

**PHONOLOGY OF TOBU AREA VARIETY IN COMPARISON WITH
STANDARD KONYAK**

**A THESIS SUBMITTED TO NAGALAND UNIVERSITY IN PARTIAL
FULFILMENT FOR THE DEGREE OF DOCTORATE OF PHILOSOPHY IN
LINGUISTICS**

BY

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Ph.D/Lin/00196, 21-8-2018

**UNDER THE SUPERVISION OF
PROF. PANGERSENLA WALLING**



DEPARTMENT OF LINGUISTICS

NAGALAND UNIVERSITY

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Dedicated to my mom, dad, and my dearest siblings.

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DECLARATION

I, Nikay Besa (Ph.D./Lin/00196), hereby submit this thesis in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Linguistics at Nagaland University, Department of Linguistics, Kohima Meriema, entitled *Phonology of Tobu Area Variety in Comparison with Standard Konyak*. This research was conducted under the supervision of Prof. Pangersenla Walling. To the best of my knowledge and understanding, the data documented and analyzed in this thesis are firsthand. This thesis is, therefore, original in form, and no similar work has been submitted for any degree or qualification at any university or institution.

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CERTIFICATE

This is to certify that the thesis entitled 'Phonology of Tobu Area Variety in comparison to Standard Konyak,' submitted to the Department of Linguistics, Nagaland University in partial fulfilment of the requirement for the award of degree of Doctor of Philosophy in the discipline of Linguistics is a record of research work carried out by Nikay Besa Registration No. Ph.D/Lin/00196 under my personal supervision and guidance.

The results of the investigation reported in the thesis have not been submitted for any other degree or diploma. The assistance of all kinds received by the researcher has been duly acknowledged.

(Prof. Pangersenla Walling)

Supervisor

Department of Linguistics

Nagaland University

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With deepest gratitude,

Nikay Besa



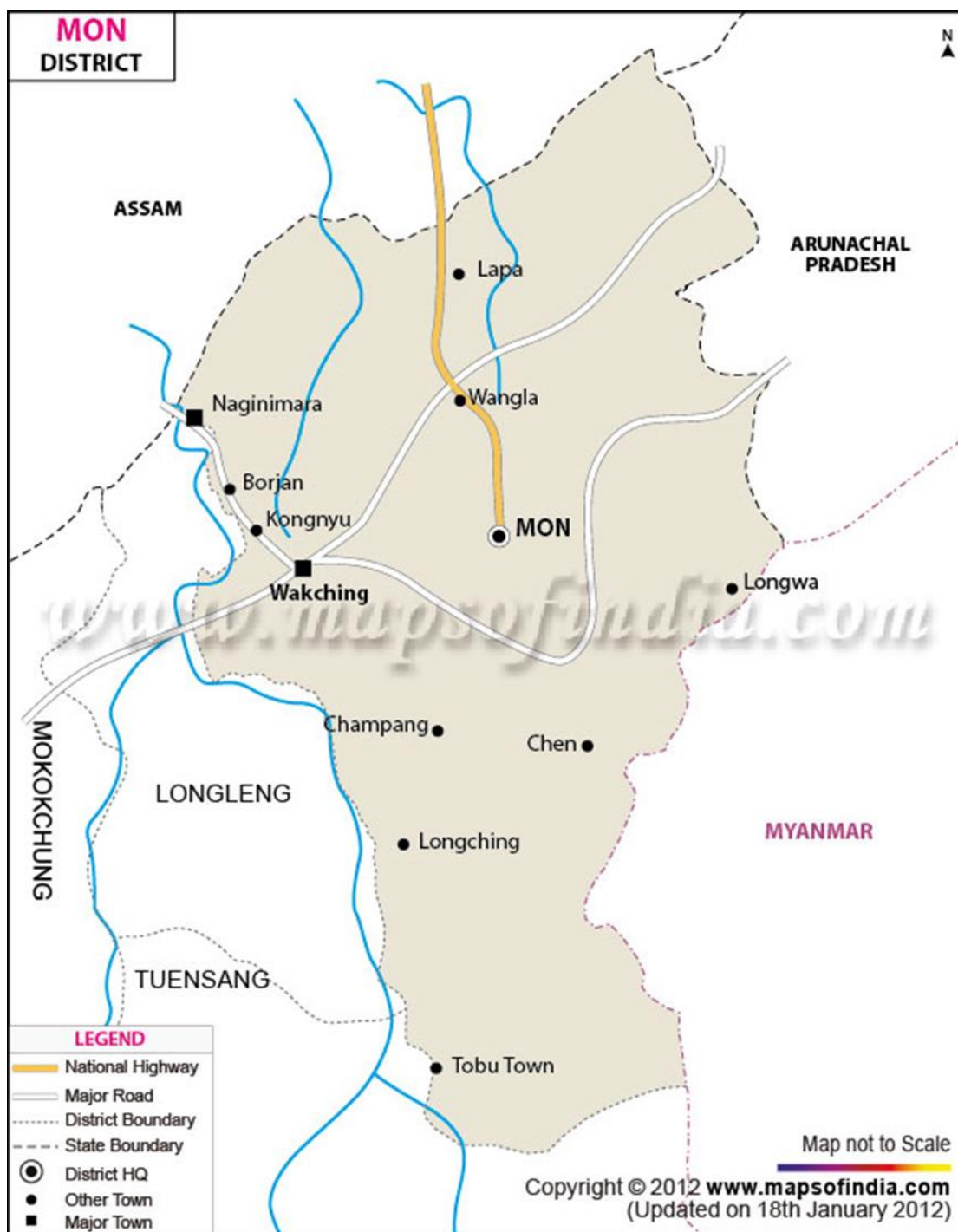
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Nagaland Map



Map of Nagaland

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CHAPTER 1

INTRODUCTION

This chapter will provide the reader a brief ethnographic introduction of the Konyak People, its linguistic situation, its genetic classification, objective of the thesis and the methodology followed while conducting the research.

1.1. Overview

The principal objective of this thesis is to elucidate the phonological characteristics of the Tobu Area variety and to undertake a comparative analysis with the phonological framework of the standard Konyak language. The phonology of standard Konyak has been the subject of prior investigation and documentation by a few researchers including the author of this thesis, which will serve as a foundational component for the forthcoming comparative study.

The Konyak territories are segmented into various areas (Sub-divisions), each falling within the jurisdiction of Mon District. Tobu constitutes one of these areas, encompassing significant villages such as *Tamkoang*, *Pessao*, *Wangshu*, *Monyakshu*, *Changlangshu*, *Yongkhao* and Tobu. New villages have also been delineated from the principal villages, including *Bumei*, *Changlangshu Changsa*, *Meinchangle*, *Pesao Changlu*, *Eyeang*, *Shinnyu*, *Yongkhao Changlu*, *Yeangmei*, *Wangshu Changle*, *Tangkhao*, *Wangshu Nguthong*, and New Tobu village. All the aforementioned villages fall under the jurisdiction of the Tobu Sub-division, Mon District. These villages speak the *Yongmang Ngao* which may be translated to Tobu Area Language. There are some minor dialectal variations within the speakers of each village under Tobu Area, but are intelligible to each other. The Konyak is classified under the Tibeto-Burman language family, and *Yongmang Ngao* or Tobu Area variety will fall as a sub-branch of Konyak. However, this linguistic variety has yet to be standardized in written form. When there arises a need to transcribe this language—for purposes such as communication via chats or local translation efforts—practitioners typically employ the Roman alphabet to represent its phonetic elements. According to the Population Census of 2011, the population of Tobu region is recorded at 16,925. Consequently, the projected number of speakers of this specific variety is estimated to range between 16,000 and 20,000 speakers. According to the Atlas of the World's Endangered Languages, the Konyak language is classified as vulnerable. Given that *Yongmang Ngao* (Tobu Area Variety) is a variety of Konyak, it is consequently categorized under the same vulnerability status.

Without active intervention by the Tobu people themselves, bolstered by academic research and description, this Tobu variety may cease being passed down to future generations. To date, no linguistic study has been undertaken on the *Yongmang Ngao* (Tobu Area Variety). Therefore, this research will be the inaugural linguistic investigation. This thesis will undertake a comprehensive examination of the phonemes, allophones, phonetic variations, syllable structure, phonological processes, and tonal patterns of the Tobu Area Variety. Also in this thesis, a preliminary acoustic analysis of both the consonants and vowels of the Tobu language will be examined. This thesis will also incorporate a comparative study examining the phonological features of Tobu Area Variety in contrast to those of Standard phonology. This analysis is intended to elucidate both the parallels and the distinctions between these two phonological systems at the phonological level.

This thesis will be an important study for Tobu Area community as this variety is in danger of losing their mother tongue, and some of the culture identified with their language. This study is also important to linguists who desire to know and understand more about Konyak languages and its variety.

1.2. Geographical and demographic status

The Konyaks, one of the prominent tribes of Nagaland, are predominantly located in the Mon District of Nagaland today. Moreover, a significant proportion of the Konyak community can be found in the Tirap and Changlang districts of Arunachal Pradesh, as well as in Upper Assam and northwest Myanmar. As per the geographical data provided on Wikipedia, the coordinates of Mon are 26.75°N 95.1°E. The average elevation of the area is 655 metres (2,148 feet). It is positioned at an elevation of 898 metres (2,945 feet) above mean sea level. It is enclosed on the north by the Sibsagar district of Assam, on the south by the Tuensang district of Nagaland and Myanmar, on the east by Myanmar, and on the west by Tuensang and Longleng. To the northeast, the Tirap district of Arunachal Pradesh is situated. The 2011 Census reports indicate that the district is comprised of 131 villages, collectively inhabited by a populace of 250,260. The district exhibits a literacy rate of 56.9 percent, comprising 118,507 females and 131,753 males. The Christian composition of the population is 94.5 percent.

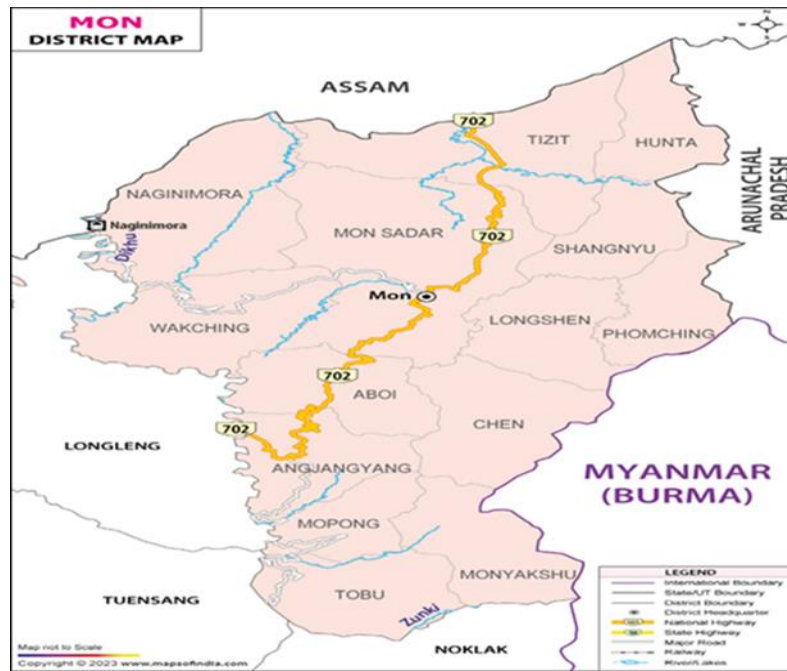


Fig. 1.1: Map of Mon.

(<https://www.mapsofindia.com/maps/nagaland/districts/mon.html>)

1.3. Name of the tribe

The word 'Konyak' is thought to have developed only when foreign invaders entered their homeland. This suggests that the Konyak Tribe, in present times, were previously comprised of distinct clans or separate entities. In the publication 'Konyak Nagas', Fürer-Haimendorf (1969) states that the term 'Konyak' originates from the word '*keniak*', which signifies 'man'. The term was initially heard in the village of *Tamlu*.

According to Yanang (1986), the word 'Konyak' is thought to originate from the combination of the term '*khao*', which refers to the head, and '*nyak*', which means black. In his studies, he stated that the term 'Konyak' is a misarticulation of the word '*khaonyak*' by the *Ahoms* when they initially interacted with the people in 1288 AD.

J.H. Hutton (1921) defined the term 'Konyak' as referring to the indigenous groups residing in the northeastern region of the *Aos* and *Changs*. These tribes are located between the *Dikhu* and *Disang* rivers, as well as north of the Patkai range. In addition, he stated that the terms 'Konyak' and '*Haha*' are used by the people of *Tamlu* to refer to themselves and the neighbouring tribes to the east, who share similar clothing, hairdressing styles, and tattooing practices.

‘Another version is that most of the Konyaks had a similar linear tattoo on the nose bridge extending to the forehead and hence they are known as ‘*Kuongnyak*’, where ‘*Kuong*’ means ‘*black*’ or men of ‘*black nose*’. (Nshoga, 2009, P.34, cited in Pereira et. al.,2019).

During the field study, a similar account was found from the Konyaks residing in the higher region, specifically the Tobu area. According to their narration, the term 'Konyak' is believed to have originated from the word '*koang*', which translates to '*nose*' and '*nyak*' for '*black*'. The narrators contended that upon the arrival of the foreigners in Konyak land, they were requested to articulate the terms for '*nose*' and '*black*' in the local language. In response, the foreigners struggled to pronounce the word '*koang*' accurately, leading them to subsequently refer to the locals as '*Kong-nyak*' by compounding the term nose and black. They further stated that some neighbouring tribes still call them *Kong-nyak* and not *Kon-yak*.

In addition to multiple instances of the term "Konyak" being documented, historical records indicate that the Konyak people During the *Ahom* era in Assam, which spanned from 1228 to 1826 A.D, the Konyak people were also referred to by many names such as *Tablungias*, *Jaktoongias*, *Moolongs*, *Changnois*, *Jabokas*, *Benferas*, *Mutonias*, *Namchangias*, and so on. The *Ahoms* bestowed these names upon the *duars* or mountain passes by which their tribe(s) migrated into the lowlands of Assam. (Devi 1968:21, as cited in Kethoukhrie, 2013). The Konyaks were also referred to as *Taprongumi* or *Minyumo-Nagami* by the Sumis, *Mirirr* by the Aos, and *Chagk* by the Changs (Hutton 1921:383, cited in Kethoukhrie, 2013).

Despite having numerous claims about the word's origin, it is widely believed that the name 'Konyak' likely refers to a person with black hair. However, it is a well-established fact that the word ‘Konyak’ gained popularity only when the British arrived in the Naga highlands. The History Committee of Konyak Students' Union Platinum Jubilee Souvenir also documented that the derivation of the term 'Konyak' is highly varied. It is formed from the terms '*Khaonyak*', '*Khezak*', '*Khelak*', '*Khenak*', and '*Shaonyak*'. The vernacular expressions all have synonymous meanings, specifically, they refer to a being, whether human or animal, that possesses black hair. (KSU Platinum Jubilee Sovenir, p.3, 2023).

1.4. Migration of the Konyaks

The history of the Konyaks remains elusive due to the absence of documented historical documents. Consequently, our understanding of their origin is limited to myth and legend. Most researchers believe that the Konyak ancestors might have migrated from

somewhere in the South-East Asia. Various records mentioning about the migration of the Konyak people have been seen documented.

According to the writings of authors such as A Yanang Konyak, A Peihwang Wangsa, and L. Metjen Konyak, tradition states that the Konyak people originated from a stone called *Longphang Phinyu* or *Longphanghong*. The word *Longphang* means ‘under the rock’ and *phinyu* means ‘wide-open’. *Longphanghong* is a term that refers to the area located beneath a hill made of stone. It is so hypothesised that they emerged from a cavern made of stone.

One historical account documents the migration of the ancestors of the Konyak people along the river banks of *Chindwin*, which flows through *Dhikhu* river, *Tapi* river, and *Lainyu* river. This migration ultimately led them to their current place of residence.

Quoted: “...origin suggests our forefathers passed through the river banks of *Chindwin* River in Burma and reach up to the bank of upper Bhramaputra (*Deilao/Deelo Yeangnyu*)... Their migratory route led them to *Dikhu* River, and on this venture, they found Ponge. History says that *Ponge*, the junction of *Pheenyu* and *lainyu*, is called *Puphan Yeangyu*. Upon arriving at *Ponge*, one group decided to travel along *Tephi/Tapi* river, while another group opted to follow the *Lainyu* river. Most of those who chose the *Tephi/Tapi* river route settled in the lower part of the Konyak region...

...The second group that travelled along the *Lainyu* river reached *Yingnyutang*, the highest peak in Long District and settled in the Upper area of the Konyak region. This mountain is supposed to be found in the current Phom area under the Longleng district of Nagaland...” (KSU Platinum Jubilee Souvenir, P.2-3, 2023).

Fürer-Haimendorf (1969) examined the ancestral origins of the Konyak people and found that a significant number of them may trace their roots back to a mountain named ‘*Yeng-yudang*’, located in the southern region of the current Konyak territory.

Yanang (1989) claims that Konyaks have passed through a gate called *Alamkaphen* which is a compounded word for ‘*Alam*’ meaning ‘Sun’, and *Kaphen* meaning ‘Gate’ indicating the meaning ‘the gate of the sun’; and “*Alamkaphen* is believed to be situated somewhere in Thailand or Burma” (Pereira et al.,2019).

Sardeshpande (2017) provides a comprehensive account of the migration of the various Konyak groups in the book ‘The Patkoi Nagas’. His five primary classifications of village groups are the *Yangkhao [Yongkao]* group, *Maniakshu [Monyakshu]* group, *Pesao [Pessao]* group, *Chen* group, and *Longching* group. The Khaimniungans of *Noklak*, *Maksha*, and *Ninyam*, the Phoms of *Sakchi*, *Aoching*, and *Longleng*, and the Burmese

Konyaks of *Haukyat*, *Lao*, and *Tsawlaw* share many similarities. The group predominantly adheres to the migration pattern. He also states that one variant of migration, predominantly observed among the Upper Konyaks, recounts a cataclysmic flood that necessitated the restructuring of settlements and population expansion. (cited in Pereira et al., 2019). ‘However, irrespective of their place of origin or which migratory route one followed, the Konyak today is one big family living together in Mon District as Konyak Jatnyu (meaning Konyak people).’ (KSU Platinum Jubilee, 2023).

1.5. Location of the research conducted

The locations chosen to conduct the research are based on three places such as, Tobu Sub-division, Mon town, Wakching Sub-division. Maps showing the location of these three places marked with red are indicated below:

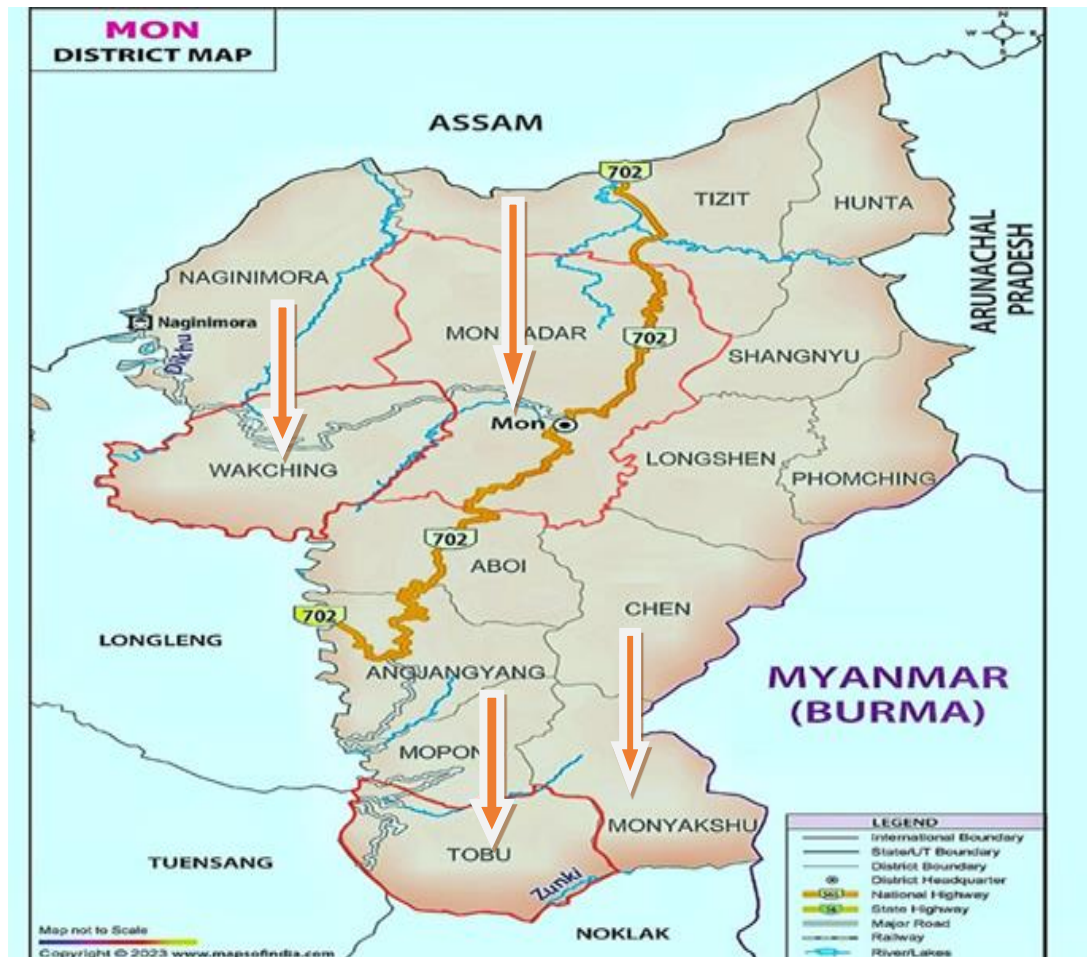


Fig. 1.2: Map of Mon indicating Tobu Sub-division and Wakching Sub-division.

(<https://www.mapsofindia.com/maps/nagaland/districts/mon.html>)

1.6. The Tobu People

The Tobu people are members of the Konyak tribe, situated within the Tobu sub-division, under Mon District in Nagaland. Since time immemorial, the Tobu people have been recognized as *Shamyoungyoungmang Ojeanghong*, encompassing various villages. Among these, there are seven principal villages and fourteen recognized sub-villages (refer the introduction section for the village names). This specific range is referred to by the local population as the Tobu Area. The term ‘Tobu’ originates from the dialect specific to Tobu Village, where it denotes an ‘elevated portion’ or ‘hilltop’. The residents of the current Tobu Village were historically identified by the term ‘*Youngnyakyanchang*’. However, given the extensive and elaborate nature of the original nomenclature for a relatively modest term, a decision was made to adopt a shorter and more concise version, hence abbreviated as Tobu Chang or Tobu Village. Henceforth, Tobu Town was incorporated into their territorial jurisdiction. As per the records narrated, The Government Nagaland has designated Tobu town as one of the sub-divisions within the Mon district in the year 1990 under the administrative set up headed by Additional Deputy Commissioner. In general, the Tobu town, Tobu village, and all the comprising villages within this range are collectively referred to under the umbrella nomenclature called Tobu or Tobu Area/range. Tobu sub-division of Mon District, Nagaland is situated in the South-East of Mon District bounded by the same topographical region of Mon in the North, Myanmar on the East, Longleng on the West and Tuensang on the South. The mother tongue of the Tobu is locally termed as *Youngmang ngao* or *Tobu ngao*. Currently, the Tobu variety is recognized as a dialect of Konyak. However, from a sociolinguistic perspective, it is challenging to definitively classify it as either a dialect or a distinct language of Konyak. The classification of the Tobu language as a dialect cannot be substantiated due to the absence of mutual intelligibility between Tobu and the majority of the Konyak mother tongues. To establish Tobu Ngao or the Tobu variety as a distinct language necessitates comprehensive research encompassing all linguistic dimensions. In addition, it is essential to conduct thorough investigation in order to substantiate the classification of Tobu Ngao or Tobu as a separate language. Therefore, this thesis also endeavours to examine the differences and similarities between this linguistic variety and the standard Konyak at the phonological level, with the goal of contributing to further research endeavours.

1.7. The Wakching village

Wakching village is situated within the administrative jurisdiction of the Wakching Circle, in the Mon District of Nagaland, India. The location is positioned at one kilometre from sub-district Wakching headquarter (tehsildar office) and is thirty-one kilometres away from the district administrative center of Mon. The contemporary Wakching village was formerly referred to as *Wangyong Ching*, a nomenclature rooted in the indigenous terminology, where 'yang' signifies 'tree' and 'yong' denotes 'big'. Consequently, the term 'Yangyong' translates to 'big tree', a reference to the prominent tree that once stood at the center of the village. Based on accounts from several villagers, it has been elucidated that the contemporary Wakching Village is situated on a mountain's cliff. Consequently, the nomenclature "Wakching" is derived from two distinct terms: 'wak', signifying 'cliff,' and 'ching', denoting 'village'. Based on the comprehensive analysis of the collected data, it becomes evident that the historical nomenclature of the contemporary Wakching village was originally 'Wangyong Ching/yangyong ching'. This narrative can likewise be traced throughout the folk songs and folklores that have been articulated since time immemorial. The Wakching village is situated at the North-west of Mon District bounded by *Shiyong* and *Tanhai* on the east, *Wanching* on the West, *Kongan* on the North and *Chingtang* on the South. Its altitude is 1030 metres and area covering 4 ½ sq. kms. 'Wakching has a total population of 2,462 peoples, out of which male population is 1,219 while female population is 1,243. Literacy rate of Wakching village is 48.01% out of which 56.77% males and 39.42% females are literate. There are about 378 houses in Wakching village.' (<https://villageinfo.in/nagaland/mon/wakching/wakching.html>). The language used by the Wakching villagers has been standardized, and its village language is now used as the Common Language and the official language of the Konyak tribe.

1.8. The Konyak Language

Konyak common Ngao or Konyak common language is the nomenclature given to the language utilised by the Konyak tribe. It has been noted during the fieldwork that the Konyak tribe speak multiple languages collectively rather than just one. Only a small number of studies have been conducted in this tribe's languages or dialects up to this point, and all the records show that they have a range of dialects; yet, given how incomprehensible the dialects are to one another, it is impossible to conclude that the Konyak people speak a single language. Even if the communities are only a few kilometres away, it has been noted that they speak unintelligible languages to one another. Fürer-Haimendorf (1969)

documented a phenomenon wherein women who remained solely within their own villages exhibited an inability to comprehend the dialects of adjacent communities. Specifically, the dialects of Shiong and Wakching, although only separated by an hour's march, displayed distinct linguistic characteristics with minimal similarities. As a result, standardisation occurred due to the presence of numerous mother tongues within the tribe that lacked significant similarities. The Wakching variety is regarded as the tribe's standard language. According to Grierson, in the *Linguistic Survey of India* (Volume-iii: Part ii, 1851-1941), the Wakching variety was referred to as *Angwanku or Tableng*. Furthermore, Grierson said in his book that the term '*Tableng*' was given to the tribe by the British. The Konyak Shüpu Council (Konyak Union Council) officially designated the Wakching variety as the standard Konyak in 1951. This decision was made in the presence of leaders from various Konyak subgroups, including Wakching, Wanching, Tamlu, Kongan, Shiyong, Tanhai, Chingtang, Oting, Pongkong, Wangla, Longlam, Lapa, Chi, and Mon (Konyak, 2008, p. 195). "One possible reason why they adopted the Wakching dialect could be possibly due to the arrival of the Whites (English Missionary) during the 19th and 20th Century particularly in Ngamsang Village and Wakching Village while missionaries began writing books using this dialect gradually becoming the norm of writing to teach the non-native learners." (Besa, 2020). According to another account narrated by a native individual, because the Konyak Tribe consists of numerous villages that speak distinct and markedly unintelligible dialects, there arises a necessity for the establishment of a common language to serve various purposes. Recognizing the requirements, the Wakching variety appeared to be the rarest and most peculiar among all the varieties. The linguistic varieties utilized in various villages exhibit both lexical similarities and dissimilarities. Therefore, if a particular dialect were selected from among these, it is foreseeable that contention might arise between the different villages. Each village might assert the authenticity of its own dialect while challenging the legitimacy of others, proclaiming 'only my village variety is genuine, and yours is not'. Consequently, given that Wakching exhibits a minimal likelihood of comparison and contrast with other varieties, The tribe unanimously selected this language to serve as their common linguistic standard, thereby fostering a sense of unity and promoting peaceful co-existence.

1.9. Status of the Standard Konyak

The Konyak language is classified as a member of the Tibeto-Burman Language Family. It is one of the most overlooked languages globally. Based on the Atlas of the World's languages in danger, the Konyak language is currently classified as being in a vulnerable state. According to the 2011 Census, there are 244,477 individuals who speak this language. The current figures may have changed, but a fresh census can determine if the number of speakers has fallen or increased. The number of speakers is believed to have grown due to the inclusion of this language in school curricula, and the churches are constantly playing a significant role in instructing individuals in the standard language.

The standard Konyak is mostly spoken by the villages of Wakching and Wanching as it is their native mother tongue, and a number of speakers may be from other villages who consciously learnt it by various means. To date, there has been a lack of comprehensive research on the Konyak standard, with just a few books and brief studies performed by international scholars and Naga researchers, primarily from tribes outside the Konyak community. This can be attributed to the intricacies resulting from the numerous language differences within the tribe, which have posed a significant hindrance for the people to research effectively in this language. In the 19th and 20th centuries, the Konyak population lacked awareness of their linguistic identity. They possessed a wealth of oral literature but did not document it in written form. The villages, as a collective, predominantly maintained a primitive perspective, residing in antiquated societies and failing to establish any means to advance their language and culture. Another contributing element could be the fragmentation of a single race into numerous smaller communities. Due to different reasons, these communities largely remained isolated from each other, resulting in a lack of linguistic connection between the villages. The lifestyle and social environment of human cultures evolve spontaneously; however, language does not undergo the same process. However, in the present day, this language has been utilised for other translations, particularly in religious texts such as the Bible and Hymns. The Government of Nagaland has implemented the School Education programme, which includes the development of school books in this language. These books are taught as a subject in schools up to the 8th standard. According to the sources, textbooks for students in the 9th and 10th grades are currently being developed and are expected to be made available to pupils in schools soon. The Konyak Literary Board (KLB), Konyak Baptist Bumeinok Bangjum (KBBB), and Konyak Union (KU) are each making noteworthy contributions to the development of the language through their distinct approaches, which include providing financial support for language initiatives,

producing Sunday School Textbooks, promoting language learning among young people, and publishing religious literature in the language. These contributions collectively suggest that this language is undergoing a progressive evolution and is not in a static state in the present scenario.

1.10. The linguistic situation

The linguistic situation in Konyak territory can be analysed from multiple perspectives, which include the presence of diverse and incomprehensible mother languages, and language politics.

If two dialects are mutually unintelligible, are they considered two different languages? This question frequently arises when discussing the language state of the Konyak Tribe. Due to the absence of thorough investigation, there is no conclusive response to that inquiry. It is uncertain if the divergent dialects are indeed two separate languages or a situation of dialect continua.

As per the data, the Konyak land comprises of 2 regions, 10 areas, and approximately 112 villages, with some of them already designated as towns. The two regions consist of an upper region and a lower region, each of which is subdivided into 10 distinct areas. Within these regions, they are approximately subdivided into around 112 villages/towns. Remarkably, nearly all the villages possess their own distinct mother tongues, which are largely incomprehensible to one another. Consequently, the distinction between language and dialect cannot be clearly drawn, as many of the languages spoken within the community are mutually unintelligible, while others are mutually intelligible. Due to the intricate nature of the situation, it is necessary for individuals to embrace more of other languages that are already part of the community's linguistic repertoire. Currently, learning foreign languages has become conveniently attainable due to their inclusion in school curricula and widespread usage throughout the state. Learning foreign languages like English, Nagamese and others is comparatively easier than acquiring proficiency in all the native languages spoken within a society. This creates one significant aspect that influences linguistic shifts in Konyak land.

The presence of linguistic politics inside the Konyak land is evident. Given the strong evidence of language distinctions, it becomes necessary to address these inequalities inside the political sphere, with the government intervening in the situation. An instance of this may be seen in the implementation of English as the primary language used for teaching in educational institutions such as schools, colleges, and universities. The Government's

language policy in the education sector has had a positive impact on people in multiple ways. However, individuals are now more inclined to learn the global language rather than local languages because they believe that having English communication skills will make them globally competitive and increase their chances of securing better job opportunities. During the research conducted utilising the observation approach, it was noted that certain individuals exhibit a preference for using the English language even in familial settings. When asked why they use the English language at home, their comments point to the elevated standing of English, which is seen as more prestigious than the local languages. In addition, within the Mon district, there is a noticeable predominance of Nagamese, Hindi, and English over the indigenous language. This linguistic trend indicates a shift in language preference and usage within the community. For example, when two Konyak individuals from different villages encounter one another, they are commonly observed conversing in either Nagamese or another foreign language instead of their native tongue.

1.11. Language usage domain

A survey was conducted to check the language usage percentage within the Mon District. Questionnaires were distributed to 200 subjects, 110 were males and 90 were females. Three age groups were distinguished: the young, the middle age and the elderly. All the subjects were from various walks of life including adolescent, students, professionals, daily wagers, social workers, business people, and homemakers. The table below represents the language usage domain within Mon district. The survey shows that the percentage of using Nagamese and English weigh more than the local languages at official institution, market, social-media and for reading and writing purposes. The percentage of using village variety weighs more at home domain. The percentage of using Standard Konyak weighs more at Church domain. The rest of the percentages shows distributed values.

Domains	Village variety	Standard Konyak	Both the village dialect and Standard Konyak	Nagamese	Hindi	English	Other	Languages I speak
At home	73.2 %	11%	5%	5%	-	5%	0.8%	

Official Institution	-	4.8%	-	22%	-	73.2%	-	
Market	2.7%	3%	-	93.3%	-	1%	-	
Local Church	-	86.6%	0.4%	10%	-	3%	-	
While praying	35.4%	31.7%	10%	-	-	20.7%	2%	
Reading and Writing	-	13.4%	-	-		86.6%	-	
Social media	1.8%	5%		3%		76.8%		13.4%

Table 1.1: language usage domain.

1.12. Language Classifications

Many researchers and authors have classified the Konyak Language, and some of the classifications are presented below:

Grierson's classification:

Grierson (LSI, VOL.111:1903) classified the Naga group of Languages into three groups: Western group, Central group, and Eastern group. Konyak falls under Eastern group. In his classification, he mentioned 'Konyak' as *Tableng*.

Marrison's Classification of Konyak Dialects:

Marrison has classified 24 dialects of Konyak such as Aopao, Changaya, Chen, Chingkso, Chinglang, Longkhai, Choka, Elokidoria, Takphang, Kongson, Longching, Longmein, Longwa, Mohung, Mon, Mulung, Ngangching, Sang, Shalang, Shayno, Tolamleinyo, and Totak. The current understanding of Marrison's categorization is limited due to changes in the nomenclature of several dialects and the omission of numerous dialects in his classification. For example, the present generation of Konyak individuals

may not be aware of the dialect called "Elokidoria" beyond their group. Additionally, they failed to acknowledge significant varieties such as Tobu, Wakching, and Tizit, which have a substantial number of speakers.

In addition, Marrison (1967) classified the Naga Languages Family into three distinct categories: type A, which encompasses subtypes A1 to A2; type B, which includes subtypes B1 to B3; and type C, which comprises subtypes C1 to C2. The items are organised in a northeast-to-southwest orientation. He categorised the Konyak language as Type A.2.

TYPE A.2 consists of Konyak, Phom, and Chang, spoken in the northern part of the Tuensang district and of Nagaland.

