after a word-initial ㅅ. Because of the tongue position needed to produce the /j/ of an iotized vowel, the blade of the tongue raises higher to the hard palate in order to ensure a smooth transition from ㅅ to the iotized vowel. This results in the aforementioned sound /ɕ/, which is identical to the English “sh”, but with the blade of the tongue being the active articulator instead of the tongue tip.

Aspiration occurs when ㅎ comes before or after ㄱ, ㄷ, ㅂ, or ㅈ. Because of the presence of ㅎ, the plain consonants are transformed into their aspirated counterparts ㅋ, ㅌ, ㅍ, and ㅊ, respectively. This causes the words 어떻게 /ɔ̃t̃ɔ̃hke/ and 어떡해 /ɔ̃t̃ɔ̃khe/ to be pronounced identically as 어떡해 [ɔ̃t̃ɔ̃k^he].

Nasalization occurs when ㄴ or ㄹ come after batchim /k̄/, /t̄/, /p̄/. The resulting sounds ㅇ, ㄴ, and ㄹ have both the nasal manner of articulation from ㄴ and ㄹ and the place of articulation from /k̄/ (soft palate), /t̄/ (alveolar ridge), and /p̄/ (closed lips).

Instruction

This experiment will be carried out in 4 parts: instruction, review, testing, and rating. The teaching portion will take ten days, as will the review portion, and the testing and rating will take a couple days. Therefore, this experiment will take place over the course of roughly one month.

The participants will be two groups of 15 college students each. One group will be the target group, and the other will be the Romanization control group. All participants will be required to be enrolled in the same Korean program at the absolute beginner level, with no previous knowledge of Hangeul. For two weeks right before the semester starts, the target group will be taught from the 3 PowerPoint presentations, for 50 minutes per day, five days per week. The contents of each presentation will be taught over the course of three days, with one review day after the nine days of instruction. The reason for the teaching portion of this experiment being two weeks earlier than the beginning of the semester is twofold: 1) the first two weeks of instruction are typically when Hangeul is taught using Romanization and, 2) the first two weeks also contain vocabulary and grammar instruction. To limit the exposure to Romanization, it was initially planned that the target group be instructed for this experiment during their Korean class time for those first two weeks. However, since in that time, vocabulary and grammar are also taught, those participants would miss out on that instruction. Therefore, the teaching portion will be two weeks before the semester in order to allow the target group to learn the vocabulary and grammar along with their peers. This is not ideal, since Romanization will be used in the classroom instruction. It is hoped that by the beginning of the semester, the target group will have a solid enough grasp on Hangeul pronunciation that they will not need to rely on any form of phonetic transcription.

The lesson plan below will be followed for the ten weekdays before the first day of the semester.

Table 4: 10-day lesson plan.

Day	Lesson Plan
1	Phonetic Significance Overview; Plain Consonants introduction lecture; HWK 1A
2	ㄱ, ㅋ, ㆁ, ㆁ: lecture; HWK 1B;
3	ㆁ, ㆁ, ㆁ, ㆁ, ㆁ: lecture; HWK 2
4	Tense and Aspirated Consonants introduction lecture; HWK 1C
5	ㆁ, ㆁ, ㆁ, ㆁ, ㆁ: lecture; HWK 1D
6	ㆁ, ㆁ, ㆁ, ㆁ: lecture; HWK 3
7	Batchim: lecture; HWK 4
8	Nasalization: lecture; HWK 5
9	Aspiration + Palatalization: lecture
10	Review

The homework assignments vary in content, but they have the same general format from day to day. The first type of homework consists of matching the Hangeul letters with the corresponding vocal tract positions as illustrated in (sagittal sections), and then writing the letters over the areas that the letters are modelled after. This is seen in the assignments labelled “HWK 1A- D”. The goal of this set of assignments is for the target group to discover and solidify their perceptions of the connections between the letters and their phonetic significance on their own.

