Brandon Marrow

Ling320: Phonetics

Southern Kannada

1.1 Introduction

Kannada is a Southern Dravidian (SD I) scheduled language of the Indian Union spoken by an estimated 25-44 million people throughout the state of Karnataka in which it is the official language. There are four major dialects of the language: (1) the southern dialect area centered around the major cities of Bangalore (Bengaluru) and Mysore, (2) the northern dialect area centered around Darwhar, (3) the western dialect in the district surrounding Mangalore, and (4) the northeastern district around Bijapur. The literature on Kannada predominantly analyzes Standard Colloquial Kannada which reflects the speech of educated speakers near the southern cities of Bangalore and Mysore (dialect number 1).[1] Kannada contrasts four stop and one affricate positions in a four-way distinction—voiceless, voiceless-aspirated, voiced, and voiced-aspirated—as well as six fricatives, four nasals, two laterals, and two approximants. The vowel system consists of 5 long and 6 short vowels.[2] The consonant system is, according to Harold Schiffman, a "…native Dravidian inventory…with a superimposed system of aspirated consonants and supplementary sibilants borrowed from Indo-Aryan, and with /f/ and /z/ borrowed from Urdu and reinforced by English loans."[3] This system reflects the age of Kannada, a language which dates back to the 6th century and has been influenced by languages as diverse as Sanskrit and English.

The recording on which this illustration is based was made by a female native speaker age 21. The speaker, Avehi Singh, speaks the southern "standard" dialect of Kannada as she grew up in Bangalore and has lived there for 17 years. She also speaks Hindi, Konkani, and English fluently and is learning Spanish. She is to some degree literate in Kannada—she says she can read street signs, but not books—and she has a semi-formal education in the language which she used in school. She almost exclusively uses the language in public—to talk to bus

[1] Sanford B. Steever, ed., "Kannada," in *The Dravidian Languages* (New York: Routledge, 1998).

[2] Krishnamurti Bhadiraju, *The Dravidian Languages*, Cambridge Language Surveys (Cambridge University Press, 2003), http://www.tamilnavarasam.in/books/others/the_dravidian_languages.pdf, 54.

[3] Harold Schiffman, "Introduction and Phonological System," in *A Grammar of Spoken Kannada* (University of Washington Press, 1983), ccat.sas.upenn.edu/plc/kannada/.

conductors, buy something in shops etc.—but rarely uses the language with family and friends with whom she speaks mostly English and Hindi.

1.2 Illustration[4]

Vowels: ɐ ɑː i iː [ɪ] u uː e eː o oː æ

Dipthongs: ɐi ɐu

	Labial	Dental/Alveolar	Post-Alveolar	Retroflex	Palatal	Velar
Plosive	p pː b bː	t̪ t̪ː d̪ d̪ː		ʈ ʈː ɖ ɖː		k kː g gː
	pʰ bʱ	t̪ʰ d̪ʱ		ʈʰ ɖʱ		kʰ gʱ
Nasal	m mː	n nː		ɳ ɳː	~~ɲ~~	ŋ
Fricative	~~f~~	s sː	ʃ	ʂ		
		~~z~~				
Affricate			ʧ ʧː ʤ ʤː			
			ʧʰ ʤʱ			
Tap/Flap		ɾ		[ɽ]		
Approximant	ʋ ʋː				j	
Lateral Approximant		l lː		ɭ ɭː		

2.1 Stops

Voice Onset Time

Kannada contrasts between voiced, voiced-aspirated, voiceless, voiceless-aspirated, and geminated stops in the Labial, Dental, Retroflex, and Velar positions. Data for the Voice Onset Time (VOT) was taken for voiced, voiced-aspirated, voiceless, and voiceless-aspirated stops in initial and medial positions. My speaker repeated each token word three times and the VOT data below is a mean of these three values. Additionally, two measurements of VOT were taken for voiced-aspirated stops—the duration of the closure, and the duration between the release and the onset of modal voicing. This allows for a comparison of the voiced-aspirated aspiration with voiceless aspiration and for a comparison of voiced-aspirated closure with voiced-unaspirated closure.

[4] Struck out phones were listed in the literature, but not found in my speaker's speech. Bracketed phones represent allophonic variations.

