

The Derivative Markers by Long Vowels in Hindi

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Abstract

This paper is the fourth report of the annual fieldwork project, conducted in the academic year of 2009, the topic of which is a short and long vowel contrast in Hindi. Through the analyses on Kiribati (Sato 2009) to Mongolian (2010b), it was found that contrasts of short and long vowels mark other functions than not only showing semantic differences. This study, first, points out that some Hindi long vowels make new derivations of words with their corresponding short vowels, and makes clear the average durational ratio of long vowels against short vowels of this group. Then, the average durational ratio will be compared with that of a group which produces semantic contrast only. Finally, the average of both groups will be given, and it will be shown where in the ranking order of durational ratios the Hindi average is located, together with other four languages.

0. Introduction

Short and long vowel contrasts do not always show phonemic oppositions only. For instance, as previous studies such as Sugita (1993) and Trussel (URL 1) mention, long vowels in Kiribati mark plural forms, as in the pair of *ben* '(a) coconut' and *been* 'coconuts', in addition to phonological oppositions. In that sense, the contrast can be considered a grammatical function. Similarly, Sato (2010b) indicates that long vowels in Mongolian make intransitive usages of short vowels transitive ones, as in *xaxax/xatax* 'become dry' and *xaxax/xata:x* 'dehydrate'. Furthermore, it was found from the data of this study that some pairs containing short

and long vowels in Hindi give rise to derivative relationships. For example, a word *sarbari* with its short vowel /i/ means ‘equal’, whereas *sarbarii* with a corresponding long vowel is its noun, ‘equality’. Other examples will be treated in section 2. The first objective of this study, thus, is to clarify the average durational ratio of these kinds of derivative pairs in Hindi, which will be gained by dividing the average duration of long vowels by that of short vowels, and compare the value with the average durational ratio of pairs which have phonemic oppositions only in Hindi.

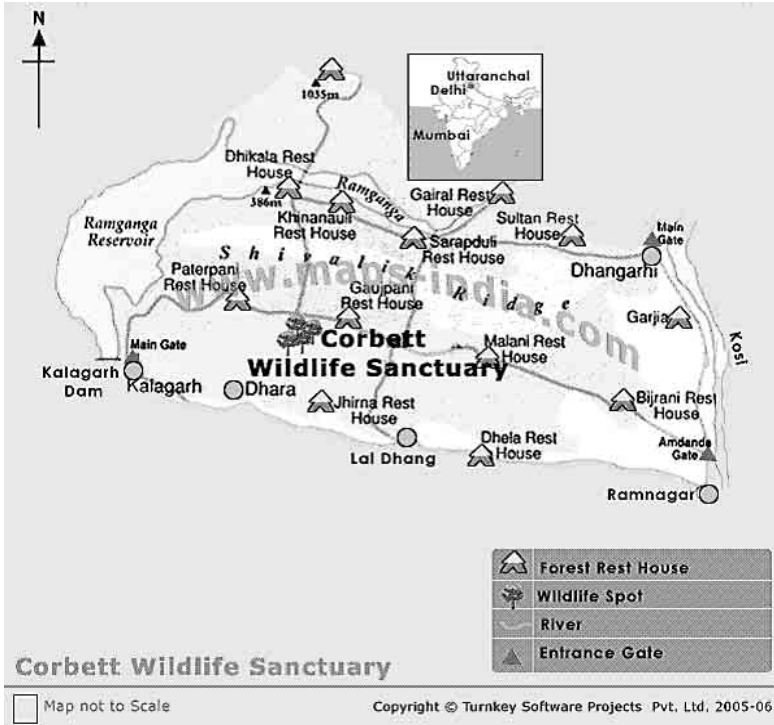
The second objective is to see where the average value of all the data of Hindi in this study stands in the ranking order from large to small of durational ratios of other languages investigated so far in this project. The results of previous studies by the author, i.e., Sato (2004, 2009, 2010a, 2010b) show that the order goes as Japanese (2.66), Mongolian (2.48), Kiribati (1.855), and Silozi (1.14). The value of Mongolian becomes 2.27, more data to analyze added, 17 pairs, 34 (17×2) words in total, which have phonemic oppositions only. See Sato (2010c) for the details and Section 4 of this paper will deal with this point.

In this way, the average value of durational ratio of short and long vowels in Hindi which have derivative relationships will be calculated. Then, the average value of durational ratio which have phonemic oppositions only will be gained and compared with that of the derivation group of words, considering results of other languages, i.e., Kiribati and Mongolian. Finally, the average value of all the data will be shown and cited in the ranking order of durational ratios of other languages.