The other assignments deal with making observations about either the letters or their sounds. These are HWK 2 through HWK 5. HWK 2 will require the target group to look at the list of tense and aspirated consonants and compare them with how the plain consonants are written. The goal is for them to discover the pattern of adding an extra line to a plain consonant to make an aspirated one, and doubling a plain consonant to make a tense one. For HWK 3, the target group will divide the consonants ㆁ ㆁ ㆁ ㆁ ㆁ ㆁ ㆁ into 3 groups based on

what the mouth does to make the sound. The goal is for them to see the logic behind (the assimilation) of the many consonants into the three unique Batchim sounds. In HWK 4, the participants will be asked about the points of commonality between / \bar{k} /, / \bar{t} /, / \bar{p} / and \circ , \sqcup , \square , and about the similarities of \circ , \sqcup , and \square . The goal is for them to see that \bar{k} and \circ , / \bar{t} and \sqcup , and \square and / \bar{p} / share the same locations of articulation, and that \circ , \sqcup , and \square are all nasal consonants. Finally, for HWK 5, the target group will be asked about their ideas on what happens during pronunciation when $\bar{\text{ㄷ}}$ comes before or after a plain consonant and when ㄷ comes before an iotized vowel. The goal is for them to discover environment-based aspiration and palatalization. Overall these assignments will prepare the target group for the following day of instruction by prompting them to think about the upcoming concepts.

After each presentation is complete, the reference sheet will be given to the target group so that they can use it to experiment and review. The 10th day will be dedicated to review and answering whatever the participants have.

The control group will learn how to read and pronounce Hangeul through the typical Romanization curriculum provided by the KOR101 instructors. Their active participation in this experiment is limited to the testing portion.

Review

Once the ten days of instruction are complete, the target group will be given access to the Quizlet flashcard set. For the next two weeks, they will be required to complete the “Learn” activity at least twice per week, but will be encouraged to do the other available activities such as “Match” and “Gravity”.

At the end of the first review week, they will record themselves reading the word list on VoiceThread and upload the recordings as private comments. They will also be instructed to ask questions concerning clarification, feedback, etc. Over the weekend, answers will be provided so that the target group can incorporate the new information over the course of the next review week.

Testing

Upon the completion of the two review weeks, there will be a testing day. Two skills will be tested: pronunciation and listening. Before the actual testing day, 1 native Korean speaker will act as a test-run participant, in order to ensure that any misunderstandings that may arise would be due to the non-native participants' own error, and not to unclear audio.

First, the target group will record themselves reading from the wordlist on VoiceThread, like in the review VoiceThread session. Then, they will listen to a recording of a native Korean speaker reading the wordlist and write down what they hear in comments on the thread.

The test will be administered to the Romanization control group two weeks after the end of their initial two-week Hangeul instruction, just like the target group. In other words, the target group will have finished testing two weeks before the control group takes the test.

Rating

During the two weeks which will be the control group's equivalent of the review period, the recordings from the target group will be collected and organized into a slide show along with the word list. This will be presented to 5 native Korean speakers in 2 parts. First, the audio from the test recordings will be played one by one, mixed so that no two recordings of one participant are played right after one another. Audio from the Korean speaker participant will also be included. After each recording is played, the native speakers will write down what they hear.

Then, the target word from the wordlist will be presented onscreen while the audio plays again, and the native speakers will then rate the pronunciation on its native-like quality by means of a Likert scale. Thus, the subsequent recordings will all be transcribed and rated.

Conclusion

Provided that all sections of this proposed experiment go smoothly, the results of the native speaker ratings should show that the participants who received instruction of the phonetic significance of the Hangeul consonants achieved overall more native-like fluency than the Romanization control group. Of course, since some aspects of the language learning process cannot be controlled, the results may not be as clear-cut as hoped. Participants from either group will most likely be rated higher if they have supplemented their respective instruction with things like speaking with native speakers or listening to music and TV. With no doubt, frequent exposure to the sounds of Korean in conversation could facilitate distinguishing between similar consonants.

However, if it is found that there is a trend of the experiment participants receiving higher ratings in general than the control group, that would be a good indication of the success of this experiment. Should this method of Korean pronunciation instruction prove successful, it could be applied in Korean language programs across the U.S., and be of use to other researchers who are also interested in alternate methods of language pronunciation pedagogy.

