ASPECTS OF PHONETICS AND PHONOLOGY OF MALWI

Thesis submitted to Jawaharlal Nehru University in partial fulfilment of the requirements for the award of the degree of

Doctor of Philosophy

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2019

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This thesis titled **"Aspects of Phonetics and Phonology of Malwi"** submitted by **Parul Upadhyay**, Centre for Linguistics, School of Language, Literature and Culture Studies, Jawaharlal Nehru University, New Delhi, for the award of the degree of **Doctor of Philosophy**, is an original work and has not been submitted so far in part or in full, for any other degree or diploma of any University or Institution.

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For my dear most Spiritual Father

the essence of my life and soul

Gurudev

H.H. Bhakṭi Charu Swami

Acknowledgements

For any work of mine, the foremost gratitude goes to Lord Sri Krishna, for always bestowing His causeless mercy upon me and devotion to whom is the ultimate goal of my life. His blessings bestowed me with people like my father, Sri Rajendra Prasad Upadhyay, who always believed in me, and taught me to fight for my dreams; without his constant encouragement and love, this thesis would never have been possible. Another blessing of the Lord to me is my loving husband, Dr. Shailendra Kumar whose constant support and guidance let me overcome all the difficulties of my PhD life. My mother Smt. Sarla Upadhayay and my mother-in-law Smt. Sudha Devi also shares important credit for making this dream of me come true by always showering me with their love and affection, teaching me how to work hard and achieve goals.

The most important person without whose vision and guidance this thesis would never have came to existence at first place, is my supervisor Prof. Pramod Kumar Pandey. His expertise and his kindness was a perfect blend for me which gave this thesis a presentable shape. My interest in phonetics and phonology was developed purely because of his lectures, and I owe to him for this. My gratitude for him is beyond this work.

The professors of IIT BHU, Dr. Sanjukta Gosh and Dr. Anil Thakur have been always a constant support since I joined the field of linguistics. I am grateful to them for many aspects of my professional and personal life. This dream to write a PhD thesis would have remained only a dream if they were not the part of my life.

Last but not the least, I would like to thank friends and well-wishers, Satyendra Kumar, Reshma Jacob, Shikha Singh, Arpita Diwedi, and others for their help and moral support in all possible ways for the completion of my thesis.

Parul Upadhyay

List of symbols and abbreviations used

C	Consonant
V	Vowel
O	Onset
N	Nucleus
R	Rhyme
TBA	Throwback Aspiration
σ	Syllable
S’	Strong node
W	Weak node
L	Light
H	Heavy
S	Super heavy

For transcription DOULOS SIL has been used

Abbreviations used in glossing of the example sentences

1	First person
2	Second person
3	Third person
M	Masculine
F	Feminine
S	Singular
Pl	Plural
Nom	Nominative
Erg	Ergative
Acc	Accusative
Dat	Dative
Fut	Future tense
Gen	Genitive
Ins	Instrumental
Loc	Locative
PR	Present tense
PRT	Particle
PST	Past Tense

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Chapter 1

Introduction

1.0 Motivation

The present thesis attempts to investigate the phonetic and phonological properties of some features of the word phonology of Malwi, spoken in Madhya Pradesh. The language is closely related to Hindi and other varieties related to Hindi such as Bundeli (Ethnologue 2019) and Bagheli (Pathak 1980). The detailed study of the phonetics and phonology of Malwi is thus expected to be of general significance for the study of new Indo-Aryan languages. This study focuses on the main word phonological features of Malwi such as aspirates, diaspirates, geminates, retroflexes and the prosodic phenomena of syllable weight and stress with both theoretical and acoustic and experimental evidence.The present study is the first on Malwi. Besides, it investigates both segmental and prosodic phonology at the word level in Malwi, taking into account the findings of these phenomena in related Indo-Aryan languages. A special feature of the present study is the evidence from acoustic phonetic investigations keeping in view the present positions in Lab Phonology that focuses on gradience in phonological realizations. This is a first attempt to analyze Malwi phonology of its own kind. Malwi phonology has some unique features like sonorant aspirates and diaspirate roots, which need to be addressed exhaustively. This research has tried to provide an authentic picture of Malwi phonology with all the possible explanations.

1.1 Research Questions

The main research questions of the present study are the following:

- What are the phonetic groundings for the segmental phenomena of aspirates, diaspirates aspirated nasals, retroflexes and geminates in Malwi?
- Does Malwi's nasal aspirates /nʱ/ behaves like phonemic breathy nasals (Marathi) or /n + ɦ/ clusters (Hindi) or as a possible transitional state between the two (Bangla)?
- Is there any role of the dialectal variation which influences the aspirates, diaspirates, aspirated nasals, retroflexes and geminates differently in other varieties of Malwi?
- How the syllable structure, word stress and other related prosodic phenomena in Malwi are dealt in relation to Hindi and other Indo-Aryan languages?

1.3 Malwi – The Language of Malwa

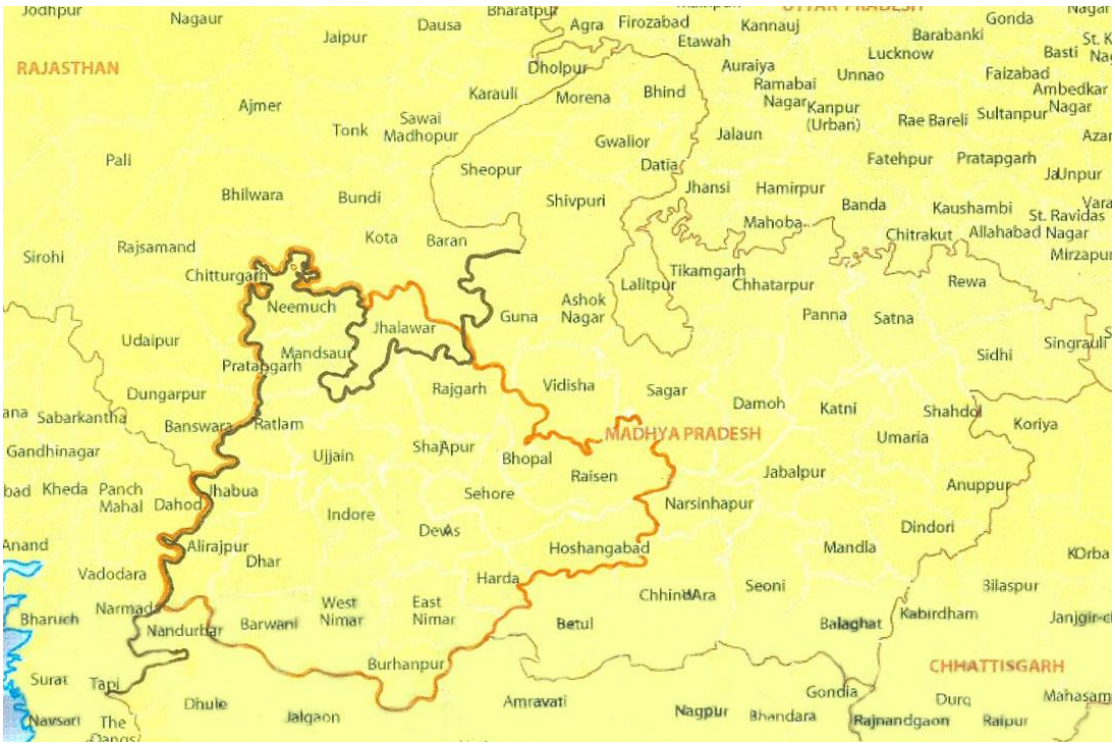
India has diversity in terms of people, religion, culture, and language. There are five language families within India. These major language families have several daughter nodes as well. The major languages of the Indo-Aryan language family are Hindi, Marathi, Bengali, Gujarati, etc. The Austro-Asiatic language family has members such as Khasi, Santhali, Mundari, etc. The languages such as Bodo, Meitei, Naga, Garo, and so on come under Tibeto-Burman language family. The Dravidian language family also has a good number of literature rich languages such as Tamil, Telugu, Malayalam, and Kannada. The Andamanese, which is the most recent discovered language family, is named after the island of India Andaman. Most of them are under indigenous or

extinct category languages. The languages spoken by the inhabitants of that region are, are Jarawa, Bo, Onge, Kede, Kol, Juwai, Khora, and so on.

As Malwi is an unexplored language, thus, it is important to discuss the language and the region before dealing with the specific areas of the research work. The knowledge about the language and the geographic region of the language always gives a better understanding while studying and exploring the specific areas of the language. So it is important to know Malwi, the language, and Malwa, the region from these perspectives.

1.2.1 The Malwa Region

Malwi is a language spoken at the plateau of Malwa region of Madhya Pradesh in Central India. Geographically, Madhya Pradesh constitutes the central part of India. The plateau of Malva or Malwa region is the western part of Madhya Pradesh covering 21 districts, predominantly referred to as 'Malwi speaking area', which also covers Jhalawar District of Rajasthan State of India. Districts which constitutes Malwa region are: Neemuch, Mandsaur, Ratlam, Ujjain, Indore, Dewas, Dhar, Jhabua, Alirajpur, Barwani, Khargone (West Nimar), Khandwa (East Nimar), Burhanpur, Harda, Hoshangabad, Raisen, Sehore, Bhopal, Rajgarh, Shajapur, Agar-Malwa and Jhalawar (Rajasthan).



Map 1.1 Malwi belt at the Malwa plateau of Madhya Pradesh

Malwa has been mentioned in many traditional Indian texts during ancient times. The number of villages of Malwa were stated in *Skanda Purana* (Skanda Purana: Kumar section 34-39). There are many occurrences in the Mahabharata where *Shudrak Malwas* have been mentioned. Until the sixth century, this region was not called Malwa, although a branch of Malawgan referred as '*Olicars*' ruled the city Dashpur (Mandsaur) during 404 AD (*Narvarman* inscription, Memorial of India: Central India, Appendix-2, Malwa section, p. 312 London). The coins '*malwanaam jay*' were obtained from Karkotak Nagar (The Age of Imperial Unity, p.165). On the name of the great ruler of the region, King Vikramaditya, the calculation of the year as *Vikram Samwat* has been started from Malwa (Vikram Samvat in BC 57). From Chandragupta-II to King Bhoj, many great emperors have ruled Malwa. From 1305 to 1531 Malwa was ruled by Dilawar Khan, Hoshang Shah, Gajani Khan, Mahmood Khilji and others. During the rule of Mughal ruler King Akbar (1562-1734), Malwa

became a small province. During British rule, Malwa was divided into different estates, where Ujjain fell under Gwalior province. There is a famous couplet on the borders of Malwa which says that the land surrounded by the Chambal Betwa and Narmada rivers should be taken as the border of Malwa. *'eed chambal betava maalav sinha sujaan, dakshin disha hai narmada yah pooree pahachaan'*.

1.2.2 Malwi, the Language of Malwa

The word 'malwi' refers to 'the princess of Malwa' or 'coming from Malwa' in Sanskrit. "The word 'malwa' refers to '*malamunnatabhutale*' in Sanskrit which means 'the land of fertile soil'. The great historical poet of India, Kalidas had defined Malwa as '*malam malava dese ca*' or '*kshetra maruhya malaya*', which indicates that it is an area of high or elevated land" (Joshi, 1999). According to the 2001 Census Report, there are total 5,560,000 speakers of Malwi language in India. Ethnologue of World Languages codified this language as ISO 639- 3:mup. The word order of Malwi is SOV. It belongs to the Indo-Aryan language family.

There are five varieties of Malwi:

- Ujjaini – spoken in Ujjain, Indore, Dewas, Sehor districts.
- Umathawadi (umaṭvāḍi) – spoken in Rajgarh district.
- Rajwadi (rājvāḍi) – spoken in Neemuch, Mandsaur, Ratlam districts.
- Nimadi (nimāḍi) – spoken in Jhabua, Alirajpur, Dhar Barwani, West Nimar, East Nimar, Burhanpur, and Harda districts.
- Sondhawadi (sondhvāḍi) – spoken in Shajapur and Jhalawar districts.

Among all the varieties of Malwi, Ujjaini, which is spoken in Ujjain district, is regarded as famous as well as prestigious by Malwa scholars.

In Ancient India, the language of Vedas was Sanskrit which is part of the Indo-European language family (Duiker and Spielvogel, 2010). It is believed that Sanskrit gradually declined to a spoken form of language and Prakrit, a simpler tongue, in northern India, replaced Sanskrit. Nevertheless, Sanskrit continued to be used as the language for literature and administration in most of the parts of India for many centuries.

Despite having a glorious history of the region, there are doubts about the origin of Malwi language among scholars. Grierson (1928) in his 'linguistic survey of India' has categorized Malwi as a dialect of Rajasthani language. However many scholars of Malwa region like Banshidhar Sharma (1973), Chintamani Upadhyay (1956) and others have shown their disagreement on Grierson's categorization of Malwi and regarded it misleading to find an authentic source of Malwi's origin.

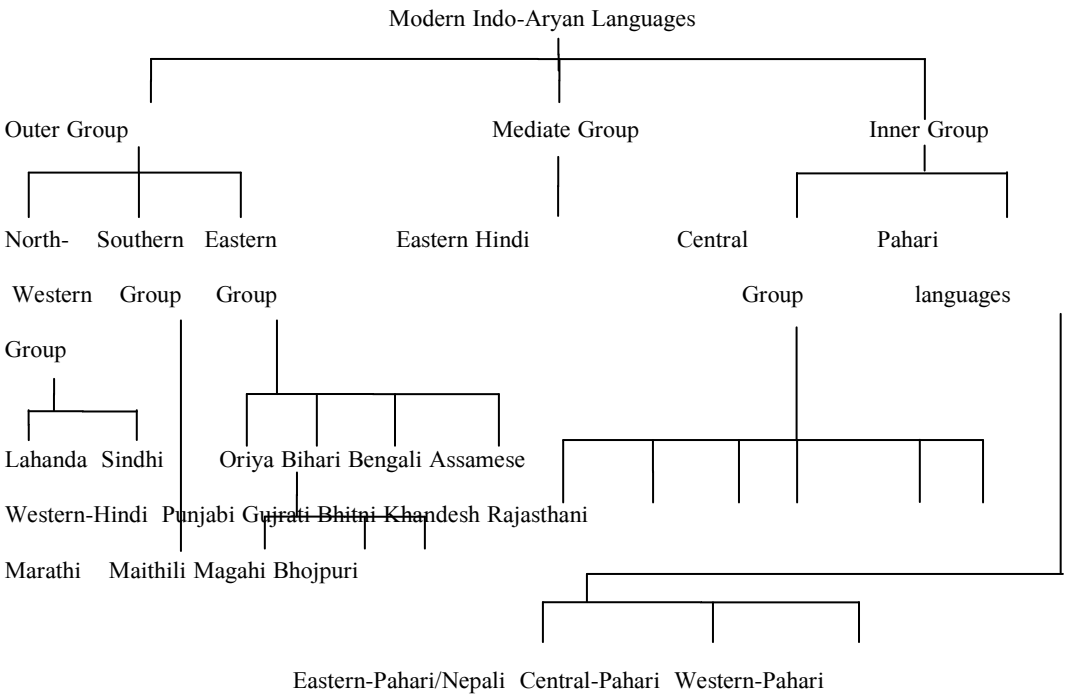


Chart 1.1: Classification of Modern Indo-Aryan Languages (Grierson,1928)

We can get an idea about the origin of Malwi only after a deeper scrutiny of the literature available in Sanskrit, Prakrit, and Apabhramsh. Scholars of Prakrit and Apabhramsh like Markandeya, Ram Sharma, Tark Vagish, Rajshekar, Bharatmuni, and others have stated that Malwi might have originated from Avanti Apbhramsh. According to Uday Singh Bhatanagar, the Prakrit of central India had been divided into Shaurseni and Avanti or Avantija and Malwi might have developed from Avanti Prakrit. Bharatmuni has mentioned seven languages in his Natyashashtra, where the language of Malwa is mentioned as 'Avantika':

aavantika vaidishika sauraashtra maalavaasatayaa

sendhvaatvaya sauviraa aanrtaas sarbud dekaa |

daashaarnaastripuraa kshechva tathaa vaimaartikaamtaa

kurvanyaavantiki mete pravartim nityamevatu ||

(Bharat: Natyashashtra, a-13)

Malwi is the language of the people of the Malwa region. It has a rich tradition and literature. A huge number of songs, folk-stories and monumental works are available from centuries. A lot of them are present in verbal traditions. The aristocratic literature of Malwi shows the smooth and unshakable expression of Malwa's culture. The earliest form of Malwi poetry can be seen from Kalidas's '*meghaduta*' where he has used Avanti Prakrit at some places. Recent developments of Malwi literature started after 1951 which were due to the organizations like 'Malwi Loksahitya Parishad, Ujjain' and 'Nimad Sarvekshan Samiti'. Some famous stories of malwi are 'khatmal pacchisi' (Nandakishor, 1928), 'malwi khatala' (Vyas, Dinanath 1928), 'rajkumari nihal de' (Joshi, 1962), 'kai tamari kai hamari' (Shukla 1995), etc, where some novels have also been published in Malwi like 'geri-geri chanva' (Raval, Lalit

1995) and ‘deshasya’ (Dubey, Chandrashekhar 1996). A collection of 600 Malwi songs have been published by Chintamani Upadhyay and Shyam Parmar. A paper in reference of book ‘malvi bhasha aur sahitya’(Sharma, Chauhan, Gautam 2010) has been recently introduced in Vikram University, Ujjain at Hindi department for the study of Malwi language by the efforts of Shailendra Kumar Sharma.

Even with a rich literary tradition and glorious history of Malwa, the language Malwi does not find a dignified position in most of the functional domain. Though Malwi classifies under Indo-Aryan language family by origin and reflects the features of Hindi, Sanskrit, and it also seems to be related to Gujarati and Rajasthani, still, the roots of Malwi is believed to be originated from Avanti Prakrit. Thus, Malwi should not be considered as a dialect of Rajasthani, Hindi or any other Indo-Aryan language without a comparative and authentic study in this matter.

The native speakers of Malwi are very worried about their mother tongue, Malwi. The urban and qualified people of Malwi speaking areas consider their own language as an inferior one. They are bound to shift from Malwi to Hindi in most of the domain. There are no political movement or awareness about Malwa’s own language. Thus, socio-politically, Malwi is a neglected language. Till date, it is a non-scheduled language of the Republic of India. It is not being accepted for educational purpose or any formal domain. Only the recognition of Malwi as a language can help to maintain the language and the flow of its age-old tradition.

1.4 Literature Review

Malwi is a poorly studied language; given the presence of many interesting phenomena in it, that are of phonetic and phonological interest, it requires an in-depth investigation. Some general studies are Joshi (1999), Rajpurohit (2004) and Varghese and Samuel (2009).

Joshi (1999) presents an exhaustive study of some grammatical aspects of Malwi in relation to other varieties of Hindi in a descriptive framework. Rajpurohit (2004) argues for treating Malwi as an independent language, giving the peculiarities of the varieties spoken in different regions- Rajwadi, Nimadi, Umathawadi, and Sondhawadi.

Varghese and Samuel (2009) is a sociolinguistic study of the Malwi-speaking community. The data was presented using IPA symbols. On the basis of data collected from different regions- Ujjaini, Rajwadi, Umadwadi, Sondhwadi, Bhili,and their linguistic analysis, the study places Ujjaini at the central position among the dialects of Malwi, because of it being intelligible to the speakers of all other varieties of Malwi. It analyses the level/percentage of bilingualism in the Malwi-speaking people and concludes that although approximately fifty percent of Malwi-speaking people might be able to understand Hindi, the others are not. The writers show that Malwi is used for performing multiple functions in the society, therefore it is not endangered. This study was guided by the need to support vernacular language development.

Phonetic and phonological studies of Malwi are entirely missing. However, there are phonetic and phonological analyses of some of the phenomena noted above in Malwi

that have been investigated for other Indo-Aryan languages, but that has a direct bearing on the proposed study. The study of Diaspirate Roots is one of them.

1.3.1 Diaspirate Roots

Diaspirates are roots in languages like Sanskrit and Greek which are accounted for having more than one aspirated consonant or have multiple linking to the laryngeal [+spread glottis] feature. However, the phenomenon is a lot more complicated as the presence of both the aspirates in the roots occurs in the underlying representations and the surface has to deal with migration of aspirates on various positions depending on the nature of suffixes the root gets attached to.

Grassmann's contribution in this area is very important as it was focused on the appearance of two aspirated consonants in the same root in Indo-European languages like Ancient Greek and Sanskrit. Grassmann's law formulates that if an aspirated consonant is followed by another aspirated consonant in the next syllable, the first one loses the aspiration. In other words, when the aspirates occur at the beginning of the successive syllables, one of them, usually the first, loses its aspiration and becomes in Greek a voiceless stop and in Sanskrit a voiced stop. For example, in Greek, /t^{h}rík-s/ 'hair' and/trík^{h}-es/ 'hairs'. The addition of suffix /-s/ leads the aspiration to be marked on the first consonant and adding suffix /-es/ lets the aspiration occur on the last consonant of the root. Roots like /bud^{h}/ in Sanskrit shows the migratingbehavior of aspiration when attached to different kinds of suffixes. There had been many different analysis and theories aiming an explanation of this kind of migrating behavior. The 'Underlying Diaspirate Theory', however, explains it with the assumption that the underlying roots have both aspirates in it, i.e., /t^{h}rik^{h}/ for Greek

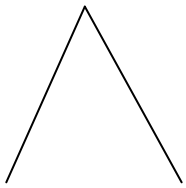
and /bʰəud̪ʰ/ for Sanskrit. In accordance with Grassmann's law, it yields the analysis that when a vowel follows the second aspirate, the second aspirate survives unaltered. Therefore the first aspiration is lost on the surface level, as seen in /tríkʰ-es/; however, if /s/ or various other sounds immediately follows, then the second aspiration is lost, and the first aspirate survives, as in /tʰrík-s/.

Ancient Indian grammarians presented an analytical explanation naming it "Aspiration Throwback (ATB)". They assumed that the roots having aspiration on the end consonant are the underlying form, as in /trikʰ/, and when it is followed by /s/ or other sounds, this activates an 'aspiration throwback', which forces the aspiration to migrate leftward, to appear on the initial consonant, as seen in /tʰrík-s/. Hoard (1973) and Sag (I974) independently presented a completely different approach. They focused on the boundaries that occur before the suffixes to exemplify the diaspiration of aspirates. According to them, diaspiration of aspirates takes place as internal sandhi (that is, across + boundary), but not as external sandhi (that is, across # boundary).

Calabrese and Keyser (2006) presented a detailed analysis of the migrating behavior of aspiration in Sanskrit diaspirate roots. They categorized the environment, that the root final stop to be aspirated before sonorant-initial suffixes and before obstruent-initial suffixes or in word-final position; the root final consonant is not aspirated and devoiced. They proposed independent diachronic evidences and structures for these roots. From Bartholomae's law which spreads the laryngeal feature to a voiced aspirated consonant onto the following stop, they went on describing Grassmann's law, restrictions on laryngeal features, constraints, neutralization, and focused on structures using feature geometry representations.

If we assume underlying diaspirate theory in relation to Malwi diaspirate roots, the underlying structure would be somewhat like shown in (1.a), and the two free variants will have surface structures similar to shown in (1.b) and (1.c), respectively.

(1.a). [+spread gl.]



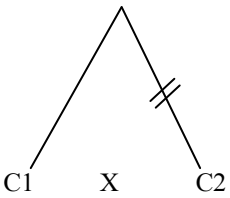
C1 X C2

Where,

C1 and C2 are stops or affricates

X = {C/V/Φ}

(1.b). [+spread gl.]



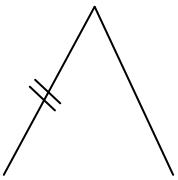
C1 X C2

Where,

C1 and C2 are stops or affricates

X = {C/V/Φ}

(1.c). [+spread gl.]



C1 X C2

Where,

C1 and C2 are stops or affricates

X = {C/V/Φ}

1.3.2 Sonorant Aspirates

Sonorant aspirate or aspirated nasals have been an interesting topic which had drawn the attention of many researchers; however, most Indo-European languages have only seen aspirated nasals, mostly at word-initial or medial positions, as seen in Hindi /kaːnʱaː/ and Rajasthani /mʱaːro/, etc. Nasal aspirates can be called a common phenomenon amongst East Asian Languages. Word-initial /mʱ/ and /nʱ/ occur in Marathi, most dialects of Rajasthani, Kumrani, Braj, and the Saurashtra languages. Non-initial /mʱ/ is also found in Gujarati, Sindhi, some dialects of Bihari language, Kalasha, and most West Bihari languages. A non-initial /nʱ/ occurs in Marathi, Bhojpuri, and Chhattisgarhi (Masica, 1991).

Previous work on the current topic in Indic languages has focused mostly on oral stops (Ohala 1983). However, some studies on Urdu advocated the existence of aspirated nasals. Bokhari (1985, 1991) and Khan (1997) include /mʱ/ and /nʱ/ in the phoneme inventory of Urdu. Although, Bokhari (1985) suggests the possibility of nasal aspirates at word-initial, word-medial, and word-final positions; but Khan (1997) on the other hand dismisses /mʱ/ in word-initial and word-final positions and only discusses /mʱ/ at the word-medial position.

Aziz (2002) conducted the acoustic study, recorded word-initial, word-medial, and word-final /nʱ/ sequences and analyzed them. But, he concludes that there is no evidence for nasal aspirates assingleton in Urdu. A phonological study of Urdu by Nisar & Baqir (2003) comments on the behavior of aspirated nasals to be the modal nasals when following a long vowel, and a coda nasal followed by an onset when following a short vowel.

Ferguson & Chowdhury (1960); and Chatterjee (1962) mention the existence of word-medial nasal aspirates /m^{ɦ}/ and /n^{ɦ}/ in very careful speech, and even while acknowledging their existence, they did not list them with either word-medial clusters or with consonantal phonemes.

Further research, however, finds this phenomenon to behave as consonant clusters, given distributional and durational evidence (Sen Gupta 1980; Bhattacharya 1984). Bhattacharya (1984) describes the phonological behavior of aspirated nasals by stating them to be the 'so-called aspirates' that do not follow the regular distributional pattern of the other oral aspirates. He, therefore, concluded that they are not 'unit phonemes' as the regular aspirates are, but the sequences of two phonemes.

Esposito, Khan, and Hurst (2005) performed a contrastive study of nasal aspirates in Bangla, Hindi and Marathi; addresses the question that in Bangla and Hindi are underlying sequences of a modal nasal /n/ followed by /ɦ/ phonetically realized as singleton /n^{ɦ}/, or as clusters /n/ + /ɦ/? They used simultaneous audio, aerodynamic, and electroglottographic recordings of Hindi, Bangla, and Marathi speakers. However, the results were inconclusive. Phonological evidence pointed out the lack of nasal aspirates in Hindi and an uncertain status in Bangla.

1.3.3 Geminates

Geminates are not uncommon in the languages like Urdu, Hindi, Bangla, Odiya, Marathi, Dogri, Tamil, Telugu, Kannada, Singhalese, and Santhali, among others. Studies on geminates are very common, and many writers have contributed to the

understanding of the phenomenon as Lahiri and Henkamer (1988), Kar (2008) on Bangla, Ohala (2011) on Hindi, Lisker (1985) on Marathi, Local and Simpson (1999) on Malayalam, Nagarajan (1985) on Tamil.

Lisker's (1985) work on geminates brought the understanding of the perceptual boundary between singletons and geminates that are conditioned by the nature of experimental stimuli. He experimented with Marathi words which gave different duration of stimuli for singletons and geminates.

The acoustic correlates of geminate consonants in Turkish were studied by Hankamer (1988) and he found that duration played a decisive role in the perception of the consonants as there were systematic variations for Voice Onset Time and closure duration in regards with gemination. The issue of possible phonetic differences between underlying, concatenated, and assimilated geminates were also taken into account and studied using material from Bangla; but could not yield any significant conclusions. Later, he examined the perception of consonant duration contrast in Turkish and Bangla. If stimuli were created by shortening geminate consonants, a perceptual shift from singleton to geminates were observed on an average of 8 ms earlier than for stimuli created by lengthening singleton consonants. This effect was observed mainly in the medial duration range, where consonants were not obviously short or long and the durational cue was not very informative. He hypothesized that acoustic cues other than increased duration are involved in the production and perception of geminate consonants.

An overview of a number of phonetic studies of geminateswere provided by Ham (2001). Most of the studies are directed at establishing the acoustic correlates of gemination, taking duration to be the major phonetic cue to gemination.

1.3.4 Retroflexes

An ample amount of work on phonetics and phonology of Retroflex consonants has been done. The foremost and detailed study of retroflexion has done by Bhat (1973) that took care of the geographical spread of retroflexes, the phonological processes its members can go through, and their phonetic motivation. In addition to Bhat's work,Sagey (1986), Ganandesikan (1993), Pulleyblank(1993) and Clements (2001)projected a number of phonological representations of retroflexes with reference to Feature Geometry. The perceptual cues of retroflexes had been discussed by Steriade (1995, 2001) and he stated that the distribution of theacoustic cues of retroflexes can give an explanation for the phonotactic restrictions and assimilatory behavior of retroflexes. Phonetic studies done by Dixit (1990) and Simonsen, Moen & Cowen (2000) have shown the articulatory variation that can be found for retroflexes and hint at the insufficiency of existing definitions. Though the most recent and detailed study of phonetics and phonology is done by Silke Hamann (2003).

1.3.5 Prosodic Phenomena

In addition to the segmental phenomena noted in the preceding sections, the word-prosodic phenomena of syllable structure, phonotactics, and word-stress have been looked at in studies of Hindi and other Indo-Aryan languages. This has been shown to be theoretical interest, such as Kelkar (1968) and Hayes (1995). The production-perception experiment (Ohala 1986) analyzed the duration of vowel and coda in

stressed and unstressed syllable and determines the phonetic correlates of lexical stress in the Hindi language. Nair stated that Hindi does not have lexical stress (Nair et. al. 2001). Roy has given a new acoustic cue named weighted duration which takes the ratio of pitch and amplitude of syllable to be compared and multiply them with their corresponding duration (Roy 2015). On the other hand, the phonological aspect of Hindi related researchers directly relates the syllable weight pattern with lexical stress (Mehrotra 1965) (Pandey 1989) & (Hayes 1995). These phenomena have been investigated to inquire into their influence on the segmental phonology of Malwi.

1.4 Data Collection and Field Work

1.4.1 Data elicitation and informant selection

This work followed methods that involve fieldwork and evaluation of both primary and secondary sources through phonemic and phonetic transcription. The data elicitation focused on primary data which was collected from 30 informants and crosschecked. The data was collected via questionnaires, interviews, translations, examples and illustrations, and observations (Abbi 2001). Data was collected from Ujjain district, mainly from Ujjain, Talod, Chintaman Jawasiya, Bamauri, Bisakhedi, etc. The informants were native speakers of Malwi and belonged to the age group 15 to 30 years.Questionnaires and interviews were prepared in a manner that provides a framework for the description of the language. Word list and sentence list by Abbi (2001) and word lists prepared by SIL have been used for data collection with necessary modifications. The secondary data for the research has been collected from various secondary sources like articles, books, etc.

