A Phonetic Comparison of Korean and Tamil

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Abstract

The paper compares the sound of Hangul (Korean) and Tamil to assess possible similarity. Outline study undertaken is primarily based on the sounds of vowels and consonants of both the languages. For comparison, a simple weighted framework is proposed to show on a conservative estimate what level of similarities can be asserted between both the languages.

Keywords

Language, Tamil, Hangul, Korean, Phonetics

1. Introduction

A language at the core of its soul is defined by the essence of its vowels and its consonants. It's especially so when you consider the sound of the language. "Vowels and consonants" based study of language is a time-tested framework that enables the unfolding of the mystery of sounds, generated by vocal cords that we call language.

Of course, a language is more than just its vowels and consonants. It is its vocabulary especially in the context of where it specializes. It is its grammar in the way it conjugates and prescribes its tenses. Not to mention other literary peculiarities. Nevertheless, basic study based on "vowels and consonants' still holds immense value, especially in comparing one language to another, provided one pays attention to the potential exceptions that may arise out of varying subtleties of phonemes.

Below is an extraordinary opportunity to look at two incredible languages based on their potential phonetic similarities. In contrast to languages like English, one could assert, that both Korean and Tamil show a highly reliable direct relationship to their transcriptions, without having to resort to an IPA-like phonetic alphabet system. This property makes the phonetic comparison study even more interesting.

Tamil is an ancient language—the only classical language of antiquity that is still in the spoken form. Korean is the only language with a man-made system of writing that is relatively modern and genuinely exemplary and beautiful. Hence to assess phonetic similarities of these languages indeed is a grand opportunity.

It must also be noted that, while there are good sets of common words in both Tamil and Korean, the possible lexical similarities haven't been clearly demonstrated. The attempt below is also not to demonstrate the similarities based on cognates.

Homer B. Hulbert, although with many mistakes, first noted there could be a link between Dravidian language and Korean (Hulbert, 1906). Subsequently, in 1970 Susumu Ōno and in 1984 Morgan E. Clippinger (Ohno, 1970; Clippinger, 1984) attempted to give cognates based comparative study to relate Darvidian, in particular Tamil and Korean along with Japanese. However, there has not been any further study proposing clear evidence for establishing deeper proto connections between these languages. Review here also takes a different approach focusing just on the nature of sound of the language tackling it from the way the language or sound itself is constructed. As the constituents of the sounds are essentially vowels and consonants, a study that measures the similarity of them will certainly go towards pointing out further connections if it can be positively shown.

Tamil has 12 Vowels (referred to as life letters) and 18 consonants (referred to as body letters) and 216 explicit compound letters. Vowels in Tamil are clustered into 5 long, 5 short and—arguably—2 diphthongs.

There is also rarely used freestanding special vowel in Tamil called "ayu-tha-eluthu (ஃ)" that we will discard for the time being. In addition, Tamil has kirantha consonants (primarily 6) that are not mainstream but still fully recognisable and are very useful in capturing foreign sounds.

Korean script called Hangul has 10 vowels 11 diphthongs making it 21 vowels altogether, and 14 consonants and 5 double consonants making it 19 consonants.

Below sections take a look at vowels and consonants of Tamil and Korean followed by a comparative study that draws attention to the naturally existing highly similar structures. Finally, with the help of linguating framework that helps to define structures of the language, a high level framework is proposed to establish the summary outcome.

2. Tamil Vowels (Table 1, Table 2)

Following observations can be made.

1) Long and short forms of 10 vowels are evenly arranged. If you combine the short and long version of similar sounding vowels into one, then you arrive at the typical vowel forms of a, I, u, e, o.

2) Transliteration is given using romanised letters and it does require more clarification to show how it truly reflects the actual sound. Particularly "u" and "e" doesn't necessarily help. உ sound is more like ou and ஊ sound is more like oo. எ and ஏ are more like ae, aae (with "a" as in April) respectively.

Table 1. Tamil vowels with Romanized equivalence.

Tamil Vowels	அ	ஆ	இ	ஈ	உ	ஊ	எ	ஏ	ஐ	ஒ	ஓ	ஔ	ஃ
ISO transliteration	a	ā	i	ī	u	ū	e	ē	ai	o	ō	au	a$\underline{k}$
Length	Short	Long	Short	Long	Short	Long	Short	Long	Diphthongs	Short	Long	Diphthongs	Special character
	a		i		u		e			o			

Table 2. Tamil vowels with basic classification.

Short	Tamil	அ	இ	உ	எ	ஒ
	ISO transliteration	a	i	u	e	o
Long	Tamil	ஆ	ஈ	ஊ	ஏ	ஓ
	ISO transliteration	ā	ī	ū	ē	ō
Diphthongs	Tamil	ஐ	ஔ			
	ISO transliteration	ai	au			

3) The two diphthongs ஐ and ஔ (sounding more like auv) are more like compound (vowel + consonant) letters. From the time of Tholkappiyar (Tamil grammar book from 2nd century BCE) even today words are written alternatively replacing these vowels with shorter vowels and consonants as below (Tolkāppiyam, https://en.wikipedia.org/wiki/Tolk%C4%81ppiyam).

Example: Iyanar: ஐயனார், அய்யனார் (ஐ is replaced by அ and consonant ய் (sounds i)). (Iyanar—name of village protection god).

Avaiyar: ஔவையார், அவ்வையார் (ஔ is replaced by அ and consonant வ் (sounds iv)). (avaiyar—name of a popular woman poet from 2nd century BCE).

In this sense, they do depart from the straightforward vowel arrangement and would argue also differ from the basic definition of diphthongs.

a) Tamil is characteristic in forming compound letters combining vowels and consonants. However, the above form of combination is unique only to these two letters where vowel precedes the consonant in transliterating the sound (அ + ய் and அ + வ்).

b) Also note that the vowel இ is like "ee" only representing the sound "I" as in "imitation". It cannot produce the sound "I" as in iodine. For aliterate the sound of "I" in iodine, the vowel ஐ is the one you will need. While appreciating the peculiarity of these two letters, as they show inherent consonants, they are strictly vowels in Tamil and should be forgiven as such. Both vowels also follow the rule of combining with 18 consonants in forming respective compound letters.

c) There is a further surprising insight if you consider the consonants ய் and வ், that's seemingly inherent in these vowels, in relation to Hangul. As it will be shown both consonants play a special role in Korean in terms of iotation and

diphthongs.

