Malayalam Retroflexes: markedness in Consonant Distribution

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Abstract

Retroflex sounds are said to be universally marked. The current paper takes up the problem of phonological and non-phonological methods that determine 'markedness' on the basis of distribution and phonotactic restrictions in Malayalam which have 9 retroflex sounds. It is widely accepted that the unmarked segment is more widely distributed than its marked segment (Battisteela 1990, Rice 1999). Further studies also suggest that the unmarked component of the inventory is identified by looking at the structural asymmetries in the phoneme inventories (Rice and Avery 1993, Rice and Causely 1998). The paper argues that the markedness of retroflex in relative to alveolar sound is problematic, for in Malayalam the retroflex sounds are more productive in terms of distribution and phonotactic restrictions in Malayalam than alveolar sound. The database suggest that the universally accepted dominance hierarchy (DH) between alveolar and retroflex sound, i. e., *retroflex >> *alveolar cannot account for the markedness relation of the retroflex and alveolar sounds in Malayalam. In other words, the dominance hierarchy between retroflex and alveolar sound in Malayalam is characterised in the reversal order.

Keywords: retroflex, alveolar, markedness, distribution, phnotactics

Introduction

Markedness is defined in terms of the opposition between unmarked and marked. Jakobson (1941) attributes markedness to the restriction that a language imposes on its phonological system and the determination of the acquisition of sound and the alternation that the system exhibits. He further proposes a universal feature hierarchy where the priority relationships within the hierarchy establish relative frequency, combinatorial ability and alternation power of feature. Trubetzkoy (1969) argued markedness as relations between elements of phonological class. This opposition of the marked and unmarked can be both accounted with phonological and non- phonological criteria. A list of phonological criteria is summarized in Rice (2007) from earlier studies is given, but those which are relevant for this study.

(1) markedness terms

a. non- phonological criteria

marked	unmarked
more complex	simpler
less common	more common
implies unmarked feature	implied by marked feature
harder to articulate	easier to articulate
perceptually more salient	perceptually less salient
smaller phonetic space	larger phonetic space

Non- phonological criteria (1) usually associated to the phonetic basis of opposition is known as 'natural' markedness following Anderson (1985) or 'frequency' markedness after Bybee (2001). Implication due to absence and presence of a feature and frequency of the featural occurrence is a major markedness diagnostics under non phonological criteria. 'Implication' in phonological literature in terms of markedness is usually understood, that a feature is more marked than another feature, if the presence of one of the feature implies the presence of the other, for example, the presence of voiced sound implies the

presence of its voiceless counterpart, which can be read in terms of the notion of markedness, that voiceless sounds are unmarked with respect to its voiced counterpart. Frequency, another diagnostic for determining markedness can be examined both language- internally and cross- linguistically. In terms of frequency markedness is established on the premise that unmarked features and sounds are more frequent than the unmarked ones. Maddieson (1984) examines many languages suggesting the argument to be true cross- linguistically. Coronal sounds are more frequent across languages than other places of articulation.

Within traditional Optimality theorectic framework by Prince and Smolensky (1993) the following Domination hierarchy (DH) is proposed which is a part of the universal grammar and each language does have this hierarchy although it is to be noted that it emerges in certain conditions or remains absent in certain other condition. This formalization of the markedness is done by ranking constraints that militate against the articulation of more complex segments than those militating against the articulation of less complex segments. The domination hierarchy is given in (2)

(2) *retroflex >> *alveolar (Prince and Smolensky 1993)

In OT (DH) the interaction of faithfulness constraints and markedness constraints determines the phonology of that particular language. In a language, if the faithfulness constraint is lower ranked than its respective constraints like (2), then neither retroflex sounds nor the alveolar sounds surface in the language, while if the faithfulness constraint is higher ranked both emerges.