1.4.2 Recordings

For experimental analysis, the data have been recorded from 6 male native speakers of Malwi language. In selecting the speakers, their educational, regional and occupational backgrounds have been taken into consideration. Special care has been taken to see that none of them had any formal training in phonetics. The speech data has been recorded in a soundproof room at Ujjain. Olympus LS-P1 Hi-Res audio recorder has been used for recording.

1.4.3 Data Analysis

Acoustic analysis of the speech samples has been done to check the presence of aspirates, geminates, sonorant aspirates, retroflexes, diaspiration, constraints, etc., in specific environments. Standard software for instrumental analysis of speech sounds, PRAAT (by Paul Boersma, University of Amsterdam) is used for acoustic analysis. The recordings were carefully evaluated and transcribed phonetically. The speech samples of the informants have been analyzed to understand the pattern and the duration of consonant length features.

1.5 Overview of the Thesis

Chapter one gives an idea about the research work and its direction. It focuses upon the research questions, Malwi language, Malwa region, review of literature along with the outline of the thesis.

Chapter two deal with an overview of basic word phonology of Malwi language. It describes the phonetic and phonological aspect of Malwi word. However, the focus of

this chapter is to describe the segmental aspect of word phonology of Malwi, focusing on the analysis of vowel phonemes, consonant phonemes, allophonic processes, constraints, and the phonotactics of Malwi.

Chapter three describes 'sonorant aspirates' and 'diaspirate roots' in Malwi and portraits sonorant aspirates to be single phonemes, not sonorant + /ɦ/ clusters as mentioned in other Indo-Aryan languages like Hindi, Marathi, and Bengali. The explanation for sonorant aspirates to be single phonemes is given on the account of the acoustic study of these segments where comparisons with singleton and geminate consonants have been made to measure durational differences. This chapter also discusses the occurrence of diaspirate roots in Mawli, a phenomenon of Proto-Indo-European and modern Indo-Aryan languages. The phenomenon is discussed in reference to Sanskrit and Nepali as well andthe framework of autosegmental phonology is used to understand the concept of diaspirate roots and spectrographic images from Praat have also been illustrated for better understanding.

Chapter four analyses two aspects of phonetics, the geminates and the retroflexes. Acoustic cues for both geminates and retroflexes have been analyzed to differentiate them from their 'singleton' and 'dental' counterparts, respectively. The methodology used for geminates is to compare and study the closure duration of geminate consonants and singleton consonants, with the duration of vowels preceding. In the case of retroflex consonants, the analysis is durationa based, where the closure duration of retroflex and dental is compared with the comparison between the durations of preceding vowels of both. Though the results show significant durational differences for both geminate-singleton consonant pairs and retroflex-dental consonant

pairs, the durational difference is quite little for the values of retroflex and dental consonants and that is explained in with reference to the quantal theory of phonetics.

Chapter five deals with the suprasegmental aspects of word phonology of Malwi, which covers topics like syllable, syllable structure, onset-coda consonant clusters, syllable weight, stress feet, and schwa deletion.

Chapter six concludes the thesis with a discussion on the scope for further future works that can be attempted to explain the aspects of phonetic and phonology with reference to not only word phonology but phonology at the level of the sentence also.

Chapter 2

Basic Structure of the Word Phonology of Malwi

2.0 Introduction

There are two levels or divisions of phonological analysis which are prevalent from the beginning and still occupy an important position for the understanding of the phonology. These divisions are the study of phonology at the level of the word and above. Phonological analysis or phonological study at the level of the word is termed as 'word phonology'. This chapter provides the basic description of word phonology of Malwi language in both the domains - phonetics and phonology. The understanding of phonemes and allophones are the basic description of the segmental unit of the sound system of any language at the level of word phonology. The main aspects of the phonology of Indo-Aryan languages have been described focusing on consonant vowel phonemic inventories, consonant and vowel allophones, constraints on the occurrence of consonant and vowels, and syllable structure (Pandey 2010). Therefore, it is essential to draw the pattern of occurrences phonemes of Malwi language and the environment of the allophones, to lay down a basic structure of the language as well as to ensurea sound background for the understanding of the other deeper topics in following chapters. The focus of this chapter is to present the basic study of segmental aspect of word phonology of Malwi, where Malwi vowel phonemes, consonant phonemes, allophonic variants and processes, and the phonotactic constraints have been described. In nutshell, this chapter tries to provide a basic picture of the description of Malwi word phonology

2.1Malwi Vowel Phonemes

2.1.1 Oral Vowels

The Phonemic inventory of Malwi consists of eight oral vowels /iː, i, eː, ə, aː, u, uː, oː/ and five nasal vowels /ĩː, ẽː, ãː, ũː, õː/. The quantity contrast of vowel length occurs at the phonemic level. The vowels /iː, eː, aː, uː, oː/ are long vowels and /i, ə, u/ are short. Like Hindi (Pandey 2010), Malwi also has more long vowels than short vowels.Among the eight oral vowels, the five long vowels have phonemic nasal counterparts and the short vowels do not occur as nasal vowels. The complete vowel chart of Malwi is as follows:

	Front	Central	Back
Close	iːĩː i		uː ũː u
Close-mid	eːẽː		oː õː
Mid		ə	
Open		aː ãː	

Table 2.1 Malwi Vowel Chart

Unlike Hindi (Ohala 1983), the vowels /ɛ/ and /ɔ/ are not found in Malwi's phonemic inventory.[1]

[1]Some Hindi words which have these vowels are also found Malwi, but with the alteration of these vowels into /eː/ and /oː/ respectively, as illustrated below:

/ɛ/ → /eː/ /ɔ/ → /oː/

Hindi	Malwi	Meaning
/pɛr/	/peːr/	'legs'
/ɔrət̪/	/oːrət̪/	'woman'

The following is the set of minimal pairs for oral vowel phonemes:

(2.1)

/i/	/iː/	/pilaː/ ‘drink (causative)’	/piːlaː/ ‘yellow’
/eː/	/oː/	/heː/ ‘be’	/hoː/ ‘hundred’
/u/	/uː/	/un/ ‘that’	/uːn/ ‘wool’
/ə/	/aː/	/d̪ən/ ‘day’	/d̪aːn/ ‘charity’

2.1.2 Nasal Vowels

This is very interesting to note that only the long vowels /iː, eː, aː, uː, oː/ in Malwi have nasal counterparts /ĩː, ẽː, ãː, ũː, õː/, and the short vowels do not have any phonemic nasal counterparts in Malwi. Another peculiarity is that the nasal vowels in Malwi are always long vowels which are lengthened quantitatively. As oral long vowels do not occur at syllables closed with a voiceless consonant, nasal vowels do not occur in syllables closed with a voiced consonant. In other words, nasal vowels in Malwi are -

i. quantitatively long, and
ii. occur everywhere except in closed syllable with a voiced coda.

The following are a few examples which demonstrate the environment where nasal vowels occur.

(2.2)

/ʊãː/ ‘there’

/kjãː/ ‘where’

/õːs/ ‘dew’

/hẽːt̪/ ‘honey’

/mãːs/ ‘meat’

/pʰũːk/ ‘blow’

/dʒʱũːʈ/ ‘lie’

/hĩːk.ɳoː/ ‘learn’

/d̪ãː.t̪əl.ɭoː/ ‘teeth’

/gʱũː.gʱə.raː/ ‘bell’

Minimal Pairs for nasal vowel phonemes:

(2.3)

/iː/	/ĩː/	/ʊiː/ ‘he’	/ʊĩː/ ‘they’
/eː/	/ẽː/	/bʱeːs/ ‘appearance’	/bʱẽːs/ ‘buffalo’
/aː/	/ãː/	/jaː/ ‘this’	/jãː/ ‘here’
/uː/	/ũː/	/uː/ ‘that’	/ũː/ ‘me’
/oː/	/õː/	/pərsoː/ ‘to-serve’	/pərsõː/ ‘day after tomorrow’

A few examples of Malwi monosyllabic, disyllabic and multisyllabic words to understand the environment where Malwi vowel:

Monosyllabic words	Disyllabic words	Multisyllabic words
/aːm/ ‘mango’	/niː.loː/ ‘blue’	/uʈ.pə.ʈəŋg/ ‘rough’
/paːk/ ‘pus’	/haː.diː/ ‘quick’	/geː.li.joː/ ‘dull’
/boːr/ ‘plum’	/peː.laː/ ‘ahead’	/ə.tʃəm.boː/ ‘surprisingly’
/dʒʱeːr/ ‘poison’	/maː.laː/ ‘garlend’	/bʱə.mər.maːɭ/ ‘bee’
/kʰiːr/ ‘sweet-rice’	/ʊeːɳ.ɖoː/ ‘crazy’	/bʱuː.t̪aː.ɭi.joː/ ‘cyclon’
/maːɭ/ ‘forest’	/huɖ̪oː/ ‘easy’	/ʊjaːg.ʃaː.ɭiː/ ‘fox’
/saːpʰ/ ‘clean’	/bʱuːroː/ ‘brown’	/ə.laːʈ.noː/ ‘move’

Table 2.2: Examples of Malwi Vowels

As shown in the above mentioned data table, the occurrence of long vowels is very common throughout the language.

2.1.3 Diphthongs and Vowel Sequences

Malwi have one oral diphthong /əi/, and one nasal /ə̃ĩ/ diphthong. The examples are as follows:

(2.4)

/əi/ /ʋəi.goː/ ‘flow’

/əi/ /səi/ ‘correct’

/əi/ /bəi.raː/ ‘women’

/ə̃ĩ/ /ə̃ĩ/ ‘come’

/ə̃ĩ/ /kə̃ĩ/ ‘what’

/ə̃ĩ/ /pə̃ĩ.jaː/ ‘wheel’

There are many vowel sequences in Malwi. The difference noticed here is that the diphthongs occur in the same syllable of the word, whereas the vowel sequences occur in such a manner that both vowels of the sequence do not occur in the same syllable. If the first vowel occurs in one syllable, the second vowel occurs at the adjacent position in the following syllable. The following examples are given here for illustration:

(2.5)

/aːiː/ /baː.iː/ ‘mother’

/əuː/ /hə.uː/ ‘good’

/oːiː/ /loː.iː/ ‘blood’

/uə/ /su.ər/ ‘pig’

/uoː/ /hu.oː/ ‘done’

2.2 Consonant Phonemes

In Malwi, consonants are categorized as plosives, affricates, fricatives, nasals, liquids, and approximants. There are total 32 consonant phonemes in Malwi, 16 plosives, 4 affricates, 3 nasals, 4 liquids, 3 fricatives, and 2 approximants. Apart from the basic phonemes, Malwi also shows the presence of nasal aspirates as phonemic consonants, however, the topic is still open for debate among linguists that whether to consider nasal aspirates as singleton phonemes or the combination of nasal and /ɦ/. This is discussed in detail in the third chapter of this thesis and for the convenience nasal phonemes are not kept here in the basic consonant phonemic inventory of Malwi.

	Bilabial	Labio-dental	Dental	Alveolar	Post Alveolar	Retroflex	Palatal	Velar	Glottal
Plosive (unasp.)	p b		t̪ d̪			ʈ ɖ		k g	
Plosive (asp.)	p^h $b^ɦ$		$t̪^h$ $d̪^ɦ$			$ʈ^h$ $ɖ^ɦ$		k^h $g^ɦ$	
Nasal	m			n		ɳ			
Flap				r		ɽ			
Fricative				s	ʃ				h
Affricate (unasp.)							tʃ dʒ		
Affricate (asp.)							$tʃ^h$ $dʒ^ɦ$		
Approximent		ʋ					j		
Lateral Approximent				l		ɭ			

Table 2.3: A Consonant Chart of Malwi

2.2.1 Plosive consonant phonemes:

When the nasal cavity is blocked by the velum, and there is a complete closure of air passage in the vocal tract, then the air is compressed inside the vocal cavity and released with a sudden plosion. The sounds articulated in such manner are called plosives or stops . Plosives in Malwi have both voiced -voiceless and aspirated - unaspirated phonemes. There are total sixteen plosive consonant phonemes , where /p/

/t̪/ /ʈ/ / k/ are voiceless -unaspirated phonemes , /b/ / d̪/ /ɖ/ /g/ are voiced-unaspirated phonemes, /pʰ/ /t̪ʰ/ /ʈʰ/ /kʰ/ are voiceless-aspirated phonemes and /bʱ/ /d̪ʱ/ /ɖʱ/ /gʱ/ are voiced-aspirated phonemes.

Minimal pairs for aspirated and unaspirated plosives:

(2.6)

/p/	/pʰ/	/pənʈ/ ‘but’	/pʰənʈ/ ‘snake’s hood’
/b/	/bʱ/	/bək/ ‘talk’	/bʱək/ ‘desire to eat’
/t̪/	/ t̪ʰ/	/t̪əl/ ‘bottom part’	/t̪ʰəl/ ‘land’
/d̪/	/d̪ʱ/	/d̪ən/ ‘day’	/d̪ʱən/ ‘money’
/ʈ/	/ʈʰ/	/ʈəp/ ‘sound of drop of water’	/ʈʰəp/ ‘pat or thump’
/ɖ/	/ɖʱ/	/ɖoːli/ ‘bridal palanquin’	/ɖʱoːl/ ‘drum’
/k/	/kʰ/	/kəli/ ‘mud-pot’	/kʰəli/ ‘cattle feed’
/g/	/gʱ/	/gəʈiː/ ‘fort’	/gʱəʈiː/ ‘fold, watch’

Minimal pairs for voiced-voiceless plosives:

(2.7)

/p/	/b/	/pəg/ ‘leg’	/bəg/ ‘insect’
/t̪/	/d̪/	/t̪aːnʈ/ ‘tension’	/d̪aːnʈ/ ‘tune’
/ʈ/	/ɖ/	/ʈaːl/ ‘wood-coal shop’	/ɖaːl/ ‘branch of tree’
/k/	/g/	/kaːm/ ‘work’	/gaːm/ ‘village’

2.2.2 Affricate consonant phonemes

An affricate phoneme is a sound which is articulated when there is a complete blockage of the nasal cavity and the complete closure of vocal tract builds up

compressed air pressure inside the oral cavity exactly like a plosive. But the release of the closure is not that of a plosive, it is not a sudden release, rather the build-up air passes slowly like a fricative phoneme. There is a total of four affricate phonemes in Malwi, where /tʃ/ /dʒ/ are unaspirated affricates and /tʃʱ/ /dʒʱ/ are aspirated affricates.

Minimal pairs for aspirated and unaspirated affricates:

(2.8)

/t͡ʃ/	/t͡ʃʰ/	/t͡ʃək/ ‘complete’	/t͡ʃʰək/ ‘satisfied’
/d͡ʒ/	/d͡ʒʱ/	/d͡ʒəɽiː/ ‘herb’	/d͡ʒʱəɽiː/ ‘heavy flow of rain’

Minimal pairs for voiced-voiceless affricates:

(2.9)

/t͡ʃ/	/d͡ʒ/	/t͡ʃək/ ‘complete’	/d͡ʒək/ ‘patience’

2.2.3 Nasal Phonemes

During the articulation of nasal phonemes, there is a complete closure in the vocal tract at some point and at the same time, the velum is lowered allowing the air to pass only through the nasal cavity. Malwi has three nasal phonemes, the voiced bilabial nasal /m/, the voiced alveolar nasal /n/ and the voiced retroflex nasal /ɳ/.

Minimal pairs for nasal phonemes:

(2.10)

/m/	/n/	/məg/ ‘path’	/nəg/ ‘valuable stone’
/m/	/ɳ/	/d̪aːm/ ‘value’	/d̪aːɳ/ ‘time’
/n/	/ɳ/	/ʃaːn/ ‘splendour’	/ʃaːɳoː/ ‘cunning’

2.2.4 Fricatives

A fricative phoneme is a sound which is articulated when the air passage in the vocal tract becomes so narrow that the air passes with audible sound or friction. In fricatives, the air flow is continuous and creates a hissing kind of sound. Voiceless alveolar fricative /s/, voiceless post alveolar fricative /ʃ/ and voiceless glottal fricative /h/ are three fricative consonant phonemes in Malwi. Voiced fricatives are not the part of Malwi phonemic inventory.

Minimal pairs for fricatives:

(2.11)

/s/	/ʃ/	/saːn/ ‘instrument to sharpen knife’	/ʃaːn/ ‘magnificence’
/s/	/h/	/sənḍeː/ ‘doubt’	/hənḍeː/ ‘together with’
/ʃ/	/h/	/ʃaːn/ ‘magnificence’	/haːn/ ‘loss’

2.2.5 Liquids

When there is a partial closure in the oral cavity and the air passes with resonance, the liquid phonemes are articulated. There are four liquid phonemes in Malwi, two rhotics as voiced alveolar flap /r/, voiced retroflex flap /ɽ/, and two laterals as voiced alveolar lateral approximant /l/ and voiced retroflex lateral approximant /ɭ/. It is important to note that among other related languages of Malwi, voiced retroflex lateral approximant /ɭ/, is not found in Hindi but occurs in Gujarati and Marathi.

Minimal pairs for liquid phonemes:

(2.12)

/l/	/ɭ/	/maːl/ ‘goods’	/maːɭ/ ‘forest’
/r/	/ɽ/	/goːroː/ ‘fair’	/goːɽoː/ ‘knee’

2.2.6 Approximants

Approximant phonemes are those phonemes which are articulated when both the active and passive articulator comes in contact without proper narrowing of air passage and without any proper production precision, and this result in sounds that lies between fricatives and vowels. There are two approximant phonemes in Malwi, voiced labiodental approximant /ʋ/ and voiced palatal approximant /j/.

Minimal pairs for approximants:

(2.13)

/ʋ/	/j/	/ʋaːɖ̪/ ‘fight’	/jaːɖ̪/ ‘remembrance’

2.3Allophonic Processes

2.3.1 Consonant Allophones

Phonemes /n/ and /ŋ/ are found to be in allophonic distribution in Malwi. This can be explained by the following simple rule:

n → ŋ /_ɡ

This means that phoneme /n/ has two realizations, [n] and [ŋ], where [ŋ] occurs in the environment when it is followed by velar plosive /k/ and /ɡ/, and [n] comes elsewhere throughout the language. For example:

(2.14)

/ŋ/ /əŋk/ ‘marks’

/pəŋkʰ/ ‘feather’

/əŋg/ ‘body part’,

/kəŋgoː/ ‘comb’, etc.

/n/ /gəndʒ/ ‘other’

/ʊɪnɖaːɽe/ ‘ear’

/haːndʒeː/ ‘evening’

/iːnɖaː/ ‘egg’

2.3.2 Nasal Palace Assimilation

Malwi shows partial nasal place assimilation exactly like Hindi (Pandey 2010). When a nasal is followed by an obstruent it takes the place of that obstruent. The nasal changes it place to labial, dental, retroflex, palatal, and velar when they occur before obstruent having place labial, dental, retroflex, palatal, and velar, respectively. Also, the obstruents are placed at onset positions and nasals which go through place assimilation are placed at coda position of the preceding syllable, as it happens in Hindi (Ohala, 1990a). Nasal place assimilation in Malwi could be understood by the following feature tree diagram:

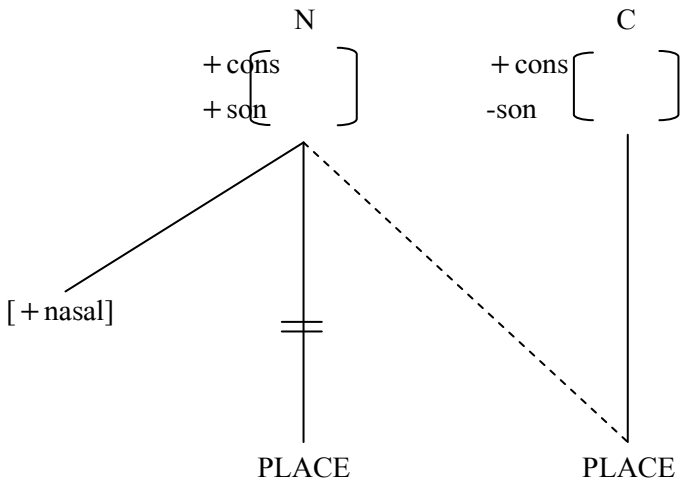


Figure 2.1: Nasal place assimilation in Malwi

Below are examples to illustrate nasal assimilation in Malwi:

(2.15)

/m/ /ləmboː/ ‘tall’

/limbu/ ‘lemon’

/n/ /gunḍ/ ‘gum’

/dʒinḍoː/ ‘alive’

/ɳ/ /ʈʰəɳɖoː/ ‘cold’

/iːɳɖaː/ ‘egg’

2.4 Phonemes in Free Variations

Free-variation between phonemes is a common feature of Malwi. There are some cases where two phonemes are occurring in words used interchangeably by different

speakers of the Malwi language. The change of one phoneme to another in such words does not bring any change in the meaning of the words. Also, the choice of the phoneme to be articulated in the word depends entirely on the free will of the speakers. One such case is the case of aphaeresis where phoneme /h/ is either kept or deleted, giving variations of same words. It means that the deletion of /h/ is optional in the language, which can be shown by the following rule:

/h/→∅ /_(optional)

In such types, the presence and absence of /h/ atthe word-initial position yield pairs such as the following:

(2.16)

/həl̪əɖ̪/ ~ /əl̪əɖ̪/ ‘turmeric’

/hod͡ʒi/ ~ /od͡ʒi/ ‘and’

Other cases of phonemes in free-variations are the cases of fricatives /s/~/h/; /ʃ/~/h/and nasals /n/~/ɳ/. The phonemes /s/ and /h/ and /ʃ/and /h/ are in regular free-variation at the word-initial position as shown in examples below:

(2.17)

/səglaː/~/həglaː/ ‘all’

/suːkkoː/~/huːkkoː/ ‘dry’

/soːnoː/~/hoːnoː/ ‘gold’

/sẽːt̪/~/hẽːt̪/ ‘honey’

/ʃɪkaːr/~/hɪkaːr/ ‘hunti

Also, the alveolar nasal varies freely with the retroflex nasal at the intervocalic and word-final position, as exemplified by the examples below:

(2.18)

/aːnoː/~/aːɳoː/ ‘come’

/kʊn/~/kʊɳ/ ‘who’

/ʋeːlən/~/ʋeːləɳ/ ‘rolling pin’

/luːn/~/luːɳ/ ‘salt’

2.5 Phonotactic Constraints on the Occurrences of Malwi Phonemes

2.5.1 Constraints on occurrences of vowel phonemes

In Malwi, all long vowels occur at syllable initial, medial and final positions. However, the short vowels occur at syllable initial and medial positions and the language do not allow them to occur at syllable final position. This is a common constraint which also holds true for other Indo-Aryan languages like Hindi, Punjabi, Sindhi, Urdu, etc. (Pandey 2010). Examples of vowels occurring at word initial, word medial and word final positions are given below:

(2.19)

	Word initial	Word medial	Word final
/i/	/illəɽ/ ‘caterpillar’	/lilloː/ ‘green’	-
/iː/	/iːɳɖaː/ ‘egg’	/ɖiːl/ ‘physic’	/maːliː/ ‘gardener’

/eː/	/eːkɖəm/ ‘exactly’	/dʒeːr/ ‘poison’	/kəneː/ ‘closely’
/ə/	/əʊɭoː/ ‘opposite’	/dʒəɽ/ ‘root’	-
/aː/	/aːloː/ ‘wet’	/ɖʱaːn/ ‘paddy’	/dʒəgaː/ ‘place’
/u/	/upp^{h}ər/ ‘up’	/guːlup/ ‘blub’	-
/uː/	/uːlɽoː/ ‘left’	/luːɳ/ ‘salt’	/p^{h}oːɽuː/ ‘image’
/oː/	/oːr/ ‘and’	/goːs/ ‘flesh’	/kaːnɖoː/ ‘onion’

2.5.2 Constraints on occurrences of consonant phonemes

In Malwi we observed the following consonant clusters at the syllable initial position:

(2.20)

/pj/ /pjaːr/ ‘love’

/bj/ /bjaːʊ/ ‘marriage’

/kj/ /kjãː/ ‘where’

/dʒj/ /dʒjaːɖaː/ ‘more’

/ʊj/ /ʊjaːgʃaːliː/ ‘fox’

Unlike Hindi (Ohala 1999) which allows 2-consonant clusters where C1 could be a stop, nasal or fricative and C2 a glide for syllable initial positions; constraints in Malwi only allows structures where C1 could be a stop or glide and C2 essentially the glide [j]. Therefore Malwi only allows consonant clusters C + j at syllable initial position, unlike other Indo-Aryan languages which allows C + G/L, N + L, C + r clusters (Pandey, 2010). The occurrence of the 3-consonant cluster at onset position is not allowed in Malwi.

At coda position, Malwi allows consonant clusters where C1 is a nasal and C2 a stop, unlike Hindi, where consonant clusters occurs in which C1 a fricative and C2 should either be a nasal or homorganic stop/fricative (Ohala, 1999). Occurrence of 3-consonant cluster at coda position is also not allowed in Malwi. Following are examples of consonant clusters in Malwi:

(2.21)

/ŋg/ /ləŋg.ɽoː/ ‘limp’

/ndʒ/ /gəndʒ/ ‘other’

2.6 Conclusion

The basic description of the word phonology of Malwi presented in this chapter is the first attempt to get an idea of the type of phonetic and phonological system the language has. The phonetic inventories and features of vowel phonemes and consonant phonemes, the allophonic processes like nasal place assimilation, and the phonotactic constraints on the occurrence of vowel phonemes and consonant phonemes have been discussed in this chapter.

Chapter 3

Sonorant Aspirates and Diaspirate Roots in Malwi

3.0 Introduction

This chapter focuses on two different phenomena which occurs in Malwi, the 'sonorant aspirates' and the 'diaspirate roots'. There have been studies for the Indo-Aryan languages, like Hindi and Bengali, which treat sonorant aspirates as consonant clusters. I assume that sonorant aspirates must be analysed not sonorant + /ɦ/ clusters, but as single phonemes. This chapter presents an acoustic study of the segments to demonstrate their status as single phonemes. Section 3.2 shows that durational measurements of sonorant aspirates compared with other singleton and geminate consonants clear demonstrate our claim. Section 3.3 of the chapter discusses the occurrence of diaspirate roots, which is a phenomenon of Proto-Indo-European and modern Indo-Aryan languages. The occurrence of diaspirate roots is also accounted for in Nepali (Bandhu et.al. 1971). The framework used in this chapter to understand the concept of diaspirate roots is in autosegmental phonology, whereas spectrographic images from Praat have also been provided for understanding and illustration purpose.

3.1 Sonorant Aspirates

Sonorant aspirates occur widely in Malwi. The topic is of considerable interest in the phonological analysis - whether they are to be treated as consonant clusters of C + ɦ or singleton units. With regards to these segments in Hindi, they are treated as a cluster sequence (Ohala 1983; Botma 2004) while others regard it as a *singleton* breathy *nasal* (Maddieson 1984; Hinskens and van de Weijer 2003). The issue is also important from

the phonetic point of view- whether the sequence is realized as [N+ ɦ] or as a nasal aspirate $N^{ɦ}$ (Esposito et al. 2005).

Malwi have four sonorant aspirates; two nasals /m/, /n/ and two liquids /r/, /l/. In Malwi, sonorant aspirates occurs at word initial and word medial positions and do not occur at word final position. The following is the lists contain many examples of sonorant aspirates:

(3.1)

	Word initial	Word medial	Word final
/$m^{ɦ}$/	/$m^{ɦ}$aːr/ ‘my’	/ə$m^{ɦ}$aːroː/ ‘our’	-
	/$m^{ɦ}$aːroː/ ‘mine’	/ə$m^{ɦ}$aːrtiːdʒ/ ‘ourselves’	-
	/$m^{ɦ}$aːraːdʒ/ ‘myself’	/t̪ə$m^{ɦ}$aːroː/ ‘your’	-
	/$m^{ɦ}$aːriː/ ‘mine’	/t̪ə$m^{ɦ}$aːraːdʒ/ ‘yourself’	-
	/$m^{ɦ}$ən/ ‘my’	-	-

(3.2)

	Word initial	Word medial	Word final
/$n^{ɦ}$/	/$n^{ɦ}$aːr/ ‘lion’	/hun^{ɦ}aːr/ ‘goldsmith’	-
	/$n^{ɦ}$aːnoː/ ‘bath’	-	-
	/$n^{ɦ}$iːgjoː/ ‘ran’	-	-

	/nʱaːʈoː/ ‘short’	-	-
	/nʱeːr/ ‘canal’	-	-

(3.3)

	Word initial	Word medial	Word final
/rʱ/	/rʱiː/ ‘anger’	/pərʱeːʊoː/ ‘sweat’	-
	/rʱiːmeː/ ‘stab’	/ʈ̤ərʱeː/ ‘thirst’	-
	-	/ɪrʱəɳ/ ‘deer’	-
	-	/ɖ̤ʱərʱəʊ/ ‘north’	-
	-	/gʱərʱəɪriː/ ‘echo’	-

(3.4)

	Word initial	Word medial	Word final
/lʱ/	/lʱeːr/ ‘wave’	/əlʱaːɽənoː/ ‘move’	-
	-	/səlʱaː/ ‘suggestion’	-

From the list of sonorant aspirates and a basic word list of Malwi words, minimal pairs were easily found. The following are the set of minimal pairs for the above-mentioned sonorant aspirates:

(3.5)

/mʱ/ vs /m/	[mʱaːriː] ‘mine’	[maːriː] ‘kill’
	[mʱən] ‘my’	[mən] ‘mind’
/nʱ/ vs /n/	[nʱaːʈo] ‘run’	[naːʈo] ‘short’
	[nʱaːno] ‘bath’	[naːno] ‘child’
/rʱ/ vs /r/	[rʱiː] ‘anger’	[riː] ‘continuous tense marker –verb keep’
	[ʈ̤ərʱeː] ‘thirst’	[təre] ‘way’
/lʱ/ vs /l/	[lʱeːr] ‘wave’	[leːriː] ‘take.F’
	[səlʱaː] ‘suggestion’	[saːlaː] ‘brother-in-law’

3.1.1 Analyzing sonorant aspirates

In order to show that Malwi has sonorant aspirates as phonemes, 25 words with sonorant aspirates were extracted from the word list of Malwi data. The data was divided into two different sets for recording. For set-1 data, the test words were recorded within the following sentence frame:

(3.6)

mʱneː	ram-ʈ̤iː	test word	boːlɪjoː
i.M.S.Erg	ram.Acc	test word	say.V.Pst-Pref

I said [test word] to Ram.

For this set, the focus was to select the words in which the sonorant aspirates occur at the intervocalic position so that these can be compared with geminates and singletons for measuring the durational differences. However, for set-2 data, the minimal pairs were selected to measure if the durational differences between the sonorant aspirate and sonorant unaspirated pairs were significant or not.