Appendix 1: Plain Consonants

Slide 1



Slide 2

Plain consonants

Korean has 19 consonants:

9 are **plain**



5 are **tense**



5 are **aspirated**



The plain consonants (plus ㅎ) of Hangul with their IPA transcriptions:

Hangul	ㄱ	ㄴ	ㄷ	ㄹ	ㅁ	ㅂ	ㅅ	ㅈ	ㅇ	ㅎ
IPA	/k/	/n/	/t/	/l/ or /r/	/m/	/p/	/s/	/t͡s/	/ŋ/	/h/

Hear them at internationalphoneticalphabet.org/ipa-sounds/ipa-chart-with-sounds/

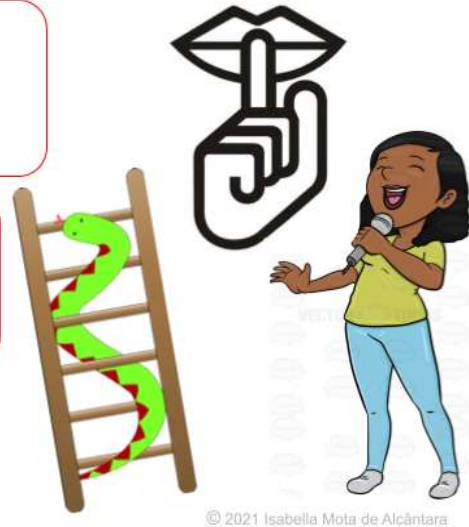
Slide 3

Plain consonants

ㅅ → /s/, a combination of /t/ and /ɕ/. /ɕ/ is like English “sh”, but with the tongue tip behind the bottom front teeth.

ㄹ → /l/ everywhere except in between vowels. There, it is /r/, the same sound as the “dd” in “ladder” of US English (and “r” in Spanish).

ㅇ → /ŋ/, like the last sound in “sing”. It is only heard at the end of a syllable.



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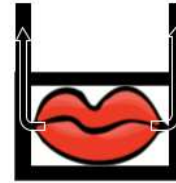
Slide 4

Letter shape = Mouth shape (ㅁ, ㅂ, ㄹ, ㅇ, ㆁ)

ㅁ: Closed lips forming a closed box.



ㅂ: Same as ㅁ, but the two vertical lines on top



indicate air escaping from the enclosure.

ㄹ: Tongue curling to hover just under the roof of the mouth.



ㅇ: The junction of the mouth and throat.

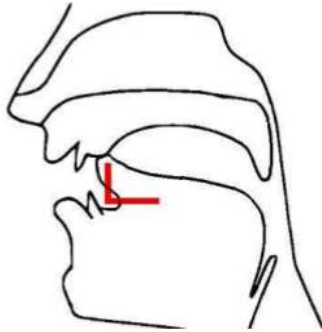


ㆁ: Same as ㅇ, but the extra lines indicate air escaping.

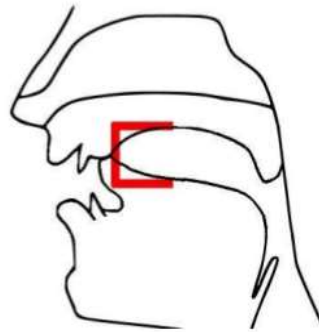
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Slide 5

Letter shape = Mouth shape (ㄴ, ㄷ)



ㄴ: The tip of the tongue touching the bump behind the top front teeth.

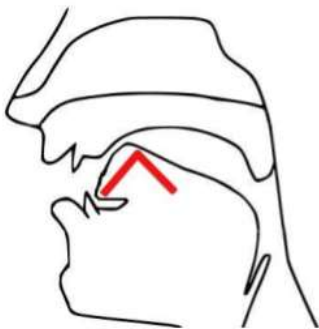


ㄷ: Same as for ㄴ, but the extra line on top indicates the firm contact with the roof of the mouth by the tongue tip.

