PHONEMIZATION PATTERNS IN THE TOMBATU LANGUAGE OF SOUTHEAST MINAHASA: A SYSTEMATIC REVIEW

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Abstract : This research aims to examine systematic sound changes that influence certain sound patterns and classes, through segmentation of language sounds, grouping patterns and sound classes of the Tombatu language. Moreover, this paper also focuses on analyzing the phonological process, explaining variations in speech sounds, describing the process of changes in language sounds, and compiling standard phonetic formulas. The techniques for providing data were tapping techniques, skillful listening techniques, recording techniques, note-taking techniques and using the Tombatu Language Vocabulary instrument based on the Swadesh list (200 Vocabulary). In terms of data analysis, several techniques are conducted according to Larry Hyman's phoneme concept, minimal pairs (1975), and by grouping distinctive characteristics by Chomsky and Halle in Yusuf (1998), Jakobson and Trubetzkoy in Kenstowicz (2007). The results showed that Tombatu language there are no phonemes /f/, /v/, /q/, /z/,/x/ and on the contrary there are other phonemes which are characteristic of the Tombatu language, but do not differentiate the meaning, such as phonemes , /š/, /đ/, /ł/ and there are diphthong phonemes. There are 19 consonant phonemes, 6 vowel phonemes, 9 diphthong phonemes /ɛi/,/ai/,/oi/,/ui/ and /aw/,/,(iw/,/uw/,/ew/,/ ow/). Distinctive characteristics of BT phonemes, especially typical BT phonemes. /ş/ languid, fricative, voiced, alveolar lamino, /đ/ suddenly loose, stop burst, voiced, apico prepalatal, /ł/ wide languid, lateral, voiced apico prepalatal, /ŧ/ tight loose suddenly, inhibited eruption, sound, apico prepalatal.

Keywords : *Patterns of Phonemization, Minahasa Language, Tombatu Language*

INTRODUCTION

Language is a series of symbolic sounds, where the sounds form a certain meaning. The science that studies the sounds of language is phonology. The sounds of each language definitely have similarities and differences, and this also applies to the sounds of the Tombatu language. Tombatu (BT) is one of the languages that is still used in everyday life, but not all Tombatu people use it anymore, because from the author's observations, those who use Tombatu without alternating with Manado Malay in their daily activities are people -people aged 50 years and over, while 50 years and under, their language has been mixed with Manadonese Melalyu. Hirabayashi et al (2003). Seeing the decreasing number of Tombatu language users, the author is interested in researching this language in the field of phonology, in order to preserve the language, as stated in UUD 45, regarding the maintenance and preservation of regional languages.

Phonology is studied in order to find language sounds and then analyze them (Zsiga, 2024). By studying and determining the sound system of a language, you can create a writing system that matches the sound system. Studying and analyzing phonology can also reveal the principles of linguistic universality, explaining variations in speech sounds and changes in the sounds of human language (Hegde, 2021., Verhoeven & Perfetti, 2022., Van't Veer, et al, 2023)

In analyzing the phonological process of Tombatu language, the author uses a

generative phonology approach. The approach, methods and techniques of analyzing this approach can complement the shortcomings of structural-descriptive theory (Rosa, et al, 2022., Sari, 2023., Zahra, et al, 2023). Generative phonology is more focused on sound changes as a result of language use in various situations and conditions and in various areas of use (Olugbodi & Affinih, 2024). The changes, both diachronic and synchronic, are expressed in various formulas according to the linguistic symptoms that occur. The formulas are what turn the phonological knowledge inherent in a language speaker into speech sounds. Through these formulas, various generalizations of phonological symptoms can be described concisely and efficiently.

$A \longrightarrow B /X\_\_\_\_Y$. This formula can be more concise by including one of the sound environments that has the greatest influence on the phonological change. $A \longrightarrow B / X$ _____ or $A \qquad B / _____Y$. This formula requires the sound environment to be specified, and is called context sensitive. Sound changes that do not depend on the environment and occur in all sound contexts are called context free. The problem to be studied is systematic sound changes that affect certain patterns and sound classes. The approach used is generative phonology which includes segmentation of language sounds, grouping patterns and classes of language sounds and describing the phonological process. Thus, the variations in speech sounds produced can be explained.

Research on the phonology of local languages in Minahasa, which uses a generative approach so far, has not been found. There is one study by Hans Lapoliwa (1981) which examines Indonesian phonology with a generative approach. The results of this study are the main reference of this research. To determine the position of phonology in the study of language, there are several models put forward by experts, from the simplest to the most complicated models. The simplest model states that language can basically be divided into two parts, namely language form and meaning. This model is not very clear where the study of phonology lies. However, it can be implicitly guessed that phonology is at the level of form, although, of course, it cannot be separated from meaning.