3.1.2 Data recording

For experimental and acoustic analysis, the test-data has been recorded from 6 male native speakers of Malwi language. In selecting the speakers, their educational, regional and occupational backgrounds have been taken into consideration. The informants were from villages of Ujjain district. The speech data has been recorded in a soundproof room at Ujjain, and Olympus LS-P1 Hi-Res audio recorder has been used for recording. For the two sets selected for analysis of sonorant aspirates, the data was recorded in two different formats. For set-1 data, the informants were asked to pronounce each of the following words withing sentence frame given in (3):

Sonorant aspirates		Singletons		Geminates	
[mʱ]	/t̪əmʱaːroː/ ‘our’	[m]	/əmərət̪/ ‘nectar’	[mm]	/əmmər/ ‘immortal’
[nʱ]	/hunʱaːr/ ‘goldsmith’	[n]	/pəniː/ ‘moccasin’	[nn]	/pənniː/ ‘thin brass pot’
[rʱ]	/t̪ərʱe/ ‘thirst’	[r]	/kʰəroː/ ‘pure’	[rr]	/kʰərroː/ ‘broom’
[lʱ]	/əlʱaːʈəroː/ ‘move’	[l]	/kɪlaː/ ‘man of kilal caste’	[ll]	/kɪllaː/ ‘fort’

Table 3.1: Test words of set-1 data

For set-2 data, the speakers were asked to repeat each of the following words three times and mostly the middle one is taken into consideration for the acoustic durational analysis:

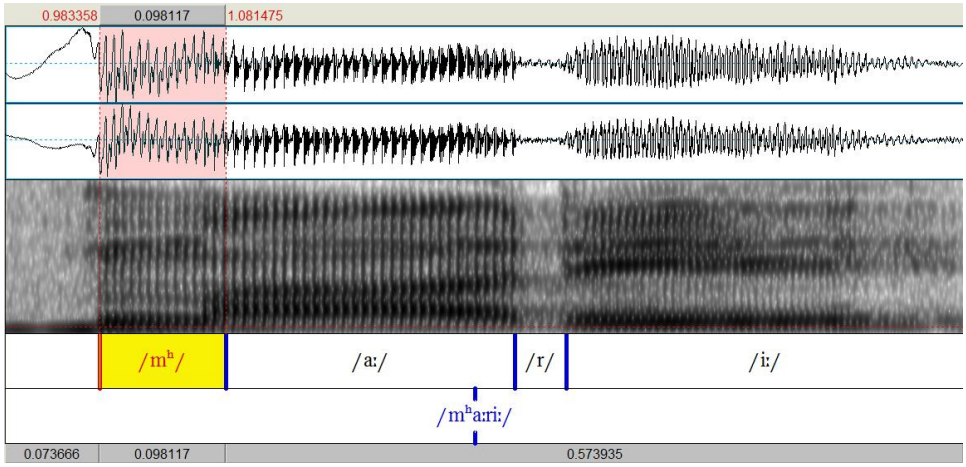
	Sonorant aspirates		Sonorant unaspirates
[m^{ɦ}]	/m^{ɦ}aːriː/ ‘mine’	[m]	/maːriː/ ‘kill’
[n^{ɦ}]	/n^{ɦ}aːnoː/ ‘bath’	[n]	/naːnoː/ ‘child’
[r^{ɦ}]	/r^{ɦ}iː/ ‘anger’	[r]	/riː/ ‘continuous tense marker – verb keep’
[l^{ɦ}]	/l^{ɦ}eːr/ ‘wave’	[l]	/leːriː/ ‘take.F’

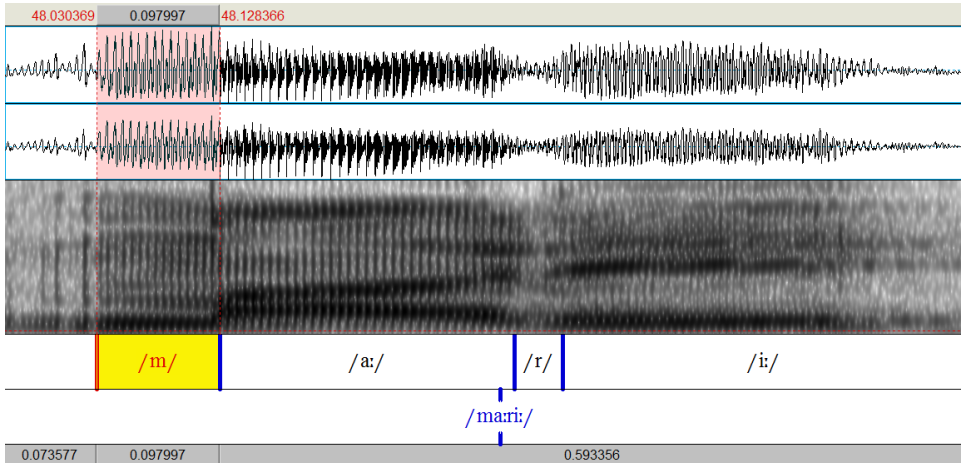
Table 3.2: Test words of set-2 data

3.1.3 Acoustic Measurements

Acoustic analysis of the recorded speech samples has been done using the standard software for instrumental analysis of speech sounds, PRAAT (by Paul Boersma, University of Amsterdam). The acoustic measurements have been carefully evaluated from spectrographic and waveform displays and transcribed phonetically. Sonorant aspirate-unaspirate pairs for nasals [m^{ɦ}]-[m], [n^{ɦ}]-[n] and for liquids [r^{ɦ}]-[r], [l^{ɦ}]-[l] have been analysed. Spectrographic images have been given for illustration purpose, keeping the time scale same for all the pictures (800 ms).

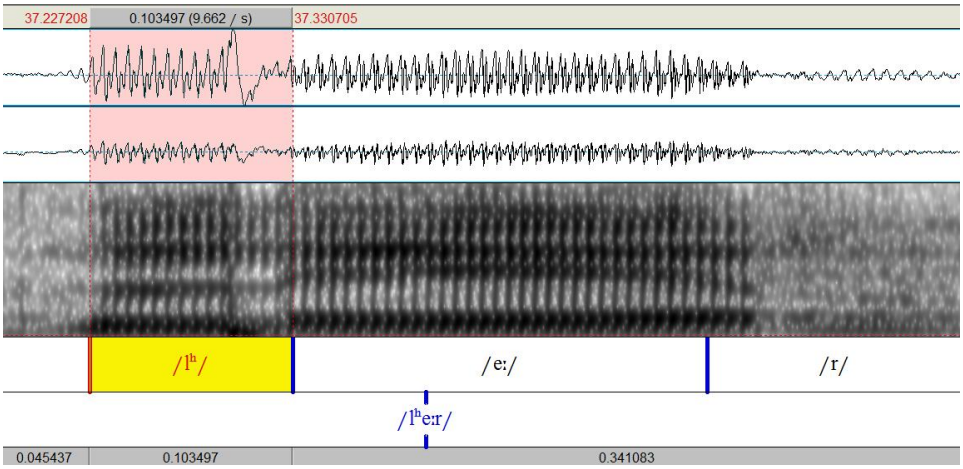
Figure 3.1: Spectrograms of Malwi sonorant aspirate-unaspirate nasals:

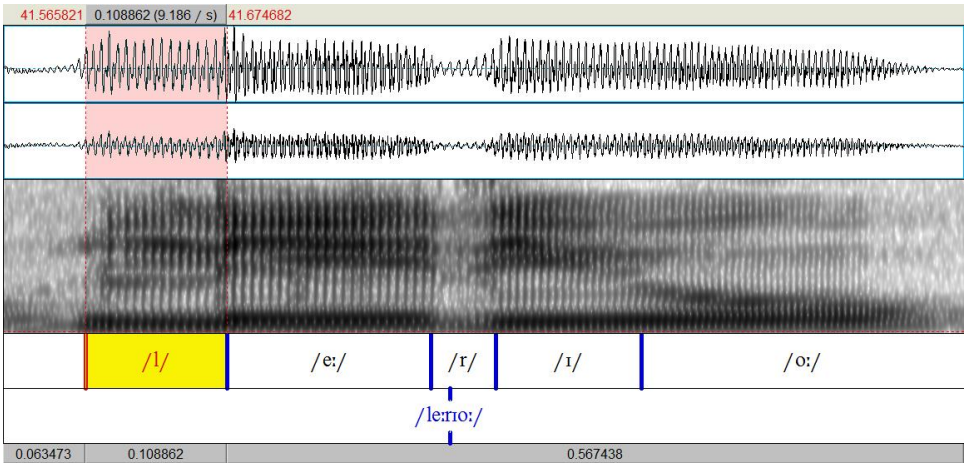




(3.i).Closure duration of sonorant aspirate-unaspirate nasals [mʱ]-[m]

Figure 3.2: Spectrograms of Malwi sonorant aspirate-unaspirate liquids:





(3.ii).Closure duration of sonorant aspirate-unaspirate liquids [lʱ]-[l]

3.1.4 Results

3.1.4.1 Results for data set-1

The mean closure duration of sonorant aspirates, sonorant singletons and sonorant geminates is shown in figure 3. The duration difference was statically insignificant in case of sonorant aspirate and sonorant unaspirate pairs, i.e., for nasals [$m^{ɦ}$]-[m], $p > 0.05$; [$n^{ɦ}$]-[n], $p > 0.05$; for liquids [$r^{ɦ}$]-[r], $p > 0.05$; except for the case of lateral [l] where the durational difference is slightly significant between [$l^{ɦ}$]-[l] pair, i.e., $p < 0.05$.

Whereas the duration difference was statically highly significant for sonorant aspirates and sonorant geminate segments i.e., for nasals [$m^{ɦ}$]-[mm], $p < 0.01$; [$n^{ɦ}$]-[nn], $p < 0.01$; for liquids [$r^{ɦ}$]-[rr], $p < 0.01$; [$l^{ɦ}$]-[ll], $p < 0.01$.

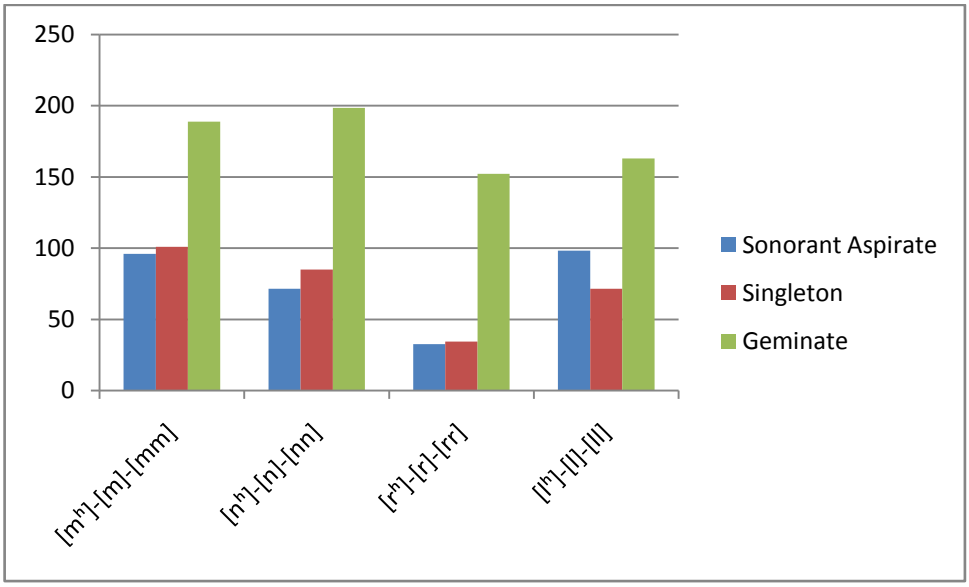


Figure 3.3: Mean closure duration of sonorant aspirate-singleton-geminate.

3.1.4.2 Results of data set-2

The mean closure duration of sonorant aspirates and sonorant unaspirtes is shown in the figure 4. The duration difference was statically insignificant in case of sonorant aspirate and sonorant unaspirate pairs, i.e., for nasals [m^h]-[m], $p > 0.05$; [$n^ɦ$]-[n], $p > 0.05$; for liquids [$r^ɦ$]-[r], $p > 0.05$; [$l^ɦ$]-[l], $p > 0.05$.

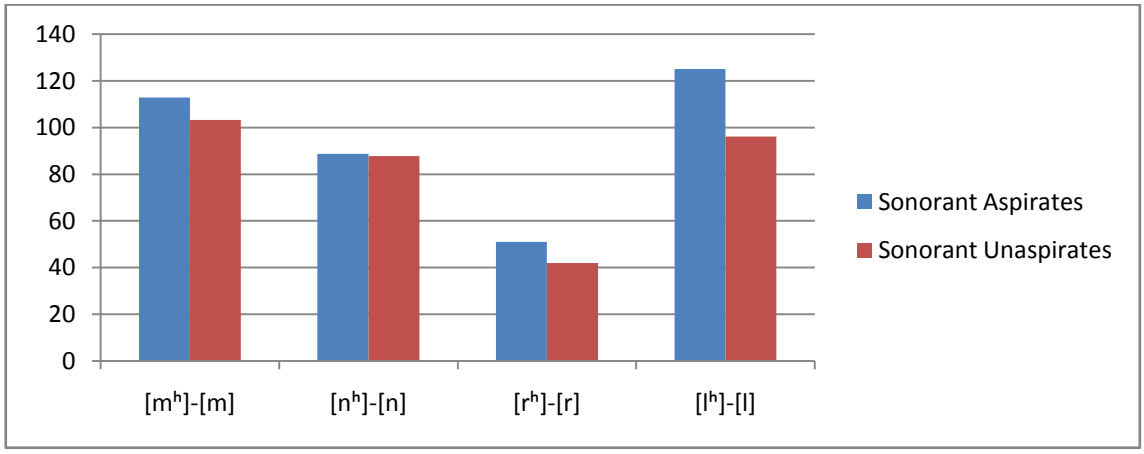


Figure 3.4: Mean closure duration of sonorant aspirate-unaspirate pairs.

3.2 Diaspirates and Laryngeal Co-occurrence Patterns

Malwi demonstrates the presence of diaspirates, a phenomenon found commonly in Proto-Indo-European (e.g. Borowsky and Mester 1983) and modern Indo-Aryan languages but lost in Sanskrit. The loss of diaspirates yielding single aspirates in roots in Sanskrit is a subject matter of several studies under the phenomenon known as Grassman's Law (cf. Anderson 1970). Malwi shows the working of Grassman's Law with various patterns. Such patterns involve roots with two stop consonants where the first one is aspirated by some speakers and the second is aspirated by other speakers. Thus in these type of patterns, there is always a loss of aspiration, either for the first stop of the word or for the second stop. Unlike Nepali (Bandhu et.al. 1971), where

diaspiration is triggered when stop consonants come before morphemes beginning with voiceless stops, the law here in Malwi applies optionally; giving rise to two forms for the same root, both used as free variants.

The optional loss or shift of aspiration in words in Malwi is quite common. The shift, also known as Throwback Aspiration for the phenomenon in Sanskrit (Calabrese and Keyser 2006), involves both voiced and voiceless aspirates, as can be seen below for Malwi:

(3.7)

(i)

/bʱaːpəɳ/ ~ /baːpʰəɳ/ ‘eyebrow’

/dʒʱaːɽkaː/ ~ /dʒaːɽkʰaː/ ‘tree’

/gʰəɽiː/ ~ / gəɽʰiː/ ‘watch’

/d̪ʰəkkoː/ ~ /d̪əkkʰoː/ ‘push’

(ii)

/pʰutʃiː/ ~ /putʃʰiː/ ‘ask’

/pʰutʃəɽo/ ~ /putʃʰəɽo/ ‘tail’

/pʰaːtʃiː/ ~ /paːtʃʰiː/ ‘again’

/pʰənkoː/ ~ /pənkʰoː/ ‘fan’

It can be seen that apritation in the above words migrates from the onset of the first syllable in one variant of the root to the next syllable in the second variant. However, there is no devoicing occurring additionally independent of the voicing status of the consonant. Unlike Sanskrit, where TBA occurs only in diaspirate roots with the initial

consonant being a voiced stop, in Malwi, it occurs with the initial consonant being both voiced and voiceless stop.

Furthermore, there are other similar patterns; in which out of the two variants, one variant shows the presence of [+spread gl.] or laryngeal feature at the initial position and in the other variant of the same root, the laryngeal feature is lost at the initial position and aspiration is triggered at the onset of next syllable. As seen in the following roots:

(3.8)

/həʈəkaː/ ~ / əʈəkʰaː/ ‘bone’

/haːkoː/ ~ /aːkʰoː/ ‘full’

/həlkoː/ ~ /əlkʰoː/ ‘light’

/haːt̪eː/ ~ / aːt̪ʰeː/ ‘in-hand’

Another pattern with a slight difference on the surface variants is seen where the [+spread gl.] is present at the onset of the second syllable in one variant and the TBA on the initial consonant of another variant. E.g.

(3.9)

/bəhoːt̪/ ~ /bʱoːt̪/ ‘many/much’

/tʃaːhət̪/ ~ /tʃʰaːt̪/ ‘like’

3.2.1 Methodology for understanding diaspirate roots

To understand the nature of diaspirate roots in Malwi, two types of studies have been done in this chapter. The first is to understand diaspirate roots in the light of the autosegmental framework of phonology and the other to look at spectrographic images using Praat software.

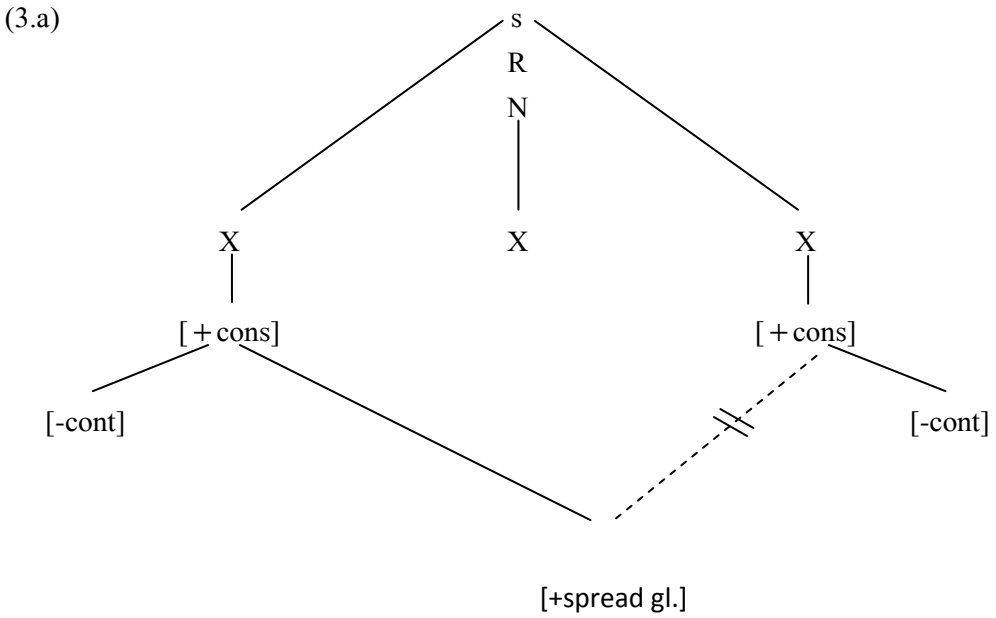
3.2.1.1 Diaspirate roots and autosegmental phonology

The framework for autosegmental phonology was initially proposed by Goldsmith (1976) and further developed by many prominent linguists, J.R. Firth (1948), Bernard Bloch (1948), Charles Hockett (1955) and others. The need for autosegmental phonology is to explain processes which influence more than one vowel or consonant at a time. As autosegmental phonology is a non-linear approach, there are different tiers and every liner sequence has a separate tier. Elements or features on different tiers are connected through vertical association lines and disconnected through dissociation lines. There are four tiers and each shows a different language feature. At segmental or skeletal tier, features are assigned to segments. Timing tier defines the length of segments. The stress tier shows the distribution of stress and tone tier defines features of tones in the phonological representation.

The autosegmental framework of phonology allows for two possible representations for diaspirate roots. Whether there is a shift of aspiration as in /bʱaːpəɳ/ ~ /baːpʰəɳ/ ‘eyebrow’ or there is a loss of laryngeal feature at the initial position and aspiration is triggered at the onset of next syllable as in /həɽəkaː/ ~ / əɽəkʰaː/ ‘bone’, figure 3.5 (3.a) illustrates how the stops of initial syllable are aspirated, or where there is loss /h/ at initial syllable and figure 3.5 (3.b) explains the delinking of aspiration from the initial

stops or loss of /h/ and linking of aspiration to the next stop. Figure 3.5 also accounts for the loss of aspiration at the initial stop and addition of /h/ to the next syllable as in /bʱoːt̪/ ~ /bəhoːt̪/. Thus figure 3.5 accounts of all three variant patterns of diaspiration in Malwi.

(3.a)



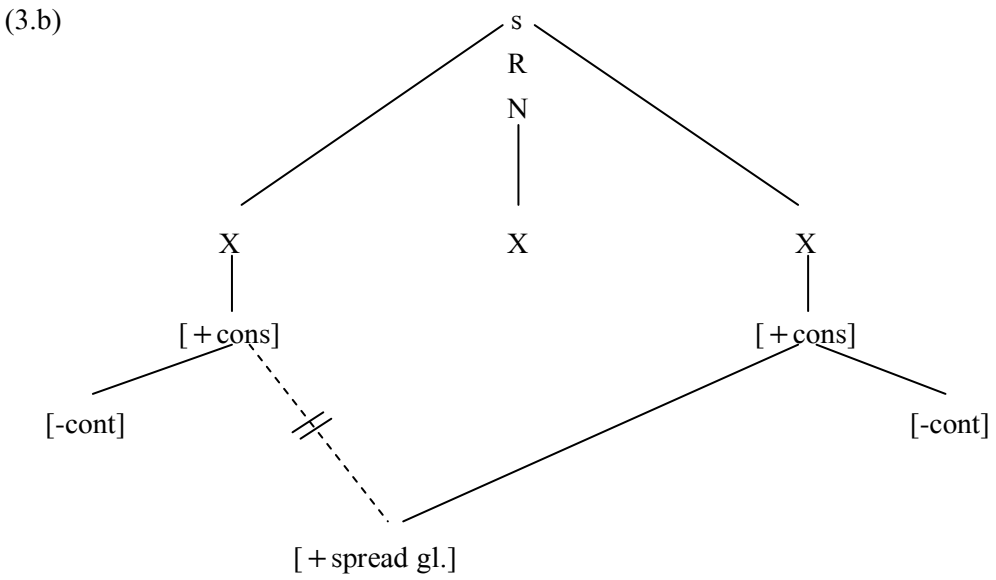


Figure 3.5: Loss/shift of aspiration in diaspirate roots

3.2.1.2 Recordings and acoustic measurements for diaspirate roots

For the acoustic understanding of the diaspirate root patterns, 14 words have been collected from the basic word list of Malwi and the test-data has been recorded from 6 male native speakers of Malwi language. The speakers were from villages of Ujjain district, and their educational, regional and occupational backgrounds have been taken into consideration. The speech data has been recorded in a soundproof room at Ujjain. Each speaker was told to articulate each test word three times. Out of these three iterations, mostly the middle one is taken into consideration for the acoustic durational analysis. Olympus LS-P1 Hi-Res audio recorder has been used for recording.

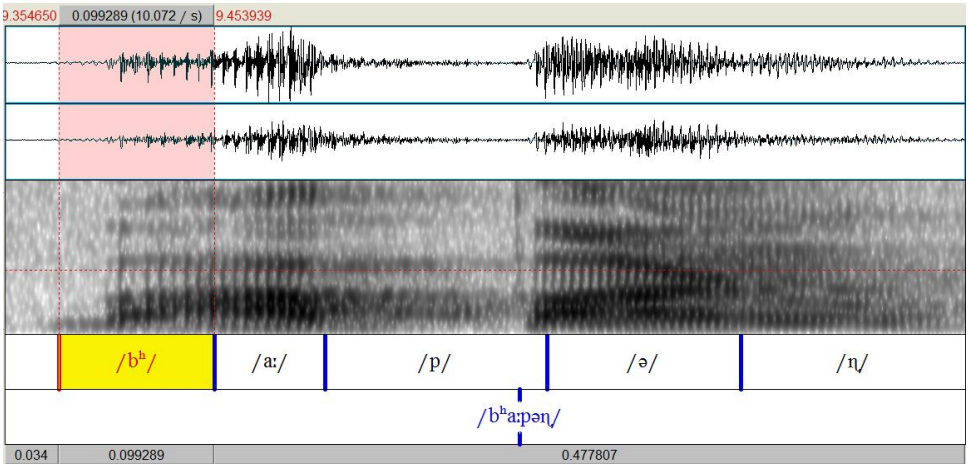
The test words are given in the following table:

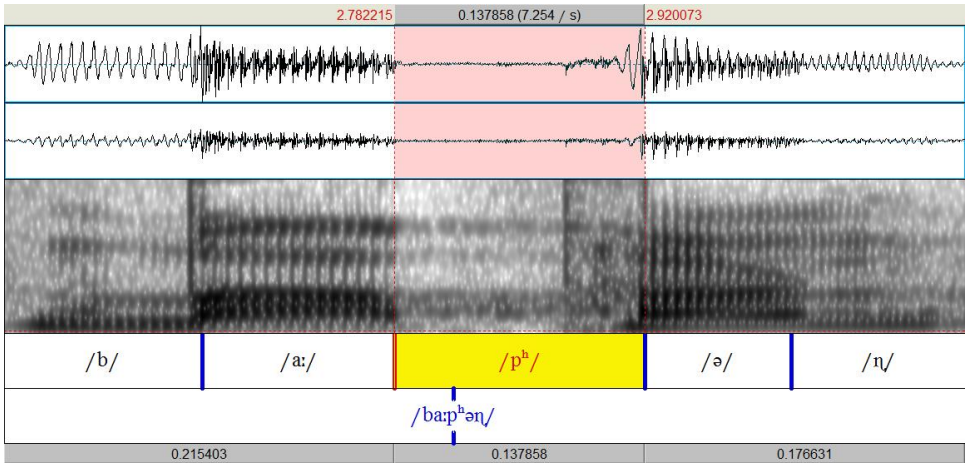
Diaspirate Roots		Word gloss
/bʱaːpəɳ/	/baːpʰəɳ/	Eyebrow
/bʱukkoː/	/bukkʰoː/	Hungry
/bʱaːʈoː/	/baːʈʰoː/	Stone
/ɖʱəkkoː/	/ɖəkkʰoː/	Push
/gʱəʈiː/	/gəʈʰiː/	Watch
/dʒʱaːʈkaː/	/dʒaːʈkʰaː/	Tree
/dʒʱəgəʈnoː/	/dʒəgʱəʈnoː/	Fight
/dʒʱuloː/	/dʒulʰoː/	Swing
/dʒʱukɳoː/	/dʒukʰɳoː/	Bend
/həʈəkaː/	/əʈəkʰaː/	Bone
/haːkoː/	/aːkʰoː/	Full
/həlkoː/	/əlkʰoː/	Light
/həʈʈoː-kəʈʈʰoː/	/əʈʈʰoː-kəʈʈoː/	Strong
/bəhoːt̪/	/bʱoːt̪/	Many/Much

Table 3.3: The diaspirate roots test words and their glosses

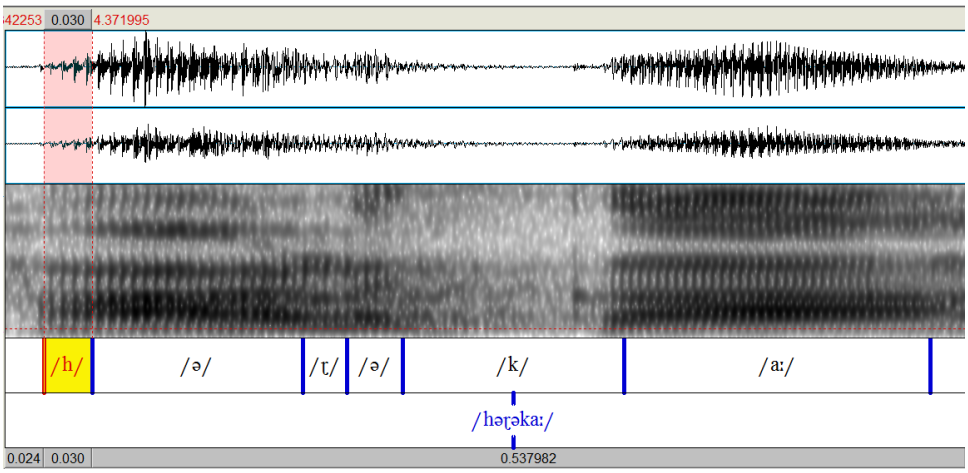
The standard software for instrumental analysis of speech sounds, PRAAT (by Paul Boersma, University of Amsterdam) is used for the acoustic analysis of the recorded speech samples. The acoustic measurements have been carefully evaluated from spectrographic and waveform displays and transcribed phonetically. Spectrographic images have been given for illustration purpose, keeping the time scale same for all the pictures (800 ms).