In Malayalam, in terms of place of articulation, retroflex sounds are more complex, for they exhibit five-way contrast among, stops, nasals, fricatives, laterals and glide. Besides the voiceless- voiced distinction, it has aspirated-unaspirated distinction too within stops excluding the alveolar stops. Some of the phonologists like Mohanan (1992) have listed another retroflex sound, a rhotic retroflex as in words like (3).

(3) ɻʂi ‘saint’ ɻdu ‘seasons’

While discussing the markedness question of retroflex sounds in Malayalam it is important to consider it with other coronal sounds and their status in the markedness property.

The coronal inventory of Malayalam is given below (Table 1)

Table1

	Dental	Alveolar	Palato- Alveolar	Retroflex
Stop	t̪ t̪ʰ d̪ d̪ʰ	n̪	c cʰ ɟ ɟʰ	ʈ ʈʰ ɖ ɖʰ
Nasal	n̪	n	ɲ	ɳ
Fricative		s	ɕ	ʂ
Lateral		l		ɭ
Tap		r ɾ		
Approximant				ɻ
Glide			j	

Markedness and Consonant distribution

The distribution of the segments in the language both cross- linguistically and language particularly help in understanding the markedness property of speech sounds. Many studies Battisteela (1990), to Rice (1999) propose that the unmarked segment is more widely distributed than its marked segment. Furthermore studies also suggest that the unmarked component of the inventory is identified by looking at the structural asymmetries in the phoneme inventories (Rice and Avery 1993, Rice and Causely 1998). Hamilton (1996) states that marked features are less frequent than the unmarked features. He also argues "features with a wider cross- linguistic distribution also occur at higher frequencies language- internally".

As already seen in (Table 1) there are eight retroflex sounds in Malayalam to five dentals, six alveolars and seven palato alveolar. Out of the eight retroflex sound two segments are aspirated sounds. Both dental and palato alveolar has two aspirated sounds. However, alveolar sounds lack aspirated sounds in the inventory. The fact that the number of sounds for retroflex sounds which exceeds the number of sounds in dental, alveolar and palato- alveolar itself oppose the concept of markedness of retroflex sounds.

In the following section we deal with the distribution of the retroflex and alveolar sounds in detail. It will be done taking each sound differently according to its manner of articulation beginning with obstruent.

Before illustrating and explaining the consonant clusters in Malayalam, the syllable division of the language has to be explained. There are several proposals of syllabification in Malayalam. Prabodhachandran Nayar (1972) and Somasekharan Nair (1979), consistent with the universal theory of syllabification illustrates syllable division with an implication 'that the maximum number of elements in a word- initial cluster is two, and the maximum of successive consonants segments at the end of a word is one'. According to Nair (1979), the first consonant of the intervocalic consonant cluster will accommodate as the coda of the preceding syllable, while the rest (either one or two) consonant(s) will join the following syllable as onsets. But Nayar (1972) syllabify the clusters in a different way where only m, n, ŋ, l, ɭ, j, r are allocated to the coda of the preceding syllable.

K. P. Mohanan (1986b) in the context of Lexical phonology suggests a different approach of syllabification which is inconsistent with the universal method. According to him, syllables have an onset and nucleus, but codas are absent. The No- coda hypothesis offered by Mohanan is based on his 'observation' that 'when asked to pronounce words very slowly, pausing after each syllable, native speakers of Malayalam break up words like kampi 'metal rod' and ka:pi 'coffee' as 'ka. mpi and kaa. pi rather than as kam. pi and kaap. pi. Concerning 'm' and 'n', which he takes as word- final consonants are extrametrical or extra- syllabic (candran 'moon' -> ca. ndra(n)). This 'observation' of Mohanan is not free from penetrating light of srutiny because of the influence of orthography, which is a language- external

argument. My own 'observation' by asking both literate and illiterate to 'easily break the word into pieces' have shown multiple results irrespective of literate or not.