Scot De Lancy's Classification:

Scot De Lancy (1987) classified Tibeto-Burman languages into several groups, including Tibeto-Himalayan, North Assam, and Assam-Burmese. The Assam-Burmese branch is further divided into multiple subgroups, with Konyak falling under the Naga group.

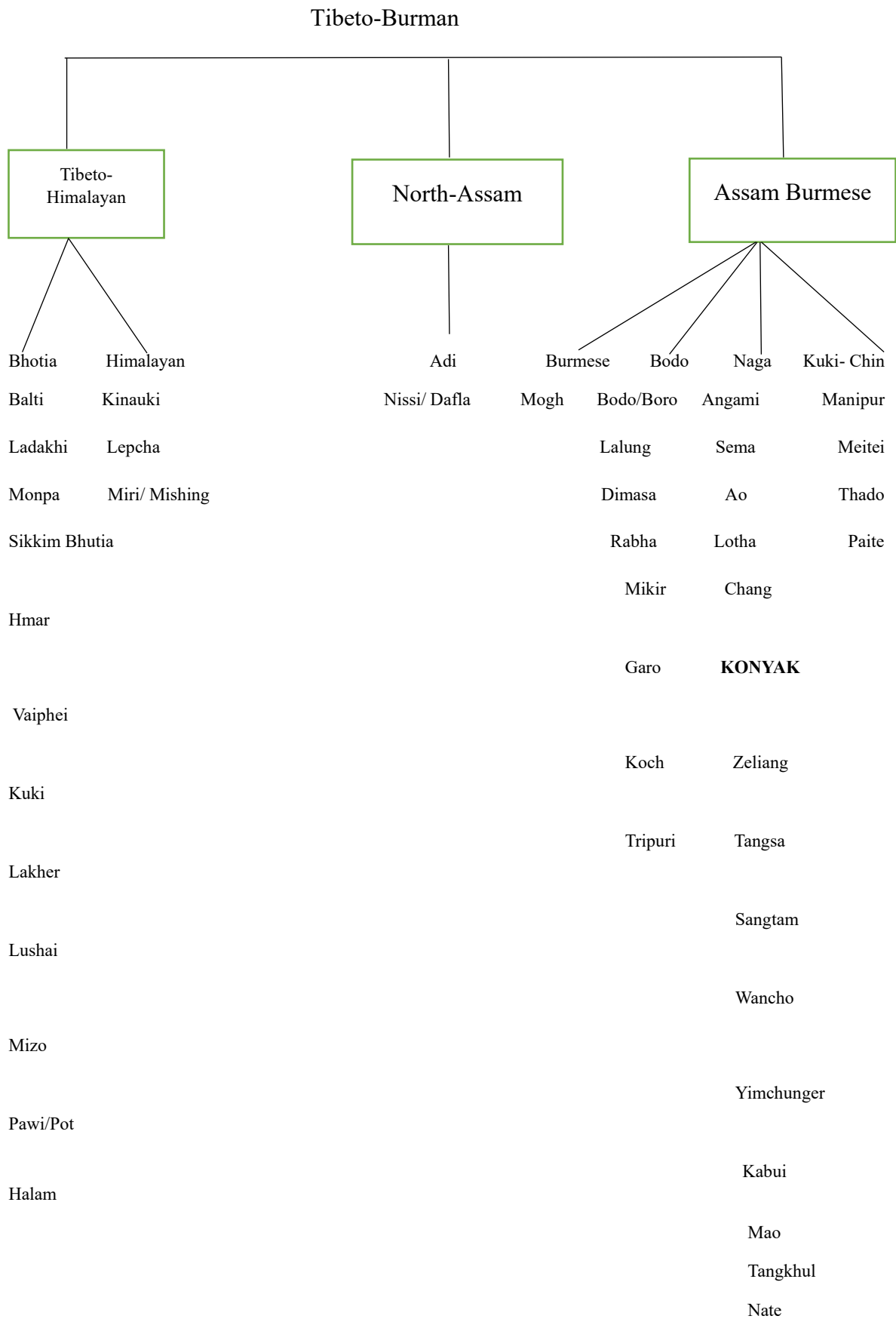


Fig 1.3: The Classification of Tibeto-Burman of Scot De Lancy (1987).

1.13. Methodology and data collection

The methodology employed for Chapter 1 involved mixed-method research, which entailed the utilisation of both qualitative and quantitative data. To collect the data, a questionnaire containing both open-ended and close-ended questions was distributed to one hundred participants, comprising both males and females aged between 20 to 60. The purpose was to gain insights into the linguistic situation of the community and obtain quantitative figures necessary for discussion within the thesis. The interview and observation methods were employed to acquire information regarding the language's status. The primary data utilised in this study were obtained using questionnaires, interviews, and observations. Secondary data was obtained and investigated using published materials. The data for the subsequent chapters was gathered through fieldwork. Data elicitation technique was employed for the following chapters. The fieldwork was conducted in Mon Town, the administrative centre of Mon District, Wakching town and Wakching village as well as Tobu Town, which is part of the Mon Sub Division. If there was a requirement for data in an emergency, the individuals who are speakers of the varieties living in Mokokchung and Kohima were requested. The informants chosen encompassed individuals of diverse ages, comprising both males and females. Data was gathered from individuals who are speakers of Wakching and Tobu, individuals who possess a high level of proficiency in their dialects. The data collected during the fieldwork was used as primary data as there is not much linguistic research conducted in both varieties. For the secondary data, published materials, dictionaries and books written in native language were used. Data collection includes word lists, sentences, recording of folktales, sermons, and natural conversations. A total of 3000 wordlists, 500 sentences, 3 audio folktales, and 2 audio sermons, along with various recordings of natural sermons, conversations were utilised to analyse the Konyak Standard Phonology. For the Tobu Phonology, 3000 wordlists, 400 sentences, 5 audio folktales, and 2 audio sermons, along with various recordings of natural conversation, were employed. The acoustic analysis was conducted using Praat version 6.3.02 (November 29, 2022). The recording equipment comprises the TASCAM DR-100 MK ii and the Voice Recorder (version 3.20) software installed on a Samsung S22 device. The audio files were recorded at Nagaland University's Semi-professional recording studio by inviting native informants to the studio.

1.14. Statement of the Problem

Tobu and Wakching (Standard Konyak) are classified as different varieties of the Konyak Language. However, there is a significant lack of mutual intelligibility between these two varieties. This raises the question of why two variations of the same language exhibit such a high level of unintelligibility. Due to the lack of linguistic research on the Tobu variety and the limited linguistic study of the standard Konyak, it is challenging to determine the causes for the high level of unintelligibility. Hence, this research will aid in identifying why they are so unintelligible at least at the phonological level. Additionally, it will facilitate the automatic advancement of the Konyak language.

The Konyak community encounters a challenge in the realm of language, namely in the domain of orthography. The Konyak language embraced the Roman Script for writing. However, it has been observed that the Roman Script is incapable of adequately depicting all the sounds of the Konyak standard language, resulting in spelling mismatch. There is a lack of consistency in the spelling patterns of the language. The employment of different spelling systems by authors in the language leads to confusion, which is a significant issue with the language's writing system. Also, the Konyak language is tonal, with tones playing a key role in both lexical and grammatical distinctions; furthermore, a comprehensive dictionary has not yet been built for this language. Without resolving the issues about the language's sound system, the prospect of creating a dictionary in the foreseeable future will be unattainable. Another issue that needs to be addressed is that this language has not been thoroughly researched or documented, yet it is being used in school curriculum. Difficulties arise during the development of educational textbooks for students due to the necessity of including accurate information in the content. For instance, to determine the number of vowels and consonants, as well as the syllables in a language, it is necessary to have a phonemic inventory and a constructed syllable structure; However, if there is no definitive reference material accessible, it becomes unfeasible to provide the necessary information. Hence, this research endeavours to effectively tackle the challenges.

Another significant issue is that the Tobu language variety remains undocumented, with not a single linguistic study having been conducted on it. Furthermore, due to the standardization of a single variety, specifically Wakching, among various linguistic varieties, there is a considerable risk that the remaining varieties may be marginalized or neglected within the scope of linguistic research. Therefore, this thesis aims to document the phonological system of these underrepresented varieties to facilitate the development of orthography and to mitigate the risk of their endangerment.

1.15. Objective of the research

- To investigate the phonology of Tobu.
- To analyse phonological features of the Konyak standard language and the Tobu dialect to identify their parallels and differences.

1.16. Organization of the chapters

This thesis will be organized in to five main chapters which are overviewed below:

Chapter 1 of the thesis will be the introduction of the thesis. In this chapter, geographical location, demographic status, about the people, location of the research conducted, language status, linguistic situation of the people, language family classification, statement of problem, methodology and objective of the research will be covered.

Chapter 2 of the thesis will be the review of literature. Literatures related to the language and the people will be reviewed in one section. On the next section, literature related to phonological studies will be reviewed.

Chapter 3 of the thesis will be the Phonology of the Tobu. In this chapter, various phonological aspects of Tobu will be discussed and presented.

Chapter 4 of this thesis will present a comparative analysis of the phonological systems of Tobu and Standard Konyak. In this chapter, the existing phonological research on Standard Konyak will be utilized as a comparative component to compare with the phonological analysis of Tobu conducted by the researcher in this thesis.

Chapter 5 of the thesis will present the findings and conclusion of the thesis.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter reviews literature in two distinct sections. The first segment will encompass a comprehensive literature review of the Konyak language. It can be stated that only limited number of linguistic works are available in the Standard Konyak; all efforts have been made to avail those literature. The second section will constitute a literature review of phonological research and books, which has been instrumental in structuring this thesis through the application of diverse knowledge derived from the works.

2.1. Literature Review on Konyak Language

Like many tribal languages in the North East India region, the first linguistic work dates to Grierson (1903). In the Linguistic Survey of India, Volume 3, Tibeto-Burman family, Part 2- specimen of the Bodo, Naga, and Kachin group (1903), G.A Grierson referred to Konyak as Angwanku or Tableng, classifying it as part of the Eastern Group. He also stated that the British named Tableng upon Wanching and Wakching. Grierson's work in this volume includes the early attempts at providing a written representation of Konyak, using the Roman alphabet. He stated that at the time, Konyak had no standardized orthography. While Grierson's transcription offers a helpful starting point, modern orthographies of Konyak have evolved, with local adaptations and refinements, especially to better capture the tonal and phonetic nuances of the language. In his survey, he stated that he was unable to create a grammatical sketch due to a lack of material. However, he did provide a list of words in which the main forms are connected. The word list includes fundamental numerals, pronouns, anatomical parts, and a few kinship concepts.

Bradley (1977), categorizes the Konyak language within the North-East India/Sal subgroup. This classification is significant as it provides a structured understanding of the linguistic framework in the region. In his scholarly work, he noted that the term 'Sal', denoting a subgroup within the Tibeto-Burman linguistic family, was attributed to Burling (1983). In his work, it has been noted that the Konyak community constitutes the largest 'Naga' group in India, comprising over 90,000 speakers. Additionally, he mentioned about an existing minor population of speakers in the areas of Burma. He also notes the Wakching dialect as the standard variety of Konyak.

Nagaraja (2010) is one of the early works on the Konyak grammar. The book broadly covers topics in phonology, morphology and syntax. This work majorly focused on morphology. The discussion on phonology covers the phonemic inventory, contrasting sounds, speech sound descriptions, distribution of phonemes, and phonetic drills. He pointed out that Konyak has a total of seven vowel phonemes and sixteen consonant phonemes. The vowel phonemes in his phonemic inventory consist of two front vowels, namely /i/ and /e/, three central vowels, namely /ɨ/, /ə/, and /a/, and three back vowels, namely /u/ and /o/. The consonant phonemes in his repertoire consist of five stops: /p/, /t/, /c/, /k/, and /ʔ/; two aspirated stops: /p^h/ and /k^h/; four nasals: /m/, /n/, /ɲ/, /ŋ/; two fricatives: /s/ and /h/; one lateral: /l/; and two continuants: /w/ and /y/.

Besa (2017) discussed the phonology of Konyak Standard where she discussed having 21 consonants, 11 vowels and six diphthongs. She has further discussed that Konyak has three register tones, namely high, low and mid.

Ezung (2023) conducted a phonological investigation of the seventeen state-recognized languages of Nagaland. This investigation was followed by a comparative study. The findings of this research were presented in a report titled "A Comparative Investigation of the Tibeto-Burman Languages of Nagaland," which was sponsored by the TRI Department of Art and Culture, Government of Nagaland. The study undertakes a comprehensive analysis of the 17 officially recognized languages of Nagaland, with particular emphasis on the segmental elements of their phonological systems. Specific attention is given to the examination of vowels, consonants, diphthongs, and syllables. Within the phonological frameworks of seventeen languages, it has been noted that the Konyak language distinguishes itself by featuring three distinct tones. The language further comprises four syllable structures, eight diphthongs, ten vowel phonemes, and eighteen consonantal sounds.

Walling and Besa (2024), offers a comprehensive and meticulous analysis of the grammatical structures within the Konyak language. The book addresses a significant component of linguistic study. The initial chapter of the book delves into the phonological system of the Konyak standard, with particular emphasis on the phonemic inventories and tonal characteristics of the language. This chapter further explores the syllable structure, phonological processes, and provides an acoustic analysis of consonants, specifically

focusing on Voice Onset Time (VOT), vowels and tone. Their work has examined and identified that Standard Konyak encompasses 17 pure consonants, 2 marginal consonants, and 5 consonants exhibiting free variation. Moreover, in their analysis of the vowel inventory, they have identified six pure vowels, ten diphthongs. Also at the suprasegmental levels, three register tones, and four primary syllable structures were identified. Additionally, this study provides a thorough discussion of the morphosyntax of Standard Konyak, including a clear analysis of word classes, noun morphology, and verb morphology in the language.

Chingang (2015) has compiled a bilingual dictionary, translating from English to Konyak, entitled "Konyak Ngaojong" (Konyak Dictionary). This dictionary currently stands as the sole comprehensive lexicon available. It is employed extensively as a reference for vocabulary in translation activities and other language-related endeavours. The lexical entry is composed in the English language and its corresponding meaning is elucidated in Konyak Standard.

2.2. Review of literature on phonology

Meyer (2009) presents a structured approach to the study of English. It adopts a top-down approach, starting from larger linguistic units (texts) and moving towards smaller ones (phonemes). Unlike conventional bottom-up approaches, the author argues that smaller linguistic units are better understood in the context of larger structures. The book is divided into two sections: (1) general characteristics of English and (2) grammatical characteristics, with seven chapters focusing on various linguistic aspects. The final chapters focus on the on the sounds of English, particularly speech sounds and suprasegmentals. It classifies phonemes based on:

- Voicing (b in bat is voiced, p in pat is voiceless),
- Place of articulation (th in thin is dental, k in cat is velar),
- Manner of articulation ('f' in fish is a fricative, 'ch' in chat is an affricate).

The author explains that a speech sound's distinctiveness can be determined by analyzing minimal pairs—words that differ by only one phoneme in the same position. For example, in the words *bat* and *cat*, the second and third sounds remain the same (/æ/ and /t/), while the initial sounds differ: *bat* starts with /b/, and *cat* starts with /k/. Since *bat* and *cat* have

different meanings, this demonstrates that /b/ and /k/ function as distinct phonemes in English. This book explores syllable structure, which is made up of three parts: the onset, the nucleus, and the coda. For instance, in the word 'hat', the nucleus is the vowel /æ/, the onset is /h/, and the coda is /t/. It also delves into phonotactics, explaining that /p/ can appear alone in the onset, as in /pæt/ or in the coda, as in /tæp/. Additionally, /p/ can follow /s/ in the onset, as in /spæt/, but it cannot precede /s/ in the onset (e.g., */psæt/). The author also covers stress, providing examples such as 'con.cert' (with stress on the penultimate syllable), 're.place.a.ble' (antepenultimate stress), and 're.ceive' (with stress on the ultimate syllable). The discussion extends to intonation, which looks at pitch and stress patterns across groups of words within a tone unit with excerpts such as, 'I couldn't REAlly //let my company DO this //' (London-Lund S.12.6.758-759), where tone unit boundaries are marked by two vertical lines //, and syllables with the highest pitch and stress are written in uppercase and bold type.

Katamba (1989), provides a comprehensive exploration of theoretical concepts in the field of phonology. This book particularly focuses on the utilization of speech sounds to convey meaning. Moreover, it engages in phonological analysis and addresses theoretical issues. The book is structured according to the principles of generative phonology. This scholarly volume encompasses a comprehensive examination of various phonological dimensions, including the concept of the phoneme, distinctive features, phonological representation, phonological processes, and natural phonology. It further delves into the structure of syllables, the mechanisms of stress and intonation, as well as the intricate interactions between phonological rules. He provides a historical overview of phonological theories, tracing the development from structuralism to generative phonology and the various debates surrounding the nature of sound systems. The author also highlights the importance of phonology in understanding linguistic competence and the mental representation of sound. In contrast to earlier structuralist models that emphasized the categorization of sound units (phonemes), the author introduces the generative approach, primarily informed by Noam Chomsky and Morris Halle's (1968) work in *The Sound Pattern of English*. He emphasizes how generative phonology provides a formal framework for understanding sound patterns, which can be generated through specific rules or principles.

The book defines phonemes as the smallest units of sound that can distinguish meaning in a language. This is a cornerstone of phonological theory, as phonemes operate as the basic building blocks for sound systems across languages. He also outlined the basic procedures for identifying the phonemes through minimal pair test with examples such as ‘read-lead’, ‘mice-nice’, and ‘buck-bug’ etc. where the forms show minimal pairs in which /l/ and /ɫ/, /m/ and /n/ and /k/ and /g/ contrast in identical environments and are therefore considered as distinct phonemes. The book also explores the SPE system of distinctive features that define phonemes, such as their ability to contrast and differentiate words. The SPE features are binary, meaning they exist in one of two possible states: for example, [±voice], [±nasal], and [±continuant]. A phoneme is a bundle of such features, and by varying these features, languages create different phonemes and, consequently, different words. The author further explores how the SPE system organizes distinctive features into categories. These include major class features such as [± cons], [± syllabic], [± sonorant]; cavity features like [± coronal], [± anterior], [± labial], [± distributed]; tongue body features such as [± high], [± low], [± back], [± velar suction]; tongue root features including [± ATR], [± tense]; laryngeal features like [± spread], [± constr], [± voice]; manner features such as [± cont], [± lateral], [± nasal], [± strident]; and prosodic features like [± long], [± stress], [± high], [± mid], [± low], [± rising], [± falling], [± fall-rise].

The author’s treatment of phonemes is not merely descriptive but deeply theoretical, engaging with issues such as the notion of allophonic variation and the way in which underlying phonemes give rise to different surface forms in speech. The notion of underlying vs. surface representations is critical in generative phonology, and the author does an excellent job of elucidating this distinction, providing readers with a clear understanding of the abstract nature of phonological rules. A wide array of phonological processes that languages exhibit is also discussed. These include processes like assimilation where he used the example of the regular plural ending in English such as [-s] as in [pet-s] pets, or as [-z] as in [bel-z] bells or even as [-iz] as in [rau-z-iz] roses. He further explains clearly about various process of assimilation such as palatalisation, labialisation, voice assimilation, and nasalization. The author emphasizes how these processes help to explain the dynamic and context-dependent nature of speech sounds. One of the major contributions of this work is his examination of the underlying mechanisms that govern these processes. Through detailed examples and theoretical discussion, he shows how phonological processes can be captured through rules, constraints, and representations within generative

frameworks. The book moves beyond merely presenting these processes as phenomena, offering a deeper understanding of how they are linked to the internal cognitive models of language users. For example, in the case of assimilation, he explains how one sound may change to become more similar to an adjacent sound. He highlights how this process is not arbitrary, but rather influenced by phonetic and phonological constraints, and it is motivated by efficiency and ease of articulation. A significant portion of the book is dedicated to syllable structure and stress, which are key elements in phonology. He presents a detailed analysis of how syllables are organized and the role of stress in determining the rhythm and intonation of languages. The author describes various representations of the syllable structure such as, the modern hierarchical branching structure of syllables in the framework of a multi-tiered phonological theory proposed by Kiparsky (1979), Halle and Vergnaud (1980), Steriade (1982) and Harris (1983), breaking them down into onset (O), nucleus (N), rhyme (R), and margin (M). On this view, syllable structure has been represented in his book as below:

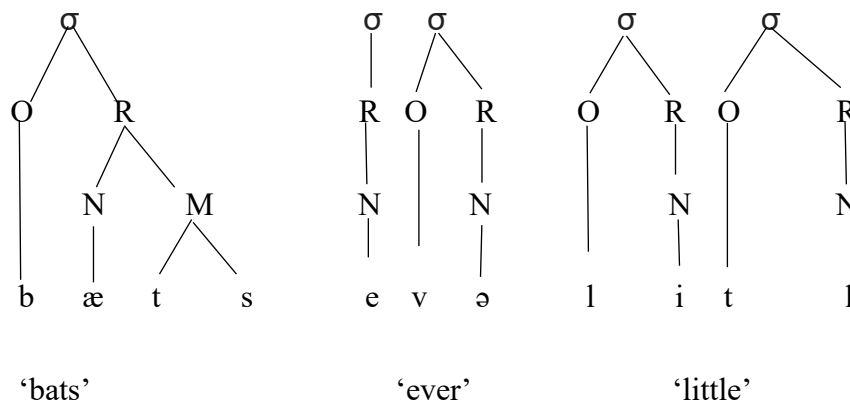


Fig. 2.1: Syllable structure (Page. 154)

He also addresses the concept of stress within languages, noting that stress patterns are often a significant aspect of phonological analysis. He discusses various theories of stress placement and how stress can alter the meaning of a word or sentence. This is particularly evident in languages with fixed stress patterns versus those that are stress-timed or syllable-timed. The author offers insight into how stress interacts with the syntax of a language, linking it to other elements of linguistic structure. In addition to the theoretical insights, Katamba's *Introduction to Phonology* is also noted for its pedagogical value. The book is well-structured for educational purposes, providing clear definitions, examples, and exercises that allow students to apply phonological theories to real-world data. The author's

approach is both accessible and rigorous, making it suitable for beginners as well as more advanced learners of phonology. His writing is complemented by illustrative examples from a wide range of languages, demonstrating the universal and language-specific aspects of phonological systems. This cross-linguistic approach helps readers appreciate the diversity of sound systems while also grasping the common principles that underlie all languages.

Gussenhoven and Jacobs (2017), offers a lucid, accessible, and comprehensive introduction to the field of phonology. It introduces fundamental concepts and provides an exhaustive account of various phonological issues, including segmental contrasts, syllables and moras, quantity, tone, intonation, and stress. Furthermore, it addresses feature geometry and the prosodic constituent structure, thereby offering an extensive overview of the subject matter. The authors also emphasize the cognitive aspects of phonology, positioning it as a crucial domain of linguistic competence that interacts with other cognitive systems in the brain. Unlike earlier approaches that focused heavily on the formal properties of phonological systems, the authors bring attention to the role of phonology in both speech perception and production, linking it to broader linguistic and cognitive theories. The authors begin the preliminary chapters with an in-depth discussion on the speech production process, highlighting the roles of various body organs involved, such as the lungs, larynx, vocal cords, and pharynx, as well as different types of articulations enumerating the detailed characteristics of varying sounds and how they are produced. The initial chapters are crucial for readers to grasp the content of the subsequent chapters, and to facilitate this understanding, the authors reference other research works such as Laver (1994), Clements (1989), among others. In the following chapters, the book focuses on the phonological processes applied to loanwords. The chapter outlines two primary approaches: the rule-based approach and the constraint-based approach. It primarily examines the Hawaiian language, which can be particularly challenging for most students. They introduce readers to the idea that phonemes are mental representations that exist in the minds of speakers and are the key to understanding patterns of sound variation within language. The authors explore the relationship between underlying and surface representations, emphasizing how phonological rules explain the differences in phoneme articulation depending on the context. They differentiate allophonic variations from situation-dependent 'stylistic variation,' noting that the surface pronunciation of a word is predictable since segment pronunciation can change based on the phonological context in which it occurs. These allophonic variations cannot be included in the underlying representations of morphemes

because they are automatically determined in the surface representations. Two factors account for this variation: style or the level of formality in the speech situation, and the phonological context. For example, in American English, the word ‘right!’ may feature an unreleased final plosive in casual speech, while in more formal speech, the [t] may be fully released. The second factor involves variation in phonological context. For instance, in British English, the /l/ phoneme has two distinct pronunciations. When it occurs at the beginning of a word (onset), it is pronounced as an alveolar lateral approximant, as in ‘leek’ or ‘follow,’ known as the clear /l/. However, in the coda, as in ‘ill’ or ‘cold,’ the alveolar contact is combined with retraction of the tongue towards the uvula, producing a sound represented by [ɫ], commonly referred to as the dark /l/. Another core discussion in the book is the ordered rules where they deal with the formal notations for writing the rules introduced by Chomsky and Halle (1968) (SPE) and also the assumption that rules are ordered, whereby the output of one rule serves as the input to the next, allows for simple phonological generalizations. Another important theme in ‘Understanding Phonology’ is the examination of syllable structure and prosody. The authors provide an in-depth exploration of how syllables function within the larger structure of words and phrases. They discuss the basic elements of syllables (onset, nucleus, coda) and their role in shaping word structure, highlighting the way in which syllables interact with other phonological processes such as stress and intonation. The authors also delve into the study of prosody—patterns of stress, pitch, and rhythm that affect the larger organization of language. Their discussion of prosodic elements such as intonation, stress, and tone demonstrate the authors’ ability to connect phonology with other aspects of linguistic analysis. They demonstrate how prosody contributes not only to the rhythmic and melodic aspects of language but also to its meaning, offering examples from languages with varied prosodic features. The authors explain how prosodic features can be represented within phonological theories, showing the distinction between linguistic tone, stress, and intonation. Their coverage of the role of prosody in discourse and sentence-level meaning is especially valuable for understanding the interface between phonology and other components of language. This book covers key concepts such as the nature of phonological representations, rule-based transformations, and the interaction of sound patterns in different languages. By integrating clear examples and explanations of phonological processes, the authors offer readers a solid foundation in classical generative phonology. The book also presents complex ideas like rule ordering and underlying versus surface representations in an approachable manner, making it an essential resource for students and anyone interested in the mechanics of spoken language.

Pascal Van Lieshout (2003) serves as a comprehensible guide for users seeking to master Praat. One of the central themes of the tutorial is the analysis of speech signals, including visualization tools that *Praat* offers. The tutorial introduces fundamental concepts in speech analysis, such as waveforms and spectrograms, and explains how users can interpret these visual representations to understand the underlying phonetic properties of speech.

- Waveform analysis: The tutorial details how to inspect the waveform of an audio file, helping users understand the temporal properties of speech, such as duration and amplitude.
- Spectrogram analysis: Van Lieshout delves into spectrograms, which display the frequency content of speech signals over time. He explains how to interpret spectrograms and use them to identify important phonetic features, such as formants, pitch, and harmonics.

By including step-by-step instructions on how to generate and manipulate these visual representations, the tutorial allows users to explore the sound structure of speech in a way that is both accessible and informative. Another important feature of the tutorial is its focus on formant and pitch analysis. The author explains how to extract formants from a speech signal using *Praat*'s built-in algorithms, offering insight into vowel quality, resonance, and articulation. Formant analysis is a critical part of phonetic studies, and *Praat* offers tools that can identify and track formants in speech signals. The author covers how users can extract these formants and analyze their frequency, bandwidth, and movement over time. Additionally, the author explores the pitch analysis features of *Praat*. Pitch is a vital component of prosody, and understanding how to track pitch contours and variations is important for analyzing intonation, stress patterns, and speech rhythm. The tutorial introduces basic pitch extraction techniques, showing how users can measure pitch and visualize it graphically. The tutorial also touches on the synthesis and manipulation of speech using *Praat*. Although this is a more advanced feature, the tutorial gives a brief overview of how to modify speech signals, such as by altering pitch or creating synthetic speech. Users are introduced to the concepts of speech synthesis and editing, which can be useful for creating speech stimuli in experimental settings or for phonetic research. The strength of the "*Praat Short Tutorial*" lies in its accessibility and practical approach. Aimed at beginners, the tutorial provides clear, step-by-step instructions, with each topic broken

down into manageable sections. The language is simple and free from unnecessary jargon, making it easy for newcomers to follow. Additionally, the tutorial includes screenshots and practical examples, allowing readers to apply the concepts as they learn. This approach is particularly helpful for students and researchers in linguistics, phonetics, and speech sciences who are looking to integrate *Praat* into their work but may not have previous experience with speech analysis software. The tutorial does an excellent job of providing a foundational understanding of the software's capabilities without overwhelming the reader with too much technical detail.

CHAPTER 3

TOBU PHONOLOGY

3.1. Overview

This study is the inaugural research endeavour carried out in Tobu. Tobu is classified as a dialect of Konyak, but it differs significantly from other Konyak dialects. Tobu and other dialects of Konyak are not mutually intelligible, except for a small number of shared lexical items. This work aims to develop the phonology of Tobu and compare it with Standard Konyak, examining their similarities and differences at the phonological level. This chapter will discuss the speech sounds of Tobu in three sections: segmental, suprasegmental, and acoustic analysis. The first section will explore the segmental features of Tobu. The second section will include suprasegmental features, including syllable structure and tones. Acoustic features and analysis will be discussed in the third section.

3.2. Segmental phonology: Consonants

This section presents the phonemic inventory of Tobu which include consonants. In phonetic representation, the high-falling tone is marked by circumflex (ˆ), the low tone by grave (ˊ) and the level tone is marked by macron (ˉ).

3.2.1. Classification of consonants

In Tobu, there are clearly twenty attested consonant phonemes. Like any other Consonants, Tobu consonants are produced when the airstream through the vocal track is obstructed somehow. All consonant sounds in Tobu are pulmonic egressive, meaning all consonant sounds are air pushed out through the mouth or the nasals. The presence of velaric egressives and glottalic egressives were not found; however, in some cases, click sounds were detected but they are not pure lexis but sounds that produced during disapproval like ‘tsst’ and while being shock or surprise ‘əhh.’ Also, Tobu do not have attested consonant clusters but consonant clusters occur in onomatopoeia. Since consonant clusters are limited to onomatopoeia, many consonant sequences that occur at syllable boundaries were investigated. The present work detected three voiceless aspirated stops occurring at different places of articulation such as bilabial, alveolar, and velar. Voiced aspiration stops are not detected in Tobu. The aspiration is marked by superscript /^h/ after the voiceless stops and the voice onset time of aspirated consonants is measured and discussed in the acoustic

analysis section. The rest of the consonant phonemes are also classified according to their places of articulation and manner of articulation. In the places of articulation, Tobu consonants are grouped into 8 categories and in the manner of articulation, the consonants are grouped into six categories. The consonantal phonemes are arranged in the table below:

Place → Manner ↓	Bilabial		Labio-dental		Labial-Velar		Alveolar		Post-Alveolar		Palatal		Velar		Glottal	
Plosive	p	b					t						k		ʔ	
Plosive aspirate	p ^h						t ^h						k ^h			
Nasal		m						n				ɲ		ŋ		
Fricative				v			s		ʃ						h	
Affricate											tʃ					
Approximant						w					j					
Lateral Approximant							l									

Table 3.1: Consonant table of Tobu.

3.2.2. Description of consonants

3.2.2.1. Plosives

Description of plosive sounds in Tobu

Plosives in Tobu are produced by completely blocking the air flow and then releasing it at some point in time. The present study has detected five unaspirated plosive consonants and three aspirated plosive consonants. The aspirated plosives are all voiceless and occur at different places of articulation such as /p^h/ in the bilabial place, /t^h/ in the alveolar place and /k^h/ in the velar place. The unaspirated plosives have one voiced sound and four voiceless sounds occurring at different places of articulation. The one voiced plosive is /b/ which occurs at the bilabial place of articulation. The four voiceless plosives are /p/ occurring at the bilabial place, /t/ at the alveolar place, /k/ at the velar place, and /ʔ/ at the glottal place.

Production of Konyak plosive consonants in Tobu

/p/: The sound /p/ appears to be produced with lips closed for a moment to block the airflow and without much delay, the airflow releases through the mouth. When tested by placing a hand on the throat, the vocal cords do not vibrate.

/b/: The sound /b/ is produced with lips closed for a moment to block the airflow and then released through the mouth. When tested by placing a hand on the throat, the vocal cords do not vibrate.

/p^h/: The sound /p^h/ is an aspirated voiceless bilabial plosive. The production of /p^h/ requires the lips to close blocking air from flowing through the mouth and releasing it with an extra puff of breath. The vibration on the vocal tract is not detected.

/t/: The sound /t/ in Tobu is produced with the tip of the tongue touching the alveolar ridge followed by a sudden air release. The cords do not vibrate.

/t^h/: The sound /t^h/ in Tobu is produced with the tip of the tongue touching the alveolar ridge followed by a sudden release of air with an extra puff of breath. The vibration on the vocal tract is not detected.

/k/: The sound /k/ is produced with the back of the tongue raised by touching the soft palate blocking the airstream for a moment, and then air is released by lowering the tongue, and the air rushes out from the mouth producing an explosive sound. The vibration on the vocal tract does not vibrate.

/k^h/: The sound /g/ in Tobu is produced with the back of the tongue raised by touching the soft palate blocking the air stream for a moment, and the air is released by lowering the tongue, and the air rushes out from the mouth with extra puff producing an explosive sound. The vibration on the vocal tract does not vibrate.

/ʔ/: The sound /ʔ/ in Tobu is produced when the vocal folds close tightly to prevent it from flowing through, allowing air pressure to build up behind them. When the vocal fold opens, the air rushes out by stopping glottal vibration, thus producing a sound like a coughing sound.

Contrastive pairs of plosives in Tobu

/p/ is contrastive to all the consonants except for /b/ in Tobu as it sometimes appears as allophones in Tobu.