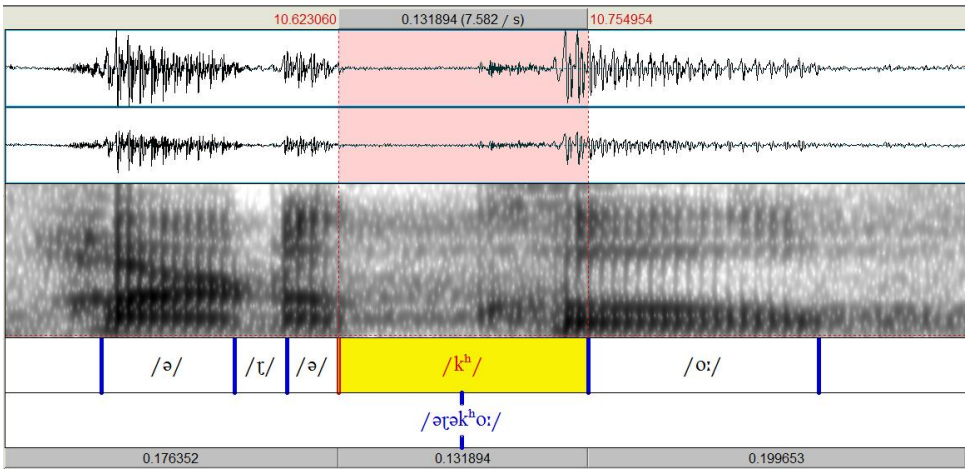
Figure 3.6: Spectrograms of Malwi diaspirate roots:



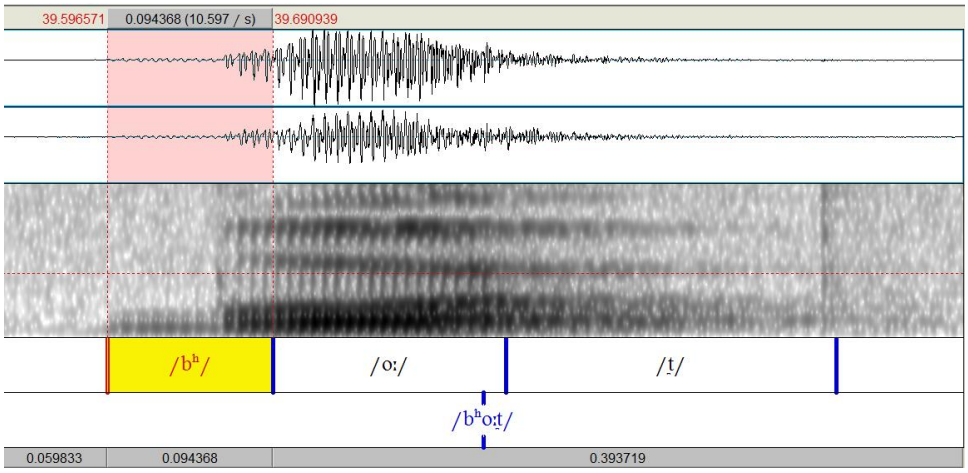


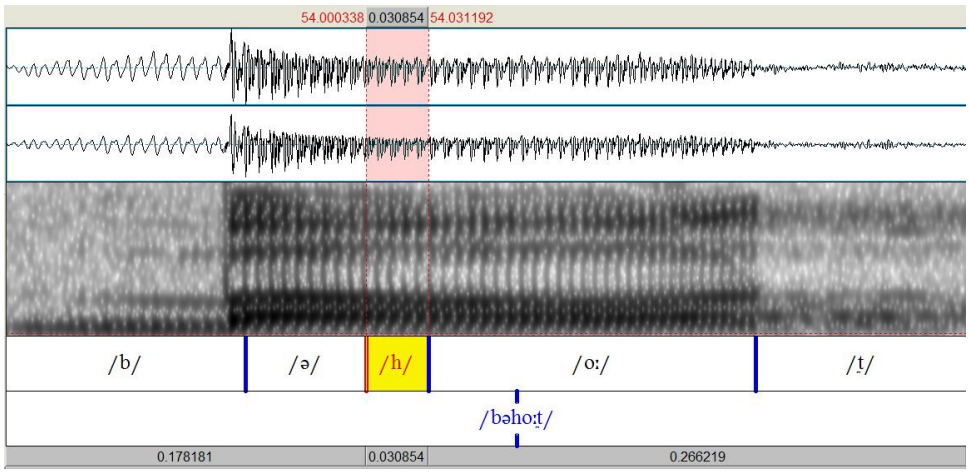
(3.iii).Optional shift of aspiration in /bʱa:pəŋ/ ~ /ba:pʰəŋ/





(3.iv).Loss and shift of aspiration in /həɽəkaː/ ~ / əɽəkʰaː/





(3.v).Loss and addition of aspiration in /bʱoːt̪/ ~ /bəhoːt̪/

3.4 Conclusion

Sonorant aspirates /m^{ɦ}/, /n^{ɦ}/, /r^{ɦ}/ and /l^{ɦ}/ in Malwi have been analyzed acoustically and on looking at durational cues it can be stated that sonorant aspirates in Malwi are single phonemes, not clusters of [C + ɦ]. The significant test came positive for the durational difference for the pairs of sonorant aspirates and geminate consonants whereas, it came negative for the pairs of sonorant aspirates and sonorant unaspirates. This makes it clear that the duration between sonorant aspirates and unaspirates is insignificant therefore sonorant aspirates in Malwi are single phonemes. Diaspirate roots and its various patterns have been discussed in the chapter with the help of autosegmental framework and acoustic spectrograms. Though the phenomenon is optional, it frequent and important with regards to Mawli.

Chapter 4

Acoustic cues for Malwi Geminate and Retroflex Consonants

4.0 Introduction

One of the aspects of word phonology is to study the different types of consonant phonemes and their behavior. One such type is a homorganic consonantal sequence is 'Geminates'. Geminates are doubled consonants or long consonants and they phonemically contrast with their single counterparts or singletons. Another type of consonantal phonemes are retroflex consonants that differ from their dental counterparts with only one difference, the place of articulation. Retroflexes are produced when the tongue is curled back and touches the hard palate as opposed to dentals in which the tip of the tongue touches the teeth ridge. This chapter, in particular, focus on these two topics, 'geminates' and 'retroflexes' in terms of analyzing the acoustics cues for both to differentiate them from their 'singleton' and 'dental' counterparts, respectively. The methodology used for this work to analyze both geminate and retroflex consonantal phonemes is pretty much the same. For geminates, the closure duration of geminate consonants and singleton consonants, with the duration of vowels preceding in both cases is compared and studied. And for retroflex too, the analysis is durational based, where the closure duration of retroflex and dental is compared with the comparison between the durations of preceding vowels of both. Though both geminate-singleton durational differences and retroflex-dental durational difference are significant, the very little difference in the values of retroflex and dental consonants is explained in with reference to quantal theory, that establishes the correlation of acoustic signals and articulatory speech signals.

4.1 Geminate Consonants in Malwi

The acoustic distinction between the singleton and the geminate consonant pairs maintain special interest to researchers from a very long time. We typically define geminates as long or double consonant that has phonemic singleton counterparts in a language. In Malwi, geminates occur phonemically and thus show contrast with their singletons. Geminates in Malwi occur intervocalically. They are preceded by a short vowel and followed by either short or long vowel; e.g.

(4.1)

/hʊkkoː/ ~ /sʊkkoː/ ‘dry’

/pəppaː/ ‘father’

/lɪlloː/ ‘green’

/hʊnnaː/ ‘hear’

/səmʊd̪d̪ər/ ‘sea’

/nɪtʃtʃeː/ ‘down’

/ʊnnoː/ ‘hot’

/əlluː/ ‘potato’

/həkkər/ ‘sugar’

/nɪʈʰəlloː/ ‘lazy’

/məkkɪjaː/ ‘maize’

Geminate aspirates, too, occur in Malwi. When geminated, aspirates follow the constraint (Lombardi 1994) that the feature [+spread glottis] can be realized only once per cluster. For example,

(4.2)

/ətʃtʃʰoː/ ‘good’

/mətʃtʃʰiː/ ‘fish’

/mətʃtʃʰər/ ‘mosquito’

/gəʈʈ̰ʰər/ ‘bundle’

In this chapter, geminates have been analyzed on the basis of their durational differences with their singleton counterparts, as well as on the basis of the durational differences of the preceding vowels of both. The durational differences of the geminate-singleton consonant pairs of stop phonemes [p], [b], [t̪], [d̪], [ʈ], [ɖ], [k], [g]; affricates [tʃ], [dʒ]; fricative [s]; nasals [m], [n]; and liquids [r], [l] are discussed in detail in this chapter. The data for this work have been taken from Ujjain district and 17 set of geminate-non geminate words have been recorded from 6 male native speakers of the language.

4.1.1 Methodology for Analysing Geminate Consonants of Malwi

4.1.1.1 Materials for geminate-singleton consonants

Chapter 1 of this thesis gives detail information about the data collection and field work done for this work. From that collected data, a list of 30 words with geminate consonants were extracted for analyzing the behavior of geminates in Malwi. Out of these 30 words which have geminate consonants, 17 were found to have minimal pairs with their singleton consonants, which in turn gave 34 test words in total to be analyzed in this chapter. Thus, pairs of 17 geminate-singleton words are taken as test

words which were recorded and acoustically analyzed. The test words are given in the following table:

	Singleton		Geminate	
	Test word	Gloss	Test word	Gloss
/p/	/ʈ^{h}əpʈ^{h}əpiː/	Dab	/ʈ^{h}əppiː/	Pile
/b/	/gəbən/	Usurp	/gəbbər/	Egoistic
/ʈ/	/pəʈər/	Stone	/pəʈʈər/	Letter
/ɖ/	/əɖaː/	Style	/əɖɖaː/	Short
/ʈ/	/kuʈiː/	Hut	/kuʈʈiː/	Unfriend
/ɖ/	/gəɖaːr/	mark of wheels of car	/gəɖɖaː/	hole on road
/k/	/sikoː/	Roast	/sikkoː/	Coin
/k/	/ʈikiː/	Rests	/ʈikkiː/	Bindi
/k/	/ʈəkoː/	10 grams	/ʈəkkoː/	coin worth 2 paisa
/g/	/ɖəgəɳoː/	get inked	/ɖəggəʈ/	Stone
/tʃ/	/bətʃiː/	left, spare	/bətʃtʃiː/	Girl
/dʒ/	/udʒəroː/	bright, shiny	/udʒdʒəʈ/	Deserted
/m/	/əmərəʈ/	nectar	/əmmər/	Immortal
/n/	/pəniː/	moccasin	/pənniː/	thin brass pot
/s/	/əsi/	like this	/əssi/	Eighty
/r/	/k^{h}əro/	pure, honest	/k^{h}ərro/	broom, horse's comb
/l/	/kilaːl/	a man of 'kilal' caste	/killaː/	Fort

Table 4.1: The geminate-singleton test-words and their glosses

4.1.1.2 Recordings

For experimental and acoustic analysis of geminates, the test-data have been recorded from 6 male native speakers of Malwi language. In selecting the speakers, their educational, regional and occupational backgrounds have been taken into consideration. The informants were from villages of Ujjain district. The speech data have been recorded in a soundproof room at Ujjain. Each speaker was told to articulate each test word three times. Out of these three iterations, mostly the middle one is taken into consideration for the acoustic durational analysis. Olympus LS-P1 Hi-Res audio recorder has been used for recording.

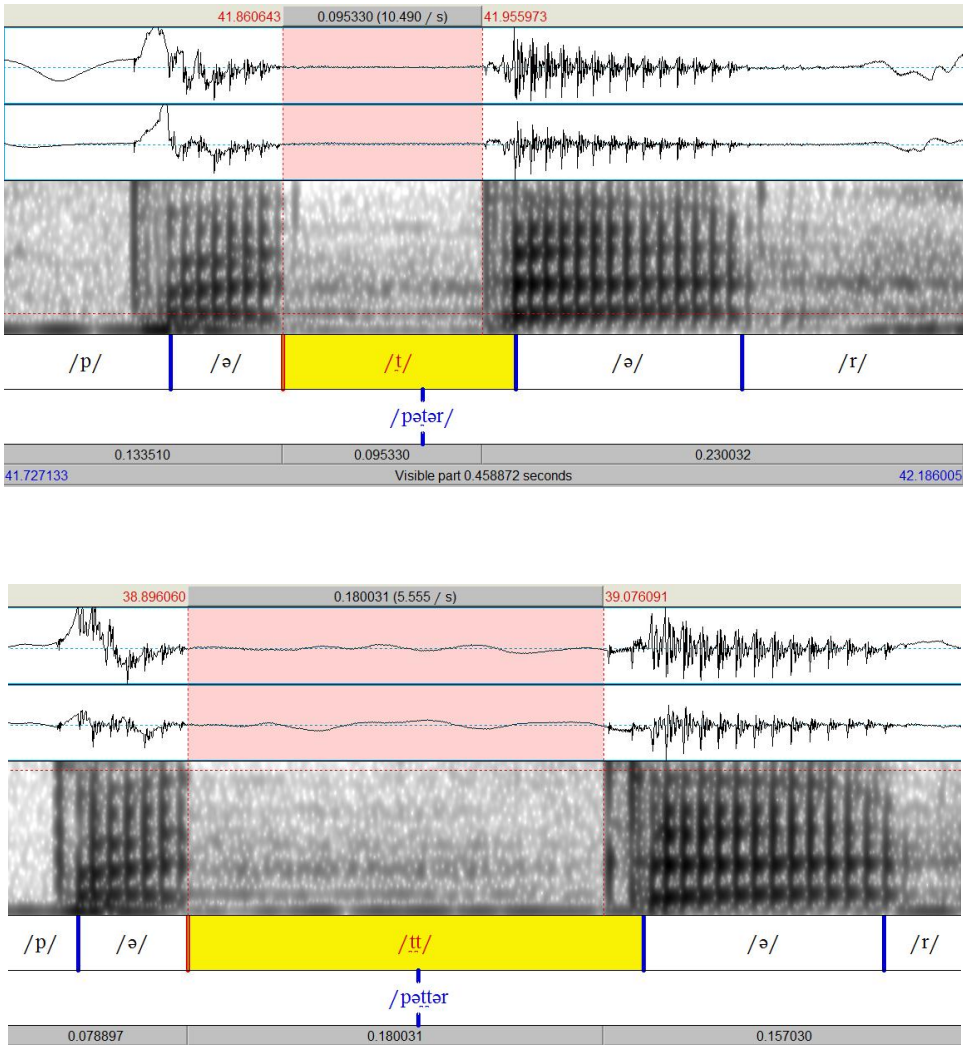
4.1.1.3 Acoustic Measurements

Acoustic analysis of the recorded speech samples have been done using the standard software for instrumental analysis of speech sounds, PRAAT (by Paul Boersma, University of Amsterdam). The acoustic measurements have been carefully evaluated from spectrographic and waveform displays and transcribed phonetically . Geminate-singleton pairs for plosives [p] [b] [ʈ] [ɖ] [ʈ] [ɖ] [k] [g], affricates [tʃ] [dʒ], nasals [m] [n], fricative [s], and liquids [r] [l] have been analysed. Spectrographic images have been given for illustration purpose, keeping the time scale same for all the pictures (800 ms).

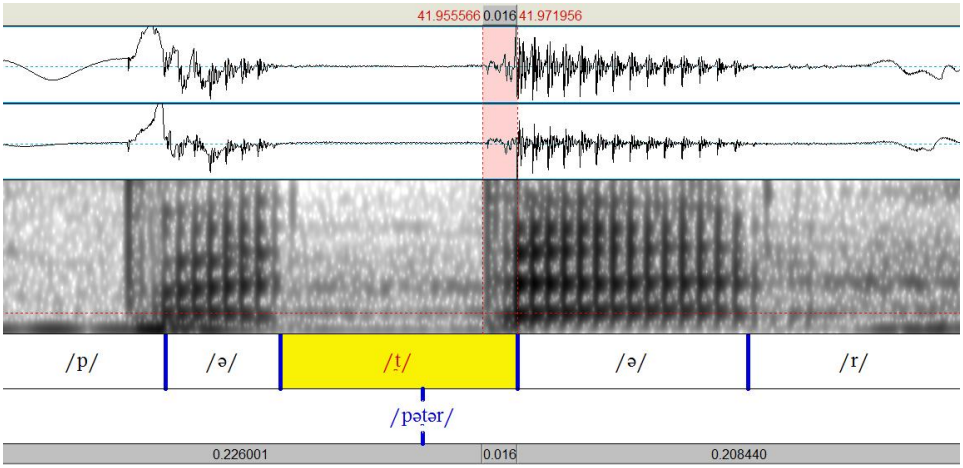
4.1.1.3.1 Duration of the closure of test consonant

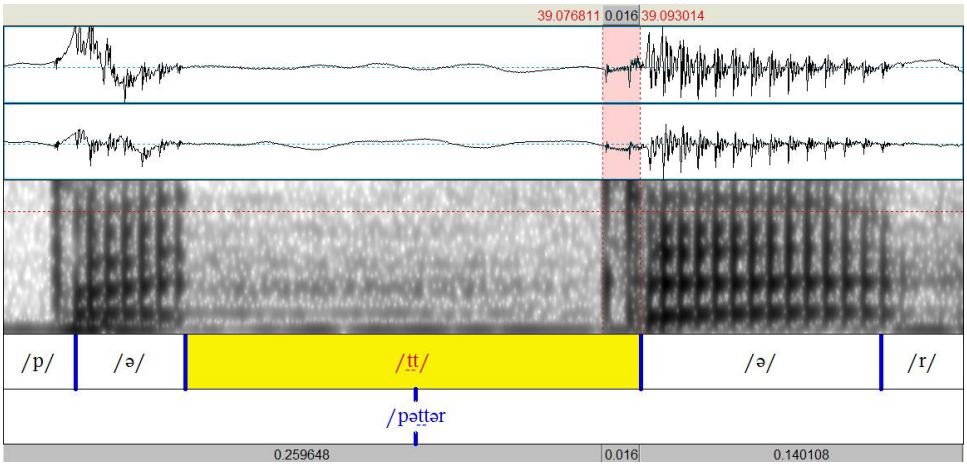
- Plosive – In case of plosives, the closure durations were measured from the offset of the preceding vowel up to the onset of the burst; and the duration of voice onset time was measured separately, i.e., from the onset of the burst to the onset of the following vocalic formant structure.

Figure 4.1: Spectrograms of Malwi singleton-geminate plosives:



(4.i).Closure duration of singleton-geminate plosive[t̪]-[tt̪]

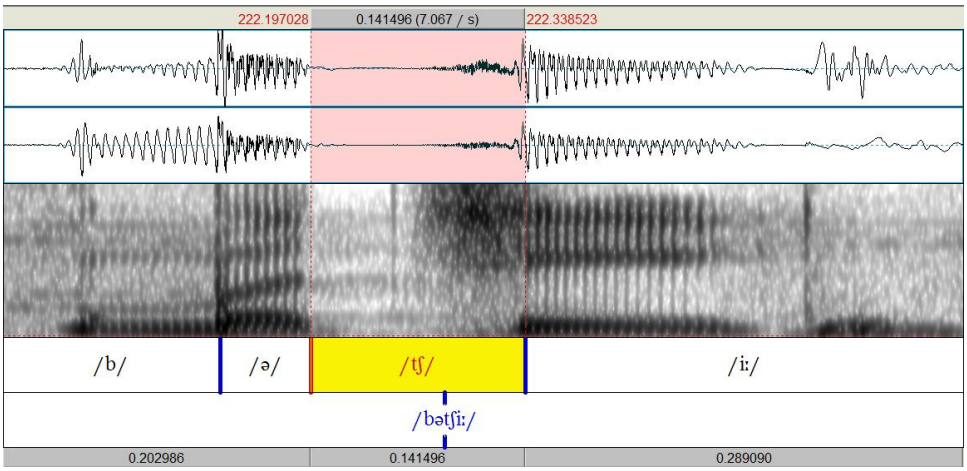


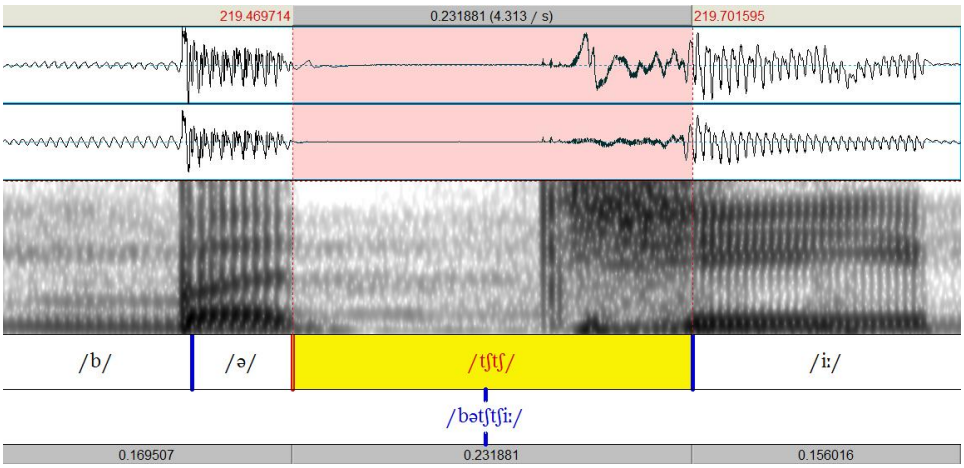


(4.ii).Duration of VOT of singleton and geminate plosive[t̪]-[t̪t̪]

- Affricates – The closure durations for affricates were measured from the offset of the preceding vowel to the onset of the following vocalic formant structure.

Figure 4.2: Spectrograms of Malwi singleton-geminate affricates:

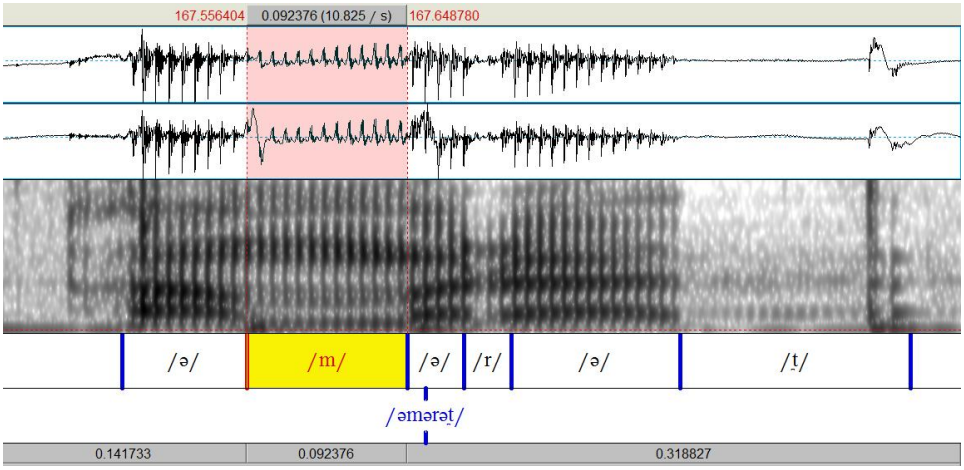


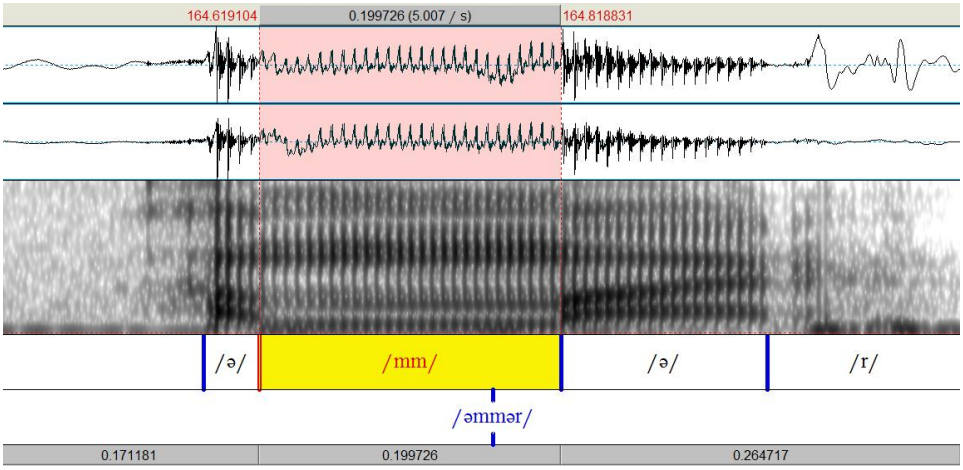


(4.iii).Closure duration of singleton-geminate affricate [tʃ]-[tʃtʃ]

- Nasals – The closure durations for nasals were measured from the offset of the preceding vowel to the onset of the following vocalic formant structure.

Figure 4.3: Spectrograms of Malwi singleton-geminate nasals:

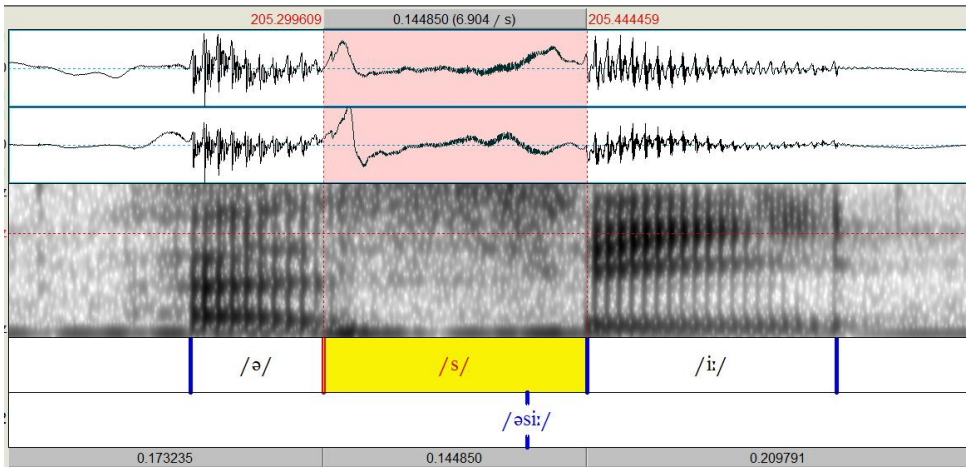


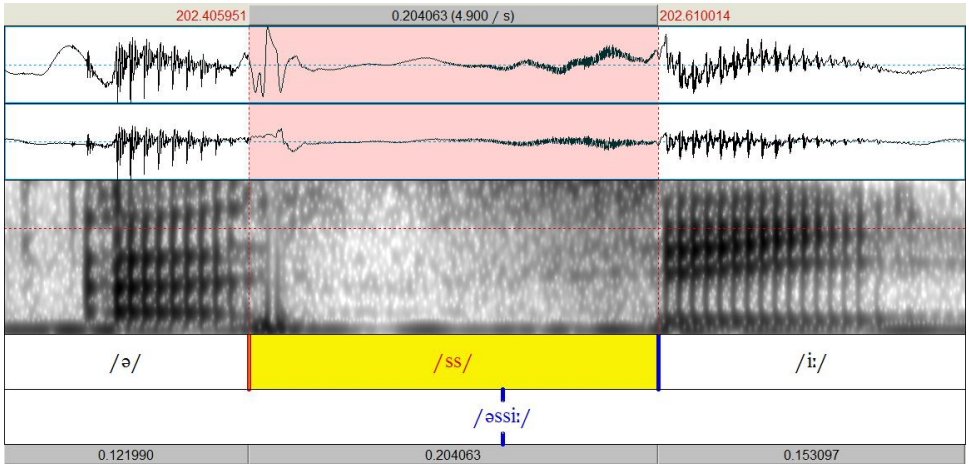


(4.iv).Closure duration of singleton-geminate nasal [m]-[mm]

- Fricatives – The closure durations for fricatives were measured from the offset of the preceding vowel to the onset of the following vocalic formant structure.

Figure 4.4: Spectrograms of Malwi singleton-geminate fricatives:

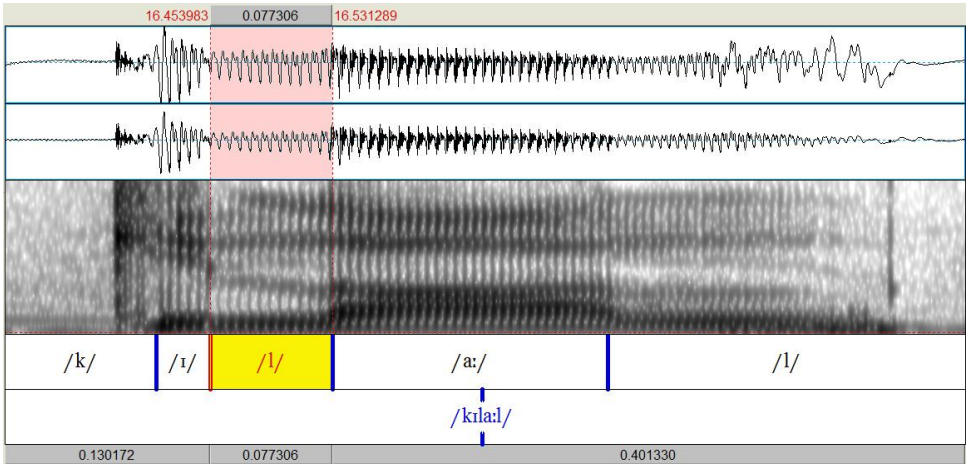


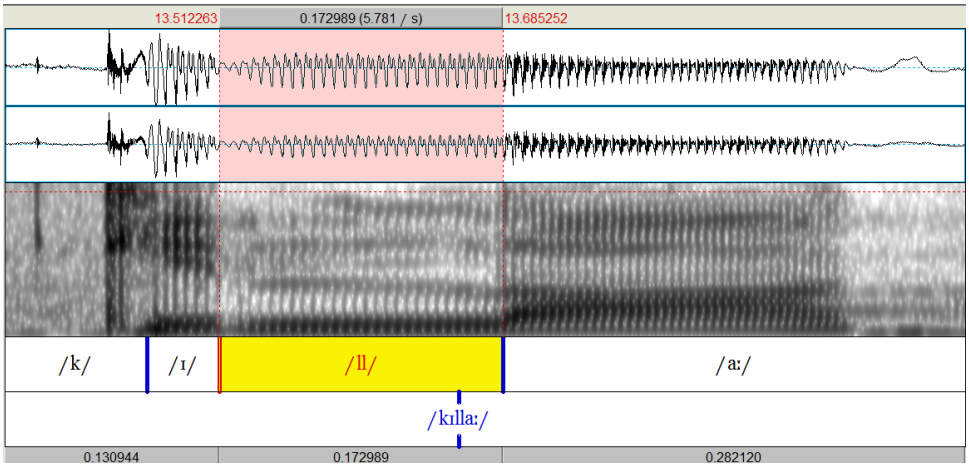


(4.v).Closure duration of singleton-geminate fricative [s]-[ss]

- Liquids – The closure durations for liquids were measured from the offset of the preceding vowel to the onset of the following vocalic formant structure.

Figure 4.5: Spectrograms of Malwi singleton-geminate liquids:



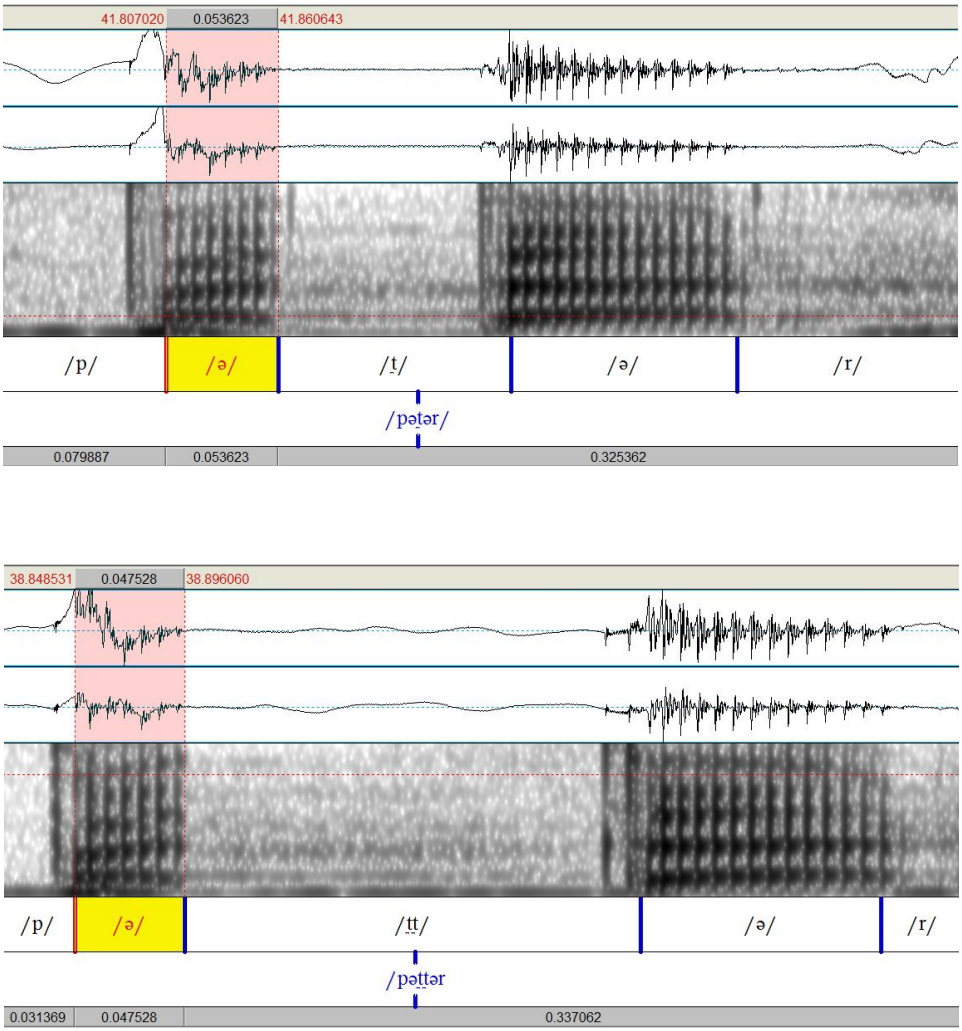


(4.vi).Closure duration of singleton-geminate liquid [l]-[ll]

4.1.1.3.2 Duration of the preceding vowel of test consonant

For all the singleton-geminate pairs, the durations of the preceding vowels were measured from the onset of the vocalic formant structure to the beginning of the closure of test consonant.