In an act of unpicking, it's the absence of things that can be more illustrative. Note that other short forms of vowels could have been combined with யʼ and வʼ or other consonants for that matter, to form more variation to the vowel pallet. For example, உ and யʼ could have been combined to form another unique sound "ui". However, to keep true to its symmetry, this would have to then follow the rule of combining with all the consonants to form additional 18 characters and sound. This may effectively change the tone of the language, even if those sounds may be used to reference the same set of objects and abstractions. Should a language follow a tree like evolution, it should not be a far-fetched idea to consider the occurrence of such variations. As we will see such a character "ui" (의) is indeed a very special character in Hangul.

Although ஒள could be controversial as its inherent consonant is well pronounced, ஐ (I as in iodine) is substantially distanced (ref IPA vowels) from other vowels and adds much needed richness to any language, regardless of its collusion with consonant.

3. Tamil Consonants (Table 3)

Following observations can be made.

1) All consonants are classified under three categories namely vallinam (hard consonants), mellinam (soft consonants, including all nasals), and itayinam (medium consonants). The 18 consonants are neatly divided into these categories as 6 each. It is as if any form of other possible sound (other potential hard or soft consonant sounds) has been discarded favoring the symmetry!

2) Consonants "na", "la" and "ra" are given somewhat special treatment. There are 3 "na" variations (ண, ந, ன) and 3 "la" (ழ, ல, ள) variation and two "ra" (ர, ற) variation. Should a single letter be considered for overloading these phonetic variations (which is not uncommon), it will result in 13 consonants instead of 18. Hence, it can be stated, for comparative purposes, that Tamil

Table 3. Tamil consonants.

Consonants	கʼ	ஙʼ	சʼ	ஞ	டʼ	ண	தʼ	நʼ	பʼ
ISO transliteration	k	ṅ	c	ñ	ṭ	ṇ	t	n	p
Group	vallinam	mellinam	vallinam	mellinam	vallinam	mellinam	vallinam	mellinam	vallinam
	k + a as in kaite	ng as in ring	ch as in catch	ng as in syringe	t as in tap	n as in Cinderella	th as in both	n as in panther	p as in pack
Consonants	மʼ	யʼ	ரʼ	லʼ	வ	ழʼ	ள	றʼ	ன
ISO transliteration	m	y	r	l	v	ḻ	ḷ	ṟ	ṉ
Group	mellinam	idaiyinam	idaiyinam	idaiyinam	idaiyinam	idaiyinam	idaiyinam	vallinam	mellinam
	m as in plum	y as in yak	r as in stir	l as in lamp	v as in victory	(tongue retracted)	l as in marble	tr as in citric	n as in sin

has 13 distinctive consonants instead of 18. It's also worth noting except for ‎ற̇, all other varying consonants are mellinam (ண̇, ந̇, ன̇) and idayinam (ழ̇, ல, ள̇ and ர̇) respectively.

3) In Tamil every consonant has an explicit phonic sound. Ex: க̇ is"ik" always carries the same phonic sound even when combined with vowels. Typically, sound of the consonants is combined with vowels (such as "a") to form compound syllabic sound ("ka" (க) that forms the root for the words. The compound symbols formed similarly are discussed below. What is interesting is that a language with explicit sound for consonants tends to be more phonetically strict. I.e. is to say they form more accurate and direct correlation between the sound and the symbols.

4. Tamil Compound Letters/Syllabic Letters (Table 4)

A salient feature in Tamil is its compound letters even when compared with other close Dravidian cousins like Malayalam and Telugu. These compound letters as shown above are simply a cartesian product of both vowels and consonants of the language. In other words, 12 vowels × 18 consonants form 216 such compound letters. It's common in languages to form syllables by adding a consonant and vowel nut not to transcribe them explicitly into new symbols as done above.

Table 4. Tamil letters in full.

consonants		அ a	ஆ ā	இ i	ஈ ī	உ u	ஊ ū	எ e	ஏ ē	ஐ ai	ஒ o	ஓ ō	ஔ au
க̇	k	க	கா	கி	கீ	கு	கூ	கெ	கே	கை	கொ	கோ	கௌ
ங̇	ṅ	ங	ஙா	ஙி	ஙீ	ஙு	ஙூ	ஙெ	ஙே	ஙை	ஙொ	ஙோ	
ச̇	c	ச	சா	சி	சீ	சு	சூ	செ	சே	சை	சொ	சோ	
ஞ̇	ñ	ஞ	ஞா	ஞி	ஞீ	ஞு	ஞூ	ஞெ	ஞே	ஞை	ஞொ	ஞோ	
ட̇	ṭ	ட	டா	டி	டீ	டு	டூ	டெ	டே	டை	டொ	டோ	
ண̇	ṇ	ண	ணா	ணி	ணீ	ணு	ணூ	ணெ	ணே	ணை	ணொ	ணோ	
த̇	t	த	தா	தி	தீ	து	தூ	தெ	தே	தை	தொ	தோ	
ந̇	n	ந	நா	நி	நீ	நு	நூ	நெ	நே	நை	நொ	நோ	
ப̇	p	ப	பா	பி	பீ	பு	பூ	பெ	பே	பை	பொ	போ	
ம̇	m	ம	மா	மி	மீ	மு	மூ	மெ	மே	மை	மொ	மோ	
ய̇	y	ய	யா	யி	யீ	யு	யூ	யெ	யே	யை	யொ	யோ	
ர̇	r	ர	ரா	ரி	ரீ	ரு	ரூ	ரெ	ரே	ரை	ரொ	ரோ	
ல̇	l	ல	லா	லி	லீ	லு	லூ	லெ	லே	லை	லொ	லோ	
வ̇	v	வ	வா	வி	வீ	வு	வூ	வெ	வே	வை	வொ	வோ	
ழ̇	ḻ	ழ	ழா	ழி	ழீ	ழு	ழூ	ழெ	ழே	ழை	ழொ	ழோ	
ள̇	ḷ	ள	ளா	ளி	ளீ	ளு	ளூ	ளெ	ளே	ளை	ளொ	ளோ	
ற̇	ṟ	ற	றா	றி	றீ	று	றூ	றெ	றே	றை	றொ	றோ	
ன̇	ṉ	ன	னா	னி	னீ	னு	னூ	னெ	னே	னை	னொ	னோ	

It's worth noting that a consonant on its own cannot form a word or form a complete or meaningful sound (with few exceptions), since they are formed by restricting the air flow. Hence often all consonants are followed by a vowel. Tamil preempts this usage by transcribing all combinations of the consonants with the vowels.