/p/ vs /p^h/, /t/, /t^h/, /k/, /k^h/, /ʔ/

pō ‘wood’
tō ‘gossip’

pāŋ ‘include’
kāŋ ‘stiff’

pê ‘forget’
k^hê ‘wet’
t^hê ‘mistake’
p^hê ‘divide’

lāp ‘nest’
lāʔ ‘arrow’

/p/ vs /m/, /n/, /ɲ/

pāŋ ‘include’
māŋ ‘dream’

pām ‘thick’
nām ‘you all’

pī ‘half awake’
ɲī ‘husking’

/p/ vs /v/, /s/, /ʃ/, /h/

pè ‘wrap’
vè ‘count’

pāŋ ‘include’
sāŋ ‘sell’

pê ‘forget’
ʃê ‘sleep’

pè ‘wrap’
hè ‘carry’

/p/ vs /w/, /j/

pê ‘kick’
wê ‘hurry’

/p/ vs /l/

pû ‘blow’
lû ‘hide’

/k/ vs /s/, /ʃ/, /l/, /j/, /w/, /n/, /m/, /h/, p/, /ŋ/ /p/

kā ‘door’
sā ‘offspring’
ʃā ‘increase’

lā ‘go’
jā ‘hand raised to strike’
wā ‘roam’
nā ‘exhaust’
mā ‘wound’
hā ‘tooth’
pā ‘kick’
ŋā ‘five’
jā ‘mithun’
tā ‘now’

/t/ vs /p/, /l/, /j/, /ʃ/, /h/, /pʰ/, /v/, /ʃ/,

tô? ‘all’
pô? ‘drainage water’
lô? ‘angry’

tî ‘scarce’
jî ‘enter’
hî ‘fur’
pʰî ‘divide’
vî ‘see’
ʃî ‘millet’
jî ‘two’
ʃî ‘try’

/ʔ/ vs /p/, /ŋ/

lāʔ ‘birth’
lāp ‘bite’

sāʔ ‘eat’
sāŋ ‘sell’
wāŋ ‘return’

/b/ vs /s/ /l/

bòŋ ‘male animal’
sòŋ ‘what do I know’

bà ‘husband’
sà ‘offspring’

bəŋ ‘granary’
ləŋ ‘swallow’

/k^h/ vs /p^h/ vs /t^h/

p^hî ‘divide’
k^hî ‘wet’

k^hê ‘wet’
t^hê ‘mistake’
p^hê ‘divide’

Distribution of plosives sounds in Tobu

All plosive sounds in Tobu can be found in all positions i.e., initial, medial, and final except for the glottal sound /ʔ/, which is not found in the initial position. Additionally, any aspirated plosive that appears at the end of a word can occur as free variations with unaspirated plosives, as the absence of aspiration does not alter the meaning of the words. During the fieldwork, some consultants consistently spoke the final word with aspiration, while some did not. The variances do not impact the meaning. The examples are presented below:

	Initial	medial	final
/p ^h /	p ^h î ‘divide’ p ^h âŋ ‘clan’ p ^h è ‘limp’	lèp ^h ē ‘didn’t distribute’ lakp ^h â ‘palm’ ləp ^h î ‘not cut’	p ^h əp ^h ‘burst’
/t ^h /	t ^h ê ‘mistake’ t ^h áoʔ ‘sit’ t ^h âŋ ‘press’	hāpât ^h âi ‘which one’ ŋāmt ^h ōaŋ ‘gun’ māimāit ^h âm ‘truly’	tə ^h ‘measure’ nə ^h ‘tolerate’
/k ^h /	/k ^h î/ ‘wet’	mə ^h k ^h è ‘eyelashes’	mə ^h k ^h ‘eyes’

	/k ^h ām/ ‘logdrum’	kēk ^h â ‘wall’	lêk ^h ‘necklace’
/p/	pôaŋ ‘sing’ pên ‘ten’ pè ‘wrap’	ʃāp̄nù ‘Bear’ kâpʃôaŋpēdūk ‘snail’ sâmpôaŋ ‘lizard’	k ^h êlāp ‘tea’ hāp ‘close’ sāp ‘cry’
/b/	bêlāmbō ‘male’ bâ ‘husband’ bêŋ ‘granary’	bêlāmbō ‘male’ ŋêlāmbō ‘female’ sêŋbō ‘thinking’	#NA
/k/	kāʔ ‘burn’ kôaŋ ‘nose’ kēk ^h â ‘door’	p ^h âkpàŋ ‘armpit’ mêkâoʔ ‘bamboo shoot’ lâklêaŋ ‘finger’	ēmpôak ‘saliva’ lâkʃôk ‘forearm’ lāk ‘hand’
/t/	tāk ‘pot’ tōʔ ‘everyone’	mâitāo ‘good’ ʃîtao ‘mouth’ ʃîŋtàoʔ ‘ginger’	sôt ‘sick’ k ^h êt ‘skin’ mêt ‘case’
/ʔ/	#NA	tôʔlêbê ‘everyone’ k ^h âʔbê ‘bitter sad’	lâʔ ‘lazy’ sâʔ ‘eat’ jâʔ ‘take it’

Table 3.2: Distribution of plosive sounds.

3.2.2.2. Nasals

Description of nasals in Tobu

Nasal sounds are generated by the act of lowering the soft palate, which results in the total obstruction of the oral passage. This obstruction is achieved by closing the lips, causing the air to be expelled solely through the nose. Vocal cords do not vibrate. In Tobu, four nasals are occurring at different places of articulation. The four nasals are /m/, /n/, /ɲ/ and /ŋ/.

/m/ occurs at the bilabial place, /n/ occurs at the alveolar place, /ɲ/ occurs at the palatal place and /ŋ/ occurs at the velar place.

Production of Tobu nasals

/n/: /n/ in Tobu is produced by blocking the airflow through the mouth by the tip of the tongue touching the alveolar ridge. During the process, the velum is lowered to let the airflow out of the nose. The vocal cord vibrates.

/m/: /m/ in Tobu is produced by blocking the air from passing through the mouth with lips closed. During the process, the velum is lowered and the air is passed through the nasal passage. The vocal cord vibrates.

/ɲ/: /ɲ/ in Tobu is produced with the body of the tongue raising towards the hard palate to block the air flowing through the mouth. During the process, the air is passed through the nasal passage. The vocal cord vibrates.

/ŋ/: /ŋ/ in Tobu is produced with the tongue retracted and raised towards the velum. During the process, the velum is lowered to let the air flow from the nose. The vocal cord vibrates.

Contrastive pairs of nasals in Tobu

All nasals are contrastive to each other. Also, all nasals can be contrastive to other consonants of different manners. Examples are presented below.

/n/ vs /m/ vs /ɲ/ vs /ŋ/

nâ? ‘smart’
mâ? ‘unnatural dead’
ɲâ? ‘doze’
ŋâ? ‘fish’

nā ‘child’
mā ‘wound’
ɲā ‘five’
ŋā ‘mithun’

/n/ vs /s/, /l/, /b/, /j/

nā ‘child’
sā ‘offspring’
lā ‘leg’
bā ‘husband’
wā ‘roam’
jā ‘hand raised to strike’

/m/ vs /s/, /l/

mî? ‘others’
sî? ‘urine’
lî? ‘fool’

/ŋ/ vs /l/, /ʎ/, /v/, /h/

ŋî ‘occur’

lî ‘die’

ʎî ‘try hard’

vî ‘see’

hî ‘fur’

/ɲ/ vs /l/, /tʰ/, /kʰ/

ɲào ‘wife’

lào ‘borrow’

tʰào ‘dug’

kʰào ‘fetch water/liquid’

Distribution of nasals in Tobu

In Tobu, the alveolar nasal, bilabial nasal, and velar nasal can occur in all positions; but the palatal nasal can occur in initial and medial but not final. Word examples showing all nasals occurring in different positions are presented below:

	Initial	Medial	Final
n	nāʔ ‘fast’ nêʔ ‘milk’ nāk ‘rice’	wânʎî ‘matchstick’ jênbè ‘dry’ jêntôŋ ‘bladder’	lâksên ‘nails’ sên ‘salt’ jîn ‘machete’
m	māŋpên ‘heart’ mêkʃî ‘tears’ māk ‘dirt’	ēmpôak ‘saliva’ pūmâi ‘rich’ ɲâkmèt ‘black’	lâm ‘sweat’ ɲām ‘money’ sâm ‘house’
ŋ	ŋâ ‘five’ mànŋ ‘dream’	māŋpên ‘heart’ jâŋŋî ‘wind’ tāŋsén ‘straight’	jêaŋ ‘bone’ mēikôaŋ ‘tail’ hônŋ ‘uncooked rice’
ɲ	ɲām ‘money’ ɲâ ‘mithun’ ɲêʔ ‘scratch’	īɲào ‘mother’ jâmpɲè ‘widow’ īɲî ‘father’s elder/younger sister’	#NA

Table 3.3: Distribution of nasal sounds

3.2.2.3. Fricatives

Description of fricatives in Tobu

Fricative sound is generated by partially closing the mouth, obstructing the airstream but not completely obstructing it; this causes audible friction as air flows through the mouth. Four fricative sounds were detected in Tobu. One labio-dental fricative /v/, one alveolar fricative which is /s/, one post alveolar fricative which is /ʃ/ and one glottal fricative which is /h/. A fricative sound is produced by slightly constricting the mouth, impeding the flow of air without totally blocking it. This results in audible friction as the air passes through the mouth. During the fieldwork, it was noted that the speakers of Tobu sometimes interchangeably use the /f/ sound with /p^h/ in a word which do not alter the meaning; therefore, these two sounds are in free variation and therefore, /f/ is not considered as a pure phoneme in Tobu.

Production of fricatives in Tobu

/v/: this sound is produced in Tobu by constricting air flow through a narrow channel at the place of articulation, causing turbulence. The active articulators are upper teeth and lower lip. Both the articulators come close together when the air flows through the mouth. During the process, the vocal cords vibrate.

/s/: /s/ is produced in Tobu by the tip of the tongue slightly touching against the teeth ridge. When the air is pushed out, the air escapes between through the narrow space between tongue and the top of the mouth like a hissing sound. During the process, the vocal cords do not vibrate.

/ʃ/: /ʃ/ in Tobu is produced by raising the body of the tongue so that the passage between the postalveolar region and the tongue body is so narrow that the air rushes out with a friction. During the process, the vocal cords do not vibrate.

/h/: /h/ in Tobu is produced with relaxed vocal folds so that they open and air freely flows out of the lungs. Between the process, some friction between the airflow and the glottis is heard. The vocal cords do not vibrate.

Contrastive pairs of fricatives in Tobu

All fricatives in Tobu can be contrastive to each other. They are also distinctively contrastive to other sounds as well. Examples are presented below:

/s/ vs /h/,

sā ‘offspring’

hā ‘become active’

/ʃ/ vs /v/

ʃî ‘sleep’
vî ‘see’

/s/, /h/ vs /k/, /tʃ/, /j/, /w/, /n/, /m/, /ɲ/, /ŋ/

sā ‘offspring’
hā ‘become active’
kā ‘door’
tʃā ‘hard’
jā ‘raising hands either to strike or other purpose’
wā ‘roam’
nā ‘younger siblings’
mā ‘wound’
ɲā ‘mithun’
ŋā ‘five’

/ʃ/, /v/ vs /l/, /tʃ/, /t/, /j/, /kʰ/, /p/

ʃî ‘sleep’
vî ‘see’
lî ‘die’
tʃî ‘hard’
tî ‘scarce’
jî ‘enter’
kʰî ‘wet’
pʰî ‘cut’

Distribution of Tobu Fricatives

All fricatives can occur in the initial and medial but do not occur in final position.

Phonemes	Initial	Medial	Final
/v/	vî ‘see’ vên ‘biscuit’ vê ‘read’	lèvî ‘didn’t see’ lèvê ‘didn’t read’	#NA
/s/	sêŋ ‘think’ sâp ‘cry’ sâŋ ‘basket’	hòsê ‘coal’ hēsā ‘puppy’ jēsê ‘sweet potato’	#NA
/ʃ/	ʃî? ‘urine’	ōŋʃê ‘beans’	#NA

	ʃɛn ‘crab’	îʔʃũ ‘fart’	
/h/	hâ ‘teeth’ hên ‘mucus’ hò ‘fire’	làohêbè ‘long’ lèhâi ‘didn’t come’	#NA

Table 3.4: Distribution of fricative sounds

3.2.2.4. Affricates

Description of Affricates in Tobu

In Tobu the only affricate sound detected is /tʃ/ which is produced in the palatal region of articulation. In Tobu, affricates are produced by initially stopping the airflow and then releasing it as a fricative. These noises are characterised by a quick shift from a state where the airflow is completely blocked to a state with partial obstruction, resulting in turbulent airflow.

Production of Affricates in Tobu

When /tʃ/ is produced, the middle or the back part of the tongue is raised to the hard palate. The airflows from the narrow passage with friction. During this process, the vocal cords do not vibrate.

Contrastive pairs of Affricates

/tʃ/ in Tobu is contrastive with many other consonantal sounds. Examples showing contrastive are presented below:

/tʃ/ vs /w/, /s/, /p/, /l/, /k/, /m/, /j/, /n/, /h/.

tʃãŋ ‘village’
wãŋ ‘return’
sãŋ ‘basket’
pãŋ ‘include’
lãŋ ‘old’
kãŋ ‘stiff’
mãŋ ‘sturdy’

tʃî ‘try’
jî ‘enter’
nî ‘laugh’
hî ‘fur’

Distribution of affricates in Tobu

In Tobu, affricate sound occurs only at initial and middle position but not in the final position.

Phonemes	Initial	medial	final
/tʃ/	tʃɔ̃tao ‘mouth’ tʃũ ‘what’ tʃəpôaŋ ‘flower’	mâiʔtʃi ‘quickly’ sôŋtʃiŋ ‘chilli’ əŋtʃã ‘body’	#NA

Table 3.5: Distribution of affricate sound.

3.2.2.5. Approximants

Description of approximants in Tobu

In Tobu, there are two approximants such as /w/ occurring at the place of labial-velar and /j/ occurring at the place of palatal. The approximants in Konyak are produced by bringing two articulators bringing close together but not touching as the sound escapes through the close space between the articulators like a fricative sound.

Production of approximants in Tobu

/w/: In Tobu, this sound is produced when the lips are rounded and protruded while the back of the tongue raised little towards the soft palate. The lips are rounded but not too close together, and when the air passes through the space between the tongue and soft palate, the sound is produced with friction. At the final voicing of this sound, the rounded lips are released and spread like a smile.

/j/: In Tobu, /j/ is produced when the body of the tongue is raised slightly without coming into contact into contact with the palate. The lower lip also tends to spread a little downwards when the air from the lungs is passed through the mouth.

Contrastive pairs of approximants

In Tobu, both the detected approximant sounds can be contrastive to each other. It can also be contrastive to other consonantal sounds which are discussed below:

/w/ and /j/ vs /s/, /l/, /b/, /n/

wā ‘roam’

jā ‘hand raised to strike’

nā ‘child’

sā ‘offspring’
lā ‘leg’
bā ‘husband’

/j/ vas /ɲ/, /ŋ/, /pʰ/, /kʰ/, /ʃ/, /f/

jî ‘enter’
ɲî ‘two’
ŋî ‘show/out’
pʰî ‘ask’
kʰî ‘wet’
ʃî ‘sleep’
fî ‘ask’

Distribution of approximants in Tobu

Approximants in Tobu can occur in initial and medial but not in final.

Phoneme	Initial	Medial	Final
/w/	wâ ‘hurry’ wāŋ ‘occur’ wânʃî ‘matchstick’	lōŋwâŋ ‘marital partner’ lêwâ ‘slow’ lēwēsâm ‘school’	#NA
/j/	jūŋ ‘stone’ jām ‘search’ jûaŋ ‘water’	kâʔjêaŋ ‘chin’ tôkjâo ‘shawl’ îakjâ ‘pumpkin’	#NA

Table 3.6: Distribution of approximants.

3.2.2.6. Lateral approximants

Description and production of Lateral approximants in Tobu:

Tobu has only one lateral approximant i.e., /l/. To produce this sound, the tip of the tongue is placed against the alveolar region, and the body of the tongue somehow closes the air passage on the middle but leave an opening on both sides of the mouth for the air to escape through. The vocal cords vibrate on the throat while producing this sound.

Contrastive pairs of lateral approximants

The lateral approximant /l/ in Tobu appears in many words of Tobu especially at the initial position. It is contrastive with all other consonantal sounds except for the phoneme /b/ and /ʔ/. The contrasts pairs of /l/ with other phonemes are presented below:

/l/ vs /tʃ/, /w/, /s/, /p/, /k/, /m/

lāŋ ‘old’
 tʃāŋ ‘village’
 wāŋ ‘occur’
 sāŋ ‘basket’
 pāŋ ‘include’
 kāŋ ‘stiff’
 māŋ ‘sturdy’

/l/ vs /kʰ/, /pʰ/, /tʰ/, /ʃ/, /v/

lî ‘die’
 vî ‘see’
 kʰî ‘wet’
 pʰî ‘divide’
 tʰî ‘error’
 ʃî ‘sleep’
 nî ‘laugh’
 ɲî ‘two’
 ŋî ‘come out’
 hî ‘fur’
 tî ‘scarce’

/l/ vs /j/, /f/

lâ ‘spicy’
 jâ ‘raise to strike or beat’
 fâ ‘give’

Distribution of lateral approximant in Tobu

In Tobu, the lateral approximant /l/ can occur in initial and medial but not in final.

phoneme	Initial	Medial	Final
/l/	lām ‘three’ lên ‘pay’ lèŋ ‘do’ lāk ‘hand’	ɲilî ‘young male’ ɲèlâ ‘young female’ lâklêaŋ ‘fingers’ lèlêaŋ ‘tongue’	#NA

Table 3.7: Distribution of lateral approximants.

3.2.3. Distribution of all consonantal phonemes

In Tobu,

- All plosive sounds (both aspirated and unaspirated) can occur in all the positions except for glottal /ʔ/ which do not occur in initial positions and /b/ which do not occur in final position unless some phonological process is involved which is discussed in later section of the thesis.
- All nasals can occur in all the positions except for palatal nasal /ɲ/ which do not occur in final position.
- All fricatives in Konyak can occur in initial and medial but do not occur in final.
- The one affricate detected in Tobu can occur in initial and medial but not in final.
- All approximants can occur in initial and medial but not in final.
- All lateral approximants can occur in initial and medial but not in final.

Phonemes	Initial	Medial	Final
/p/	+	+	+
/b/	+	+	-
/t/	+	+	+
/k/	+	+	+
/ʔ/	-	+	+
/p ^h /	+	+	+
/k ^h /	+	+	+
/t ^h /	+	+	+
/m/	+	+	+
/n/	+	+	+
/ŋ/	+	+	+
/ɲ/	+	+	-
/v/	+	+	-
/s/	+	+	-
/ʃ/	+	+	-
/h/	+	+	-
/tʃ/	+	+	-

/w/	+	+	-
/j/	+	+	-
/l/	+	+	-

Table 3.8: Distribution of all consonants indicated by (+) and (-) values.

3.2.4. Consonant adaptations in loan words

In this section, consonant changes that occur in loan words when they are assimilated into the Tobu lexicon will be discussed.

Tobu adapts loanwords from other languages like English, Hindi and Nagamese to suit its pre-existing phonology. Words borrowed from other languages are treated according to the sound system of the receiving language. Loanwords whose phonological structure does not fit into the phonology of the borrowing language need to be adapted to fit that phonological system, and consistent patterns of adaptation can be explained by assuming rankings of phonological constraints (Prince and Smolensky 1993). Since English, Nagamese and Hindi have different phonemic consonants, Tobu employs ways to re-phonologize new words borrowed into its vocabulary to fit and conform to native structure demands. Although various repair strategies are used, this study will limit itself to consonant preservation and consonant substitution only. Also, in this analysis, changes happening in vowels are not discussed. Since the phonology model of the source languages is different from the Tobu phonological system, native speakers of Tobu resort to the closest native sound available in their repertoire. Some of the consonant adaptations found in Tobu are discussed in the following sections.

3.2.4.1. Devoicing of stops (Consonant substitution)

The voiced counterparts of velar and alveolar stops are not there in the Tobu phonological system; also, despite the voiced bilabial stops being detected in this language, they are limited in distribution. therefore, when the loanwords from the source language have voiced sound, the Tobu speakers devoiced it unintentionally to fit them into their repertoire.

Examples are presented below:

g	k
/gi:/ ‘ghee’ (source language- Hindi) >	/keo/ ‘ghee’

b	p
ba:lte: ‘baaltee’ (source language-English) >	paltin ‘bucket’
biskit ‘biscuit’ (Source-language-English) >	piskot ‘biscuit’
bɒtl ‘bottle’ (source language-English) >	poter ‘bottle’
ʃabe: ‘key’ (source language-English) >	ʃape ‘key’

3.2.4.2. Random consonant substitution

Another characteristic seen is the random substitution of certain consonants in borrowed words when spoken by native speakers. The rules of this substitution are non-directional and arbitrary (because the sound change is not regular).

/n/ or /r/ substituting /l/

It has been observed that whenever there is an alveolar nasal or alveolar approximant present in the borrowed word, the Tobu speakers substitute it with lateral approximant and vice versa. For instance, the word ‘baalte’ is a Hindi word for bucket, and Tobu has borrowed this word and modified it into ‘pantin’ where /l/ is substituted by /n/ in the word. Example: /ba:lte/ ‘bucket’ (source language- Nagamese) > /pantin/ ‘bucket’

/bɔ:l/ ‘ball’ (source language- English) > /bon/ ‘ball’

Also, another instance in contrast to what has been discussed above, is that, the alveolar approximant /r/ do not exist in Tobu sound system; however, when certain borrowed words have lateral approximant /l/ in the final position of the source word, the Tobu speakers substitute the lateral approximant /l/ with alveolar approximant /ɹ/ despite it is not present in their sound system.

Example: kændəl ‘candle’ (source language-English) > kanter ‘candle’

bɒtl ‘bottle’ (source language-English) > poter ‘bottle’

3.3. Segmental Phonology: Vowels

This section presents the phonemic inventory of Tobu vowels.

3.3.1. Classification of vowels

In Tobu, there are six pure short vowels. They are classified into three parameters such as openness of the mouth, position of the tongue raised and the roundness of the lips.

All short vowels in Tobu are syllabic and forms the peak of the syllable. A chart is presented below showing all the vowels that occurs as per different parameters:

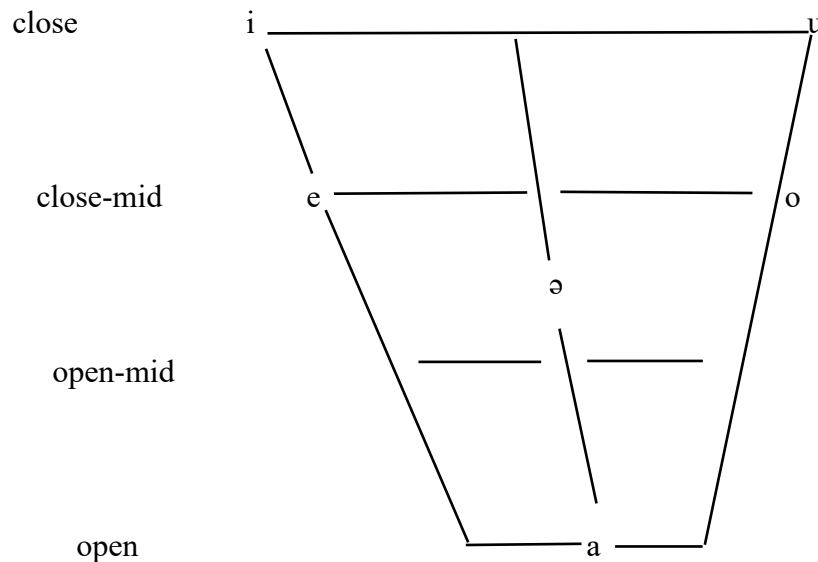


Fig 3.1: Vowel chart.

3.3.2. Features of Vowels

3.3.2.1. Front vowels

Tobu has two front vowels such as /i/ and /e/.

/i/ is a high vowel produced with the tongue positioned close to the roof of the mouth without any constriction; and the lips are not rounded but spread while producing it.

/e/ is high-mid vowel produced with tongue positioned halfway between a high vowel and a mid-vowel; and the lips are not rounded but spread while producing it.

3.3.2.2. Central vowels

Tobu has two central vowels such as /ə/ and /a/.

/ə/ is a mid-vowel produced with tongue positioned half-way between close-mid and open-mid; and the lips are not rounded when this sound is produced.

/a/ is an open vowel with tongue positioned far from the roof of the mouth. In Tobu, this sound appears to be more central. The lips are not rounded when produced.

3.3.2.3. Back Vowels

Tobu has three back vowels such as /u/, and /o/.

/u/ is a close vowel with tongue positioned close to the roof of the mouth. While producing the sound, the lips are rounded and protruded with lips drawn together exposing the inner surfaces.

/o/ is a close-mid vowel with tongue positioned half-way between a close-vowel and open-mid. While producing this sound, the lips are rounded and protruded with lips drawn together exposing the inner surfaces.

3.3.3. Phonemic contrasts of vowels

In Tobu, all six vowels can be contrasted in minimal and near-minimal pairs. In this study, contrasts are based on one articulatory parameter in three ways, i.e., tongue position which are front vs back, front vs central, and back vs central.

3.3.3.1. Front vs back

/i/ vs /u/

lî ‘die’

lû ‘there’

pû ‘fly’

pî ‘forget’

/i/ vs /o/

hō ‘fire’

hī ‘dog’

pì ‘carry’

pò ‘smell’

/tʃi/ ‘try’

/tʃo/ ‘pull’

/e/ vs /u/

pû ‘fly’

pê ‘carry’

ʃû ‘passing gas’

ʃê ‘sleep’

/e/ vs /o/

mô ‘festival’
mê ‘a variety of palm tree’

sê ‘sleep’
sô ‘pour’

pē ‘carry’
pō ‘smell’

3.3.3.2. Front vs central

/i/ vs /ə/

lî ‘die’
lê ‘breath’

hì ‘fur’
hè ‘hut’

jîn ‘machete’
jên ‘show’

/i/ vs /a/

jî ‘enter’
jâ ‘raise’

tî ‘testical’
tâ ‘now’

/e/ vs /ə/

wên ‘biscuit’
wên ‘hooking’

mên ‘win’
mən ‘name’

pên ‘ten’
pên ‘hang’

/e/ vs /a/

ɲīlâ ‘young woman’

nĩlê ‘young man’

pāsê ‘old man’

pāsâ ‘stick’

wē ‘read’

wā ‘knitting’

3.3.3.3. Back vs central

/u/ vs /ə/

ʄũ ‘what’

ʄê ‘fit’

jũ ‘ask’

jê ‘fence’

hũ ‘variety of spade’

hê ‘carry’

/o/ vs /ə/

lõ ‘hide’

lã ‘new’

hè ‘hut’

hò ‘fire’

nô ‘cicada’

nê ‘hail stone’

/u/ vs /a/

Pũ ‘snake’

Pâ ‘scoop’

ʄũ ‘what’

ʄã ‘lit’

sũk ‘

sâk ‘one’

/o/ vs /a/

Pô ‘wood’

Pâ ‘kick’

pôk ‘ball’

pâk ‘climb’

môk ‘bubbles’

mâk ‘dirt’

3.3.4. Distribution of vowels

In Tobu, all vowels occur in all the positions except /u/ which does not occur in the initial position.

phoneme	initial	medial	final
/i/	ī ‘thread’ î ‘lead’ îpi ‘grandmother’	jîn ‘goat’ mî? ‘others’ sî? ‘urine’	ĵī ‘millet’ vî ‘see’ lī ‘neice’
/e/	êt ‘open’ ê? ‘stool’ ên ‘separate’	pêt ‘beat’ sên ‘crab’ wên ‘taste it’	sê ‘sleep’ pê ‘wrap’ lê ‘intestine’
/ə/	êŋ ‘drink’ ênhái ‘bring up’ êtək ‘dry it’	jəŋ ‘lift up’ bəŋ ‘granary’ səŋ ‘think’	tʰəŋbə ‘friend’ lə ‘breath’ əosə ‘bird’
/a/	âpti ‘gone away’ apâ ‘this one’ āŋ ‘neck’	jāŋ ‘rain’ māŋ ‘dead’ lāŋ ‘old’	hā ‘teeth’ là ‘leg’ ġā ‘hard’
/u/	#NA	jū? ‘rat’ sūŋ ‘ear’ lúŋ ‘grow’	tānpū ‘found’ pū ‘snake’ sù ‘grandchild’
/o/	oŋ ‘chicken’ ôlenŋ ‘how’ ôŋ ‘whom’	lōŋ ‘insect’ jōŋ ‘stone’ kōsēn ‘cap’	lô ‘hide’ jó ‘paralyse’

Table 3.9: Distribution of vowels.

Segments	Initial	Medial	Final
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i	+	+	+
e	+	+	+
a	+	+	+
ə	+	+	+
u	-	+	+
o	+	+	+

Table 3.10: Distribution of vowels indicated by (+) and (-) values.

3.3.5. Diphthongs

The present work has identified five diphthongs and no presence of triphthongs. The diphthongs in Tobu are determined for closing, opening, and centering types. Narrow and wide diphthongs are also specified as another type in Tobu. Diphthongs in Tobu mostly glides downwards to /a/ except for one diphthong, i.e., /a/ gliding upwards to /i/ with a greater tongue movement, and this diphthong can occur only in the medial position in the CVC structure. Discussions are presented below:

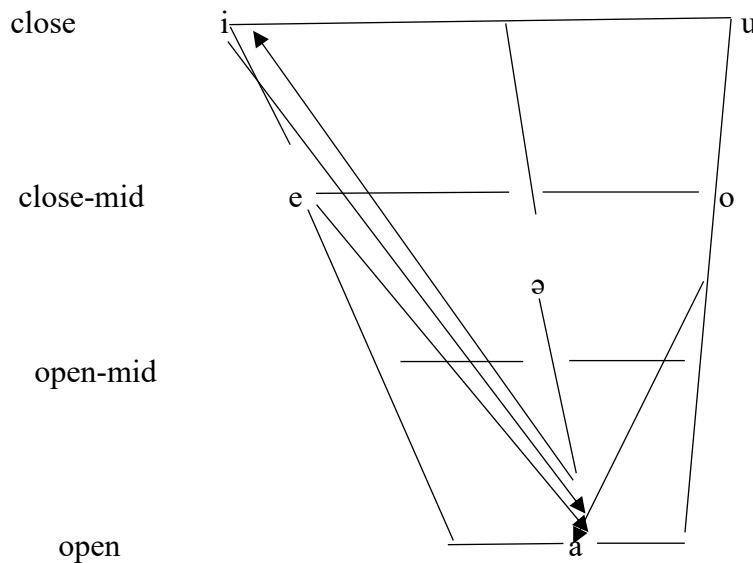


Fig. 3.2: Diphthong chart.

3.3.5.1. Closing Diphthongs

Tobu features a single closing diphthong, specifically /ai/, in which the second vowel is closer than the first. This diphthong can also be classified as a fronting or falling diphthong because the /a/ in Tobu is pronounced as a central rather than a front vowel. The movement also begins with a vowel quality that is more prominent and ends with less

prominence. This diphthong can occur in all the positions such as, initial, medial and final. The direction of gliding is illustrated below:

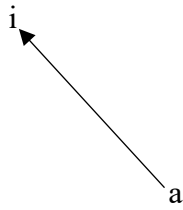


Fig. 3.3: Glide direction of closing diphthong.

3.3.5.2. Opening diphthongs

Tobu features a single opening diphthong, i.e., /ia/, in which the second element is more open than the first. This diphthong begins with a less prominent vowel and ends with a more prominent full vowel which can also be determined as a rising diphthong. This diphthong can occur only in the medial position in Tobu. The direction of gliding is illustrated below:

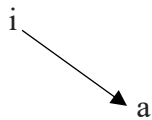


Fig. 3.4: Glide direction of opening diphthong.

3.3.5.3. Centering diphthongs

In Tobu, there are three centering diphthongs. As discussed earlier, the vowel /a/ in Tobu is a central vowel and not a front vowel, the vowel direction that glides towards /a/ are /ia/, /oa/ and /ea/. These three diphthongs can be determined as centering diphthongs because the vowel begins with either front or back and moves toward central. The vowel /ia/ has already been discussed earlier as an opening diphthong and likewise, the remaining diphthongs such as /oa/ and /ea/ are both opening types. These three sounds occur at the initial and medial but not at the final. The direction of gliding is illustrated below:

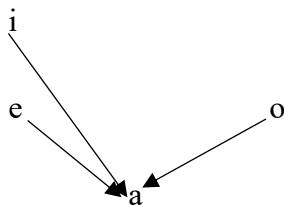


Fig. 3.5: Glide direction of centering diphthong.

3.3.6. Distribution of diphthongs

In Tobu, the diphthongs /ai/ and /ao/ can occur in all the positions, but the diphthongs /ea/, /ia/ and /oa/ can occur in initial and medial but do not occur final position.

	Initial	Medial	Final
ai	âi ‘placing a thing above a surface to enhance weight’ āi ‘this one also’	mâimâit ^h ām ‘for real’ bêmâiloŋwāŋ ‘rich’ mâijnák ‘monkey’	lāi ‘four’ ŋāi ‘pour/ leftover’ nāi ‘return’
ao	āosè ‘bird’ âo ‘female genitalia’ âo ‘hug’	jão? ‘wearing shawl’ pão? ‘play’ lōaŋ ‘like’	mão ‘work’ lāo ‘get up’ k ^h āo ‘fetch’
ea	êak ‘pig’ êaŋ ‘messenger’ êaŋ ‘untie’	pêaŋ ‘sweep’ k ^h êaŋ ‘bag’ mêaŋ ‘blur’	#NA
ia	#NA	sîak ‘stir’ t ^h îak ‘tear’ wîak ‘clap’	#NA
oa	ôak ‘chafing’ ôaŋ ‘go up’	mōaŋ ‘prostitute’ jōaŋ ‘water’ pōaŋ ‘sing’	#NA

Table 3.11: Distribution of diphthongs.

Segments	Initial	Medial	Final
ai	+	+	+

ao	+	+	+
ea	+	+	-
ia	-	+	-
oa	+	+	-

Table 3.12: Distribution of Diphthongs indicated by (+) and (-) values.

3.4. Suprasegmentals: phonotactics

This section will discuss the primary syllables and their structure, syllable types, syllabic patterns and phonotactics of the Tobu syllable.

3.4.1. The primary syllable and their structure

In Tobu, both open and closed syllables are found. Onsets and coda are simple in Tobu consisting of only one consonant. Consonant sequences occur word medially and vowel sequences occur at initial or word medial.

The primary syllable types found in Konyak are CV, CVC, VC, and V. The primary syllable types are combined to create all other permissible syllables. Tobu syllable requires two elements: an obligatory vowel, a tone and one or two optional elements. Both onset and coda are not obligatory. All vowels constitute the nucleus of a syllable, and they are obligatory and act as the tone-bearing unit. Also, when diphthongs occur as the nucleus, the first vowel is the tone-bearing unit which serves as the [+syllabic] component, while the second vowel serves as the [-syllabic] component. The structure of the Tobu syllable shown in linear structure is shown below:

$C_1V_1V_2C_2T$

C_1 - [-syll, +cons] —————> Optional

V_1 - [+syll] —————> Obligatory

V_2 -[-syll,-cons] —————> Optional

C_2 -[-syll, +cons, -Continuant] —————> Optional

T-[+any tone]—————> Obligatory

The metrical syllable structure following hierarchical structure are shown below:

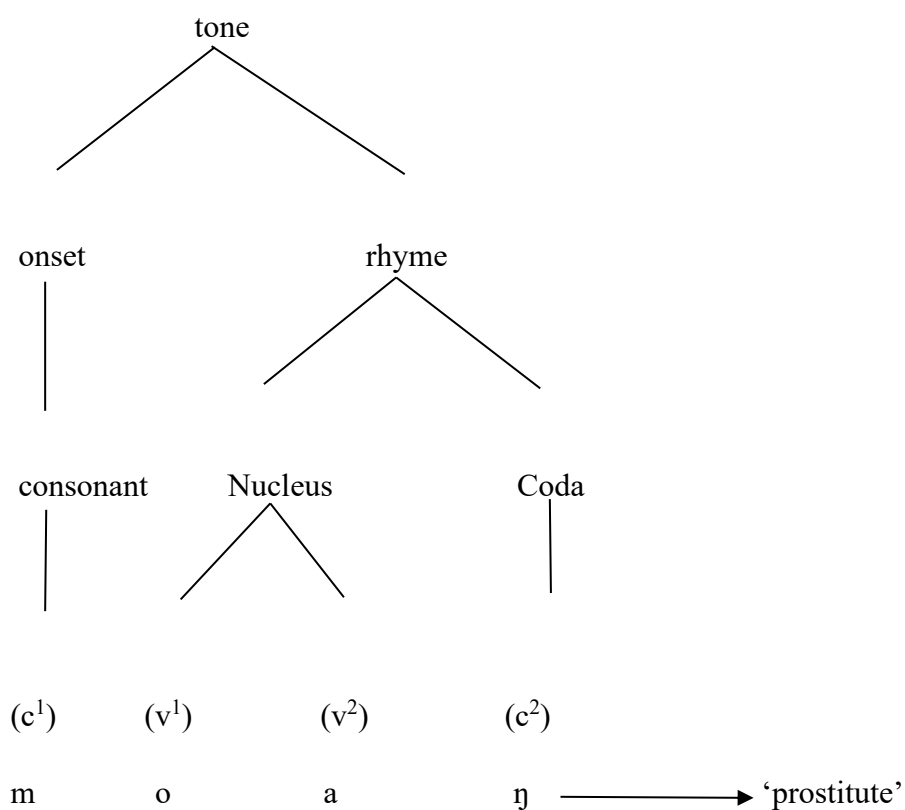


Fig. 3.6: Metrical syllable structure of the Tobu syllable with diphthong as the nucleus.