Figure 4.6: Spectrograms of vowels preceding Malwi singleton-geminate consonants for illustration:



(4.vii).Duration of vowels preceding the singletongeminate plosives[t̪]-[tt̪]

4.1.2 Results for geminate-singleton consonants

4.1.2.1 Mean Closure Duration – Figure 4.7 shows the mean closure durations of plosives, affricates, nasals, fricatives, and liquids. Mean closure durations of geminates is longer than their single counterparts. The duration difference was statically highly significant for all segments, i.e., for plosives /p/ $p < 0.001$, /b/ $p < 0.001$, /t̪/ $p < 0.001$, /d̪/ $p < 0.001$, /ʈ/ $p < 0.001$, /ɖ/ $p < 0.001$, /k/ $p < 0.001$, /g/ $p < 0.001$, affricates /tʃ/ $p < 0.001$, /dʒ/ $p < 0.001$, nasals /m/ $p < 0.01$, /n/ $p < 0.001$, fricative /s/ $p < 0.001$, and liquids /r/ $p < 0.001$, /l/ $p < 0.001$.

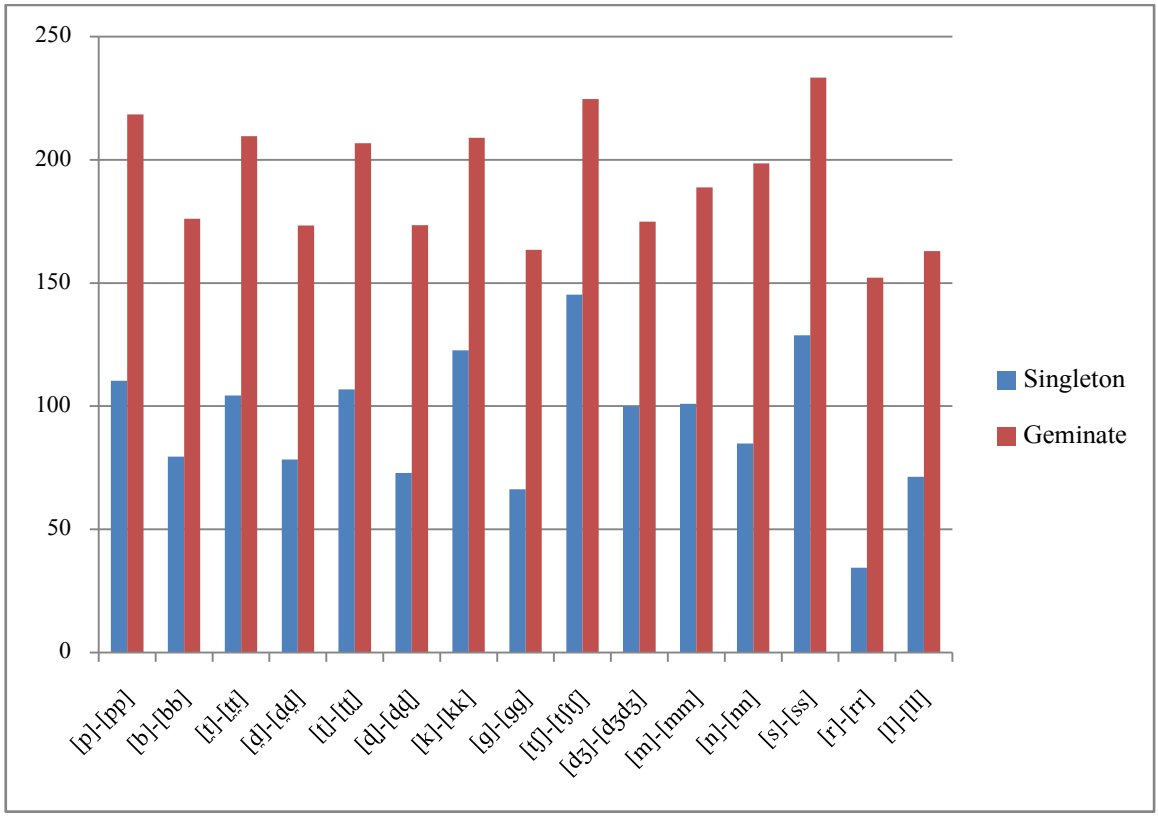


Figure 4.7: Mean Closure Duration for Singleton-Geminate Test Consonants

4.1.2.2 Mean Duration of Preceding Vowel – The mean duration of preceding vowel is significantly short before all geminates than singletons, except for /k/ and /l/ where the vowel duration of vowel preceding [kk] is longer than of [k] and [ll] is longer than [l].

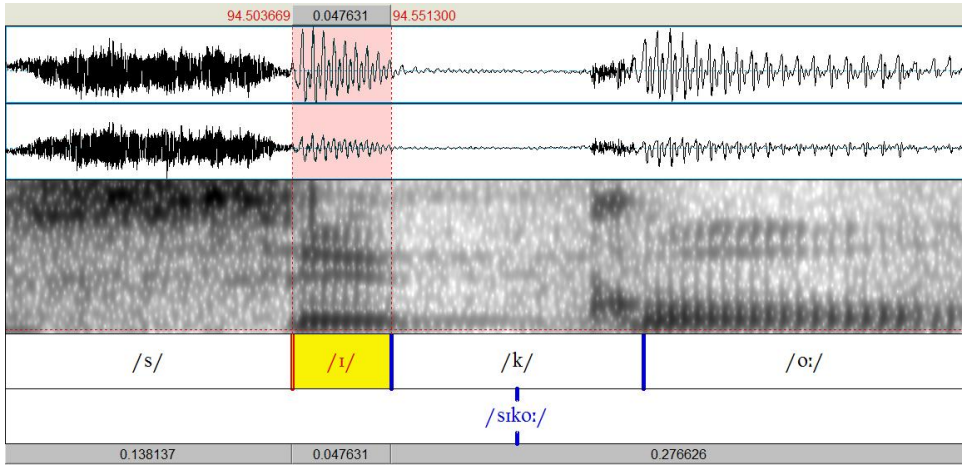
It is noted here that the vowel preceding [k] and [l] is [i], and vowel preceding test consonants in all other segments is [ə].The test words for /k/ and /l/ are as follows:

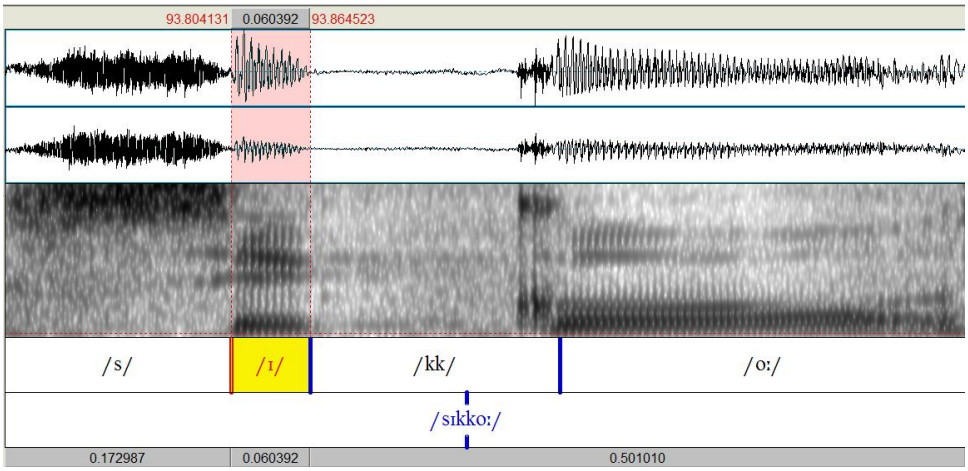
(4.3)

/si.ˋkoː/ ‘roast’	/ˆsik.koː/ ‘coin’
/ʈi.ˋkiː/ ‘rests’	/ˆʈik.kiː/ ‘bindi’
/ʈə.ˋkoː/ ‘10 grams’	/ʈək.ˋkoː/ ‘coin worth 2 paise’
/ki.ˋlaːl/ ‘a man of ‘kilal’ caste’	/ˆkil.laː/ ‘fort’

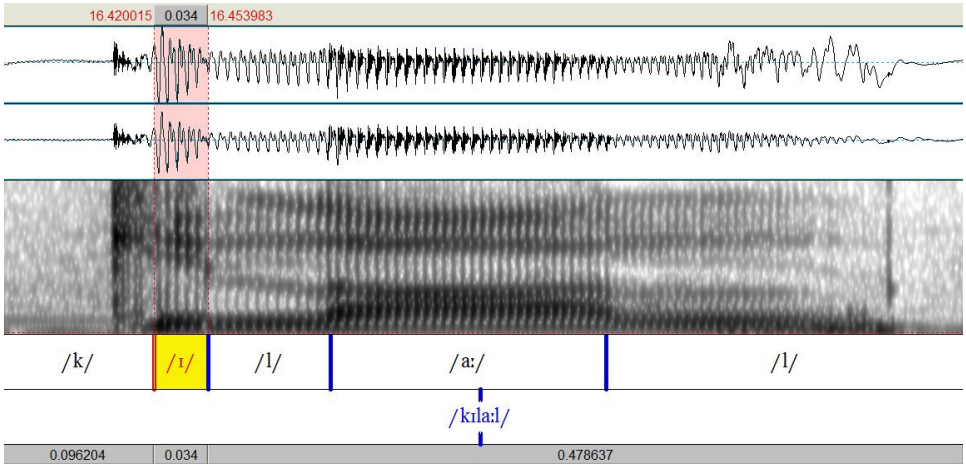
The above-mentioned test words here also illustrate the stressed syllables. We have already dealt with stress pattern in Malwi in chapter 2 of this thesis. Here, when the vowel /i/ precedes the geminate consonants, in these words, the stress falls upon the syllables with nucleus /i/. For example, in /ˆsik.koː/ the stress is on syllable /ˆsik-/, in /ˆʈik.kiː/ the stress is on syllable /ˆʈik-/, in /ˆkil.laː/ the stress is on syllable /ˆkil-/. Therefore, vowel /i/ in these three words, although preceding the geminates [kk] and [ll] is not shortened in duration rather give longer duration than the /i/ preceding singleton [k] and [l], as it is stressed before geminates and is not stressed before singletons. This gives us a rule that “if the vowels before geminates are stressed, they will not be of shorter duration than the vowels preceding their singleton counterparts.”

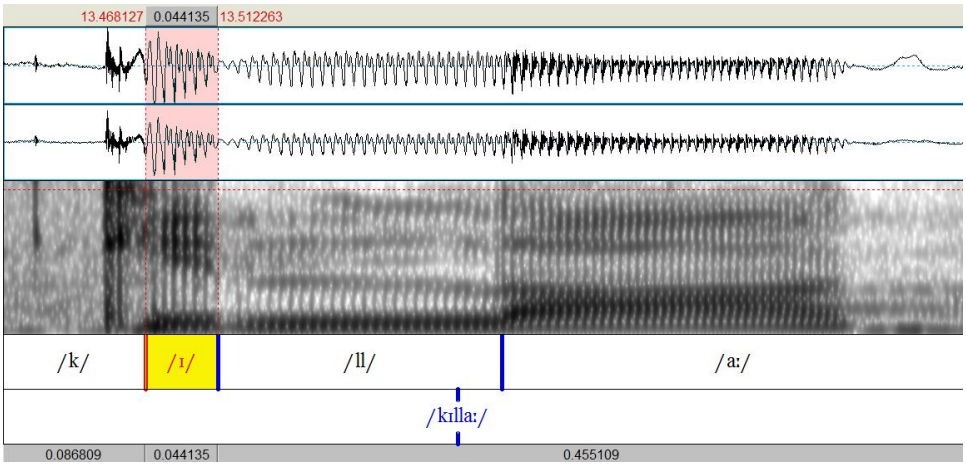
Figure 4.8: Spectrograms of stressed vowels preceding Malwi singleton-geminate consonants for illustration:





(4.viii).Duration of vowels preceding the singleton-geminate plosives [k]-[kk]





(4.ix).Duration of vowels preceding the singleton-geminate liquid [l]-[ll]

However, the mean duration differences shows statistical significance as for vowel preceding [p]-[pp], $p<0.001$; for vowel preceding [b] [bb], $p<0.001$; for vowel preceding [t̪]-[t̪t̪]; for vowel preceding [d̪]-[d̪d̪], $p<0.01$; for vowel preceding [ʈ]-[ʈʈ], $p<0.05$; for vowel preceding [ɖ]-[ɖɖ] $p<0.01$; for vowel preceding [k]-[kk], $p<0.01$; for vowel preceding [g]-[gg] $p<0.001$; for vowel preceding [tʃ]-[tʃtʃ], $p<0.05$; for vowel preceding [dʒ]-[dʒdʒ], $p<0.01$; for vowel preceding [m]-[mm], $p<0.01$; for vowel preceding [n]-[nn], $p<0.01$; for vowel preceding [s]-[ss] $p<0.01$; for vowel preceding [r]-[rr] $p<0.01$; and for vowel preceding [l]-[ll] $p<0.001$. Figure 9 shows the mean difference of vowel durations for all the test segments.

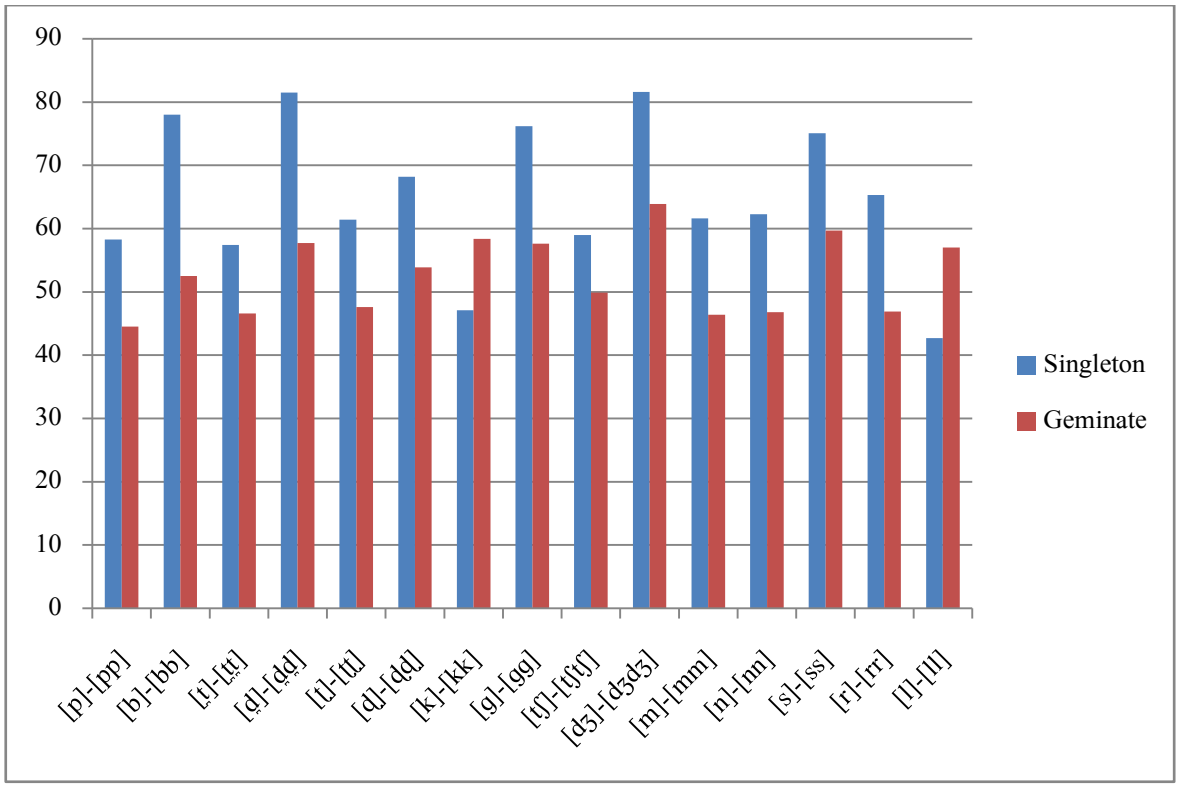


Figure 4.9: Mean Duration Difference for Preceding Vowels

4.1.2.3 Mean Duration Difference of VOT for Plosives– The duration of voice onset time however did not show any significant difference . The negative t -test results for [p]-[pp], p = 0.590; for [b]-[bb], p = 0.422; for [t̪]-[t̪t̪], p = 0.183; for [d̪]-[d̪d̪], p = 0.666; for [ʈ]-[ʈʈ], p = 1.0; for [ɖ]-[ɖɖ], p = 0.422; for [k]-[kk], p = 0.477; for [g]-[gg], p = 1; as well as the graph (figure 10) demonstrate that the VOT is nearly same for singleton-geminate pairs for all the plosives.

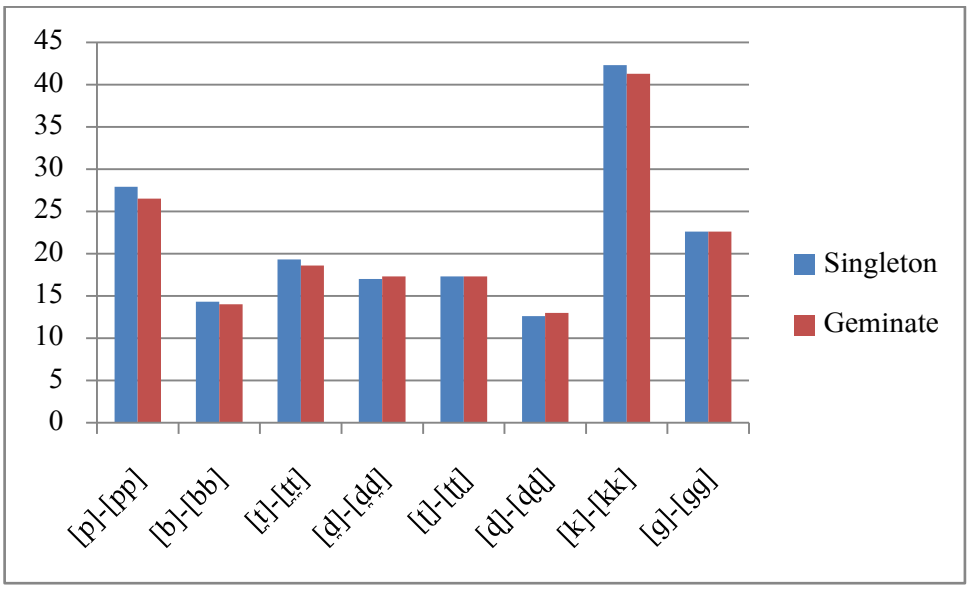


Figure 4.10: Mean Duration Difference of VOT

4.2 Retroflex consonants in Malwi

Retroflexes differ with dentals only for the place of articulation, and that is for the retroflex sound the tongue curls backward and touches the hard palate in the vocal tract whereas, for dentals, the tongue touches the teeth ridge. Apart from this being the only difference, the manner of articulation and the voicing is the same for the retroflex and dental pairs.In Malwi, retroflexes occur either word initially, intervocalic, or preceded by a nasal and followed by a vowel, or preceded by a vowel and followed by a glide. In Malwi, plosives, nasals, and liquids have their retroflexed counterparts; e.g.

(4.4)

/ɖəkaːləna:/ ‘drink’ #_V

/moʈo/ ‘big’ V_V

/t̪aːʈ/ ‘cold’ V_#

/ɖ^{ñ}aːŋɖaː/ ‘animal’ N_V

/pəʈjo/ ‘fall’ V_G

The durational differences of the dental-retroflex consonant pairs of stops [t̪]-[ʈ], [d̪]-[ɖ],[t̪ʰ]-[ʈʰ], [d̪ʱ]-[ɖʱ], nasals [n]-[ɳ]; and liquids [r]-[ɽ], [l]-[ɭ] are discussed in detail in this chapter. Though, this chapter, not only describes retroflexes on the basis of their durational differences with their dental counterparts, but also focuses on the relationship of differences in articulatory measures and acoustic signals with the help of quantal theory.

4.2.1 Methodology for Analysing Retroflex Consonants of Malwi

4.3.1.1 Materials for retroflex-dental consonant analysis

From the data collected of a basic word list of Malwi, 7 dental and 7 retroflex words are selected for recording and analyzing the behavior of retroflexes in Malwi. These minimal pairs of 7 dental and 7 retroflex words, gives us a total of 14 test words for the acoustic analysis of retroflexes in this chapter which. The test words are given in the following table:

Dental			Retroflex		
	Test Word	Gloss		Test Word	Gloss
/t̪/	/ʊaːt̪/	Talk	/ʈ/	/ʊaːʈ/	path
/d̪/	/d̪aːl/	Lentils	/ɖ/	/ɖaːl/	branch
/t̪ʰ/	/aːt̪ʰ/	Hand	/ʈʰ/	/aːʈʰ/	eight
/d̪ʱ/	/d̪ʱək- d̪ʱək/	Nervousness	/ɖʱ/	/ɖʱəknoː/	to cover
/n/	/baːn/	wedding gifts	/ɳ/	/baːɳ/	arrow
/r/	/goːroː/	Fair	/ɽ/	/goːɽoː/	knee
/l/	/maːl/	Goods	/ɭ/	/maːɭ/	forest

Table 4.2: The dental-retroflex test-words and their glosses

4.2.1.2 Recordings for Dental-Retroflex pairs of Malwi consonants

Recordings for dental-retroflex pairs are done in a similar pattern as it was done for singleton-geminate pairs. For acoustically analyzing the dental-retroflex durational differences, the test-data has been recorded from 6 male native speakers of Malwi language. The speakerswere from villages of Ujjain district, and their educational, regional and occupational backgrounds have been taken into consideration. The speech data has been recorded in a soundproof room at Ujjain. Each speaker was told to articulate each test word three times. Out of these three iterations, mostly the middle one is taken into consideration for the acoustic durational analysis. Olympus LS-P1 Hi-Res audio recorder has been used for recording.

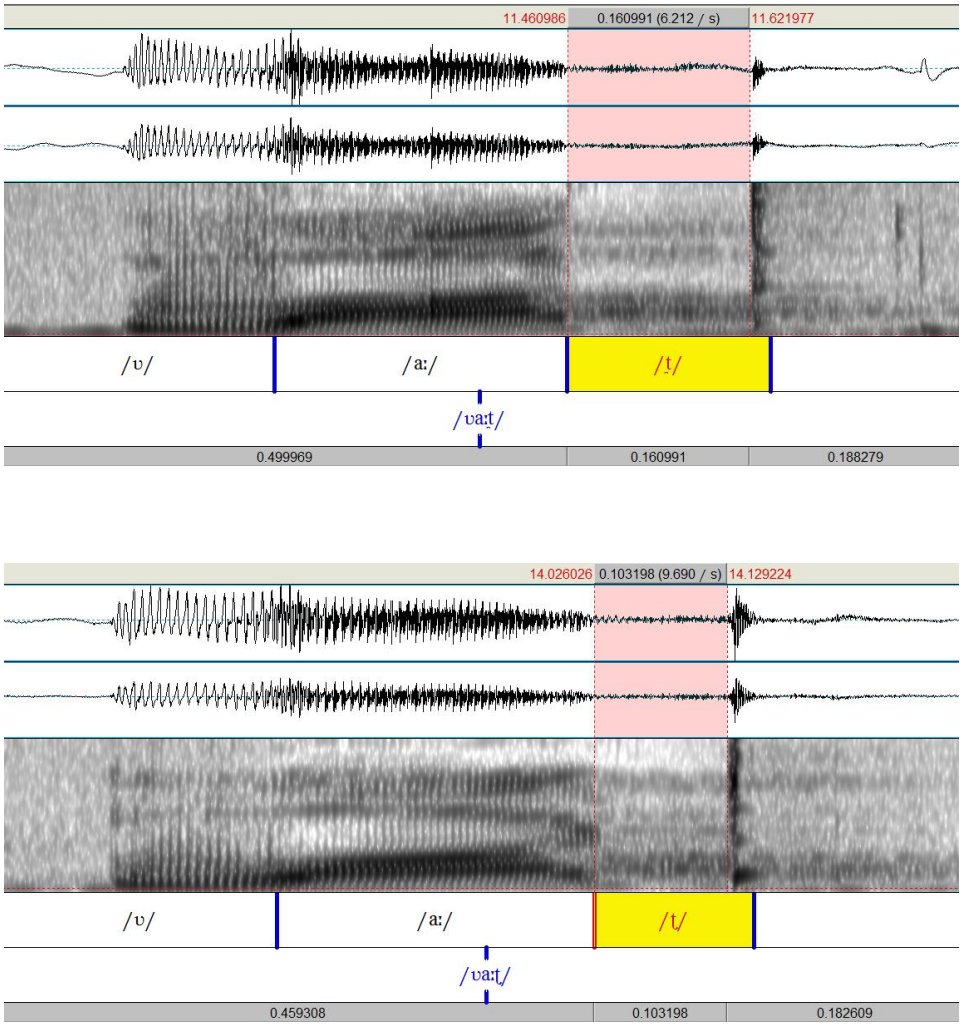
4.2.1.3 Acoustic Measurements Dental-Retroflex pairs of Malwi consonants

The standard software for instrumental analysis of speech sounds, PRAAT (by Paul Boersma, University of Amsterdam)is usedfor the acoustic analysis of the recorded speech samples. The acoustic measurements have been carefully evaluated from spectrographic and waveform displays and transcribed phonetically. Dental-retroflex pairs for plosives [t̪]-[ʈ],[t̪^{h}]-[ʈ^{h}], [d̪]-[ɖ],[d̪^{ɦ}]-[ɖ^{ɦ}], nasals [n]-[ɳ], and liquids [r]-[ɽ], [l]-[ɭ] have been analysed. Spectrographic images have been given for illustration purpose, keeping the time scale same for all the pictures (800 ms).

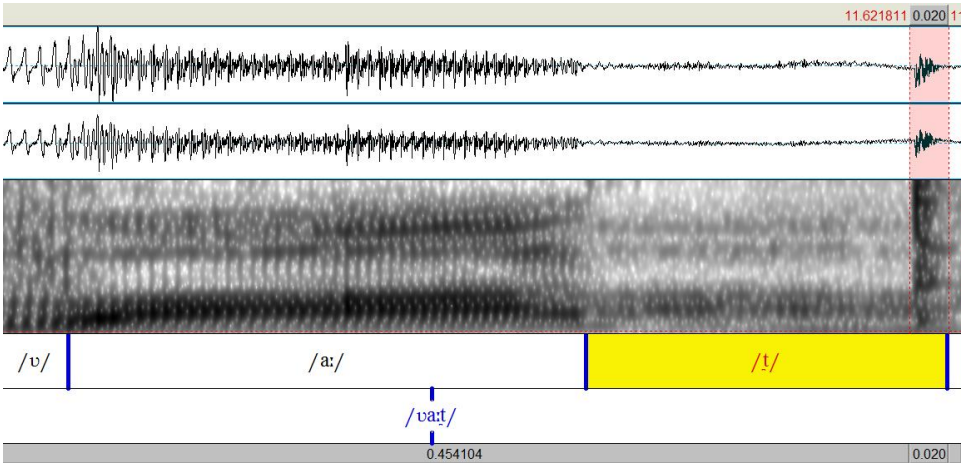
4.2.1.3.1 Duration of the closure of test Dental-Retroflex pairs of Malwi consonants

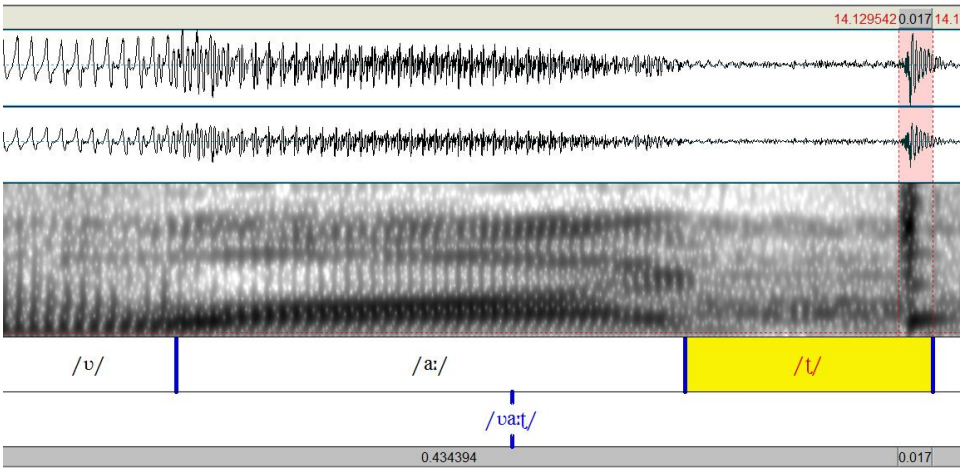
- Plosive – In case of plosives, the closure durations were measured from the offset of the preceding vowel up to the onset of the burst; and the duration of voice onset time was measured separately, i.e., from the onset of the burst to the onset of the following vocalic formant structure.