According to Halliday (1961), language has 5 levels consisting of 3 main levels, namely substance content, form and extra-linguistic situation, and added with 2 inter-levels, namely phonology and context. Halliday's model, phonology is the link between the substance of language and its form. Phonology is the study of the sounds of language. Larry M. Hyman (1975: 1) says "phonology, the study of sound systems of language" and the purpose of studying phonology according to him is "to study the properties of sound systems which speakers must learn or internalize in order to use their language for the purpose of communication." Roges Lass (1984: 1) says "Phonology, broadly speaking, is that subdiscipline within linguistics concerned with 'the sounds of language'." And further said that "phonology is the study of the sounds of language". And further said that "phonology proper is concerned with the function, behavior, and organization of sounds as Linguistic items; as opposed to phonetics".

Phonology is distinguished from phonetics, phonology as written above is studying the sound system of language, namely studying how speech sounds, their structure and function in language (Sulaeman & Syafri 2024). Lapoliwa (1988: 4) says that: "Phonetics talks about the process that occurs from the time of the formation of sounds by the speaker until the time the listener realizes the news that is realized through the sounds. John Clark & Colin Yallop (1990: 1), says that in phonetics will be studied about "anatomy

and physiology of speech, articulatory phonetics (which often tends to deal with the identification and classification of individual sounds), acoustic phonetics (sometimes restricted to instrumental analysis and measurement of sound waves) and auditory of perceptual phonetics." The sounds of language are not spoken.

The sounds of language are not pronounced separately in speech, but always in series with other sounds. Therefore, to learn the sounds of the language, one by one. It is necessary to break down the series in which the sound is located. The series of sounds that can be used to start work is the syllable, because the syllable is the smallest form that can be pronounced. Syllable analysis produces segments consisting of two classes, namely vowels and consonants. Vowel segments are characterized by the absence of significant resistance to air escaping. It is these segments that usually top the syllable containing that segment.

Chomsky and Hall (1968) reveal that phonology is : "an interpretative device which projects surface representations on to phonetic forms" (Durand, 1990). In Suhendra J. (1998). In linguistics, phonology is a sub-discipline that is very rapidly developing. Before generative phonology appeared there was already a flow of phonology developed by Leonard Bloomfield, known as structural phonology. This school developed at the beginning of the 1930s until the end of the 1950s. Linguists who contributed a lot to the development of this school include Eugene A. Nida, Kenneth L. Pike and others. Since Chomsky and Hall published The Sound Patttern of English (1968), many other schools have also emerged, including: autosegmental phonology, metrical phonology, CV phonology, natural phonology, dependency phonology, three-dimensional phonology, natural generative phonology, lexical phonology and others, all of which are rooted in the generative

phonology developed by Chomsky and Halle.

The purpose of phonology is to find out how the process of pronouncing a word in relation to human language skills (Maharani, 2023). The phonological process in question is a systematic sound change that affects certain patterns and sound classes. Phonologists usually assume that this phonological process passes through two levels. First, the underlying form, also known as phonological representation. This implied form turns into a new form as a result of a phonological process. Second, the surface formed or phonetic representation, which is the actual speech we hear. In children's speech, for example, there is often a process of simplification of consonant clusters (cluster reduction) caused by the child's physiological inability to pronounce two sounds together. For example, the word drink is pronounced [num], don't is pronounced [ŋan]. Phonologists assume that the child already has the implied ability to drink, but because the child is still growing physiologically, what comes to the surface is [num], [ŋan]. The process from the implied form to the explicit form occurs usually through the formulation or derivation of the form..

RESEARCH METHOD

The method used in this research was descriptive method, according to Sudaryanto (1992):

> *"Penelitian yang dilakukan semata-mata hanya berdasarkan pada fakta yang ada atau fenomena yang memang secara empiris hidup pada penutur penuturnya, sehingga yang dihasilkan atau yang dicatat berupa perian bahasa seperti adanya, tidak mempertim-bangkan benar salahnya penggunaan bahasa oleh penuturnya-penuturnya."*

"The research carried out is solely based on existing facts or phenomena that are empirically alive in the speakers, so that what is produced or recorded is a description of the language as it is, not considering the correctness of the use of language by its speakers."

The technique of providing data was by tapping techniques, listening techniques, recording techniques, recording techniques and using instruments Tombatu language vocabulary based on Swadesh's list (200 vocabulary). In terms of data analysis, the author uses data analysis techniques according to Larry Hyman's concept of phonemes, minimal pairs (1975), and by grouping the distingictive features of Chomsky and Halle in Yusuf (1998), Jakobson and Trubetzkoy in Kenstowicz (2007).

FINDINGS AND DISCUSSION

Phonology of Tombatu Language

Consonants

BT (Tombatu Language) phonology recognizes 21 consonants. These consonant sounds are usually represented by symbols: /b/ [baˀba] 'mulut' (mouth) /c/ [cucur] 'kue cucur' (cucur cake), /d/ [do,na] 'boleh' (may), /g/ [guˀun] 'jual' (sell) /h/ [hiˀi] 'tidak' (no), /l/ [liahayu] 'cabe' (chili), /ł/ [buł] 'bulu tubuh' ('body hair) /m/ [momon] 'blow to light (an almost dead fire), /n/ [naˀam] 'jangan' (do not), /ɲ/ [maɲaɲan] 'eating' /ŋ/ [maŋaɲan] 'eating areca nut', /p/ [paloˀ] 'lelah' (tired) /r/ [darahum] 'needle', /s/ [sawa] 'when', 'belonging' /t/ [tutu] 'lie', /ł/ [tułu] 'tengah' (middle), /w/ [wana] 'that' /y/ [ɛyem] 'ya' (yes), /k/ [kɛˀdoŋ] 'child', /j/ [injon] 'take' /ˀ/ [kurɛˀ] 'belanga' (pot).

