

A Critical Study of Tone in Bodo Language

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Abstract- The Indian languages which have tones are mostly Tibeto-Burman languages which are spoken in North-Eastern part of India, except two languages namely Gojri and Punjabi which belong to Indo-Aryan language family. Like many others Tibeto-Burman Languages, Bodo is also tonal Language. However dearth of proper research of its tonal phenomenon has left many questions unanswered. There have been conflicting views about the number of tones (rising from zero to four) tone assignment system and morpho-phonemics of the languages. The only agreement among the researchers is that, the Bodo language is a tonal language. So, this analysis is a step to settle regarding the tone or tonal phonology of the Bodo language with the help of Bodo informants and other scholars' research works.

Index Terms- Bodo, conflicting, dearth, tone, tonal

I. INTRODUCTION

When a syllable is associated with a particular pitch level such as high, mid, low etc. and the pitch distinguishes the meanings of words, then the pitch is called tone and the language which has tone is called tonal language [1]. In Bodo language also the pitch level differs the meanings of word. So it is called a tonal language. The pitch not only changes the nuance of the language but also changes the core meaning of the language.

The Indian languages which have tones are mostly Tibeto-Burman languages which are spoken in North-Eastern part of India, except two languages namely Gojri and Punjabi which belong to Indo-Aryan language family [2].

Like many others Tibeto-Burman Languages Bodo is also tone Language. However dearth of proper research of its tonal phenomenon has left many questions unanswered. There have been conflicting views about the number of tones (rising from zero to four) tone assignment system and morpho-phonemics of the languages. The only agreement among the researchers is that, the Bodo language is a tonal language [3]. So, this analysis is a step to settle regarding the tone or tonal phonology of the Bodo language with the help of Bodo informants and other scholars' research works.

II. LITERATURE REVIEW

In spite of being spoken by almost a million speakers, Bodo is still not a well-researched language [4]. In this field some scholars have done the same works in Articulatory method. Among them P.C. Bhattacharya's "A Descriptive Analysis of the Boro Language (1977)", Madhuram Boro's "Structure of Boro Language (1990)" and Swarna Prabha Chainary's "Boro Raokhanthi (2006)" are mentionable.

Pramod Chandra Bhattacharya described maximum four (4) numbers of tone in Bodo language in his Doctoral Thesis "A Descriptive Analysis of the Boro Language" (1977), i.e. neutral /0/, high /1/, mid /2/ and low /3/.

Tone /0/ neutral is dependent on tone/1, 2, 3/, and the quality of vowel is centralized and more lax.

In high /1/ tone the level of pitch contour is level or rising and the quality of vowel is closer and tense.

In mid tone /2/ the level of pitch contour is level or falling and the quality of vowel is medium as to closeness and tenseness.

In the low tone /3/ the level of pitch contour is falling and the quality of vowel is open and lax.

M.R. Boro is also described the maximum four (4) numbers of tone in Bodo Language, i.e. rising or high / 1 /, falling or low / 2 /, rising falling or mid / 3 / and falling rising / 4 / in his Book "Structure of Boro Language" (1990).

On the other hand S.P. Chainary described that, there are only Two (2) numbers of tone in Bodo Language, i.e. high /1/ and low /2/ in her Book "Boro Raokhanthi" (2006).

So, that analysis would be the best starting point for this research. The methodology used for analysis is given bellow.

III. THE DATA AND THE METHODOLOGY IN PRESENT STUDY

The analysis of this paper is based on the data collected from the two trend native speakers of Bodo language who are fluent in speaking and writing the language. One male and one female, (which two are selected from the ten speakers, 5 male and 5 female) educated, age between 20 to 30(adult) native speakers of Bodos in standard. The data of 200 sets of words are constructed in the form of different sentences. A specific word is used in three sentences with three different senses of same meanings. Firstly in initial position of the sentence, second in the middle position of the sentence and thirdly in the final position. Then the native speakers were ask to pronounce the mono syllabic words firstly and secondly in three sentences with different senses of meanings.