Building on to Mohanan, T. Mohanan (1989) advances a different approach where she claims that there are two levels of syllabification, where codas are allowed in the initial syllabification, but not in later syllabification.

Asher and Kumari (1997) instead presents one level syllabification in which the basis of allocating of word- medial consonant clusters to syllable is according to the range of consonants surfacing word- initial and word- final position. Asher's approach is different in way that he takes consonant classes rather than consonants; where consonant class 'P' includes stops, oral and nasal, 'F' for fricatives and 'L' for liquids and glides. The syllabification He thus proposes can be summarized in (4):

(4)

P. P ʋaɳ. ɖi 'vehicle' . PL sa. t̪jam 'truth'

. PF pa. kʂi 'bird' . FP pu. st̪a. kam 'book'

. FL de:. ʂjam 'anger' L. P al. bʱu. t̪am 'astonishment'

L. F ul. sa. vam 'festival' P. PL man. tram ''

L. PP ar. t̪t̪ʱam 'meaning' L. PL ar. gʱjum 'health'

. FPL va. stram 'cloth'

. LL ka:vjam 'poetry', but when in a cluster / j / comes as first consonant followed by 'L' class then it will be syllabified as j. L, for example dej. vam 'diety'.

In this book, we assume that the syllabification is close to principles of universal syllabification, where intervocalic consonant sequences are assigned to the onset if and only if a particular 'cluster' is allowed as sanctioned as an initial onset and otherwise consonants apportioned between adjacent syllables as codas and onsets, as is normally assumed in the literature.

Distribution of Obstruent retroflex and alveolar sounds

There are four retroflex obstruents / ʈ,ʈʰ , ɖ, ɖʱ / and one / t / alveolar obstruents in Malayalam. The fact that there are more retroflex obstreunts than alveolar obstruents in Malayalam suggest that the occurrence of retroflex sounds will be more in terms of the distribution of sounds, thus the unmarkedness is predictable. Both retroflex and alveolar sounds do not occur stem- finally; in word- initial clusters and word- final clusters.

stem- initially

Retroflex and alveolar sounds does not occur stem- initially, but in loan words from English retroflex sounds occur stem initially as shown below. The existence of alveolar stop in the language and the absence of occurrence of retroflex and alveolar sound in the stem- initial position and the change of alveolar stop to the retroflex sound of the English loans demonstrate the prominence of retroflex sounds in the language. This prominence could be because of the phonetic similarity of retroflex stop of Malayalam to the alveolar stop of the English, where retroflex stops in Malayalam are contrastively specified as apical. It is interesting to note that the English alveolar stop did not get accustomed to dental stop, which by the way occur stem- initially in Malayalam. This is due to the fact that dentals in Malayalam are redundantly laminal in specification . The occurrence of alveolar stop only as geminate

consonant in the language system of Malayalam further explains the adaptation of English alveolar stop to retroflex stop.

e.g., Retroflex loans: ʈajarə ‘tyre’ ʈaimə ‘time’

inter- vocalically

Alveolar stop do not occur inter- vocalically in singleton consonant, while retroflex stops occur regularly.

e.g., vaʈi ‘stick’ mu:ɖʱan ‘fool’

Word- medial cluster

In word- medial clusters both retroflex and alveolar stops occur. But Retroflex make combinatorial relation with many other consonants alveolar combines with another alveolar stop forming a geminate and with nasal in GEN forms.

e.g., Retroflex: iʂʈam ‘love’ paɳḍiṯan ‘scholar’
Alveolar: vittu ‘sell’ – past n̪inte ‘you- GEN’

with retroflex sounds

Alveolar stops do not cluster with retroflex sounds.

e.g., ʈi:vaɳʈi ‘train’ ɕreʂʈʰam ‘noble’

The following generalization can be made from the above examples.