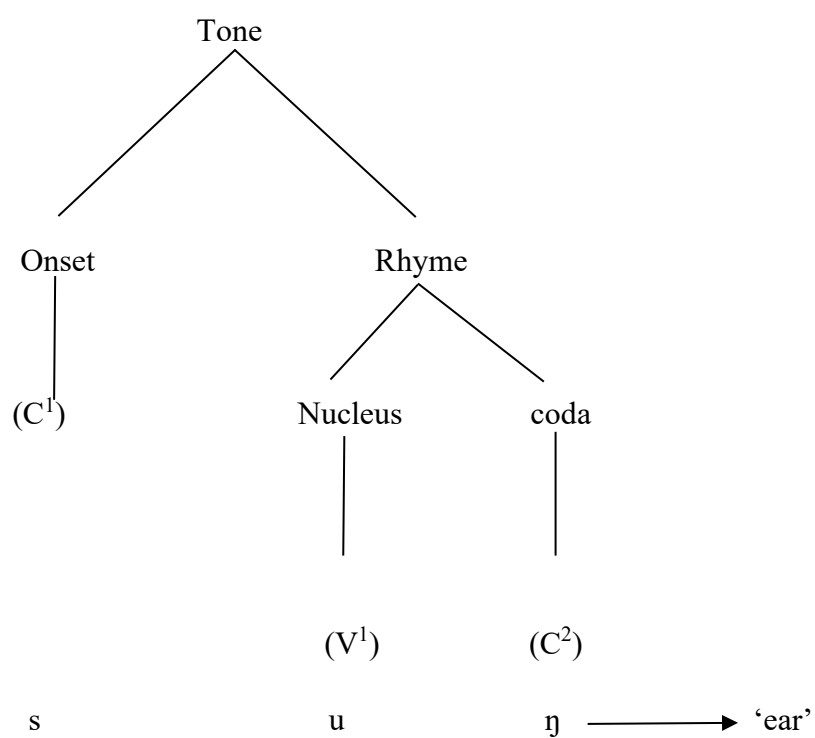


Fig. 3.7: The metrical syllable structure of the Tobu syllable with a vowel as the nucleus.

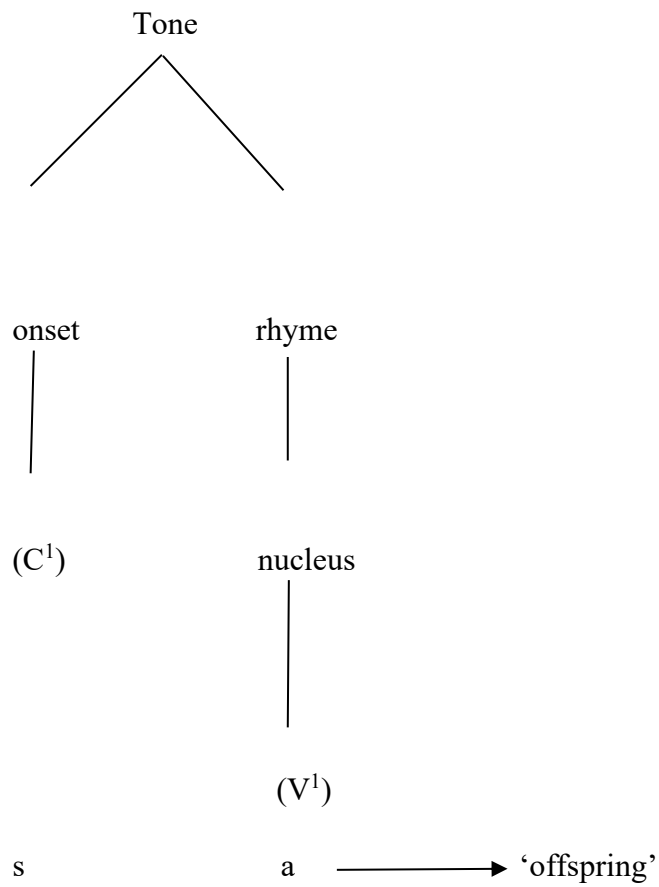


Fig. 3.8: The metrical syllable structure of the Tobu syllable without coda.

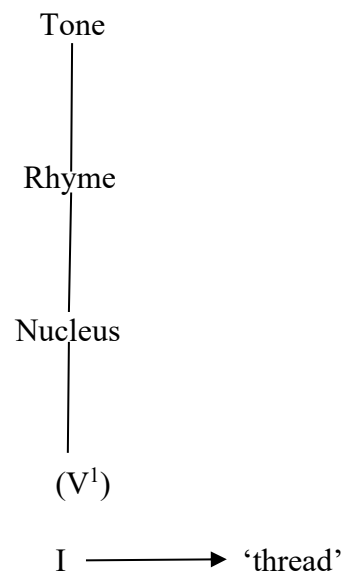


Fig. 3.9: The metrical syllable structure of Tobu syllable with only vowel.

3.4.2. Syllable types

The types of syllables found in Tobu are closed, open, simple, complex, checked, smooth and sesquisyllables. The syllable types with supporting examples are shown below:

Closed syllable: Closed syllable in Tobu have closing coda mostly with nasals and glottal stop.

ôaŋ ‘go up’

êʔ ‘stool’

ōŋ ‘drink’

Open syllable: Open syllable in Tobu has a vowel at the end and all vowel can occur for this syllable type.

li ‘die’

lê ‘breath’

t^hô ‘short’

pô ‘wood’

pâ ‘kick’

wē ‘read’

Simple syllable: in Tobu, simple syllables are common. A detailed discussion given in section 3.11.1.

pâoʔ ‘play’

sēn ‘crab’

wên ‘taste it’

Complex syllable: in Tobu, complex syllables can be structured only in onomatopoeia words as clusters occur only in borrowed words.

/klin-klin/ ‘sounds of church bells’

Checked syllables: In Tobu, all plosive consonants except /b/ can occur in coda position.

p^hōp^h ‘burst’

nê^t ‘tolerate’

lêk^h ‘necklace’

hāp ‘close’

lāk ‘hand’

sāt ‘sick’

láʔ ‘lazy’

Smooth syllable: Smooth syllables are very common in Tobu. All syllables are either open or closed, and if it is open, it ends with a vowel, and if it is closed, it either ends with a plosive or a nasal, and from the wordlist collected, it has been observed that most of the syllable ends with a sonorant sound i.e., either a vowel or a nasal.

sèn ‘salt’

lām ‘sweat’

jêaŋ ‘bone’

là ‘leg’

ʔā ‘hard’

Sesquisyllable syllable: The term sesquisyllable was first introduced by an American Linguist James Matisoff in (Matisoff, 1973, P. 86) meaning ‘one and half syllable’. Tobu features sesquisyllables where the first syllable is short followed by a long syllable in a word. The first short syllable lacks coda and immediately followed by a more prominent syllable. The short syllables are usually with a nucleus vowel /ə/ which is the schwa sound. Examples are presented below:

sākā ‘face’

bālām ‘male’

lōmāi ‘bad’

3.4.3. Syllabic Patterns

The present work has found that Tobu has syllabic patterns such as, monosyllabic, disyllabic, tri-syllabic, and tetrasyllabic patterns. Instances of hexa-syllabic words were not found from the wordlist collected for this study. Discussion of different syllabic patterns with examples are presented below:

3.4.3.1. Monosyllabic patterns

All primary syllables are monosyllabic patterns in Tobu. As discussed earlier, Monosyllabic patterns found in Tobu are V, VC, CV, CVC. The closed syllables are VC and CVC and the open syllables are V and CV.

Examples of all the monosyllabic pattern are presented below:

CVC: míʔ ‘others’

jāŋ ‘rain’

k^hêaŋ ‘bag’

CV: fā ‘give’

sā ‘offspring’

hā ‘become active’

VC: êak ‘pig’

êaŋ ‘messenger’

ôak ‘chafing’

V: âo ‘hug’

ī ‘thread’

ā ‘this’

In addition to the monosyllabic patterns illustrated above, Tobu permissible syllable structures are discussed below:

3.4.3.2. Disyllabic patterns

The disyllabic patterns in Tobu are CV+CV, CVC+CV, CVC+CVC, CV+CVC, V+CVC, VC+CV, and V+CV. Examples supporting the pattern are discussed below:

CV+CV: mâi+pū ‘good’

CVC+CV: tâk+jāo ‘shawl’

CVC+CVC: tāŋ+sên ‘straight’

CV+CVC: là+k^hāp ‘shoe’

V+CVC: ô+t^hiāk ‘how much’

VC+CV: àŋ+k^hā ‘throat’

V+CV: ē+pâ ‘father’

3.4.3.3. Tri-syllabic patterns

The tri-syllabic pattern found in Tobu are VC+CVC+CVC, V+CVC+CV, V+CV+CVC, CVC+CV+CV, CVC+CVC+CVC, CVC+CV+CVC, CVC+CVC+CV, CV+CV+CV, CV+CV+CVC, CV+CVC+CVC, CV+CV+VC, CV+V+CV, VC+CVC+CV.

VC+CVC+CVC:	ēʔ+pèaŋ+sām	‘toilet’
V+CVC+CV:	òʔĩaŋsā	‘chick’
V+CV+CVC:	ā+p ^h āi+nāp	‘day after tomorrow’
CVC+CV+CV:	tōn+lāo+k ^h ā	‘midnight’
CVC+CV+CVC:	ʃĩŋ+sə+lāʔ	‘root’
CVC+CVC+CV:	mēn+sāoʔ+māi	‘beef’
CV+CV+CV:	pà+b ^h ā+sā	‘son’
CV+CVC+CV:	ɲà+lōŋ+sā	‘eldest daughter’
CV+CV+CVC:	hè+k ^h āo+jūʔ	‘squirrel’
CV+CVC+CVC:	sā+t ^h āoʔ+tāŋ	‘womb’
CV+V+CV:	hāi+e+bā	‘income’
VC+CVC+CV:	ēn+tāk+bā	‘expenditure’

3.4.3.4. Tetra syllabic patterns

The tetra syllabic pattern found in Tobu are CVC+CVC+CV+CV, CVC+CV+CVC+CV, CVC+CVC+CVC+CV, CVC+CVC+CV+CVC, CV+CV+CV+CV, VC+CVC+CV+CV+CV, V+CVC+CV+CV.

CVC+CVC+CV+CV:	sām+pèaŋ+pā+sà	‘broom’
CVC+CV+CVC+CV:	lōŋ+ɲû+māt+ɲû	‘insects’
CVC+CVC+CVC+CV:	māŋ+bēn+lōŋ+tāo	‘being brave’

CVC+CVC+CV+CVC:	jôŋ+nâŋ+ʈâ+nâŋ	‘strong’
CV+CV+CV+CV:	ɲē+lē+ɲə+lā	‘youngsters’
VC+CVC+CV+CV:	â+lāk+lâ+mə	‘recently’
V+CVC+CV+CV:	ō+lên+ʈē+t ^h ai	‘how’

3.4.3.5. Penta syllabic patterns

The Penta syllabic patterns found in Konyak are CVC+CVC+CV+CVC+CV, CVC+CVC+CV+CV+CV, CV+CVC+V+CV+CV, V+CVC+CV+CV+CV.

CVC+CVC+CV+CVC+CV:	jâŋ+sê+jə+tē+pə	‘sunset’
CVC+CVC+CV+CV+CV:	lā+sên+lā+ŋê+pə	‘illiterate’
CV+CVC+V+CV+CV:	ʈū+sək+mâi+lā+lāi	‘nothing’
V+CVC+CV+CV+CV:	ō+sək+mâi+lā+lāi	‘nobody’

3.4.4. Phonotactic rules

This section will summarize the phonotactic rules of Tobu. The CVC structure is chosen as the component to investigate the rules. The following are the rules found in Tobu:

1. Stop sounds including both aspirated and unaspirated that can occur in both onset and coda are /p/, /t/, /k/, /p^h/, /k^h/, and /t^h/. Glottal stop /ʔ/ cannot occur in onset position but occur in coda, and voiced bilabial stop /b/ can occur in onset but not in coda unless some phonological processes are involved, refer section 3.7.6.
2. Nasals which can occur in both onset and coda are /m/, /n/, /ŋ/. Palatal nasal /ɲ/ can occur in onset but not in coda position.
3. All fricatives such as /v/, /s/, /ʃ/, /h/ can occur in onset but not in coda position.
4. The only affricates in Tobu which is /ʈ/ can occur in onset but not in coda position.
5. The approximant and lateral approximant such as /j/, /w/ and /l/ can occur in onset but not in coda position.
6. All vowels and diphthongs can occur as the nucleus of the syllable. The nucleus vowel acts as the tone bearing unit; however, in the case of diphthongs, the V1 is marked for the tone. vowels such as /a/, /e/, /i/ and /o/ can occur in V1 slot, whereas, in V2 slot, only vowels such as /i/, /o/, and /a/ can occur. The vowel /u/ cannot be paired with any vowel for diphthongs.

3.4.5. Consonant sequences

The term consonant sequences in the present analysis refers to the combination of more than one consonant occurring at the syllable boundary with no intervening vowels between the consonants. In Tobu, a total of 1500 disyllable and polysyllable words and 150 sentences were examined, and it was found that there were fifty-six instances of consonant sequences. The consonant sequence combinations found in Tobu are stops + stops, nasals + nasals, nasals + fricatives, nasals + affricates, nasals + approximants, nasals + lateral approximants, stops + nasals, stops + stops, stops + fricatives, stops + affricates, stops + approximants, stops + lateral approximants. The combinations of Affricates, fricatives, and approximants on the front of the sequence were not detected as these sounds in Tobu do not occur in the final position of the word. Due to the nature of Tobu being an agglutinating language, the occurrence of consonant sequences is significantly very high. The Tobu dictionary has not been compiled, so there is a significant possibility of more consonant sequences than the ones we have detected. However, compiling the dictionary is not within the scope of this study. Therefore, consonant sequences that have been detected in this study are discussed below:

Nasals + Stops

/-ŋp-/ k^hêaŋháŋpū ‘foundation’

/-ŋb/ mǎŋbèn ‘heart’

/-ŋk/ hǎŋkǎo? ‘thigh’

/-nk-/ ǎnkôaŋ ‘outside’

/-mk-/ lǎmkên ‘stairs’

/-mb-/ jǎmbǎ ‘search’

/-np-/ jêanpū ‘dry’

/-mt^h-/ k^hǎmt^hôaŋ ‘pillar’

/-ŋt^h-/ ʃŋt^hǎo? ‘ginger’

/-ŋk^h/ âŋk^hǎ ‘throat’

/-ŋp^h/ tǎŋp^hèaŋ ‘fog’

/-nt-/ jèntēbè ‘ripen’

Nasals + Nasals

/-mm-/ pām^hmmōt ‘needle’

/-ŋm-/ līaŋm^hənsài ‘slowly’

/-ŋŋ-/ jûaŋŋ^həu ‘sea’

/-nm-/ jēnmāi ‘mutton’

/-mŋ-/ jāmŋ^hū ‘widow’

/-ŋŋ-/ jēŋŋ^hù ‘tiger’

/-ŋŋ-/ jôŋŋ^hāŋŋ^hānāŋ ‘strong’

/-ŋŋ-/ sôŋŋ^hào ‘banana’

Nasals + Fricatives

/-ŋh/ k^hēaŋh^hānpū ‘foundation’

/-ŋs/ êp^hēaŋsām ‘toilet’

/-ns-/ mēnsào? ‘cow’

/-ŋh-/ kōaŋh^hī ‘nasal hair’

/-ŋs-/ tāŋsēn ‘straight’

Nasals + Affricates

/-ŋt̪-/ ólēnt̪fī ‘how’

/-ŋt̪-/ sôaŋt̪fēŋ ‘chilli’

Nasals + Approximants

/-ŋw-/ lòŋwāŋ ‘marital partner’

/-ŋj-/ kâŋjèaŋ ‘shoulder’

Nasals + Lateral approximants

/-nl-/ lênlâ ‘between’

/-ŋl-/ jãŋŋèjãŋlài ‘storm’

Stops + Nasals

/-kɲ-/ lōakɲù ‘elephant’

/-km-/ îakmāi ‘pork’

/-pɲ/ ʃãpɲə ‘bear’

/-ʔɲ-/ mājɲùjêʔɲə ‘animal’

/-tɲ-/ lōŋŋəmətɲə ‘insect’

/-ʔŋ-/ ɲèʔŋâɲilè ‘smooth’

Stops + Stops

/-kp-/ p^hâkpāŋ ‘armpit’

/-kp^h-/ lāk^hp^hā ‘palm’

/-kt^h-/ lōk^ht^hāo ‘frog’

/-kk^h-/ lâk^hk^hāo ‘dorsal side of the hand’

/-ʔp-/ nâʔpū ‘intelligent’

/-ʔt-/ môʔtâkbə ‘fat’

Stops + Fricatives

/-kh-/ mōkhī ‘eyelash’

/-ks-/ lâksən ‘nails’

/-kʃ/ lâkʃōk ‘forearm’

/-pʃ-/ k^hâpʃōaŋ ‘snail’

/-ts-/ ōk^hûmâtsū ‘butterfly’

Stops + Approximants

/-kj-/ tākjāoʔ ‘shawl’

/-ʔj/ ɲāʔjòaŋ ‘honey’

/ɲj/ sôaɲjũ? ‘mouse’

Stops + Affricates

/-ʔʃ-/ mēiʔʃĩ ‘fastly’

/-kʃ/ âsəʔkʃĩmâilēmāĩnà ‘severely’

Stops + lateral approximants

/-ʔl-/ sêʔlōŋ ‘fox’

/-kl-/ lôklēn ‘cockroach’

/-tl-/ pêtlōŋbà ‘flat’

3.4.6. Vowel Sequences

While Tobu exhibits numerous consonant sequences, it is different for vowel sequences. As per the 1500 wordlists and 150 sentences collected; the present work has found that Tobu has just 12 vowel sequences. In Tobu, all vowels can be paired with /a/ as the second member with no intervening consonants. Additionally, sequences consisting of /i/, /ə/, and /u/ as the initial member of the sequence, and with /ə/ as the subsequent member, have also been identified. Upon observing the regular pattern, it is evident that the phonemes /a/, /ə/ and /e/ consistently emerge as the second element in the vowel sequence in Tobu. The vowel sequences tend to pair mostly with suffixes /-aʔ/ and /ə/ which are suspected to be grammatical affixes. From the data collected, only one vowel i.e., /e/ sequence pairing with diphthong i.e., /ai/ as the initial member was found while conducting this research. Since creating a dictionary and researching grammar are outside the purview of this study, it may be possible that there may be more vowel sequences than the ones we have identified. Nevertheless, the current work has also thoroughly explored the number of vowel sequences. Vowel sequences that have been detected in this study are discussed below:

The sequences found in Tobu are discussed below:

Segments	i	e	a	ə	u	o	ai
i			i.a	i.ə			
e			e.a				

a		a.e	a.a				
ə			ə.a	ə.ə			
u			u.a	u.ə			
ɔ			ɔ.a				
o			o.a				
ai		ai.e					

Table 3.13: Tobu vowel sequences.

Examples showing vowel sequences are shown:

i.a: jî.ā? ‘enter’ (in imperative tone)’

e.a: sê.ā? ‘sleep’ (in imperative tone)

a.a: ŋâ.ā? ‘call’ (in imperative tone)

ə.a: sē.ā? ‘divide’ (in imperative tone)

u.a: mû.ā? ‘fill it up’

o.a: mò.ā? ‘follow it’

ɔ.a: ɔ:â? ‘be happy’

u:ə: lû.ə? ‘down there’

ə:ə: sēnbə.ə? ‘at my place’

i:ə: î.ə ‘take (him/her)’

u:ə: pū.əŋfɪ ‘after smelling’

ai.e: hâi.ēpə ‘income’

a.e: nākhâ.ē? ‘earwax’

3.5. Suprasegmentals: tone

In this section, preliminary tonal description of Tobu will be presented.

3.5.1. Overview

Tobu is a tonal language characterized by contrastive tonal distinctions between syllables with identical segmental features but differing tonal attributes. This study represents the initial analysis of tone in Tobu, which has been found to exhibit one contour tone—a high falling tone—and two register tones—a mid-tone and a low tone. Although a high tone has been observed in a limited number of lexical items produced by certain speakers, it is not consistently present; for instance, the same word may exhibit a high-falling tone when recorded by different speakers. This inconsistency presents challenges in establishing the phonemic status of the high tone in Tobu. Given that this research is

pioneering in its examination of Tobu's tonal system, the focus has been on tones that exhibit clear contrastive pairs. A more comprehensive investigation into Tobu's tone system would likely provide a more detailed understanding than is currently available from this initial study. For the present study, the high falling tone is marked by circumflex $\hat{}$ placed over a vowel, low tone by grave marker $\grave{}$ and Mid tone is marked by macron $\bar{}$. Tone in Tobu is inflected in vowel. In this section, the three tones of Tobu will be discussed showing contrastive pairs.

3.5.2. Tonal contrasts

Tonal contrasts of tone will be shown in pairs below:

High-falling vs Low tone vs Mid tone

tʃâŋ ‘keep’
tʃàŋ ‘village’
tʃāŋ ‘debts’

pôaŋ ‘year’
pòaŋ ‘sing’
pōaŋ ‘sprout’

sên ‘know’
sèn ‘salt’
sēn ‘foster’

mât ‘fire extinguish’
mèt ‘needle’
māt ‘case’

mô ‘festival’
mō ‘full’
mò ‘follow’

High-falling vs low

Kâm ‘corner’
kàm ‘basket’

pôŋ ‘meet’
pòŋ ‘male animal’

lâ ‘spicy’
là ‘go’

High-falling vs Mid

lâ ‘spicy’

lā ‘leg’

jê ‘wine’

jē ‘chase’

jâm ‘dry’

jām ‘search’

low vs Mid

pò ‘smell’

pō ‘wood’

lè ‘paper/book’

lē ‘pick’

là ‘go’

lā ‘lard’

3.5.3. Tonal shifts

In Tobu, it has been observed that tones not only distinguish lexical items, but it also shows some other functions as well. These following functions have been recognized and discussed below:

- Change of lexical meaning: Change of lexical meaning has been illustrated in section 3.5.2. All the contrastive pairs show the change of lexical meaning.
- Change of parts of speech: A change in tone will change parts of speech in Tobu.

Noun to verb

ʈʂāŋ ‘keep’

ʈʂāŋ ‘debts’

pôaŋ ‘year’

pòaŋ ‘sing’

Adjective to verb

lâ ‘spicy’

là ‘go’

Noun to adjective

mâi ‘meat’

māi ‘good’

3.5.4. Acoustic analysis of tone

In this section, the preliminary acoustic analyses of Tone in Tobu will be discussed.

3.5.4.1. Methodology

Sample:

Two native speakers, one aged eighteen and the other twenty-two, were chosen to record the audio. Upon examination, both subjects demonstrated normal speech and hearing ability as well as complete dentition.

Data collection:

13 contrastive pairs targeting tone were recorded in isolation as well as in carrier speech. Through auditory perception, the words were listed in contrastive pairs, however; on the Praat analyses, some words were shown carrying same pitch contours with no significant contrasts. However, all words recorded were analysed to determine the tone.

Data recording: PRAAT software (version 6.3.02, 29 November 2022) was downloaded to analyse the acoustic properties of all sounds. To reduce reflections and extraneous noise, all sentences were recorded separately and recorded in a professional-quality recording studio. with 44kHz sampling, high quality; and WAV recording format, Voice Recorder software (version 3.20) was installed on the Motorola Edge 40 to record audio. Some audio was also recorded with a TASCAM DR-100 MK. When recording, the speakers maintained 10 to 20 inches away from the microphone.

Analyses for Tone:

For preliminary investigation, the Praat Software was downloaded to analyse the tone. A recording of 13 contrastive pairs were recorded in isolation as well by inserting the target words in elicited sentences. The pitch settings on the Praat were adjusted between 50-180 Hz for men and 80-250 Hz for Women. Cross-correlation analysis method was preferred

for the analysis. The variation in fundamental frequencies (pitch contours) were determined for each tone in Tobu. Maximum pitch and Minimum pitch were extracted from the pitching listing.

The 13 contrastive pairs were annotated using Praat text-grid, and a Praat script, ‘Analyse tone and Plot. Praat’ was downloaded from the website <https://github.com/lingdoc/praatscripts> to analyse the smooth pitch contours tones of Tobu measured in Hertz.

3.5.4.2. Discussion

The wordlist recorded and the graphic representations of the three tones of a female and male speaker with discussions are presented below:

wordlists	
word	meaning
ʃaŋ	village
ʃaŋ	debt
ʃaŋ	keep
sən	salt
sən	foster
sən	know
maŋ	dead body
maŋ	dream
maŋ	sturdy
la	leg
la	go
la	spicy
la	neighbouring village
lam	three
lam	sweat
lam	warm
suŋ	ear

suŋ	pour
suŋ	slope
wa	knit
wa	roam
wa	hurry
jam	search
jam	dry
jam	soak
mo	festival
mo	full
mo	follow
kam	corner
kam	finish
kam	basket
huŋ	rice
huŋ	to hammer
huŋ	ring
le	paper
le	intestine
le	pick
mai	good
mai	meat

Table 3.14: Recorded wordlists to analyse acoustic properties of Tobu tones.

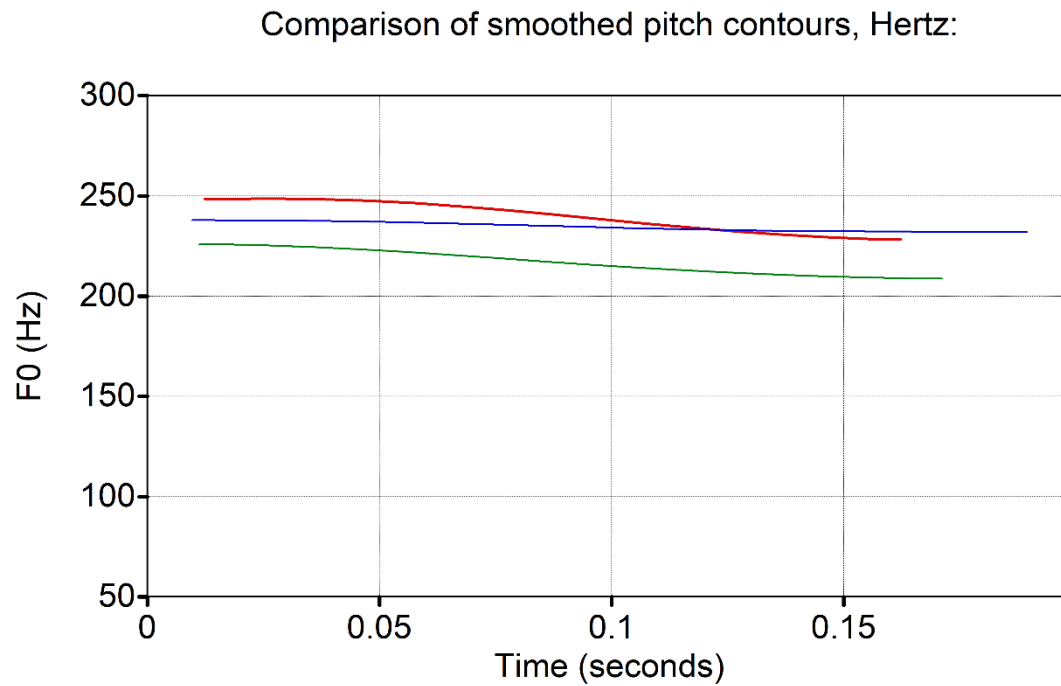


Fig. 3.10: Graph depicting a comparison of smoothed pitch contours of female speech.

From the Fig. 3.10 above, it can be observed that the graph displays three smoothed pitch contours over a time span of 0-0.20 seconds. The contours represent variations in pitch for three tones detected in Tobu. The Y-axis represents the fundamental frequency (F0) in Hertz, and the X-axis represents time in seconds. Based on the graph, the red line represents a high-pitched tone, starting at approximately 250 Hz and descending to about 225 Hz over the 0.15 second period. This red line represents a high falling tone because it can be observed that the gradual decrease in pitch over time is consistent which indicates the characteristics of a falling tone. The blue line represents a mid-range tone, starting at about 235Hz and maintaining a relatively steady pitch, ending at around 230 Hz. This blue line represents the mid tone in Tobu. The green line represents a lower-pitched tone, starting at about 225 Hz and descending to approximately 210 Hz. The green line represents the low tone in Tobu.

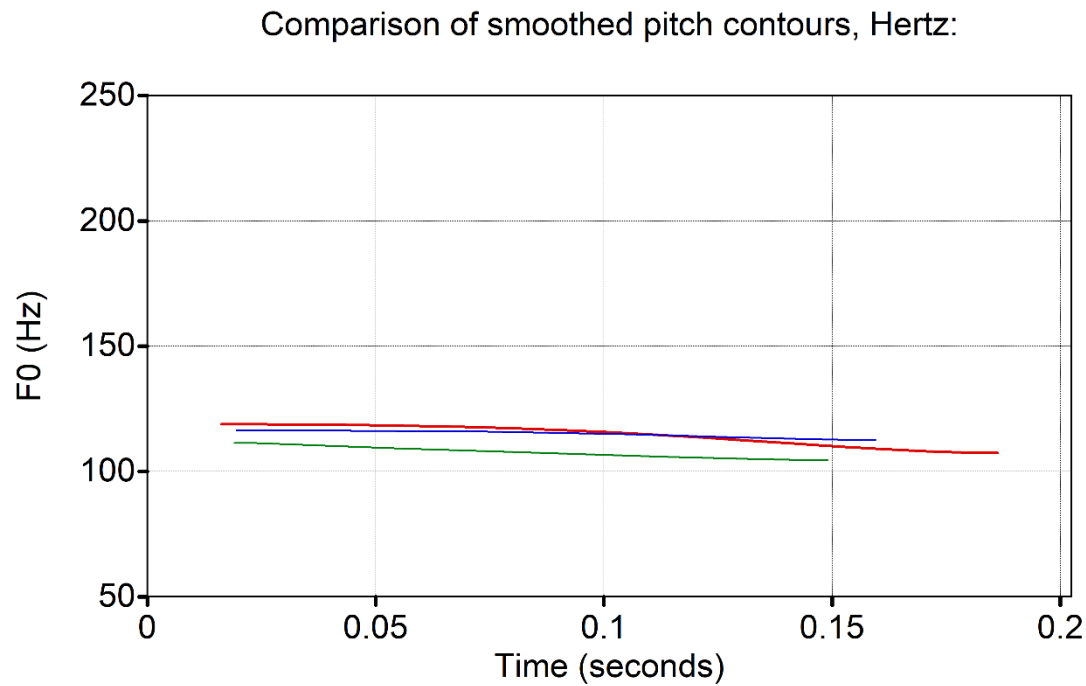


Fig. 3.11: Graph depicting a comparison of smoothed pitch contours of male speech.

The Fig 3.11 above represents the smoothed pitch contours a male speaker. The pitch contour is shown over a short time span approximately around 0-0.2 seconds. Since the male has relatively thicker and longer vocal cords, which vibrate more slowly resulting in a lower fundamental frequency (F0), the lines above the graph shows the pitch ranges between 100-150 Hz. The high-falling tone of a male speaker starts relatively around 130 Hz and descends to about 110 Hz. And the mid-tone is just below the starting of the high-falling at around 125 and maintain steady pitch. And the low tone starts at around 120 Hz and slightly slope down around 90 Hz. In comparison with the female smoothed pitch contours, the high falling tone and the mid-tone of male speech is relatively very close and gathered around the mid-level pitch.

Fig. 3.12 below is a sample spectrogram showing pitch variations of three contrastive tones for the word ‘faj’ in Tobu is presented below for reference. For these three tones, the first tone which is the low tone has maximum pitch of 107 Hz and minimum pitch of 98 Hz. The second tone which is mid-tone has maximum pitch as 128 and minimum pitch of 124. The third tone which is the High- falling tone has maximum pitch of 132 Hz and minimum pitch of 119 Hz.

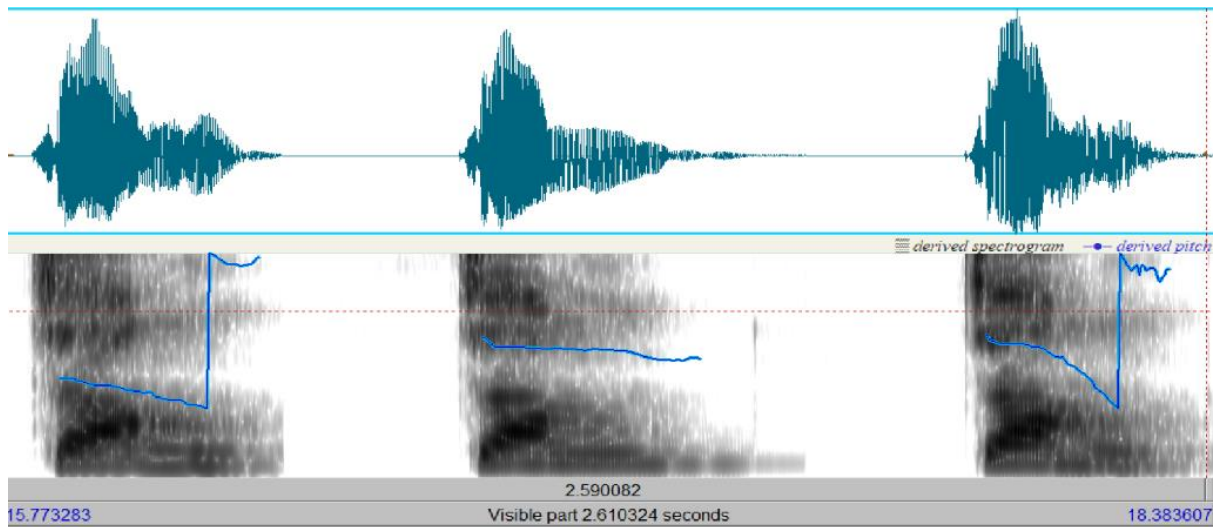


Fig. 3.12: Sample spectrogram showing pitch variations of three contrastive tones for the word 'fan.'

3.6. Acoustic analysis: Consonants and Vowles

In this section, the preliminary acoustic analysis of consonants will be discussed.

3.6.1. Methodology

Sample:

Four native speakers aged 20-30 were selected to record their voices. Among the four speakers, the best voices of two subjects, one male and one female, were selected to analyse the acoustic properties of the Tobu phonemes. All subjects selected had full teeth, speech and normal hearing. Spectrogram image, acoustic measurement and analyses used for this thesis were mostly taken from a female speaker.

Data collection:

The oral data comprising of various tokens elicited from the list of words and sentences were collected. In the Tobu, it is not feasible to isolate a specific phoneme within a given context. Consequently, various contexts were employed for the compilation of word lists, and target words were embedded within carrier sentences. Several instances were collected utilizing the context V, VC, CVC, VC-CV for vowels; however, for those instances that were unavailable, alternative words targeting the specific sound were collected. For consonants CV and VCV were collected.

Data recording:

PRAAT software (version 6.3.02, 29 November 2022) was downloaded to analyse the acoustic properties of all sounds. To reduce reflections and extraneous noise, all sentences were recorded separately and recorded in a professional-quality recording studio. with 44kHz sampling, high quality; and WAV recording format, Recorder Audio software (version 3.20) was installed on the Motorola Edge 40 to record the audios. Some audio was also recorded with a TASCAM DR-100 MK. When recording, the speakers maintained 10 to 20 inches away from the microphone.

