

***BHARIA  
PHONEMIC SUMMARY***



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2015***

# Table of Contents

<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1THE BHARIA PEOPLE.....	1
1.2THE BHARIA LANGUAGE.....	1
1.3PURPOSE OF THIS STUDY.....	1
1.4SYMBOLS AND ABBREVIATIONS.....	2
<b>2 SEGMENTATION ISSUES.....</b>	<b>3</b>
2.1ASPIRATION AND BREATHY VOICE.....	3
2.2CLOSE VOWELS AND APPROXIMANTS.....	4
<b>3 THE PHONETIC CHART.....</b>	<b>5</b>
3.1CONSONANT CHART.....	5
3.2VOWEL CHART.....	5
<b>4 THE PHONEMIC INVENTORY.....</b>	<b>6</b>
4.1CONSONANT CHART.....	6
4.2VOWEL CHART.....	6
<b>5 DESCRIPTION OF PHONEMES.....</b>	<b>7</b>
5.1CONSONANTS.....	7
5.1.1Stops.....	7
5.1.2Fricatives.....	10
5.1.3Nasals.....	10
5.1.4Liquids.....	11
5.1.5Approximants.....	12
5.2VOWELS.....	13
5.2.1Oral Vowels.....	13
5.2.2Nasal Vowels.....	14
<b>6 EVIDENCE OF CONTRAST.....</b>	<b>16</b>
6.1CONSONANTS.....	16
6.1.1Stops.....	16
6.1.2Nasals.....	21
6.1.3Fricatives.....	22
6.1.4Liquids.....	23
6.1.5Approximants.....	25
6.2VOWELS.....	26
6.2.1Vowel Quality.....	26

6.2.2	<i>Nasalized Vowels</i> .....	27
<b>7</b>	<b>SYLLABLE STRUCTURE</b> .....	<b>29</b>
<b>8</b>	<b>DISTRIBUTION OF PHONEMES</b> .....	<b>30</b>
8.1	CONSONANTS.....	30
8.1.1	<i>Distribution of Consonant Phoneme Chart</i> .....	30
8.1.2	<i>Word Initial Consonants</i> .....	32
8.1.3	<i>Word Final Consonants</i> .....	34
8.1.4	<i>Intervocalic Consonants</i> .....	36
8.1.5	<i>Complex Onsets and Codas</i> .....	39
8.1.6	<i>Word-medial CC Sequences</i> :.....	40
8.1.7	<i>Retroflex Consonant Harmony</i> :.....	41
8.2	VOWELS.....	41
8.2.1	<i>Vowels in Open Syllables</i> .....	41
8.2.2	<i>Vowels in Closed Syllables</i> .....	42
8.2.3	<i>Vowel Sequences</i> :.....	43
<b>9</b>	<b>OUTSTANDING ISSUES</b> .....	<b>44</b>
<b>10</b>	<b>BIBLIOGRAPHY</b> :.....	<b>45</b>

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Pavan Kumar P.  
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## 1 Introduction

### 1.1 The Bharia People

The Bharia people are one of the largest tribal groups in Madhya Pradesh. According to the 2001 census the population was 242,061. The main concentration of the Bharia is in Pataalkot Valley in Chhindwara District. They also inhabit Jabalpur District and its adjoining regions. They have been awarded a status as of one of the scheduled tribes of the Indian subcontinent.

Another name for the Bharia people is 'Bhumia', meaning "lord of the soil". Some of the tribal communities of the Indian subcontinent also identify Bharia Tribe as 'Bharia Bhumia'. Bhumia refers to a priest of the village gods and is thus considered as a very respectable designation for the people of this tribe.

### 1.2 The Bharia Language

According to the Ethnologue, Bharia (ISO 639-3: bha) is classified as a Dravidian language (Lewis et. al. 2015). However, writing more than 100 years ago, Grierson pointed out that although "The Bharias have probably once spoken a form of Gondi... Their dialect is, however, now a corrupt Bundeli" (2005 [1904]: 640). Gondi is a South-Central Dravidian language, while Bundeli is an Indo-Aryan language of the Central zone. Thus, it seems that the Bharia people have been speaking an Indo-Aryan language for some time. This is consistent with our observations. With a few exceptions, most of the vocabulary that we have collected appears to be of Indo-Aryan origin, and the phonemic system is certainly more similar to other Indo-Aryan languages, including Bundeli (cf. Jaiswal 1962), than to that of any Dravidian language, including Gondi (cf. Steever 1998). Thus, although the Bharia people may have once spoken a Dravidian language, the language they now speak is almost certainly Indo-Aryan. Some people refer to the language as Bhariati or Parsi. The classification of the Bharia language within the Indo-Aryan family is a question that requires further research.

### 1.3 Purpose of this Study

The analysis presented here is based on research conducted from February 2013 to July 2015. This analysis was done on a corpus of 1200 words collected through conversations, language-learning classes, and stories.

This phonemic summary of the Bharia language was undertaken as part of the Bharia language development. The analysis in this paper is based on the dialect spoken in Chhindwara district of Madhya Pradesh. The Bharia community as a whole consider

## Introduction

this dialect to be the most widely accepted and intelligible of the varieties spoken in this region.

The main purpose of this research is to have a thorough understanding of the Bharia language sound system. I expect this research to lead to the documentation of the language and the production of easy-to-use teaching materials in the Bharia language. I trust that from this research, quality mother-tongue literacy materials can be developed using the Devanagari script so that the community can become familiar with the sounds and symbols of their own language. Almost all members of the Bharia tribe, whether literate or non-literate, speak Bharia, but most have never had an opportunity to read or write their own language. It is my hope that this project will enable them to start reading and writing in their heart language so that they can achieve their literacy goals. Ideally, this project will also generate an interest and love for their language and a new, higher respect for their mother tongue.

### 1.4 Symbols and Abbreviations

[ ]	Phonetic data
//	Phonemic data
Vl	Voiceless
Vd	Voiced
C	Consonant
V	Vowel
.	Syllable break
ĩ	Nasalized
~	Variation
imp	imperative
PRES	Present
cont	Continuous
SG	Singular
PL	plural
fem	female

All the phonetic symbols used are from the International Phonetic Alphabet.

## 2 Segmentation Issues

### 2.1 Aspiration and Breathy voice

Following standard conventions of the South Asian tradition, we have interpreted phonetic sequences such as [tʃ] and [dʒ] as affricated stops, [tʃ̤] and [dʒ̤] respectively. In addition, we have interpreted phonetic sequences such as [pʰ], [tʰ], [tʰ̤], [tʰ̤̤], [kʰ], and [bʰ], [dʰ̤], [dʰ̤̤], [dʒ̤̤̤], [gʰ̤], as aspirated and breathy voiced units: [pʰ̤], [tʰ̤̤], [tʰ̤̤̤], [kʰ̤], and [bʰ̤̤], [dʰ̤̤̤], [dʰ̤̤̤̤], [dʒ̤̤̤̤̤], [gʰ̤̤̤̤̤], respectively.

In our data, we also find sequences involving sonorants + [ʱ], including [mʱ], [nʱ], [rʱ], [ɽʱ], [lʱ] and [wʱ]. For example:

/kumha/	[kumʱa]	'a type of mashroom'	0084
/tʃinʱa/	[tʃinʱa]	'mark'	0589
/t̤erhe/	[t̤erʱe]	'below'	0163
/d̤erʱa/	[d̤erʱa]	'thick'	1133
/balh̤ej/	[balh̤ej]	'grass flower'	0446

It might be possible to interpret these as breathy voiced units, parallel to the stops. This interpretation has been proposed for some Indo-Aryan languages including Bundeli (Jaiswal 1962), Bhojpuri (Shukla 1981; Verma, M. 2003), Magahi (Verma, S.. 2003) and Rājban̄shi (Wilde 2008), among others. For the present analysis, we have chosen to interpret them as consonant sequences for the following reasons:

- The phoneme /h/ (which is realized as phonetic [ʱ] in most positions) occurs independently in syllable onsets (i.e., word-initial and intervocalic positions).
- Unlike the aspirated and breathy-voiced stops, sequences of sonorant + [ʱ] do not occur in word-initial onset positions. They occur primarily in word-medial positions, where they can be interpreted as coda-onset sequences separated by a syllable boundary.
- Along with medial sequences such as [nʱ], [rʱ], [ɽʱ], and [lʱ], we also find medial sequences such as [ʱn], [ʱr], [ʱɽ], and [ʱl]. This suggests that [ʱ] is an

## Segmentation Issues

independent segment, which can occur as the first or second member of medial CC sequences.