- Retroflex sounds occurs stem- initial position in loan words (ʈ), medially (ʈ, ʈʱ, ɖ, ɖʱ) medially when doubled (ʈ), intervocalic position (ʈ), in the medial sequence -ɳʈ- (ʈ) and in the medial sequence with other consonants (ʈʱ), and in the medial sequence -ɳɖ- (ɖ).
- Alveolar sounds occurs medially when elongated (t), word- finally in loan words form English (t), and in a medial consonant sequences sequence (d).
- Retroflex and alveolar stops do not cluster with each other. While they combine to form cluster with other coronal place of articulation.
- Both sounds do not get combined with other sounds including other coronal sounds, except that the voiceless retroflex stop (ʈ) comes as the second element in the medial consonant cluster with / k / preceding.
- Both retroflex and alveolar sounds occur as geminate word- medially.

As we mentioned earlier that retroflex stops exceed in number with alveolar counterpart itself proves that retroflex stops are less marked than the alveolar stop.

Distribution of nasal retroflex and alveolar sounds

There is only one nasal sound each for retroflex and alveolar, / ɳ / and / n / respectively. According to Asher and Kumari (1999) the retroflex nasal is a underlying nasal while alveolar nasal is not. Mohanan and Mohanan (1984) maintain the same observation, where out of the six- way contrast in nasals in Malayalam, only three of them are underlying nasal sounds (m, n̪, ɳ) and the rest is derived one (n, ɲ, ŋ). Both retroflex nasal and alveolar nasal does not occur stem- initially and in word- final position as clusters. They does not form cluster with other coronal sounds in the language.

inter- vocalically

e.g., Retroflex nasal: kaɳakkə ‘accounts’ karaɳam ‘reason’

Alveolar Nasal: pana ‘palm’ a:na ‘elephant’

stem- finally

e.g., Retroflex nasal: a:ɳ ‘male’ peɳ ‘female’

Alveolar nasal: ma:n ‘deer’ t̪an ‘you’

word- initial cluster

Retroflex sounds do not combine in word- initial positions. \

e.g., alveolar nasal: nja:jam ‘justice’ nju:naṯa ‘deficiency’

Word- medial cluster

e.g., Retroflex nasal: kaʂɳam ‘piece’ kaa:ɾuɲjam ‘mercy’

Alveolar nasal[1]: ccenni ‘madness’ n̪inde ‘you- GEN’

with retroflex sounds

Alveolar nasal do not cluster with retroflex sounds.

e.g., Retroflex nasal: guɳɖʰa: ‘rowdy’ sahiʂɳuṯa ‘tolerance’

with alveolar sounds

Both retroflex nasal and alveolar nasal are less productive with alveolar sounds as clusters.

e.g., Retroflex nasal: varɳam ‘color’

Alveolar nasal: ccenni ‘madness’ n̪inde ‘you- GEN’

with sounds other than coronals

e.g., Retroflex nasal: puɲjam ‘virtue’ peɳma ‘feminity’

Alveolar nasal[2]: :jam ‘justice’ nju:naṯa ‘deficiency’

Geminate

e.g., Retroflex nasal: piɳɳakkə ‘oil cake’ eɳɳa ‘oil’

Alveolar nasal: annam ‘food’[3]

The following generalization can be made from the above data.

- Retroflex nasals [ɳ] occur intervocalically, in medial clusters, and word- finally in rare occasions.
- Alveolar nasals [n] occurs word- finally in limited occasions, intervocalically, word- initial cluster with palatal glide / j / in English loans, few though, and in a nasal- plosive sequence.
- Alveolar nasals [n] cluster with only homorganic nasal- plosive sequence.
- Retroflex nasals [ɳ] combine with other alveolar sounds and with other retroflex sounds.

[1] Alveolar nasals in the word- medial clusters are less productive.
[2] Alveolar nasals are less productive in making cluster with sounds other than coronal sounds
[3] This word often replaced by another word making the geminate alveolar nasal completely not in use in the language.