Table 1 below shows data measured between the time between stop release and the onset of modal voicing in the vowel in voiceless, voiceless-aspirated, and voiced-aspirated stops. The voiceless and voiceless-aspirated sections of this data are consistent with articulatory expectations—in general, the time between release and onset of modal voicing increases as the place of articulation moves back in the mouth and the stops become "messier." The VOT of voiced-aspirated stops does not follow this expectation, however, as the velar voiced-aspirated stop has a noticeably lower VOT. This could perhaps be explained by the fact that it is harder to sustain voicing when making a [g] due to the fact that the closed space between the velum and the glottis is so small. That the breathy-voiced aspiration is shorter than the voiceless-aspiration is in line with articulatory expectations given that [fi] is voiced and is therefore harder to sustain. As expected, the duration of both the voiceless- and voiced-aspiration is longer than their voiceless-unaspirated counterparts.

	Labial (ms)	**Dental (ms)**	**Retroflex (ms)**	**Velar (ms)**
Voiceless	14	11	13	48
Voiceless-Aspirated	69	74	90	104
Voiced-aspirated	58	41	52	39

Table 1. Time in milliseconds between release and modal voicing in voiceless, voiceless-aspirated, and voiced-aspirated stops.

Table 2 below shows measurements of the duration of voiced stops and the duration of the closure in voiced-aspirated stops. The stops represented below in the dataset are fully voiced and the closure continues for a significant amount of time before the release. That voiced-aspirated closure is not consistently longer than the closure in voiced stops indicates that the length of closure is not a contrastive part of these stops in Kannada.

	Labial (ms)	**Dental (ms)**	**Retroflex (ms)**	**Velar (ms)**
Voiced-Unaspirated	-107	-68	-47	-72
Voiced-aspirated Closure	-99	-96	-131	-54

Table 2. The duration in milliseconds of voiced stops, as well as the duration of the closure in voiced-aspirated stops.

Geminates

Kannada also has a set of geminated stops which have been included in this study as contrastive phonemes with their singleton pairs. Minimal pairs which contrast geminated and singleton stops are so difficult to find that every study referenced in this analysis has discussed gemination as a suprasegmental or at least non-contrastive feature of the language. I have included geminates as contrastive elements for two reasons: (1) minimal pairs can be found (e.g. /d̪ɐɖɐ/ vs. /d̪ɐɖːɐ/), and (2) the functional load of these minimal pairs is so low that the lack of minimal pairs seems insignificant.

Measurements for the duration of stop geminates and their singleton pairs were taken for words with these phonemes in medial position. On average, the geminated stops in my speaker's speech are 270% longer than their singleton pairs.

Phonological Notes

Scholars such as Schiffman and Leonard have noted frication of word initial stops in Kannada such that /d̪/ becomes [ð] and /t̪/ becomes [θ].[5] Though it is possible that this frication of stops would arise in my speaker's fast speech, this phenomenon did not arise in her careful articulation of stops for the recordings.

This much is also true of another phenomenon which Schiffman notes, where aspirated stops are often replaced by their unaspirated counterparts.[6] This likely occurred because my speaker carefully repeated each word three times for the recording.

With regard to consonant clusters involving stops, I found that my speaker lightly aspirated her underlying /t̪/ in the word /tʃʰɐt̪ri/.[7] Unfortunately, this was the only token word in the recordings with a consonant cluster involving a stop, as consonant clusters are rare and non-native to Kannada.[8] As such, this potential alternation could not be explored further.

2.2 Affricates

Kannada affricates contrast in voicing and aspiration in the same way as the stops. As such, the same methods were used to take measurements of the Voice Onset Time of Affricates. The data is shown in Table 3 on page 5.

[5] Schiffman, "Introduction and Phonological System." and Anne P. Leonard, "Partial Analysis of the Phonology of Formal Kannada" (The University of Montana, 1964).

[6] Schiffman, "Introduction and Phonological System," 12.

[7] See the "Affricates" recording to hear this phenomenon. It is especially prominent in the third repetition of the word.

[8] S. N. Sridhar, *Kannada* (London: Routledge, 1990).

	Post-Alveolar (ms)
Voiceless-unaspirated	86
Voiceless-aspirated	84
Voiced-aspirated	87
Voiced	-72
Voiced Aspirated Closure	-66

Table 3. The VOT in milliseconds of voiceless, voiced, aspirated, and breathy-voiced affricates of Kannada.