1) The phoneme /p/ is a voiceless bilabial erupted consonant with contrast to other phonemes
   (1) /p/ - /b/ [pakoˀ] - [bakoˀ]
                'cut'   'big'
   (2) /p/ - /t/ :[pałuha] - [tahuła]
              'shoulder' - 'how much'

2) The phoneme /b/ is a voiced bilabial delayed consonant with contrast to other phonemes.
   (1) /b/- /p/ [bɛkow] - [pɛkow]
       'paddy' 'kick'
   (2) /b/ - /d/ [bahi] - [dahi]
        'fishy' 'dirt on the skin'

3) Apico dental phoneme /t/ with contrast to other phonemes
   (1) /t/ - /d/ [tuping] - [duping]
            'black from scorching' 'wok'
   (2) /t/ - /g/ [tuˀun] - [guˀun]
                'cook'   'sell'

4) The phoneme /ł/ is an apico-alveolar delayed consonant with contrast to other phonemes.
   (1) /ł/ - /t/ [tułu] - [tutu]
       'middle' 'lie'
       [bułul] - [butul]
        'knot' 'stick'

5) The phoneme /d/ is a voiced apico dental delayed consonant with contrast to other phonemes.
   (1) /d/ - /t/ [dɛkaŋ] - [tɛkaŋ]
   'far away' 'black in the eyes of the day'
   (2) /d/ - /l/ [dihuˀ] - [lihuˀ]
        'fist' 'back'

6) The phoneme /k/ is a dorso-velar delayed consonant with contrast to other phonemes
   (1) /k/ - /g/ [karot] - [gorit]
               'scratch' 'saw'
   (2) /k/ - /p/ [karua] - [parua]
               'friend' 'half'

7) The phoneme /g/ is a voiced dorso-velar delayed consonant with contrast to other phonemes
   (1) /g/ - /k/ [gorit] - [korit]
        'saw' 'claw'

8) Bilabial nasal consonant phoneme /m/ with contrast against other phonemes

(1) /m/ - /n/ [mamaʔ] - [nanaʔ]
'mother' 'ulcer'

(2) /m/ - /p/ [milah] - [pilah]
'search' 'look'

9) Apico-alveolar nasal consonant phoneme /n/ with contrast to other phonemes

(1) /n/ - /h/ [duni] - [duhi]
'rainbow' 'bone'

(2) /n/ - /w/ [səsən] - [səsəw]
'collect' 'suck'

10) Phoneme /ŋ/ dorso-velar nasal consonant with contrast to other phonemes

(1) /ŋ/ - /n/ [bɛnɛ] - [bɛŋɛ]
'female' 'oblique'

11) Phoneme/s/ lamino-apveolar sliding consonant with contrast to other phonemes

(1) /s/ - /l/ [sopoi] - [lopoi]
'sak sarung' 'hang'

(2) /s/ - /n/ [buʔbus] - [buʔbun]
'swampy' 'hole'

12) Phoneme /ɲ/ medio-palatal nasal consonant with contrast to other phonemes

(1) /ɲ/ - /ŋ/ [maŋaɲan] - [maɲaɲan]
'is eating' 'is chewing betel nut'

(2) /ɲ/ - /j/ [ɲaman] - [jaman]
'healthy' 'saman'

13) The phoneme /c/ is a medio-palatal hitch-letup consonant with contrast to other phonemes

(1) /c/ - /j/ [cuʔcur] - [juʔjur]
'a kind of cake' 'honest'

14) The phoneme /j/ is a voiced medio-palatal hmbat letup consonant with contrast to other phonemes

(1) /j/ - // [injon]
'take'
[janela]
'window'

15) Apico-alveolar trill consonant phoneme /r/ with contrast to other phonemes

(1) /r/ - /l/ [kolai] - [korai]
'taro yam' 'a type of mucus'

(2) /r/ - /s/ [kurɛ] - [kusɛ]
'wrestle' 'a kind of animal'

16) Phoneme /ʔ/ glottal stop hamzah consonant with contrast to other phonemes

(1) /ʔ/ - / / [kurɛʔ - [kurɛ]
'belanga' 'wrestle'

17) Apico-alveolar side consonant /l/ phoneme with contrast to other phonemes

(1) /l/ - /d/ [lohoʔ] - [dohoʔ]
'extravagant' 'cloth'

(2) /l/ - /r/ [kolai] - [korai]
'taro yam' 'a kind of liquid'

18) Bilabial and labio-dental semi-vowel phoneme /w/ with contrast to other phonemes

(1) /w/ - /p/ [wana] - [pana]
'that' 'pana'