In Korean (and in other languages), a consonant may also be followed by another consonant, hence called double consonant, before followed by a vowel. Such cases are used to provide more emphasis (loud) to that specific consonant sound. This is particularly useful in the absence of transcribed compound letters that offer all the possible combinations with vowel sounds. In comparison Tamil may have a consonant followed by a compound letter that in essence provides for the double consonant effect.

Following observations can be made.

1) Compound letters are the syllabic unit formed by a strict rule of Consonant + Vowel. Note that the reverser pattern Vowel + Consonant is not allowed or followed. This is with the exception of two letters (ai(ஐ), auv(ஒள)) as shown previously. This property has a resultant effect of an almost algorithmic-like predictable pattern of vowels and consonants leading to clear lexical rules in the language. For example, no word in Tamil can start with a consonant. They may start with a compound letter that has inherent consonant sound. It means one can make a clear statement that all words in Tamil start either with a vowel or syllabic unit of compound letter—never a consonant. Let's say C represents consonant, V vowel and C.V the compound letters, then following can be stated.

a) All words start with either V or C.V never C.

b) When a word starts with V it must always be followed by C or C.V never V. (i.e. no doubling of vowels).

c) Two consonants cannot follow each other. i.e. C.C form is prohibited. In other words if V followed by C.V, then it must be followed by either V or C.V (there are no double consonants).

d) Above are not an exhaustive set of rules and extensive sets could be found in Tamil grammar books starting with Tholkappiyar's time. However, as will be shown later, the above chosen rules are indeed specifically useful to compare with Hangul.

2) Compound letters do form different sounds as opposed to a sound that may be formed by equivalent consonant and vowel.

Example: Ka = க் + அ, is pronounced as ka (க) as opposed to iikka (formed by க்+ அ).

This in a way avoids pronouncing double consonants explicitly as in "Appa (அப்பா)", the word meaning father. In this case அப்பா could have been written as "Aa-ip-ip-aa (அப்பஆ)". Here, the word is written with a vowel followed by a consonant and then by a compound letter that in essence is a consonant and a vowel.

Note that this variation in sound is visible only if one is to follow the strict phonetic of the transcribed letters. As often the case in a language even without

explicit compound letters can also follow the same sound by vomiting the double consonant part as in ("Appa (அப்பா)"), although that may require extra energy in the way tongue movement is spent.

Often it can be seen, as it will be shown in Hangul too, double consonant, as shown above, is a preferred feature to strike a phonetically rigorous language.

3) Compound letters can be a word on its own.

There are 42 single letter words in Tamil including vowel based single words made possible only by compound nature of the syllable. (https://www.valaitamil.com/42-Tamil-letters-can-give-several-meaning_11852.html), although many of them are not in common use.

4) Old and modern Tamil scripts/compound letters also show some level of typographic ligatures (writing form itself compounding from its root vowel and consonants). Unfortunately, they do not have consistency or clear logic for the glyphs of the compound letters. (ex: consider the two different consonants (ர and ல) created with vowel ஊ (oou). They are ரூ (roo) லூ (loo). Modifiers used to form the compound letters are entirely different.)

5. Summary of the Observations from Tamil

Following summary is stated primarily with the view to compare with Hangul.

1) Tamil has 6 (5 pairs of long and one short ("i")) distinctive vowel sounds. While this makes it similar to most of the languages, the actual sound is not standard.

2) Romanisation to represent Tamil sound can be problematic and should only be considered as approximate representation. Romanisation may be relevant, should Tamil or Hangul be compared with roman script based languages, It may hold less relevance when comparing Hangul and Tamil.

3) There are 2 diphthongs with inherent consonant endings (ய and வ). This potentially supports double consonant sound but separated by syllabic units.

4) There are 13 distinctive consonants with additional variations on "na", "la", and "ra".

5) Consonants have explicit sounds and are spelt accordingly in a word.

6) Although there are only 30 (12 vowels and 18 consonants) primary letters in Tamil, it has a distinctive feature of compound letters represented by distinctive symbols of their own. Compound letters are syllabic units formed by cartesian product of vowels and consonants.

7) Compound letters also have a distinctive sound that is different from the sound of consonant and vowel they combine.

6. Korean Vowels (Table 5)

"Hangul must surely rank as one of the great intellectual achievements of Mankind" (Sampson, 2015: Writing systems, p. 165).

Hangul has 10 basic vowels and 11 diphthongs as shown above making the total vowel sounds to 21. Above also shows the letters with the placeholder consonant "ㅇ", a helpful place holder like feature to form syllabic units. Unlike

Table 5. Korean vowels.

	아	이	우	어	오	야	으	유	여	요	
Basic vowels	ㅏ	ㅣ	ㅜ	ㅓ	ㅗ	ㅑ	―	ㅠ	ㅕ	ㅛ	
Romanisation	a	i	u	eo	o	ya	eu	yu	yeo	yo	
Diphthongs	ㅐ	ㅒ	ㅔ	ㅖ	ㅘ	ㅙ	ㅚ	ㅝ	ㅞ	ㅟ	ㅢ
Romanisation	ae	yae	e	ye	wa	wae	oe	wo	we	wi	ui/yi
	애	얘	에	예	와	왜	외	워	웨	위	의

many languages, Korean gives the peculiar impression that it has more vowels than consonants. However, as we will see, Korean diphthongs that make this number bulge are special and bear the burden of consonants. Even among basic vowels, 4 of the vowels have iotation with inherent consonant sounds in them.

Note: Since definition of iotation and diphthong (double vowels) can be very similar, here, iotation is considered as partial diphthong as opposed to fully long vowels. More specifically iotation can be defined as a consonant like constriction added to the vowel at the beginning of the sound. This is particularly helpful considering the role "Y" like consonant sound plays within the basic set of Korean alphabets.

Following observations can be made.

1) Typically, there are 6 distinctive primary vowel sounds given in Hangul. Those are ㅏ, ㅣ, ㅜ, ㅓ, ㅗ, ― (typographically these simple letters with single vertical/horizontal lines). However, the sound of ―, although belongs in this group for simple script symmetry, does look controversial with sort of iotation as will be noted below.