It is unexpected that the aspirated phones do not differ in any significant length from their unaspirated pairs. This lack of difference could be a manifestation of what Schiffman noticed with regards to stops where aspirated phones are replaced by their unaspirated pairs. That the aspiration in /tʃʰɐ̪ʈi/ is so light is probaly a result of the fact that the functional load for differentiating /tʃ/ and /tʃʰ/is not high and my speaker did not know any minimal pairs for this feature. As demonstrated in Figure 1, length of the "affricate portion" could perhaps be a contrastive factor, as the duration of the unaspirated affricate /tʃ/ is significantly longer than the affricate portion in /tʃʰ/, the former being about 350% of the latter's length.

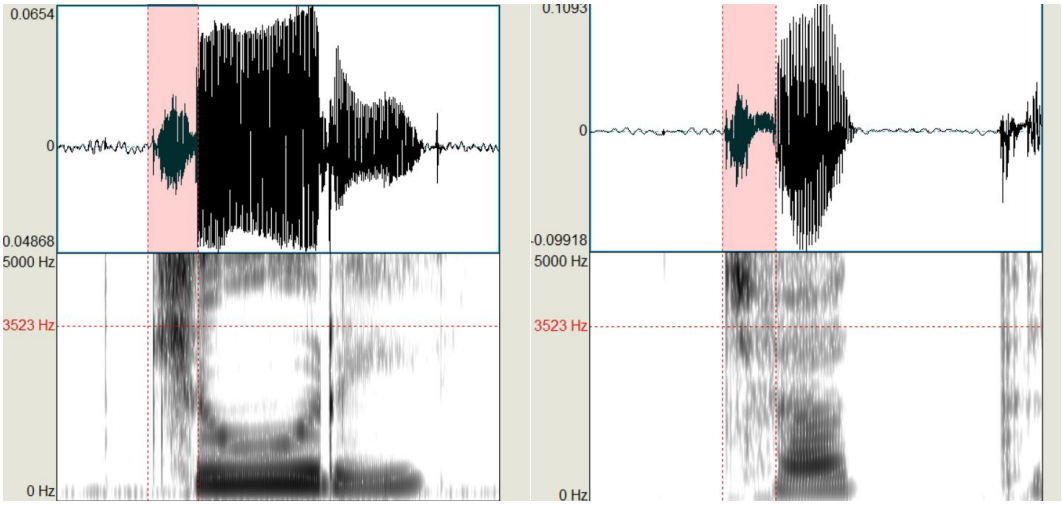

Figure 1. Spectrograms of the /ʧuːri/ 'kinfe' (on the left) and /tʃʰɐ̪ʈi/ 'umbrella' (on the right). The highlighted segments show the unaspirated and aspirated affricates. The red line is at 3523 hz. See the "Affricates" recording for these tokens.

2.3 Fricatives

Kannada is said to contrast fricatives in the labial, alveolar, post-alveolar, and retroflex positions. My speaker, however, hesitated to pronounce any words with the labial fricative /f/

or the voiced-alveolar fricative /z/, as /f/ and /z/ only occur in loan words from English. This hesitation could perhaps be attributed to the fact that she is an educated speaker of Kannada who speaks mostly English with her family and close friends. For this reason, pronouncing English words with the Kannada phoneme inventory may be stigmatized.

According to Schiffman, many dialects of Kannada speech eliminate contrasts between sibilants.[9] This seems to be the case in my speaker's speech, in which underlying /ʂ/ appears as [ʃ]. This lack of contrast between the retroflex and post-alveolar is demonstrated in Figure 2. In both token words given, the vowels before the segments which are underlyingly /ʂ/ do not demonstrate the expected drop in F3 before retroflex phones. Rather, all fricatives in /ʋiʃeːʂɐ/ and /ʋiʂɐ/ appear to be [ʃ].