(2) /w/ - /r/ [bowot] - [borot]
'load' 'little mouse'

19) Laryngeal sliding consonant phoneme /h/ with contrast to other phonemes

(1) /h/ - /k/ [hiʔit] - [kiʔit]
'brought closer' 'a kind of mosquito'

(2) /h/ - /t/ [hombal] - [tombal]
'call' 'young (coconut)'

19) Phoneme /y/ with contrast to other phonemes

(1) /y - /b/ [mayayaŋ] - [mabayaŋ]
'play' 'imagine'

(2) /y/ - /p/ [yana] - [pana]
'just like that' 'pana'

20) Prepalatal apico side consonant phoneme /ɫ/ with contrast to other phonemes

    [bul] - [buɫ]

    'goose bumps' 'body hair'

Vowel Phonemes

There are 6 vowel phonemes and 8 diphthongs in Tombatu language.

1) Front high vowel phoneme /i/ with contrast to other phonemes

    (1) /i/ - /a/ [bahi] - [baha]

      'fishy' 'fire'

    (2) /i/ - /o/ [ihi] - [oho]

      'a kind of shellfish' 'grass'

2) Front low vowel phoneme /a/ with contrast to other phonemes

    (1) /a/ - /i/ [baha] - [bahi]

      'fire' 'fishy'

    (2) /a/ - /e/ [balas] - [beɫes]

      'reply' 'dear'

3) Back high vowel /u/ phoneme with contrast to other phonemes

    (1) /u/ - /a/ [tumbal] - [patch]

      'crash' 'lift'

    (2) /u/ - /i/ [uhu] - [ihi]

      'knee' 'a kind of shell'

4) Front intermediate vowel phoneme /e/ with contrast to other phonemes

    (1) /e/ - /i/ [pelah] - [pilah]

      'dry' 'see'

    (2) /e/ - /o/ [boˀen] - [boˀon]

      'put to bed' 'put to sleep'

5) Back intermediate vowel phoneme /o/ with contrast to other phonemes

    (1) /o/- /a/ [tombal] - [tambal]

      'young' 'lift'

    (2) /o/ - /u/ [oho] - [uhu]

      'grass' 'knee'

6) Phoneme /ɛ/ front intermediate vowel with contrast to other phonemes

    1) /ɛ/ - /e/ [ɛsandom] - [esandom]

    'united' 'only one/there is one'

    [maŋɛšɛh] - [maŋešɛh]

    'washing dishes' 'panting'

    2) /ɛ/ - /u/ [pɛnɛˀ] - [punuˀ]

    sit on the floor' 'rice husk'

Diphthongs

The characteristic of diphthongs is that when pronounced the position of the tongue is different from one another. The difference concerns the height, the low of the tongue, the part of the tongue that moves, and the structure (the distance between the tongue and the ceiling). Based on that, diphthongs are classified into: Rising diphthongs, when the second vowel is pronounced with a higher tongue position than the first. The falling diphthongs are when the second vowel is pronounced in a lower tongue position than the first. Centering diphthongs are when two rising and falling vowels are pronounced by moving the tongue to the central middle vowel.

1) Diphthong /ɛi/ with contrast to another phoneme

    (1) /ɛi/ - /ai/ [pandɛi] - [pandai]

      'smart' 'temporary roof'

    (2) /ɛi/ - /oi/ [lepɛi] - [lopoi]

      'persuade' 'hang (drying)'

2) Diphthong /ai/ with contrast to other phonemes

    (1) /ai/ - /oi/ [kolai] - [kaloi]

      'taro yam' 'brought nothing'

    (2) /ai/ - /ui/ [bolai] - [balui]

      'daki' 'change'

3) Diphthong /oi/ with contrast to other phonemes

    (1) /oi/ - /ai/ [kaloi] - [kolai]

      'did not bring' 'taro yam'

    (2) /oi/ - /ui/ [kaloi] - [balui]

      'did not bring' 'change'

4) Diphthong /ui/ with contrast to other phonemes

(1) /ui/ - /oi/ [balui] - [kaloi]

(2) /ui/ - /ai/ [tukui] - [kohai]

'the back' 'unload'

5) Diphthong /aw/ with contrast to other phonemes

(1) /aw/ - /ow/ [taw] - [tow]

'tapis' 'person'

[kulaw] - [bulow]

'light' 'blue'

(2) /aw/ - /iw/ [endaw] - [indiw]

'peek' 'it's late

6) Diphthong /ow/ with contrast to other phonemes

(1) /ow/ - /aw/ [tow] - [taw]

'people' 'tapis'

(2) /ow/ - /iw/ [liahow] - [liliw]

'extravagant' 'go inside'

(3) /ow/ - /uw/ [putow] - [lutuw]

'machete' 'arrive/arrive'

7) Diphthong /iw/ with contrast to other phonemes

(1) /iw/ - /aw/ [liliw] - [kulaw]

'enter into' 'light'

(2) /iw/ - /uw/ [sindiw] - [lutuw]

'quiet' 'fall'

8) Diphthong /əw/ with contrast to other phonemes

(1) ew/ - /ow/ [lekew] - [lahow]