- Both retroflex [ɳ] and alveolar nasal [n] cluster with sounds other than coronal sounds, though alveolar nasal [n]'s occurrence in a cluster is limited to word- initial position with / j /.
- Both retroflex [ɳ] and alveolar nasal [n] occurs word- medially as geminate. However retroflex nasal occurs as geminate word- finally in rare occasions with an alternative articulation with vocalic release.

The above data and generalization explicitly proves that alveolar nasal sounds are less distributed in comparison with its retroflex counterpart.

Distribution of fricative retroflex and alveolar sounds

There is only one fricative sound each for retroflex and alveolar, / ʂ / and / s / respectively. According to Asher and Kumari (1999), both these sounds are not underlying segment, rather they got into the language system 'through the influx of Sanskrit'. Panikkar (1973) include only alveolar fricative in the Ernad variety of Malayalam. Both retroflex fricative and alveolar fricative does not occur as cluster in the stem- final position.

stem- initially

e. g.,	Retroflex fricative:	ʂaʂʈi 'sixty'	ʂa:ppə 'shop'
	Alveolar fricative:	sa:kʂi 'witness'	sinima 'cinema'

inter- vocalically

e. g.,	Retroflex fricative:	ʋe:ʂam 'cloth'	bʱi:ʂəɳi 'threaten'
	Alveolar fricative:	ma:sam 'month'	asu:ja 'jealousy'

stem- finally

Retroflex fricative and alveolar fricative does not occur stem- finally except the fact that alveolar fricative occurs in loans from English in very limited area, that too, with an alternate pronunciation with an added 'enunciative vowel' and elongation of the fricative.

word- initial cluster

e. g.,	Retroflex fricative:	kʂema 'patience'	kʂi:ɳam 'tiredness'
	Alveolar fricative:	swabʱavam 'manner'	swi:karikkuka 'to accept'

Word- medial cluster

e. g.,	Retroflex fricative:	ɾakʂa 'protection'	ɖeʂjam 'anger'
	Alveolar fricative:	vasʈram 'cloth'	va:sʈavam 'reality'

with retroflex sounds

e. g.,	Retroflex fricative:	iʂʈam 'love'	kaʂɳam 'piece'
	Alveolar fricative:	visɽaʈa 'spread'[4]	

[4] Alveolar fricative with retroflex sounds are not productive.

with alveolar sounds

Alveolars do not cluster with other alveolar sounds.

e. g., Retroflex fricative: varʂikam ‘anniversary’ ulkkarʂam ‘admiration’

with other coronal sounds

e. g., Retroflex fricative: varʂam ‘year’ amarʂam ‘anger’

Alveolar fricative: vas̪tram ‘cloth’ va:st̪avam ‘reality’

with sounds other than coronals

Alveolar fricative do not combine with sounds other than coronals.

e. g., Retroflex fricative: n̪iʂpakʂa ‘impartial’ d̪eʂjam ‘anger’

geminate

Retroflex fricative do not occur as geminate.

e. g., Alveolar fricative: nissahaja̪d̪a ‘helplessness’[5]

The following generalization can be made from the above data.

- Retroflex fricative [ʂ] sound occurs stem- initially and word- medially, in word- initial cluster and in word medial cluster.
- Alveolar fricative [s] sound occurs initial, word- medially, and in word- initially and word-medially as cluster consonant.
- Retroflex fricative [ʂ] combines to form cluster with all sound segment in the language.
- Alveolar fricative [s] clusters with retroflex sounds in very limited occasions, coronal sounds except for alveolar sounds. It does not combine to form cluster with sound other than coronals.
- While alveolar fricative [s] occurs as geminate word- medially in Malayalam, retroflex fricative [ʂ] does not.

The above data and generalization proves that alveolar fricatives are more marked than its retroflex counterpart.

Distribution of liquid retroflex and alveolar sounds

There are two retroflex liquids, the lateral / ɭ / and the approximant / ɻ /. As for the alveolar there are two alveolar tap/ trill [r, ɾ] and a lateral / l /. Each one of these categories is exemplified separately in the coming sections.