Figure 4.11: Spectrograms of Malwi dental-retroflex plosives:



(4.x).Closure duration of dental-retroflex plosives

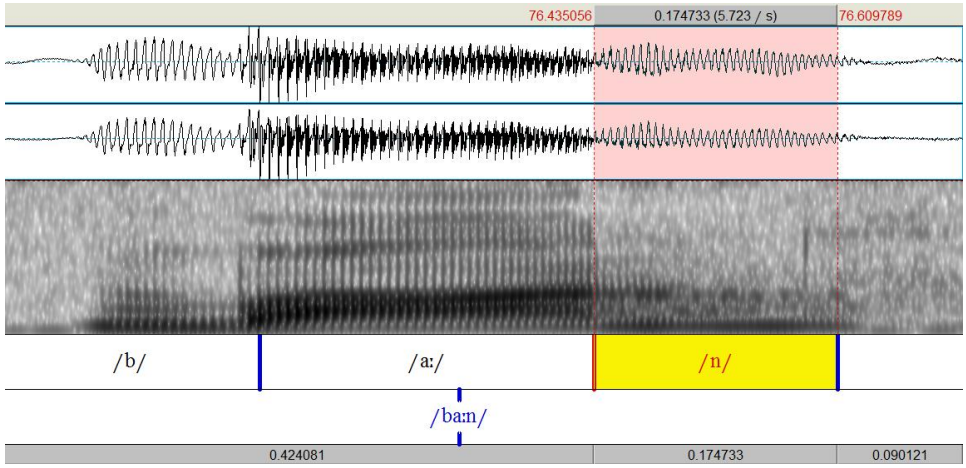


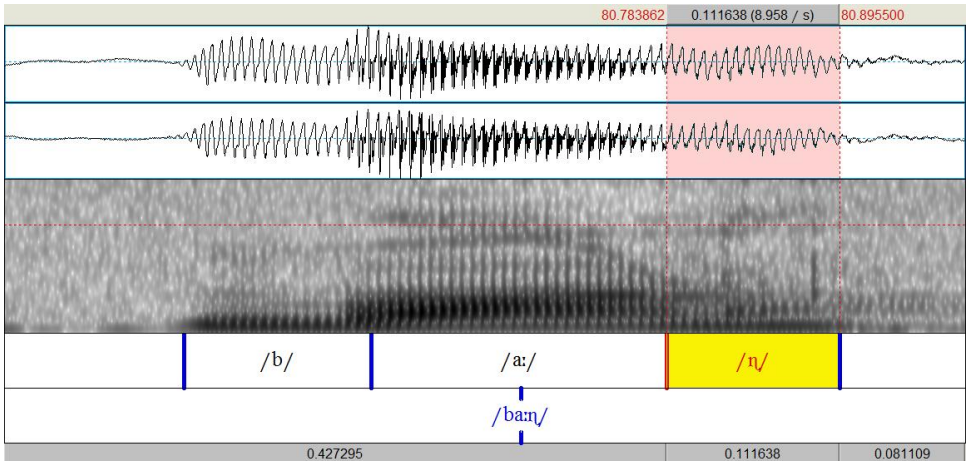


(4.xi).Duration of VOT of dental-retroflex plosives

- Nasals – The closure durations for nasals were measured from the offset of the preceding vowel to the onset of the following vocalic formant structure.

Figure 4.12: Spectrograms of Malwi dental-retroflex nasals:

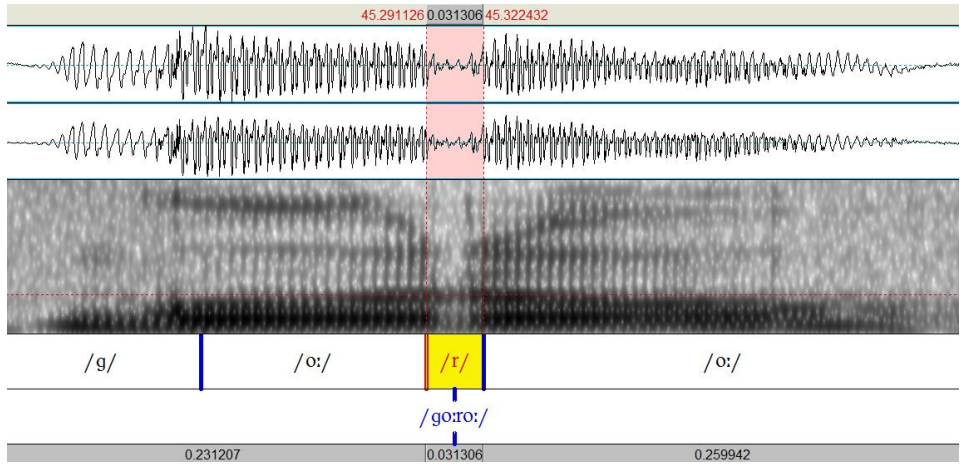


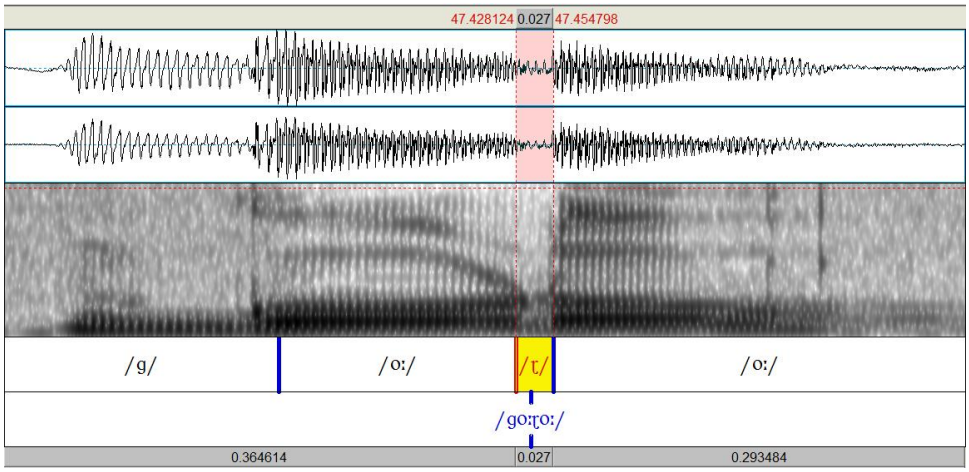


(4.xii).Closure duration of dental-retroflex nasals [n]-[ɳ]

- Liquids – The closure durations for liquids were measured from the offset of the preceding vowel to the onset of the following vocalic formant structure.

Figure 4.13: Spectrograms of Malwi dental-retroflex liquids:



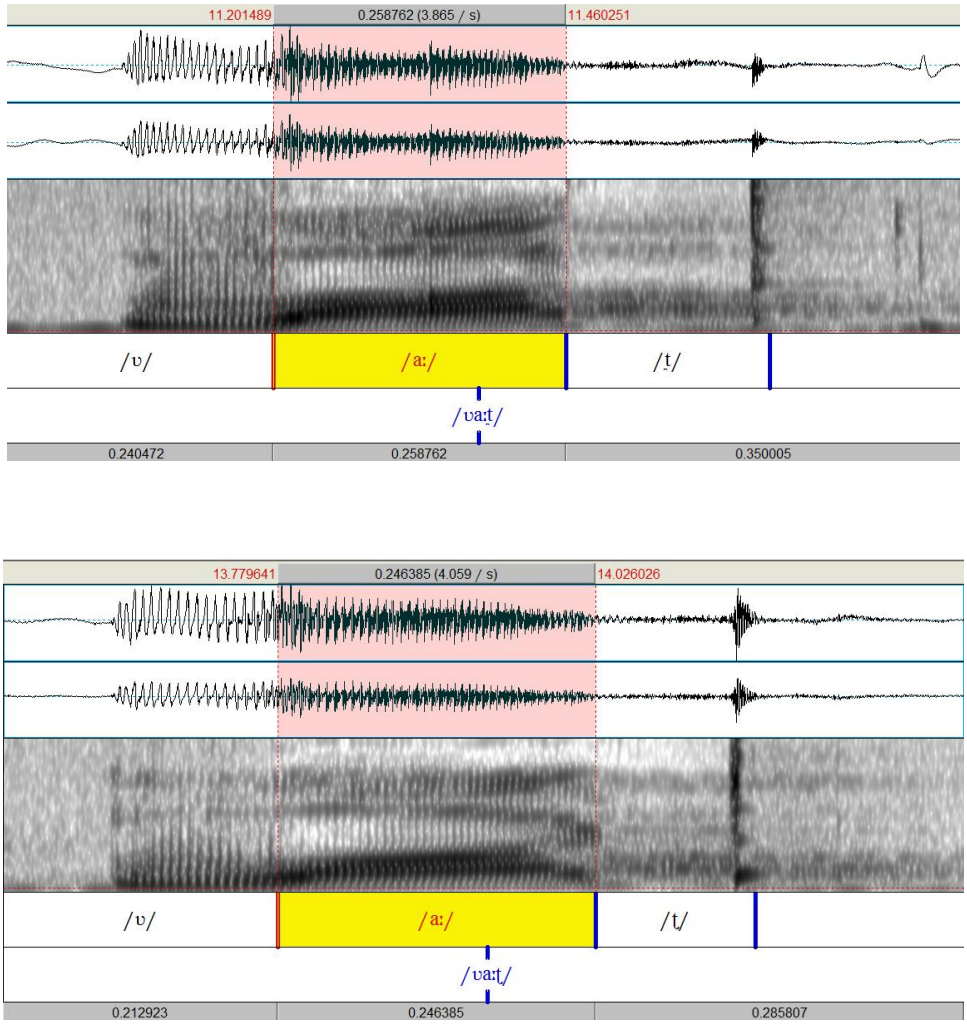


(4.xiii).Closure duration of dental-retroflex liquids [r]-[ɾ]

4.2.1.3.2 Duration of the preceding vowel of test consonant

For all the dental-retroflex pairs, the duration of the preceding vowel was measured from the onset of the vocalic formant structure to the beginning of the closure of test consonant.

Figure 4.14: Spectrograms of vowels preceding Malwi dental-retroflex consonants for illustration:



(4.xiv).Duration of vowel preceding dental-retroflex plosives

4.2.2 Results for Dental-Retroflex pair of Malwi consonants

4.2.2.1 Mean Closure Duration – The mean closure durations of retroflexes are significantly shorter than the mean closure durations of the dentals. Figure 4.15 shows the mean closure durations of dental-retroflex plosives, nasals, and liquids. The duration difference was statically significant for all segments, i.e., for plosives /t̪/-/ʈ/, $p < 0.05$;/t̪^{h}/-/ʈ^h/, $p < 0.05$; nasals /n/-/ɳ/, $p < 0.01$; and liquids /r/-/ɽ/, $p < 0.05$; /l/-/ɭ/, $p < 0.01$. Mean closure durations for pair /d̪/-/ɖ/ and /d̪^{ɦ}/-/ɖ^ɦ/were not possible to measure as they comes at the initial position of words leaving no scope for closure measurements.

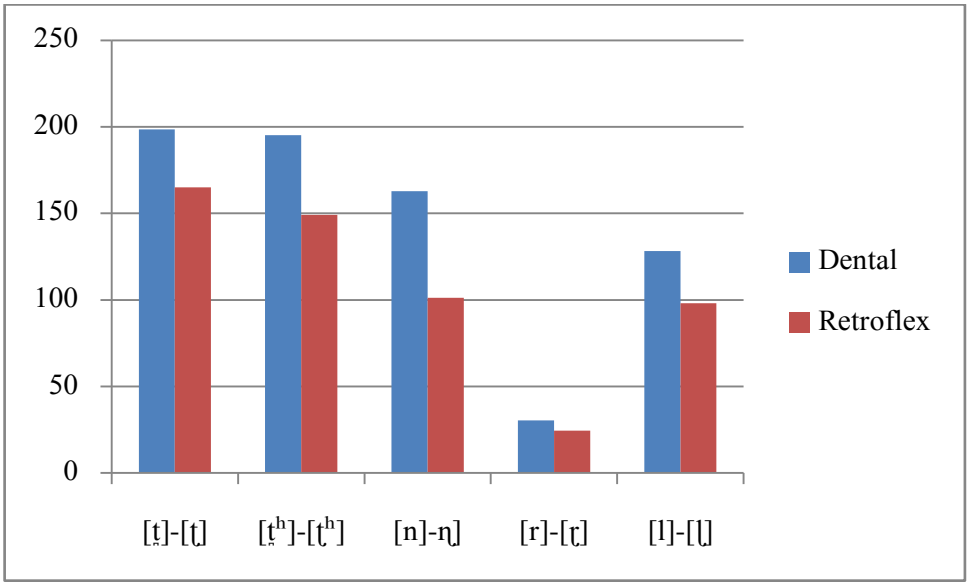


Figure 4.15: Mean Closure Duration for Dental-Retroflex Test Consonants

4.2.2.2 Mean Duration of Preceding Vowel – The mean duration of preceding vowel is significantly short before all retroflexes than dentals. However, the mean duration differences shows statistical significance as for vowel preceding /t̪/-/ʈ/, $p < 0.05$; for vowel preceding/t̪^{h}/-/ʈ^h/, $p < 0.05$; for vowel preceding /n/-/ɳ/, $p < 0.01$; and for vowel preceding /r/-/ɽ/, $p < 0.01$;and for vowel preceding /l/-/ɭ/, $p < 0.05$. It was not possible

to find durations for vowels preceding pairs /d̪/-/ɖ/ and /d̪ʱ/-/ɖʱ as they occur at initial positions of words. Figure 16 shows the mean difference of vowel durations for all the test segments.

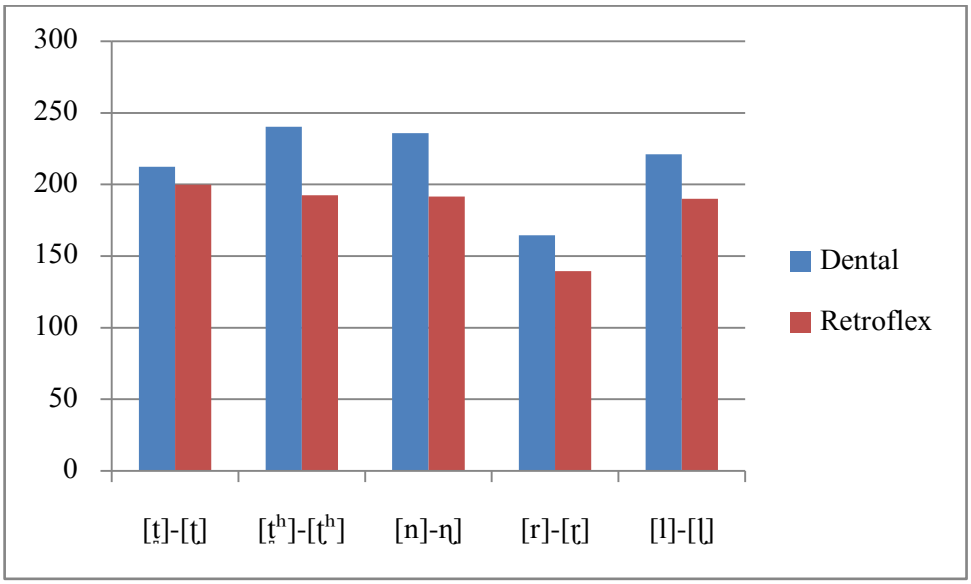


Figure 4.16: Mean Duration Difference for Preceding Vowels

4.2.2.3 Mean Duration Difference of VOT for Plosives –Unlike geminate-singleton plosive pairs where the durations of voice onset time did not show any significant difference, for dental-retroflex plosive pairs, the voice onset time also showed shorter values for retroflex plosives when compared with dental plosives. The mean durational differences of VOT for /t̪/-/ʈ/, $p < 0.001$; for /d̪/-/ɖ/, $p < 0.001$; for/t̪ʰ/-/ʈʰ/, $p < 0.05$; and for /d̪ʱ/-/ɖʱ/, $p < 0.05$. Figure 4.17 demonstrate the mean durational differences of VOT for all the plosives.

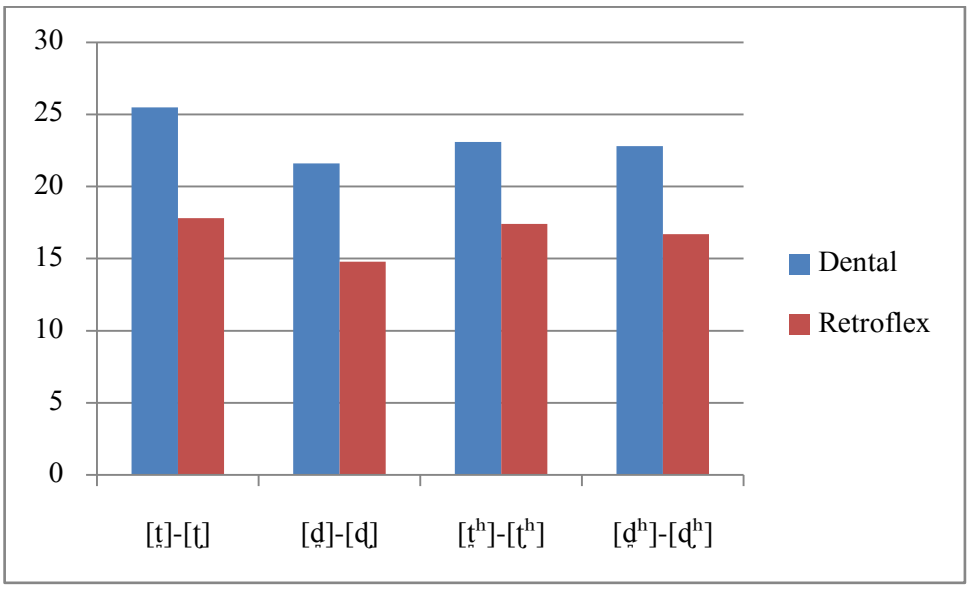


Figure 4.17: Mean Duration Difference of VOT

4.2.3 Retroflexes in Reference to Quantal Theory

The acoustic properties and perceptual characteristics of retroflex stop consonants can be studied in detail using quantal theory. Quantal Theory states that the relatively large changes in articulator position will cause a little change in the acoustic signal, while other, relatively small changes in articulator placement will cause large changes in the acoustic signal. The extent of the acoustic change appears to be related to the particular region of the vocal tract where the articulation is located. In certain critical regions, a slight adjustment of articulatory placement will cause a quantal change in sound. In the case of Malwi, the articulatory dimensions of dentals and retroflexes pairs, have exactly the same manner of articulation, voicing as well as aspiration. What causes the difference in both types of consonants is the minute change in the place of articulation, which is teeth ridge for dentals and hard palate for retroflexes. This little adjustment of the articulatory position causes a phenomenal change in acoustic signals of the speech sounds. From the data and results shown in 4.2.2, it is

clear that the durational differences of closures of dental-retroflex pairs as well as the durational difference of the vowel preceding dental-retroflex pairs are significant as all the segments have P value less than 0.05. Even the voice onset time shows significant durational changes. These durational differences in acoustic signals indicate a huge difference in terms of the articulation of these sounds. But we know that this is not the case. These significant acoustic changes correlate with a very slight adjustment in the articulatory apparatus of humans. Therefore a little change in place of articulation in the vocal tract brings about a quantal (significant) change in the acoustic values of the duration of these particular speech sounds. Thus the articulatory adjustment in the position of dentals and retroflexes is inversely proportional to the duration change in acoustic signals of the same which is accounted perfectly with help of quantal theory.

4.3 Conclusions

Geminate-singleton consonantal phonemes and retroflex-dental consonantal phonemes of Malwi language have been described in this chapter providing the analysis of acoustic features, focusing on the durational changes of the same. The durations of geminates are longer than their counterparts whereas the durations of retroflexes is shorter than their dental counterparts. However, the durations of preceding vowels of geminates are shorter than the vowels preceding their singleton counterparts, whereas the durations of preceding vowels of retroflexes are also shorter than the preceding vowels of their dental counterparts. The durational difference of voice onset time for both cases is interesting to ponder upon as in geminate-singleton plosive pairs, the VOT is almost the same but for retroflex-dental plosive pairs, and the VOT of retroflex stops is shorter than the VOT of dental stops. This may be due to the fact that geminates and singletons are exactly the same consonants in quality and the only

difference is of the quantity or lengthening, whereas in case of retroflex and dental phonemes, though they have a very slight difference in the place of articulation, still they are different in terms of quality. For retroflexes and dentals, the correlation of the articulatory measures and the acoustic measures have also been described properly with reference to quantal theory.

Chapter 5

The Supra-segmental Unit of Sound – Malwi Word Prosody

5.0 Introduction

This chapter deals with the supra-segmental analysis of Malwi phonology at word prosodic level which covers topics like syllable, syllable structure, onset-coda consonant clusters, syllable weight, and stress feet, and schwa deletion. The different areas described in the sections 5.1.1 to 5.1.2 concerns with the study of the syllable in Malwi, that is how the onset, nucleus and coda work at word level and what is the canonical syllable structure in Malwi including the occurrence pattern of onset and coda consonant clusters. The description of the syllable weight and stress pattern of Malwi and how it is different from Hindi is also discussed in this chapter, which follows a description of the phonological phenomenon of 'schwa deletion' in the language. In nut-shell, this part describes the prosodic aspect of Malwi's word phonology.

5.1 Word Prosody of Malwi

5.1.1 Syllable Structure

A syllable (σ) is the smallest unit at word level which explains how many rhythmic units are arranged in a word and how the word is divided into different rhythmic units. The syllable structure is divided into three parts – onset, nucleus, and coda where the onset and coda are consonants and the nucleus is a vowel. Malwi have monosyllabic, disyllabic and trisyllabic words. Canonical syllable structures are the pattern of C and V, where C is the consonant and V is the vowel. Words with single syllables are called

monosyllabic words, words with two syllables are disyllabic words and words with three syllables are called trisyllabic words.

Thus using V for short vowels and V: for long vowels, and C for the prevocalic andthe postvocalic consonant, Malwi monosyllabic word have minimal structures as V: (/uː/ ‘he’) and VC (/un/ ‘him’). But, CV structure as a monosyllabic word is not possible, as monosyllabic words do not end with short vowels in Malwi.Also, the maximal structure which can compose a Malwi monosyllabic word is CCV:C, as for /bjaːʊ/ ‘marriage’.

Some examples are given below:

Monosyllabic Words

(5.1)

/ũː/ ‘he’ V:

/un/ ‘him’ VC

/nĩː/ ‘not’ CV:

/eːk/‘one’ V:C

/d̪ən/ ‘day’, /dʒəd̪/ ‘when’ CVC

/laːʈ/ ‘affection’ CV:C

Disyllabic Words

(5.2)

/ə.gər/ ‘if’ V.CVC

/kə.riː/ ‘did’ CV.CV:

/goːʈoː/ ‘knee’ CV:.CV:

/pi.jaːr/ ‘love’ CV.CV:C

/lim.buː/ ‘lemon’, /bəl̪.d̪iː/ ‘forest’ CVC.CV:

Trisyllabic Words

(5.3)

/tʃi.ɽaːn.d̪oː/ ‘angrily’ CV.CV:C.CV:

/nək.sə.l̪iː/ ‘maoist’ CVC.CV.CV:

Both onset consonant clusters and coda clusters are very rare in Malwi. The occurrence of the pattern of consonant clusters in Malwi suggest that this language follows the sonority sequencing principle (SSP), that is, the nucleus is the peak of sonority in the syllable, and from onset to nucleus the sonority increases and from the nucleus to coda, the sonority decreases:

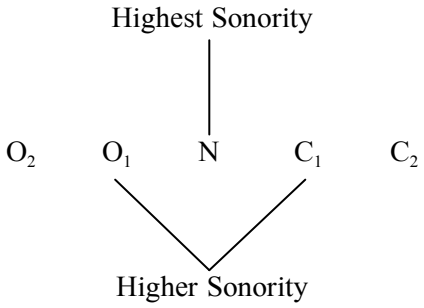


Figure 5.1: Sonority Sequencing Principle

“This order adheres to a UNIVERSAL ONSET CONDITION stating that the onset consonant closest to the nucleus must have a greater sonority that the more distant consonant; i.e., onset-1 must have a higher sonority value than onset-2. There is also a UNIVERSAL CODA CONDITION which applies to the coda cluster; namely, the

coda-1 (the consonant immediately following the nucleus) must have a higher sonority value than coda-2 (the consonant following coda-1)" (Shukla Shaligram 1990).

From the examples given below, we can see that the consonant clusters behave in such a way that more sonorous consonant is near the nucleus. For example the onset consonant clusters are /kj-/, /bj-/, /ʊj-/ where /j/ being an approximant is much more sonorous than the least sonorous stops /k/ and /b/.

(5.4)

/kjãː/ 'where' CCV:

/bjaːʊ/ 'marriage' CCV:C

/kjõː.kiː/ 'because' CCV:.CV:

/ʊjaːg.ʃaːɭiː/ CCV:C.CV:.CV:

Similarly, the codaconsonant clusters are /-ndʒ/, /-ŋg/ where the nasals /n/ and /ŋ/ are much more sonorous than stop /g/ and affricate /dʒ/, as shown in the following examples:

(5.5)

/gəndʒ/ 'other' CVCC

/ləŋg.ɽoː/ 'limp' CVCC.CV:

/hiŋg.ɽaː/ 'horn' CVCC.CV:

/uɻ.pə.ʈəŋg/ 'rough' VC.CV.CVCC

Therefore it is clear from the above examples (5.4) and (5.5) that consonant clusters in Malwi have a structure where the less sonorous consonant will be the one away from the nucleus and more sonorous consonant will be near to the nucleus.

(5.a)

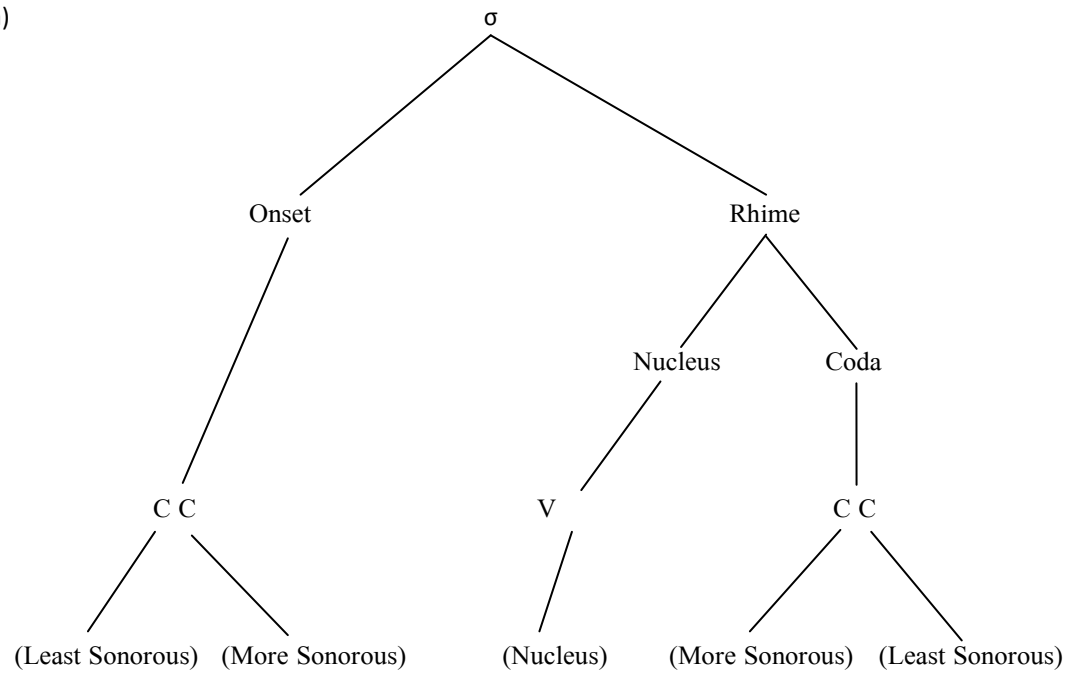


Figure 5.2: The sonority sequence pattern in Malwi

5.1.2 Syllable Weight and Stress Feet

Syllable weight pattern in Malwi resembles with that of Hindi (Pandey 1989), which exhibits contrastive weight. Contrastive weight is measured in terms of 'moras'. Within the syllable, the short vowels (/ə/, /u/, /i/) carry one mora each,and the long vowels (/aː/, /eː/, /iː/, /uː/, /oː/) carry two moras per vowels.Though the onset consonants carry zero mora, the postvocalic consonants carry one mora per vowel.There can be a maximum of three moras per syllable in Malwi.Therefore, a

syllable with one mora is light (L), with two moras is heavy (H) and with three moras is superheavy (SH). We can understand this from the following examples:

(5.6)

Word – Mora – Strength

/pə.riː/ ‘fairy’ – 1.2 – L.H

/niː.loː/ ‘blue’ – 2.2 – H.H

/keːṭ.roː/ ‘how much’ – 3.2 – S.H

/meːḷ.noː/ ‘serve’ – 3.2 – S.H

For Hindi Mehrotra (1965) stated stress patterns in two ways, for bisyllabic words, if the word has a super heavy syllable, then it is stressed, else the leftmost syllable is stressed; whereas for trisyllabic words, the stress falls on the super heavy syllable, and if in case all syllables are light then stress falls on rightmost syllable else the penultimate syllable is stressed. Pandey (1989) agreed with Mehrotra’s stress placement rules but added a new rule of foot formation later (Pandey 2014). For bisyllabic words, if it has a super heavy syllable that is stressed, else the left syllable is stressed; however for trisyllabic words, if the word has a super heavy syllable, that syllable is stressed. In case, if a trisyllabic word has two adjacent heavy syllables, then the right syllable is stressed and if it has two adjacent light syllables then the left syllable is stressed; moreover, if the rightmost syllable is heavy, it is never stressed as it is extrametrical.

The Malwi stress pattern is in such a way that the stress falls oneither on the strongest syllable or the heaviest available foot as shown in the following words:

(5.7)

/ˈnaː.gəɳ/ ‘snake’(ˈSH)

/ˈʋaːn.ɖə.roː/ ‘monkey’(ˈSLH)

However, if there are two syllables of the same weight, then there is a tie amongst both to be the stressed syllable. Unlike Hindi, when there are two syllables of the same strength, the stress falls on the rightmost non-final candidate (Dixit 1963, Kelker 1968, McGregor 1977, Pandey 1989); the Malwi pattern is slightly different. In Malwi, when the weight of two or more syllables is the same, the stress falls on the syllable which has the most ‘high’ vowel as the nucleus. The priority of vowels on which the stress should fall, depends on the feature ‘high’ of vowels. The order of vowels according to feature ‘high’ is as follows:

/iː/ > /uː/ > /oː/ >/eː/ >/aː/

We can take the example of the word /haː.ˈɖiː/ ‘landlord’. Here both the first syllable /haː/ and the second syllable /ɖiː/ are of same syllable weight, i.e., heavy(H). But the stress does not fall on the penultimate syllable, but on the second syllable as its nucleus vowel is /iː/ which is a high vowel and the nucleus vowel of the first syllable is /aː/ which is a low vowel.

Therefore, the stress pattern of Malwi depends on two criteria;

1. The weight of the syllable
2. The highness of the vowel quality or the feature high of the vowel

Among the above mentioned criteria, measuring the weight of the syllable is the first step. If there are no two syllables of the same weight, then we don't need to look for the second criteria of the 'high vowel'. In case, if two syllables are of the same weight and have the same vowel as their nucleus, then the stress will fall on the penultimate syllable, as in the word /ˈgoː.loː/ 'circle'.