2) Rest of the 4 basic vowels are seemingly longer versions of the primary sound with a palatal approximant. That is to say, they are vowels with iotation-inherent associated consonant "Y" sound, which precedes them. They are ㅑ, ㅠ, ㅕ, ㅛ. These vowels are marked with an extra line as shown as if to indicate the long form of the primary vowel sounds. Example: ㅑ forms the yaa sound with Y + ㅏ (y + aa). It raises the question, what really is this "Y" sound? As it behaves like an inherent consonant. Is there really a corresponding consonant for "Y" in Hangul? The challenge due to romanisation appears again as there are no obvious candidates in the direct sense! In Tamil, this is comparable to the consonant and related compound letters of ய (யா = yaa). If one has to try then only consonant in Hangul that this sound may relate to is ㅈ (j/ch).

a) Notably, we also saw this consonant (ய) appearing in Tamil vowel (ஐ) as well. (ex: ஐயனார், அய்யனார் (ஐ is replaced by அ and consonant ய (sounds i)))

3) In the similar vein, all the diphthongs can be stated as preceded with "Y" or "W" sounds to the basic vowels. Additionally, in the way diphthongs script are formed they can be seen as derived from primary vowels by adding "ㅣ". As ex: ㅏ (a) and ㅣ (i) forms ㅐ (ae). Note that in order to be true to the sound it's bet-

ter not to read too literally into the derivation of script in this way (ex ㅙ (wae) has no ㅣ sound in it.[1]

Below Table 6 shows basic vowels with derived diphthongs by the constriction "Y" or "W".

4) A consonant-like sound "Y" is prefixed with basic 4 short vowel sounds to form further basic vowels. It may also be stated that this in a way is a slightly labored long vowel sound especially since the "y" sound does twist the tongue. For example in Tamil, you can go to the long vowels in one breath from its short without tongue movement but by just jaw movement like reaching a musical upper note. In Korean tong movement is needed before raising the longer note.

5) Diphthongs are essentially made by combining the basic vowels with the very special ㅣ (i), (except naturally combining with itself!).

a) A special case among these diphthongs is the formation of two letters ㅘ, ㅝ. These two diphthongs are formed by combining the key 4 short basic wolves and are pronounced with "w" sound in front. Unlike in the case of "Y", where it is represented by an additional line in the character, there is no specific marking in the way it's written. Perhaps one could take a hint from the way a single horizontal line is written by making it look a bit above or lower, giving an impression of a single letter (these two special letters are explicitly stated, probably to support Chinese sounding words in Hangul).

b). These newly formed only two letters are the one without ㅣ in the diphthongs set. These two letters are also followed angina by adding ㅣ to complete the whole set of diphthongs.

Table 6. Korean vowels with "Y" and "W" constrictions.

			Vowels					
10 Basic vowels	Short	Hangul	ㅏ	ㅓ	ㅗ	ㅜ	ㅡ	ㅣ
		Romanized	a	eo	o	u	eu	i
	Long (y + short)	Hangul	ㅑ	ㅕ	ㅛ	ㅠ		
		Romanized	ya	yeo	yo	yu		
11 Diphthongs	Short + ㅣ	Hangul	ㅐ	ㅔ	ㅚ	ㅟ	ㅢ	
		Romanisd	ae	e	oe	wi	ui	
	Long + ㅣ	Hangul	ㅒ	ㅖ	?	?		
		Romanisd	yae	ye				
	w + short + short	Hangul	ㅘ	ㅝ	ㅘ	ㅝ		
		Romanized			wa	wo		
	w + short + short + ㅣ	Hangul	ㅙ	ㅞ	ㅙ	ㅞ		
		Romanized			wae	we		

[1]For fresh eyes ㅐ can be ambiguous as it could be read as ㅣ and ㅓ as in "eeeoo" instead of "aaaee". However, if we assume rule that ㅣ always has lower preference to other vowels as it always follows, then it removes that ambiguity.

6) Since all 11 diphthongs are somewhat derivatives of basic vowels (with 2 as compound vowels) by adding I, one could argue they are indeed closer to consonant sounds than vowels. In that way giving benefit to the "w", hence counting the special two diphthongs (ㅚ, ㅟ), one could mount an argument there are indeed only 12 vowels in Hangul, speaking in a puritan sense.

7) ㅛㅣ or ㅠㅣ are missing. That is to say for basic long wolves ㅛ and ㅠ were not subjected to iotation with ㅣ (obsolete).

7. Korean Consonants (Table 7)

Following observations can be made.

1) Double consonants sound in this case can be drawn as equivalent to its singular form with long vowels (ㄱㅏ (ka), and ㄲ (kaaa)), provided we overlook the "Y" sound that long vowels were prefixed with. In that context, these consonants can be said to play a substitute role for possible compound letters that could have been formed by the consonant and such vowels. In other words, double consonants can be viewed as a compound letter formed by consonant + vowel + consonant.

2) Just looking from the perspective of phonics—as shown in the table—all 19 consonants can be categorized under 9 distinctive sounds.

3) Note that ㅎ (ha) is similar in written form to vowel ㅗ (o) with 0 flipped below. However, it has no correspondence in meaning.

4) Not all basic consonants have corresponding double consonants. Notable it's the hard consonants (as in vallinam in Tamil) and the "ㅅ" that gets the double consonant treatment.

8. Korean Batchim and Compound Letters

As shown earlier, Tamil tries to take advantage of the nature of consonants, as they must be combined with vowels by providing compound letters that are often used at the beginning or end of a word.

There is no such explicit transcription for combined vowel + consonant pairs in Hangul. However, there is indeed an elegant equivalent approach in Hangu

Table 7. Korean consonants.

|		Hangul	ㄱ	ㄲ	ㄴ	ㄷ	ㄸ	ㄹ	ㅁ	ㅂ	ㅃ	ㅅ	ㅆ	ㅇ	ㅈ	ㅉ	ㅊ	ㅋ	ㅌ	ㅍ	ㅎ
Final	Romanization		*k* g	*k* kk	*n* n	*t* d	–	*l* l	*m* m	*p* b	–	*t* s	*t* ss	*ng* ng	*t* j	–	*t* ch	*k* k	*t* t	*p* p	*t* h
	IPA		/k̚/	/n/	/t̚/	–	/l/	/m/	/p̚/	–	/t̚/	/ŋ/	/t̚/	–	/t̚/	/k̚/	/t̚/	/p̚/	/t̚/		
Basic jamo	Hangul		ㄱ		ㄴ	ㄷ		ㄹ	ㅁ	ㅂ		ㅅ		ㅇ	ㅈ		ㅊ	ㅋ	ㅌ	ㅍ	ㅎ
	Roman		g/k		n	d		r/l	m	b		s		-/ng	j		ch	k	t	p	h
Composite	Hangul		ㄲ			ㄸ				ㅃ		ㅆ			ㅉ						
	Roman		gg/kk			tt				bb/pp		ss			jj						

namely "syllable block mechanism". A syllable block in Korean is a more extensive feature than the compound letters in Tamil. A syllable block can be consonant + vowel or consonant + vowel + consonant (final consonant/batchim).