(a) **Laterals**

stem- initially

Retroflex laterals do not occurs stem- initially

e.g., Alveolar lateral: la:bʱam ‘profit’ lokʱam ‘world’

[5] Alveolar fricative as geminate are not productive.

inter- vocalically

e.g., Retroflex lateral: ɖaɾa:ɭam ‘a lot’ ni:ɭam ‘length’

Alveolar lateral: pa:lam ‘bridge’ ka:lam ‘time’

stem- finally

e.g., Retroflex lateral: karaɭ ‘heart’ vaaɭ ‘sword’

Alveolar lateral: pa:l ‘milk’ kappal ‘ship’

word- initial cluster

Alveolar laterals do not occur in word- initial position as part of consonant cluster.

e.g., Retroflex lateral: pɭavə ‘jack tree’ kɭa:və ‘verdigris’

Word- medial cluster

e.g., Retroflex lateral: vipɭavam ‘revolution’ keɭvi ‘hearing’

Alveolar lateral: alpəm ‘little’ agalca ‘seperation’

word- final cluster

Both Retroflex lateral and alveolar lateral sounds do not combine with other sounds in the word- final position.

with retroflex sounds

Alveolar laterals don’t form cluster with retroflex sound.

e.g., Retroflex lateral: kɭeɕam ‘difficulty’ paɾikɭiʂʈa ‘extremely distressed’

with alveolar sounds

Retroflex lateral do not combine with alveolar sounds to form cluster.

e.g., Alveolar lateral: agalca ‘seperation’[6]

with other coronal sounds

Alveolar lateral do not combine with other coronal sounds to form cluster.

e.g., Retroflex lateral: vaɾaɭca ‘famine’ muɾaɭca ‘growling’

with sounds other than coronals

e.g., Retroflex lateral: vipɭavam ‘revolution’ keɭvi ‘hearing’

Alveolar lateral: ulgʱaɖanam ‘inauguration’ alpəm ‘little’

geminate

e.g., Retroflex lateral: kuɭɭan ‘dwarf’ ʈoɭɭa ‘throat’

Alveolar lateral: ellə ‘bone’ pullə ‘herbs’

[6] It is less productive.

The following generalization can be made from the above data.

- Retroflex lateral [ɭ] occurs at intervocalic position, medially, and as cluster in word- initial and word- medial position.
- Alveolar lateral [l] occurs word- initially, in intervocalic position, word- medially and word-initially in consonant cluster.
- Retroflex lateral [ɭ] and alveolar [l] lateral do not form cluster together; however they combine with other consonants. Retroflex lateral [ɭ] combines to form cluster with other retroflex lateral [ɭ] and alveolar lateral [l] with other alveolar sounds.
- Both retroflex [ɭ] and alveolar liquids [l] occur as geminate in word- medial positions.

Tap/ trill

Asher and Kumari (1999) in their text "Malayalam" do not list a retroflex tap, while Mohanan (1984) includes it in the phonological system he proposes. The tap / ɾ / is more near to the dental area than the trill / r /. However a more clear distinction is the palatal feature and the 'possibility of more than one tap' (Asher and Kumari 1999). They does not occur stem- finally, and word- finally as clusters.

stem- initially

ɾa:və 'night' ɾakt̪am 'blood'

inter- vocalically

ura 'cover' aɾa 'waist'

word- initial cluster

prəʂɳam 'problem' gɾamam 'village'

Word- medial cluster

a:kramaɳam 'attack' mud̪ra 'sumbol'

with retroflex sounds

The alveolar tap does not cluster with retroflex sounds.

varʂam 'year' amarʂam 'anger'

with alveolar sounds

an̪d̪arlinam 'inherent'

with other coronal sounds

vert̪iɾijuga 'separate'

with sounds other than coronals

d̪i:rgʱam 'lengthy' garbʱam 'pregnancy'