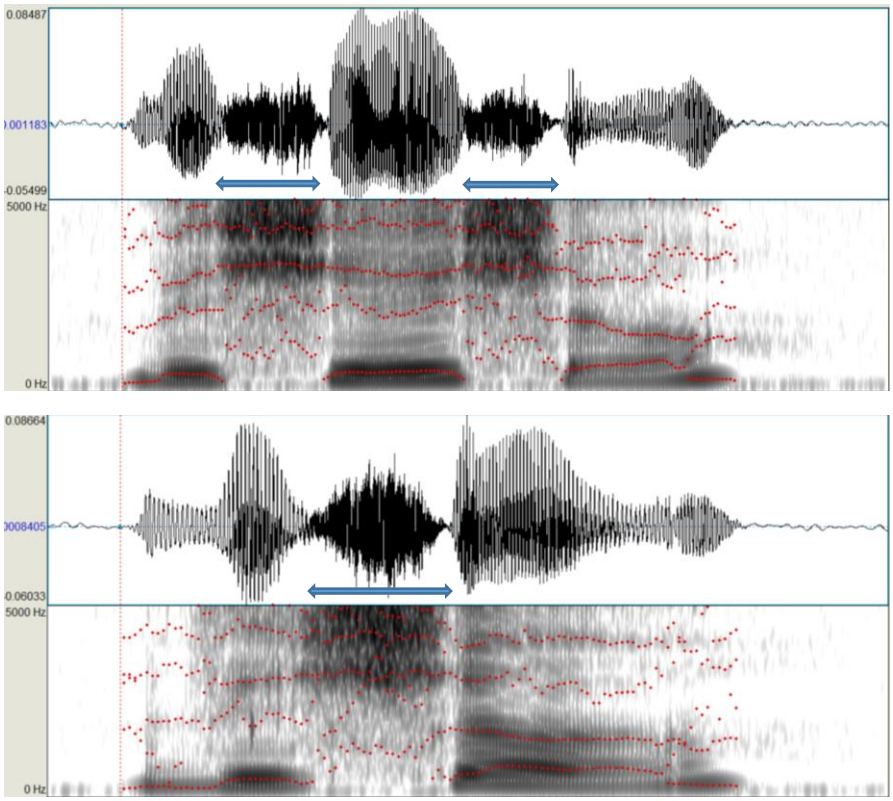

Figure 2. (Above) spectrogram of /ʋiʃeːʂɐ/ [ʋiʃeːʃɐ] 'special'. (Below) Spectrogram of /ʋiʂɐ/ [ʋiʃɐ] 'poison.' The fricative segments are marked by arrows.

Geminates

According to the literature, only fricatives in the alveolar position can be geminated in Kannada. My speaker did not know any minimal pairs for the singleton alveolar fricative and its geminate pair. The one token word she did know with a geminated alveolar fricative,

[9] Schiffman, "Introduction and Phonological System."

/ʊɐjɐsːu/ ‘age’, appears as [ʊɐjɐsu] as the underlying /sː/ in this word is shorter in length than all other /s/ segments in the data set. This is probably a result of the low functional load of the /s/ vs. /sː/ contrast.

2.4 Sonorants

Nasals

Kannada contrasts nasals in the bilabial, alveolar, retroflex, and velar positions. While some of the literature has reported a palatal /ɲ/, this phoneme is found to appear predictably before /j/ and should therefore be considered an allophone of /n/.

Kannada nasals in the labial, alveolar, and retroflex positions can be geminated. These geminated nasals were found to be on average 190% longer than their singleton pairs.

Approximants

Kannada has approximants in the bilabial and palatal positions. These approximants can both be geminated and were found to be 280% longer than their singleton pairs.

[ʲ] is often inserted before front vowels in word-initial position. In the recording, this on-glide was notably present in the word for ‘why’ /eːke/ [ʲeːke] and ‘that’ /endu/ [ʲen̪du], but not in the word for ‘today’ /in̪du/.[10] Given that /i/ and /j/ are so close in articulation, perhaps my speaker felt it was unnecessary to add the on-glide in this context.

Liquids

Kannada contrasts lateral approximants in the alveolar and retroflex positions, both of which can be geminated. On average, these geminates were found to be 270% longer than their singleton pairs.

Taps

Kannada has a phonemic tap in the alveolar position. It also has a retroflex flap which is an intervocalic allophone of /ɖ/. In some token words, a narrow [ɖ] was transcribed in intervocalic positions. These tokens seem to be instances of hypercorrection where the speaker carefully articulated the syllable with the phone /ɖ/.

[10] See the “Vowels” recording for these tokens.

2.5 Vowels

General Phonetic and Phonological Notes

Kannada has eleven contrastive vowels—five long and 6 short—as well as two diphthongs. There is some debate in the literature, as to whether the Kannada vowel inventory consists of five contrastive vowels that vary in length or whether the inventory actually consists of ten contrastive vowels that also vary in length. In the section below, I will argue that both length and quality are important indicators of contrast in my speaker's Kannada speech.