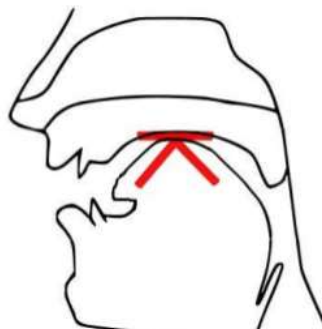
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Slide 6

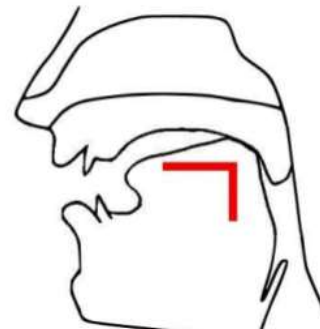
Letter shape = Mouth shape (ㄹ, ㅈ, ㅊ)



ㄹ: The tip of the tongue behind the bottom front teeth, and the blade of the tongue touching the bump behind the top front teeth.



ㅈ: Same as ㄹ, but the extra line indicates firm contact (as in ㄷ).



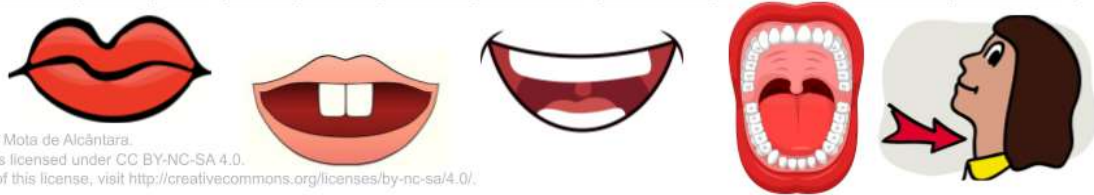
ㅊ: Touching the back of the tongue against the roof of the mouth

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Slide 7

Location of production

	Lips		Tongue tip behind top teeth			Tongue tip behind bottom teeth		Back of tongue with roof of mouth		Throat
Plain	ㅁ	ㅂ	ㄴ	ㄷ	ㄹ	ㄱ	ㅋ	ㆁ	ㅇ	
Aspirated		ㅃ		ㄸ			ㆁ	ㆁ		ㅎ
Tense		ㅍ		ㅌ		ㅍ	ㅍ	ㅍ		



Appendix 2: Tense VS Aspirated Consonants

Slide 1

한글 Part 2: Tense vs Aspirated Consonants

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Slide 2

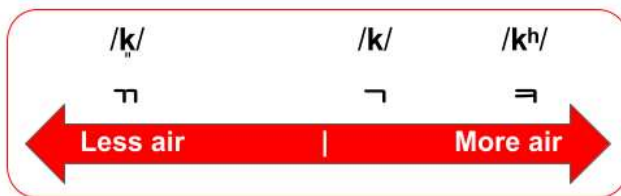
Tense vs Plain vs Aspirated

English consonants are distinguished by vibrating vocal chords.

Ex: “k” (No vibration) vs. “g” (Vibration)



Korean consonants depend on how much air exits your mouth.



The IPA indicates these consonants with extra markings: /^h/ is aspiration and /_̚/ is tenseness.

Tense: Plain: Aspirated:
 ㄱ ㄲ ㅋ ㄷ ㄸ ㅌ ㅈ ㅉ ㅊ

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Slide 3

Plain consonant voicing

HOWEVER, between vowels, plain consonants are pronounced like their **voiced** English counterparts.



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Consonant			Example	
Hangul	IPA (Voiceless)	IPA (Voiced)	Hangul	IPA
ㄱ	/k/	/g/	가가	/k g a/
ㄷ	/t/	/d/	다다	/t d a/
ㅂ	/p/	/b/	바바	/p b a/
ㅈ	/t͡ɕ/	j	자자	t͡ɕ j a

Slide 4

Tense vs Aspirated

Tense consonants: Two small plain consonants mean double the difficulty for air to escape your mouth.

