

# Phonetic Notation in Phonetic Research

- IPA and International Korean Phonetic Alphabet -

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## 음성의 연구와 음성의 표기법

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### <Abstract>

The aim of this paper is to stress the importance of phonetic notation in phonetics/linguistics and its related fields such as spoken language processing and language teaching/learning, and to make a comparison of the International Phonetic Alphabet and the International Korean Phonetic Alphabet in respect to their theoretical background and practical application.

### 1. What is the Use of Phonetic Alphabet?

A phonetic notation or transcription is the only reliable way to represent minute shades of speech sounds in writing. For instance, the four /H/ phonemes in the Korean word "비빔밥" are realized as different sounds at the phonetic level. The first /q/ is realized as a voiceless plosive and the second one as a voiced plosive. Therefore we need to represent the two /ㅃ/ as two different allophonic variants in narrow transcription.

The phonetic alphabet is an indispensable tool in the following areas:

- 1) Phonetic and linguistic studies of languages,
- 2) Native and foreign language teaching and learning,
- 3) Phonetic study of dialect pronunciation,
- 4) Speech science : synthesis and recognition,
- 5) Contrastive study of sounds of languages,
- 6) Speech therapy: diagnosis and treatment,
- 7) Singing, Drama, Poetry,
- 8) Forensic research, etc.

where accurate notation of speech sounds is required.

## 2. Earlier Attempts to Devise Universal Phonetic Alphabets

Serious attempts have been made by phoneticians and linguists in the past to devise universal alphabets. Notable among them are those of Bell, Sweet, Jespersen etc. Their attempts were highly rewarding and yet their ideas were all short-lived, due largely to what Professor Eugenie Henderson of London University described as "lack of royal authority and blessing", which the Korean alphabet "Hangeul" has enjoyed to a great extent.

## 3. International Phonetic Alphabet(IPA)

The IPA is no doubt the most widely used and at the same time, highly successful phonetic alphabet. However, the IPA symbols, based mainly on Roman and Greek letters, has some serious disadvantages and drawbacks. For one thing, the IPA symbols do not represent or reflect the shapes or movements of the organs of speech in the manner that the Korean alphabet does. Notice the formal similarity of the shape of the back of the tongue blocking the soft palate and the Korean letter representing the velar plosive sound /ㄱ/ Moreover, unlike in Korean alphabet, no formal interrelationship can be found in IPA between the phonetic symbols representing homorganic sounds such as p/b, t/d, k/g, s/z, f/v, etc. They are simply arbitrary symbols totally unrelated in shape. This makes it very hard for beginners to learn the IPA symbols and use them in research and teaching.

Roman: [ a, i, e, o, u, p, t, k, s, z, f, x ] etc.

Greek : [ φ, β, γ, θ, λ ] etc.

Modified : [ ø, ε, œ, ø, ʃ, ʒ, ʋ, ç ]

## 4. limitations of Hangeul (Korean Alphabet) as Phonetic Symbols

Hangeul[hangul], the Korean alphabet has been widely acclaimed by phoneticians and linguists as an excellent phonetic writing system. Although Hangeul is for doubt a highly successful writing system for the Korean language, it leaves much to be desired before it can be utilized as a truly international phonetic alphabet capable of representing minute phonetic differences of human speech sounds. For instance, there is no way to represent the voiced/voiceless distinction or to distinguish labial and labio-dental articulation in Hangeul writing.

Thus the following pairs of English words are indistinguishable in the Hangeul writing.

f/p: fine/pine	→	파인[pain],
ð/d: they/day	→	데이[dei],
v/b: vote/boat	→	보우트[bout],
z/ʒ: zoo/jew	→	주[ʒu],
l/r: lice/rice	→	라이쓰 [rais],
ʒ/ʒ: leisure/ledger	→	레저[leʒə].

On the other hand, the Korean alphabet has a definite advantage over IPA in that it has basic letters available for representing the unaspirated, slightly aspirated and strongly aspirated consonants in Korean such as /ㅍ/(voiceless unaspirated p), /ㅍ'/(voiceless slightly aspirated b) and /ㅍ''/(voiceless strongly aspirated). The IPA would need to utilize additional diacritical marks to represent the relevant distinction, i.e., /p/, /p'/, /p''/.

It is necessary, therefore, to implement the current Korean alphabet to make it a really versatile international phonetic alphabet.

## 5. Principles of International Korean Phonetic Alphabet

Based on the articulatory phonetic (or organic) principle, the Korean alphabet of 28 letters as invented by King Sejong in 1443 is not only systematic and scientifically oriented but also easy to learn and use in everyday life of the Korean people. The International Korean Phonetic Alphabet, first published in 1971 was devised by the present writer by applying the organic principle much more extensively than King Sejong had done. Accordingly, the IKPA symbols are just as simple and easy to learn and memorize as the Korean alphabet, but at the same time they are much more consistent and logical than the IPA symbols which, having been derived mainly from Roman and Greek letters, are unsystematic mass of letters except in one respect, i.e., retroflex symbols. The organic principles exploited in devising the International Korean Phonetic Alphabet can be summarized as follows:

### 5.1. To Use all Hangeul letters in current use

All Hangeul letters are utilized in the making of the Korean Phonetic Alphabet except those representing diphthongs such as /ㅈ/(ja), /ㅊ/(jʌ), /ㅉ/(jo), /ㅊ'/(ju), /ㅊ''/(jɛ), /ㅊ'''/(wʌ), /ㅊ''''/(we), /ㅊ''''''/(wi).