'even/all' 'wasteful'

(2) /ew/ - /iw/ [sesew] - [sisiw]

'suck' 'insert'

Table. Consonant Phoneme Map of Tombatu Language

Positional relationship between inhibitors (Strictures)	How to inhibit (articulation)	Voiced/Silent	Place of Inhibition (place of articulation)											
			Bila bial	La bio den tal	Api ko Alveolar	Api ko Pre palatal	Api ko Palatal	Lamino Alveolar	Lamino Palatal	Me dio Palatal	Dor so Ve lar	Uvu lar	Laringal	Glotal Hamzah
Closed and release suddenly	Inhibit burst	T	p		t	ŧ				c	k			ʔ
		B	b		d	đ				j	g			
Closed and release suddenly	Nasal	B	m		n					ɲ	ŋ			
Closed and release slowly	Africative	T												
		B												
Wide spacing	Lateral	B			l	Ł								

Wide	Frikatif	T B					s ş					h	
Tenuous Meeting	Tril			r									
Tenuous Meeting 1x	Touch (tap)												
Tenuous Meeting 1x Strong	Touch (flap)												
Wide stretch	Semi vocal	B		w				y					

Phonemes (,đ, ł, and ş,) are present in Tombatu, but do not differentiate meaning.

Vowels

BT phonology recognizes 6 vowel phonemes: [i], [ə], [ɛ], [a], [o], [u].

Table. Vowel Phonemes and Their Articulation Positions.

VOCAL	High Low Tongue	Tongue Movement	Structure	Lip Shape	Example
[i]	Top height	Front	Closed	Not Circle	Iwus
[ə]	Intermediate	Middle	Semi-Open	Not Circle	ənəm
[ɛ]	Lower Intermediate	Front	Semi-Open	Not Circle	dɛkaŋ
[a]	Low down	Front	Open	Not Circle	ahəm
[o]	Upper intermediate	Back	Semi-Closed	Circle	Oʔbol
[u]	Top height	Back	Closed	Circle	Lutam

Table. Vowel Phonemes

[i]	/iwus/	[iwus]	'ujung'
[ə]	/enem/	[ənəm]	'enam'
[ɛ]	/dekang/	[dɛkaŋ]	'jauh'
[a]	/asia/	[asia]	'apa'
[o]	/obol/	[oʔbol]	'asap'
[u]	/tumbal/	[tumbal]	'tabrak'

Table. Vowel Phoneme Map

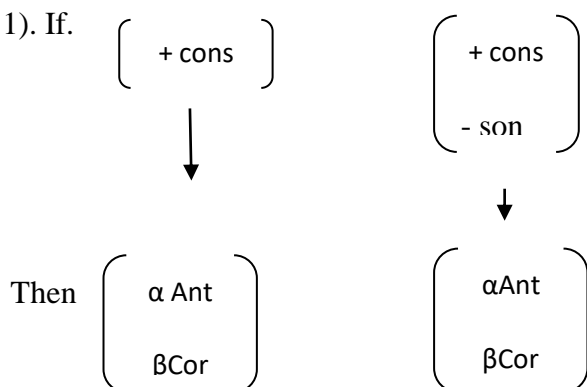|	Front	Middle	Behind
Top	I		u
Intermediate	ɛ		o
Low		a	

DISCUSSION

Phonological Process of Tombatu Language

In general, the phonological process of Tombatu language is almost the same as Indonesian, there are only a few phonemes that characterize Tombatu language. The following is the sequence of phonemes based on 'if...then'.

Consonant Sequence (nasal and obstruent)

Nasal and obstruent phonemes (m-p, m-b, n-t, n-d, ɲ-č, ɲ-ĵ, ŋ-k, ŋ-g, n-s, ŋ-s.

1). If.

$$\begin{bmatrix} +\text{cons} \end{bmatrix} \qquad \begin{bmatrix} +\text{cons} \\ -\text{son} \end{bmatrix}$$

Then

$$\begin{bmatrix} \alpha\,\text{Ant} \\ \beta\text{Cor} \end{bmatrix} \qquad \begin{bmatrix} \alpha\text{Ant} \\ \beta\text{Cor} \end{bmatrix}$$

The condition states that if the first consonant of a sequence of two consoant is specified as a nasal ([+cons, + nasal]) and the second as a non-sonorant, non-continuant consonant ([+cons, -sonorant, -constinuant]) – thus excluding nasal , trill, lateral and fricative consonant – then the two consonant will agree on the features anterior, coronal and back. Phonemes r-b,d,g,m,n,l,t,k,s,c. The phoneme /r/, may precede almost any type of consonants. It can be formulated as follows:

2) If

$$\begin{bmatrix} +\text{cons} \\ \downarrow \end{bmatrix} \qquad \begin{bmatrix} +\text{cons} \end{bmatrix}$$

Then

$$\begin{bmatrix} +\text{son} \end{bmatrix}$$
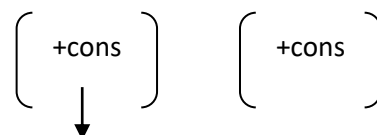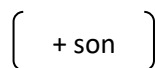
The condition (rule) state that if the second segment or a sequence of two consonant is a voiceless consonant ([+cons, -voi]) and the first segment is a voiced consonant, then it must be a sonorant sound ([+cons, +voice, + sonorant]) such as nasal or trill or lateral.