This interpretation is consistent with the syllable structure of the language and avoids the need for positing additional breathy voiced phonemes. However, we have found one example with [nh̥] occurring in stem-final position and a few examples of [wh̥] in word-medial onset position.

/tʃinh-na/	[tʃinhna]	'recognize'	0781
/gir.whã/	[girwhã]	'tether'	0064

In these cases, [nh̥] and [wh̥] occur as CC clusters within the syllable. Complex CC onsets and codas do occur in Bharia, so a CC sequence interpretation is still consistent with the syllable structure of the language. However, if more examples of this kind are found, they may be grounds for interpreting syllable-internal [Cf̥] sequences as breathy units ([C<sup>h̥</sup>]). We leave this question for future research.

## 2.2 Close Vowels and Approximants

Close vocoids<sup>1</sup> are highly ambiguous when they occur next to other vowels within the same syllable. In these contexts they can be interpreted as close vowels, [i] and [u], or consonantal approximants, [j] and [w], respectively. For the present analysis we have chosen to interpret them as approximants in these contexts.

/ja/	[ja]	'this'	0985
/mijar/	[mijar]	'a roof'	0062
/ɖawa/	[ɖawa]	'left'	0544
/d̪ʒogaj/	[d̪ʒogaj]	'near'	0631
/bɛw/	[bɛw]	'mother'	0611

<sup>1</sup>We use the term 'vocoid' to refer to any vowel-like segment, including vowels and approximants.



### 3 The Phonetic Chart

#### 3.1 Consonant Chart

	Bilabials		Dentals		Alveolar	Retroflex		Palatal		Velar		Glotal
Plosives	p	p <sup>h</sup>	t̪	t̪ <sup>h</sup>		ʈ	ʈ <sup>h</sup>			k	k <sup>h</sup>	
	b	b <sup>h</sup>	d̪	d̪ <sup>h</sup>		ɖ	ɖ <sup>h</sup>			g	g <sup>h</sup>	
Affricates								tʃ	tʃ <sup>h</sup>			
								dʒ	dʒ <sup>h</sup>			
Fricatives					s							h
												ɦ
Nasals	m		ɳ		n	ɳ		ɲ		ŋ		
Laterals					l							
Trill					r							
Flaps					ɾ	ɽ						
Approximants	w							j				

Table 1: Phonetic Consonant Chart

#### 3.2 Vowel Chart

	Front	Central	Back
Close	i    ĩ		u    ũ
Near-close	ɪ		ʊ
Mid	e    ě		o    õ
Open-mid	ɛ		ɔ    õ
Near-open		ɐ    ẽ <sup>i</sup>	
Low		a    ã	

Table 2: Phonetic Vowel Chart



## 5 Description of Phonemes

All the phonemes are laid out in the following order of positions in the examples whenever they occur:

- Word initial
- Word medial
- Word final

### 5.1 Consonants

#### 5.1.1 Stops

Bharia has five series of stops: labial, dental, retroflex, palatal and velar. The palatal stops are realized as laminal post-alveolar affricates. All other stops are realized as unaffricated plosives. Aspirated stops do not occur in word-final positions. All stops contrast for voicing and aspiration/breathy voice.

/p/ [p] a voiceless unaspirated bilabial plosive.

/pipli/	[pipli]	'butterfly'	0219
/tʃilpi/	[tʃilpi]	'pieces of fire wood'	0170
/k <sup>h</sup> op/	[k <sup>h</sup> op]	'wall'	1066

/p<sup>h</sup>/ [p<sup>h</sup>] a voiceless aspirated bilabial plosive.

/p <sup>h</sup> ipri/	[p <sup>h</sup> ip <sup>h</sup> ri]	'whistle'	1085
/sulp <sup>h</sup> i/	[sulp <sup>h</sup> i]	'country liquor'	0668

/b/ [b] a voiced unaspirated bilabial plosive.

/birla/	[birla]	'fire spark'	0391
/b <sup>h</sup> ibla/	[b <sup>h</sup> ibla]	'caterpillar'	0230
/ɖub/	[ɖub]	'grass plant'	0676

/b<sup>h</sup>/ [b<sup>h</sup>] a voiced aspirated bilabial plosive.

/b <sup>h</sup> iṭra/	[b <sup>h</sup> iṭra]	'inside'	0518
/gab <sup>h</sup> en/	[gab <sup>h</sup> en]	'foetus'	0406

## Description of Phonemes

/t̪/	[t̪]	a voiceless unaspirated dental plosive.	
/t̪it̪ur/	[t̪it̪ur]	'partridge'	0725
/t̪ur̪t̪ej/	[t̪ur̪t̪ej]	'quickly'	0772
/ɛd̪awɛt̪/	[ɛd̪awɛt̪]	'revange'	0789
/t̪ʰ/	[t̪ʰ]	a voiceless aspirated dental plosive.	
/t̪ʰubr̪i/	[t̪ʰubr̪i]	'mouth'	0612
/kɛt̪ʰɛr̪i/	[kɛt̪ʰɛr̪i]	'duvet'	0346
/d̪/	[d̪]	a voiced unaspirated dental plosive.	
/d̪iwar̪o/	[d̪iwar̪o]	'white ant'	1087
/m̪and̪i/	[m̪and̪i]	'talk'	0958
/d̪ond̪/	[d̪ond̪]	'navel'	0629
/d̪ʰ/	[d̪ʰ]	a voiced aspirated dental plosive.	
/d̪ʰãt̪/	[d̪ʰãt̪]	'urinal disease'	1052
/sad̪ʰejka/	[sad̪ʰejka]	'normal'	0645
/t̪/	[t̪]	a voiceless unaspirated retroflex plosive.	
/t̪ipt̪i/	[t̪ipt̪i]	'sitting place'	0854
/t̪ʃam̪t̪i/	[t̪ʃam̪t̪i]	'stick'	0917
/popɛt̪/	[popɛt̪]	'cooked beans'	0269
/t̪ʰ/	[t̪ʰ]	a voiceless aspirated retroflex plosive.	
/t̪ʰãw/	[t̪ʰãw]	'place'	0743
/kot̪ʰi/	[kot̪ʰi]	'a box'	0022
/d̪/	[d̪]	a voiced unaspirated retroflex plosive.	
/d̪ihi/	[d̪ihi]	'edge'	0356
/ged̪a/	[ged̪a]	'a long piece of wood'	0048
/und̪ka/	[und̪ka]	'toe'	1020
/d̪und̪/	[d̪und̪]	'wood'	1111

## Description of Phonemes

/dʰ/	[dʰ] a voiced aspirated retroflex plosive.		
/dʰubla/	[dʰubla]	'clay pot'	0245
/kodʰu/	[kodʰu]	'lazy'	0539
/tʃ/	[tʃ] a voiceless unaspirated palatal (laminal post-alveolar) affricate.		
/tʃingri/	[tʃingri]	'finger'	0389
/bɛɾtʃi/	[bɛɾtʃi]	'spear'	0902
/gōtʃ/	[gōtʃ]	'leech'	0543
/tʃʰ/	[tʃʰ] a voiceless aspirated palatal (laminal post-alveolar) affricate.		
/tʃʰeli/	[tʃʰeli]	'goat'	0438
/bitʃʰi/	[bitʃʰi]	'scorpion'	0820
/dʒ/	[dʒ] a voiced unaspirated palatal (laminal post-alveolar) affricate.		
/dʒewna/	[dʒewna]	'right'	0792
/ubdʒɛn/	[ubdʒɛn]	'birth'	0174
/gadʒ/	[gadʒ]	'thunderbolt'	0991
/dʒʰ/	[dʒʰ] a voiced aspirated palatal (laminal post-alveolar) affricate.		
/dʒʰɛɾ/	[dʒʰɛɾ]	'rainy season'	0774
/bedʒʰa/	[bedʒʰa]	'much'	0617
/k/	[k] a voiceless unaspirated velar plosive.		
/kakra/	[kakra]	'whose'	1093
/pɛnka/	[pɛnka]	'big roti'	1135
/ɕɛnɛk/	[ɕɛnɛk]	'little'	0557
/kʰ/	[kʰ] a voiceless aspirated velar plosive.		
/kʰaɕi/	[kʰaɕi]	'aslope'	0122
/ɕɛkʰɾa/	[ɕɛkʰɾa]	'balance'	0132

## Description of Phonemes

/g/ [g] a voiced unaspirated velar plosive.