In simple terms the syllable blocks formed as follows, It shows a normal left to right case of consonant followed by a vowel and the special final consonant case where the consonant written below the consonant and vowel pair.

C	V

C	V
C	

In the above simplicity one must overlook the place holder "ㅇ" for starting vowels and diphthongs that are formed by double vowels (ex: 배 doesn't mean CVV, it's best considered CV).

There is a special case with "—", where it is written in the following form.

	C
C	V
V	C
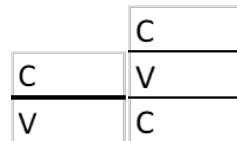
Ex: 한글 (hangeul)

It may have been derived from the time Hangul is written top to bottom. Nevertheless, it helps to form a compact syllable block.

Similar to Tamil, formation of syllable blocks in this way, by helping to separate the syllable, makes it easy to pronounce words phonetically correctly.

Below is a alphabet table that shows combined syllables similar to combined letters of Tamil but with the exception that combination also happens explicitly in the way letters are written (Figure 1).

9. Vowels of Korean and Tamil—Comparison

Table 8 below shows how the basic set of vowels of both Hangul and Tamil are mapped.

Following can be noted.

1) Five of the primary short vowels of both Tamil and Korean are similar and have direct phonetic correspondence.

2) 어 specialization: There is a special case with 어(ஒ) and 오(ஓ) and 요 (யூ யொஜ In this case, the longer version of Tamil vowel is also seemingly covered by the basic vowels of Hangul. Hence making Hangul a bit more specialized with addition of 요, which is also a long vowel with an iotated "y".

3) "—" mapped to a compound letter யூ + ஒ = யூ, (but the sound is with explicit யூ + ஒ pronunciation) in Tamil. Clearly, it appears as if there is indeed a consonant sound inherent in it, especially if one considers the definition of consonant as the one that interrupts the flow of air.

Korean Alphabet Chart

Consonants	Vowels									
	ㅏ (a)	ㅑ (ya)	ㅓ (o)	ㅕ (yo)	ㅗ (oh)	ㅛ (yo)	ㅜ (ow)	ㅠ (you)	ㅡ (er)	ㅣ (ee)
ㄱ(G)	가	갸	거	겨	고	교	구	규	그	기
ㄴ(N)	나	냐	너	녀	노	뇨	누	뉴	느	니
ㄷ(D)	다	댜	더	뎌	도	됴	두	듀	드	디
ㄹ(R/L)	라	랴	러	려	로	료	루	류	르	리
ㅁ(M)	마	먀	머	며	모	묘	무	뮤	므	미
ㅂ(B)	바	뱌	버	벼	보	뵤	부	뷰	브	비
ㅅ(S)	사	샤	서	셔	소	쇼	수	슈	스	시
ㅇ Silent	아	야	어	여	오	요	우	유	으	이
ㅈ(J)	자	쟈	저	져	조	죠	주	쥬	즈	지
ㅊ(CH)	차	챠	처	쳐	초	쵸	추	츄	츠	치
ㅋ(K)	카	캬	커	켜	코	쿄	쿠	큐	크	키
ㅌ(T)	타	탸	터	텨	토	툐	투	튜	트	티
ㅍ(P)	파	퍄	퍼	펴	포	표	푸	퓨	프	피
ㅎ(H)	하	햐	허	혀	호	효	후	휴	흐	히

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Figure 1. Korean alphabet chart (similar to Tamil compound letters).

Table 8. Tamil & Korean vowel comparison.

Hangul & Tamil Vowel comparison					
	Hangul	Tamil	Romanisation		Notes
1	아	அ, ஆ	a, aa	1	Applies to short and long form of Tamil vowels
		(야) (யா)	ya	2	However, with Y or ய் consonant iotation 야 produces the long vowel sound
				3	In Tamil ய் + ஆ = யா produces the exact sound
2	이	இ, ஈ	I, ī	1	Applies to short and long form of Tamil vowels
3	우	உ, ஊ	u/ū	1	Applies to short and long form of Tamil vowels
		ᅳ (ய் + உ = யு)	eu	2	ᅳ sound with Y iotation is closer to ய் + உ rather than the compound யு ex 으뜸가는 (eutteumganeun—Foremost) contrast with 우뜸가는 utteumganeun Superior
		유 (யு)	yu	2	With Y or ய் iotation long 유 (யு) soud produced (யு produced by ய் + ஊ)
4	어	ஒ	o	1	ex: 어려서부터 (eolyeoseobuteo—From a young age) more on the ஒ (o) side as opose to eo
		여 (ய ெர)	yeo	2	With Y or ய் iotation similar to ய் + ஒ=ய ெரEx 여러분 (yeoleobun—Everyone)
5	오	ஓ	ō	1	ex;
		요 (ய ோர)	yo	1	With Y or ய் iotation 요 maps to ய ோர(ய் + ஓ)
	야, 으, 유, 여, 요 ஆ, ஈ,ஊ, ஒ,ஓ யா, ய் + உ, யு, ய ெர ய ோர			1	Y or ய் based iotated vowels of the basic 5 vowel sounds

Continued

1	애	ㄲ	ae	1	ex: 에두아르도 (Eduardo)
2	에	ㄲ	e	1	ex: 애완동물 aewandongmul(Pets)
				3	In Tamil ㄲ is clear well pronounced long vowel

4) Concept of inherent or indirect consonant sound in vowels: if a vowel sound should start with fricative sound (tongue touching the top of the mouth) then, they are indeed biased towards consonant-like sound. Both Korean and Tamil, have the "Y", a consonant like sound, playing a part in the vowels. In the case of Tamil ய indeed is given as a consonant. Hence diphthongs ஜ and ஔ can be deconstructed as (அ + ய and அ + வ. In the case of Korean, long vowels have explicit "Y" prefixed with them, although there is no explicit "y" consonant stated in Hangul. In addition, Korean also has "W" prefixed in its diphthongs.

5) With application of tolerance to iotation of "y" for Hangul, if one looks at the long sounding nature of the four of the long Hangul vowels, they do also have phonetic correspondence with the four long vowels of Tamil.