1. Hindi

Hindi belongs to the Indic Branch in Indo-Iranian subgroup of Indo-European family and is mainly used in the north part of the Republic of India. The fieldwork of this study was mainly carried out at a base camp in the Corbett National Park, Uttaranchal, for 14 speakers, which is

located in the north west of Delhi, in the direction to China and Nepal, as indicated in the Map 1 (URL 2). A recording was also held for another speaker in Delhi. 15 speakers of Hindi in total are participants of production experiments of this study and results of six speakers will be presented in this paper.



Map 1 The location of the Corbett National Park

The views on Hindi vowel system differ among scholars, such as Maddieson (1984) and Ohala (1999). This study follows the classification of vowels by Machida (1992, 1998). The data of this study are minimal pairs which have either *i* /i:/ and *ii* /i:/ contrast or *a* /ə/ and *aa* /a:/ contrast, as in *dui* ‘two’ and *duii* ‘duality’, and *sadaa* ‘always’ and *saadaa* ‘plain’.

2. Derivation

In finding minimal pairs containing short and long vowels from McGregor (2002) as tokens for the data collection, it was found that some long vowels function to make a new derivation of a word with a short vowel, as can be seen in (1).

- | | | | |
|-----|----|-------------------|----------------------------|
| (1) | a. | krmi 'worm' | krmii 'having worms' |
| | b. | tanti 'string' | tantii 'musician' |
| | c. | dui 'two' | duii 'duality' |
| | d. | suuri 'wise' | suurii 'wise man' |
| | e. | sarbari 'equal' | sarbarii 'equality' |
| | f. | kanhari 'boatman' | kanharii 'piloting a boat' |
| | g. | plavan 'water' | plaaavan 'floating' |
| | h. | ujihalnaa 'flow' | ujijaalnaa 'pour out' |
| | i. | anuhar 'imitate' | anuhaar 'imitation' |

Although derived forms in the examples above except for (1 h) become nouns or gerunds, it is difficult to generalize what is common here for making derivations. Further investigation is needed for more examples like these.

Other minimal pairs are the ones which produce semantic differences only.

- | | | | |
|-----|----|--------------------|---------------------|
| (2) | a. | miti 'measuring' | mitii 'day' |
| | b. | badi 'in vain' | badii 'speaking' |
| | c. | paali 'edge' | paalii 'protecting' |
| | d. | nemi 'rim wheel' | nemii 'principled' |
| | e. | anucar 'follower' | anucaar 'adherence' |
| | f. | sadaa 'always' | saadaa 'plain' |
| | g. | udhar 'over there' | udhaar 'loan' |

- h. aukal 'restless' aukaal 'untimely'
i. bidar 'frightened' bidaar 'drive away'

3. Recordings

The nine pairs of 18 words each, 36 words in total as shown in (1) and (2), were written on a sheet in a randomized order and presented to six male speakers, DU (34), SG (34), MR (23), PR (23), GS (29), HS (33). Then, they were asked to read the list of tokens with five-time repetitions, after some practice-readings. In this way, 1,080 tokens were recorded in total ($36 \times 6 \times 5$).

The data were recorded into a linear PCM recorder, the PCM-D50 by SONY, with 44.10 kHz, 16 bit settings. Then, the recorder was connected with a PC and the data were automatically digitized into sound files. At the same time, a portable Minidisc Recorder, the MZ-N920 by SONY was used for the backup recordings.

Waveforms and wide-band spectrograms were referred to in measuring the short and long vowel parts in the data by the *Sugi Speech Analyzer*. Figure 1.1 shows the first reading of the word *plavan* by DU, and Figure 1.2 is the example of the corresponding word with a long vowel, *plaavan*.

The examples of fifth readings of a pair *nemi* and *nemii* by SG are shown in Figure 2.1 and 2.2.

4. Results and Discussion

The resulting durational ratios by the individuals and the average of the whole data are shown in Table 1 and Table 2.