ㄱ → ㄲ ㄷ → ㄸ ㅂ → ㅃ ㅅ → ㅆ ㅈ → ㅉ



Aspirated consonants: An extra line means an extra breath of air

ㄱ → ㅋ ㄷ → ㅌ ㅂ → ㅍ ㅈ → ㅊ

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Slide 5

Tense vs Plain vs Aspirated

Airflow	Sounds in IPA with Hangul									
Plain	ㅂ	/p/	ㄷ	/t/	ㄱ	/s/	ㅈ	/tʃ/	ㅋ	/k/
Aspirated	ㅃ	/p ^h /	ㅌ	/t ^h /			ㅊ	/tʃ ^h /	ㆁ	/k ^h /
Tense	ㅃ	/p̚/	ㄸ	/t̚/	ㅆ	/s̚/	ㅉ	/tʃ̚/	ㄲ	/k̚/

For **aspiration**, sigh while producing the consonant.



For **tenseness**, hold your breath in your chest while producing the consonant with your mouth

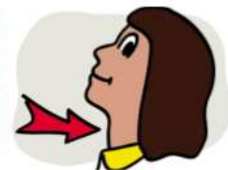


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Slide 6

Location of production

	Lips		Tongue tip behind top teeth			Tongue tip behind bottom teeth		Back of tongue with roof of mouth		Throat
Plain	ㅁ	ㅂ	ㄴ	ㄷ	ㄹ	ㄱ	ㅋ	ㆁ	ㅇ	
Aspirated		ㅃ		ㄸ			ㆁ	ㆁ		ㅎ
Tense		ㅍ		ㅌ		ㅍ	ㅍ	ㅍ		



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Appendix 3: Batchim & Quick Tips

Slide 1

한글 Part 3: Batchim & Quick Tips

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Slide 2

받침 (Last consonant in a syllable block)



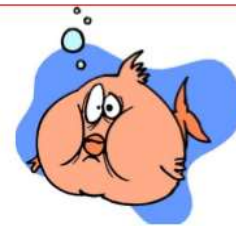
Korean consonants are usually made by

- 1) some sort of closure in the mouth or throat
- 2) releasing air

BUT USUALLY, **Batchim** have no air release. Since air release distinguishes Korean consonants, some consonants sound the same when being Batchim.

Batchim	ㄱ ㅋ ㆁ	ㄷ ㅌ ㄹ	ㄴ ㄷ ㄷ	ㅈ ㅊ ㅉ	ㅂ ㅃ ㅍ
IPA	/k̚/	/t̚/		/p̚/	

The IPA indicates unreleased consonants with the symbol /̚/.



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받침 (Alone vs With a vowel following)

If followed by a vowel:

Plain → voiced

Aspirated → as written

Tensed → as written



Most other times:

Plain → unreleased

Aspirated → unreleased

Tensed → unreleased

Hangul	IPA
각아	/kaga/
각아	/k ^h ak ^h a/
꺄아	/k̚ak̚a/

Note: These are just pronunciation examples which may or may not have meaning.

Hangul	IPA	Hangul	IPA
각	/ka ^h k̚/	각다	/ka ^h k̚ta/
꺄	/k̚ak̚/	꺄다	/k̚ak̚ta/
꺄	/k̚ak̚/	꺄다	/k̚ak̚ta/

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Slide 4

IPA Overview

	Hangul (dark)										IPA (light)									
P	ㅍ	ㅃ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ	ㅍ
A			ㅏ	ㅑ			ㅓ	ㅕ				ㅗ	ㅛ	ㅜ	ㅠ			ㅛ	ㅝ	ㅟ
T			ㅌ				ㅊ	ㅌ			ㅍ	ㅑ	ㅕ	ㅗ	ㅛ	ㅜ	ㅠ			

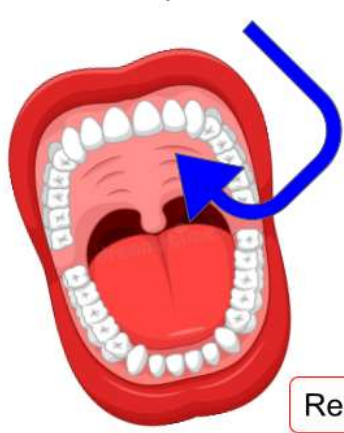
To hear what these IPA symbols sound like, visit internationalphoneticalphabet.org/ipa-sounds/ipa-chart-with-sounds/