Phoneme S-t,l, k-t,s,d,n,l,r,z,p-t, h-t,k,b,l,y,w,h,r,l,m,b-r. The formulation is as follows:

3) If

$$\begin{bmatrix} +\text{cons} \\ +\text{voice} \end{bmatrix} \qquad \begin{bmatrix} +\text{cons} \\ \downarrow \end{bmatrix}$$

Then

$$\begin{bmatrix} +\text{voice} \\ +\text{son} \end{bmatrix}$$
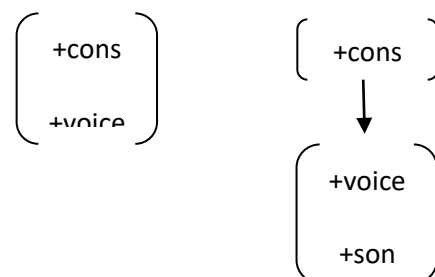
The condition states that if the first element of a sequence of two consonant is specified as a non-sonorant voiced consonant ([+consonant, +voice, -sonorant]), then the second must be a non-high sonorant consonant (+consoanant, +voice, +voice, +sonorant, -high]). The feature specification [-high] blocks the nasals /ɲ/ and /ŋ/.

4) If

$$\begin{bmatrix} +cons \\ -son \\ -cont \end{bmatrix} \quad \begin{bmatrix} +cons \end{bmatrix}$$

Then

$$\begin{bmatrix} +voice \end{bmatrix} \quad \begin{bmatrix} \pm voice \end{bmatrix}$$
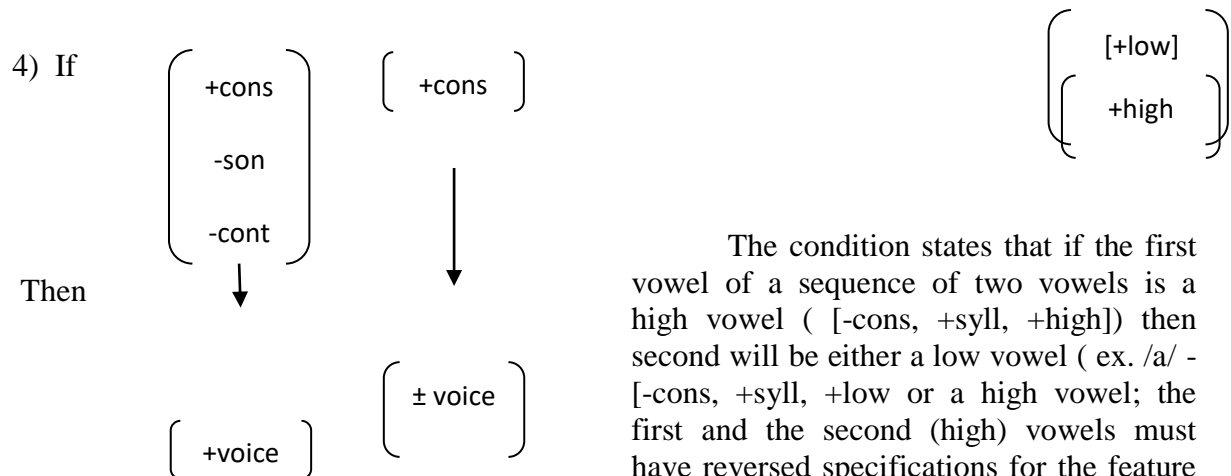
The condition state that if the first element of a sequence of two consonant is an affricate ([+cons, -son, -con, -ant, -cor, -back]) then it must be voice (/j/), and the second will be a voiced sonorant consonant ([+cons, +voice, +son]). Fonem /w/, /y/

5) If

$$\begin{bmatrix} -cons \end{bmatrix} \quad \begin{bmatrix} -syll \end{bmatrix}$$

Then

$$\begin{bmatrix} -voice \\ . \end{bmatrix} \quad \begin{bmatrix} +voice \end{bmatrix}$$

The condition state that if the first segment of a sequence of two non-syllabic segments is specified as a glide then it must be the voice-less glottal fricative /h/ ([-cons, - syll, -voice, +low, +cont]). And if the second segment is further specified as a glide then it must be voiced (ex. /w/ or /y/.

