DADIBI PHONOLOGY

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0. INTRODUCTION

The Dadibi language is spoken by 5,000 to 6,000 people living in the Karimui, Daribi and Bomai Census Divisions of the Karimui area of the Chimbu District, and by dwellers in three small villages along the Erave River in the Kerabi Census Division of the Southern Highlands District. Wurm (1962:118) calling it "Mikaru", has classified Dadibi as a language of the East New Guinea Highlands (Micro) Phylum, not belonging to the East New Guinea Highlands Stock and only very distantly related to the stock. Franklin (1968:25) includes the language in his "Mikaruan Family", which is being renamed "Teberan Family". This is described in the chapter, "The Teberan Language Family", by George Mac Donald, in "The Linguistic Situation in the Gulf

District and Adjacent Areas, Papua New Guinea", K.J. Franklin, ed. Forthcoming as Pacific Linguistics, Series C, No. 26.

The three Erave River villages were only recently discovered to be Dadibi speakers. Several minor speech differences were noted, but determination of any possible further divergencies from the bulk of Dadibi speakers awaits further study.

This paper is a description of the phonemes and syllable structures in Dadibi. Whereas our previous analysis concentrated on tone in reference to the syllable, shifting our emphasis to word tone analysis leads to a better description of tone, stress and length which are all interrelated on the word level. There is a brief discussion of intonation on the phrase level.

Conclusions regarding phonological features of Dadibi were reached with the aid of a concordance of 16,000 words of Dadibi text, produced by a joint project of the Oklahoma University Research Institute and the Summer Institute of Linguistics, which was partially supported by Grant GS-1605 of the National Science Foundation.

1. PHONEMES

1.1 Chart of the Phonemic norms

Consonants:

		BILABIAL	ALVEOLAR	VELAR
STOPS	aspirated	p	t	k
	unaspirated	b	d	g
FRICATIVES			s	h
NASALS		m	n	
LATERAL			l	
SEMIVOWELS		w	y	

Vowels:

	FRONT	CENTRAL	BACK
HIGH	i		u
LOW	e	a	o

1.2 Contrastive features

The stops /p/, /t/, /k/ and /b/, /d/, /g/ contrast at bilabial, alveolar, and velar points of articulation. In initial analysis with Eunice Pike's help, [b] , [d] , and [g] were listed as voiced stops, as compared with [p], [t], and [k] as voiceless counterparts. The Phonemics Department consultants felt that word-medial [b] , [d] , and [g] tended toward voicelessness. Literacy pupils encountered difficulty with the stop series, causing us to postpone publication of a phoneme paper. More recent investigation, using Dr. Peck's prosodies machine, has shown that the distinction between the two stop sets is aspiration versus lack of aspiration, rather than the presence or absence of voicing. However, intervocalically, unaspirated stops tend to pick up some voicing. This is parallel to the [s] phoneme, which changes to [z] , its voiced counterpart, word-medially.

The fricatives contrast at alveolar and velar points of articulation, the lateral at alveolar points of articulation, and the nasals and semivowels at bilabial and alveolar points of articulation.

There is contrast between high and low vowels. The high vowels contrast at front and back positions, and the low vowels contrast at front, central, and back positions.

1.3 Interpretation of non-syllabic vocoids

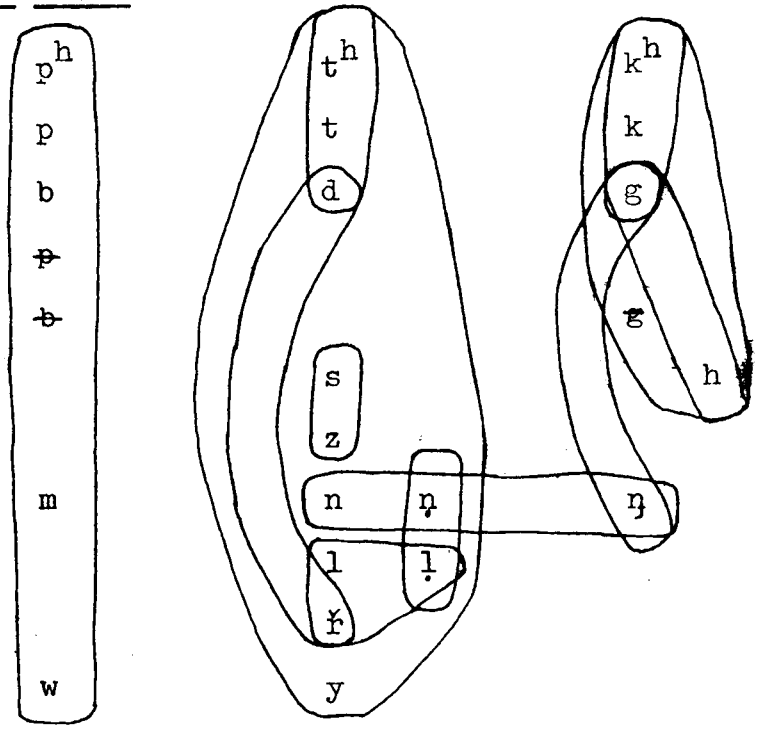
Non-syllabic vocoids y and w are interpreted as consonants because they occur only in consonant position in CV syllables.