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Slide 5

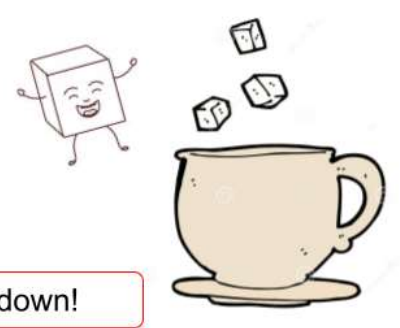
Quick Tips and Tricks: Palatalization

Palate (Roof of mouth)



	lotized
ㅅ+	ㅅ
	ㅆ
	ㅈ
	ㅊ
	ㅌ

Say "sh" instead of "s".



Remember: Keep the tongue tip down!

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Slide 6

Quick Tips and Tricks: Aspiration

If **ㅎ** is before or after a plain consonant, the consonant becomes aspirated.

Plain		Aspirated
ㄱ	+ ㅎ	ㅋ
ㄷ		ㅌ
ㅂ		ㅍ
ㅈ		ㅊ

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Spelling	Pronunciation
어 떨 게	[어 떠 캐]
어 떡 해	[어 떠 캐]

Slide 7

Quick Tips and Tricks: Nasalization

When /k̄/, /t̄/, or /p̄/ are in front of a nasal, they turn into nasals that maintain the original location of production.



Batchim	/k̄/	/t̄/	/p̄/
+	ㄴ or ㅁ		
Result	ㅇ	ㄴ	ㅁ



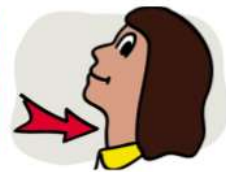
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	Batchim alone	Batchim + environment	
학 년	/hak̄/	/han̄n/	[향 년]
꽃 나 무	/k̄ot̄/	/k̄onn/	[꼰 나]
감사 합 니다	/hap̄/	/ham̄n/	[함 니]

Slide 8

Location of production

	Lips		Tongue tip behind top teeth			Tongue tip behind bottom teeth		Back of tongue with roof of mouth		Throat
	ㅁ	ㅂ	ㄴ	ㄷ	ㄹ	ㄱ	ㅋ	ㆁ	ㅇ	
Plain	ㅁ	ㅂ	ㄴ	ㄷ	ㄹ	ㄱ	ㅋ	ㆁ	ㅇ	
Aspirated		ㅃ		ㄸ			ㆁ	ㆁ		ㅎ
Tense		ㅍ		ㅌ		ㅍ	ㅍ	ㅍ		



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Appendix 4: Hangeul Reference Sheet

A Basic Guide to Hangeul (한글) Consonants, page 1

A Basic Guide to Hangeul (한글) Consonants

Korean has 19 consonants: 9 are plain, 5 are tense, and 5 are aspirated. Since many of these consonants are not found in English, and Romanization does not come close to accurately transcribing them, they are taught here using the International Phonetic Alphabet (IPA). Below are the plain consonants (plus ㅇ) of Hangeul with their IPA transcriptions. Slash brackets (/ /) are used to denote IPA transcriptions.

Table 1: The plain consonants (plus ㅇ) of Korean in Hangeul with their IPA equivalents

Hangul	ㄱ	ㄴ	ㄷ	ㄹ	ㅁ	ㅂ	ㅅ	ㅈ	ㅇ	ㅎ
IPA	/k/	/n/	/d/	/l/ or /ɾ/	/m/	/p/	/s/	/tʃ/	/ŋ/	/h/

New symbols:

- ㄹ is /l/ at the beginning and end of a word. In between vowels, it is /ɾ/, the same sound as the “dd” in “ladder” of American English.
- ㅈ is /tʃ/. This is a combination of /t/ and /ʃ/, the latter being equivalent to English “sh”, but with the tip of the tongue behind the bottom front teeth.
- ㅇ is /ŋ/, which is equivalent to “ng” in “sing”. It is only heard at the end of a syllable.