Vocal Sequence

Fonem i-a,u,o,u-a,u-e,u-u,a-i,

1) If

$$\begin{bmatrix} -cons \\ +syll \end{bmatrix} \quad \begin{bmatrix} -cons \end{bmatrix}$$

Then

$$\begin{bmatrix} [+low] \\ [+high] \end{bmatrix}$$

The condition states that if the first vowel of a sequence of two vowels is a high vowel ([-cons, +syll, +high]) then second will be either a low vowel (ex. /a/ - [-cons, +syll, +low or a high vowel; the first and the second (high) vowels must have reversed specifications for the feature back. The condition exludes the sequence i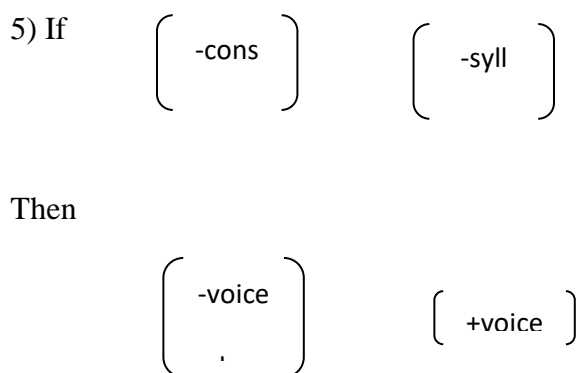-e, i-I, u-e, and u-u which occur in loan items only. Items containing the sequence a-e and a-o are very few in number. The constrain on the vowels that may immediately follow /a/ can be state as follows :

2) If

$$\begin{bmatrix} -cons \\ +syll \end{bmatrix} \quad \begin{bmatrix} -cons \\ +syll \end{bmatrix}$$

Then

$$\begin{bmatrix} \alpha Back \end{bmatrix}$$

The condition state that if the first vowel of a sequence of two vowels is specified as a low ([-consonant, +syllabic, + low]) and the second vowel is a non-low vowel, then it must be a round back vowel (ex. /u/ or /o/) or a front non-round vowel (ex. /i/ or /e/). The condition blocks the occurrence of /ə/ which has the feature specifications [+Back, -round]. This vowel may immediately be follow by /o/ only as in /bao/[bao]'atas', /meong/ [mɛoŋ] 'kucing'. The above constraint can be state as follows.

3) If

$$\begin{bmatrix} -cons \\ +syll \end{bmatrix} \quad \begin{bmatrix} -cons \end{bmatrix}$$

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Then

$$\left[\ -\text{back} \ \right] \qquad \left[\begin{array}{c} +\text{back} \\ \\ +\text{round} \end{array} \right]$$
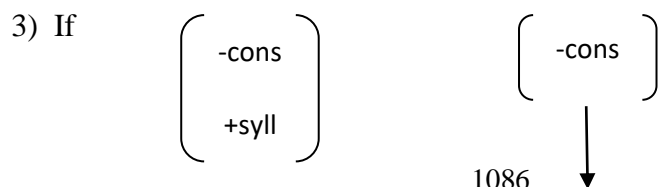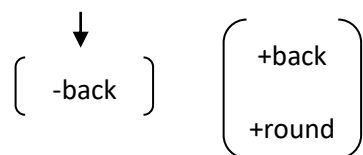
The condition (rule) state that if the first vowel of a sequence of two vowels is a mid vowel then it must be /e/ ([-cons, +syll,-high,-low,-back]), and the second will be a back rounded mid vowel ([-cons, +syll, +back, + round, -high]). The condition excludes the sequence e-I, e-e,o-I,oe and o-o which accur in a few loan item. There is still another type of sequence constraint which can be accounted for here-constraint dealing with diphtong. BT has five diphthongs, ei, ai,oi,ui, aW (ow,iw,uw,ew).

4) if
$$\left[\ -\text{cons} \ \right] \qquad \left[\begin{array}{c} -\text{cons} \\ \\ \end{array} \right]$$

$$\left[\begin{array}{c} -\text{High} \\ \\ +\text{back} \end{array} \right] \qquad \left[\ <\text{-round}> \ \right]$$
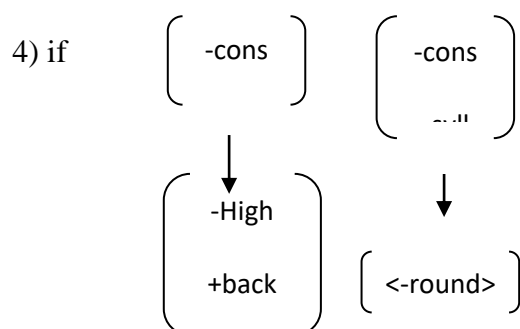
The condition states tahat if the final segment of a morpheme is specified as a voice glide ([-cons, -syll, +voice]), and the second last segment as a vowel, then it must be /o/ ([-cons, +syll, -low, + round]) in which case the final glide must have the feature specification [-round].

BT phonemes are generally the same as Indonesian phonemes, there are only a few phonemes that are unique to BT, namely /ş/, /đ/, l/, and /ɬ/. The first 3 phonemes are present in BT phonemes, but they do not distinguish meaning but the last phoneme does. These phonemes can only be explained by analyzing their distinguishing features or by explaining their points of articulation.

/ş/ loose, fricative, voiced, lamino alveolar

/đ/ tight abrupt release, delayed eruption, voiced, prepalatal apico.

/l/ widely spaced, lateral, voiced prepalatal apico

/ɬ/ tight abrupt release, inhibited lapping, voiced, apico prepalatal.