3.6.2. Acoustic properties of vowels

"Usually, there are more than three formants of vowels (for example, F4, F5), but these types of formants do not necessarily represent vowels, they are more related to defining the quality of the voice of a speaker," says O' Connor. Therefore, the first two types of vowels are used as the acoustic cues. The table 3.15 and the graph of vowels Fig. 3.13 below show the average values of F1, F2 values and duration of the vowels production, and the vowel position specified in Tobu. All measured words are spoken by an adult female speaker.

Item	Vowels	syllable	F1	F2	Time Duration in milliseconds
i	i	V	282	2665	329
apti	a	VC-CV	880	1359	493
et	e	VC	566	2396	283
əŋ	ə	VC	523	1380	248
oŋ	o	VC	432	887	565
huŋ	u	CVC	364	925	183

Table 3.15: Wordlist recorded to analyse the acoustic properties of vowels in Tobu.

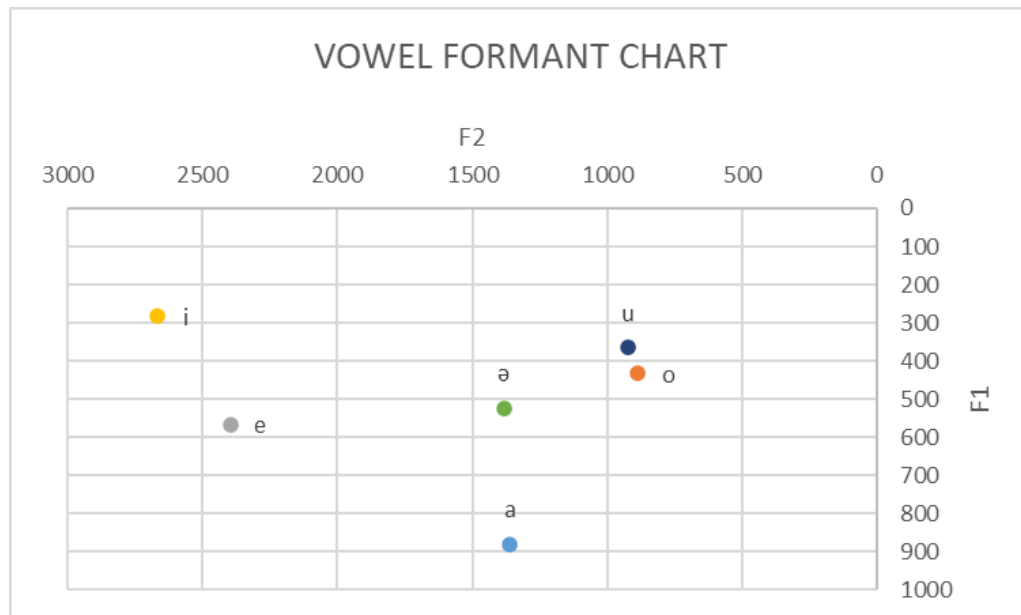


Fig. 3.13: Scattergram plot of vowel using the average values of F1 and F2 showing the position of vowels in isolated words.

From the acoustic measurement of vowels detected in Tobu, it can be observed that 'i' has the lowest F1 value and /a/ has the highest F1 value. Also, in the F2 values, we see that /i/ has the highest value and /u/ as the lowest value. The time duration of all the vowels is measured around 248-565 milliseconds.

As mentioned earlier in section 3.6.1, it is not possible to target all the vowel sounds in a specific context, therefore, the vowel sound was placed at the onset position followed by a consonant except for the vowel /u/ which do not occur at the onset position. From the plot, it has been observed that the acoustic spacing of the vowels in the plot presented shows a six-vowel system with some comments. Firstly, from the plot, it can be observed that /i/ and /u/ are at the same height. The central mid vowel /ə/ and central open /a/ vowels are slightly away towards back from the central position but remains on the same line. Secondly, the most striking observation is that the back rounded vowel /o/ are /u/ are placed very closely where /u/ is more back than /o/ sound. Also, an attempt was made to insert the recorded words in carrier speech to check whether the vowels stay in the same position after plotting. A table with formant values and graph chart is presented below to show at what positions, the vowels is placed if targeted in running speech.

item	vowels	syllable	f1	f2	time
i 'thread'	i	V	282	2555	329
i 'thread'	i	V	332	2510	145
et 'open'	e	VC	566	2396	283
et 'open'	e	VC	461	2471	158
əŋ 'drink'	ə	VC	523	1380	248
əŋ 'drink'	ə	VC	778	1306	120
apti 'gone away'	a	VC-CV	880	1359	493
apti 'gone away'	a	VC-CV	929	1406	267
oŋ 'go up'	o	VC	432	887	565
oŋ 'go up'	o	VC	428	792	203
huŋ 'rice'	u	CVC	344	720	250
huŋ 'rice'	u	CVC	323	827	122

Table 3.16: Average formant value of F1 and F2 and time duration of vowels in isolation and running speech.

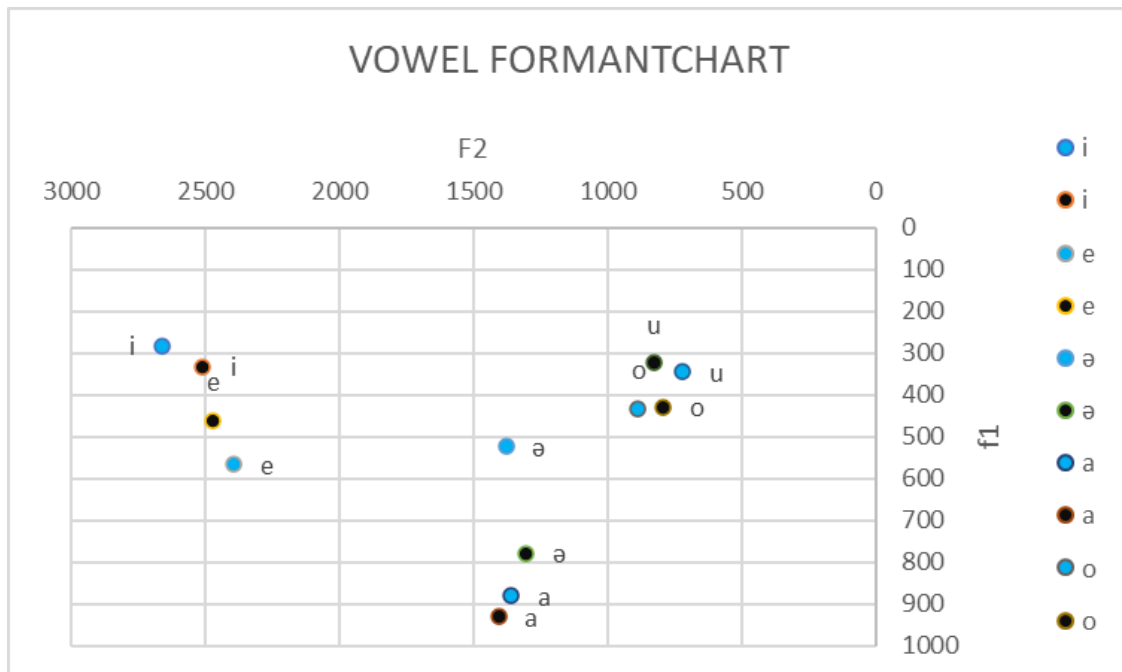


Fig. 3.14: Scattergram plot of vowel using the average values of F1 and F2 showing the position of vowels in isolated words and running speech.

On the above Table 3.16 and Fig. 3.14, the blue colour indicates the vowel produced in isolated words and the black colour indicates the vowels produced in running speech. It can be observed that the positions of the vowel produced in running speech vary with the vowels produced in isolation as the average formant values change. It can be seen that almost all the vowels do not change the position drastically except for the close-mid central vowel which is seen to be lowered towards open position as its f2 value decreased drastically.

3.6.3. Sample of spectrograms

In this section, spectrograms of Tobu Vowels produced in isolation and in running speech will be presented. All the above analysis are based on the following samples presented below:

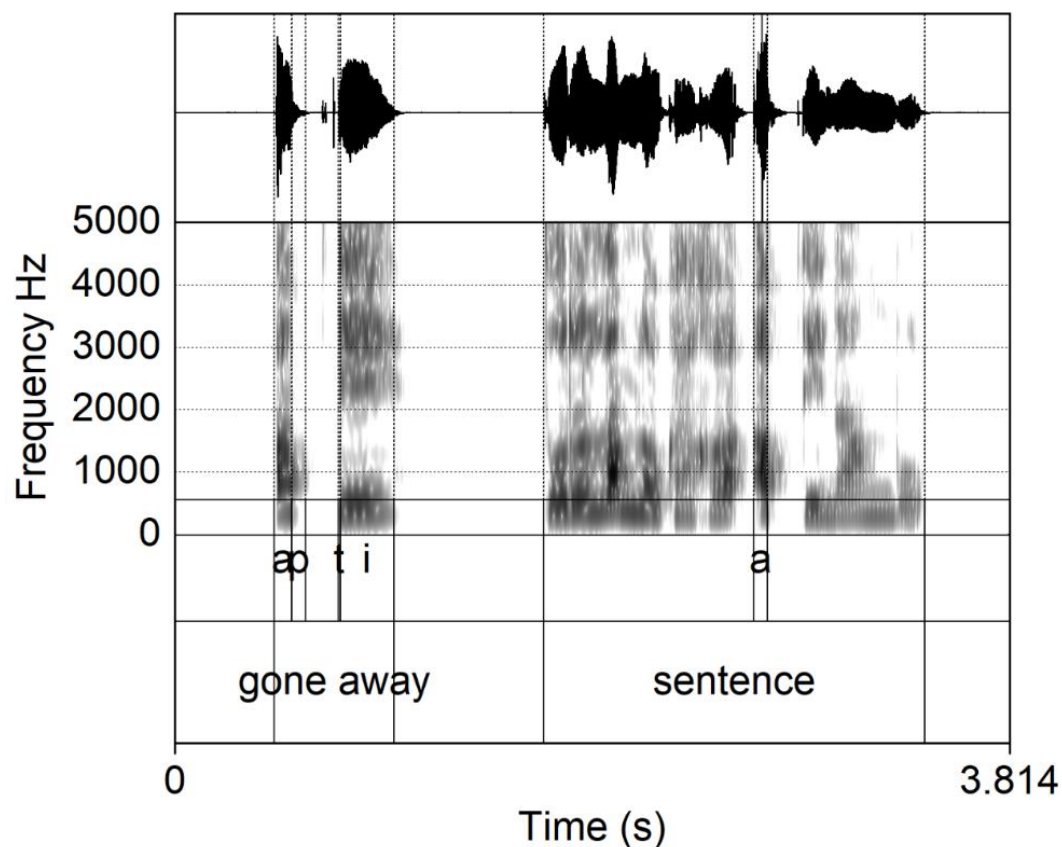


Fig. 3.15: Sound wave, wide band spectrogram with text-grid of vowel /a/.

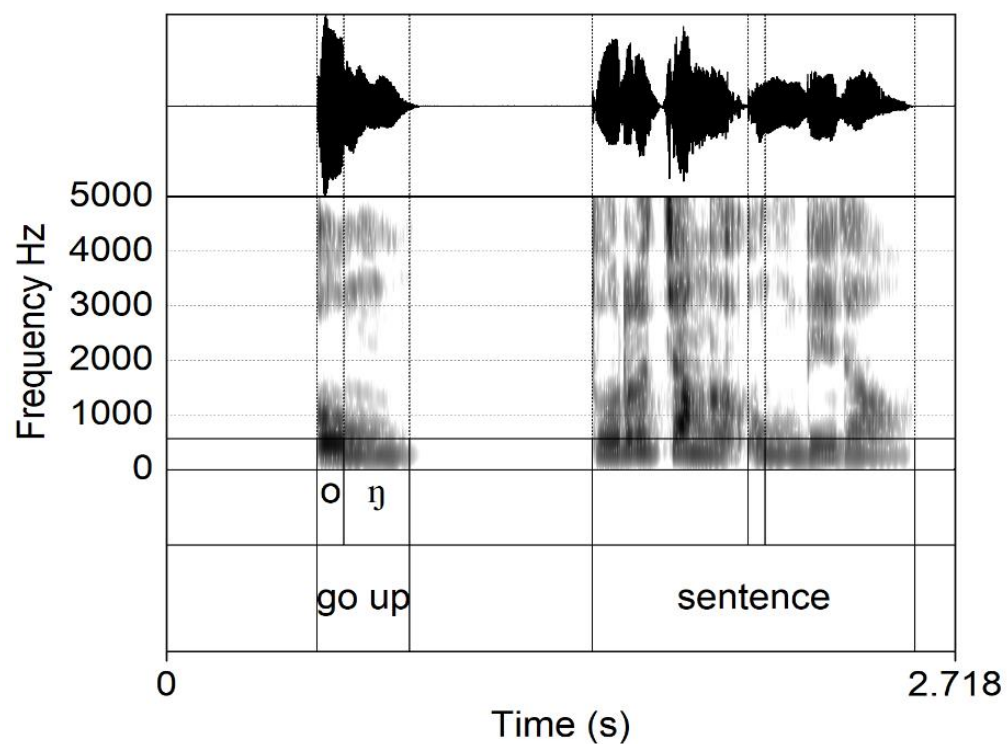


Fig.3.16: sound wave, wide band spectrogram with text-grid of vowel /o/.

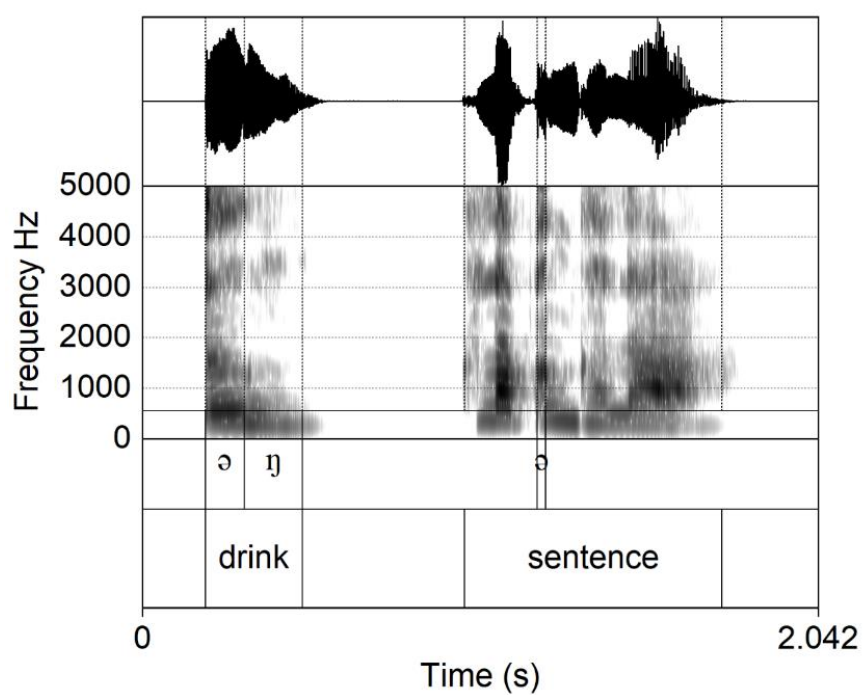


Fig. 3.17: Sound wave, wideband spectrogram, and text-grid of vowel /ə/.

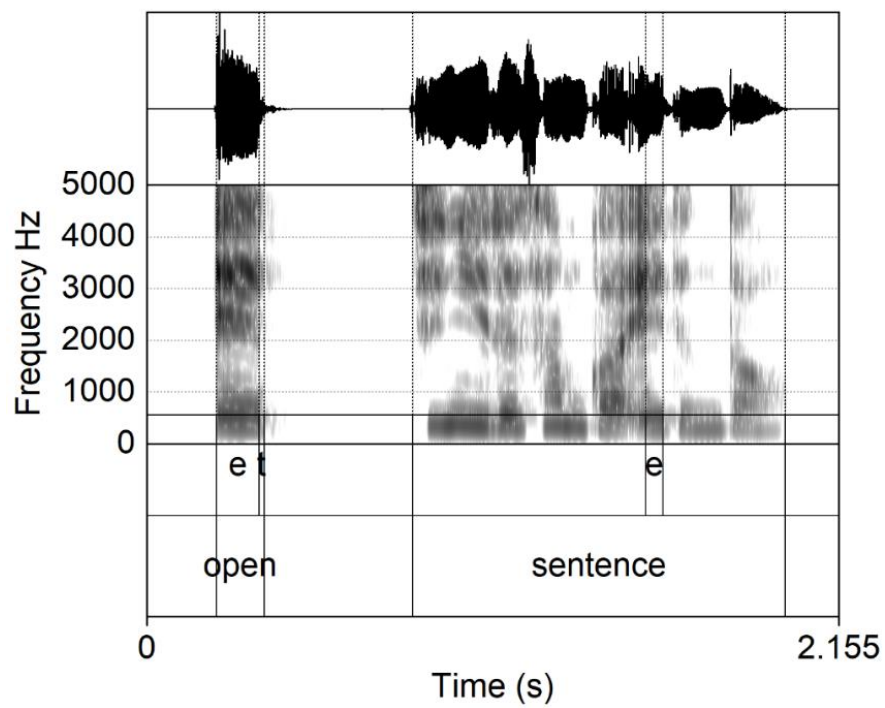


Fig.3.18: Sound wave, wideband spectrogram, and text-grid of vowel /e/.

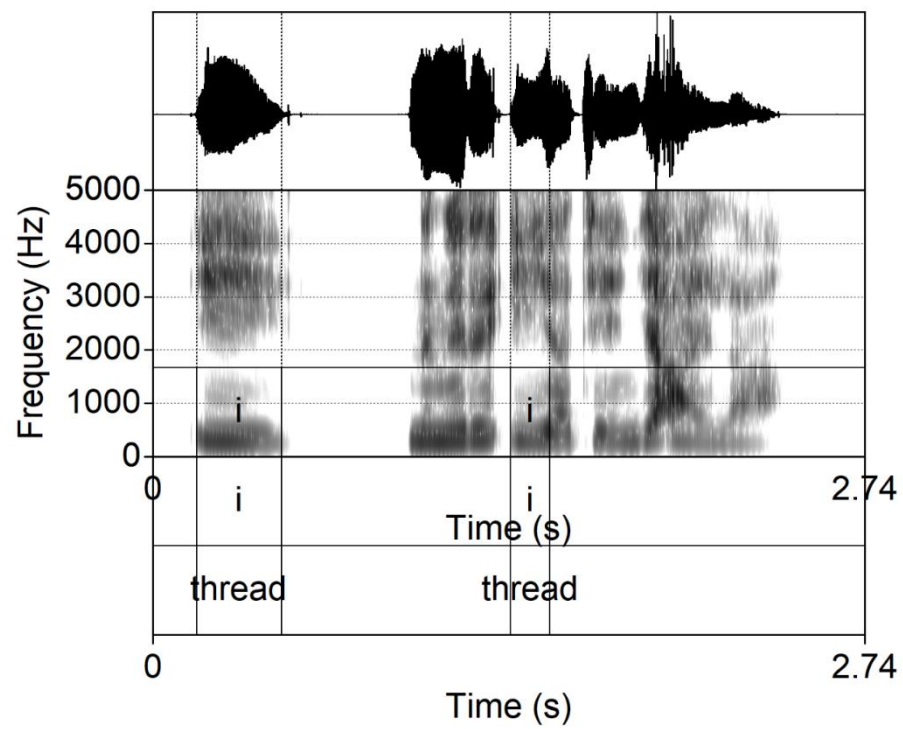


Fig. 3.19: Sound wave, wideband spectrogram, and text-grid of vowel /i/.

3.6.4. Acoustic properties of consonants

In this section, preliminary investigation of acoustic properties of consonants in Tobu will be presented by looking at different acoustic cues.

3.6.4.1. Plosives

To determine the stop sounds acoustically, four acoustic properties of stop sound such as, release burst (VOT), voicing bar, duration of the stop gap, and aspiration were analysed. In Tobu, it has been detected that there five voiceless unaspirated stops and one voiced aspirated stop. All these sounds will be discussed acoustically as per their properties below:

3.6.4.1.1. VOT and Burst release

Voiceless unaspirated velar plosives /k/:

From the Fig.3.20 and Fig. 3.21 below, the analyses show that the breast release indicates a strong vertical spike where the formants are scattered lightly around 1000 to 5000 frequency indicating stop sound. The time between the burst and the voice onset shows 0-19.751 milliseconds which is a positive voice onset time.

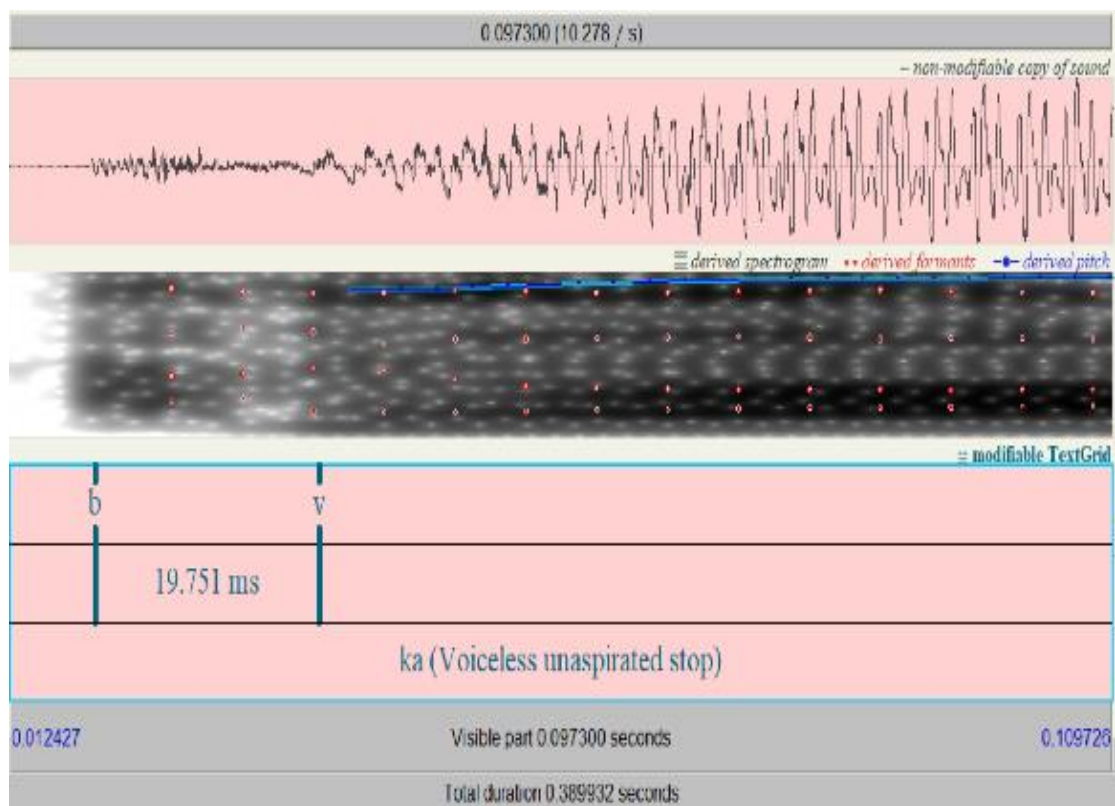


Fig. 3.20: Waveband, spectrogram, and text grid showing burst release before voicing of a female speaker

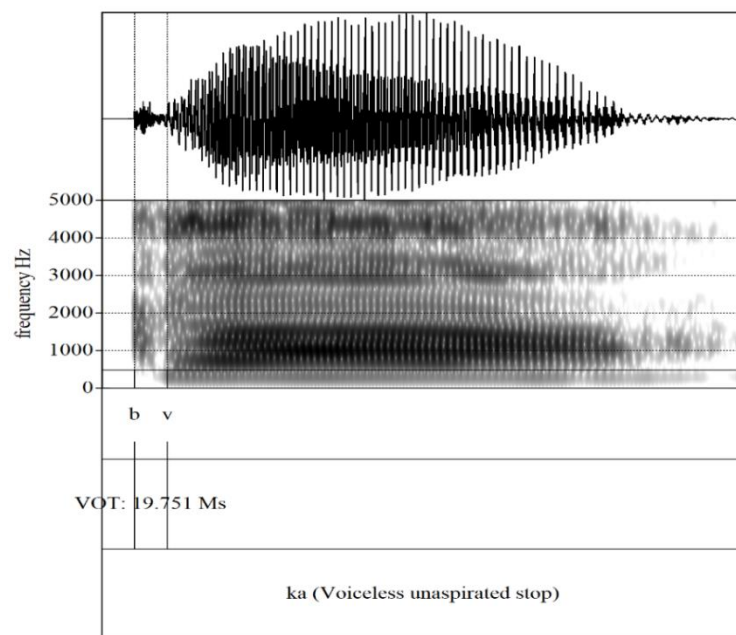


Fig. 3.21: Wave band, wide spectrogram with text grid showing VOT of voiceless velar plosive /k/ of a female speaker.

Unaspirated voiceless bilabial Stop /p/:

From the Fig. 3.22 and Fig. 3.23 below, the analyses show that the burst release indicates the voiceless bilabial stop. The VOT is measured in positive time around 0-10.761 milliseconds which is relatively lower than the velar stop, meaning the following sonorant sound begins near to burst release. The formants are scattered in above 1000 frequency, and it shows a spike indicating voiceless stop sound.

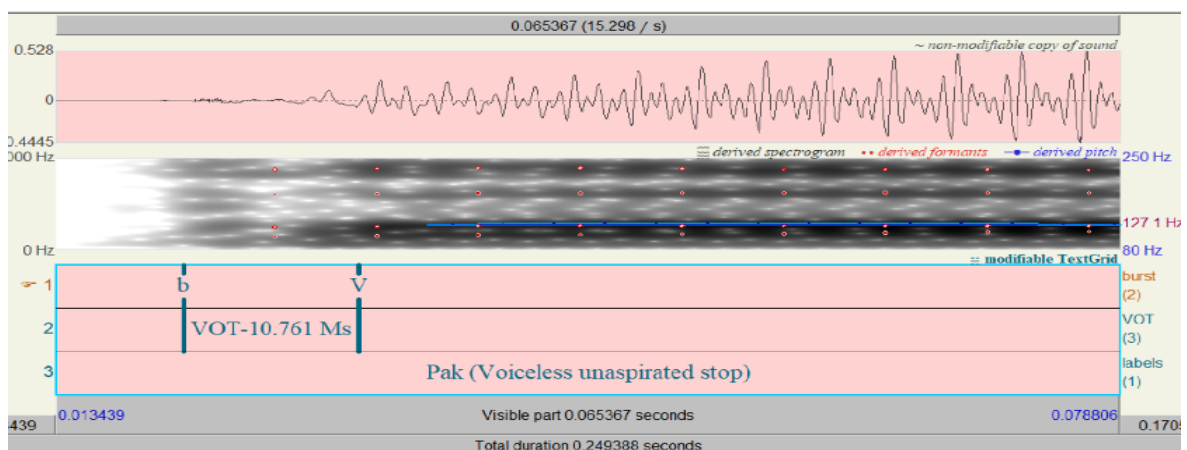


Fig.3.22: Wave band, wide spectrogram with text grid showing burst release before voicing of voiceless bilabial plosive /p/ of a female speaker.

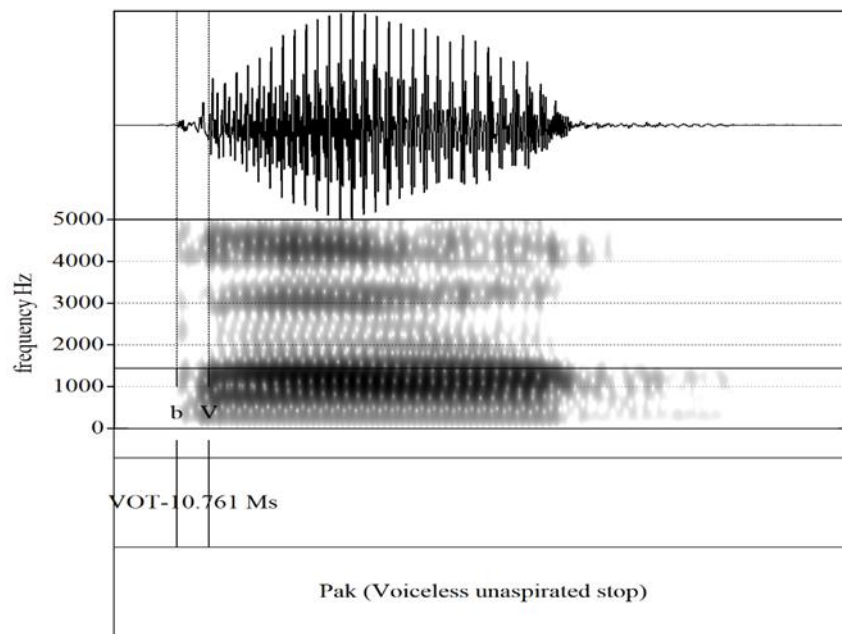


Fig. 3.23: Soundwave, wide-band Spectrogram and text-grid showing VOT of voiceless unaspirated stop /p/.

Voiceless unaspirated Alveolar Stop /t/:

From the Fig. 3.24 and Fig.3.25 below, the analyses shows that the alveolar stop of Tobu is relatively longer VOT than all the other unaspirated stop sounds. The VOT of /t/ is measured around 0-26.555 milliseconds. The formants are scattered around 3000 to 5000 frequency Hz with a spike indicating voiceless stop consonant.

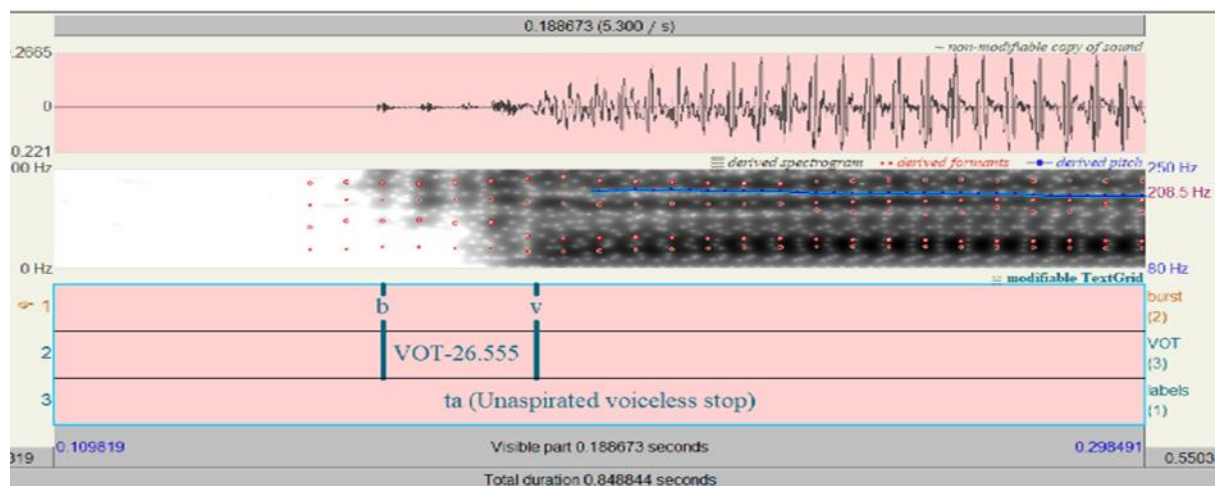


Fig.3.24: Sound wave, spectrogram, and text-grid showing burst release before voicing of voiceless unaspirated stop of a female speaker.

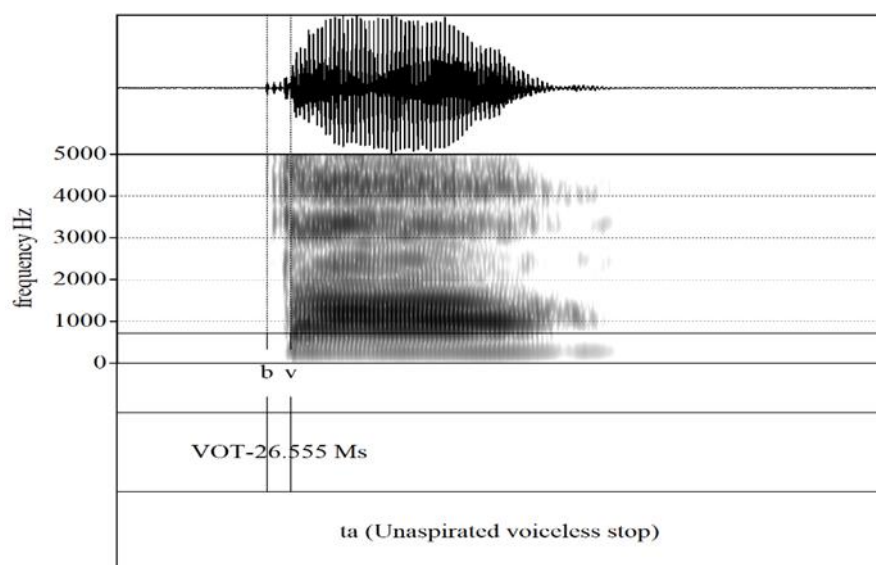


Fig. 3.25: Wave band, wide spectrogram with text grid showing VOT of voiceless alveolar plosives /t/ of a female speaker.

Voiced unaspirated bilabial plosive /b/:

While conducting the study, it has been observed that Tobu exhibits one voiced sound with limited distribution. From the below Fig. 3.26 and Fig. 3.27, the analyses show that the VOT of the voiced alveolar stop is measured at -52.177 Ms. The voicing starts vibrating before the stop is released. Also, looking at the spectrogram, the voicing bar appears normally at low frequencies which indicates that it is a voiced bilabial stop.

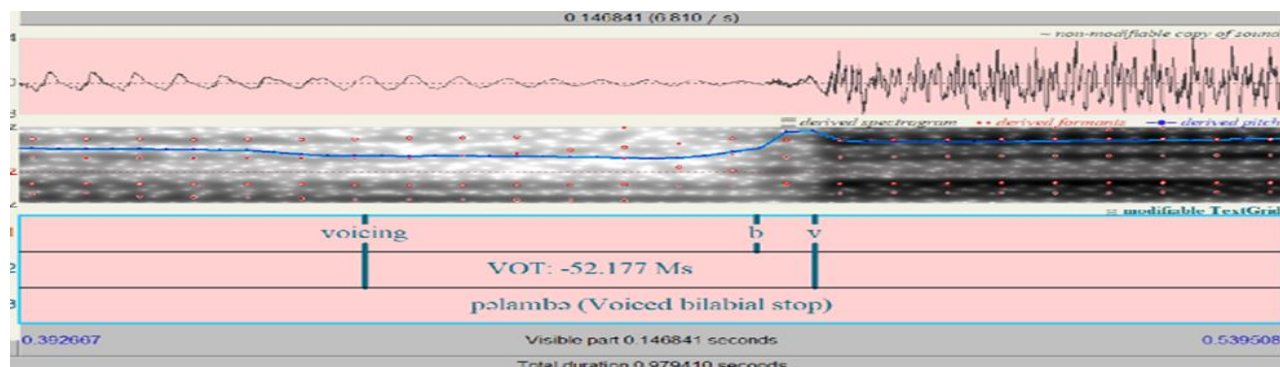


Fig. 3.26: Soundwave, wide band spectrogram and text-grid showing voicing before the burst release burst of /b/ of a female speaker.