/gar/	[gar]	'hail'	0459
/tɛŋga/	[tɛŋga]	'thumbs-up'	0990
/d̪aŋg/	[d̪aŋg]	'grass'	0445

/g<sup>h</sup>/ [g<sup>h</sup>] a voiced aspirated velar plosive.

/g <sup>h</sup> ogra/	[g <sup>h</sup> ogra]	'spring'	0908
/uŋg <sup>h</sup> as/	[uŋg <sup>h</sup> as]	'feeling sleepy'	0381

### 5.1.2 Fricatives

/s/ [s] a voiceless alveolar grooved fricative.

/si <sup>h</sup> a/	[si <sup>h</sup> a]	'useless'	1055
/mɛski/	[mɛski]	'fly'	0404
/gos/	[gos]	'meat'	0598

/h/ This phoneme has two allophones which are realized as follows:

[ɦ] ~ [h] a voiced glottal fricative which varies freely with a voiceless glottal fricative word-initially.

/hɛɾga/	[ɦɛɾga]	'bone'	0188
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[ɦ] a voiced glottal fricative which occurs elsewhere.

/bɛɦɛɾi/	[bɛɦɛɾi]	'wrist'	1117
/kumɦa/	[kumɦa]	'a type of mushroom'	0084
/unɦari/	[unɦari]	'flat land'	0397

### 5.1.3 Nasals

<sup>̃</sup>/m/ [m] a voiced bilabial nasal stop.

/mewa/	[mewa]	'pumpkin'	1156
/bambi/	[b <sup>̃</sup> ambi]	'snake hole'	0886
/guɖam/	[guɖam]	'button'	0221

/n/ This phoneme has five allophones which are realized as follows:

[n̥] a voiced dental nasal stop which occurs before dental stops.

/mind̥i/	[mind̥i]	'eye lashes'	0369
/ɛnt̥mul/	[ɛnt̥mul]	'a herbal root'	0036

[ɳ] a voiced retroflex nasal stop which occurs before retroflex stops.

/len̥ɟi/	[len̥ɟi]	'goat-dung'	0441
/bɛn̥ɟa/	[bɛn̥ɟa]	'a local game'	0032

[ɲ] a voiced palatal nasal stop which occurs before palatal stops.

/gɛnd̥ʒa/	[gɛnd̥ʒa]	'big tumbler'	0171
/mɛnd̥ʒla/	[mɛnd̥ʒla]	'middle son'	0600

[ŋ] a voiced velar nasal stop which occurs before velar stops.

/ringwa/	[riŋwa]	'earwax'	0353
/tɔŋg/	[tɔŋg]	'stone'	0924

[n] a voiced alveolar nasal stop which occurs elsewhere.

/nenu/	[nenu]	'butter'	0218
/k <sup>h</sup> uɳni/	[k <sup>h</sup> uɳni]	'lice'	0548
/gɛɳan/	[gɛɳan]	'knot'	0531

#### 5.1.4 Liquids

/l/ [l] a voiced alveolar lateral approximant.

/lɛt̥ʃka/	[lɛt̥ʃka]	'gruel'	0452
/pipli/	[pipli]	'butterfly'	0219
/rɛkil/	[rɛkil]	'line'	1130

In certain words [l] varies freely with [r]. For example: /t̥ʃ<sup>h</sup>eli/ [t̥ʃ<sup>h</sup>eli] ~ [t̥ʃ<sup>h</sup>eri] 'goat', /at̥ʃɛl/ [at̥ʃɛl] ~ [at̥ʃɛr] 'hot spring'. We have opted to represent all

## Description of Phonemes

these examples with /l/ because this variation is more commonly used and is widely accepted.

/r/ This phoneme has two allophones which are realized as follows:

[ɾ] a voiced alveolar flap which occurs finally.

/t̪ihar/	[t̪ihar]	'festival'	0386
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[r] a voiced alveolar trill which occurs elsewhere.

/ruwani/	[ruwani]	'betroth'	0166
----------	----------	-----------	------

/t̪ʃunri/	[t̪ʃunri]	'scarf'	0817
-----------	-----------	---------	------

/ɐrija/	[ɐrija]	'almirah'	0099
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In gemination, this phoneme is realized as a long trill.

/kɛrra/	[kɛrra]	'tight'	1129
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/d̪ʰurra/	[d̪ʰurra]	'torch'	1038
-----------	-----------	---------	------

/ɽ/ [ɽ] a voiced unaspirated retroflex flap.

/p̪ɛp̪ɽi/	[p̪ɛp̪ɽi]	'trumpet'	1041
-----------	-----------	-----------	------

/d̪ʒ̪ʰaɽ/	[d̪ʒ̪ʰaɽ]	'tree'	1036
-----------	-----------	--------	------

This phoneme is in near complementary distribution with the voiced retroflex stop /d̪/. The stop occurs word-initially, after homorganic nasals and in gemination. The flap occurs primarily in inter-vocalic position, in medial non-homorganic consonant sequences and word-finally. However, there are exceptions to this generalization. As a result, the two segments contrast in some non-initial positions. For examples, (see section 6.1.4)

### 5.1.5 Approximants

/w/ [w] a voiced labial-velar approximant.

/nɛtwa/	[nɛtwa]	'ox (young one)'	0713
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/sew/	[sew]	'ringworm'	0795
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/j/ [j] a voiced palatal approximant.

/ja/	[ja]	'this'	0985
/bijari/	[bijari]	'give birth'	0432
/sedʒej/	[sedʒej]	'simple'	0843

## 5.2 Vowels

Bharia distinguishes six basic vowels. Each vowel has contrasting oral and nasal counterparts. In our phonetic transcription we have noted some minor variations in vowel quality including: [i] vs [ɪ], [u] vs [ʊ], [e] vs [ɛ], and [o] vs [ɔ]. However, we have not found clear evidence of contrast between these pairs. As a result, we have treated each pair as a single phoneme. For the time being, we have retained these distinctions in our phonetic transcription wherever we noted them. Further research is required to determine what factors, if any, are responsible for conditioning the variation.

### 5.2.1 Oral Vowels

/i/ [i] a voiced close (or near-close) front unrounded oral vowel.

/pira/	[pira]	'yellow'	1119
/pipli/	[pipli]	'butterfly'	0219

/e/ [e] a voiced mid (or open-mid) front unrounded oral vowel.

/p <sup>h</sup> eʈa/	[p <sup>h</sup> eʈa]	'a thin towel'	0081
/pedʒ/	[pedʒ]	'gruel'	0453

/ɐ/ [ɐ] a short voiced mid (or near open) central unrounded oral vowel.

/bɛno/	[bɛno]	'but'	0216
/bɛnsi/	[bɛnsi]	'anchor'	0107

/a/ [a] a voiced open central unrounded oral vowel.

/baʈa/	[baʈa]	'a long piece wood'	0089
/bahri/	[bahri]	'broom'	0207

## Description of Phonemes

/u/ [u] a voiced close (or near-close) back rounded oral vowel.