The alveolar tap though combines to form cluster with the palatal glide:

kaɾjam 'matter' d̪ʱaiɾjam 'courage'

From the above data the following generalizations can be made:

- The alveolar tap and trill occurs word- initially [ɾ, r], in intervocalic position [ɾ, r], in medial cluster [ɾ, r], in initial consonant cluster [r].
- Alveolar tap [ɾ] occurs with all most all consonants are clusters.
- Alveolar tap [ɾ] and trill [r] occur word- medially as geminate.
- Alveolar trill [r] combines to form consonant cluster mainly when the following consonant are doubled (geminate).

Approximant

Alveolar does not have a approximant sound, while retroflex has one approximant sound / ɻ /. They does not occur stem- initially, word- initially and word- finally as clusters. It does not also cluster with other retroflex sounds, alveolar sounds and does not form geminates.

inter- vocalically

maɻa ‘rain’ kuɻi ‘hole’ koːɻi ‘chiken’

stem- finally

paːɻ ‘waste’

Word- medial cluster

t̪aːɻma ‘humility’ kiɻvaɻakkam ‘precedent t̪aːɻn̪n̪a ‘lower’

with other coronal sounds

aːɻca ‘week’ vaːɻca ‘reign’ kaːɻca ‘view’

with sounds other than coronals

kiːɻvaɕam ‘underside’ paɻmanassə ‘one’s old fashioned’ t̪aːɻma ‘humility’

The following generalizations can be made from the above data.

- Retroflex approximant [ɻ] occurs in intervocalic position, in medial cluster and finally rarely.
- Retroflex approximant [ɻ] combines to form cluster with all category of sounds except for its fellow retroflex sounds.

Conclusion

Among the different frameworks that discuss markedness of retroflex segments the traditional Optimality theoretic framework by Prince and Smolensky (1993) is significant one which proposes a domination hierarchy between retroflex and alveolar sounds. The constraint hierarchy approach with reference to segmental processes in Malayalam brings home the point that retroflex are more marked than the alveolar sounds. It is widely accepted that the unmarked segment is more widely distributed than its marked segment (Battisteela 1990, Rice 1999). Further studies also suggest that the unmarked component of the inventory is identified by looking at the structural asymmetries in the phoneme inventories (Rice and Avery 1993, Rice and Causely 1998). The coronal inventory of Malayalam, as explained in the paper shows that the numbers of retroflex sounds are more than the number of alveolar sounds. There are 9 retroflex sounds, including the tap, to 6 alveolar sounds. It is especially the case with stops of the two

segments, where there are four retroflex sounds in Malayalam; only one alveolar stop exists in the language. It is easy to predict that retroflex stops will be more productive in terms of distribution than the stops in Malayalam. Further the fact that the number of sounds for retroflex sounds which exceeds the number of sounds in dental, alveolar and palato- alveolar itself questions the concept of markedness of retroflex sounds in the language.