[waḷi]	/wali/	'wind'
[hauwa]	/hauwa/	'many'
[wawi]	/wawi/	'prickers'
[yowi]	/yowi/	'dog'
[waya]	/waya/	'pandanus'

1.4 Description of phonemes

1.4.1 Consonants

Work chart:



Description

/p/ [p^h] Voiceless aspirated bilabial stop, occurring only word initially.

[p^hu]	/pu/	'mud'
[p^hapa]	/paba/	'mother's co-wife'

/t/ [t^h] Voiceless aspirated alveolar stop, occurring only word initially.

[t^he]	/te/	'who'
[t^hokopo]	/togobo/	'cutting'

/k/ [k^h] Voiceless aspirated velar stop, occurring only word initially.

[k^hipu]	/kibu/	'pig'
[k^hoko]	/kogo/	'cold wind'

/b/ [p] Voiceless unaspirated bilabial stop occurring word initially and in

[p̶] fluctuation medially with [p̶] ,

[b] voiceless bilabial fricative, [b] lightly voiced bilabial stop and

[b̶] [b̶] voiced bilabial fricative.

[pa]	/ba/	'bird'
[pono]	/bono/	'vine'
[p^hopao ~ p^ho$\not{p}$ao ~ p^hobao ~ p^ho$\not{b}$ao]	/pobao/	'going'
[hopi ~ ho$\not{p}$i ~ hobi ~ ho$\not{b}$i]	/hobi/	'bark string'

/d/ [t] Voiceless unaspirated alveolar stop, occurring word initially, and medially

[d] with [d] , voiced alveolar stop, and

[ř] [ř] voiced flapped alveolar vibrant, following vowels other than [i].

[to]	/do/	'yesterday'
[ita ~ ida]	/ida/	'mother'
[nɛřu ~ nedu]	/nedu/	'pumpkin'

/g/ [k] Voiceless unaspirated velar stop, occurring word initially and in fluctu-

[g] ation word medially with [g] voiced

[ɡ] velar stop, and [ɣ] , voiced velar fricative; and in fluctuation between

[ŋ] nasalized vowels with [ŋ] , voiced velar nasal.

[ki]	/gi/	'garden'
[kazi]	/gasi/	'sick'
[apaki ~ apagi ~ apaɣi]	/abagi/	'friend'
[sąką ~ sąŋą]	/sągą/	'foot'

/s/ [s] Voiceless central grooved alveolar fricative occurring only word initially.

[z] Voiced central grooved alveolar fricative occurring only word medially.

[si]	/si/	'two'
[sizi]	/sisi/	'black'
[mazaḷu]	/masalu/	'scar'

/h/ [h] Voiceless velar fricative occurring only word initially.

[ho]	/ho/	'whistle'
[hapu]	/habu/	'buttock'

/m/ [m] Voiced bilabial nasal occurring word initially and medially.

[me]	/me/	'another'
[maziki]	/masigi/	'stone'
[mama]	/mama/	'red'

/n/ [n] Voiced alveolar nasal occurring word initially and medially.

[ni]	/ni/	'wood'
[mɛna]	/mena	'where?'
[k^hanɪmi]	/kanimi/	'blood'

/l/ [l] Voiced alveolar lateral occurring word medially between [i] , and in fluctu-

[ɻ] ation with [ɻ] voiced alveolar retro-flexed lateral elsewhere. Contiguous to nasalized vowels there is fluctua-

[ɳ] tion with [ɳ] voiced retroflexed nasal. It has also been observed to occur following a vowel that follows a nasal consonant.

	[pilipo]	/bilibo/	'walking'
	[ilinizi]	/ilinisi/	'grey hair'
	[sɛla]	/sela/	'three'
	[p^hɛ nạni ~ p^hɛ nạli]	/penạli/	'chin'

/w/ [w] Voiced bilabial semivowel occurring word initially and medially.

[waḷi]	/wali/	'wind'
[yowi]	/yowi/	'dog'
[wawi]	/wawi/	'prickers'

/y/ [y] Voiced palatal semivowel occurring word initially and medially.