/p <sup>h</sup> uḍi/	[p <sup>h</sup> uḍi]	'insect'	0517
/pur/	[pur]	'fresh water'	0393

/o/ [o] a voiced mid (or open-mid) back rounded oral vowel.

/bora/	[bora]	'dumb'	0344
/pohna/	[pohna]	'guest'	1061

### 5.2.2 Nasal Vowels

Oral vowels contrast with their nasal counterparts. This contrast may be neutralized in the context of nasal consonants, where all vowels are predictably nasalized to some extent. Nasal vowels are also quite frequent in the context of /h/, /w/, and /j/. However, nasalization is not entirely predictable in these and other environments. Thus, it is necessary to recognize the following nasal vowel phonemes.

/ĩ/ [ĩ] a voiced close (or near-close) front unrounded nasal vowel.

/gojĩ/	[gojĩ]	'cousin. female'	0275
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/ẽ/ [ẽ] a voiced mid (or open-mid) front unrounded nasal vowel.

/g <sup>h</sup> ẽtʃi/	[g <sup>h</sup> ẽtʃi]	'corn-cob '	0593
/pẽpɾi/	[pẽpɾi]	'trumpet'	1041

/ẽ/ [ẽ] a voiced mid (or near open) central unrounded nasal vowel.

/kɛrẽtʃo/	[kɛrẽtʃo]	'do.pre.cont'	0316
/kẽwla/	[kẽwla]	'soft'	0892

/ã/ [ã] a voiced open central unrounded nasal vowel.

/gojã/	[gojã]	'cousin. male'	0276
/pãs/	[pãs]	'ploughed instrument'	0749

## Description of Phonemes

/ũ/	[ũ] a voiced close (or near-close) back rounded nasal vowel.		
/d̪ehũ/	[d̪ehũ]	'I give'	0430
/t̪ <sup>h</sup> ũt/	[t̪ <sup>h</sup> ũt]	'stem'	0134
/õ/	[õ] a voiced mid (or open-mid) back rounded nasal vowel.		
/koḍõ/	[koḍõ]	'one type of rice'	0686
/bõt/	[bõt]	'any flesh pieces'	1149

## 6 Evidence of Contrast

### 6.1 Consonants

#### 6.1.1 Stops

Bharia contrasts stops at five places of articulation: labial, dental, retroflex, palatal (laminal post-alveolar), and velar.

/paṭ <sup>h</sup> a/	[paṭ <sup>h</sup> a]	'rock'	0799
/ṭaṭa/	[ṭaṭa]	'warm'	1069
/ṭaḍa/	[ṭaḍa]	'stand'	0912
/ṭʃaha/	[ṭʃaɦa]	'tea'	0964
/kawa/	[kawa]	'crow'	0287

At each place of articulation, voiceless stops contrast with their voiced counterparts.

/p/	/b/		
/paṛ/	[paṛ]	'edge'	0855
/baṛ/	[baṛ]	'hair on body'	0461
/ḍopa/	[ḍopa]	'a leaf bowl'	0070
/ḍoba/	[ḍoba]	'ox'	0712
/pip/	[pip]	'pus'	1141
/ḍub/	[ḍub]	'one type of grass'	0676
/ṭ/	/ḍ/		
/ṭaṭa/	[ṭaṭa]	'warm'	1069
/ḍeḍa/	[ḍeḍa]	'father'	0378
/p <sup>h</sup> iṭa/	[p <sup>h</sup> iṭa]	'ribbon'	0791
/biḍa/	[biḍa]	'departure'	0304
/kuṭna/	[kuṭna]	'leak'	0542
/kuḍna/	[kuḍna]	'jump'	0525

## Evidence of Contrast

	/laṭ/	[laṭ]	'hit'	0493
	/gaḍ/	[gaḍ]	'gum'	0458
/t/	/d/			
	/ṭaŋg/	[ṭaŋg]	'leg'	0545
	/ḍaŋg/	[ḍaŋg]	'grass'	0445
	/kəṭək/	[kəṭək]	'thicket darkness'	0979
	/kəḍək/	[kəḍək]	'strong'	1162
	/ṭʃənt/	[ṭʃənt]	'wise'	1106
	/mũṇḍ/	[mũṇḍ]	'head'	0475
/ṭʃ/	/ḍʒ/			
	/ṭʃəha/	[ṭʃəha]	'tea'	0964
	/ḍʒəha/	[ḍʒə-ha]	'go.imp'	1165
	/ḍəṭʃək/	[ḍəṭʃək]	'break'	0200
	/sedʒəj/	[sedʒəj]	'simple'	0843
	/kotʃni/	[kotʃni]	'a tool for clean ear'	0054
	/ləḍʒni/	[ləḍʒni]	'touch me not plant'	1029
	/ṭʃātʃ/	[ṭʃātʃ]	'belch'	1143
	/gaḍʒ/	[gaḍʒ]	'thunderbolt'	0991
/k/	/g/			
	/kurla/	[kurla]	'mouthwash'	0615
	/gurla/	[gurla]	'sweety'	0947
	/ḍəkəl/	[ḍəkəl]	'push'	0767
	/ḍəgal/	[ḍəgal]	'branch'	0199
	/ḍokra/	[ḍokra]	'old man'	0654
	/gogra/	[gogra]	'spring'	0908

## Evidence of Contrast

/t̪ək/	[t̪ək]	'till'	0996
/d̪ɛg/	[d̪ɛg]	'step'	0915

All unaspirated stops, whether voiceless or voiced, contrast with their aspirated counterparts.

/p/	/p <sup>h</sup> /		
/peɽa/	[peɽa]	'stomach'	0922
/p <sup>h</sup> eɽa/	[p <sup>h</sup> eɽa]	'a thin towel'	0081
/ripɛɽna/	[ripɛɽna]	'slide'	0861
/bip <sup>h</sup> ɛrna/	[bip <sup>h</sup> ɛrna]	'struggle'	0932
/d̪up <sup>h</sup> ra/	[d̪up <sup>h</sup> ra]	'afternoon'	0096
/t̪ɛpra/	[t̪ɛpra]	'hot'	0503
/b/	/b <sup>h</sup> /		
/bar/	[bar]	'hair on body'	0461
/b <sup>h</sup> ap/	[b <sup>h</sup> ap]	'vapour'	1056
/sabɛr/	[sabɛr]	'a tool for digging'	0052
/gab <sup>h</sup> ɛn/	[gab <sup>h</sup> ɛn]	'foetus'	0406
/t̪ <sup>h</sup> ubɽi/	[t̪ <sup>h</sup> ubɽi]	'mouth'	0612
/d̪zab <sup>h</sup> ɽi/	[d̪zab <sup>h</sup> ɽi]	'jaw'	0523
/t̪/	/t̪ <sup>h</sup> /		
/t̪ari/	[t̪ari]	'drum skin'	1166
/t̪ <sup>h</sup> ari/	[t̪ <sup>h</sup> ari]	'plate'	0745
/baɽa/	[baɽa]	'a long piece of wood'	0089
/haɽ <sup>h</sup> a/	[haɽ <sup>h</sup> a]	'hand'	0465