Table. BT Phoneme Sound Segments

Sound Classes	Sound	Indonesian	Tombatu Language
Obstruent	p b	Paku (Nail) Baku	Pako Bako
	t ł d	Tata (Organize) Dada (Chest)	Tutu' Tułu' Duhi
	k g	Kaya (Rich) Gaya (Style)	Karot Gorit
	c j	Curang (Unfair) Jurang (Canyon)	Cucur Ju'jur

Continuous	s z	Sakar zakat	Sopoi
	š ž		- -
	ɵ δ		- -
	f v	Fatal	-
Nasal	m n ɲ ŋ	Mama (Mother) Mana (Which) Menyapa (Greetings) Mengapa (Why)	Mama' Nana' Manganyan Mangangan
Flow	l ł r	Lupa (Forget) Rupa (Image)	Bul Buł Korai
Semi-vocal	w y	Awan (Could) Ayan	Wana yana

Table. Consonants, vowels and nasals

Sound	Obstruent	Vocal	Semi-vocal	Syllabic		Non-Syllabic	
				Nasal	Flow	Nasal	Flow
[kons]	+	-	-	+	+	+	+
[sil]	-	+	-	-	-	+	+
[son]	-	+	+	+	+	+	+
[nasl]	-	+/-	+/-	+	-	+	-

CONCLUSION

Based on the data obtained from this study, as well as through the analysis of the distribution of phonemes, minimal pairs, distinguishing features, it can be stated that in Tombatu language there are no phonemes /f/, /v/, /q/, /z/, /x/ and vice versa there are other phonemes that are characteristic of Tombatu language, but do not distinguish the meaning, such as phonemes, /š/, /đ/, /ł/ and there are diphthong phonemes. There are 19 consonant phonemes, 6 vowel phonemes, 9 diphthong phonemes /ɛi/, /ai/, /oi/, /ui/ and /aw/, /,(iw/, /uw/, /ew/, /ow/). Details can be seen in the phoneme map table as follows:

Positional relationship between inhibitors (Strictures)	The way it is inhibited (articulation)	Voiced/Silent	Place of Stop (Place of Articulation)											
			Bila bial	La bio den tal	Api ko Alveolar	Api ko Pre palatal	Api ko Palatal	Lamino Alviolar	Lamino Palatal	Me dio Palatal	Dor so Ve lar	Uvu lar	Laringgal	Glotal Hamzah
Closed and release suddenly	Stop and release	T	P		t	ɫ				c	k			?
		B	b		d	(đ)				j	g			
Closed and release suddenly	Nasal	B	m		n					ɲ	ŋ			
Closed and release slowly	Affricative	T												
		B												
Wide stretch	Lateral	B			l	(ł)								
Strech	Fricative	T						s						
		B						(š)					h	
Closed and strech	Trill				r									
Closed and strech 1x	Touch(tap)													
Closd and stretch 1x strong	Touch(flap)													
Wide strech	Semi-vocal	B		W						y				

The phonemes in brackets are found in the Tombatu language, but do not differentiate the meaning.

	Front	Middle	Back
Top	i		i
Intermediate	ε		o
Low		a	

Vocal	High and Low Tongue	Tongue Movement	Structure	Lips Shape	Example
[i]	Top height	Front	Closed	Not Circle	iwus
[ə]	Intermediate	Middle	Semi-Open	Not Circle	ənəm
[ε]	Lower Intermediate	Front	Semi-Open	Not Circle	dɛkaŋ
[a]	Low down	Front	Open	Not Circle	ahəm
[o]	Upper intermediate	Back	Semi-Closed	Circle	OʔbƆl
[u]	Top height	Back	Closed	Circle	lutam

BT phonemes according to generative phonology:

Sound Classes	Sound	Indonesian	Tombatu Language
Obstruent	p	Paku (Nail)	Pako
	b	Baku	Bako
	t	Tata (Organize)	Tutu'
	ŧ		Tuŧu'
	d	Dada (Chest)	Duhi
	k	Kaya (Rich)	Karot
	g	Gaya (Style)	Gorit
	c	Curang (Unfair)	Cucur
	j	Jurang (Canyon)	Ju'jur
Continuous	s	Sakar	Sopoi
	z	zakat	
	š		-
	ž		-
	θ		-
	δ		-
	f	Fatal	-
	v		
Nasal	m	Mama (Mother)	Mama'
	n	Mana (Which)	Nana'
		Menyapa	

	ɲ	(Greetings)	Manganyan
	ŋ	Mengapa (Why)	Mangangan
Flow	l	Lupa (Forget)	Bul
	ł		Buł
	r	Rupa (Image)	Korai
Semi-vocal	w	Awan (Could)	Wana
	y	Ayan	yana

Distinguishing features of BT phonemes, especially the typical BT phonemes

/ş/ loose, fricative, voiced, lamino alveolar

/đ/ tight abrupt release, delayed eruption, voiced, prepalatal apico.

/ł/ widely spaced, lateral, voiced prepalatal apico

/ŧ/ tight abrupt release, inhibited lapping, voiced, apico prepalatal

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