First, it is clear from the Tables 1 and 2 that the average durational ratio (DR, hereafter) of the derivative group is smaller than that of the phonemic-contrast group, i.e., $1.23 < 1.35$. Just for comparisons, the average DR of singular/plural group in Kiribati is smaller than that of Kiribati

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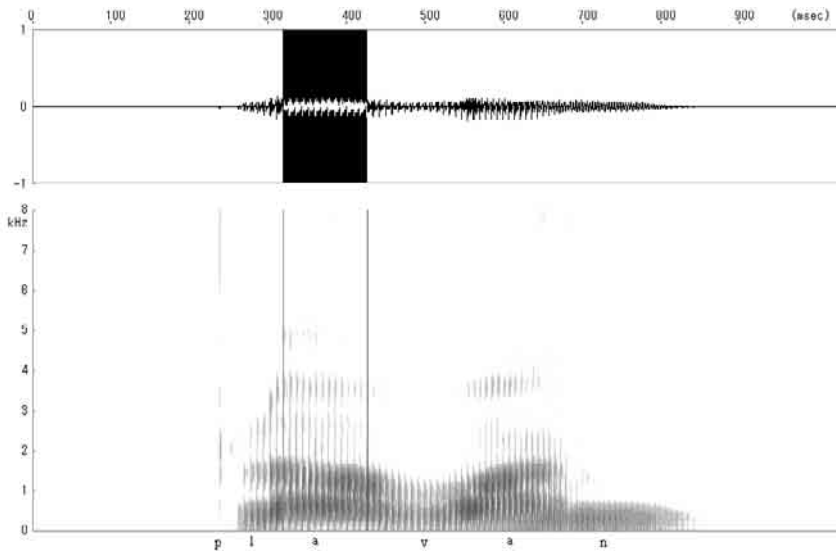


Figure 1.1 The waveform and wide-band spectrogram of *plavan* by DU

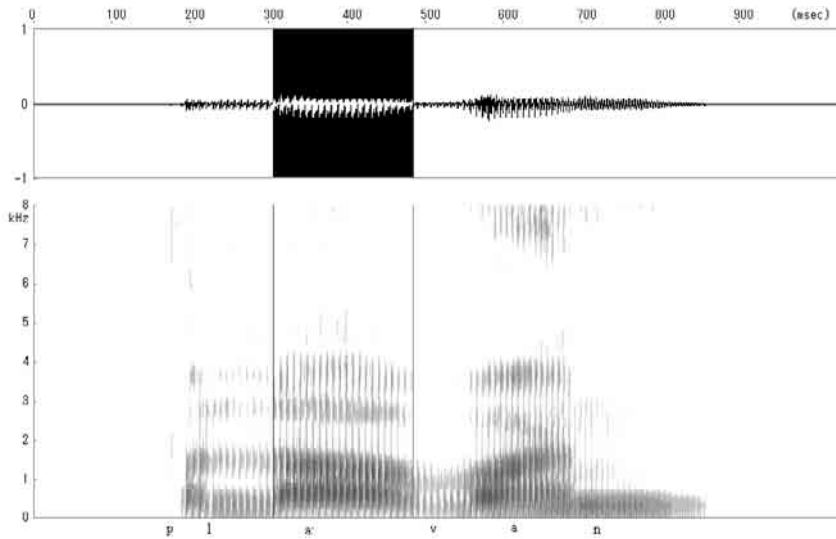


Figure 1.2 The waveform and wide-band spectrogram of *plaavan* by DU

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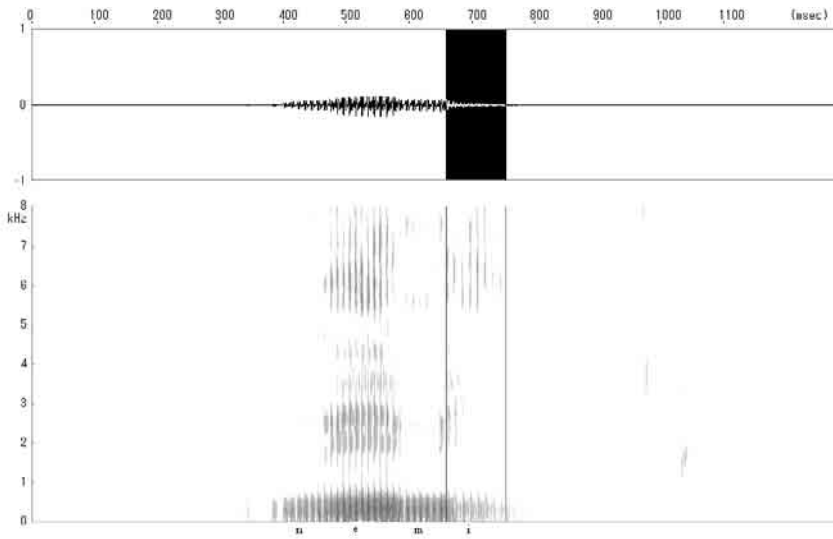