The following exampleswill further exhibit stress (ˋ) at word level in Malwi:

(5.8)

/hʊ.ˋkʰoː/ 'dry' LˋH

/ˈpeː.laː/ 'first' ˋHH

/baː.ˋloːʈ/ 'bean' HˋS

/kə.rəm.ˋɖaː/ 'gooseberry' LHˋH

/raː.kʰoː.ˋʈiː/ 'ash' HHˋH

/dʒə.ˋmiːn.ɖaːr/ 'land-lord' LˋSS

5.1.3 Schwa Deletion

At the word level, schwa deletion is a phonological process, in which there is deletion of the schwa phoneme in a particular syllable of some words, where ideally it should have been pronounced. Unlike Hindi, where schwa is deleted optional, that is, schwa can be deleted or cannot be, purely depending on the choice of the speaker; in Malwi, it is not optional and it has become a regular practice by all the native speakers of Malwi language. If we ask Malwi speakers to pronounce just the word where schwa should be present, they pronounce it fully without any deletion. But when they use the word in sentences and normal speech, the schwa is always deleted. There are two motivating factors for schwa deletion:

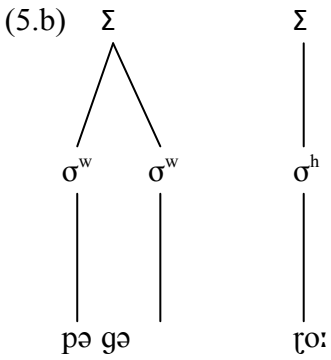
i. fast speech, and

ii. ease of pronunciation.

Because of the deletion of schwa, the number of syllables reduces by one and leads to faster communication. This leads to minimization of syllables, which reduces overall effort and duration, and might cause stress shift from one syllable to another.

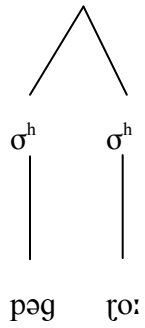
Now the question arises, when and which schwas have to be deleted. There are many different positions where schwa appears in words, and not any schwa or all schwas can be deleted. Rather, only schwas of the weak syllable in the rightmost node of a foot can be deleted. For example:

(5.b)



In (5.b), the word /pəgəɽoː/, ‘leg’ the right-most syllable of the first foot is /gə/, which is a weak syllable, therefore the schwa gets deleted giving way for resyllabification, i.e., the single consonant which is left after the deletion of schwa acquires the coda position of the preceding syllable. The resyllabified structure is thus shown below in (5.c):

(5.c) Σ



Some more examples to further illustrate ə-deletion are as follows:

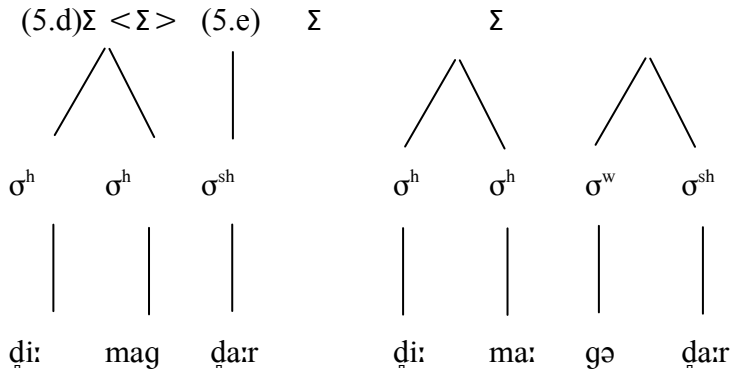
Underlying Phonetic Form	Schwa Deletion	Re-syllabified Form	Gloss
/ʈeːkəroː/	/ʈekroː/	[ʈek][roː]	Mountain
/rəməna:/	/rəmna:/	[rəm][na:]	Play
/a:ɖ̪əmiː/	/aɖ̪miː/	[aɖ̪][miː]	Person
/dʒiːʋəɳoː/	/dʒiʋɳoː/	[dʒiʋ][ɳoː]	Live
/ʈ̪oːkənoː/	/ʈ̪oknoː/	[ʈ̪ok][noː]	Carry

Table 5.1: Examples of Schwa Deletion in Malwi

5.1.4 Shorting of vowel duration due to schwa deletion

Schwa deletion also leads to the shortening of the long vowels in the preceding syllable or the re-syllabified structure, which is sure to path the way for faster and easier speech. For instance, if we take the word /ɖ̪iː.mag.ɖ̪aːr/ 'intelligent' which has three syllables, vowel /a/ in the penultimate syllable is short but vowels in first and last syllables, i.e., /iː/ and /aː/ are long. 'ə-deletion' in Malwi leads to the shortness of duration of vowels in preceding syllable. Deletion of vowel /ə/ changes the syllabic structure of a word and makes way for re-syllabification. Here in Malwi, the re-

syllabified syllable or the new syllable structure formed after /ə/ is deleted, loses its vowel length, and converts into a short vowel. Again we can take the same word /d̪iː.mag.d̪aːr/ for illustration:



The initial syllabification for the word /d̪iː.mag.d̪aːr/ was /d̪iː.maː.gə.d̪aːr/, which had four syllables out which three syllables were heavy in terms of weight. When the schwa of the third weak syllable /gə/ was deleted, re-syllabification occurred merging the second and third syllables as one, '/mag/'. Here, the long /aː/ of the second syllable prior to re-syllabification was also changed into short /a/ after re-syllabification. To make it clear, few more examples are given below:

Root	Before ə deletion	After ə deletion
/meːl/ 'serve'	/meː.lə.noː/ 'to serve'	/mel.noː/ 'to serve'
/bʱeːdʒ/ 'send'	/bʱeː.dʒə.noː/ 'to send'	/bʱedʒ.noː/ 'to send'
/roːk/ 'stop'	/roː.kə.noː/ 'to stop'	/rok.noː/ 'to stop'
/baːg/ 'run'	/baː.gə.noː/ 'elopement'	/bag.noː/ 'elopement'
/paṭ̪ɭoː/ 'thin'	/paː.ṭ̪ə.ɭoː/ 'thin'	/pəṭ̪.ɭoː/ 'thin'
/keṭ̪roː/ 'how much'	/keː.ṭ̪ə.roː/ 'how much'	/keṭ̪.roː/ 'how much'

Table 5.2: Examples of Long-Short Vowels before and after ə-Deletion

Therefore, the environment which accounts for the change of long vowels into short is that particular syllable which is the result of re-syllabification after ə-deletion. So it could be concluded that in Malwi, the long vowels tend to be short when they go through re-syllabification due to schwa deletion. Or the deletion of /ə/, affects the length of the vowel in the preceding syllable, probably to contribute the ease of pronunciation of the word with re-syllabified syllable.

5.2 Conclusion

The suprasegmental aspect of word phonology of Mawli is discussed in this chapter. For the analysis of prosody of Malwi, the chapter tried to analyze syllable structure, syllable weight, and stress feet, as well as some phonological process like schwa deletion, provided that everything is restricted to the domain of the word.

Chapter 6

Conclusion

6.0 Conclusions

This thesis analyses the phenomenon of phonetics and phonology of Malwi language. It explores the peculiarities of word phonology of Malwi with the help of autosegmental framework, quantal theory of phonetics, and acoustic phonetics. Occurrences of phonetic and phonological features in Malwi appear to carry features similar to Indo-Aryan languages such as Hindi, Bangla, Oriya, Marathi, and many others. Along with such similarities, there are differences between Malwi and other Indo-Aryan languages as well which makes this study relevant.

Linguistically, Malwi is an unexplored language from the analytical and theoretical point of view. This is an initial attempt to analyze the aspects of phonetics and phonology of Malwi.This study mainly focuses on the word phonological features of Malwi language. It includes the analysis of Malwi consonants, phonemes, allophones, constraints, aspirates, diaspirates, geminates, retroflexes along with the prosodic phenomena of syllable weight and stress. It examines these notions on a theoretical, acoustic and experimental level.This is a very first attempt to examine Malwi's sound system both segmental and prosodic.

The acoustic phonetic investigation technique has been used in this research. Malwi phonology has some peculiar features like sonorant aspirates and diaspirate roots. The present research addresses these features and tried to provide solutions to all research

questions which were initially hypothesized. Along with it, this research work tries to draw a clear picture of Malwi phonology with the help of collected data and gives the possible explanations.

The Malwi data has been collected from the fieldwork with the help of a questionnaire (Abbi 2001). The data collected from Ujjain district, mainly from Ujjain, Talod, Chintaman Jawasiya, Bamauri, Bisakhedi, etc. from a total number of 30 informants. A soundproof room at Ujjainhad been used for recording purpose. PRAAT software has been used for data analysis. The spectrogram images are taken from the PRAAT analysis. The collected data has been transcribed in IPA for the analysis purpose. After collection of Malwi data, the data was analyzed and categorized with separate word lists for every phoneme.In the present research work, the analysis of data goes along with the fieldworks. This procedure mainly helps to detect all the features of the language in the field of phonetics and phonology.

While examining the phonological details of an unexplored language, it becomes imperative to discuss the language first. The first chapter of this thesis gives a brief account of Malwi, the language, and Malwa, the region, review of the literature and the outline of the thesis.

Chapter two discusses the basic word phonology of Malwi language. It illustrates the phonetic and phonological aspects of Malwi word. The segmental aspect of word phonology of Malwi is the main focus of this chapter. The vowel phonemes, consonant phonemes, allophonic processes, constraints, and the phonotactics of Malwi have been analyzed in detail in this chapter. There are 8 oral vowels, 5 nasal vowels, and 32

consonant phonemes where 16 are plosives, 4 are affricates, 3 are nasals, 4 are liquids, 3 are fricatives, and 2 are approximants.

Chapter three of this thesis deals with 'sonorant aspirates' and 'diaspirate roots' in Malwi. It considers sonorant aspirates to be single phonemes. While other Indo-Aryan languages like Hindi, Marathi, and Bengali, which portraits sonorant + /ɦ/ as consonant clusters.It also tries to give the explanations of the assumption for sonorant aspirates to be single phonemes. That is given on account of the acoustic study of these segments where comparisons with singleton and geminate consonants have been made to calculate durational differences.In Malwi, the Sonorant aspirates /$m^{ɦ}$/, /$n^{ɦ}$/, /$r^{ɦ}$/ and /$l^{ɦ}$/ have been analyzed acoustically.After analyzing the durational cues it can be stated that sonorant aspirates are single phonemes in Malwi, not clusters of [C + ɦ]. The significant test is positive for durational difference for pairs of sonorant aspirates and geminate consonants. On the other side, it is negative for the pairs of sonorant aspirates and sonorant unaspirates. It proves that the duration between sonorant aspirates and unaspirates is insignificant. Thus, sonorant aspirates must be treated as single phonemes in Malwi.

The diaspirate roots isa peculiar phenomenon of Proto-Indo-European and modern Indo-Aryan languages. It has been also discussed in this chapter. For this, the framework of autosegmental phonology is used to get the concept of diaspirate roots of Malwi and spectrographic images from PRAAT have also been used for better analysis and understanding.

The geminates and the retroflexes have been analyzed in chapter four. To differentiate them from their ‘singleton’ and ‘dental’ counterparts, acoustic cues for both geminates and retroflexes have been analyzed ofMalwi data. The methodology used for geminates is to compare the closure durations of singletonconsonants and geminate consonants, with the durations of the precedingvowels.In the case of retroflex consonants, the analysis is directly duration based only. On the other hand, the closure durations of retroflex and dental is compared with the comparison between the durations of the preceding vowels of both.The outcome shows significant durational differences for both geminate-singleton consonant pairs and retroflex-dental consonant pairs.The durational difference is quite little for the values of retroflex and dental consonants. The VOT is almost the same but for retroflex-dental plosive pairs, and the VOT of retroflex stops is shorter than the VOT of dental stops. It indicates that geminates and singletons are the same consonants in quality and the only difference is of the lengthening/quantity. In the case of retroflex and dental phonemes, though they have a very slight difference in the place of articulation, still they are different in terms of quality, and this has been explained with the reference to the quantal theory of phonetics.

Chapter five is dedicated to the suprasegmental aspects of word phonology of Malwi.Under which it describes the syllable, syllable structure, onset-coda consonant clusters, syllable weight, and stress feet, and schwa deletion phenomenon with respect to the Malwi data.

In chapter six, the outcome and the summary of all the chapters have been given in a concise way. This study must be useful for further phonological and typological

studies of the other languages of the surrounding areas. The outcomes, observations and related details of the research work can be used for a variety of linguistics fields, mainly in applied fields like second language teaching and computational linguistics.Besides this, it also sketches the blueprint of future directions.

Analyzing the aspects of phonetics and phonology of Malwiis an empirically and theoretically grounded research work which can help in understanding Malwi in a proper way as it is the first attempt for the case of Malwi which is poorly studied language. It is astatus uplifting work for Malwi in the field of linguistics.

6.1 Future Directions

This study must be useful to further phonological and typological studies of the other languages of the surrounding areas.The outcomes, observations and related details of the research work can be used for a variety of linguistics fields, mainly in applied fieldslike second language teaching and computational linguistics. This research work on ‘Aspects of Phonetics and Phonology of Malwi’ can be further extended in many ways.

Contrastive analysis can be done with the other Indo-Aryan languages.The outcome of the research work can be applicable to several modules of Machine Translation system while focusing on localization.The understanding of the sound system of any language gives an edge to ‘speech to text’ or ‘speech to speech’ machine translation system. The speech data and its PRAAT analysis can be used for speech synthesis, text-to-speech analysis, forensic linguistic and other purposes as well.In the future, the research work can be extended to the sentence level of the phonology of Malwi language. In which

the works that can be attempted to explain the aspects of phonetics and phonology at the level of the sentence.

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Appendix 1

List of Informants

1. Name: Vishal Singh

   Age: 21

   Sex: Male

   Educational qualification: 12th

   Location: Bamori

   Languages known: Malwi, Hindi

2. Name: Virendra Singh

   Age: 31

   Sex: Male

   Educational qualification: 7th

   Location: Bamori

   Languages known: Malwi, Hindi

3. Name: Sumer Singh Solanki

   Age: 41

   Sex: Male

   Educational qualification: B.A.

   Location: Village Jambura

   Languages known: Hindi , Malwi

4. Name: Prachi Solanki

   Age: 18

   Sex: Female

   Educational qualification: 11th

   Location: Indira Nagar, Ujjain

   Languages known: Hindi,Malwi

5. Name: Roop Kunwar

   Age: 35

   Sex: Female

   Educational qualification: 10th

   Location:Indira Nagar, Ujjain

   Languages known: Hindi , Malwi

6. Name: Virendra Singh Solanki

   Age: 35

   Sex: Male

   Educational qualification: 12th

   Location: Village Jambura

   Languages known: Hindi , Malwi

7. Name: Krishnapal Singh Solanki

   Age: 30

   Sex: Male

   Educational qualification: 12th

Location: Village Jambura

Languages known: Hindi Malwi

8. Name: Arjun Singh Panchal

   Age: 42

   Sex: Male

   Educational qualification: M.Com.

   Location: Chintaman-Jawasiya

   Languages known: Hindi, Malwi ,English

9. Name: Jaya Panchal

   Age: 14

   Sex: Female

   Educational qualification: 10th

   Location: Chintaman-Jawasiya

   Languages known: Hindi , Malwi

10. Name: Ashish Panchal

    Age: 17

    Sex: Male

    Educational qualification: 12th

    Location: Chintaman-Jawasiya

    Languages known: Hindi , Malwi

Appendix 2

Person in Malwi

	Subject Pronoun	Object Pronoun	Possessive Adjective	Possessive Pronoun	Reflexive Pronoun
1st Person, Singular	/mu/ 'I'	/mʱaːreː/ 'me'	/mʱaːroː/ 'my'	/mʱaːroː/ 'mine'	/kʰuːɖ̤/ 'myself'
2nd Person, Singular	/ʈ̤u/ -hon, /təm/ /aːp/ + hon 'you'	/ʈ̤əmʱaːre/ /aːpke/ + hon 'you'	/ʈ̤əmʱaːroː/ /aːpəroː/ + hon 'your'	/ʈ̤əmʱaːroː/ /aːpəroː/ + hon 'yours'	/kʰuːɖ̤/ 'yourself'
3rd Person, Singular, M	/uː/, /ʊɪ/ 'he'	/ukeː/ 'him'	/ʊiː-/ 'his'	/uk-/ 'his'	/kʰuːɖ̤/ 'himself'
3rd Person, Singular, F	/uː/, /ʊɪ/ 'she'	/ukeː/ 'her'	/ʊiː-/ 'her'	/uk-/ 'hers'	/kʰuːɖ̤/ 'herself'
1st Person, Plural	/əpən/ 'we'	/əpəneː/ 'us'	/əpənoː/ 'our'	/əpənoː/ 'ours'	/kʰuːɖ̤/ 'yourself'
2nd Person, Plural	/təm/ /aːp/ + hon 'you'	/ʈ̤əmʱaːreː/ /aːpkeː/ + hon 'you'	/ʈ̤əmʱaːroː/ /aːpəroː/ + hon 'your'	/ʈ̤əmʱaːroː/ /aːpəro/ + hon 'yours'	/kʰuːɖ̤/ 'yourself'
3rd Person, Plural	/ʊiː/ 'they'	/unke/ 'them'	/unkaː/ 'their'	/unkaː/ 'theirs'	/kʰuːɖ̤/ 'themselves'

Number in Malwi

Numbers in Malwi are categorised into singular and plural. Number in Malwi agrees with the gender of the noun. The singular morpheme in Malwi is /o/ if the natural gender of the noun is masculine and /iː/ if the natural gender of the noun is feminine. Whereas the plural morpheme is /aː/ if the natural gender of the noun is masculine and /iːon/ if the natural gender of the noun is feminine, for example:

	Singular	Plural
Boy (M)	/tʃʰoːr-oː/	/tʃʰoːr-aː/
Girl (F)	/tʃʰoːr-iː/	/tʃʰoːr-iːoːn/
Donkey (M)	/gəɖ̪ɾ-oː/	/gəɖ̪ɾ-aː/
Book (F)	/poːt̪ʰ-iː/	poːt̪ʰ-iːon/

Gender in Malwi

Malwi has masculine and feminine gender. The masculine morpheme is /oː/, whereas the feminine morpheme is /iː/.

	Masculine	Feminine
Boy	/tʃʰoːr-oː/	/tʃʰoːr-iː/
Shoe	/dʒuːt̪-oː/	/dʒuːt̪-iː/
Cooking Pot	/bʱaːɳɖ̪-oː/	/bʱaːɳɖ̪-iː/
Black	/kaːl-oː/	/kaːl-iː/

Case in Malwi

From the data collected, the following cases are found in Malwi:

Case	Case Marker
Nominative	/-ɸ/
Ergative	/-neː/
Accusative/Dative	/-neː/
Ablative	/-t̪iː/
Genitive	/-noː ~-niː ~-naː/
Locative	/-maː ~-pə/
Instrumental	/-t̪iː/

Nominative

tʃʰoːroː	kʰeːliː-rijoː	heː
boy.**Nom**.Sg.M	play.V1-stay.V2	be.Aux

The boy is playing.

Ergative

tʃʰoːriː-**ne**	roːʈəlaː	kʰəi-lijaː
girl.**Erg**.Sg.F	food.Acc	eat.V1-take.V2

The girl had eaten the meals.

Accusative/Dative

mãːjeː	tʃʰoːriː-**ne**	d̪uːd̪ʱ	paːjoː
mother.Erg.Sg.F	girl.**Dat**	milk.**Acc**	feed.V.Perf

Mother fed the baby.

Ablative

unaːlaː-maː	dʒʱaːɽ-**ʈ̪iː**	pəʈ̪ʈaː	pəɽeː
autumn.Loc	trees.**Abl**	leaves	fall.V.Prs

The leaves fall from trees in autumn.

Genitive

gəŋgaː-**noː**	paːniː	səbəseː	saːpʰ	heː
ganges.**Gen**.F	water.**M**	most	clean.V.Prs	Aux

The Ganga water is the cleanest.

raːm-**niː**	ʈoːpiː	niːliː	heː
ram.**Gen**.M	cap.**F**	blue.Adj	be.V.Prs

Ram's cap is blue.

kiʈ̪aːb-**naː**	pənnaː	məʈ̪	pəlʈaːoː
book.**Gen**.M.Sg	page.M.**Pl**	not.Neg	turn.V.Perf

Don't turn the book's pages.

Locative

pʰuːl	bəgiːtʃaː-**meː**	kʰiːlrijaː		heː
flower.Acc	garder.**Loc**	gloom.V1-stay.V2	Aux	

Flowers are blooming in the garden.

kiʈ̪aːb	ʈeːbəl-**peː**	heː
book.Acc	table.**Loc**	be.V1.Prs

The book is on the table.

Instrumental

tʃʰoːroː	gend̪-t̪iː	kʰeːliː-rijo	heː
boy.Nom.M.Sg	ball.**Inst**	play.V1-stay.V2	Aux

The boy is playing with a ball.

When ergative marker /neː/ is added to a nasalized sound, it changes to /jeː/, for example

/mãː/ + /neː/ = /mãjeː/

The morpheme /uː/ 'he', when occur in sentence which is spoken in fast speed, it changes to /u/, as in the following sentences:

uː dʒaː rijo he (normal speech)
He is going.

u dʒaː rijo he (fast speech)
He is going.

Appendix 3

The Basic Word List A(218) + B(89) + C(100)

From the book "Manual of Linguistic Field Work and Structures of Indian Languages"

	English	Malwi – IPA
1	All	/səgəl̪aː/, /həgəl̪aː/, /səb/
2	And	/oːdʒiː/, /hoːdʒiː/, /oːr/
3	Animal	/ɖ^{ɦ}aːɳɖaː/, /ɖ^{ɦ}oːrə/
4	Ashes	/raːk^{h}oːɽoː/, /raːk^{h}oːɽiː/
5	At	/peː/, /pəɳ/, /uːpər/
6	Back	/paːtʃ^{h}e/
7	Bad	/k^{h}oːɽoː/, /gənd̪aːɽoː/, /buroː/
8	Bark	/b^{ɦ}uːsənaː/
9	Because	/kãkiː/, /kãʋaːniː/
10	Belly	/oːd̪ər/, /dund̪/, /peːɽ/
11	Big	/moːɽoː/, /bəɽoː/
12	Bird	/tʃərəkəliː/
13	Bite	/kaːɽiː/
14	Black	/kəlijoː/, /kaːl̪oː/
15	Blood	/loːiː/, /k^{h}uːn/
16	Blow	/p^{h}uːkənoː/
17	Bone	/həɽəkaː/, /əɽək^{h}aː/
18	Breast	/ãntʃəl/, /t^{h}aːn/

19	Breath	/haː/, /sãs/
20	Burn	/baːlənaː/
21	Child	/tʃʰoːroː/, /naːnoː/
22	Claw	/hətʰeːliː/, /pəndʒoː/
23	Cloud	/baːɖ̤əloː/
24	Cold	/ʈ̤aːɽ/, /tʰəɳɖ̤oː/
25	Come	/əɳoː/, /aːnoː/
26	Count	/giɳənoː/, /gaːninoː/
27	Cut	/kaːʈəɳoː/, /kaːʈənoː/
28	Day	/ɖ̤ən/
29	Die	/mərijoː/
30	Dig	/kʰoːɖ̤joː/
31	Dirty	/gənɖ̤aːnaː/, /gənɖ̤aːɽoː/, /gənɖ̤aːnoː/, /gənɖ̤oː/, /meːlaː/, /kʰəraːb/
32	Dog	/ʈ̤eːŋgəɽoː/, /kuʈ̤roː/
33	Drink	/ɖ̤əkaːləna:/, /piːɳoː/
34	Dry	/hukənaː/, /hukkoː/, /sukkoː/
35	Dull	/ɖ̤ʱiːloː/, /aːləsiː/, /əʈ̤/
36	Dust	/bəgɖ̤oː/, /ɖ̤ʱuːloː/
37	Ear	/kaːn/, /kaːnnɳoː/
38	Earth	/dʒəmiːn/, /ɖ̤ʱərəʈ̤iː/
39	Eat	/kʰaːɳoː/, /roːʈ̤oː/
40	Egg	/əɳɖ̤oː/
41	Eye	/ɖ̤oːloː/, /ɖ̤ʱoːliːjoː/, /ãnkʰ/

42	Fall	/pəɽjoː/, /pəɽnoː/
43	Far	/tʃʰeɽi/, /d̪uːroː/
44	fat/grease	/dʒaːɽoː/
45	Father	/baːudʒiː/, /pəppaː/
46	Fear	/d̪ərnoː/, /kʰoːp/
47	Feather	/pĩnkʰəɽaː/, /pĩnkʰəɽo/
48	Few	/t̪ʰoːɽoː/
49	Fight	/dʒʱəgəɽoː/, /ləɽəiː/
50	Fire	/ʋaːd̪iː/, /ʋaːd̪ʱiː/
51	Fish	/mətʃtʃʰiː/
52	Five	/pãːtʃ/
53	Float	/t̪irənoː/
54	Flow	/ʋəigoː/, /ʋəinoː/
55	Flower	/pʰuːl/, /pʰuːləɽoː/
56	Fly	/uɽənoː/
57	Fog	/d̪ʱund̪ʱər/, /d̪ʱund̪ʱəl/, /megʱəroː/
58	Foot	/pəg/, /pəgəɽaː/
59	Four	/tʃaːr/
60	Freeze	/dʒəmənoː/
61	Fruit	/pʰəl/
62	Full	/haːkoː/, /aːkʰoː/
63	Give	/d̪enoː/
64	Good	/həu/, /bʱəloː/, /ətʃtʃʰoː/
65	Grass	/baːgəd̪oː/, /tʃʰaːroː/

66	Green	/həroː/, /lilloː/
67	Guts	/ʈaːkəʈ/, /roːs/
68	Hair	/ləʈʈaː/, /baːl/
69	Hand	/haːʈʰəɽoː/
70	He	/uː/, /ʊɪ/
71	Head	/maːʈʰoː/
72	Hear	/hunnaː/, /huɲjoː/
73	Heart	/hiʋəɽaː/, /hərəɖaː/, /kəleːdʒoː/
74	Heavy	/dʒbəroː/
75	Here	/jã/, /jaːdʒ/
76	Hit	/mərənoː/, /ʈʰoːkənoː/, /kuːʈənoː/
77	hold/take	/pəkəɽjoː/, /leɳõː/
78	Horn	/ʋaːdʒoː/, /piːŋgõː/, /bʱoːŋgəloː/
79	How	/kəsəʈər/, /keːsəʈər/
80	Hunt	/hikaːr/, /ʃikaːr/
81	Husband	/aːɖəmiː/, /laːɽo/, /gʱərəʋaːlo/
82	I	/hũː/, /muː/
83	Ice	/bərəpʰ/, /gaːr/
84	If	/dʒəɖi/, /dʒoː/, /pənɽ/, /niʈoː/
85	In	/maːj/, /maiʈeː/, /biʈʰər/
86	Kill	/maːrjo/, /maːriː/
87	Knee	/goːɽoː/, /goːɽaː/
88	Know	/oːləkʰənaː/, /maːləm/-/kərənoː/
89	Lake	/ʈələi/, /tʃʰaːpəroː/, /ɖoːbəɳoː/

90	Laugh	/ɖãʈ̪/-/kaːʈənoː/
91	Leaf	/pəʈ̪toː/
92	Leftside	/ɖaːboː/, /ɖʱaːʋiː/-/ʈ̪ərəpʰ/
93	Leg	/pəg/, /pəgəʈoː/
94	lie (lying position)	/hunaː/, /huɭoː/, /soɳõː/
95	Live	/dʒiːʋəʈõː/, /dʒiːʋiː/-/rijoː/
96	Liver	/kaːlədʒoː/
97	Long	/ləmboː/, /moːʈoː/
98	Louse	/dʒuːʋã/, /liːkʰ/
99	man/male	/aːɖ̪əmiː/, /mərəɖ̪/
100	Many	/gʱəɳoː/, /gəndʒ/, /kʰoːb/
101	meat/flesh	/goːs/, /maːɖ̪eːlaː/, /mãːs/
102	Moon	/tʃənɖ̪ərəmaː/, /tʃãːnɖ̪/
103	Mother	/baːiː/
104	Mountain	/məgəraː/, /ʈ̪eːkəroː/
105	Mouth	/mũːɳɖoː/
106	Name	/naːm/
107	Narrow	/hənkəʈaː/, /tʃəpəʈoː/
108	Near	/kəneː/, /meːreː/
109	Neck	/gʱoːbəʈiː/, /gaːbəʈoː/
110	New	/nəʋoː/, /nəjoː/
111	Night	/raːʈ̪/, /iːnɖ̪araː/
112	Nose	/nəkʰoːroː/, /nəkəʋoːraː/
113	Not	/niː/, /niʋoː/

114	Old	/dʒunoː/
115	One	/eːk/
116	Other	/pəraːjoː/, /dusəroː/
117	Person	/aːḍəmiː/
118	Play	/rəməna:/, /kʰeːləʊaːneː/
119	Pull	/ṭaːnəna:/, /gələḍəna:/
120	Push	/ʈəllaː/
121	Rain	/bərəsaːṭ/
122	Red	/laːl/
123	right/ correct	/hãtʃoː/, /səi/
124	Rightside	/dʒəməɳoː/
125	River	/nəḍḍiː/
126	Road	/ʊaːʈ/, /həʈək/
127	Root	/dʒəʈəkəlaː/
128	Rope	/ɖʱoːlɖoː/
129	Rotten	/həʈiːgjoː/, /səʈiːgjoː/
130	Round	/tʃəkroː/, /goːlmaːʈək/
131	Rub	/gʱisənaː/
132	Salt	/luːɳ/
133	Send	/bʱedʒnoː/
134	Say	/keɳoː/
135	Scratch	/ʈintʃaː/, /huʈənaː/
136	Sea	/səmuḍḍər/, /saːgər/
137	See	/dekʰjoː/, /dekʰəɳoː/

138	Seed	/biːdʒʊaːraː/, /bidʒəɽoː/
139	Sew	/hiṯãːng/, /hiʋəɳoː/, /siʋəɳoː/
140	Sharp	/ḏ^{ɦ}aːr/
141	Short	/tʃ^{h}oːɽoː/, /naːnoː/
142	Sing	/gaːɳoː/
143	Sit	/bəidʒaː/, /beɽ^{h}joː/
144	Skin	/tʃaːməɽiː/
145	Sky	/baːḏəlaː/
146	Sleep	/ũːng/
147	Small	/dʒəra/-/soː/
148	Smell	/bəḏbuː/, /k^{h}uʃbuː/
149	Smoke	/guʋaːɽoː/
150	Smooth	/tʃikəɳoː/
151	Snake	/hãːnp/, /bəu/
152	Snow	/bərəp^{h}/
153	Some	/ṯ^{h}oːɽoː-soː/
154	Spit	/ṯ^{h}uːkənoː/
155	Split	/ɽuːɽənoː/
156	Squeeze	/nitʃoːinoː/
157	stab/pierce	/gətʃoːɽnaː/
158	Stand	/uːboː/
159	Star	/taːroː/
160	Stick	/kaːmtʃiː/, /laːkəɽiː/
161	Stone	/bɦaːɽoː/, /kənkəraː/