According to Schiffman 1983, the short vowels are often lower and more lax in initial and medial position. In addition, the mid vowels /e o/ are often "colored" by following vowels.[11] In the Kannada literature, there a number of discrepancies with regards to characterizing the vowel which I have illustrated here as /ɑː/. This lengthened pair of /ɐ/ has been characterized as both a "long, low central" /ɐː/ and as a "low, back, unrounded vowel" /ɑː/.[12] I will attempt to resolve this discrepancy below.

One of the short vowels in the inventory, /æ/ only appears in loan words, and my speaker did not recognize Kannada words with /æ/ as part of the language and therefore did not pronounce them. This could perhaps be attributed to the fact that she is an educated speaker of Kannada, and pronouncing English words with the Kannada phoneme inventory may be stigmatized.

Methods and Analysis

Measurements of first, second, and third formant frequencies for my speaker's vowels were collected using a variety of methods depending on the consonants and vowels preceding and following the vowel and the nature of the vowels themselves.

The Kannada vowels measured are shown in Table 4 on page 9. All the vowels appear in a medial context, before a sonorant. For the most part, the frame for all of the vowels is [k _ sonorant…], though this is not the case for /uː/, /i/, and the diphthongs for which the speaker did not know any words that fit this frame.

[11] Schiffman, "Introduction and Phonological System."

[12] Ibid. and U.P. Upadhyaya, *Kannada Phonetic Reader*, ed. H.S. Biligiri, CIIL Phonetic Reader Series-1 (Mysore: Central Institute of Indian Languages, 1972).

Short Vowel	Context and Gloss		Long Vowel	Context and Gloss	
i	dinɐ	‘day’	**iː**	kiːɾɐ	‘mongoose’
o	[koɽu]	‘to give’	**oː**	[koːɽu]	‘horn’
u	[kuɽi]	‘to drink’	**uː**	uːɾu	‘place’
e	keɾe	‘lake’	**eː**	keːndrɐ	‘center’
ɐ	kɐɾe	‘call’	**ɑː**	[kɑːɽu]	‘forest’
ɐi	ɾɐilu	‘train’	**ɐu**	mɐuna	‘silence’

Table 4. Kannada vowels and diphthongs and the context in which their formants were measured. All of the monophthongs can be found in the “Vowels” recording, except for /uːɾu/ and / dinɐ/ which can be found in the “short-long vowels” recording. The diphthongs can be found in the “diphthongs” recording.

Many of the vowels above displayed noticeable shifts in F1 and F2 during the last 20% of the vowel before the onset of the sonorant. This shift seemed to correspond with the F1 and F2 of the vowels following the sonorant, as demonstrated in Figure 3. Though Schiffman suggests that this “coloring” should only occur with the mid-vowels, it seems like this happens for vowels of all height. Given these formant shifts, measurements for F1, F2, and F3 were taken at around 50% of vowel duration.

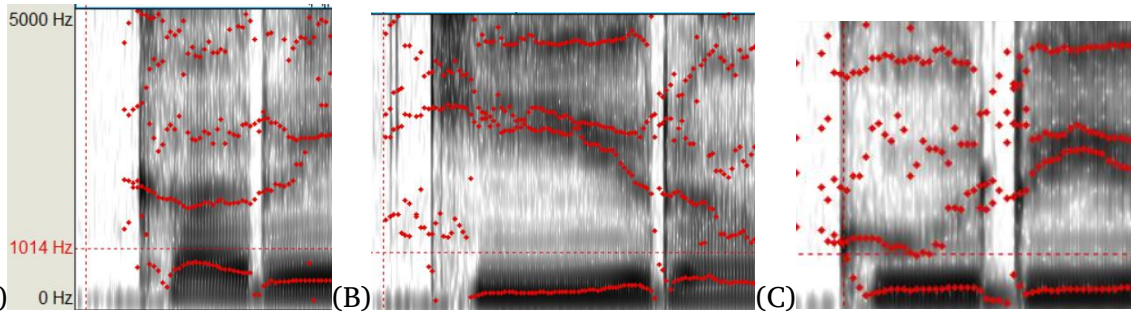

Figure 3. The first and second syllables of the words (A) /kɐɾe/ ‘call’, (B) /kiːɾɐ/ ‘mongoose’, and (C) /kuːɾidɐ/ ‘beloved’ are shown above. The medial white space is the closure of the tap between the vowels. The red line is at approximately 1000 Hz. Notice how the final portion of the F1 and F2 of the first vowel transition into the F1 and F2 of the following vowel just before the closure of the alveolar tap. This transition occurs irrespective of vowel height. All token words can be found in the “Vowels” recording.