Figure 2.1 The waveform and wide-band spectrogram of *nemi* by SG

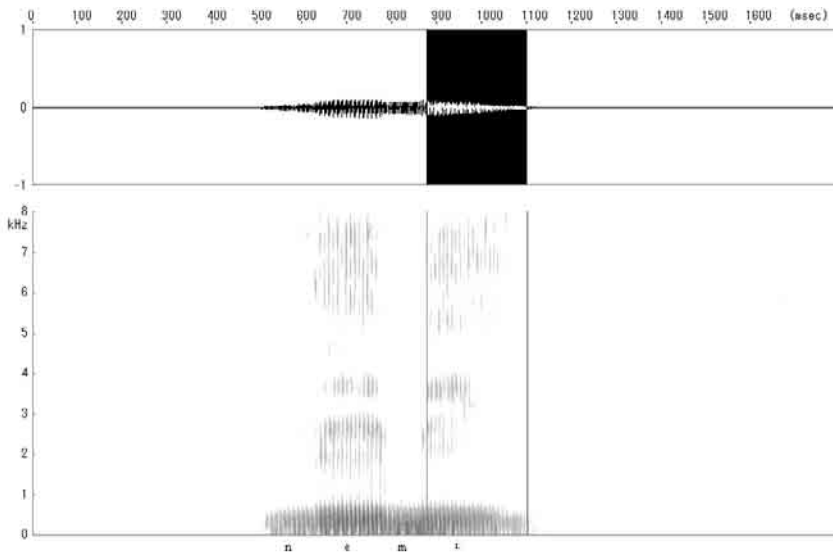


Figure 2.2 The waveform and wide-band spectrogram of *nemii* by SG

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Table 1 The average durational ratio of derivative group

	DU	SG	MR	PR	GS	HS	Ave
kanhari/kanharii	0.98	1.19	1.06	1.24	1.16	1.12	1.125
krmi/krmii	0.92	1	1	1.14	1.01	1.44	1.085
tanti/tantii	1.04	1.05	1.1	0.77	0.93	1.04	0.988333
suuri/suurii	0.94	1.18	1.2	1.31	1.07	1.46	1.193333
dui/duii	1.16	1.03	1.14	1.26	0.95	1.02	1.093333
sarbari/sarbarii	0.96	1.17	0.86	1.26	1.15	1.45	1.141667
anuhar/anuhaar	1.29	1.19	1.45	1.3	1	1.37	1.266667
plavan/plaavan	1.29	2.45	1.3	1.14	2.05	2.56	1.798333
ujihalnaa/ujihhaalnaa	2.15	1.14	1.16	1.27	1.35	1.67	1.456667
Ave	1.192222	1.266667	1.141111	1.187778	1.185556	1.458889	1.238704

Table 2 The average durational ratio of phonemic-contrast group

	DU	SG	MR	PR	GS	HS	Ave
miti/mitii	0.97	1.07	1.01	0.9	1.04	1.45	1.073333
badi/badii	0.97	0.98	1.1	0.97	1	1	1.003333
paali/paalii	0.99	1.06	0.89	1.26	1.05	1.28	1.088333
nemi/nemii	1.59	2.86	1.23	1.61	2.09	1.32	1.783333
anucar/anucaar	1.72	0.96	1.72	1.72	0.86	1.04	1.188333
sadaa/saadaa	2.81	1.84	1.18	1.15	2.7	1.87	1.925
udhar/udhaar	1.37	1.21	1.33	1.04	1.1	1.05	1.183333
aukal/aukaal	1.88	1.59	1.02	1.63	1.15	1.73	1.5
bidar/bidaar	1.54	1.49	1.63	1.52	1.05	1.21	1.406667
Ave	1.537778	1.451111	1.234444	1.215556	1.357778	1.304444	1.350185

phonemic-contrast group, $1.85 < 1.86$, as indicated in Sato (2009). Mongolian intransitive/transitive group has a larger average DR than that of its phonemic-contrast group, $2.48 > 2.07$, as presented in Sato (2010c). As for Mongolian data of the phonemic-contrast group, they are listed in

Appendix at the end of this paper with those of intransitive/transitive group, cited from Sato (2010b), since the phonemic-contrast data were not shown either in (2010b) or in (2010c).

Second, the average DR of the whole data of Hindi turned out to be 1.29, and the value stays in the order of DRs of the five languages investigated so far as follows: Japanese 2.66 > Mongolian 2.27 > Kiribati 1.855 > Hindi 1.29 > Silozi 1.14.