## Evidence of Contrast

/d/	/d <sup>h</sup> /			
	/d̥ɛsti/	[d̥ɛsti]	'handkerchief'	0467
	/d <sup>h</sup> ɛrti/	[d <sup>h</sup> ɛrt <sup>h</sup> i]	'floor'	0400
	/bando/	[bando]	'a small plant'	0073
	/gɛbd <sup>h</sup> o/	[gɛbd <sup>h</sup> o]	'fat'	0377
/t/	/t <sup>h</sup> /			
	/t <sup>h</sup> epri/	[t <sup>h</sup> epri]	'shim'	0072
	/tɛpri/	[tɛpri]	'cow bell'	0281
	/kot <sup>h</sup> i/	[kot <sup>h</sup> i]	'a box'	0022
	/tʃot̃i/	[tʃot̃i]	'youngest daughter'	1126
/d/	/d <sup>h</sup> /			
	/d̥ori/	[d̥ori]	'thread, rope'	0987
	/d <sup>h</sup> od̥ji/	[d <sup>h</sup> od̥ji]	'a small stream'	0075
	/ged̥a/	[ged̥a]	'a long piece of wood'	0048
	/tɛd <sup>h</sup> a/	[tɛd <sup>h</sup> a]	'turn'	1044
/tʃ/	/tʃ <sup>h</sup> /			
	/tʃ <sup>h</sup> ot̃i/	[tʃ <sup>h</sup> ot̃i]	'youngest daughter'	1126
	/tʃok <sup>h</sup> a/	[tʃok <sup>h</sup> a]	'clean'	0246
	/nitʃona/	[nitʃona]	'squeeze'	0910
	/bitʃ <sup>h</sup> ona/	[bitʃ <sup>h</sup> ona]	'abed'	0091
/dʒ/	/dʒ <sup>h</sup> /			
	/d̥ʒam/	[d̥ʒam]	'black berry'	0178
	/d̥ʒ <sup>h</sup> at̃/	[d̥ʒ <sup>h</sup> at̃]	'tree'	1036
	/ped̥ʒa/	[ped̥ʒa]	'maze mixed liquid'	0595
	/bed̥ʒ <sup>h</sup> a/	[bed̥ʒ <sup>h</sup> a]	'much'	0617

## Evidence of Contrast

/k/	/k <sup>h</sup> /			
	/kəŋɖa/	[kəŋɖa]	'dry dung cake'	0339
	/k <sup>h</sup> əŋɖa/	[k <sup>h</sup> əŋɖa]	'split'	0903
	/ɖ <sup>h</sup> əkəl/	[ɖ <sup>h</sup> əkəl]	'push'	0767
	/rak <sup>h</sup> ət/	[rak <sup>h</sup> ət]	'ash'	0121
	/tʃ <sup>h</sup> əkɾa/	[tʃ <sup>h</sup> əkɾa]	'chariot'	0238
	/tək <sup>h</sup> ɾa/	[tək <sup>h</sup> ɾa]	'balance'	0132
/g/	/g <sup>h</sup> /			
	/geda/	[geda]	'a long piece of wood'	0048
	/g <sup>h</sup> ega/	[g <sup>h</sup> ega]	'a yellow bird'	0090
	/goda/	[goda]	'nest'	0639
	/g <sup>h</sup> oɾa/	[g <sup>h</sup> oɾa]	'horse'	0502
	/sungət/	[sũŋgət]	'pig'	0737
	/ung <sup>h</sup> as/	[uŋg <sup>h</sup> as]	'feeling sleepy'	0381



### 6.1.2 Nasals

Nasals contrast with their corresponding stops and with each other.

/b/	/m/			
	/bora/	[bora]	'dumb'	0344
	/mora/	[mora]	'my'	0624
	/gəmi/	[gəmi]	'loose'	0574
	/kəbi/	[kəbi]	'stuck'	0934
	/t <sup>h</sup> ubɾi/	[t <sup>h</sup> ubɾi]	'mouth'	0612
	/tʊmɾi/	[tʊmɾi]	'small bottleguard'	0867
	/bambi/	[bāmbi]	'snake burrow'	0886
	/kəlmi/	[kəlmi]	'one type of mango'	0685
/d/	/n/			
	/dɛtwa/	[dɛtwa]	'side of plough'	0322
	/nɛtwa/	[nɛtwa]	'ox (young one)'	0713
	/d <sup>h</sup> eda/	[d <sup>h</sup> eda]	'give'	0431
	/tɛna/	[tɛna]	'to make sharp'	1008
	/dʒoɾda/	[dʒoɾda]	'gather'	1147
	/baɾna/	[baɾna]	'grow'	0451
m/	/n/			
	/tɛma/	[tɛma]	'weather'	1081
	/tɛna/	[tɛna]	'to make sharp'	1008
	/mewa/	[mewa]	'pumpkin'	1156
	/newa/	[nēwa]	'call for women'	0024

## Evidence of Contrast

/kərma/	[kərma]	'one type of dance'	0677
/pərna/	[pərna]	'concentrate'	0266
/tʃomri/	[tʃomri]	'a roled cloth'	0061
/tʃunri/	[tʃunri]	'scarf'	0817
/ɛgum/	[ɛgum]	'deep'	0302
/apun/	[apun]	'we'	1078

### 6.1.3 Fricatives

The fricative /s/ contrasts with /tʃ/ and /h/.

/tʃ/	/s/		
/tʃãʔa/	[tʃãʔa]	'slap'	0857
/saʔa/	[saʔa]	'sugar cane'	0937
/k <sup>h</sup> otʃni/	[k <sup>h</sup> otʃni]	'a tool for clean ear'	0054
/k <sup>h</sup> osni/	[k <sup>h</sup> osni]	'half-pant'	0463
/k <sup>h</sup> ɛrsi/	[k <sup>h</sup> ɛrsi]	'compost of cow dung'	0264
/kirtʃi/	[kirtʃi]	'pieces of firewood'	0871
/gos/	[gos]	'meat'	0598
/gõtʃ/	[gõtʃ]	'leech'	0543
/s/	/h/		
/səpəʔna/	[səpəʔna]	'to bath'	0999
/həpəsna/	[həpəsna]	'gasp'	0424
/k <sup>h</sup> osi/	[k <sup>h</sup> osi]	'dandruff'	0295
/gohi/	[gohi]	'mangoo seed'	0586
/gomsɪ/	[gomsɪ]	'anklet'	0110
/kumhi/	[kumhi]	'one kind of tree'	0702

/kosni/	[kosni]	'half-pant'	0463
/tʰohni/	[tʰofni]	'elbow'	0357

### 6.1.4 Liquids

Liquids contrast with their nearest corresponding stops and with each other.

/l/	/ɖ/		
/lukna/	[lukna]	'hide'	0489
/ɖukna/	[ɖukna]	'pain'	0714
/biɖa/	[biɖa]	'departure'	0304
/pila/	[pila]	'drink'	0327
/hɛrɖi/	[hɛrɖi]	'turmeric'	1042
/hɛsli/	[hɛsli]	'chisel'	0001
/tʃolna/	[tʃolna]	'peel'	0731
/kuɖna/	[kuɖna]	'jump'	0525
/ɖal/	[ɖal]	'pulse'	0765
/gɑɖ/	[gɑɖ]	'gum'	0458
/r/	/ɖ/		
/ɖɛɖa/	[ɖɛɖa]	'father'	0378
/rɛɖa/	[rɛɖa]	'crowd'	0288
/biɖa/	[biɖa]	'departure'	0304
/pira/	[pira]	'yellow'	1119
/tʃunɖi/	[tʃunɖi]	'hair'	0460
/tʃunri/	[tʃunri]	'scarf'	0817
/hɛrɖi/	[hɛrɖi]	'turmeric'	1042
/bɛɖri/	[bɛɖri]	'cloud'	0251

## Evidence of Contrast

	/gɑḍ/	[gɑḍ]	'gum'	0458
	/gar/	[gar]	'hail'	0459
/d/	/ɾ/			
	/gedɑ/	[gedɑ]	'a long piece of wood'	0048
	/beɾɑ/	[beɾɑ]	'fool'	0409
	/d <sup>h</sup> oḍɑ/	[d <sup>h</sup> oḍɑ]	'a big stream'	0017
	/toɾɑ/	[t <sup>h</sup> oɾɑ]	'an ornament'	0103
	/gudɾɑ/	[gudɾɑ]	'nest.of.hen'	0480
	/sæɾɑ/	[sæɾɑ]	'rotten'	0805
/l/	/r/			
	/log/	[log]	'husband'	0508
	/rop/	[rop]	'plant. vb. Imp'	1035
	/d̄z̄eri/	[d̄z̄eri]	'a type of big basket'	0662
	/t̄ <sup>h</sup> eli/	[t̄ <sup>h</sup> eli]	'goat'	0438
	/t̄firna/	[t̄firna]	'tear'	0966
	/gilna/	[gilna]	'swallow'	0941
	/t̄ir/	[t̄ir]	'arrow'	0120
	/sil/	[sil]	'local grinder'	0044
/r/	/ɾ/			
	/pira/	[pira]	'yellow'	1119
	/piɾɑ/	[piɾɑ]	'small stool'	0876
	/p <sup>h</sup> ipri/	[p <sup>h</sup> ipri]	'whistle'	1085
	/t̄ <sup>h</sup> ipɾi/	[t̄ <sup>h</sup> ipɾi]	'eyewax'	1089
	/kirt̄fi/	[kirt̄fi]	'pieces of fire wood'	0871
	/beɾt̄fi/	[beɾt̄fi]	'spear'	0902

/par/	[par]	'edge'	0855
/bɛɾ/	[bɛɾ]	'banyan tree'	0141

### 6.1.5 Approximants

Approximants contrast with their nearest corresponding stops and with each other.