The data was recorded on a portable Digital sound proof lab with Dynamic microphone of frequency response 80 Hz-20 K Hz, which ensures recording with minimum distortion by using Cool Edit Pro software, Sampling Frequency 22,050 Hz and 16 bit (PCM) resolution. The recording is done one-by one manner. The speakers were instructed to read each word or sentence naturally, without emotions and expression. They were asked to speak clearly and to keep their normal speaking rate and volume.

Then the analysis was done by speech analysis software called PRAAT 4.0.20. The words were segmented from the different sentences and compare to that root words recorded by the informants in first step and with the help of the different graphic

representations created by the software, the pitch and sound quality (which is called tone) were determined.

For example a set of words and their used in different words and sentences and their Pulse, Intensity contour, Pitch contour

with Spectra for both male and female are given the following figures. But the analysis is done only on the basis of Pitch contour.

1. **ai¹** (goddess, female diety)
ai² (mother)
ai³ (income)

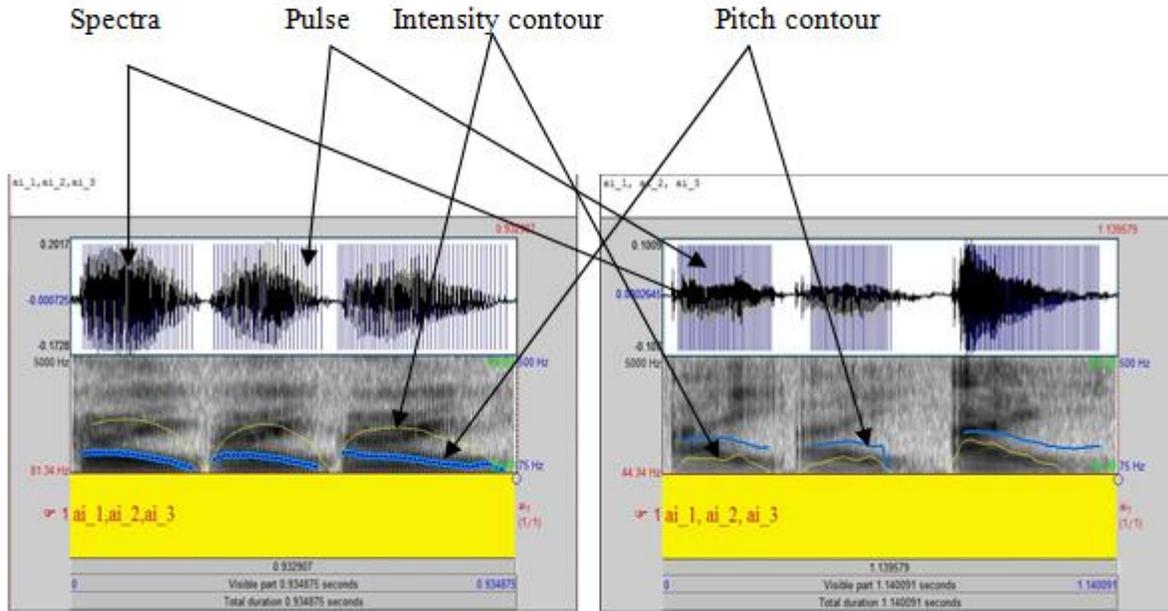


Figure (1 & 2): Pitch contour, Intensity contour and Spectra of ai¹, ai², ai³ for Male and Female

2. **ai¹** (goddess, female diety):

- i. ai sworaswatic^huo p^horaisap^hra p^huzi nanguo.
- ii. dinui ai kalini p^huza don.
- iii. sworaswati mudajzuja zu^hgni ai.