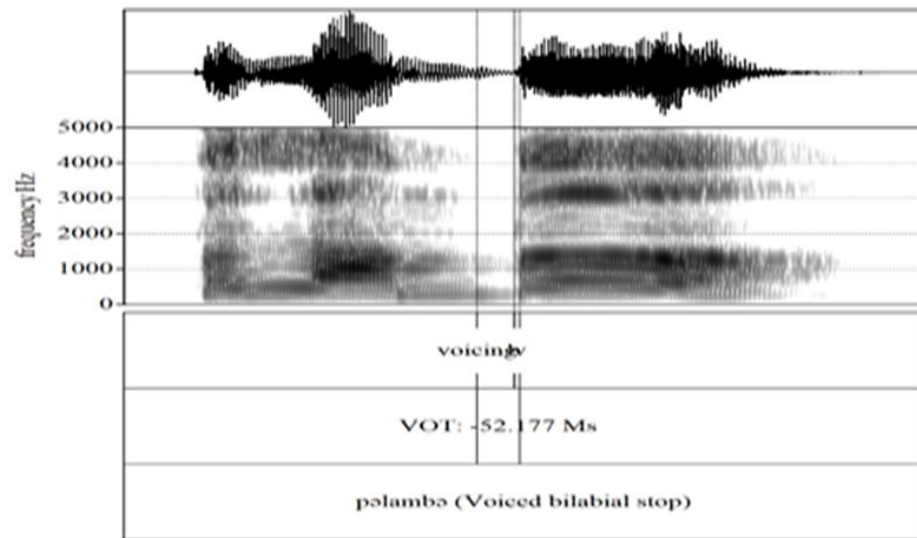


Fig. 3.27: Wave band, wide spectrogram with text grid showing VOT of voiced bilabial plosives /d/ of a female speaker.

Voiced aspirated bilabial plosives /p^h/:

From the below Fig. 3.28 and Fig. 3.29, the analyses show that the VOT of /p^h/ is measured at around 0-27.015 Ms. The burst is released before voicing and time duration is relatively longer than the unaspirated plosives which indicated that it is aspirated stop.

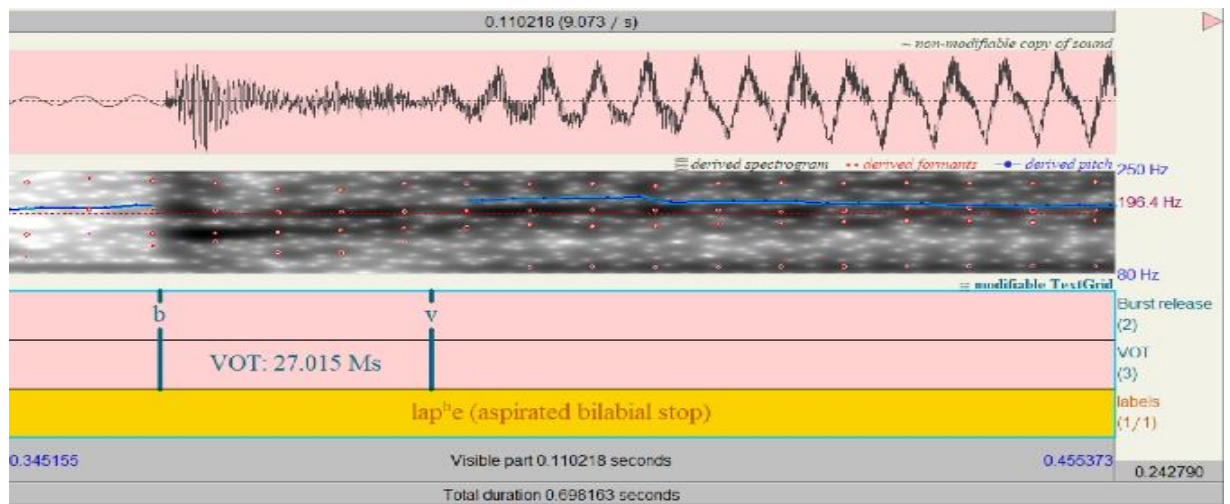


Fig. 3.28: Soundwave wideband spectrogram and text-grid showing burst release before voicing of /p^h/.

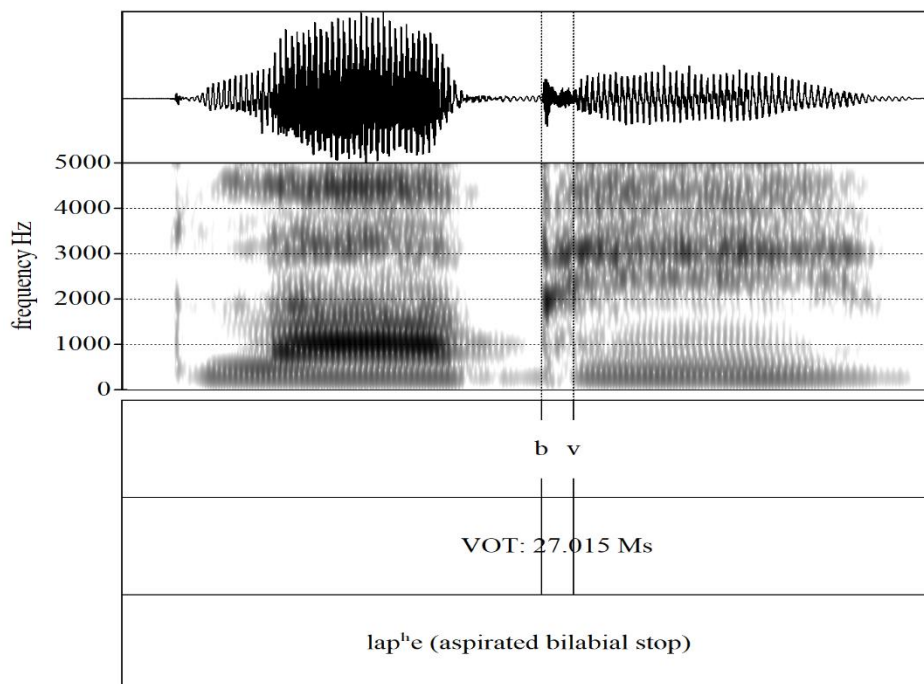


Fig. 3.29: Wave band, wide spectrogram with text grid showing VOT of voiceless aspirated bilabial plosives /pʰ/ of a female speaker.

Voiceless aspirated alveolar stop (tʰ):

From the Fig. 3.30 and Fig. 3.31, the analyses show that the VOT of this aspirated sound is measured around at positive 0- 54.011 Ms indicating strong aspiration. As it is an aspirated sound the time duration is longer than the unaspirated stop. The formants also show a vertical spike indicating the velar stop sound.

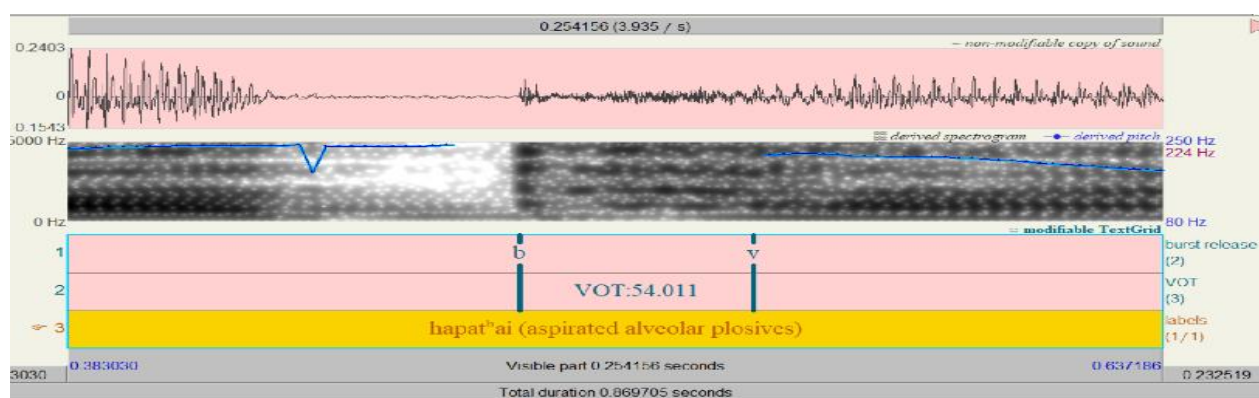


Fig. 3.30: Sound wave, wideband spectrogram and text-grid showing burst release before voicing of the sound /tʰ/ of a female speaker.

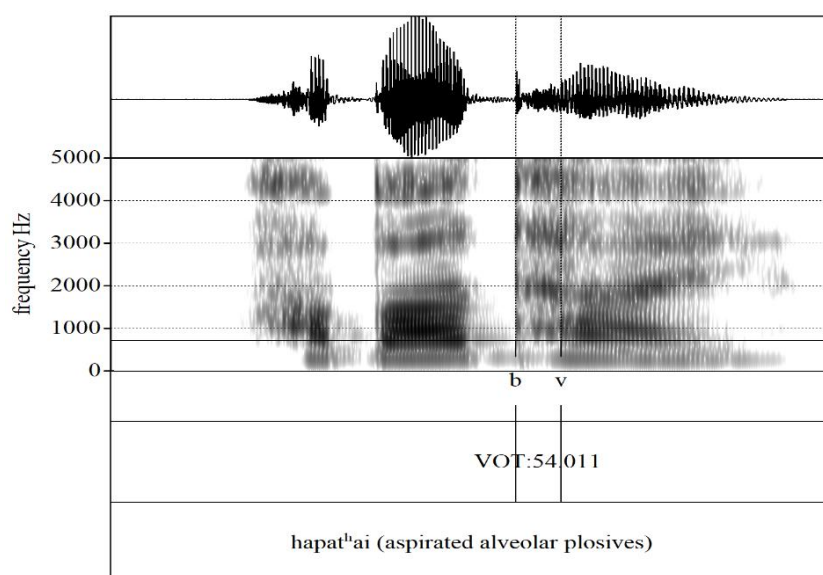


Fig. 3.31: soundwave, wideband spectrogram and text-grid showing VOT of the sound /tʰ/ of a female speaker.

Voiceless aspirated velar plosives:

From the Fig. 3.32 and Fig 3.33 below, the analyses show that the VOT of /kʰ/ is measured at positive 63 Ms which indicates strong aspiration. It has also been observed on the spectrogram that after the closure stop, the burst release shows a strong vertical spike indicating the stop sound.

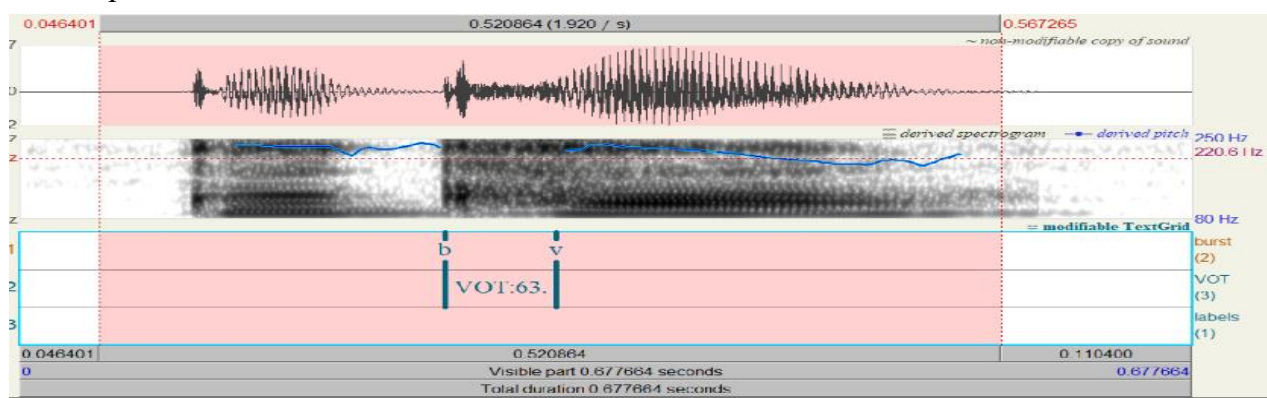


Fig. 3.32: Soundwave, wideband spectrogram, and text-grid showing the burst release before voicing of the sound /kʰ/ of a female speaker.

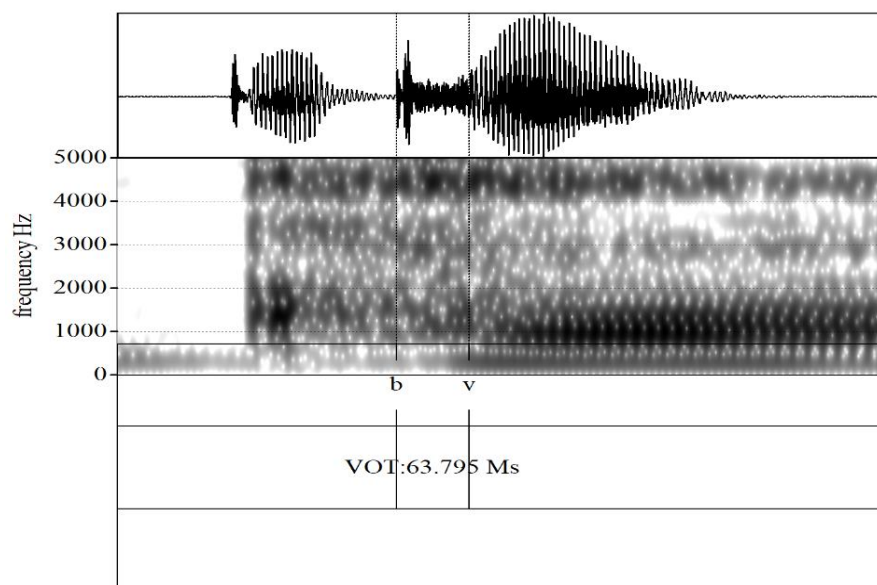


Fig. 3.33. Soundwave, wideband spectrogram, and text-grid showing the VOT of the sound /kʰ/ of a female speaker.

3.6.4.1.2. Duration of stop gap- silent period on the closure phase

Tobu exhibits 9 stops sounds. For the acoustic analysis, five stop sounds such as, /p/, /b/, /t/, /k/, /pʰ/, /tʰ/ and /kʰ/ were analysed for duration of stop gap. The specific sounds were targeted and inserted in running speech to check its silent period. As per the analyses, the Fig. 3.34 shows the duration of stop gap of the unaspirated stop sounds are measured as 98 ms for /p/, 124 ms for /t/, 85 ms for /k/ and 105 ms for /b/. The Fig. 3.35 shows aspirated stop sounds measured at around 69 ms of /pʰ/, 54 ms for /tʰ/ and 51 ms for /kʰ/. The duration might have variations depending on the sound environment; however, it may not vary by big margin.

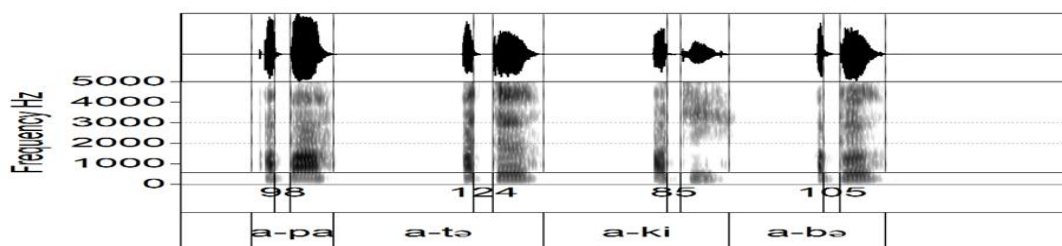


Fig. 3.34: Spectrogram showing duration of stop gap for unaspirated plosives produced by a female speaker.

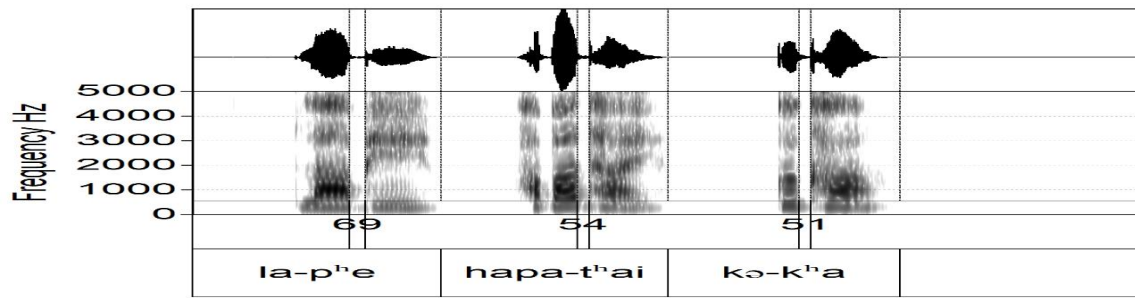


Fig. 3.35. Spectrogram showing stop gap duration of aspirated plosives produced by a female speaker.

3.6.4.1.3. Voicing bar

Voicing bar is a dark bar that is shown at the low frequency, usually between 200 Hz. In Tobu, only one voiced stop sound has been detected; therefore, a recording of four stop sounds such as, /p/, /b/, /t/ and /k/ was conducted with a female speaker to check the formants of the speech recorded. The Fig. 3.36 illustrates the voicing bar of Tobu voiceless plosive sounds and the only one voiced plosive sound detected. From the illustration, we see that there are strong energy of voicing appearing at lower frequency for the voiced bilabial sound, whereas the other voiceless sounds do not appear as such but the energy is showing stronger at the higher frequencies.

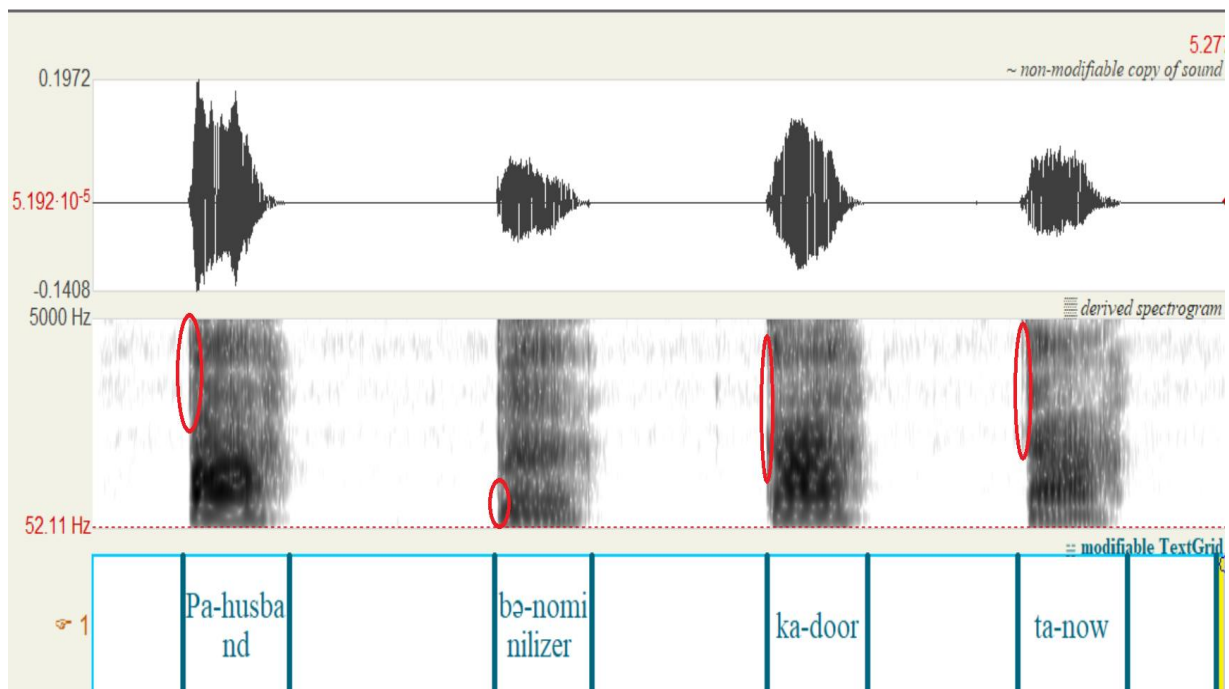


Fig. 3.36: Screenshot of spectrogram of words “pa, bə, ka, and ta” for the voicing bar.

3.6.4.2. Fricatives

This study has detected four pure fricative sounds in Tobu such as, one voiced labiodental fricative, one voiceless alveolar fricative, one voiceless post-alveolar fricative, and one voiceless glottal fricative. Fricatives can be divided into sibilants and non-sibilants. In Tobu, /s/, and /ʃ/ are sibilants sounds and /v/ and /h/ are non-sibilants. The fricatives of Tobu are acoustically analysed on the bases of its turbulence noise, its intensity, and its acoustic energy occurring at various frequencies. Illustrations of the acoustic properties of fricatives in Tobu are presented and discussed below:

From the Fig. 3.37 below, the analyses show that the post-alveolar fricative has stronger formants concentration at around 2300-5000 Hz than the alveolar fricative where the formants are weaker and scattered at around the 1000-5000 frequency range. As both the sounds are sibilants, they appear to be loud measuring at 75.03 dB for /s/ and 72.09 for /ʃ/. Normally, the intensity of the alveolar fricative is higher than the post-alveolar fricative; therefore, it can be observed from the spectrogram that the intensity of the alveolar fricative is louder than the post-alveolar fricative. The turbulence of the both the sounds presented shows strong at around 2000-5000 Frequency Hertz.

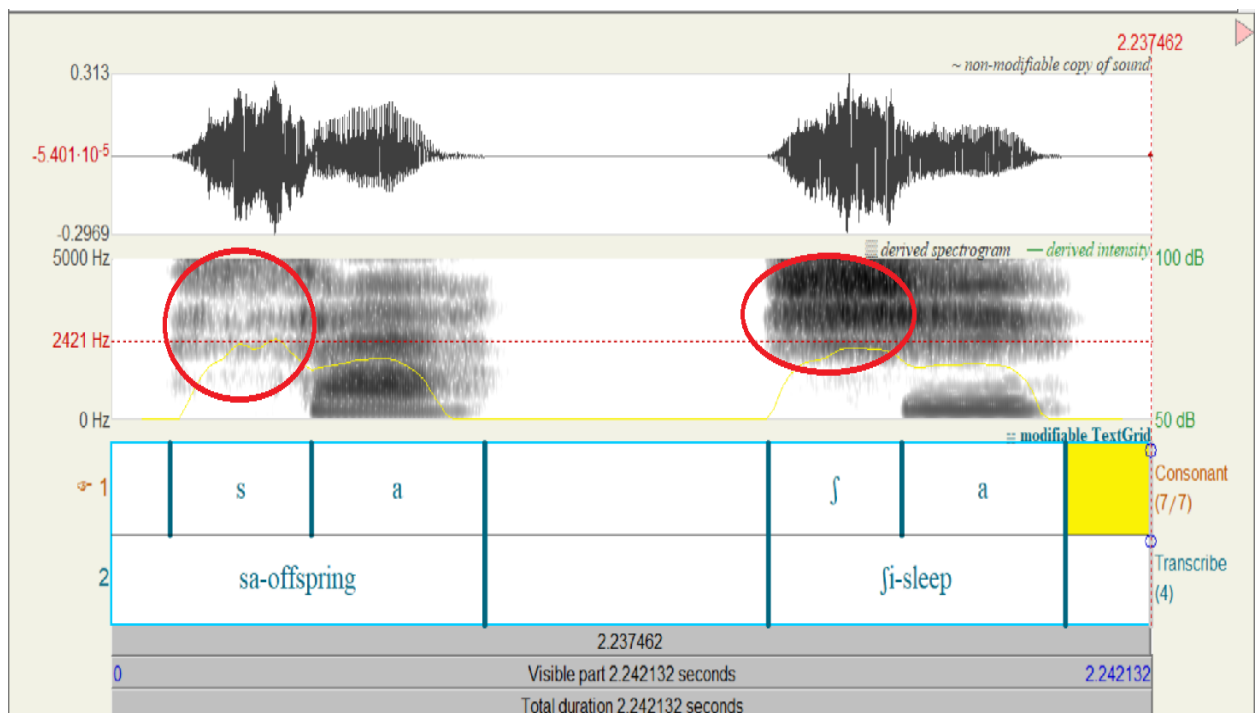


Fig. 3.37: Spectrogram of voiceless alveolar and post alveolar fricatives of a female speaker.

Tobu has only one pure voiced labio-dental fricative, and the voiceless labio-dental fricative is only an allophone that occurs in free variation with /p^h/ in Tobu sound system, therefore, only the acoustic analyses of the voiced counterparts have been considered in this research. From the Fig.3.38 below, the analyses show that /v/ exhibits strong turbulence focussed above 4000 Hz but might be comparatively lower if compared with voiceless counterparts. Since it is a voiced sound, the spectrogram shows voicing bar where the formants are concentrated at lower frequency around 200-250 Hz. The analyses also show that it has a relatively long noise time interval and frication noise measured around 200-240 ms.

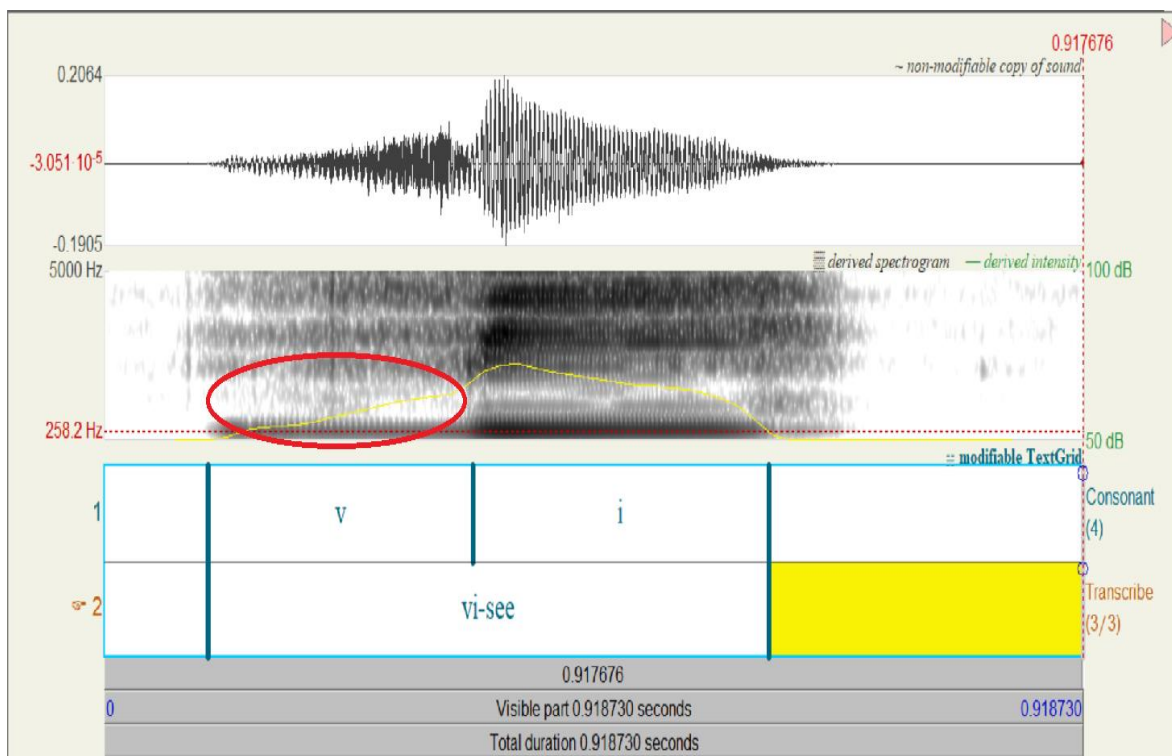


Fig. 3.38: Spectrogram of voiced labio-dental fricative /v/ of a female speaker.

Tobu exhibits one voiceless glottal fricative. From the Fig.3.39 below, the analyses show that it is a non-sibilant fricative showing weak turbulent noise. The turbulence appears to be slightly stronger at around 1000-4000 frequency Hz which is marked by a red circle on the figure above. From the spectrogram, we can observe that there is no voicing bar which is indicated by a red box on the figure above. The intensity is very low and remains the lowest frequency. Its duration is also relatively shorter than the other sibilant fricatives in Tobu measured at around 53.4 ms.

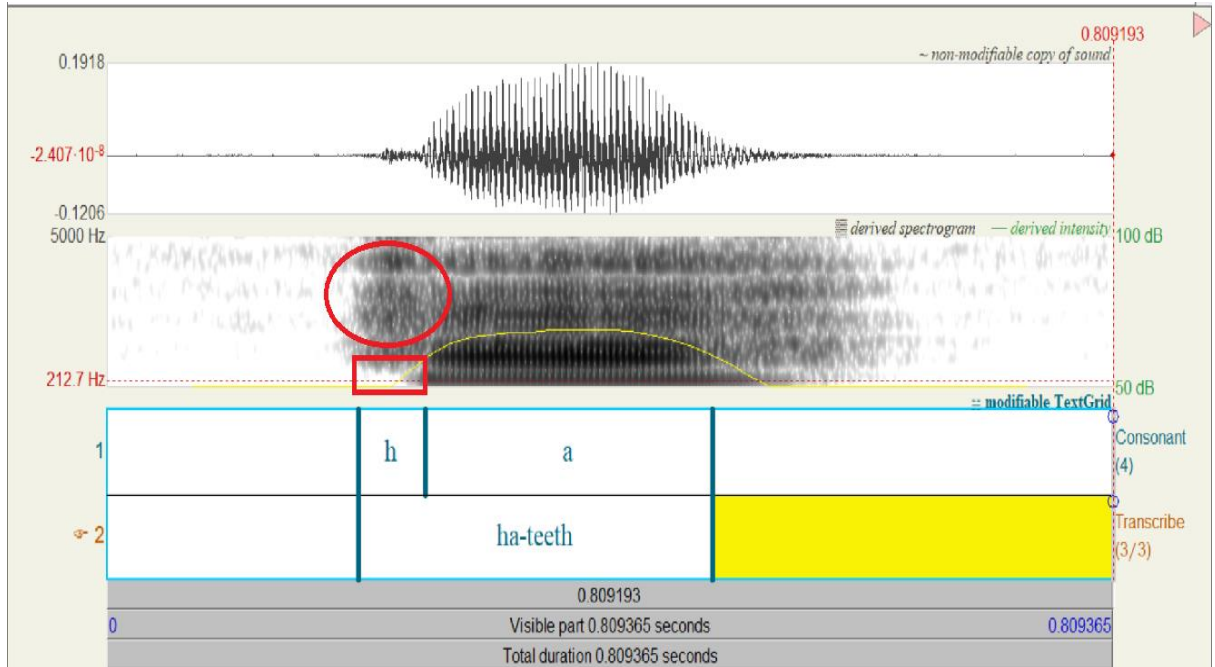


Fig. 3.39: Spectrogram of glottal fricative /h/ of female speaker.

A summary table of turbulence frequency and intensity of the fricatives in Tobu is presented below:

Fricatives	Frequency range	Intensity
s	1000-5000 above	high
ʃ	5000 above	high
v	1000-5000	low
h	1000-4000	low

Table 3.18: Turbulence frequency and intensity of the fricatives in Tobu.

3.6.4.2. Nasals

Nasals have the same constrictions as plosives except that the air is allowed to pass through the nose but not through the mouth. Nasal consonants involve a lowering of the soft-palate which links in the nasal cavities as additional as acoustic resonators. Tobu exhibits four nasals such as, bilabial nasal /m/, alveolar nasal /n/, palatal nasal /ɲ/ and velar nasal /ŋ/. Since all nasals are voiced, the acoustic cues for nasals include manner cues which

include the presence of low-frequency resonance, the rapid fall and rise in energy as the nasal is produced and released. Also, another acoustic cues will be place cues which can be analysed form the F2 and F3 formant transitions. From the figures below, the analyses show that the formants of all the Tobu vowels are dark but not as the dark as the vowel formats. The frequency of F1 of all the nasals relatively at the same lowest range around 92-495 Hz. The F2 of bilabial nasal is placed at 1297 Hz and the velar nasal is placed at 1176 Hz. Also, the F2 of the alveolar nasal shows an upward direction starting from 614 Hz to 1176 Hz and the F2 of the palatal nasal shows straight formants placed at 1136 Hz. The F3 formants of /m/ and /ɲ/ are shown clearly at around 2300-3000 Hz. And the F3 for /n/ and /ŋ/ are scattered and generally not so visible. Below Fig.3.40 and Fig.3.41 are the spectrograms showing the acoustic representation of nasals:

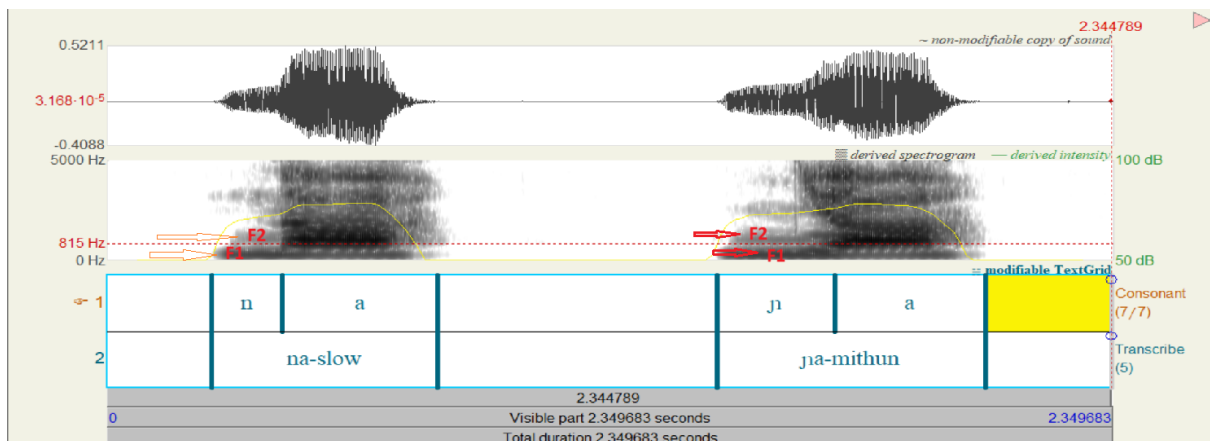


Fig. 3.40: Spectrogram of nasals /m/ and /n/ of a female speaker.

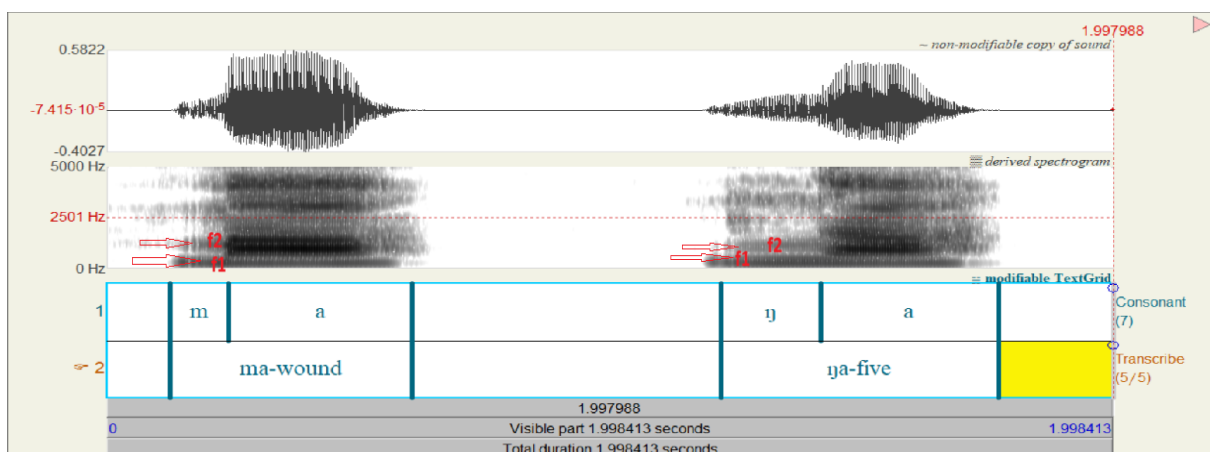


Fig. 3.41: Spectrograms of nasals /m/ and /ɲ/ of a female speaker.