The generalizations that we made regarding the distribution of retroflex and alveolar sounds in the paper suggest, with reference to the argument that the unmarked segment is more widely distributed in a language system than the marked segment, that the unmarkedness of retroflex in relative to alveolar sound are problematic. Retroflex stops occurs in stem- initial position in loan words (ʈ), medially (ʈ, ʈʰ, ɖ, ɖʱ) medially when doubled (ʈ), intervocalic position (ʈ), in the medial sequence -ɳʈ- (ʈ) and in the medial sequence with other consonants (ʈʰ), and in the medial sequence -ɳɖ- (ɖ), while alveolar sounds only occur in medial position once it is elongated, word- final in English loans and in medial consonant cluster sequences (d). It is highly predictable that, with four way contrast within the retroflex segment opposing to one segment in alveolar, retroflex stops will be more productive than the alveolar stops. Coming to nasals, alveolar nasals occurs word- finally in limited occasions, intervocalically, and in a nasal- plosive sequence, whereas Retroflex nasals occur intervocalically and in medial clusters extensively, and word-finally in rare occasions. Thus the distribution of alveolar nasals (n) within the language is very less compared to the distribution of retroflex nasals (ɳ). Both retroflex and alveolar fricative sounds are very productive in Malayalam. Retroflex fricative (ʂ) sound occur stem- initially and word- medially, and in word- initial cluster and in word medial cluster; and Alveolar fricative (s) occur initially, word- medially, and in word- initially and word- medially as cluster consonant. Laterals, both retroflex and alveolar are moreover productive in the language. While Retroflex lateral occurs at intervocalic position, medially, and as cluster in word- initial and word- medial position, alveolar laterals occur word- initially, in intervocalic position, word- medially and word- initially in consonant cluster. It is with lateral sounds the distribution of occurence in terms of the positions seems similar. Retroflex trill are really rare in the language and not used in common speech. The alveolar tap and trill occurs word- initially (ɾ, r), in intervocalic position (ɾ, r), in medial cluster (ɾ, r), in initial consonant cluster (r). Malayalam does not have alveolar approximant. Retroflex approximant is productive in its distribution. Retroflex approximant (ɻ) occurs in intervocalic position, in medial consonant cluster and in rare case word- finally.

In terms of phonotactics the cluster combination of both the sounds demonstrate that alveolar sounds have more phonotactic restriction than retroflex sounds. Retroflex and alveolar stops resist clustering with each other, but they combine to form a cluster with other coronal place of articulation. Both sounds do not get combined with other sounds including other coronal sounds, except that the voiceless retroflex stop (ʈ) comes as the second element in the medial consonant cluster with / k / preceding. Retroflex and alveolar stops are highly productive as geminate in word- medial positions, where the number of lexicon of retroflex stops compared with alveolar will be more. Further the four different retroflex stops compared to the alveolar ones makes retroflex stops to be more productive. The phonotactic restriction on the alveolar nasal is highly restricted. They occur as cluster only with homorganic nasal- plosive sequence and in sequence with / j / in limited word- initial position. Whereas retroflex sound combine with all consonants to form consonant clusters. Both retroflex and alveolar nasals occur as geminate in word- medial position. However retroflex nasal occurs as geminate word- finally, though in some rare occasions with an alternative articulation with a vocalic release. Retroflex fricative combines to form cluster with all sound segment in the language. However, alveolar fricative occurs as cluster with retroflex sounds in very limited occasions. They are productive with coronal sounds except for alveolar sounds. And they do not combine to form cluster with sound other than coronals. So as a whole retroflex fricative sound is more productive than alveolar fricative. When it comes to laterals both retroflex and alveolar lateral, both do not combine with each other to form cluster, however they combine with other consonants. Retroflex approximant combine to form cluster with all category of sounds except for its fellow retroflex sounds.

In terms of occurrence of geminates, both retroflex and alveolar stops, liquids, and nasals occur as geminate word- medially. However retroflex nasal occur as geminate word- finally in rare occasions with an alternative articulation with vocalic release. The occurrence of geminate of retroflex and alveolar fricative is rather interesting. Retroflex fricative do not occur as geminate, while alveolar do.

Thus the entire data exemplified in the paper and the generalizations made on the basis of the data given it is clear that retroflex sounds are more productive in terms of distribution and phonotactic restrictions in Malayalam than alveolar sound. This is interesting to observe that a sound which has been regarded as 'universally marked' has got a prominent presence in the language. Moreover the database suggest that the universally accepted dominance hierarchy (DH) between alveolar and retroflex sound, i. e., *retroflex >> *alveolar cannot account for the markedness relation of the retroflex and alveolar sounds in Malayalam. In other words, the dominance hierarchy between retroflex and alveolar sound in Malayalam is characterised in the reversal order.

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