Figure 4 on page 10 shows a plot of the contrastive vowels of Kannada. It is evident from this plot that the long vowels differ in quality from their short pairs. /i/ and /u/ are lower and more “lax” than /iː/ and /uː/, though /u/ also may be fronter (that is further away from /uː/) given that it is followed by /i/ in the context in which it was measured. As recorded in Schiffman 1983, /e/ and /o/ are, in fact, lower and more central than /eː/ and /oː/.

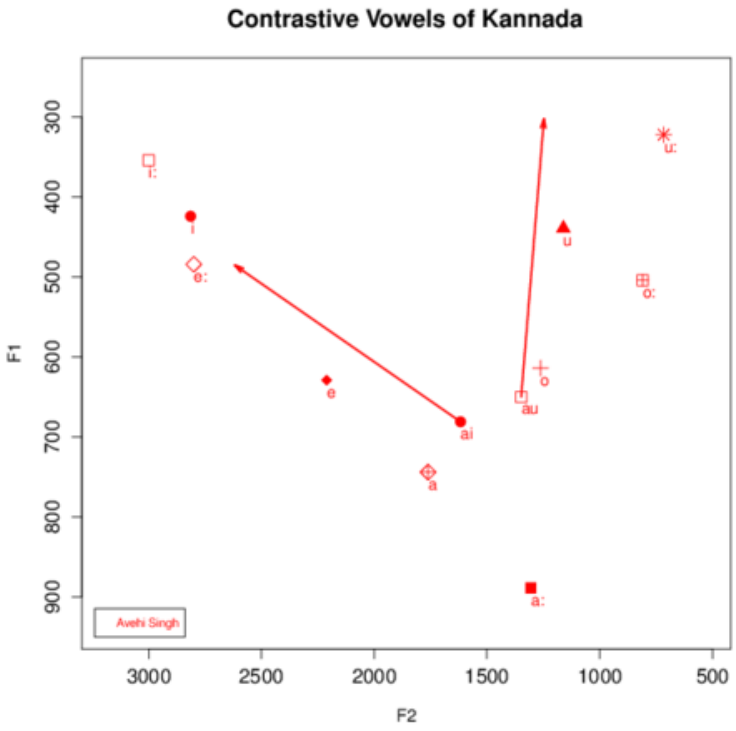

Figure 4. A vowel plot of the contrastive Kannada Vowels. The data points labeled a, au, ai, a: represent /ɐ/, /ɐu/, /ɐi/, and /ɑː/ respectively. Plots done with: Thomas, Erik R. and Tyler Kendall. 2007. NORM: The vowel normalization and plotting suite. [Online Resource: http://ncslaap.lib.ncsu.edu/tools/norm/]

Considering Figure 4 it is difficult to say with confidence that the vowel represented as /a:/ in the plot is /ɑː/. Though the vowel is certainly further back than /ɐ/, it corresponds in backness with /o/ and /u/, the lax variants of their longer pairs. Furthermore, the initial vowel in the diphthong /ɐu/ seems to be just as back as the vowel labeled as /a:/ in the plot. I chose to represent this vowel as /ɑː/ nonetheless given my own perceptions of the vowel, the fact that the vowel is about as far from its short pair as /o/ and /oː/, and the fact that the vowel is by far the lowest vowel in my speaker's vowel space.

Figure 5 on page 11 shows other phonological alterations of /i/ in my speaker's speech which appear as a more central [ɪ]. Though this allophone was not reported in the Kannada literature, it was for Telugu, a close Dravidian relative to Kannada, which attributed the alternation to a following syllable with the low vowel /ɐ/.[13] Given the token words here, this

[13] Peri Bhaskararao and Arpita Ray, "Telugu," *Journal of the International Phonetic Association: Illustrations of the IPA*, 2016, 1–11, doi:10.1017/S0025100316000207, 7.

description does not fit this allophonic variation in Kannada where [ɪ] appears in positons before consonants articulated further back in the mouth (here, post-alveolar and retroflex).