/b/ /w/

/tʃ̃āwɛn/	[tʃ̃āwɛn]	'baby. PL'	0128
/sabɛɾ/	[sabɛɾ]	'a tool for digging'	0052
/b <sup>h</sup> ibla/	[b <sup>h</sup> ibla]	'caterpillar'	0230
/siwli/	[siwli]	'lip'	0556
/rɛk <sup>h</sup> waɾi/	[rɛk <sup>h</sup> waɾi]	'guard'	0455
/k <sup>h</sup> ɛɾbɛɾi/	[k <sup>h</sup> ɛɾbɛɾi]	'scattered'	0819

/dʒ/ /j/

/d̃ʒa/	[d̃ʒa]	'go'	0436
/ja/	[ja]	'this'	0985
/sod̃ʒa/	[sod̃ʒa]	'swell'	0948
/koja/	[koja]	'dry mahuwa'	0341
/moj/	[moj]	'I'	0509
/gad̃ʒ/	[gad̃ʒ]	'thunderbolt'	0991

/j/ /w/

/paja/	[paja]	'fencing stick'	0384
/tʃ̃āwa/	[tʃ̃āwa]	'baby, child'	0127
/bid̃ja/	[bid̃ja]	'one type of tree'	0703
/d̃ɛɾwa/	[d̃ɛɾwa]	'side of plough'	0322
/tʃ̃āj/	[tʃ̃āj]	'shadow'	0832
/t <sup>h</sup> āw/	[t <sup>h</sup> āw]	'place'	0743

## Evidence of Contrast

### 6.2 Vowels

#### 6.2.1 Vowel Quality

/i/	/e/			
	/sina/	[sina]	'to stitch'	1016
	/sena/	[sena]	'breed'	0201
	/gɛlli/	[gɛlli]	'courtyard'	0274
	/gɛlle/	[gɛlle]	'much'	0618
/e/	/a/			
	/er/	[er]	'they'	0977
	/aɾ/	[aɾ]	'supportive thing'	0939
	/peni/	[peni]	'sharpness'	0834
	/pani/	[pani]	'water'	1073
/ɐ/	/a/			
	/ɛr/	[ɛr]	'and'	0108
	/aɾ/	[aɾ]	'supportive thing'	0939
	/bɛɾtʃi/	[bɛɾtʃi]	'spear'	0902
	/baɾna/	[baɾna]	'grow'	0451
/u/	/o/			
	/dʒur/	[dʒur]	'fever'	0387
	/dʒor/	[dʒor]	'zeal'	1128
	/tu/	[tu]	'you'	1122
	/ho/	[ho]	'he'	0474
/o/	/a/			
	/tɔŋg/	[tɔŋg]	'stone'	0924

## Evidence of Contrast

	/t̪aŋg/	[t̪aŋg]	'leg'	0545
	/koɽi/	[koɽi]	'small honeybee'	0869
	/k <sup>h</sup> aɽi/	[k <sup>h</sup> aɽi]	'aslope'	0122
	/bɛno/	[bɛno]	'but'	0216
	/pena/	[pena]	'A vapourizer utensil'	0087
/o/	/ɐ/			
	/log/	[log]	'husband'	0508
	/lɛg/	[lɛg]	'seem'	0826
	/g <sup>h</sup> oɡra/	[g <sup>h</sup> oɡra]	'spring'	0908
	/gɛɡra/	[gɛɡra]	'a big bronze pot'	0015
/e/	/ɐ/			
	/ɛr/	[ɛr]	'they'	0977
	/ɛr/	[ɛr]	'and'	0108
	/peɽa/	[peɽa]	'stomach'	0922
	/b <sup>h</sup> ɛɽa/	[b <sup>h</sup> ɛɽa]	'brinjal'	0204
	/menɽa/	[menɽa]	'near'	0632
	/ɽenɽa/	[ɽenɽa]	'stick'	0918

**6.2.2 Nasalized Vowels**

/i/	/ĩ/			
	/baji/	[baji]	'sister'	0849
	/gojĩ/	[gojĩ]	'cousin. female'	0275
/e/	/ẽ/			
	/t <sup>h</sup> ɛpri/	[t <sup>h</sup> ɛpri]	'shim'	0072
	/pẽpɽi/	[pẽpɽi]	'trumpet'	1041

## Evidence of Contrast

	/beʈi/	[beʈi]	'sit.pre.cont.fem'	0853
	/g <sup>h</sup> ẽʈi/	[g <sup>h</sup> ẽʈi]	'corn-cob '	0593
/e/	/ẽ/			
	/rɛwna/	[rɛwna]	'resound'	0788
	/kẽwla/	[kẽwla]	'soft'	0892
/a/	/ã/			
	/agi/	[agi]	'fire'	0390
	/ãki/	[ãki]	'eye'	0368
	/paʈ <sup>h</sup> a/	[paʈ <sup>h</sup> a]	'rock'	0799
	/ʈjãʈa/	[ʈjãʈa]	'slap'	0857
	/paɾ/	[paɾ]	'edge'	0855
	/pãs/	[pãs]	'ploughed instrument'	0749
/o/	/õ/			
	/kokna/	[kok-na]	'to bend'	0029
	/kõkɾa/	[kõkɾa]	'curly'	0290
	/lot/	[lot]	'lie down'	0549
	/bõʈ/	[bõʈ]	'any flesh pieces'	1149
/u/	/ũ/			
	/ʈ <sup>h</sup> ur/	[ʈ <sup>h</sup> ur]	'one type of tree'	0701
	/ʈ <sup>h</sup> ũʈ/	[ʈ <sup>h</sup> ũʈ]	'stem'	0134
	/ʈu/	[ʈu]	'you'	1122
	/hũ/	[hũ]	'be. 1SG. PRES'	1164



## 7 Syllable Structure

All the syllables in Bharia conform to the following template: (C)(C)V(C)(C).

Eight individual syllable types can be distinguished. Examples of each are listed below. Note that complex onsets and codas do not appear to occur together in the same syllable (i.e., the syllable type CCVCC does not occur in our data).

1. <b>V</b>				
	/ɐ̃.d̪i/	[ɐ̃d̪i]	'if'	1145
2. <b>CV</b>				
	/ko.la/	[kola]	'lap'	0537
3. <b>VC</b>				
	/aɾ/	[aɾ]	'supportive thing'	0939
4. <b>CVC</b>				
	/d̪or/	[d̪or]	'cattle group'	0231
5. <b>CCV</b>				
	/kja.ɾe/	[kjaɾe]	'why'	1094
6. <b>VCC</b>				
	/ɐ̃ng.la/	[ɐ̃ŋgla]	'charcoal'	0236
7. <b>CVCC</b>				
	/d̪ond̪/	[d̪ond̪]	'navel'	0629
8. <b>CCVC</b>				
	/pjar.mi.jar/	[pjar̪mijar]	'love'	0578

## 8 Distribution of Phonemes

### 8.1 Consonants

#### 8.1.1 Distribution of Consonant Phoneme Chart

Table 4 shows the distribution of consonant phonemes in word-initial, intervocalic and word-final positions.