3.6.4.4. Approximants and lateral approximants

Tobu exhibits two approximants such as /w/ and /j/ and one lateral approximant /l/. The main acoustic cues to check approximants are its resonance, its identifiable formant structures, and its continuant feature since there is no occlusion or momentary stoppage of the airstream. From the Fig. 3.42 below, the spectrogram shows that all the approximants are highly resonant, relatively produced with open vocal tract and non-turbulent due to the lack of constriction. Since they also act like vowels, sometimes called semi-vowels, their acoustic energy concentration is strong but not exactly strong as vowels.

The labial velar approximant /w/ shows both F1 and F2 a downward transition where the F1 is placed at around 258 Hz, F2 at around 1096 Hz and F3 shows a bit scattered at around 2000 to 3000 Hz.

The palatal approximant /j/ on the Fig. 3.42 below shows a front open as the following sound is an open vowel. While producing the palatal sound, the articulators usually stay neutral and move per the anticipation of the following sound. On the spectrogram, the F1 is placed low around 205 Hz, the F2 is placed relatively away from F1 placing at around 2563 Hz, and F3 placing at around 2000-3000Hz.

The alveolar lateral approximant on the Fig 3.42 below shows that the F1 is at low frequency placed around 350-900 Hz, F2 at around 2000 Hz and F3 at around 3400 Hz. On the spectrogram, the F1 rises to the vowel which may apply the same to other vowels.

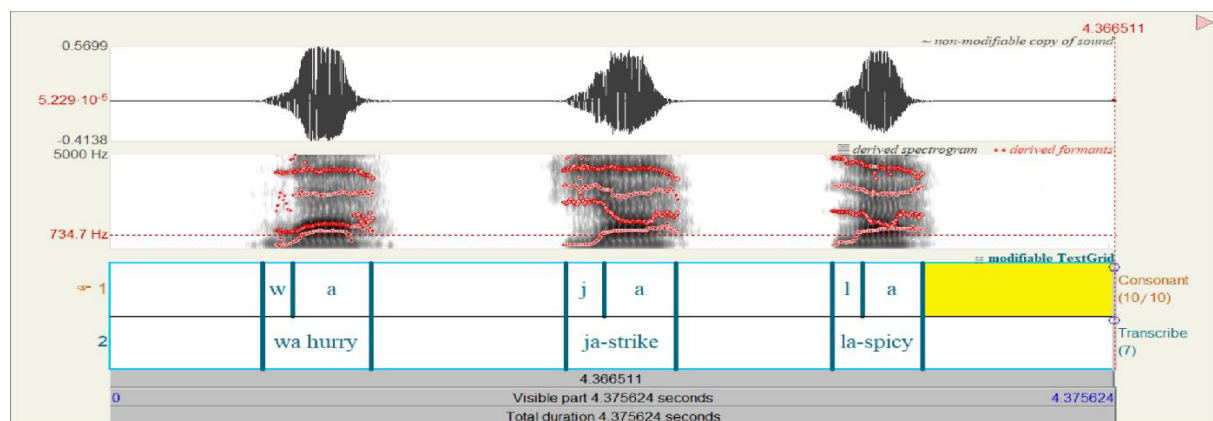


Fig. 3.42: Spectrogram of approximants /w/, /j/ and /l/ of a female speaker.

3.6.4.5. Affricates

Tobu exhibits one voiceless palatal affricate sound /tʃ/ which is a combination of a plosive sound and a fricative sound. The Fig. 3.43 below indicates that it is voiceless sound showing no voicing bar indicated by a blue square box. The fricative noise of this sound is placed around the frequency range of 2200-5000 Hz indicated by a red circle. The stop gap before the release burst on the spectrogram is indicated by the red vertical box. The turbulence energy of this affricate sound in Tobu occurs at around 1800 Hz.

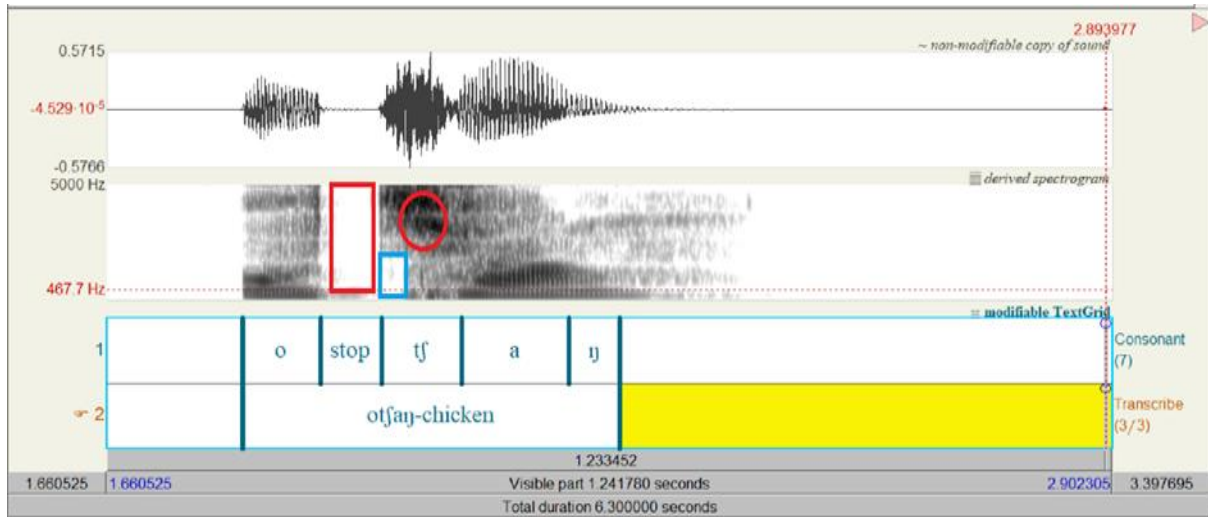


Fig. 3.43: Spectrogram of affricate palatal affricate /tʃ/ of a female speaker.

3.7. Phonological and Morphophonological Processes

Normal speech flows quickly and sometimes involve complete or partial sound changes. Numerous processes that are referred to as phonological processes can have an impact on the characteristics of sounds in a language's phonological system. In this section, the phonological and morphophonological processes found in Tobu will be presented.

3.7.1. Assimilation

An articulatory adjustment of one sound to a neighbouring sound in terms of one or more characteristics is called assimilation. One vowel may have an impact on another, or one consonant may influence another. There are two types of assimilation process such as regressive and progressive.

Both regressive and progressive assimilation has been detected in Tobu. Both the assimilations trigger resyllabification in Tobu as discussed below.

Regressive assimilation in Tobu occurs when the first syllable of a word ends with a velar stop /k/ and is followed by a glottal fricative or a vowel on the next syllable, the two adjacent sounds /k/-/h/ are assimilated, resulting in an aspirated velar stop taking the onset position of the second syllable. Also, if the following syllable is a vowel instead of a glottal fricative, the unaspirated velar stop becomes aspirated velar stop taking the onset position of the second syllable. This process is purely regressive assimilation as the following sounds influence the preceding sound causing resyllabification of the second syllable.

Examples are illustrated below:

Underlying		Surface
mək-he ‘eyelash’	>	mə-k ^h ə ‘eyelashes’
mək-eʔ ‘eye gunk’	>	mə-k ^h əʔ ‘eye gunk’
sək-ha ‘face’	>	sə-k ^h a ‘face’
lak-hao ‘fist’	>	la-k ^h ao ‘fist’
mək-haoken	>	mə-k ^h aoken ‘eyebrow’
ʃək-ha	>	ʃə-k ^h a ‘anus’

Another regressive assimilation detected in Tobu is that in a rapid flow of normal speech, when a word on the first syllable ends with the mid central vowel /ə/ followed by an alveolar nasal /n/ on the second syllable, another alveolar nasal /n/ is added on the first syllable at the coda position. Examples are illustrated below:

Underlying		surface
sə-nəŋ	>	sen-nəŋ
‘morning’		‘morning’
lə-naŋ	>	lən-naŋ
‘not have’		‘not have’
lə-ŋe	>	lən-ŋé
‘insufficient’		‘insufficient’

In Tobu, resyllabification is observed which is triggered by a progressive assimilation. This process occurs when a word ends with a voiceless bilabial stop /p/ or a

nasal sound before the conjunctive participle marker (-ə), the next syllable is resyllabified under the influence of the preceding sound as shown below:

- ə becomes -pə if preceded by a bilabial plosive /p/
- ə becomes -nə if preceded by an alveolar nasal /n/
- ə becomes -ŋə if preceded by a velar nasal /ŋ/
- ə becomes -mə if preceded by a velar nasal /m/

Underlying	Surface
sap-ə	sap-pə
‘cry-CP’	cry-CP
lap-ə	lap-pə
‘flip-CP’	‘flip-CP’
əŋ-ə	əŋ-ŋə
drink-CP	drink-CP
len-ə	len-nə
pay off-CP	pay off-CP
jam-ə	jam-mə
dry-CP	dry- CP

3.7.2. Epenthesis

In Tobu, to break a vowel cluster in a word, transitional sounds are added in between two vowels. Underlyingly, the vowel appears as diphthongs, but on the surface perception, a semi-vowel sounds such as /w/ and /j/ are added in between to break the vowel cluster. It has observed that /w/ is added in between to break the vowel sound /oa/ and /j/ is added in between to break /ia/ or /ea/. Examples are illustrated below:

Underlying	Surface
oakti ‘chafed’ >	owakti ‘chafed’
eak ‘pig’ >	ejak ‘pig’

siak	‘stir’	>	sijak	‘stir’
ʃiak	‘buy’	>	ʃijak	‘buy’
soak	‘roast’	>	sowak	‘roast’
kiaŋ	‘start’	>	kijaŋ	‘start’
poaŋ	‘year’	>	powaŋ	‘year’

3.7.3. Consonant gemination

Consonant gemination is an articulation of a consonant for a longer period than that of a singleton consonant. Tobu exhibits the process of consonant lengthening in a condition when two nasals are adjacent to each other in a word at the morpheme boundary. The nasal sound occurring at coda position of the first syllable is usually lengthen. This process is illustrated with examples below:

Underlying		surface
nəŋ:ɲi	‘you two’ >	nəŋ:ɲi ‘you two’
lamɲi	‘road’ >	lam:ɲi ‘road’
jaŋɲi	‘wind’ >	jaŋ:ɲi ‘wind’
jenmai	‘mutton’ >	jen:mai ‘mutton’

3.7.4. Free variations

Free variations in linguistics refer to the occurrence of two or more sounds or forms in the same context without altering the meaning or being rejected by the native speakers. Tobu exhibits free variations in both vowels and consonants.

The phonemic sounds /s/ and /ʃ/ are two distinct phonemes in Tobu and can be contrastive to other phonemes; however, they also occur in free variations. Examples supporting the statement are discussed below:

sampeaŋpəsa	‘broom’ >	ʃampeaŋpəsa	‘broom’
laksok	‘elbow’ >	lakʃok	‘elbow’
sən	‘salt’ >	ʃən	‘salt’
sek ^h ao	‘day’ >	ʃek ^h ao	‘day’

The phonemic sounds /u/ and /o/ are two distinct vowel phonemes in Tobu and are contrastive to each other; however, they also occur in free variations in some certain words. Examples are presented below:

suŋ ‘ear’	>	soŋ ‘ear’
huŋ ‘rice’	>	hoŋ ‘rice’
suŋtʃiŋ ‘ginger’	>	soŋtʃiŋ ‘ginger’

In Tobu, the aspirated plosives and the unaspirated plosives can occur as free variations when they occur in coda positions. They are distinctive phonemes in Tobu, but when they occur in coda position, substituting the aspirated plosives with unaspirated plosives do not alter the meaning. Examples are presented below:

p^həp^h ‘burst’
 p^həp ‘burst’

nát^h ‘tolerate’
 nət ‘tolerate’

lək^h ‘necklace’
 lək ‘necklace’

Also, the labio-dental fricative /f/ and aspirated bilabial stop /p^h/ can occur as free variations in Tobu. Examples are presented below:

p^ha ‘give’
 fa ‘give’

p^haŋsak ‘something’
 p^haŋsak ‘something’

3.7.5. Reduplication

Reduplication is a typical characteristic of the Tobu variety. It can be phonologically described as a reduplicated prosodic unit (syllables). There are lexical words which are formed by reduplicating the syllable of the word. If the reduplicant is dropped, the word becomes meaningless. Examples are illustrated below:

mai-mai-t^ham ‘truly’
 sak-sak-əŋ ‘each other’

lak-pepu-ju	‘thumb’
joŋ-naŋ-tʃa-naŋ	‘strong’
mai-tʃam-tʃam	‘beautiful’
joŋ-tʃam-tʃam	‘costly’
mai-səʔ-juʔ-səʔ	‘animal’

3.7.6. Neutralisation

In Tobu, Voiceless bilabial stops sound /p/ and voiced bilabial stop sound /b/ are two distinct phonemes, but voiceless alveolar stop /t/ do not have its voiced counterparts. However, both voiced sounds act as allophones in Tobu, especially when they occur in the coda position of a final syllable. The reason why they are considered as allophones in such cases is because they become neutralized by removing a phonemic distinction in a specific phonological context as shown in the examples below:

sab	>	sap	‘cry’
hap	>	hap	‘close/cover’
tʰəd	>	tʰət	‘collect’
pʰəd	>	pʰət	‘residue’
tʃət	>	tʃət	‘hear’

CHAPTER 4

COMPARATIVE PHONOLOGY

4.1. Overview

In this chapter, a comparative analysis of the phonological systems of Tobu and Standard Konyak will be presented. This study represents the first linguistic investigation into the Tobu variety focussing on the phonological system. In contrast, the phonology of Standard Konyak has been explored by several authors, including Nagaraja K.S. (2010), Besa N. (2017), Ezung (2023), and Walling and Besa (2024). In conducting a comparative analysis of Tobu phonology, I have chosen to focus on the work of Walling & Besa, 2024. This work is not only the most recent and comprehensive study on Standard Konyak phonology, but also directly involves my own contributions. As a result, the findings in this study hold a greater degree of familiarity and validation, making it an appropriate reference point for my comparison with Tobu phonology. The main objective of doing a comparative study between Tobu and Konyak phonological system is to analyse and juxtapose the phonological features of the Konyak standard language and the Tobu dialect to identify their parallels and differences. This chapter will focus on a comparative analysis of the segmental features of the two varieties. Additionally, the comparative study on suprasegmental features, such as tone and syllable structure, will be also examined. As the objective of the thesis is to identify the parallels and differences, a lexical comparison will also be presented in this chapter.

4.2. Segmental: consonants

In this section, consonants of Standard Konyak will be first overview and a comparative study of Tobu and Standard Konyak will be discussed.

4.2.1. Over view of Standard Konyak consonantal phonemes

Walling and Besa (2024) has identified 17 pure phonemic consonants, 2 marginal consonantal phonemes such as /ɹ/ and /z/, and five free variation consonantal phonemes shown under brackets below the table 4.1 in Standard Konyak occurring at eight places of articulation and six manners of articulation. On the places of articulation, the Standard Konyak has bilabial, labiodental, alveolar, post alveolar, palatal, velar and glottal. On the manners of articulation, the Standard Konyak has unaspirated plosive, aspirated plosive,

nasals, fricatives, affricate, approximants, and lateral approximants. The phonemic sounds of consonants in Konyak are illustrated on the table below:

Place → Manner ↓	Bilabia		Labio-dental		Labial-Velar		Alveolar		Post-Alveolar		Palatal		Velar		Glottal	
Plosive	p	(b)					t	(d)					k	(g)	ʔ	
Plosive aspirate	p ^h												k ^h			
Nasal		m						n				ɲ		ŋ		
Fricative			(f)	(v)			s	(z)	ʃ						h	
Affricate											tʃ					
Approximant						w		(ɹ)				j				
Lateral Approximant								l								

Table 4.1: Consonantal Phonemes of Standard Konyak. (Walling & Besa, 2024)

4.2.2. Contrastive pairs of consonantal phonemes in Standard Konyak

Stops

/p/ vs /p ^h /	/k/ vs /k ^h /	/t/ vs /t/	/ʔ/ vs /h/
pōn ‘ten’	kò ‘recent cut mark’	tói ‘kill’	saʔa ‘now’
p ^h ōn ‘piece’	k ^h ò ‘spade’	lói ‘excessive’	saha ‘alone’

Nasals

/m/ vs /n/	/ŋ/ vs /ɲ/
mā ‘wound’	ɲè ‘see’
nā ‘ear’	ɲè ‘shawl’

Fricatives

/ʃ/ vs /tʃ/	/s/ vs /t/	/h/ vs /j/
ʃón ‘fishing net’	sák ‘buy’	/hāʔ/ ‘eat’
tʃón ‘touch’	ták ‘sick’	/jāʔ/ ‘take’

Affricate

/tʃ/ vs /ʃ/

tʃú ‘mouth’
 ʃú ‘pull’

Approximants and Lateral approximants

/w/ vs /j/ /ɹ/ vs /l/
 wói ‘leading’ ɹá ‘male servant’
 jói ‘self’ lá ‘new’

4.2.3. Comparison of consonantal phonemes

Like Standard Konyak which has been overviewed on the previous section, Tobu and Standard Konyak have the same articulatory features. For the Tobu consonantal table, refer chapter 3 of the thesis. All the consonantal phonemes of both the varieties occur at eight places of articulation and six manners of articulation which can be referred from table 4.1. The difference is on the number of phonemic sounds where Tobu has 20 pure phonemic consonants; whereas, Standard Konyak has 17 pure phonemes, 2 marginal phonemes and five free variation phonemes. Pure consonantal phonemes of both the varieties are compared below as per the articulatory features:

Place and Manner of articulation (Pure Phonemes)	Standard Konyak	Tobu
Voiceless unaspirated plosives	/p/, /t/, /k/, /ʔ/	/p/, /b/, /t/, /k/, /ʔ/
Voiced aspirated stop	/p ^h /, /k ^h /	/p ^h /, /k ^h /, /t ^h /
Nasals	/m/, /n/, /ɲ/, /ŋ/	/m/, /n/, /ɲ/, /ŋ/
Voiceless fricatives	/s/, /ʃ/, /h/	/s/, /ʃ/, /h/
Voiced fricatives	#NA	/v/
Voiceless affricate	/tʃ/	/tʃ/
Voiced affricate	#NA	#NA
Voiceless approximant	#NA	#NA
Voiced approximant	/w/, /ɹ/, /j/	/w/, /j/
Voiceless lateral approximant	/l/	/l/

Table 4.2: Comparison of consonantal phonemes of Std. Konyak and Tobu.

From Table 4.2, it is evident that Standard Konyak and Tobu share common consonantal phonemes in the categories of nasals, voiceless fricatives, affricates, and lateral approximants. However, notable phonemic divergences can be observed between the two languages. Standard Konyak lacks the voiced unaspirated bilabial stop /b/, which is present in Tobu. Conversely, Standard Konyak lacks the aspirated voiceless alveolar stop /tʰ/, a phoneme which is present in Tobu. Additionally, while the Tobu exhibits the voiced labiodental fricative /v/, this sound is not attested in Standard Konyak. Moreover, Standard Konyak exhibits the alveolar approximant /ɹ/ which is a marginal phoneme in Standard Konyak, but Tobu does not exhibit the alveolar approximant.

4.2.4. Comparison of distribution of consonantal phonemes

From the below table 4.3, it can be observed as the following:

- All voiceless unaspirated bilabial in both the languages can occur in all the positions except for the glottal sound which cannot occur in the initial position in both the varieties.
- Nasals in both the varieties can occur in all the positions except for the palatal nasal which does not occur in the final position.
- Fricatives in both the varieties can occur in the initial and medial positions but not in the final position
- Affricates in both the varieties can occur in the initial and medial positions but not in the final position
- Approximants in both the varieties can occur in the initial and medial positions but not in the final position.
- Lateral approximants in both the varieties can occur in the initial and medial positions but not on the final position.
- The only difference detected between the two varieties on the distribution of consonantal phonemes is that all the aspirated plosives found in Tobu can occur in all the positions; whereas, all the aspirated plosives found in Standard Konyak cannot occur in final positions.

Tobu

Phonemes	Initial	Medial	Final
/p/	+ p ên ‘ten’	+ ʃā p ɲù ‘Bear’	+ hā p ‘close’

/b/	+	+	-
	b əŋ ‘granary’	ɲə̀lāmbə ‘female’	
/t/	+	+	+
	t āk ‘pot’	ʃɔ̃táo ‘mouth’	kʰə̀t ‘skin’
/k/	+	+	+
	kāʔ ‘burn’	lākləaŋ ‘finger’	lāk ‘hand’
/ʔ/	-	+	+
		tóʔlábə ‘everyone’	láʔ ‘lazy’
/pʰ/	+	+	+
	pʰi ‘divide’	ləpʰē ‘didn’t distribute’	pʰə̀pʰ ‘burst’
/kʰ/	+	+	+
	/kʰi/ ‘wet’	mékʰè ‘eyelashes’	mêkʰ ‘eyes’
/tʰ/	+	+	+
	tʰê ‘mistake’	hāpátʰai ‘which one’	tə̀tʰ ‘measure’
/m/	+	+	+
	māk ‘dirt’	ɲāk mət ‘black’	sām ‘house’
/n/	+	+	+
	nāʔ ‘fast’	jən bə ‘dry’	sən ‘salt’
/ŋ/	+	+	+
	ŋā ‘five’	māŋ pən ‘heart’	jēaŋ ‘bone’
/ɲ/	+	+	-
	ɲām ‘money’	ɪŋáo ‘mother’	
/v/	+	+	-
	ví ‘see’	ləvı ‘didn’t see’	
/s/	+	+	-
	səŋ ‘think’	hòsê ‘coal’	
/ʃ/	+	+	-
	ʃiʔ ‘urine’	ōŋʃē ‘beans’	
/h/	+	+	-
	hā ‘teeth’	lào hē bə ‘long’	
/ʈ/	+	+	-

	ʈû ‘what’	sôŋ ʈ ĩŋ ‘chilli’	
/w/	+ wâ ‘hurry’	+ lōŋwàŋ ‘marital partner’	-
/j/	+ jūŋ ‘stone’	+ káʔjêaŋ ‘chin’	-
/l/	+ lām ‘three’	+ lâklêaŋ ‘fingers’	-

Standard Konyak

Phonemes	Initial	Medial	Final
/p/	+ pó ‘dance’	+ ōpú ‘grandfather’	+ sōp ‘cry’
/t/	+ ták ‘sick’	+ hātəo ‘that’	+ ɲót ‘scratch’
/k/	+ kén ‘love’	+ sōko ‘woman’	+ sāk ‘buy’
/ʔ/	-	+ kāʔtā ‘human’	+ ɲāʔ ‘fish’
/pʰ/	+ pʰā ‘give’	+ mōŋpʰáŋ ‘liver’	-
/kʰ/	+ kʰáʔ ‘bitter’	+ lāikʰōp ‘envelope’	-
/m/	+ món ‘name’	+ sōmpā ‘friend’	+ jōm ‘ripe’
/n/	+ nā ‘ear’	+ ɲīʔnōŋ ‘day light’	+ pʰōn ‘piece’
/ɲ/	+ ɲāk ‘dark’	+ sáʔɲú ‘tiger’	-
/ŋ/	+ ŋā ‘five’	+ ʃōŋɲū ‘pillar’	+ wāŋ ‘sky’

/s/	+	+	-
	sāk ‘buy’	hāsē ‘colour’	
/ʃ/	+	+	-
	ʃi ‘sleep’	mēŋʃiʔpú ‘ruthless’	
/h/	+	+	-
	hát ‘week’	máhu ‘ox’	
/tʃ/	+	+	-
	tʃái ‘hear’	hátʃá ‘Monday’	
/w/	+	+	-
	wāŋ ‘sky’	káʔwán (kahwang) ‘God’	
/ɹ/	+	-	-
	/ɹá/ ‘servant’		
/j/	+	+	-
	jāk ‘hand’	hēnjip ‘west’	
/l/	+	+	-
	lōm ‘path’	tʃálūn ‘increase’	

Table 4.3: Distribution of consonantal phonemes of Tobu and Standard Konyak indicated by + and – values.

4.3. Segmental: Vowels and Diphthongs

In this section, a comparative study of Tobu and Standard Konyak vowels and diphthongs will be discussed.

4.3.1. Overview of Standard Konyak vowels and diphthongs

Walling and Besa (2024) mentions that Standard Konyak has 6 short vowels and ten diphthongs. The 6 short vowels occur at different parameters such as, openness of the mouth (height), position of the tongue raised and the configuration of the lips. As per different parameters, the Standard Konyak has high front unrounded vowel /i/, front mid unrounded vowel /e/, low central unrounded vowel /a/, central mid unrounded vowel /ə/, back high rounded vowel /u/ and back mid rounded vowel /o/.

The identified diphthongs of Standard Konyak in Walling and Besa (2024) is based as per opening, closing and narrowing types. Closing diphthongs consist of /ai/, /ei/, /ui/, /əi/, /oi/ and /au/; opening diphthongs consist of /ea/ and /əo/ and narrowing diphthongs such as /ao/

and /ie/. Vowel chart and diphthongs chart presenting all the vowels at different positions is represented below

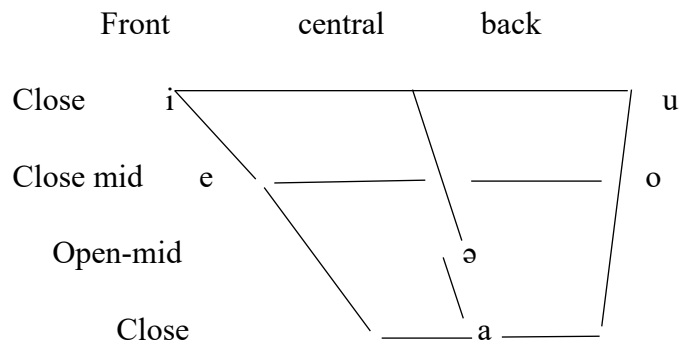


Fig. 4.1: Vowel chart of Std. Konyak.

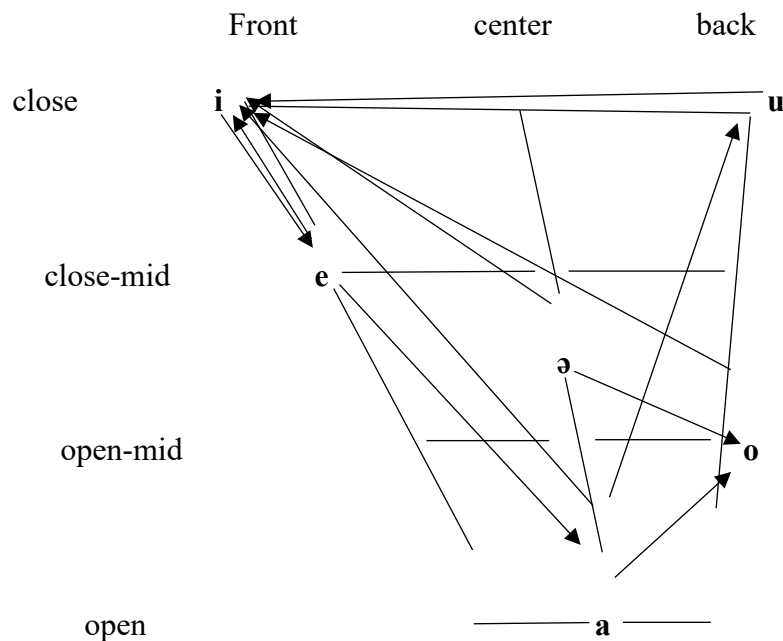


Fig.4.2: Diphthong chart of Standard Konyak.

4.3.2. Contrastive pairs of vowels of Standard Konyak

Front vs back

/i/ vs /u/
 ʃi (shi) 'sleep'
 ʃu (shu) 'pull'

/i/ vs /o/
 tí 'small breadth'
 tó 'left over'

/e/ vs /u/
 pú 'snake'
 pé 'tree'

/e/ vs /o/
 jé 'returning'
 jó 'store'

/a/ vs /u/

/a/ vs /o/

sú ‘pull’ wán̄ ‘sky’
 sá ‘bind’ wón̄ ‘strength’

Front vs Central

/i/ vs /ə/ /e/ vs /ə/ /a/ vs /ə/
 ī ‘3rd person’ jé ‘return’ sák ‘buy’
 ā ‘possive marker’ jə̄ ‘negative marker’ sák ‘lice’

Back vs Central

/u/ vs /ə/

hún̄ ‘support by a stick.’
 hən̄ ‘grass’

4.3.3. Comparison of vowel and diphthong

Vowels:

From the analyses, it can be observed that both Tobu and Standard Konyak have 6 vowels each occurring at similar articulatory parameters. Both the varieties have high front unrounded vowel /i/, high back rounded vowel /u/, close-mid unrounded front vowel /e/, close-mid unrounded central vowel /ə/, open unrounded central vowel /a/, and close-mid rounded back vowel /o/. A simplified chart table is presented below to show its similarities:

Height ↓ position ⇒	Front		Central		Back	
	Std. Konyak	Tobu	Std. Konyak	Tobu	Std. Konyak	Tobu
High	i	i			u	u
mid	e	e	ə	ə	o	o
low			a	a		

Table 4.4: Comparisons of vowels of Std. Konyak and Tobu.

Diphthongs

From the analyses, it can be observed that there is a huge difference in the production of diphthongs between these two varieties. The differences in diphthongs might be one phonological reason of why these two varieties are highly unintelligible to each other. It is

very clear that diphthongs are unique sounds that begin with one vowel and transition to another within one syllable signifying complex blend that creates a rich, evolving sound as the speakers' mouth moves from one vowel position to another. It clearly contributes to phonetic identity of words and influence the rhythm and melody of a spoken language. 'Diphthongs contribute to the linguistic diversity and evolution of languages. They emerge, shift, or disappear overtime, reflecting changes in language and interactions.' (<https://www.verbalplanet.com/learn-english/blog/english-grammar-diphthongs-explained.asp>). Standard Konyak as mentioned by Walling and Besa (2024) exhibits ten diphthongs; whereas, this present study has examined that Tobu has only five diphthongs. Except for a few vowels, the analyses also shows that Standard Konyak diphthongs mostly glide upwards towards close vowel /i/ and Tobu diphthongs mostly glide downwards towards open vowel /a/. The directions of vowel glide of both the varieties are illustrated below:

Standard Konyak vowel glide directions:

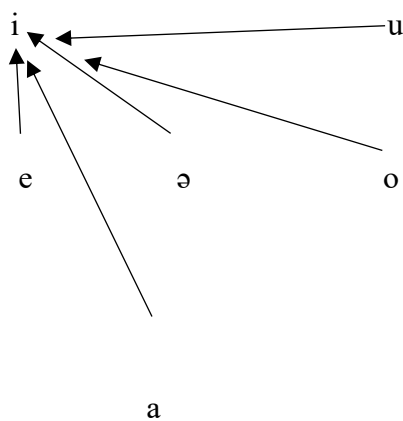


Fig. 4.3: vowel glide upward direction.

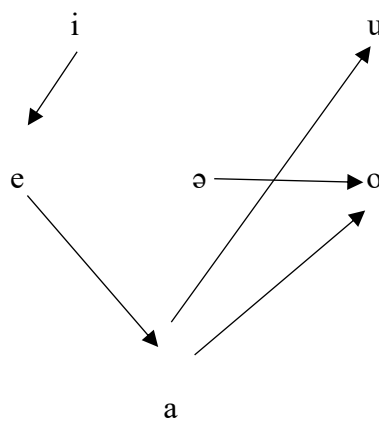


Fig 4.4: Vowel glide direction towards different Positions.

Tobu Vowel glide directions:

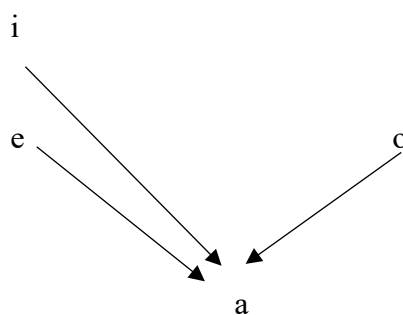


Fig. 4. 5 Vowel glide downward direction.

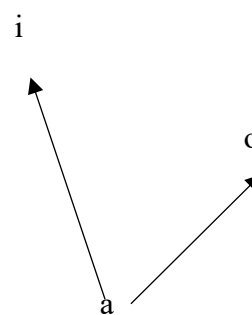


Fig.4.6 Vowel glide upward direction.

4.3.4. Comparison of distribution of vowels and diphthongs

In this section, the comparative study of distribution of vowels and diphthongs of both Tobu and Standard Konyak is discussed.

Vowel distribution of Tobu is presented in the table below:

phoneme	initial	medial	final
/i/	+ i ‘thread’	+ jîn ‘goat’	+ ʃi ‘millet’
/e/	+ êṭ ‘open’	+ pêṭ ‘beat’	+ sê ‘sleep’
/ə/	+ êṇ ‘drink’	+ jəṇ ‘lift up’	+ tʰəṇbè ‘friend’
/a/	+ âpti ‘gone away’	+ jāṇ ‘rain’	+ hā ‘teeth’
/u/	-	+ jū? ‘rat’	+ tāṇpū ‘found’
/o/	+ ōṭṣāṇ ‘chicken’	+ lōṇ ‘insect’	+ lô ‘hide’

Table 4.5: Vowel distribution of Tobu.

Vowel distribution of Standard Konyak

Segment	Initial	Medial	Final
/i/	+ ī ‘blood’	+ lēṇ ‘bed’	+ ʃi ‘sleep’
/e/	+	+	+

	ēpū ‘dry’	wék ‘husk’	mē ‘smasher’
/a/	+ án ‘biscuit’	+ wák ‘cliff’	+ nā ‘ear’
/ə/	+ éwó ‘middle’	+ jét ‘fall’	+ ātō ‘to me’
/u/	+ úʔ ‘feed’	+ lūŋ ‘bamboo rope’	+ jú ‘alcohol’
/o/	+ ō ‘near’	+ jópū ‘finish’	+ tó ‘extra’

Table 4.6: Vowel distribution of Std. Konyak.

From the above tables 4.5 and 4.6, it can be observed that all vowels of both the varieties can occur in all positions such as initial, medial and final except for the vowel /u/ in Tobu which does occur in the initial position.

Distribution of diphthongs of Tobu

	Initial	Medial	Final
ai	+ ai ‘this one also’	+ mâɲpák ‘monkey’	{+ nai ‘return’
ao	+ âo ‘hug’	+ lōaŋ ‘like’	+ k ^h âo ‘fetch’
ea	+ êak ‘pig’	+ pêaŋ ‘sweep	-
ia	-	+ sîak ‘stir’	-
oa	+ ôak ‘chafing’	+ mōaŋ ‘prostitute’	-

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Table 4.7: distribution of diphthongs of Tobu.

Distribution of diphthongs of Standard Konyak

Segments	initial	medial	final
/ei/	-	+ ātéim ‘wet’	+ ṇēi ‘extra’
/ai/	+ ái ‘peer’	+ láipán ‘school’	+ tāi ‘go’
/əi/	-	+ tái? ‘concern’	+ mói ‘meat’
/ui/	-	+ kúimá? ‘wither’	+ súi ‘less’
/oi/	+ ói ‘mucus’	+ wóipa ‘conductor’	+ tói ‘work’
/ie/	-	+ ṇáókíeṇ ‘rules’	-
/ea/	-	+ péaṇ ‘bloom’	-
/əo/	-	+ téɔ? ‘imperative marker’	- ṭṣáo ‘cook’
/ao/	+ āɔǰí? ‘onion’	- ṭṣáosēpū ‘hygiene’	+ ṇáo ‘language’
/au/	+ /āu/ ‘bird’	+ jáupu ‘fats’	+ ṣāu ‘dig’

Table 4.8: distribution of diphthongs of Standard Konyak.