6) The other primary vowel sound in Tamil ㄲ and ㄲ are mapped by Korean diphthongs ㅐ and ㅔ (Table 9).

7) As stated above rest of the 9 diphthongs in Hangul are consonant like, can be mapped to compound letters of Tamil (Table 10).

a) Arguably these Hangul diphthongs could have also been a compound letter form derived from vowels and a corresponding consonant. Unfortunately, there are no corresponding consonants to draw out from. So importantly these diphthongs are the only way to form these sounds (Y and W).

b) Since there is no "V" sound at all in Korean except the one present in these diphthongs, it makes it even more special and important for Hangul to form the syllable for the words.

8) The letter ஔ (auv) is a more difficult candidate, to map especially since there is no v consonant in Korean. It also has much less frequent usage in Tamil. Also, as shown previously this can also be replaced by double vowels (அவ).

9) Similarly, there seems to be no correspondence in Tamil of the Hangul letter ㅢ (ui).

10) Letter ஜ while similar ㅢ is indeed different, Potentially ஜ (ai) sound is mapped by combining two vowels similar to "ㅏ ㅣ (아이) (it is also a word in Korean meaning child). ஜ on its own also means beauty or king in Tamil). Again as shown previously ஜ is indeed a dipthong and can also be replaced by vowel followed by the consonant (அய).

10. Summary

One of the key motivating factors that drove the comparative study is the observation that both Tamil and Korean share structurally similar properties. Consider the following fundamental features or structures that make up a language.

Table 9. Tamil vowel mapping to korean diphthongs.

애	எ	ae	1	ex: 에두아르도 (Eduardo)
에	ஏ	e	1	ex: 애완동물 aewandongmul (Pets)
			3	In Tamil ஏ is clear well pronounced long vowel

Table 10. Tamil compound letters mapping to Koren diphthongs.

			Vowels				
		Hangul	ㅒ	ㅖ	ㅚ	ㅟ	ㅢ
	Short + ㅣ	Romanisd	ae	e	oe	wi	ui
		Tamil	எ	ஏ	வெ	வி , வீ	ui
		Hangul	ㅒ	ㅖ			
	Long + ㅣ	Romanisd	yae	ye			
		Tamil	யெ	யே			
11 Diphthongs		Hangul			ㅘ	ㅝ	
	w + short + short	Romanisd			wa	wo	
		Tamil			வா	வ ோ	
		Hangul			ㅙ	ㅞ	
	w + short + short + ㅣ	Romanisd			wae	we	
		Tamil			வே	(வே) வ ெள	

1) Linguistic syntactic typology.

2) Arrangement/pattern of Vowels and Consonants.

a) Abugida/alphasyllabary.

3) Phonemic orthography (written symbol is closer to the sound).

4) Morphology: Agglutination or fusional.

As shown in Table 11 below, both Korean and Tamil share the above structural aspects.

Typically, lexical structures or cognates can also be considered to compare both languages to show any similarities or possible proto relationship. However, such cognates based lexical structures or similarities are, while detailed, subtly different from the aforementioned features. These features help specify the type or category of languages, like setting out a blueprint. For that reason, we shall refer to them as that makes up a "language Architecture". Using that definition, both Korean and Tamil can be stated as "architecturally similar" languages.

The architectural similarity in fact helps to reduce the burden of framework that needs to be formed for the phonetic comparison of both languages, as it provides a strong structural context. Without going through the detailed phonetic analysis with IPA charts and occurrence of sounds in generic terms, a simplistic "parameter and weightage" is considered. Given the purpose is to show the outline view and nature of phonetic similarity of these languages, the following weightage system is considered (Table 12).

Table 11. Language architectural similarities of Tamil and Korean.

Criteria	Korean	Tamil
linguistic syntactic typology?	SOV (Subject-Object-Verb)	SOV (Subject-Object-Verb)
Arrangement/pattern of Vowels and Consonants	1. Abugida language as it has a syllabic concept with an explicit case called bitchem	1. Abugida language as it has explicit compund letters that even specially transcribed
Phonemic orthography	Yes: Given the explicitly written syllabic nature	Yes: Given the explicitly written syllabic nature
Morphology: Agglutination or fusional	Tamil is an agglutinative language. Root word is combined with suffixes to form words	Korean is an agglutinative language. Root word is combined with suffixes to form words

Table 12. Weighted system for comparison.

Parametric Case	Weightage: % of similarity	Notes
In the case where letters are phonetically identical	100	
In the case letters are Similar but differs by a consistant singular pattern of iotation. But has examples of common cognates that shows the derivation of iotation.	75	Since it's a positive similarity, weightage is raised above 50%
In the case letters are Similar but differ by a consistant singular pattern of iotation. But has no examples of common cognates that shows the derivation of iotation.	20	
There are no direct similarities within corresponding vowel or consonant set, but similar sound can be shown with compound letters or syllabic context	40	The weightage is given closer to the positive threshold
Not similar	0	

Above, a conservative approach is proposed. High threshold of 50% (compensating for inherent ambiguity) is considered to suggest any form of similarities (in the absence of large data analysis of all or large sets of languages) (Table 13).

1) As per the above, there are 62% phonetic similarities in the way vowels are arranged in Tamil and Hangul.

2) Most Tamil vowels map onto Hangul than the other way around.

3) Vowels in Hangul and Tamil are comparable in terms of numbers if one is to accept the "y" and "w" based vowels of Hangul as corresponding to consonants.

4) Unique Difference

● One known vowel in Tamil is not easily mapped to Hangul (ஔ).

● One vowel in Hangul is not mapped to Tamil (ㅢ).

Table 13. Phonetic similarity by weighted method.