Consonant Phonemes	Word Initial (#_)	[V]_[V]	Word Final (_#)
p	111	29	8
p <sup>h</sup>	24	4	0
b	117	23	1
b <sup>h</sup>	30	5	0
t̥	42	29	14
t̥ <sup>h</sup>	8	5	0
d̥	50	26	10
d̥ <sup>h</sup>	11	3	0
t	40	50	22
t <sup>h</sup>	5	9	0
d̥	52	29	2
d̥ <sup>h</sup>	8	4	0
t̥ʃ	107	56	2
t̥ʃ <sup>h</sup>	9	6	0
d̥ʒ	60	22	3
d̥ʒ <sup>h</sup>	7	2	0
k	159	55	24
k <sup>h</sup>	36	6	0
g	77	29	11
g <sup>h</sup>	11	1	0
s	77	28	21

## Distribution of Phonemes

Consonant Phonemes	Word Initial (#_)	[V]_[V]	Word Final (_#)
h	29	39	0
m	59	21	9
n	32	96	26
r	35	53	0
ɾ	0	42	14
l	35	62	29
j	2	70	20
w	0	47	13

*Table 4: Distribution Chart for Consonants*

### 8.1.2 Word Initial Consonants

All consonants except for /ɾ/ and /w/ occur word-initially. Examples of word-initial consonants are listed below:

/p/

/pipli/                      [pipli]                      'butterfly'                      0219

/p<sup>h</sup>/

/p<sup>h</sup>iɾija/                      [p<sup>h</sup>iɾija]                      'pimple'                      0738

/b/

/birla/                      [birla]                      'fire spark'                      0391

/b<sup>h</sup>/

/b<sup>h</sup>āwɛr/                      [b<sup>h</sup>āwɛr]                      'bee'                      0158

/ṭ/

/ṭɛnra/                      [ṭɛnra]                      'tight'                      0995

/ṭ<sup>h</sup>/

/ṭ<sup>h</sup>ama/                      [ṭ<sup>h</sup>ama]                      'wooden pillar'                      1112

## Distribution of Phonemes

/d/

/ḍiwaɾo/                      [ḍiwaɾo]                      'white ant'                      1087

/d<sup>h</sup>/

/ḍ<sup>h</sup>uḍer/                      [ḍ<sup>h</sup>uḍa]                      'dust'                      0345

/t/

/tɛtɛk/                      [tɛtɛk]                      'chameleon'                      0234

/t<sup>h</sup>/

/t<sup>h</sup>ãw/                      [t<sup>h</sup>ãw]                      'place'                      0743

## Distribution of Phonemes

/d/				
	/d̪aɾwa/	[d̪aɾwa]	'chin'	0241
/d <sup>h</sup> /				
	/d <sup>h</sup> andɟija/	[d <sup>h</sup> andɟija]	'peacock'	0729
/tʃ/				
	/tʃiŋgri/	[tʃiŋgri]	'finger'	0389
/tʃ <sup>h</sup> /				
	/tʃ <sup>h</sup> eka/	[tʃ <sup>h</sup> eka]	'hole'	0497
/dʒ/				
	/dʒɐpni/	[dʒɐpni]	'drowsiness'	0335
/dʒ <sup>h</sup> /				
	/dʒ <sup>h</sup> aɾ/	[dʒ <sup>h</sup> aɾ]	'tree'	1036
/k/				
	/kiwaɾ/	[kiwaɾ]	'door'	0319
/k <sup>h</sup> /				
	/k <sup>h</sup> op/	[k <sup>h</sup> op]	'wall'	1066
/g/				
	/gɐptʃa/	[gɐptʃa]	'dwarf'	0347
/g <sup>h</sup> /				
	/g <sup>h</sup> ogra/	[g <sup>h</sup> ogra]	'spring'	0908
/s/				
	/saɬa/	[saɬa]	'sugar cane'	0937

## Distribution of Phonemes

/h/				
	/həsli/	[həsli]	'chisel'	0001
/m/				
	/mind̩i/	[mind̩i]	'eyelash'	0369
/n/				
	/nɛt̩wa/	[nɛt̩wa]	'ox (young)'	0713
/r/				
	/ringwa/	[ringwa]	'earwax'	0353
/l/				
	/lɛt̩ka/	[lɛt̩ka]	'gruel'	0452
/j/				
	/ja/	[ja]	'this'	0985

### 8.1.3 Word Final Consonants

The consonants /p<sup>h</sup>/, /b<sup>h</sup>/, /t̪<sup>h</sup>/, /d̪<sup>h</sup>/, /t̪<sup>h</sup>/, /d̪<sup>h</sup>/, /t̪<sup>h</sup>/, /d̪<sup>h</sup>/, /k<sup>h</sup>/, /g<sup>h</sup>/, /r/ and /h/ do not occur word-finally. All other consonants can occur word-finally, as illustrated below:

/p/				
	/kuɖɔp/	[kuɖɔp]	'thicket forest'	0980
/b/				
	/ɖub/	[ɖub]	'one type of grass'	0676
/t̪/				
	/sut̪/	[sut̪]	'thread'	0986
/d̪/				
	/ɖond̪/	[ɖond̪]	'navel'	0629

## Distribution of Phonemes

/t/				
	/p <sup>h</sup> apɛt/	[p <sup>h</sup> apat]	'storm'	0927
/d/				
	/d̥und/	[d̥ũnd]	'wood'	1111
/tʃ/				
	/gõtʃ/	[gõtʃ]	'leech'	0543
/dʒ/				
	/gadʒ/	[gadʒ]	'thunderbolt'	0991
/k/				
	/t̥ɛnɛk/	[t̥ɛnɛk]	'little'	0557
/g/				
	/long/	[loŋg]	'nose-pin'	0646
/s/				
	/gos/	[gos]	'meat'	0598
/m/				
	/gudam/	[gudam]	'button'	0221
/n/				
	/tʃun/	[tʃun]	'flour'	0401
/ɾ/				
	/p <sup>h</sup> iskur/	[p <sup>h</sup> iskur]	'foam'	0405
/l/				
	/rɛkil/	[rɛkil]	'line'	1130

## Distribution of Phonemes

/j/	/d̥ʒogaj/	[d̥ʒogaj]	'near'	0631
/w/	/gɐlaw/	[gɐlaw]	'cold'	0256

### 8.1.4 Intervocalic Consonants

All consonant phonemes occur intervocalically, as illustrated by the following examples:

/p/	/kopɐr/	[kopɐr]	'bronze basin'	0206
/p <sup>h</sup> /	/gʊp <sup>h</sup> ena/	[gʊp <sup>h</sup> ena]	'catapult'	0228
/b/	/d̥oba/	[d̥oba]	'ox'	0712
/b <sup>h</sup> /	/gab <sup>h</sup> ɛn/	[gab <sup>h</sup> ɛn]	'foetus'	0406
/t̥/	/t̥ata/	[t̥ata]	'warm'	1069
/t̥ <sup>h</sup> /	/kut̥ <sup>h</sup> ini/	[kut̥ <sup>h</sup> ini]	'louse'	1153
/d̥/	/d̥ɛd̥a/	[d̥ɛd̥a]	'father'	0378



## Distribution of Phonemes

/d <sup>h</sup> /				
	/kɪd <sup>h</sup> ɐrri/	[kɪd <sup>h</sup> ɐrri]	'wood peaker'	0021
/t/				
	/b <sup>h</sup> ɐtʰa/	[b <sup>h</sup> ɐtʰa]	'egg-plant'	0204
/t <sup>h</sup> /				
	/pat <sup>h</sup> a/	[pat <sup>h</sup> a]	'rock'	0799
/d/				
	/tada/	[tada]	'stand'	0912
/d <sup>h</sup> /				
	/kod <sup>h</sup> u/	[kod <sup>h</sup> u]	'lazy'	0539
/tʃ/				
	/ɐngotʃa/	[ɐngotʃa]	'towel'	1032
/tʃ <sup>h</sup> /				
	/pitʃ <sup>h</sup> a/	[pitʃ <sup>h</sup> a]	'temple'	0969
/dʒ/				
	/sedʒɐj/	[sedʒɐj]	'simple'	0843
/dʒ <sup>h</sup> /				
	/bedʒ <sup>h</sup> a/	[bedʒ <sup>h</sup> a]	'much'	0617
/k/				
	/sākɐl/	[sākɐl]	'bolt'	0187
/k <sup>h</sup> /				
	/ruk <sup>h</sup> a/	[ruk <sup>h</sup> a]	'cockroach'	0255