From the above tables 4.7 and 4.8, it can be observed as follows:

- Both the varieties exhibit similar diphthongs such as, /ai/, /ao/, and /ea/.
- Tobu has diphthongs such as, /ia/ and /oa/ which are not present in Std. Konyak.
- Standard Konyak has diphthongs such as, /ei/, /əi/, /ui/, /oi/, /ie/, /əo/, and /au/ but Tobu lacks these diphthongs.
- When comparing the similar diphthongs in the two varieties, /ai/ and /ao/ can occur in all positions, but the diphthong /ea/, which is present in both varieties, does not appear in the initial position in Tobu in contrast to Standard Konyak.

4.4. Suprasegmentals: Syllable

In this section, comparison of syllable structures of Tobu and Standard Konyak will be presented.

4.4.1. Syllable structures of Tobu and Standard Konyak: a comparison

Both open and closed syllables are found in both the varieties. The primary syllable types found in both the varieties are CV, CVC, VC, and V. The syllable structure of these two varieties requires two elements such as an obligatory vowel and one or two optional elements which are not obligatory. In both the varieties, the vowel or the diphthong constitute the nucleus of a syllable, which is also the tone-bearing unit. In the case of diphthongs, the first vowel is the tone-bearing unit. In both the varieties, consonant clusters and vowel clusters are not present. Only in onomatopoeia words, the consonant cluster can occur in both the varieties.

The structure of both the varieties in linear syllable structure is shown below:

$C_1V_1V_2C_2T_2$

C_1 - [-syll + cons] —————> optional

V_1 - [+syll] —————> obligatory

V_2 - [-syll -cons] —————> optional

C_2 - [-syll +cons, -continuant] —————> optional

T - [+tone] —————> obligatory

The structure of both the varieties following hierarchical structure are shown below:

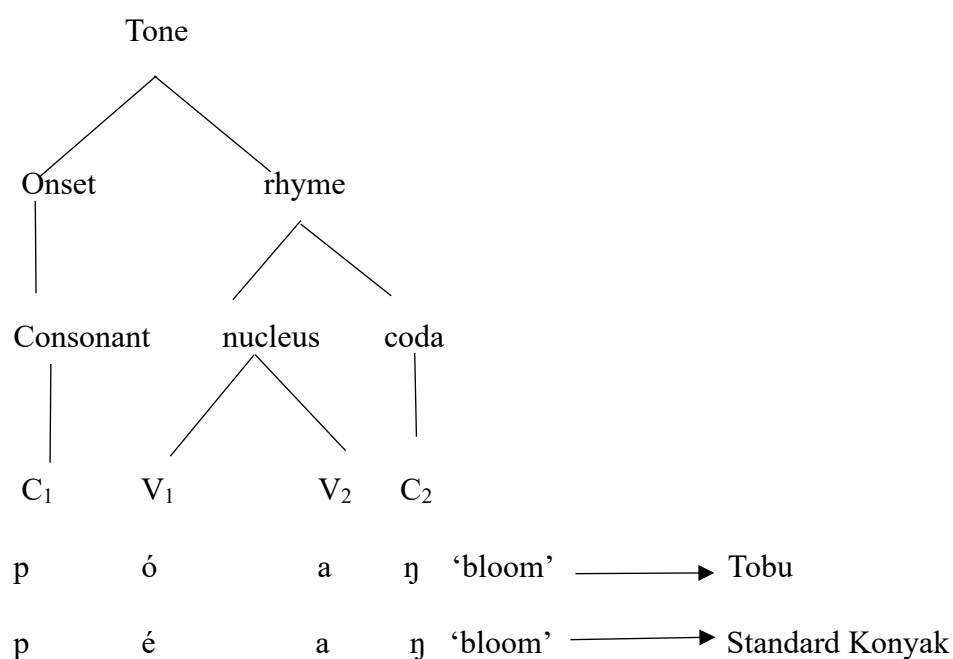


Fig. 4.7 syllable structure of Standard Konyak and Tobu.

4.4.2. Comparison of syllables types

Tobu and Standard Konyak have the same primary syllable structures; however, one difference has been observed on the syllable types found in these two varieties. In this study, it is observed that Tobu have seven types of syllables such as, closed syllable, open syllable, simple syllable, complex syllable, checked syllable, smooth and sesquisyllables. Whereas, this research has examined that Standard Konyak exhibits six syllable types and lacks sesquisyllable types.

Syllable types	Examples	
	Tobu	Standard Konyak
Closed syllable	əŋ ‘drink’	ēp ‘open’
Open syllable	lî ‘die’	ʃû ‘melt’
Simple syllable	sēn ‘crab’	ʃék ‘burn’
Complex syllable	kliŋ-kliŋ ‘sound of church bells’	plaŋ-plaŋ ‘sound of falling object’
Checked syllable	hāp ‘close’	wók
Smooth syllable	lām ‘sweat’	ʃúm ‘morning’

	là ‘leg’	ʃĩ ‘sleep’
Sesquisyllable	sōkā ‘face’	#NF

Table 4.9: Comparison of syllable types.

4.4.3. Comparison of syllabic pattern

According to the data gathered for this study, the penta-syllabic pattern is the largest number of syllables inside a word found in both variants. Given the high agglutinative character of these two varieties, hexa-syllabic patterns are possible; nevertheless, in the data gathered for this study, the longest word found contained just five syllables.

Syllabic pattern	Examples	
	Tobu	Standard Konyak
Monosyllable	i ‘thread’	an ‘biscuit’
Disyllable	la-k ^h ap ‘shoe’	moŋ-ʃaŋ ‘heart’
Tri-syllable	o-ʃaŋ-sa ‘chick’	haʔ-nak-pu ‘greedy’
Tetra syllable	sam-peaŋ-pe-sa ‘broom’	ʃĩŋ-haʔ-tam-pu ‘conquest’
Penta syllable	jaŋ-se-je-ti-pu ‘sunset’	ko-toŋ-taʔ-pa-lan ‘jury’
Hexa-syllable	#Not found	#Not found

Table 4.10: Comparison of syllabic patterns.

4.5. Suprasegmental: Tone

Walling and Besa (2024) have identified three register tones in Standard Konyak: high, low, and mid. In contrast, this research has found that Tobu features one contour tone and two register tones: high-falling, mid, and low.

4.5.1. Overview of Standard Konyak Tones

In Standard Konyak, vowel tones are phonemically marked and distinguished by three register tones: high, mid, and low. The high tone is characterized by a very high pitch and represents the highest tonal level. The mid tone is situated immediately below the high tone, while the low tone is the lowest in pitch. Tone marking in Standard Konyak employs an acute accent (´) for the high tone, a grave accent (`) for the low tone, and leaves the mid-tone unmarked. Tonal variation in Standard Konyak is not only crucial for distinguishing the meanings of lexical items but also plays a role in grammatical functions, such as indicating changes in parts of speech and other grammatical purposes.

Contrastive pairs of Standard Konyak Tones

tó ‘remaining’
to ‘yeast’
tò ‘left over’

Change of grammatical markers (Walling and Besa, 2024)

pu ‘verb be’
pú ‘nominalizer’

Change of lexical meaning

lu ‘bandage’
lù ‘deep’

4.5.2. Comparison of tone

Both Tobu and Standard Konyak are tonal languages; however, they do not share identical tonal systems. The lack of mutual intelligibility between these varieties may be attributed to their tonal differences. Standard Konyak features three distinct register tones: high, mid, and low. In contrast, Tobu displays one contour tone—a high falling tone—and two register tones: mid and low. A notable similarity between the two varieties is that both mark tonal distinctions within the vowel of a syllable, and a change in tone can alter the meaning of a word. A graphical representation of smoothed pitch contours in Hertz of both the varieties are presented below:

Comparison of smoothed pitch contours, Hertz:

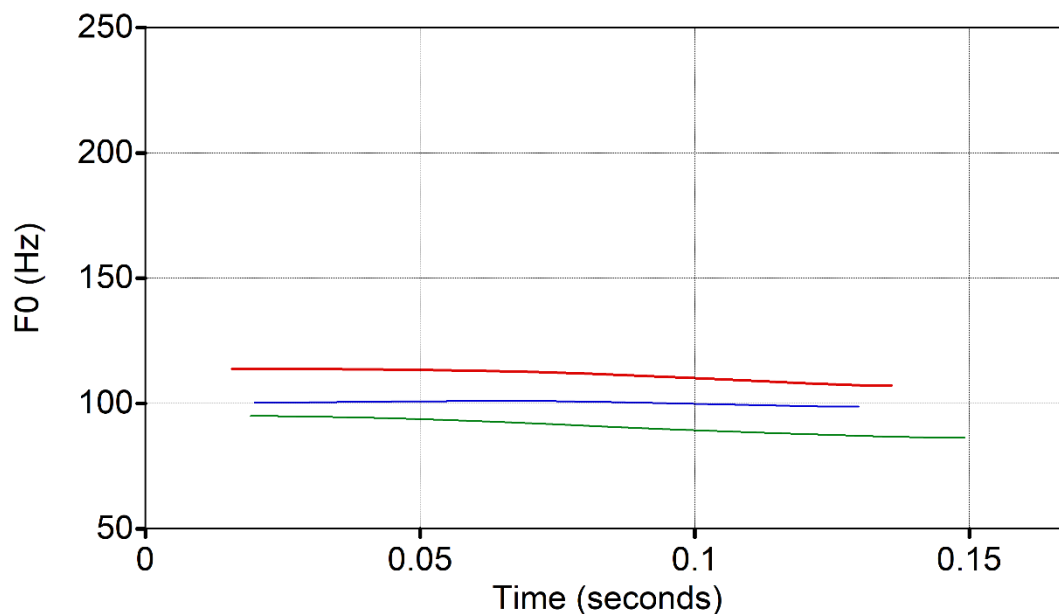


Fig.4.8: Graph depicting a comparison of smoothed pitch contours of male speech in Standard Konyak.

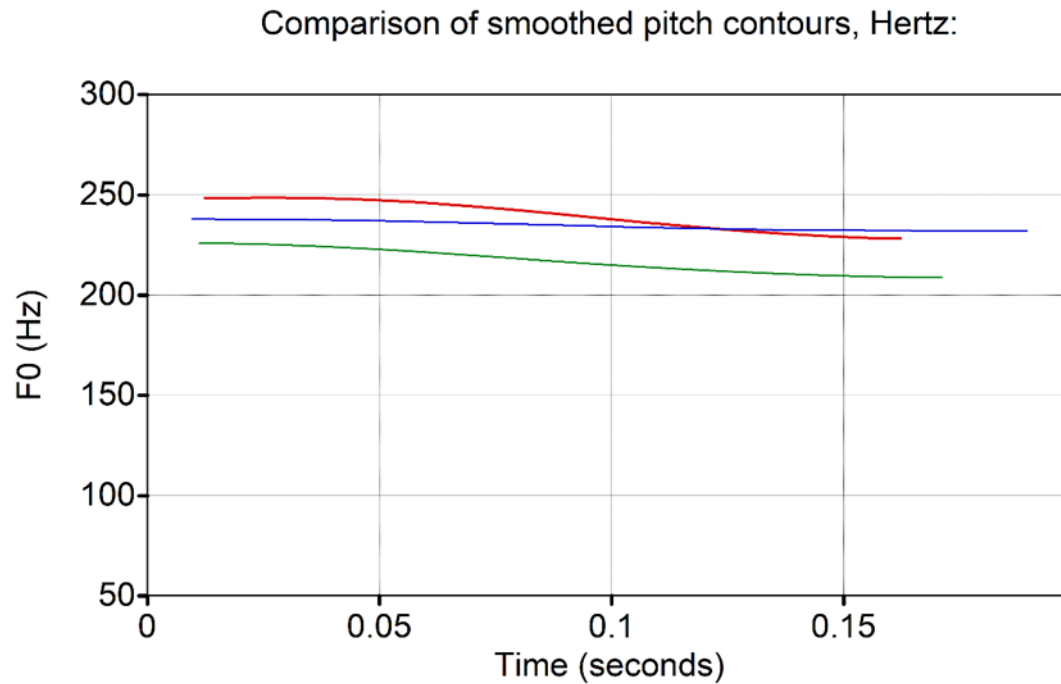


Fig 4.9: Graph depicting a comparison of smoothed pitch contours of female speech in Tobu.

From the figures 4.8 and 4.9, it is evident that Standard Konyak exhibits three distinct register tones, with pitch levels remaining relatively constant at different heights without significant variation over time. Specifically, the red line remains around 120 Hz, indicating the high tone; the blue line is consistently at approximately 100 Hz, representing the mid-tone; and the green line begins around 90 Hz, descending to approximately 80 Hz between 0.05 and 0.15 seconds, indicating the low tone.

In contrast, Tobu tones demonstrate a contour pattern, with noticeable pitch variation over time. The first red line shows a high-falling tone, characterized by a descending pitch. The second blue line remains relatively stable, indicating a mid-tone. The final green line begins at around 230 Hz and gradually descends to approximately 210 Hz by 0.05 seconds, reflecting the low tone.

4.6. Comparative Lexical variations

This section presents a comparative analysis of lexical items between Standard Konyak and Tobu. The aim of this comparison is to identify lexical similarities and differences between the two varieties. The comparative analysis on lexical items will focus will be on a selection of fundamental lexical categories, including body parts, kinship terms, natural elements, numerals, colour terms, and flora and fauna.

4.6.1. Body parts

English	Tobu	Standard Konyak
Brain	k ^h ūlî	ʃéló
Head	k ^h áo	ʃán
Forehead	k ^h àŋkôaŋ	sékéaŋ
Throat	āŋk ^h â	əŋtúʔ
Hand	lāk	jāk
Leg	là	jà
Toe	lêpêpūpū	jàlán
Eye	māk	māk
Nose	kôaŋ	nātéaŋ
Mouth	ʃōtāo	ʃū
Face	sākā	ʃētá
Tongue	lālêŋ	jī
Teeth	hâ	p ^h á
Ear	sùŋ	ná
Eyebrow	mākk ^h āokên	mākmón
Cheeks	àŋ	ómtáo
Fingers	lāklêŋ	jāklán

Nails	lâksôn	jākk^hón
Neck	àŋ	əŋ
Elbow	lâkʃōk	jákón
Skin	k ^h ət	əʃó
Body	əŋʃā	póm
Knee	lək^həʔ	jātúʔ
Shoulder	kāŋjêaŋ	p ^h āktéŋ
Thigh	həŋkáo	jūŋkéaŋ
Hair	k ^h ôjāʔ	sāŋmón
Heart	māŋpèn	mōŋʃán
Liver	ʃèn	mónp ^h án
Stomach	jèn	sēa
Lungs	ʃào	wúkvēk
Kidney	jáiʃə	tītōi
Intestine	lè	jèi
Bone	jêaŋ	wàn
Skull	k ^h əjêaŋ	ʃánwàn
Buttock	āŋkəʔ	kūŋtói
Penis	ʃō	k ^h ōʔ
Vagina	ào	ào
Bladder	jêntōŋ	sēatāk
Eye-ball	məkjeaŋ	məktōi

The data pertaining to body parts indicates that Tobu and Standard Konyak exhibit minimal similarities, with the exception of a few lexical items demonstrating partial

resemblance. The observed correspondences suggest that Standard Konyak employs the approximant sound /j/, whereas Tobu utilizes the lateral approximant /l/ in the initial position of some words. Words exhibiting partial resemblance and sound correspondences are highlighted in bold for reference.

4.6.2. Kinship terms

English	Tobu	Standard Konyak
Great grand father	ēpū pūt ^h ên	pūjōn
Great grand mother	ēpē pūt ^h ên	pējón
Grand father	ēpū	əpù
Grand mother	ēpē	əpè
Father	ēbā	əpā
Mother	ēpào	əpù
Son	pābəsā	jōihà nētán
Daughter	pāobəsā	jōihà sākó
Grandson	pābəfū	hūjím nētán
Granddaughter	pāubəfū	hūjím sākó
Father's elder brother	ēpā	əpājón
Father's elder brother's wife	ēpào	əpùjón
Father's elder sister	ēpì	əpājón
Father's elder sister husband	ēhāo	əkəojón
elder sister	ēpà	pājónpū
elder brother	ēfāi	jējónpā
ancestor	ēpūēbà	pūjímlán
generation	ŋātân	ŋín

relatives	sâmp ^h âŋ	p ^h ēipù jàpò
family	sâmk ^h áo	nóksā
Father-in-law	êhāo	àkèo
Mother-in-law	êŋà/ēŋào	àŋèi
clan	p ^h âŋ	pūhū/nókp ^h úŋ
Uncle	êhāo	àkèo
Aunty	ēŋà	ōŋéi
wife	sēnlōŋ	sōkórù
husband	bà	nótánpā

From the above comparison, it can be observed that the correspondences are found only on the vowel where the Std. Konyak employs the /ə/ sound and the Tobu employs /e/ sound at the initial position of the word.

4.6.3. Vegetation

English	Tobu	Standard Konyak
Brinjal	lùŋk ^h ôak	āns ^h áo
Sweet potato	júsēy	mèilòŋsé
Mushroom	p ^h àopôaŋ	péŋkán
Chilli	sāoŋŋŋ	māktík
Ginger	ŋŋtāo?	tíeŋ
Garlic	lāŋŋ	āosī? ēhéaŋ
Papaya	pōlōk	tōmwóŋlík
Fruit	bəlòk	pélék
Seed	jēaŋ	ōlí

Berry	ʃōaŋpê	ǎjéŋ p ^h ēipù pélík
Jackfruit	pōjón	pējón
Pineapple	jōlǎk	jénkónpéjón
Root	ʃĩŋsǎláʔ	jàláʔ
Cucumber	tâŋʃē	māikóʔ
Sunflower	jâŋsēʃĩpôaŋ	hēsápéaŋ
Beans	ōŋʃē	p ^h ēaŋ
Pumpkin	ēakja	máilón
Flower	ʃĩpôaŋ	ʃũpéaŋ
Mango	ām	āotói
Banana	sónào	ηào
Tree	pô	pē
Yam	tōaŋ	tēaŋ
Tapioca	pôʃĩ	pēséa
Gourd	ēakjā	māikók
Bitter Berry	kēnk ^h ān	k ^h áʔhá
Bitter eggplant	ōkēn	k ^h ēm ^h áʔ
Onion	pālkôak	āoʃĩʔ áp ^h úk
Mustard leaf	sôaŋʃĩ	jánhōi
Potato	ālò	ʃālík
Banana flower	k ^h ènpū	ʃòn
Szechuan Pepper	ʃēaŋ	mákát
Banana stem	lèk ^h ām	ηót
Grapes	ʃēan	wūwónlīk

Plum	sōaŋ sâŋpî	əhəmp ^h áŋk ^h áʔ
Pear	sāŋlálək	p ^h áŋnú
orange	ʃēaŋpí	tāŋjéan
Peach	kāŋlīsāŋpí	p ^h áŋk ^h áʔ
Corn	sōaŋ-î	wóŋlí
Passion Fruit	pəl	wùk ^h áʔlīk
Jenkins Plum	láoʔlək	jəoʔlīk
Calamus Erectus	jêk ^h ânlək	wéijóŋlīk

From the wordlists above, it can be observed that most of the words do not share similarities except for some few words that share partial resemblances.

4.6.4. Animal, bird, and insects

English	Tobu	Standard Konyak
Tiger	ʃēŋŋū	ʃāʔnú
Lion	môlòʃēŋnù	máiláŋ
Bear	ʃāppnù	ʃāp
Wild Boar	mēilā	mēilá
Deer	mēiʃí	mēiʃí
Horse	mēnsāoʔ kōlì	kóipōŋ
Elephant	lôaknù	mēijnú
Giraffe	khêwâŋlào	əŋjālào
Monkey	máijnák	ʃəméi
Fox	ʃíʔlōŋ	hējān
Squirrel	hijūʔ	pēk ^h āo

Dog	hì	kōi
Goat	jîn	jún
Porcupine	lè	āolé
Mithun	ɲâ	ɲā
Frog	lǎkt ^h ào	lūk
Toad	kījōak	ŋāmǰái
Buffalo	lōn	tíek
Cat	âɲāʔ	āmí
Grasshopper	kît	tūk
Lizard	ʃāmpôaŋ	ǰá
Cockroach	létlēn	āsāpāŋsáo
Mosquito	mākǰilələ	mōŋǰōŋ
Butterfly	ōk ^h ēmmǎtǰò	p ^h úǰěk
Earthworm	pə̀sèn	púhān
Cicada	ɲò	ɲó
Termit	lōŋkēn	lónǰ
Cricket	mǎttū	p ^h ōŋǰúk
Centipede	ʃēaŋkát	pūsíjānsō
Scorpion	ʃēnpêjōŋkēaŋ	tōiǰītōlāo
Crab	sēan	ǰàn
Snake	pú	pú
Tortoise	ʃējāŋk ^h ôaŋ	ʃéaŋwénǰ
Mouse	jūʔ	jūʔ
Leech	wât	āt

Fish	ɲāʔ	ɲāʔ
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The analysis of the wordlists reveals that only animals and insects commonly found within the community show similarities. Examples include words for animals such as mouse, fish, wild boar, mithun, snake, and cicada. Additionally, there are a few words like ‘tiger’, ‘goat’ and ‘monkey’ which exhibit partial similarities, sharing limited correspondences in their sounds.

4.6.5. Numerals

English	Tobu	Standard Konyak
One	sāk	ʃā
Two	ɲí	ɲí
Three	lām	lóm
Four	lái	pəlí
Five	ɲâ	ɲá
Six	jók	wók
Seven	nèt	ɲít
Eight	ʃɲào	tét
Nine	səkótú	tù
Ten	pén	pén
One hundred	k ^h òsāk	k ^h òʃā
Fifty	lāmpəʃɲaŋsík	təɲā
Sixty	pəlām	təwók
Seventy	lâipəʃɲaŋsík	təɲít
Eighty	pūlâi	tètét

Ninety	ŋâpəŋʔaŋsĩk	tètú
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From the wordlist above, it can be observed that the decimal numbers in Tobu and Std. Konyak share similarities, but the vigesimal numbers do not share similarities.

4.6.6. Colour terms

English	Tobu	Standard Konyak
Red	ʔākʃĩ	ə̄tāk
Green	sāŋkôn	ə̄həŋ
White	tāokə̄	ə̄hēaŋ
Blue	sāŋkôn	ə̄mòn
Brown	ʔāk	ə̄máŋ
Grey	mə̄ntəŋ	ə̄mòn
Yellow	ʃúkáŋ	ə̄ŋàŋ
Black	ŋākmət	ə̄ŋāk

The colour terms in Standard Konyak consistently exhibit a regular sound pattern in the initial position of the word, which is hypothesized to serve as the adjective marker in the language. However, despite this pattern, the two varieties differ both in the root words and in the way they lexically encode the colour terms.

4.6.7. Natural elements

English	Tobu	Standard Konyak
Air	jāŋjè	wāŋjáŋ
Cloud	tə̄ŋp ^h ēaŋ	wáŋp ^h óm
Earth	hāpēaŋtôk	kāʔtôk
Fire	hò	wèn

Forest	làn ^h â	p ^h ào
Hill	jâk ^h ào	kāʔtán
Lightening	jânpīʔkêaŋpū	wáŋpīʔlán
Moon	ʔēaŋ	lēnpú
Sun	jâŋʔē	wāŋhī
Mud	hâpīʔ	ʃām
Rain	jâŋ	wái
River	jōaŋjəu	jēŋjín
Sky	jàn ^h áo	wāŋ
Rock	jōŋjəu	lòŋpù
Slope	sûŋ	kāʔsón
Water	jōŋ	jēaŋ
Pebble	jòŋ	lōŋ ^h óiʔ
Mountain	kâŋsōaŋ	kāʔtán
Thunder	jāŋmòk	wáŋ ^h úŋpù

The examination of the wordlists above indicates that the majority of the words are distinct from one another, with the exception of the word "water," which exhibits correspondences in both the initial and final sounds.

4.6.8. Basic verb

English	Tobu	Standard Konyak
Sing	pòaŋ	lók
Laugh	ŋí	ŋī
Cry	sāp	sáp

Speak	tài	ηào
Walk	hèn	kēm
Run	hài	p ^h ót
Cut	kèn	kò
Wash	ʈʂ?	pói/sáo
Take	jā?	jā?
Listen	ʈʂt	ʈʂái
Cough	ηáo pā?	kāi
Smell	pò	pè
Think	sèŋ	téi?
Work	máo	tói
Sleep	ʃi	ʃi
Come	hài	pēi
Go	lā	tāi
Know	sên	ʃiŋ
Love	ŋĩ?ŋían	kōn

The analysis of the wordlists reveals that certain verbs, such as "take" and "cry," exhibit complete similarities. Additionally, some words show correspondences, while others are entirely distinct.

CHAPTER 5

FINDINGS AND CONCLUSION

5.1. Overview

This study has examined the mutual intelligibility of Standard Konyak and Tobu, which, despite being considered as dialects of Konyak, are found to be mutually unintelligible. Phonological analysis reveals that the two varieties exhibit more similarities than differences in terms of vowel and consonantal phonemes as well as syllabic structure. However, certain consonants are present in one variety but absent in the other. The primary divergence is observed in the diphthongs, tones, and lexicon, which may contribute as one reason to the high degree of unintelligibility between the two varieties. This raises the question of whether these varieties should be classified as dialects or distinct languages. To arrive at a definitive conclusion, further in-depth linguistic research is required to explore both varieties comprehensively. Throughout the course of this research, no linguistic work has explicitly addressed the language classification of Tobu, although its features and characteristics suggest a connection to the Tibeto-Burman Language Family. One possible explanation for its absence in language family classifications is that the overarching term "Konyak" may obscure its distinct identity. Many researchers may mistakenly categorize Tobu as a dialect of Konyak; however, this assumption cannot be substantiated without a comprehensive investigation of the language. This study reveals that, phonologically, Tobu shares both similarities and differences with Standard Konyak. However, to definitively categorize Tobu as a separate language within the Konyak group, a thorough examination and comparison with other Konyak languages/dialects are necessary, as the Konyak community itself is known to encompass several mutually unintelligible mother tongues.

5.2. Major findings on the segmental phonology of Tobu

This research has found that Tobu has twenty consonantal phonemes. In the places of articulation, Tobu consonants are grouped into 8 categories and in the manner of articulation, the consonants are grouped into six categories. All the sounds detected in this language are phonemic in nature. The twenty consonants are all tested in contrastive pairs. The phonemes found in Tobu sound system are:

/p/, /b/, /t/, /k/, /ʔ/, /p^h/, /t^h/, /k^h/, /m/, /n/, /ŋ/, /ɲ/, /v/, /s/, /ʃ/, /h/, /tʃ/, /w/, /j/ and /l/.

Along with the consonants, 6 short vowels are identified. These vowels are classified into three parameters such as openness of the mouth, position of the tongue raised and the roundness of the lips. All the vowels are tested in contrastive pairs based on one articulatory parameter in three ways i.e., front versus back, front versus central and back versus central. The vowel phonemes detected in Tobu sound system are:

/i/, /e/, /ə/, /a/, /u/ and /o/.

No triphthongs in Tobu were found. There are five diphthongs. The diphthongs are determined as closing, opening and centering types. The diphthongs detected in Tobu sound system are: /ai/, /ao/, /ea/, /ia/ and /oa/.

5.3. Major findings on the suprasegmentals of Tobu

Tobu has both open and closed syllables. Tobu syllable requires two elements: an obligatory vowel, a tone and one or two optional elements. Both onset and coda are not obligatory. All vowels constitute the nucleus of a syllable, and they are obligatory and act as the tone-bearing unit. Also, when diphthongs occur as the nucleus, the first vowel is the tone-bearing unit which serves as the [+syllabic] component, while the second vowel serves as the [-syllabic] component. The primary syllables found in Tobu are:

CV, VC, CVC and V.

The types of syllables found in Tobu are closed, open, simple, complex, checked, smooth and sesquisyllable. Tobu also has syllabic patterns such as, monosyllabic, disyllabic, trisyllabic, and tetrasyllabic patterns.

Three tones are detected in Tobu. It represents the initial analysis of tone in Tobu, which has been found to exhibit one contour tone-a high falling tone-and two register tones-a mid-tone and a low tone. Although a high tone has been observed in a limited number of lexical items produced by certain speakers, it is not consistently present; for instance, the same word may exhibit a high-falling tone when recorded by different speakers. This inconsistency presents challenges in establishing the phonemic status of the high tone in Tobu. Tonal shifts like change of lexical meaning and parts of speech have also been observed in this study. An attempt was made to examine Tone Sandhi in Tobu; however, no consistent patterns were observed during the analysis, resulting in inconclusive findings.

5.4. Findings on the acoustic properties of vowels and consonants

Vowels

From the acoustic measurement of vowels detected in Tobu, it can be observed that ‘i’ has the lowest F1 value and /a/ has the highest F1 value. Also, in the F2 values, we see that /i/ has the highest value and /u/ as the lowest value. The time duration of all the vowels is measured around 248-565 milliseconds.

Consonants

Plosives: Plosives were determined for VOT, voicing bar and duration of stop gap were analysed.

Phonemes	VOT	Voicing Bar	Duration Of Stop Gap
p	0-10.761 ms.	Low energy	98 ms
b	-52.177 ms.	High energy	105 ms
t	0-26.555 ms.	Low energy	124 ms
k	0-19.751 ms.	High energy	85 ms
p ^h	0-27.015 ms	Low energy	69 ms
t ^h	0- 54.011 ms	Low energy	54 ms
k ^h	63 ms	Low energy	51 ms.

Table 5.1: Summary of the acoustic properties of plosive sounds.

Fricatives:

The fricatives of Tobu are acoustically analysed on the bases of its turbulence noise, its intensity, and its acoustic energy occurring at various frequencies.

Fricatives	Frequency range	Intensity
s	1000-5000 above	high
ʃ	5000 above	high
v	1000-5000	low
h	1000-4000	low

Table 5.2: Summary of the acoustic properties of fricatives.

Nasals:

The formants of all the Tobu vowels are dark but not as the dark as the vowel formants. The frequency of F1 of all the nasals relatively at the same lowest range around 92-495 Hz. The F2 of bilabial nasal is placed at 1297 Hz and the velar nasal is placed at 1176 Hz. Also, the F2 of the alveolar nasal shows an upward direction starting from 614 Hz to 1176 Hz and the F2 of the palatal nasal shows straight formants placed at 1136 Hz. The F3 formants of /m/ and /n/ are shown clearly at around 2300-3000 Hz. And the F3 for /ŋ/ and /ɲ/ are scattered and generally not so visible.

Approximants and lateral approximants:

To determine the acoustic features of approximants and lateral approximants, the main acoustic cues were determined for its resonance, its identifiable formant structures, and its continuant feature. The labial velar approximant /w/ was shown both F1 and F2 a downward transition where the F1 is placed at around 258 Hz, F2 at around 1096 Hz and F3 shows a bit scattered at around 2000 to 3000 Hz. The palatal approximant /j/ was shown as a front open as the following sound was an open vowel. On the spectrogram, the F1 was shown placed low around 205 Hz, the F2 is placed relatively away from F1 placing at around 2563 Hz, and F3 placing at around 2000-3000Hz. The alveolar lateral approximant was shown that the F1 at low frequency placed around 350-900 Hz, F2 at around 2000 Hz and F3 at around 3400 Hz.

Affricates:

The acoustic analysis of the affricate sound in Tobu indicated a voiceless sound showing no voicing bar. The frication noise of the sound was shown placed under the frequency range of 2200-5000 Hz. The turbulence energy was placed around 1800 Hz.

5.5. Findings on the phonological and morphophonological processes

The phonological and morphophonological processes found in Tobu are assimilation, epenthesis, consonant germination, free variations, reduplication, and neutralization.

5.7. Findings on the comparative phonology

Tobu has 20 pure phonemic consonants; whereas, Standard Konyak has 17 pure phonemes, 2 marginal phonemes and five free variation phonemes. A table below presents the consonantal phonemes of both the varieties:

Place and Manner of articulation (Pure Phonemes)	Standard Konyak	Tobu
Voiceless unaspirated plosives	/p/, /t/, /k/, /ʔ/	/p/, /b/, /t/, /k/, /ʔ/
Voiced aspirated stop	/p ^h /, /k ^h /	/p ^h /, /k ^h /, /t ^h /
Nasals	/m/, /n/, /ɲ/, /ŋ/	/m/, /n/, /ɲ/, /ŋ/
Voiceless fricatives	/s/, /ʃ/, /h/	/s/, /ʃ/, /h/
Voiced fricatives	#NA	/v/
Voiceless affricate	/tʃ/	/tʃ/
Voiced affricate	#NA	#NA
Voiceless approximant	#NA	#NA
Voiced approximant	/w/, /ɹ/, /j/	/w/, /j/
Voiceless lateral approximant	/l/	/l/

Table 5.3: Consonantal phonemes of both the varieties.

Both Tobu and Standard Konyak have 6 vowels each occurring at similar articulatory parameters such as /i/, /e/, /a/, /ə/, /u/ and /o/. However, there is major difference between Tobu and Standard Konyak in regard to Diphthong sounds. Tobu exhibits only five diphthongs and Standard Konyak exhibits ten diphthongs gliding mostly in different directions. As discussed in the previously, this could also be possible reason why these two varieties are highly unintelligible despite the people belong to one community. Table below shows the diphthongs of both the varieties:

Tobu diphthongs	Standard Konyak diphthongs
ai	ei
ao	ai
ea	əi

ia	ui
oa	oi
	ie
	ea
	əo
	ao
-	au

Table 5.4: Diphthongs of both the varieties.

Both Tobu and Standard Konyak display similar syllabic structures, including CV, CVC, VC, and V patterns. Additionally, both varieties also form more possible syllabic patterns by combining primary syllables. Notably, the penta-syllabic pattern emerges as the highest syllabic structure within a word for both varieties.

In terms of syllable types, Tobu is characterized by seven distinct syllable types: closed, open, simple, complex, checked, smooth, and sesquisyllables. In contrast, Standard Konyak has six syllable types, notably lacking the sesquisyllable category.

Regarding tonal systems, Tobu employs two register tones—mid and low—as well as a contour tone, specifically the high-falling tone. In comparison, Standard Konyak utilizes three register tones: high, mid, and low.

5.8. Conclusion

This thesis represents the first linguistic research ever conducted on Tobu, marking a significant step in documenting and analysing its phonology. Given the absence of secondary sources in the language, this study has relied entirely on first-hand data collected directly from native speakers. Every effort has been made to ensure the authenticity and accuracy of the information, making this research a valuable contribution to both linguistic scholarship and the preservation of Tobu. While this thesis does not claim to be an exhaustive phonological analysis, it provides a solid foundation for further studies. The patterns, observations, and classifications presented here offer a starting point for future linguistic inquiries, whether in phonology, morphology, syntax, or sociolinguistics. Additionally, by comparing Tobu phonology with that of Standard Konyak, this study highlights the phonological differences and similarities between the two varieties. This

comparative approach not only aids in understanding the distinctiveness of Tobu but also contributes to the broader classification and study of Konyak languages.

This study has fulfilled the objectives of the study, and by remaining loyal to its objective, this study has laid the groundwork for future researches, serving as both a reference and an inspiration for linguists, language enthusiasts, and community members interested in preserving and understanding Tobu. It is hoped that this research will encourage more scholars to explore and document the language, ensuring that its linguistic heritage is not only recognized but also passed on to future generations.

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