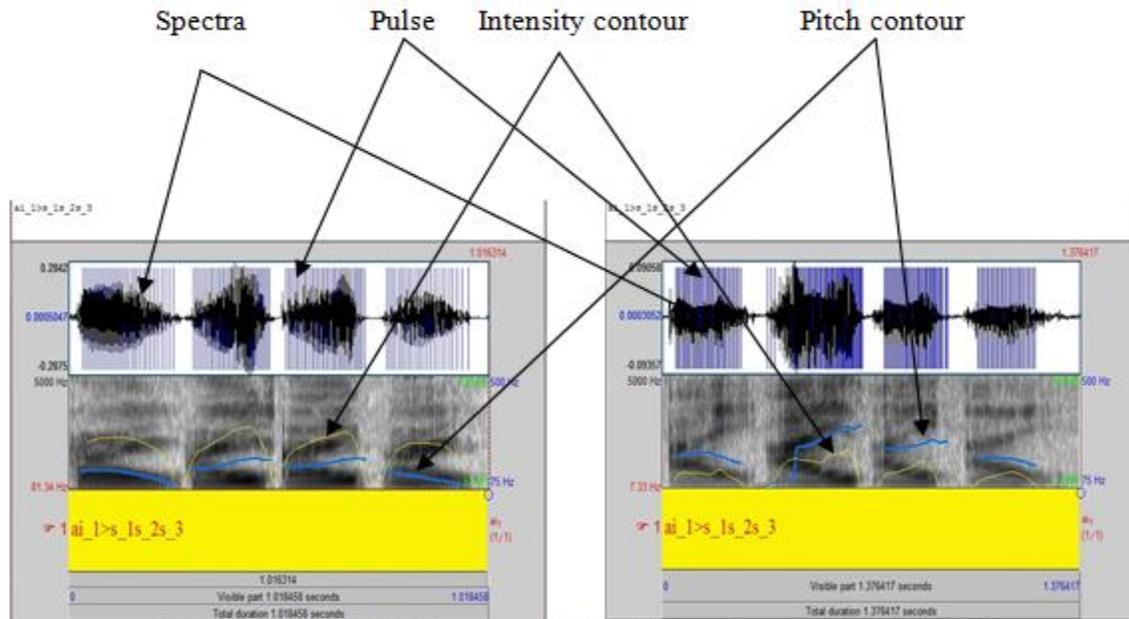


Figure (3 & 4): Pitch contour, Intensity contour and Spectra of **ai¹>s¹, s², s³** for Male and Female

3. **ai²** (mother):

- i. ai ap^hani onnajaosw dinui an besim sop^huinuu hadun.
- ii. zunuumgiri ai-ap^ha/a ank^hwo onsw garuu.
- iii. bijuu ani ai