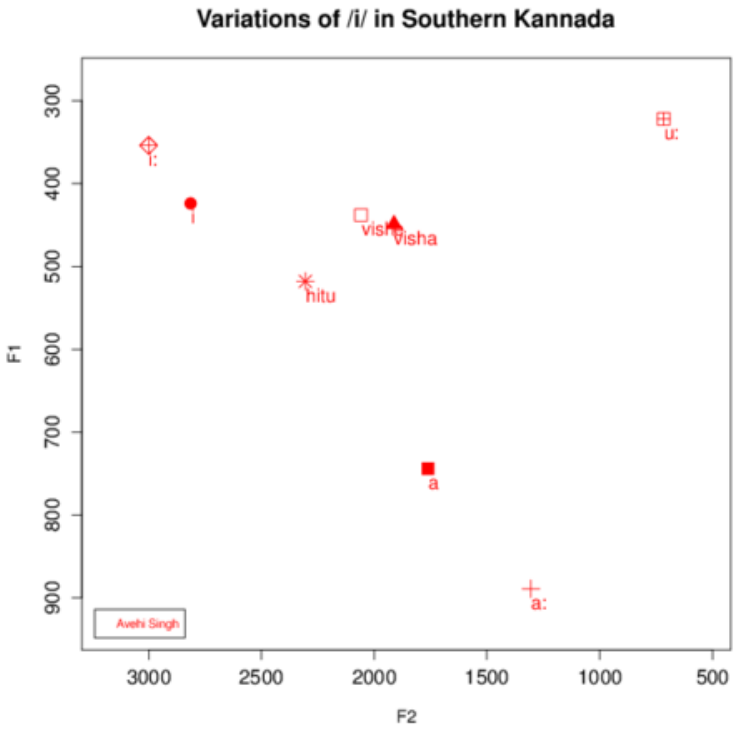

Fig 5. A plot showing allophonic variations of /i/. 'visha' represents the [ɪ] in /vɪʂɐ/ [vɪʃɐ], 'vishe' the [ɪ] in /vɪʃeːʂɐ/ [vɪʃeːʃɐ], and 'hitu' the [ɪ] in /hiɪːu/ [hɪɪːu] . /ɑː/, /ɐ/, /uː/, and /iː/ are included for reference.

A table showing data for the duration of vowels in short and long vowel minimal pairs is shown in Table 5.

Vowel	Context and Gloss		Duration (ms)	Vowel	Context and Gloss		Duration (ms)
i	dinɐ	'day'	108	**iː**	diːnɐ	'poor man'	250
e	beɭe	'crop'	237	**eː**	beːɭe	'lentil'	251
o	[koɽu]	'to give'	125	**oː**	[koːɽu]	'horn'	344
u	guɭi	'pit'	117	**uː**	uːɾu	'place'	324
ɐ	ɐɭu	'cry'	100	**ɑː**	ɑːɭu	'servant'	240

Table 5. The table above shows the duration in milliseconds of all the Kannada vowels which contrast in length. These tokens can be found in the recording labeled "short-long vowels."

From this table, it is clear that vowel duration is an important factor in contrasting most of the Kannada vowels. /e/ and /eː/ are the exception to this rule. This example of the words /beɭe/ and /beːɭe/ attests to the fact that length is not the only means of contrasting these vowels. While I measured the F2 value of /e/ in the token word to be 2635 hz, I measured the F2 value of /eː/ to be 2755 hz. These values are consistent with the observations made about the vowel plot above and are strong evidence for the fact that both quality and length are contrastive elements in the set of Kannada vowels.

Appendix: Word Glossary[14]

Stops

pɑːlu	ಪಾಲು	share
bɑːlɐ	ಬಾಲ	tail
lɐŋgɐ	ಲಂಗ	skirt
lɐŋkɐ	ಲಂಕಾ	(Sri) Lanka
ʈoːʈa	ತೋಟ	garden
ʈoːɖɐ		toda people
ɐɳɖu	ಅಂದು	that day
hiʈːu	ಹಿಟ್ಟು	flour
hɐʈːu	ಹತ್ತು	ten
upːu	ಉಪ್ಪು	salt
/ʈɐɖɐ/ [ʈɐɽɐ]	ತಡ	‘delay’
ɖɐɖɐ	ದಡ	‘shore, border’
ɖɐɖːɐ	ದಡ್ಡ	lazy
mɐʈʰɐ	ಮಠ	monastery
bɐru-	ಬರು	to come
bʱɐrɐ	ಭರ	speed, load, burden
ɖɐnɐ	ದನ	cow
ɖʱɐnɐ	ಧನ	riches, money
*muːkɐ	ಮೂಕ	‘mute’
*mukʰɐ	ಮುಖ	‘face, surface’
*kʰuːni	ಖೂನಿ	‘murder’
giːɾu	ಗೀರು	a line
gʱɐɳɐ	ಘನ	hard
pʰɐlɐ	ಫಲ	fruit, outcome
pɑːlu	ಪಾಲು	share
mɐtɐ	ಮತ	caste
ɾɐtʰɐ	ರಥ	chariot, coach
*/ɖʱɐkːe/[ɖʱɐkːʰe]	ಧಕ್ಕೆ	‘jeopardy’