Parametric Case	Tamil	Hangul	Notes
In the case where letters are phonetically identical	5 (42%)	5 (22%)	5 of the basic short Hangul vowel (of 21) maps onto 5 of the short vowels of Tamil (of 12). I.e. 22% of vowels in Hangul maps to 42% of Tamil vowels
In the case where letters are phonetically identical	2 (17%)	2 (10%)	2 of the Tamil vowel (17%) mapps to 2 (10%) of the diphthong in Hangul
In the case letters are Similar but differes by a consistant singular pattern of iotation. But has examples of common cognates that shows the derivation of iotation.			
In the case letters are Similar but differes by a consistant singular pattern of iotation. But has no examples of common cognates that shows the derivation of iotation.	4 (33%)	4 (19%)	4 of the long Tamil vowel (33%) maps onto 4 of the long vowels of Hangul (19%)—but with iotation difference.
There are no direct similarity within corresponding vowel or consonnat set, but similar sound can be shown with compund letters or syllabic context		9 (42%)	9 of the Hangul diphthongs maps to comound ltters in Tamil
Not similar	1	1	
Weighted averge	65%	60%	

11. Consonants of Korean and Tamil—Comparison

There is one fundamental difference in the way the sound of the consonant are stated on their own between Korean and Tamil. Consider the words 아빠 (ap-pa)—அப்பா (appa) meaning dad and 엄마 (eomma)—அம்மா (amma) meaning mother. Both words are nearly phonetically identical in both the languages. However, the corresponding consonants, that appears between two vowels, ㅃ, ㅁ and ப், ம், when stated on their own are stated in different styles and sound. In Tamil they are pronounced as "ip" and "im" with closed mouths (as if to prevent the opening of air after that to avoid the trailing potential vowel sound!). In the case of Korean, a sort of "ooo" is used following the pronunciation with a closed mouth like, "ip-ooo", "im-ooo". In this case Tamil pronunciation of consonants on its own is closer to the actual sound as it appears in the word. Nevertheless, this should have no bearing on the comparison of the consonants since both the consonants are identical as it is used in the context of the words. In a similar vein, it should also be noted that most of the consonants are closed mouth sounds in both Tamil and Korean (just as in many languages) (Table 14, Table 15).

Following can be observed.

1) As shown above, for all Tamil 18 consonants, except for two consonants (வ், ஞ்), corresponding Korean consonants can be found. Similarly, for all 19 consonants of Korean, except one (ㅎ), corresponding Tamil consonants can be found. The following exceptions can be noted.

a) Ex: of ஞ் (inch): மஞ்சள் (mainchal) meaning yellow. Although there is

Table 14. Tamil mapped to Hangul by phonetic similarities.

Roman	Tamil mapped to Hangul by phonetic similarities				
k/g	ㄱ	ㅋ	ㄲ		
	க்(g)	க்(க)	(க்)கா		
p/b	ㅂ	ㅍ	ㅃ		
	ப்	ப்/ப	(ப்)பா		
t	ㄷ	ㅌ	ㄸ		
	ட்	த்	(ட்)டா		
s	ㅅ	ㅈ	ㅊ	ㅆ	ㅉ
	ச் (ச)	ய்(ய)	ச்(ச)	ச்/ஸ்(சா)	(ய்)யா
n	ㄴ				
	ண்/ந்/ன				
l/r	ㄹ				
	ர்/ல்/ழ்/ள்/ற				
m	ㅁ				
	ம்				
ng	ㅇ				
	ங்				
h	ㅎ				
	ஹ்/ஹ				

Table 15. Hangul mapped to Tamil.

Hangul mapped to Tamil		
க்	ㄱ	க
ங்	ㅇ	ங
ச்	(ㅊ)	ச
ஞ்		ஞ
ட்	ㄷ	ட
ண்/ந்/ன	ㄴ	ண்/ந்/ன
த்	ㅌ	த
ப்	ㅂ	ப
ம்	ㅁ	ம
ய்	(ㅈ)	ய
ர்/ற்	ㄹ	ர்/ற
ல்/ழ்/ள்	ㄹ	ல்/ழ்/ள
வ்		வ

no such explicit sound in Korean, something similar can be found when 공 followed by ㅈ. Ex: 공주 (kung-chu, princess), 공자 (gongja, Confucius).

b) Although ǒ (v or iv) has no direct correspondence among Korean consonants, the sound exists in the Korean diphthong (by all the letters starting with w iotation, ex: ㅘ wa). As noted earlier, this should not be surprising given that Korean diphthong indeed carries consonant sounds.

c) Specially to support the foreign sounds (primarily Sanskrit) Tamil also has additional letters as shown below. ㅎ (ha) sound can be mapped by choosing the ஃள/ஹ from this extended set. Likewise, for the ㅆ and similar sounds, letter ஃஸ can also be compared (Table 16).

d) As shown in Table 17, although consonants ㅅ,ㅈ,ㅊ,ㅆ,ㅉ vary based on whether its basic, aspirated (burst of air) or tense (harder or stiffer voice).

On the other hand, in Tamil, consonants themselves are not aspirated or tensed. Sound variation happens when they are compounded with vowels. For clarity and comparison of phonetic similarities are considered by how these consonants sound with first vowel (ㅏ, அ). From this perspective, although in Korean, in the written form, these consonants are classified as similar sounds, from Tamil perspective they contain the sound of both ச/ஃஸ (sa) and ய (ya) and with variation that can be captured by compound letters to show aspirated and tense forms. So 2 consonants and respective compound letters are used to map the 4 Korean consonants (with preference to borrow ஃஸ in some cases). Same can be said about ㄱ, ㅋ, ㄲ and ㅂ, ㅍ, ㅃ where one consonants and related compound letter is used to map to three Korean consonants. On the other

Table 16. Tamil Kirantha letters.

ஃஜ	*j*	[dʑ]
ஃஷ	*ś*	[ɕ]
ஃஷ	*ṣ*	[ʂ]
ஃஸ	*s*	[s]
ஃள	*h*	[h]
ஃக்ஷ		

Table 17. Korean consonnats by "plain", "aspirated", or "tense".

Basic	Letter (*jamo*)	ㄱ	ㄷ	ㅂ	ㅅ	ㅈ
예사소리	Romanization	*g* or *k*	*d* or *t*	*b* or *p*	*s*	*j* or *ch*
	Pronunciation	[g] or [k]	[d] or [t]	[b] or [p]	[s]	[dʑ] or [tɕ]
Aspirated	Letter (*jamo*)	ㅋ	ㅌ	ㅍ		ㅊ
거센소리	Romanization	*k*	*t*	*p*		*ch*
	Pronunciation	[kʰ]	[tʰ]	[pʰ]		[tɕʰ]
Tense	Letter (*jamo*)	ㄲ	ㄸ	ㅃ	ㅆ	ㅉ
된소리	Romanization	*gg* or *kk*	*dd* or *tt*	*bb* or *pp*	*ss*	*jj*
	Pronunciation	[k̚]	[t̚]	[p̚]	[s̚]	

hand, Korean consonants ㄴ and ㄹ are mapped to three and four Tamil consonants respectively. More details are discussed below.