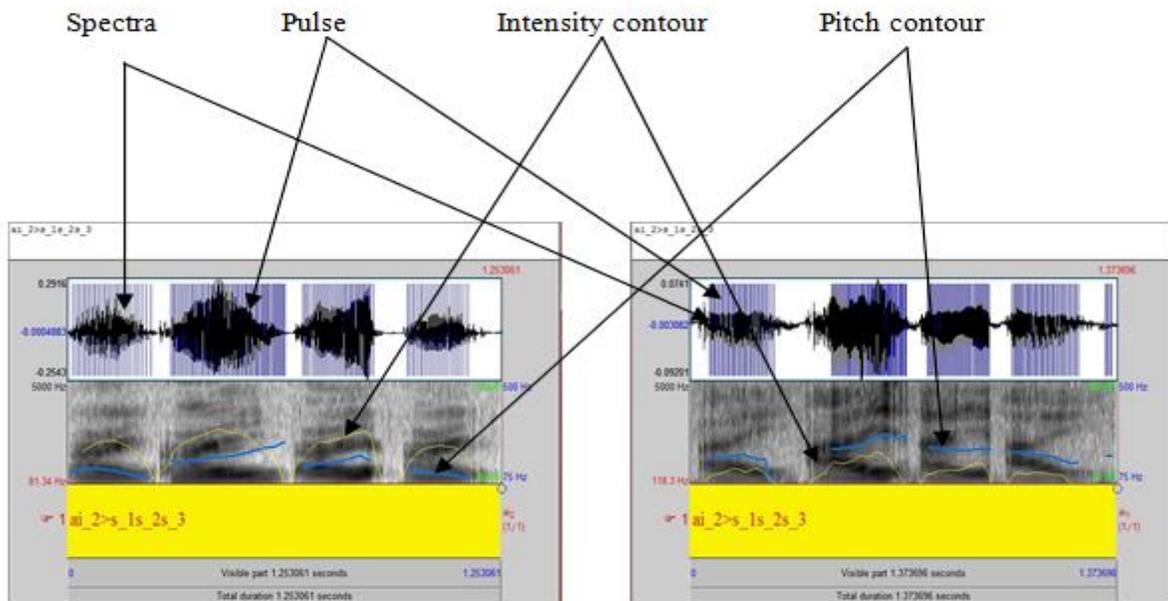


Figure (5 & 6): Pitch contour, Intensity contour and Spectra of **ai²>s¹, s², s³** for Male and Female

4. ai³ (income):

- i. ai k^halamnu**bla** k^horosk^huo k^hom k^halam.
- ii. bek^huo maou**bla** nu**n**ha ese ai zagun.
- iii. be k^hinija anni bu**su**r**se**ni ai.

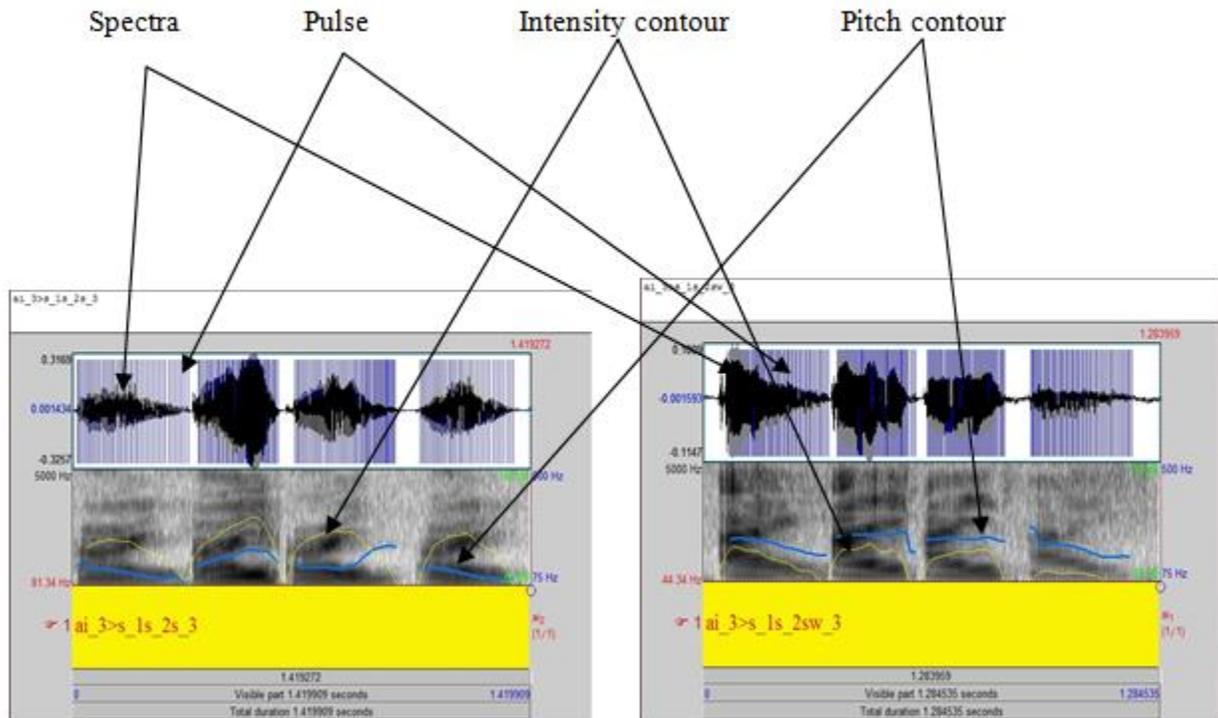


Figure (7 & 8): Pitch contour, Intensity contour and Spectra of ai³>s¹, s², s³ for Male and Female