Fricatives

/ʋiʂɐ/ [ʋiʃɐ]	ವಿಷ	poison
/ʋiʃeːʂɐ/ [ʋiʃeːʃɐ]	ವಿಶೇಷ	special
sɑːlu		path
ʃɑːlu		a blanket
/ʋɐjɐsːu/ [ʋɐjɐsu]	ವಯಸ್ಸು	age
hiʈːu	ಹಿಟ್ಟು	

Affricates

/tʃʰɐʈɾi/[tʃʰɐʈʰɾi]	ಛತ್ರಿ	umbrella
dʒʱuɾi	ಝರಿ	waterfall
ʧuːri	ಚೂರಿ	‘knife’
ʤoːɖi	ಜೋಡಿ	‘pair’
ɐɲʧu	ಅಂಚು	edge-verb
ɐɲʤu	ಅಂಜು	fear, dread
ɐʤːɐ	ಅಜ್ಜ	‘grandfather’

[14] A (*) denotes words from the “additional words” recording.

Sonorants

nɑːnu	ನಾನು	I
nɑːʊu	ನಾವು	we-NOM
bɐɭe	ಬಳೆ	glass bangle
bɐle	ಬಲೆ	ring
muːɾu	ಮೂರು	three
nuːɾu	ನೂರು	century
ɐmːɐ	ಅಮ್ಮ	mother
ɐnːɐ	ಅನ್ನ	rice
ɐɳːɐ	ಅಣ್ಣ	brother
huːʊu	ಹೂವು	flower
mɐnɐ	ಮಾನ	mind
mɑːɳɐ	ಮಾನ	measure
ʊɐjɐsːu	ವಯಸ್ಸು	age
/eːke/ [ʲeːke]	ಏಕೆ	why
hɐlːi	ಹಲ್ಲಿ	lizard
hɐɭːi		village
njɑːjɐ	ನ್ಯಾಯ	justice
lɐŋgɐ	ಲಂಗ	skirt
lɐŋkɐ	ಲಂಕಾ	(Sri) Lanka
ɐʊɐru	ಅವರು	he
ɐʊːɐ	ಅವ್ವ	grandmother

Vowels

/kuɖi/ [kuɽi]		to drink
kuːɾidɐ	ಕೂರಿದ	beloved
/koɖi/ [koɽi]		to give
/koːɖu/ [koːɽu]	ಕೋಡು	horn
kɐre	ಕರೆ	call
/kɑːɖu/ [kɑːɽu]	ಕಾಡು	forest
kɐre	ಕೆರೆ	lake, pond
keːnɖrɐ	ಕೇಂದ್ರ	center
kiːɾɐ	ಕೀರ	mongoose
inɖu	ಇಂದು	today
/enɖu/ [ʲenɖu]	ಎಂದು	that
ɐpɑːjɐ	ಅಪಾಯ	danger
upɑːjɐ	ಉಪಾಯ	Idea

Short-Long Vowel Contrasts

diːnɐ	ದೀನ	poor man
dinɐ	ದಿನ	day
beɭe	ಬೆಳೆ	crop
beːɭe		lentil
/koɖu/ [koɽu]	ಕೊಡು	to give
/koːɖu/ [koːɽu]	ಕೋಡು	horn
guɭi	ಗುಳಿ	pit, shaft
uːɾu	ಊರು	place
ɐɭu	ಅಳು	cry
ɑːɭu	ಆಳು	servant

Dipthongs

ɐiɖu	ಐದು	five
ɾɐilu	ರೈಲು	train
mɐuna	ಮೌನ	silence
ɐuʂɐɖʱi	ಔಷಧ	medicine

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