### **5.2. Reviving the extinct letters (from Hunminjeongeum)**

The extinct letters of Hunminjeongeum of the 15th century have all been revived and given definite phonetic values. For instance, the triangle is introduced as a symbol representing voiced alveolar fricative.

### **5.3. Devising new symbols based on the principles of Hunminjeongeum**

New symbols have been devised on the basis of the principles of Hunminjeongeum. For instance, voiced symbols are derived from voiceless ones by a voice bar as illustrated in the following section.

### **5.4. Representing homorganic sounds mnemonically and systematically**

The symbols of homorganic sounds that are articulated at the same place of articulation are designed in such a way that they all share a basic element of articulatory phonetic features. ㄱ -> ㅋ -> ㆁ ->

### **5.5. Devising Diacritical Marks to Enrich the Phonetic Representation**

A number of diacritical marks have been devised to represent various shades of speech sounds such as voicing, palatalization, retroflexion, etc.

## **6. Organic Principles Extensively Exploited in Deriving Indispensable Symbols.**

- 1) By adding the voice bar [ʹ] [ˀ] or [ʷ] to derive voiced symbols from voiceless ones.
- 2) By adding a hook showing the front of the tongue curling upward to derive palatalized symbols from non-palatalized ones.
- 3) By adding a hook showing the tongue tip curling upward to derive retroflex symbols from non-retroflex ones.
- 4) By adding a small circle to derive fricative symbols from homorganic plosives.
- 5) By adding a small hook to derive uvular symbols from velars.
- 6) By deleting a stroke to derive fricative symbols from related plosives.
- 7) By adding a stroke to derive lateral symbols from homorganic trills.

## 7. Advantages of International Korean Phonetic Alphabet.

The advantages of the International Korean Phonetic Alphabet can be summarized as follows:

- 1) IKPA represents the shape and/or articulating action of the organs of speech, just like Hangeul(Korean Alphabet), i.e., Organic phonetic alphabet.
- 2) IKPA represents the place and manner of articulation in a consistent manner,
- 3) Homorganic symbols share the common element in IKPA,
- 4) IKPA is easy to learn, teach and memorize.
- 5) IKPA is capable of serving as a truly universal phonetic alphabet common to all races and nations,
- 6) IKPA is more than a mere phonetic alphabet. It is in reality the articulator phonetic theory itself which is duly represented by the shape of the letters,

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<Consonants>

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b ㅍ ㅂ			t d ㅌ ㄷ		t d ᄏ ᄏ	c ɟ ㄷ ㄹ	k g ㅋ ㆁ	q ɢ ㆁ ㆁ		? ㅇ
Nasal	m ㅁ	ɱ ㅱ		n ㄴ		ɳ ㄴ	ɲ ㄴ	ŋ ㅇ	ɴ ㅇ		
Trill	ʙ ( )			r ㄹ					ʀ ㄹ		
Tap or Flap				ɾ ㄹ		ɽ ㄹ					
Fricative	ɸ β ㅍ ㅂ ㅍ ㅂ	f v ㅍ ㅂ	θ ð ㅌ ㄷ ㅌ ㄷ	s z ㅌ ㄷ	ʃ ʒ ㅌ ㄷ ㅌ ㄷ	ʂ ʐ ㅌ ㄷ	ç ʝ ㅌ ㄷ ㅌ ㄷ	x ɣ ㅌ ㄷ ㅌ ㄷ	χ ʁ ㅌ ㄷ ㅌ ㄷ	ħ ʕ ㅌ ㄷ ㅌ ㄷ	h ɦ ㅇ ㅎ ㅇ ㅎ
Lateral fricative				ɬ ɮ ㅌ ㄷ							
Approximant		ʋ ㅌ ㄷ		ɹ ㄹ		ɻ ㄹ	j ㄹ	ɰ ( )			
Lateral approxima nt				ɭ ㄹ		ɮ ㄹ	ʎ ㄹ	ʟ ( )			

<Vowels>

	Front	Central	Back
Close	i y	ɨ ʉ	ɯ u
	ɪ ʏ	ɨ̟ ɨ̠	ɯ̟ ɯ̠
Close-mid	e ø	ə ɵ	ɤ ɔ
	ɛ ɔ̟	ə̟	ɛ̟ ɔ̟
		ɛ̠	
Open-mid	ɛ œ	ɜ ɞ	ʌ ɔ̠
	ɛ̟ œ̟		ɛ̟̠ ɔ̟̠
	æ	ɛ̠	
Open	a ɶ	ɜ̠	ɑ ɒ
	ɶ̟		ɑ̟ ɒ̟