Like this, In this analysis only 18 mono syllabic words putting initial, middle and final positions in 54 sentences with different sense of meanings, whereas 200 mono syllabic words are taken in the experiment as a whole and used in different sentences putting initial, middle and final position of the sentences. But only eight figures are given here for example, but all the values in Hz. of 18 mono syllabic words for both the Male and Female is given in the **Table 1**.

IV. RESULT AND DISCUSSION

- 1. From the above analysis it is clearly observed that Pitch contour of female is always higher than male, which is also globally accepted.
- 2. There is no tone difference between the male and female in Bodo language.
- 3. The tone of mono syllabic words cannot be determined in the study of word level only. It can determine by the study of sentence level.

4. It is observed that there are three tones in Bodo language, which is level tone, rising high tone and falling low tone.

Level tone: Level tone means the tone level or the level of pitch contour of such words is in level, it seems that there are no major changes of pitch from beginning to end of the sound. The difference of the value of sounds (0-15 hz.) from beginning to end is considered as a Level tone in this paper. It is symbolically denoted here [3].

Rising high: Rising high means the tone level or the pitch contour of such words are above the level and the pitch is gradually rise from the beginning to end. Rising high tone is symbolically denoted here [1].

Falling low: Falling low means the the pitch contour of such words are below the level tone and its pitch are always fall the downwards. Falling low tone is symbolically denoted here [2].

5. Finally in the whole observation of this study some mono syllabic words and their results (tones) are given in **Table: 1**.

Word in IPA	Meaning	Sentence No.	Starting Value Fo (Hz.)	Ending Value Fo (Hz.)	Tone
ai ¹	Goddess/Female deity	S ¹	151(M) 225.2(F)	187.2(M) 294.5(F)	1
		S ²	160.5 (M) 221.9(F)	189.1 (M) 249.2(F)	
		S ³	144.1 (M) 184.5(F)	165.4 (M) 206.7(F)	
ai ²	Mother	S ¹	170 (M) 219.9(F)	245.6 (M) 261.9(F)	1
		S ²	142.6 (M) 226.5(F)	194.6 (M) 249.3(F)	
		S ³	139.4 (M) 208(F)	187.7 (M) 232.7(F)	
ai ³	Income	S ¹	152.4 (M) 234.4(F)	160.1 (M) 244.6(F)	3
		S ²	156.3 (M) 227.6(F)	164.8 (M) 225.8(F)	
		S ³	124.3 (M) 166.3(F)	120.2 (M) 164.4(F)	
dan ¹	Month	S ¹	155.8 (M) 249.3(F)	161.2 (M) 233.3(F)	3
		S ²	191.3 (M) 249.1(F)	203.6 (M) 261.7 (F)	
		S ³	157.5 (M) 227.8 (F)	166.5 (M) 239.7 (F)	
dan ²	Gift	S ¹	167.1 (M) 244.3 (F)	212.2 (M) 246.7 (F)	1
		S ²	144.9 (M) 249.1 (F)	216 (M) 257.1 (F)	
		S ³	150.7 (M) 201 (F)	180.6 (M) 217.3 (F)	
dan ³	To cut	S ¹	165.4 (M) 217.4 (F)	95.48 (M) 210 (F)	2
		S ²	134.1 (M) 266.9 (F)	124.9 (M) 208.8 (F)	
		S ³	129.5 (M) 239.5 (F)	77.99 (M) 173.2 (F)	
dwi ¹	Water	S ¹	139.5 (M) 237.2 (F)	130.7 (M) 221 (F)	2
		S ²	170.3 (M) 244.7 (F)	141.3 (M) 230.3 (F)	
		S ³	165.5 (M) 243.2 (F)	112.4 (M) 186.7 (F)	
dwi ²	To take in hand	S ¹	144.1 (M) 230.5 (F)	142.2 (M) 226 (F)	3
		S ²	124.7 (M) 273.1 (F)	117.2 (M) 267.8 (F)	
		S ³	160.5 (M) 203.5 (F)	160.6 (M) 199.1 (F)	
dwi ³	To lay egg	S ¹	184 (M) 240.5 (F)	152.1 (M) 219.3 (F)	2
		S ²	165.2 (M) 228.2 (F)	124 (M) 198.6 (F)	
		S ³	141.7 (M) 235.6 (F)	118.7 (M) 198.5 (F)	