## Distribution of Phonemes

/g/				
	/nagəl/	[nāgəl]	'plough'	0747
/g <sup>h</sup> /				
	/ḍewag <sup>h</sup> ər/	[ḍewag <sup>h</sup> ər]	'hindu worship place'	0757
/s/				
	/musa/	[musa]	'rat'	0777
/h/				
	/bihane/	[bifane]	'yesterday'	1120
/m/				
	/ṭ <sup>h</sup> ama/	[ṭ <sup>h</sup> ama]	'wooden pillar'	1112
/n/				
	/nenu/	[nenu]	'butter'	0218
/r/				
	/sari/	[sari]	'sister-in-law'	0850
/ɽ/				
	/beɽa/	[beɽa]	'fool'	0409
/l/				
	/keli/	[keli]	'cobra'	0253
/j/				
	/saja/	[saja]	'bottom-skirt'	0193

/w/

/ɖawa/	[ɖawa]	'left'	0544
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### 8.1.5 Complex Onsets and Codas

Complex syllable onsets consist primarily of stops or fricatives followed by /j/ or /w/. In addition, /wh/ occurs as a medial onset in a few words, and /ɖr/ occurs as an initial onset in one English loanword.

/kja.se.ki/	[kjaseki]	'because'	0154
/swa.pi/	[swapi]	'an inner garment'	0101
/biɾ.whaj/	[biɾwhaj]	'fence'	0382
/ɖraj.bel/	[ɖrajbel]	'driver'	0330

Complex codas consist primarily of homorganic nasal-stop clusters. In addition, there are two examples of /wC/ and one example of /nh/ occurring in syllable codas in our data. These result from our interpretation of close vocoids as approximants in syllable margins. Alternatively, they might be interpreted as /uC/ (see section 2).

/pɛrɾɛwn/	[pɛrɾɛwn]	'a thin snake'	0080
/mund/	[mũŋɖ]	'head'	0475
/tʃinh-na/	[tʃinfna]	'recognize'	0781

# Distribution of Phonemes

## 8.1.6 Word-medial CC Sequences:

	p	pʰ	b	bʰ	t	tʰ	d	dʰ	t	tʰ	ɖ	ɖʰ	ʃ	ʃʰ	ʒ	ʒʰ	k	kʰ	g	gʰ	ʔ	s	h	m	n	ɳ	ɲ	l	r	ɽ	v	j		
p					1				1								1								2			2		1				
pʰ																													1					
b						1																												
bʰ																																		
t						1											4											1			1			
tʰ																																		
d						1														2					1				1		1			
dʰ																																		
t			1														5	1							2			2	1		1			
tʰ																																		
ɖ							2										4		3					2				1						
ɖʰ																																		
ʃ	1												1																					
ʃʰ																																		
ʒ					1																				1				1					
ʒʰ																																		
k			1		2								1	2										1		1		2	2					
kʰ																									1									
g			2		1				1	1																					1	3		
gʰ																																		
ʔ				1	1												1																	
s				4		1											2		1							1								
h						1																				1		2	1		2	2		
m			7	2		1			1	1							2																	
n					3	1	20	7									4								3	7	6	1				1	1	
ɳ								4		19	2						1																	
ɲ													4		16																			
l	1					1			1			1					4		48	5								2	2	1		1		6
r			4	1	1		1						3		8		4	3		2		4	2	4	1			1	2		5			
ɽ	1																1		1			1	4											
v											2						2		1										2	1	1			
j					1				1		1		1															1						

Table 5: Word-medial CC Sequences

### 8.1.7 Retroflex Consonant Harmony

Like most north Indian languages, Bharia has a pattern of retroflex consonant harmony in lexical roots (cf. Arsenault 2015). Dental and retroflex stops do not occur together within roots. If a root contains two coronal stops, then both are either dental or retroflex. This harmony pattern applies only to stops. Thus, for example, the retroflex flap occurs with both dental and retroflex stops. The table below shows word-initial  $C_1V(N)C_2$  sequences in which  $C_1$  and  $C_2$  represent dental stops, retroflex stops, or /ʈ/,  $V$  represents any intervening vowel, and  $N$  represents an optional homorganic nasal.

$C_1 \setminus C_2$	ɽ, ɽ <sup>h</sup> , ɖ, ɖ <sup>h</sup>	ʈ, ʈ <sup>h</sup> , ɖ, ɖ <sup>h</sup>	ʈ
ɽ, ɽ <sup>h</sup> , ɖ, ɖ <sup>h</sup>	14	0	2
ʈ, ʈ <sup>h</sup> , ɖ, ɖ <sup>h</sup>	0	23	1

Table 6: Retroflex Consonant Harmony

Examples of roots containing two coronal stops or a coronal stop and a retroflex flap are listed below.

/ɖɛɽwa/	[ɖɛɽwa]	'side of plough'	0322
/ɖɛɖɛk/	[ɖɛɖɛk]	'humid'	0507
/tɔɽri/	[tɔɽri]	'neck'	0634
/ɖ <sup>h</sup> ɛɖɛja/	[ɖ <sup>h</sup> ɛɖɛja]	'rainbow'	0773
/ɖɛɽha/	[ɖɛɽha]	'thick'	1133
/ɖɛɽwa/	[ɖɛɽwa]	'chin'	0241

## 8.2 Vowels

### 8.2.1 Vowels in Open Syllables

All vowels found in Bharia occur in open syllables.

/i/

/kuh.ki/	[kufiki]	'fog'	0407
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## Distribution of Phonemes

/e/				
	/gɐ.l.le/	[gɐlle]	'much'	0618
/ɐ/				
	/ɐ.d̪i/	[ɐd̪i]	'if'	1145
/a/				
	/tʃ̄ɐ.ha/	[tʃ̄ɐha]	'tea'	0964
/u/				
	/be.ɽu/	[beɽu]	'mad'	0579
/o/				
	/go.ho/	[goho]	'lane'	0536

### 8.2.2 Vowels in Closed Syllables

All vowels found in Bhabia occur in closed syllables.

/i/				
	/p <sup>h</sup> ipri/	[p <sup>h</sup> ipri]	'whistle'	1085
/e/				
	/ped̪ɜ̄/	[ped̪ɜ̄]	'gruel'	0453
/ɐ/				
	/pɛn.ka/	[pɛnka]	'big roti'	1135
/a/				
	/pat̪/	[pat̪]	'goat female child'	0440
/u/				
	/d̪und̪/	[d̪ũnd̪]	'wood'	1111

/o/

/log.ni/	[logni]	'wife'	1096
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### 8.2.3 Vowel Sequences:

As a result of our interpretation of close vocoids as approximants in syllable margins, we do not find vowel sequences within syllables. However, we have found a few examples of vowel sequences involving vowels in adjacent syllables.

/d̄ʒuan/	[d̄ʒuan]	'young'	1124
/suãli/	[suãli]	'pudi (eatable thing)'	0764
/ɖuã/	[ɖuã]	'smoke'	0882

## 9 Outstanding Issues

There are a few outstanding issues that require further attention. First of all, we have tentatively analyzed sonorant [h] sequences as CC sequences. Since some of these sequences occur in onset and coda positions, it might be possible to interpret them as breathy units, parallel to the breathy-voiced stops.

Secondly, we have noted some minor variations for vowel quality (which is often correlated with length) in the close and mid vowels. We have not found evidence of contrast for quality or length in those vowels. However, further research is required to determine what factors are responsible for conditioning the variation.

Thirdly, our study has focused on determining the phonemes of the language. We have not investigated other aspects of the phonology, including prosodic factors such as stress and intonation, and morphophonology. We leave these for future research.



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