Table 2: Korean consonants organized by location of production

	Lips		Tongue tip behind top teeth			Tongue tip behind bottom teeth		Back of tongue with roof of mouth		Throat
Plain	ㅁ	ㅂ	ㄴ	ㄷ	ㄹ	ㅅ	ㅈ	ㄱ	ㅇ	
Aspirated		ㅃ		ㅌ			ㅊ	ㅋ		ㅎ
Tense		ㅍ		ㄸ		ㅍ	ㅊ	ㅋ		

Letter shape = Mouth shape

Hangeul was created so that the shapes of the letters mimic the mouth’s shape when producing the sounds. Here are some descriptions of the similarities:

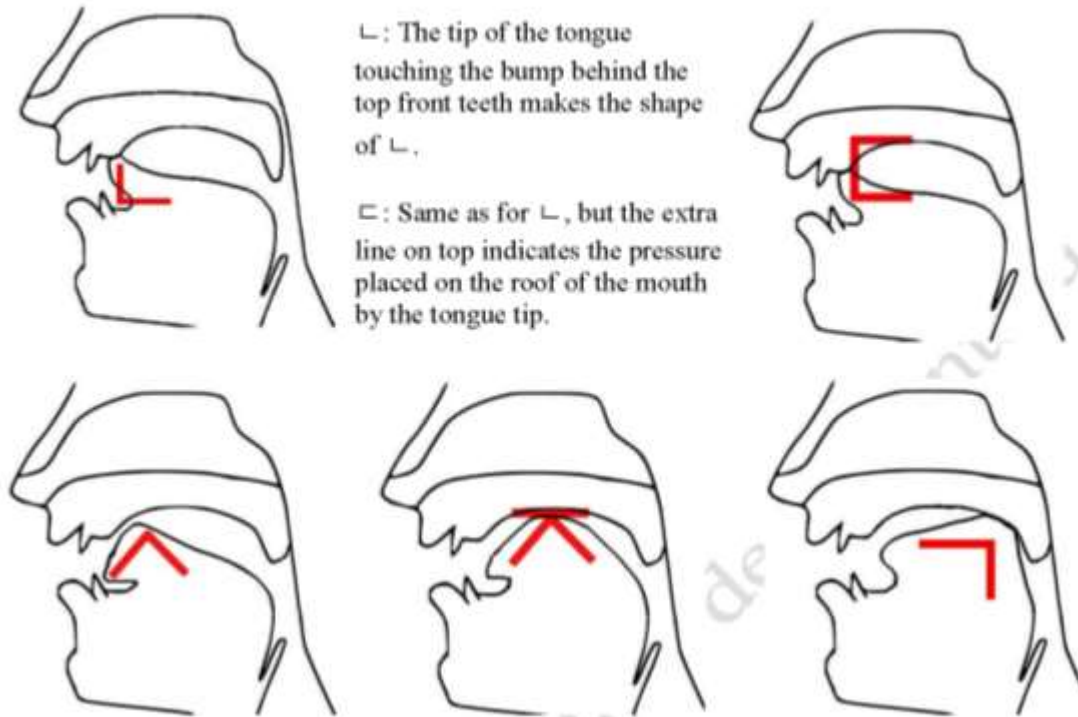
- ㅁ: The shape of ㅁ comes from closed lips forming a closed box.
- ㅃ: Same as ㅁ, but the two vertical lines on top indicate air escaping from the enclosure.
- ㄹ: The shape comes from the tongue being curled to hover just under the roof of the mouth.
- ㅇ: The shape of ㅇ comes from the shape of the junction of the mouth and throat.
- ㅎ: Same as ㅇ, but the extra lines indicate air escaping.

The diagrams below show the more obscure similarities between the mouth shape and the letters.

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ㄴ: The tip of the tongue touching the bump behind the top front teeth makes the shape of ㄴ.

ㄷ: Same as for ㄴ, but the extra line on top indicates the pressure placed on the roof of the mouth by the tongue tip.