162	Straight	/huḍoː/
163	Suck	/tʃusənoː/
164	Sun	/surədʒ/
165	Swell	/hoːdʒən/
166	Swim	/ṭeːrnoː/
167	Tail	/pũːtʃʰəɽiː/
168	That	/uː/
169	There	/ʋãː/
170	They	/ʋiː/
171	Thick	/dʒaːɽoː/
172	Thin	/ʈãʈəloː/, /ḍubəloː/
173	Think	/hoːtʃənaː/
174	This	/joː/
175	Thou	/ṭəm/
176	Three	/ṭiːn/
177	Throw	/pʰeːkəɳõː/
178	Tie	/hələgaːnaː/, /baːḍənoː/
179	Tongue	/dʒibaːn/, /dʒiːbəɽoː/
180	Tooth	/kʰupəlaː/, /ḍãt/
181	Tree	/dʒʱaːɽəkaː/, /dʒaːɽəkʰaː/
182	Turn	/ʋãkəɽ/, /baːriː/
183	Two	/ḍoː/
184	Vomit	/ulʈiː/
185	Walk	/tʃaːlənoː/

186	Warm	/uːnoː/
187	Wash	/d̪ʱoːɳoː/
188	Water	/paːɳiː/
189	We	/əpən/, /həmiː/
190	Wet	/aːloː/
191	What	/kəĩ/
192	When	/kəd̪iː/
193	Where	/kãː/
194	White	/d̪ʱoːl̪oː/
195	Who	/kun/, /kuɳ/
196	Wide	/tʃoːɽoː/
197	Wife	/laːɽiː/, /gʱərʊaliː/, /loːgəi/
198	Wind	/dʒʱãːiɽoː/
199	Wing	/pənkʰəɽiː/
200	Wipe	/pũtʃʰəɳoː/
201	With	/haːt̪ʰeː/
202	Women	/bəi/, /bəiraː/
203	Woods	/ədʒiːroː/, /ləkəɽaː/
204	Worm	/kiːɽoː/
205	Ye	/t̪ʰəmiː/, /t̪ʰəm/
206	Year	/bərəs/
207	Brother	/d̪aːd̪oː/, /bʱəi/
208	Clothing	/tʃĩt̪əraː/
209	Cook	/roɽiː/-/kərnoː/

210	Dance	/naːtʃənoː/
211	Eight	/aːʈʰ/
212	Hundred	/hoː/
213	Seven	/haːʈ̪/
214	Shoot	/maːrənoː/
215	Sister	/beːn/
216	Spear	/bʱaːloː/
217	Twenty	/biːs/, /koːʈiː/
218	Work	/kaːdʒ/, /kaːm/
	List B	
219	Bindi	/ʈĩːkiː/, /ʈipəkiː/
220	Flour (kneaded)	/məsaː/-/huo/-/aːʈoː/
221	Jura (bun)	/dʒuɖ̪oː/
222	Roti	/roːʈ̪əlaː/, /roːʈoː/, /tʃaːnəkoː/
223	Banana	/keːloː/
224	Bangles	/tʃuʈoː/
225	Blouse	/poːləkoː/
226	Book	/kiʈ̪aːb/
227	Brother (elder)	/moːʈoː/-/d̪aːd̪oː/
228	Brother's wife	/bʱoːdʒaːiː/, /bʱaːbʱiː/
229	Cat	/minəkiː/
230	Chilli	/mərtʃaː/, /mərətʃ/
231	Cold	/ʈʰənɖ̪oː/
232	Comb	/kaːŋgsiː/, /kaːŋgoː/

233	Copper	/t̪əmboː/
234	Cough	/ud̪ər/, /kʰãːsiː/
236	Cow	/gəu/
237	Crow	/kaːgəloː/, /kaːgəlaː/
238	Cry	/roːɳõː/
239	Dog	/ʈeːŋgəʈaː/
240	Door (entrance)	/baːrnõː/
241	Down	/t̪əleː/, /nitʃtʃeː/
242	Drizzle	/pʰuʋaːraː/
243	Earring	/suljaː/, /kəʈiː/, /dʒʱumkoː/, /kuɳɖəl/
244	Elephant	/həṭ̪ṭ̪iː/
245	Eyebrow	/bʱaːpəɳ/, /baːpʰəɳ/
246	Fever	/t̪aːʊ/, /bukʰaːr/
247	Finger	/aːŋgəliː/
248	Fish	/mətʃtʃʰiː/
249	Flour (dry)	/aːʈoː/
250	Food	/roːʈiː/, /roːʈoː/, /kʰanõː/
251	Forest	/dʒʱoːʈiː/, /maːl̪/
252	Garlic	/l̪əsən/
253	God	/bʱəgʊaːn/
254	Goddess	/bʱəgʊaːn/, /maːt̪aː/
255	Gold	/hoːnoː/, /soːnoː/
256	Grandfather F	/d̪aːdʒiː/
257	Grandfather M	/dʒiː/, /bəj/

258	Grandmother F	/d̪aːdʒiː/, /nanadʒiː/
259	Grandmother M	/dʒiː/, /naniːdʒiː/
260	Green vegetable	/bʱaːdʒiː/, /saːg/
261	Hot	/unnoː/, /uni/, /gərəm/
262	House	/məkaːn/, /gʱər/
263	House fly	/maːkʰoː/
264	Inch	/ʈərmoː/, /intʃ/
265	Language	/boːliː/, /ʋaːtʃaː/
266	Lion	/maːhər/, /ʃer/
267	Lips	/hoːd̪əɽaː/, /hõːʈʰ/
268	Liquor	/d̪aːru/, /ʈ̪aːɽiː/
269	Mango	/keriː/, /aːm/
270	Medicine	/d̪əʋaiː/
271	Milk	/d̪uːd̪ʱ/
272	Mirror	/kãːtʃ/, /aiːna/
273	Money	/rupəjaː/, /pənjaː/
274	Mosquito	/mətʃtʃʰər/
275	Mouse	/uːd̪əroː/
276	Nails	/nək/, /nəkʰ/
277	Necklace	/maːlaː/, /haːr/
278	Nose-pin	/nəʈ̪ʰ/, /nəʈ̪ʰəɽiː/
279	Oil	/ʈ̪eːl/
280	Onion	/kənd̪oː/
281	Pain	/dukʰənoː/

282	Peacock	/moːr/
283	Plait	/tʃoːɽiː/, /baːl/
284	Pond	/taːlaːʊ/
285	Potato	/əlluː/
286	Rice (cooked)	/tʃoːkʰaː/, /pulaːʊ/
287	Rice (raw)	/tʃoːkʰaː/, /tʃaːʊəl/
288	Round	/goːloː/
289	Road	/həɽək/, /səɽək/, /ʊaːʈ/
290	Run	/naːʈʰənaː/, /bʱaːgnaː/
291	Sari	/haːɽiː/, /saːɽiː/, /ɖʱoːʈiː/
292	Shawl	/haːl/, /hãːlaː/, /kaːməl/
293	Shirt	/ʊuʃəʈ/, /kurʈoː/
294	Sister (elder)	/dʒiːdʒiː/, /moːɽiː/-/beːn/
295	Sister's husband	/dʒijaːdʒiː/, /beneʊilaːl/
296	Small	/tʃʰoːʈoː/, /naːnoː/
297	Snake	/hãːp/, /naːg/
298	Spectacles	/tʃəʃmoː/
299	Spices	/musaːloː/
300	School	/iskuːl/
301	Sugar	/həkkər/
302	Tasty	/mədʒaːɖaːr/, /həuː/, /bəɽijaː/
303	Tea	/tʃaː/
304	Teeth	/kʰupəlaː/, /ɖãːʈ/
305	Thumb	/aːŋgoːʈʰoː/

306	Turmeric	/hələ̪d/, /ələ̪d/
307	Up	/maːʈ̪ʰaːpeː/
308	Village	/gaːm/, /gãːʊ/
	List C	
309	Rolling pin (belan)	/ʋeːlən/, /ʋeːlənɻ/
310	Rolling board (chakla)	/paːʈəloː/
311	Charpaai	/kʰaːʈəloː/, /pələŋg/
312	Dal	/d̪aːl/
313	Kadai	/kəʈʰaːiː/
314	Neem	/limətaː/, /liːm/
315	Abuse	/gaːl/, /gaːlaː/
316	Air	/həʊaː/
317	Ant	/kiːʈiː/
318	Aroma	/kʰuʃəbu/
319	Bald	/ʈəkəloː/, /gəndʒoː/
320	Bathe (V)	/nəʊaːʈənoː/, /naːɳoː/
321	Bazaar	/haːʈ/, /baːdʒaːr/
322	Begin	/tʃaːluː/, /huru/
323	Behind	/paːtʃʰeː/
324	Blind	/aːnd̪ʱoː/
325	Brass	/piːʈ̪əl/
326	Brave	/himməʈ̪/-/ʊaːloː/
327	Bull	/bəlʃjaː/
328	Butter fly	/pʰuʈ̪iː/, /ʈ̪iʈ̪liː/

329	Buy	/leɳoː/
330	Cheap	/səsʈoː/
331	Coconut	/naːrijəl/
332	Corpse	/murɖoː/, /laːʃ/
333	Costly	/meːŋgoː/
334	Cry of X	/roːʊəɳ/
335	Curse	/həraːp/
336	Daily	/roːdʒinaː/, /roːdʒ/
337	Danger	/aːʈiː/, /kʰəʈroː/,
338	Deal	/kəraːr/, /oːɖoː/, /soːɖoː/
339	Donkey	/gəɖəʈoː/
340	Double	/ɖugnoː/
341	Draught	/hukʰoː/, /sukʰoː/, /əkaːl/
342	Earn	/kəmaːɳoː/
343	End	/aːkʰiriː/
344	Enemy	/duʃmən/
345	Farmer	/kərsaːn/
346	Feed	/kʰəʊaːʈənaː/
347	Flood	/baːʈ/
348	Front of	/haːme/, /saːme/
349	Goat	/ʈeʈiː/, /gəʈʰeraː/, /boːkəʈiː/
350	Goldsmith	/hunaːr/, /sunaːr/
351	Halves	/aːɖʱoː/, /aːdaː/
352	Hard	/kaːʈʰoː/

353	Heels	/eːɽiː/
354	Her	/ʋiːniː/
355	High	/bəɽoː/, /ũːtʃoː/
356	His	/ʋiːnoː/
357	Honey	/hẽːʈ̪/, /sẽːʈ̪/
358	Horn	/ʋaːdʒoː/, /bʱoːpuː/
359	Hunger	/bʱuːkʰ/
360	Ill	/maːnd̪oː/, /biːmaːr/
361	Ironsmith	/luhaːr/
362	King/chief	/raːdʒaː/
363	Landlord	/pəʈeːl/, /dʒmiːnd̪aːr/
364	Lazy	/məkkar/, /niʈʰəllo/, /aːləsiː/
365	Letter	/kaːgədʒ/, /ʈ̪aːr/, /sənd̪eːʃ/
366	Lonely	/eːkəloː/
367	Love	/preːm/, /laːɽ/
368	Maid	/ʋaiːd̪ʱaː/-/ʋaːliː/
369	Maize	/məkkijaː/
370	Memory	/jaːd̪əgaːr/, /jaːd̪d̪aːʃʈ̪ə/
371	Mine	/mʰaːroː/
372	Monkey	/ʋaːnd̪əroː/
373	Paint	/rəŋg/
374	Pig	/bud̪ʱəʋaː/, /suər/
375	Price	/moːl/, /d̪aːm/, /bʱaːʊ/, /kiːməʈ̪/
376	Priest	/guru/, /pəɳɖiʈ̪/, /pudʒaːriː/

377	Read	/bʱənɳənaː/
378	Remember	/jaːɖ̤/-/kəriːno/
379	Rice (crushed)	/tʃoːkʰaː/
380	Rice (husk)	/haːɽ/, /bəgəɖ̤aː/, /bʱuːsaː/
381	Rice (paddy)	/tʃoːkʰaː/, /ɖ̤ʱaːn/
382	Rice (puffed)	/pərəməl/, /ɖ̤ʱəniː/
383	Sell	/betʃəɳoː/
384	Sheep	/gaːɖ̤əraː/
385	Shop	/ɖ̤uːkaːn/
386	Silver	/tʃaːnɖ̤iː/
387	Sometimes	/kəɖ̤iː/-/kəɖ̤iː/
388	Sparrow	/tʃirəkəliː/
389	Sugar cane	/hãːʈaː/, /sãːʈaː/
390	Sweet potato	/rəʈ̤aːluː/
391	Tailor	/dərdʒiː/, /ʈeːlər/
392	Teach	/sikaːɳoː/
393	Teacher	/maːstərdʒiː/
394	Thirst	/ʈ̤əs/, /ʈ̤iːs/, /ʈ̤ərʰeː/
395	Thongs	/tʃəɖɖ̤iː/, /dʒaːŋgijo/
396	Train	/reləgaːɽiː/
397	Upside down	/ulʈoː/
398	War	/dʒʱəgəɽaː/, /ləɽəiː/
399	Weave	/bunənoː/
400	Weaver	/bunəkər/

401	Well	/kuːɽoː/
402	Wheat	/gəhũː/
403	Worship	/puːdʒaː/
404	Write	/likʰəɳoː/
405	Yours	/t̪əmaːroː/, /t̪ʰəmaːroː/

Appendix 4

BASIC SENTENCES LIST OF MALWI

SIMPLE

raːm keriː kʰəi rijo he
Ram is eating a mango.

siːt̪aː pəkiː keriː khəi riː he
Sita is eating a ripe mango.

raːm aːm kaːʈiː rijo he
Ram cut the mango.

tʃʰoraː-tʃʰoriː tʃaːkkuː t̪iː keriː kaːʈiː rija he
The children cut the mango with a knife.

ridʒəʋaːn niː aːngəliː keriː kaːʈəʋaː me kaːʈiː gəi
Rizwan cut his fingers while cutting the mango.

ruʈʰ neː bəs meː keriː kʰəi
Ruth ate the mango in the bus.

səlmaː neː həʋeːreː keːriː kʰəi
Salma ate the mango in the morning.

bətʃtʃõ neː həgəlːiː miːʈʰai kʰəi liː
The child ate up all the sweets.

NEGATIVES

hũ isku:l ni: dʒəũ
I don't go to school.

həm ka:le: dʒəjəpur ni: dʒa:va:ŋga:
We will not go to Jaipur tomorrow.

hũ ka:le isku:l ni: gəjo:
1 did not go to school yesterday.

ʧʰora: ne uki: be:n ke: ni: ma:rjo:
The child did not hit his/her sister.

unəne: pəɽʰa:i ni: kəri: ʈo: pʰe:l hui gəja:
Because they did not study they failed in the exams.

ni: ʈo: mʰa:ri: bəi: a:i ni: mʰa:ri: be:n
Neither my mother came nor my sister.

buɖʱɖʱo: ha:ʈʰi: ni: mərjo:
The old elephant did not die.

IMPERATIVES

əiː dʒaː

Come in.

məʈ̪ aː

Don't come in.

beːʈ̪^{h}iː dʒaː

Please sit down.

bəiː dʒaː

Sit/sit down.

aːnoː mənaː heː

Admission is prohibited.

tʃəliː dʒaː

Get lost!

CONDITIONAL AND COORDINATION

dʒəd̪i mʰaːreː mɪʈʰai niː dogaː ʈ̪oː hũ roʊŋgaː
If you don't give me the sweets, I will cry.

dʒəd̪i ʈ̪əm mʰaːreː maːroːgaː ʈ̪oː hũ roːuŋgaː
If you will hit me 1 will cry.

u ʊegi aːʈ̪oː ʈ̪oː kaːgədʒ ʊãtʃiː leːʈ̪oː
If he had come earlier he would have seen the letter.

u puːtʃʰeːgaː ʈ̪oː səb bəʈ̪aːɽ duːŋgaː
If he asks me 1 will certainly tell the whole story.

u aːnoː tʃaːheː ʈ̪oː əiː dʒaːeː
If he can come then he should.

raːm or siʈ̪aː doːiː pʰiləm deːkʰəneː gəjaː
Ram and Sita both went to watch the movie.

bətʃtʃaː ʊeː kʰaːjoː or ʈʰəɳɖoː paːniː piːd̪oː
Children ate and drank cold water.

meriː həu heː pən subʱaːʃ ətʃtʃʰoː niː heː
Mary is beautiful but ill natured.

soːhel reʃmaː niː məd̪əd̪ niː kəreːgoː
Sohail will help but not Reshma.

INTERROGATIVES

t̪əmaːroː naːm kəiː heː

What is your name?

t̪əm kãː roː

Where do you stay?

t̪əm kesaː hoː

How are you?

t̪əm kəd̪ gʰər dʒaːoːgaː

When are you going home?

d̪illiː kãː dʒəiː rijaː hoː

Why are you going to Delhi?

uː kuːn heː

Who is he/she?

t̪ʰaːroː kɪt̪əraː məleː

How much did you get?

t̪əmaː ne kʰaːd̪oː

Have you eaten?

hũː kaːle aːũː

Shall 1 come tomorrow?

aːdʒ koː əkʰəbaːr bãtʃɪjoː

Did you see the papers today?

aːdʒ roːʈəlaː bənaːoːgaː gʰəreː

Will you be cooking today at home?

uː kəiː hoːtʃirijoː heː t̪əmaːreː maːləm heː
What do you think he was thinking?

t̪əmaːroː bʱəiː kuːn heː
Which one is your brother?

RELATIVIZATION, PARTICIPIALIZATION, ADJECTIVES

tʃʰoːroː dʒineː bukʰaːr ʈʰoː kaːleː məriː gəjoː
The boy who had fever died yesterday.

kãːntʃ ʈoːɽəvaː vaːlaː tʃʰoraː neː ʈeɽoː
Call the boy who broke the glass.

vɪːneː ʈeɽoː dʒineː kaːle kãːntʃ ʈoːɽijoː
Call the boy who broke the glass day before yesterday.

ʈuːɽiː ʈəkiː ɖaːliː neː pʰẽkiː ɖoː
Throw away the broken branch.

uː baːɳɖoː bənɖər kʰəraːb heː
The tail cut monkey was a nuisance.

aːŋgəliː naː nəkʰəniː ʈoːpiː pəɽiː giː
The cap which was hung on the nail, fell.

bimaːr tʃʰoːroː məriː gəjoː
The fevered boy died.

un tʃʰoːraː neː ʈeɽoː dʒinəneː kãːntʃ pʰoːɽijoː
Call the glass-breaker boy.

tʃaːj piːvaː vaːlaː tʃʰoːraː neː teːɽoː
Call the tea-drinker boy.

dʒʱuːləvaː vaːlo kəp pəɽiː gəjoː
The hung cup fell down.

gelijoː tʃʰoːroː

The innocent child.

tʃʰoːroː gelijoː heː

The child is innocent.

CAUSATIVES, PASSIVES/INCAPABILIATATIVE

mãː-jeː tʃʰoːriː neː ɖuːɖʱ paːjoː
Mother fed the baby.

mãːjeː tʃʰoːri neː ɖuːɖʱ paːvaː vaːsʈeː aːjaː neː kiːɖoː
Mother made the ayaa [nurse] feed the baby.

noːkər niː piʈaːdʒiː jeː səbʱiː kaːgədʒ pʰekaːɽ ɖiːɖaː
Father got all the papers thrown away by the servant.

tʃʰoːriː noːkəraːniː ʈiː vəraːɳɖoː saːpʰ kərəiː riː heː
The girl is getting the varandah cleaned by the maid.

ʃiːlaː rəʈnaː ʈiː boliː keː siʈaː neː uʈʰaːɽ ɖeː
Shila asked Ratna to make Sita rise.

maːɽ saːbeː tʃʰoːraː neː bʱəɳəvaː vaːsʈe kiː ɖoː
The teacher made the child study.

vən əɖʱikaːriː ne ləkkəʈaː kəʈʈaːʈiː peːɽ kəʈvaːnoː boːlijoː
The forest officer is making the wood-cutter cut the trees.

peːɽ kaːʈiː ɖiːɖaː
Trees were cut.

beːn naːnaː neː huvaːvəʈəneː noː prəjaːs kəriː riː he
The sister is making the little brother sleep.

raːdʒiːv gaːnɖʰiː bəm ʈiː mərjaː
Rajiv Gandhi was killed by a bomb.

dʒəɖiː unəne inəkeː cəmpuʈər bʱəɳəvəiː ɖeːʈaː ʈoː inəneː aːdʒ noːkəriː məliː dʒaːʈiː

If he had made him study computers he would have got the job by now.

əreː mʰaːraː maːi baːp mʰaːreː ʊigjaːn bʱʱəɳəʊaːnoː kiḍoː
Alas, my parents had made me study science!

ʃiːʃiː mʰaːre ṭiː ʈuːʈiː giː
The bottle broke (by me).

məḍraːsiː kʰoːkʰaː kʰaːjeː
Rice is eaten in the Southern India.

kaːleː ek tʃʰoriː noː reːp huiː gəjoː
A girl was raped last night.

mhaːreː lugaːɽaoːneː bəhoːṭ maːɪjoː
I was beaten furiously by the goondas/hooligans.

bətʃtʃaː roːʈiː ʊeːgiː niː kʰəiː rijaː heː
The food cannot be eaten fast by the child.

ʈʰəɳḍ naː kaːrəɳ likhiː niː pəiːrijoː hũː
Because of cold, writing cannot be done by me.

CASES, AGREEMENT, COINDEXING

tʃʰoːroː kʰeːliː rijoː heː
The boy is playing.

tʃʰoːroː geːnd̪ ʈiː kʰeːliː rijo heː
The boy is playing with a ball.

tʃʰoːroː eːk keːloː kʰəi gəjoː
The boy ate a banana.

tʃʰoːroː həu kʰeːlijoː
The boy played well.

tʃʰoːriː neː roːʈəlaː kʰəiː lijaː
The girl had eaten the meals.

mãː əbeː roːʈəlaː bənaːʋeːgaː
Mother will cook now.

mʰaːreː d̪uːkʰ heː
I am sad.

raːm bʱuːkʰoː heː
Ram is hungry/thirsty/in pain.

kiʈaːb uʈʰəineː ʈeːbəl peː meliː d̪eː
Pick up the book and keep it on the table.

gʱoːʈaː niː d̪aːnoː d̪əiː d̪oː
Give the horse the feed.

kripəjaː kəpʈaː d̪ʱui loː

Wash the clothes please.

raːm neː kaːleː unəniː maːneː kaːgədʒ likʰijoː
Ram wrote a letter to his mother yesterday.

d̪əhiː d̪ud̪ʱ ʈiː bənəjoː
Curd is made from milk.

raːʊən raːm ʈiː ləɽɪjoː
Ravan fought with Ram.

hənumaːndʒiː neː pũːtʃʰ ʈiː lənkaː dʒələiː d̪iː
Hanuman burnt Lanka with his tail.

unaːlaː maː dʒʱaːɽ ʈiː pət̪t̪aː pəɽeː
The leaves fall from trees in autumn.

mʰaːriː tʃʰoːriː kʰaːʈt̪ər mʰaːreː peːsaː d̪oː
Give me some money for my daughter.

gʱəreː koiː niː heː
Nobody is at home.

hũː hər maːl d̪əs rupəja maː laːjoː
I bought everything in ten rupees.

pʰuːl bəgiːtʃaː meː kʰiːlrija heː
Flowers are blooming in the garden.

kiʈaːb ʈeːbəl peː heː
The book is on the table.

kəpɽaː peːʈiː naː uːpər pəɽijaː heː

Clothes are kept on the top of the box.

kiʈaːb peːʈiː naː ʈəleː heː
Books are kept at the bottom of the box.

mʰaːraː gʱər naː paːtʃʰe ek bəgiːtʃoː heː
There is a garden behind my house.

beːn beːn-niː səheːliː naː haːʈʰeː kʰəriːɖɖaːriː kərʊaː dʒaːʊegiː
Sister will go shopping only with her friends.

raːm niː beːn noː bjaːʊ kaːle heː
Ram's sister's wedding is tomorrow.

raːm niː ʈopiː niːliː heː
Ram's cap is blue.

pətʃtʃiːs rʊpəjaː niː həkkər ləiː loː
Buy twenty-five rupees' sugar [i.e. for 25 Rupees.].

kiʈaːb naː pənnaː məʈ pəlʈaːoː
Don't turn the book's pages.

ʊiːna gʱər dʒaːʊaː naː pəhilaː kəpʈaː bəɖlijaː
Before 1 went to her house I changed my clothes.

pitʃtʃər ɖeːkʰəʊaː naː ʊaːɖ hũː hoːjoː
After coming back from the movie 1 went to sleep.

COMPARATIVE/CONTRASTIVE

nəd̪iː noː paːniː dʒʱiːl naː paːniː ʈ̪iː həu heː
River water is cleaner than lake water.

gəŋgaː noː paːniː səbəseː saːpʰ heː
The Ganga water is the cleanest.

mumbəiː noː moːsəm giːloː pən dilliː noː hukʰoː heː
Bombay weather is wet but Delhi weather is dry.

mʱariː ɖ̪reːs ʋiːniː ɖ̪reːs ʈ̪iː səpʰeːd̪ heː
My uniform is whiter than his uniform.

ECHO-FORMATIONS

kripəjaː tʃaː pijoː

Please have some tea etc.

uː kaːpiː kiṯaːb leːvaː gəjoː

He has gone to buy some stationary etc.

viːneː ḏəheːdʒ meː kursiː məliː

He got some chairs etc. on his marriage.

beːʈʰoː

Sit.

huː tʃəliː niː səkũː

I cannot walk.

ṯəm kaːjə vaːsṯeː gussaː hoː

Why do you get angry?

bətʃtʃaː bəsṯoː ləiːneː bʱəɳəvaː dʒaːveː

Children go to study carrying bag.

gaːvaː ṯiː gəloː kʰəraːb niː veː

The throat does not go bad by singing etc.

CLASSIFIERS

ḍoː kɪṭaːb tʃoːriː ʋəiː giː
Two books were stolen.

ləmboː bãːns ʋãː peːɽəjoː ʈʰoː
Longish bamboo was lying there.

goːl tʃənḍərəmaː
Round moon.

eːk tʃʰoːroː/tʃʰoːriː
One girl/boy.

REDUPLICATION

uː ɖʱiːreː ɖʱiːreː tʃaːliː rijo ʈʰoː
He was walking slowly slowly.

uː baːr baːr əiː rijoː heː
He came again and again.

ʊiːneː kəĩ kʰaːjoː
What all did he eat?

paːrʈiː me kuːɳ kuːɳ aːjaː
Who all came to the party?

ʈəm rãːntʃiː kəɖiː kəɖiː dʒaːoː
When when (how often) will you go to Ranchi?

raːm neː siːʈaː naː səb aːbʱuːʃəɳ kã mələjaː
Where all Ram found Sita's ornaments?

uː beːʈʰeː beːʈʰeː ʈʰaːkiː gəjoː
He got tired (of) sitting sitting.

hũː kaːgədʒ likʰəʈeː likʰəʈeː bor hʊiː gəjoː
I got bored writing letters.

unəneː kʰaːʈeː kʰaːʈeː boːləjoː
She spoke while eating.

ʧʰoːroː peːɖəl ʧələʈeː ʧələʈeː pəʈiː gəjoː
The child fell down while walking on the footpath.

ʋiːnaː saːməneː tʃoːr peːsaː ləine bʱagiː gəjoː

While/As he was watching, the thieves ran away with the cash.

gərəm kaːpʰiː pilaːoː

Give me hot hot coffee.

laːl laːl seːʋəpʰəl rəs ʋaːlaː heː

Red red apples are juicy.

miːʈʰiː miːʈʰiː keːriː laːoː

Bring sweet sweet mangoes.

iʈ̪əriː ũːtʃiː ũːtʃiː kjaːriː kəsətər kuːɖ̪ogaː

How are you going to jump over these high high hedges?

məneː ʈ̪əreː ʈ̪əreː niː ʈ̪ʰoɽiː ʈ̪ʰoɽiː miːʈʰai ɖ̪oː

Give me little little of every variety of sweets.

mʰaːreː paːtʃʰeː paːtʃʰeː məʈ̪ aːoː

Don't come after me (Hindi: *pic_e pic_e*)

aːdʒ niː ʈ̪oː kaːleː u mʰaːreː kəneː aːʋeːgaː

Sometime or the other (Hindi: *k_b_i na k_b_i)*he will come back to me.

COMPOUND VERBS

buːɽoː haːʈ̪^{h}iː məriː gəjoː
The old elephant died.

piʈ̪aːdʒiː naː aːʋaː naː peːlãː unaː ɖ̪oːsʈ̪ dʒəiː tʃukijaː ʈ̪^{h}aː
By the time papa came home his friend had left.

m^{h}aːreː kaːgədʒ ɖ̪oː
Give me the letter.

dʒaoː
Get out!

kripəjaː m^{h}aːraː ʋaːsʈ̪eː sʋeːʈər bənaːoː
Please knit a sweater [for me].

k^{h}uɖ̪ naː ʋaːsʈ̪eː sʋeːʈər bənaoː
Please knit a sweater [for yourself].

ɖ̪eːk^{h}oː ləkʃəmiː gəiː riː heː
See Lakshmi sing!

uː beːʈ̪^{h}iː gəjoː
He sat down.

CONJUNCT VERBS/ CONVERBS

paːpaː roʈiː kʰəi neː pʰərəʊaː gəjaː
Having eaten his meal papa went out for a stroll.

tʃiʈʈʰiː dʒoːr ʈiː bãːtʃ
Read the letter loud (Hindi: *p__ k_r sunao*).

gʱərənoː ɖʱjaːn ʈʰiːk ʈər seː rəkʰoː
See the house properly (Hindi: *g_um k_r)*.

uneː əpənaː bʱəiː naː saːʈʰeː ɖʱoːkʰoː kəriːneː ətʃtʃʰoː niː kərijoː
He did not do well having cheated his own brother.

dʒəineː ɖekʰoː
Go and see (Hindi: *ja k_r dek_o*).

u mʰaːreː maːriː neː bʱaːgiː gəjoː
He hit me and ran away.

INFINITIVES, COMPLEMENTS

ʈəmaːroː jãː aːnoː mʰaːreː ətʃtʃʰoː niː ləgeː
I don't like your coming here.

kuːn ɖʱəŋg ʈiː roːʈiː niː kʰaːnoː tʃaːʊeː
Who does not like to eat well?

ʊiːnaː ʊaːpəs aːʊaːʈiː ʊiːniː mãː dʒinɖaː bətʃiː
Because of his coming back his mother could survive.

unəneː bəʈaːjoː ki uː dʒəlɖiː ʃəhər tʃʰoːʈ rijoː heː
He told me that he was leaving the town soon.

ʊaː boːliː keː ukeː roːʈiː bənaːnoː ətʃtʃʰoː ləgeː
She said that she likes to cook.

mʰaːriː beːn neː bəʈaːjoː ki kaːleː gʱəniː dʒoːr ʈiː baːriʃ huiː
My sister told me that it rained heavily last night.