eo¹	To clear by cutting	S ¹	157.4 (M) 238.3 (F)	165.2 (M) 256.6 (F)	1
		S ²	146.5 (M) 176.9 (F)	159.8 (M) 226 (F)	
		S ³	140.4 (M) 239.7 (F)	192.9 (M) 192.1 (F)	
eo²	To plough	S ¹	161.3 (M) 254.2 (F)	106.3 (M) 214.9 (F)	2
		S ²	149.6 (M) 258.4 (F)	83.76 (M) 220.1 (F)	
		S ³	133.4 (M) 220.1 (F)	89.64 (M) 176.1 (F)	
eo³	To fry	S ¹	193.3 (M) 235.3 (F)	92.11 (M) 252.2 (F)	2
		S ²	157.5 (M) 130.2 (F)	218.3 (M) 112.2 (F)	
		S ³	149.2 (M) 109.1 (F)	95.8 (M) 101.5 (F)	
k^ha¹	To pluck	S ¹	192.7 (M) 321.7 (F)	113.7 (M) 308.1 (F)	2
		S ²	179.2 (M) 271.2 (F)	163.8 (M) 265.4 (F)	
		S ³	178 (M) 268.3 (F)	104.1 (M) 194.9 (F)	
k^ha²	To tie/ to bind	S ¹	192.6 (M) 311.3 (F)	113.6 (M) 287.6 (F)	2
		S ²	179.2 (M) 279.6 (F)	163.8 (M) 231 (F)	
		S ³	180.4 (M) 228.8 (F)	104.1 (M) 169.4 (F)	
Kha³	To test bitter	S ¹	191.4 (M) 221.1 (F)	184.1 (M) 195.3 (F)	3
		S ²	211.7 (M) 295 (F)	219 (M) 299.1 (F)	
		S ³	131.5 (M) 140.3 (F)	125 (M) 135.1 (F)	
on¹	To open, to spread, to unfold	S ¹	154.5 (M) 248.9 (F)	146.6 (M) 257 (F)	3
		S ²	164.8 (M) 238.9 (F)	266.7 (M) 230.3 (F)	
		S ³	112.7 (M) 238.9 (F)	105.9 (M) 235.2 (F)	
on²	To love	S ¹	164.2 (M) 257.4 (F)	75.24 (M) 167.4 (F)	2
		S ²	159.6 (M) 208.2 (F)	104.8 (M) 114.4 (F)	
		S ³	139.5 (M) 223.2 (F)	83.04 (M) 168.7 (F)	
on³	Powder of rice	S ¹	179.6 (M) 238.4 (F)	141.2 (M) 222.2 (F)	2
		S ²	153.6 (M) 240.5 (F)	124.8 (M) 211.1 (F)	
		S ³	146.7 (M) 212.3 (F)	119.31 (M) 155 (F)	

Table: 1: Values of Formant Frequency of pitch in Hz. of Mono syllabic words

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