- ㄹ: The shape is made by the tip of the tongue behind the bottom front teeth, and the blade of the tongue touching the bump behind the top front teeth.
- ㅈ: Same as ㄹ, but the extra line indicates more pressure (as in ㄷ) and more friction.
- ㅋ: The shape is made by touching the back of the tongue against the roof of the mouth.

Plain VS Tense VS Aspirated

In English, consonants are distinguished by whether or not your vocal chords are vibrating. Put a hand to your throat when saying the “k” and “g” sounds (not the letter names!) to feel the difference. In Korean, consonants are distinguished by how much air exits your mouth. If barely any air comes out of your mouth, the consonant is “tense”. If a little air comes out, it is “plain”. If a lot of air comes out, it is “aspirated”. The IPA indicates these consonants with extra markings: /^h/ is aspiration and /_̚/ is tenseness.

Table 3: Plain, aspirated, and tense consonants in Hangul with their IPA equivalents

Airflow	Sounds in IPA with Hangul									
Plain	ㅍ	/p/	ㄷ	/t/	ㄴ	/s/	ㅈ	/tɕ/	ㅋ	/k/
Aspirated	ㅍ _̚	/p ^h /	ㄷ _̚	/t ^h /			ㅈ _̚	/tɕ ^h /	ㅋ _̚	/k ^h /
Tense	ㅍ̚	/p̚/	ㄷ̚	/t̚/	ㄴ̚	/s̚/	ㅈ̚	/tɕ̚/	ㅋ̚	/k̚/

Make the sounds: For aspiration, sigh while producing the consonant. For tenseness, hold your breath in your throat while producing the consonant.

Note: When in between vowels, the plain consonants are pronounced as their voiced English counterparts.

For example: 아가 (aga), 아다 (ada), 아바 (aba), 아자 (aja)

Batchim

받침 (or batchim) are the last consonants in a syllable block. Korean consonants are made by 1) some sort of closure in the mouth 2) releasing air. But most of the time, Batchim consonants have no air release. Since air release distinguishes Korean consonants, some consonants sound the same when being Batchim.

Batchim	ㄱ ㅋ ㆁ	ㄷ ㅌ ㄹ	ㅅ ㅆ	ㅈ ㅊ	ㅂ ㅍ ㅃ
IPA	/k̚/	/ɾ̚/			/p̚/

However, when followed by a vowel, Batchim are pronounced as they are originally written.

For example: 각아 → /kaga/ 깃아 → /k^hak^ha/ 깃아 → /k̚ak̚a/

All other times, Batchim are unreleased.

IPA Overview

Table 4: All consonants in Hangul with their IPA equivalents

	Hangul (dark)										IPA (light)									
P	ㅁ	m	ㅂ	p	ㄴ	n	ㄷ	t	ㄹ	l/r	ㅅ	s	ㅈ	tɕ	ㄱ	k	ㅇ	ŋ		
A			ㅃ	p ^h			ㅌ	t ^h					ㅊ	tɕ ^h	ㅋ	k ^h			ㅎ	h
T			ㅍ	p			ㅍ	t̚			ㅆ	s̚	ㅈ	tɕ	ㄱ	k̚				

The sounds of the symbols: internationalphoneticalphabet.org/ipa-sounds/ipa-chart-with-sounds/.

Tips and tricks

1. Visually identify aspiration: With the plain consonant as reference, if there is an extra horizontal line, it signifies an extra breath of air. ㄷ → ㅌ
2. Visually identify tenseness: With the plain consonant as reference, if there are two small plain consonants, it signifies double the difficulty for air to escape. ㄷ → ㅌㅌ
3. ㅅ + (ㅇ, ㅏ, ㅑ, ㅓ, ㅕ, or ㅗ) = No /s/ sound, but a “sh” sound before the vowel.
4. If ㅎ is before or after Batchim ㄱ, ㄷ, ㅂ, or ㅈ, the resulting sound is ㅋ, ㅌ, ㅃ, or ㅊ.
5. (/k̚/, /ɾ̚/, or /p̚/) + ㄴ or ㅁ = (ㅇ, ㄴ, or ㅁ)

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