5. Concluding Remarks

This paper reports the result of six male Hindi speakers and the data of other nine speakers are to be analyzed to get more objective average durational ratio.

Another fieldwork had been conducted in Nicaragua for gathering Miskito data and the result of six male speakers was already presented in Sato (2010c). The resulting average durational ratio of Miskito short and long vowels is 1.0005, and the value is placed in the lowest rank in the order of DR above, among the six languages. An effort will be made to analyze more participants out of the rest, nine speakers, and the result is supposed to be shown in a forthcoming paper.

Acknowledgements

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References

- Machida, Kazuhiko (1992) Hindi. In Kamei, Takashi, Mutsuro Kawano, and Eiichi Chino (eds.) *Gengogaku Daijiten*, 3, 620–627.
- Machida, Kazuhiko (1998) Hindi. In *A Guide to the World's Languages*. Part 2: Asia and Frica. 273–285. Sanseido.
- Maddieson, Ian (1984) *Patterns of Sounds*. Cambridge University Press.
- McGregor, R. S. (ed) (2002) *Oxford Hindi-English Dictionary*. Oxford University Press.
- Ohala, Manjari (1999) Hindi. In *Handbook of the International Phonetic Association: A Guide to the Use of the International Phonetic Alphabet*. Cambridge University Press.
- Sato, Tsutomu (2004) *The Production and Perception of Japanese Identical Vowel Sequences and their Acoustic Characteristics in Connected Speech*. Ph. D. Thesis. University of London.
- Sato, Tsutomu (2009) Durational Contrasts in the World's Languages: Short and Long Vowel Oppositions in Kiribati. *The Journal of English and American Literature and Linguistics*, Meiji Gakuin University, 124, 153–165.
- Sato, Tsutomu (2010a) Durational Ratios of Long Vowels against Short Vowels in Silozi. *The Journal of English and American Literature and Linguistics*, Meiji Gakuin University, 125, 15–24.
- Sato, Tsutomu (2010b) Intransitive and Transitive Distinction Marked by Short and Long Vowels in Mongolian. *The Journal of English and American Literature and Linguistics*, Meiji Gakuin University, 125, 25–33.
- Sato, Tsutomu (2010c) The Comparison of Durational Ratios of Long and Short Vowels in Six Languages. *The Proceedings of the 24th General Meeting of the Phonetic Society of Japan*, 37–42.
- Sugita, Hiroshi (1993) Kiribasugo. In Kamei, Takashi, Mutsuro Kawano, and Eiichi Chino (eds.) *Gengogaku Daijiten*, 5, 120–124. Sanseido.

URL

1. <http://www.trussel.com/kir/glossary.htm>
2. <http://www.maps-india.com/uttaranchal/wildlife/corbett-wildlife-sanctuary.html>

Appendix

Mongolian Data

Phonemic-contrast group

a. ded 'secondary'	deed 'upper'
b. der 'pillow'	deer 'on'
c. ex 'mother'	eex 'to warm'
d. badzax 'hold tightly'	badzaax 'prepare'
e. bolax 'bury'	bolaax 'rob'
f. daBoo 'excellent'	daaBoo 'cloth'
g. dzalxax 'be tired of'	dzalxaax 'punish'
h. dzoBox 'suffer from'	dzoBoox 'torment'
i. orox 'enter'	oroxx 'to wind'
j. odam 'origin'	oodam 'spacious'
k. orag 'relatives'	oorag 'protein'
l. borax 'exaggerate'	boorax 'reduce'
m. box 'ox'	boox 'come down'
n. od 'feathers'	ood 'up'
o. xox 'blue'	xoox 'drive away'
p. ud 'midday'	uud 'door'
q. nux 'hole'	nuux 'move'

Intransitive/transitive group (Sato 2010b)

- a. acax /asax/ 'catch fire'
acaax /asa:x/ 'make something burn'
- b. xatax /xatax/ 'become dry'
xataax /xata:x/ 'dehydrate'
- c. халах /xalax/ 'become warm'
халаах /xala:x/ 'heat up something'

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- d. нурах /nurax/ 'fall down'
нураах /nura:x/ 'destroy'
- e. хөлдөх /xoldox/ 'be frozen'
хөлдөөх /xoldo:x/ 'make something frozen'
- f. зогсох /zogsox/ 'come to a stop'
зогсоох /zogso:x/ 'bring to a stop'
- g. ноцох /notsox/ 'be lit'
ноцоох /notso:x/ 'set fire to'
- h. хохирох /xohirox/ 'get hurt'
хохироох /xohiro:x/ 'cause damage'