2) In Korean there is a special consonant ㄹ that changes its sound distinctively depending on whether it comes at the beginning or in the middle of the word. ㄹ is pronounced as "l/ல" when placed at start but as "r/ர" when in the middle. For this reason Koreans never pronounce "r" sound (radio is always ladio/라디오, sar(l)anghaeyo (love you)-사랑해요, mirae (future)-미래). Hence both ர and ல variation of the Tamil consonants are mapped to it. In Tamil, ல has much wider variation by the nature of compounding with all the vowels. All the words வளவு (land), வழவு (slippery), and வலவு (right), while distinctive in Tamil, have the same Romanised sound "valavu". ழ is considered special in Tamil. One way to say the correct pronunciation of ழ is to say that you start the tong where you would start for "r" and go with how you would say எ. In that sense there is a surprising connection with "r".

பலம், பழம், and பளம் also have different meanings but the same romanisation (palam).

3) ㄴ is also loaded with ண, ந, ன. However, it's not as dramatic as ㄹ. கணம், கனம், and கநம் are different words with the same romanization (kanam).

4) As we saw earlier ய is another unique consonant in Tamil. We saw its inherent in the Tamil vowel ஐ. **Ex:** எம்.ஜீ.ஆர் (M.G.R where ஜீ could have been written as யி). Similarly in the word கதையில்ல (kadayalla—not a story), the current pronunciation is almost silent and replaced by அ (a) as in kaday-alla. However, in the context of Korean this is used along with ஈ to map the ㅅ family of sounds.

5) A passing observation is that there are no F or V sounds in Korean. Tamil also doesn't have some sounds formed by b, f, g, q, x, z. Another obvious statement is to say neither neighthertamil nor Korean has any words that are formed just with consonants. In contrast English has many such words. Ex: dry, gym, ply, shy, why, try, myth, crypt

6) As noted above in Korean words, a consonant can follow another. Double consonants that are part of the consonant list are such an example. Although from phonetic perspective the purpose is to capture the tense sound, in writing form it appears as one follows the other (ㄲ, ㄸ, ㅃ, ㅆ, ㅉ). In contrast, there are no words in Tamil with a consonant followed by another consonant in the written form (ex: ம் ம் is not allowed). Since Tamil transliterates compound letters explicitly, from phonetic perspective, sound of consonant followed by consonant is widely seen. Ex: அம்மா (amma) has ம் and ம் as part of மா .

12. Summary

As per the weighted system established in the previous section, phonetic correspondence can be stated as follows (Table 18).

Based on the above approximate assessment, phonetic similarities of consonants between Korean and Tamil can be stated as 62%.

Table 18. Phonetic correspondence observed.

Phonetic correspondence observed
Generally 16 Tamil consonants and 18 Korean consonnats have correspondence
the core correspondence—ie without variations (5 Tamil, 7 Korean letters)
50% correspondence on other letters
wider variation of ㅅ sounds in Korean (5) but mapped with 2 Tamil letters
wider variation of ㄱ (3) mapped by 1 Tamil
wider variation of ㄷ (3) to 1 Tamil
Shrunk ㄴ (1) to 3 Tamil
Shrunk ㄹ (1) to 5 Tamil

Phonetic correspondence observed	Tamil	Hangul	Weightage assigned
In the case where letters are phonetically identical (8)—from 18 Tamil and 19 Korean consonnats	8 (44%)	8 (42%)	100%
correspondence with exceptions—basic consonnat mapping (4) with similar sounds in Hangul (10) mapping to 2 Tamil consonants and compound letters of Tamil	2 (11)	52 (10)	40%
consonnats in Tamil (2) with varying sound mapping in Tamil (6)	6 (33)		40%
consonnats that has least or no mapping	2	1	0%
Weighted average	62%	63%	

13. Overall Summary

The basic outline review conducted above suggests a clear positive correlation between Korean and Tamil phonetics.

This is not to suggest there is sufficient evidence for potential proto phonemes. To draw such conclusions, more substantial lexical analysis will have to be undertaken potentially including other similar languages to both, such as Japanese.

Nevertheless, a positive relationship is an interesting hint in its own right.

"Sound correspondence is so unlikely to occur by chance that they are valid evidence of a historical relationship (Ringe Jr., 1992)."

Suggestions for Further Research

Research 1: Comprehensive study of cognates in both Tamil and Korean, taking into account the language transformation across time and the significant influences from other languages.

Research 2: Develop a more rigorous framework for measuring phonetic distances between the languages and their correlation to other linguistic evolutionary aspects.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Glossary

- Vowel:

A speech sound which is produced by comparatively open configuration of the vocal tract, with vibration of the vocal cords but without audible friction, and which is a unit of the sound system of a language that forms the nucleus of a syllable. (https://languages.oup.com/)

- Consonant:

A basic speech sound in which the breath is at least partly obstructed and which can be combined with a vowel to form a syllable.
(https://languages.oup.com/)

- Syllable

A unit of pronunciation having one vowel sound, with or without surrounding consonants, forming the whole or a part of a word. (https://languages.oup.com/)

- Aspirated consonant

A consonant is aspirated because they are pronounced with an accompanying forceful expulsion of air. (https://www.britannica.com/topic/aspirate)

- Tense consonant

Tense consonants (ㄲ, ㄸ, ㅃ, ㅆ, and ㅉ) are said with a harder, stiffer voice than their plain counterparts.
(https://en.wikibooks.org/wiki/Korean/Essential_Pronunciation_Rules)

- Diphthong

A diphthong is a sound made by combining two vowels, specifically when it starts as one vowel sound and goes to another, like the oy sound in oil.
(https://www.vocabulary.com/dictionary/diphthong)

- Cognates

A word that has the same origin as another word, or is related in some way to another word. (https://dictionary.cambridge.org/dictionary/english/cognate)

- Iotation

A consonant combined with the palatal approximant /j/ to form a palatalized consonant. (https://www.yourdictionary.com/iotation)

Appendix

Assumptions

1) Focus of discussion above is on the phonics of vowels and consonants of both the language—and not on grammar or vocabulary etc.

2) The Tamil letter Ahenam is not considered. However there could be usage similar to ha ㅎ—although it's not vowel but a consonant in Hangul.

3) The comparison is based on the South Korean language and all reference of Korean refers to South Korean.

4) Hangul and Korean are used as interchangeable words.

5) As this is a comparison between two non Latin script based languages IPA is not considered.

6) Study is also based on the language as practices in mainstream sense—not

considering the changes or accent.

7) The purpose is to simply measure and present the sound similarities or lack thereof.