[yowi]	/yowi/	'dog'
[aya]	/aya/	'father'
[yizu]	/yisu/	'corn'

Contrast:

/p/, /b/, /m/, /w/

[p^ha]	/pa/	'grubworm'
[pa]	/ba/	'bird'
[ma]	/ma/	'ma'
[wa]	/wa/	'net bag'
[p^haḷi]	/pali/	'went'
[paři]	/badi/	'and'
[maḷi]	/mali/	'earthquake'
[waḷi]	/wali/	'wind'

[apa]	/aba/	'to there'
[ama]	/ama/	'brother'
[awa]	/awa/	'uncle'

/t/, /d/, /n/, /l/, /s/, /y/

[t^hapi]	/tabi/	'abdomen'
[tapi]	/dabi/	'plural'
[napi]	/nabi/	'poison'
[sapi]	/sabi/	'namesake'
[yapɛ]	/yabe/	'leaf'
[eta]	/eda/	'here is'
[ɛna]	/ena/	'I'
[ɛl̥a]	/ela/	'hit'
[tazi]	/dasi/	'we two'
[tal̥i]	/dali/	'both'
[ata]	/ada/	'there is'
[aza]	/asa/	'come!'
[aya]	/aya/	'father'
[pitipo]	/bidibo/	'staying'
[pilipo]	/bilibo/	'walking'

[yao]	/yao/	'do!'
[sao]	/sao/	'get!'
[t^hau]	/tau/	'ripe'
[ɗao]	/dao/	'is'
[t^hoko]	/togo/	'tree species'
[soko]	/sogo/	'tobacco'
[yoko]	/yogo/	'broom tree'
[noko]	/nogo/	'arm'

/k/, /g/, /h/

[hono]	/hono/	'shrub species'
[komo]	/gomo/	'source'
[k^hoko]	/kogo/	'cold wind'
[k^hų]	/kų/	'green'
[kų]	/gų/	'burial rack'
[ki]	/gi/	'garden'
[hi]	/hi/	'bird species'
[k^haza]	/kasa/	'another'
[haza]	/hasa/	'animal'

1.4.2 Vowels

Work chart:

	FRONT		CENTRAL		BACK	
	Oral	Nasal	Oral	Nasal	Oral	Nasal
HIGH	i ɪ	ɨ̃			u	ʊ̃
LOW	e ɛ	ɛ̃	ə a	ą̃	o ɔ	ɔ̃

Description:

/i/ [i] High close front unrounded vocoid, fluctuating occasionally in high tone syllables and in unstressed

[ɪ] syllables with [ɪ], high open front unrounded vocoid.

[ita]	/ida/	'mother'
[nizi]	/nisi/	'hair'
[maziki ~ mazɪki]	/masigi/	'stone'

/e/ [ɛ] Mid open front unrounded vocoid, (which is more frequent) fluctuating in high tone syllables and in un-

[e] stress syllables with [e], mid close front unrounded vocoid.

[ɛno]	/eno/	'mine'
[e]	/e/	'this'
[meke ~ mɛkɛ]	/mege/	'resin type'

/a/ [a] Low open central unrounded vocoid, fluctuating occasionally in high tone syllables and in unstressed syllables [ə] with [ə], mid open central unrounded vocoid.

[aya]	/aya/	'father'
[ama]	/ama/	'brother'
[wamia ~ wamiə]	/wamia/	'back skirt'

/u/ [u] High close back rounded vocoid.

[u]	/u/	'that'
[uni]	/uni/	'owl'

/o/ [o] Mid close back rounded vocoid.

[ɔ] [ɔ], low close back unrounded vocoid observed only with nasalization.

[o]	/o/	'sago'
[ona]	/ona/	'flute'
[t^hǫ]	/tǫ/	'ground'
[t^hǫ̣li]	/tǫ̣li/	'cassowary type'

Contrast:

/i/, /e/, /a/, /o/, /u/

[i]	/i/	'there distant'
[e]	/e/	'this'
[a]	/a/	'thumb'
[u]	/u/	'that'
[o]	/o/	'sago'

[wi]	/wi/	'fear'
[we]	/we/	'woman'
[wa]	/wa/	'string bag'
[wo]	/wo/	'tree type'
[wu]	/wu/	'answer to call'

[mano]	/mano/	'grasshopper'
[mino]	/mino/	'bark frayings'
[mono]	/mono/	'old'
[mɛna]	/mena/	'where?'
[munolubo]	/munolubo/	'putting'

1.4.3 Nasalization

Nasalization is contrastive on all five vocoids.

/i/ /į/

[yowi]	/yowi/	'dog'
[yǫwį]	/yǫwį/	'moss type'

/e/ /ę/

[we]	/we/	'woman'
[wę]	/wę/	'water'

/a/ /ą/

[wa]	/wa/	'string bag'
[hwą]	/hwą/	'axe'

/o/	/ọ/	
[o]	/o/	'sago'
[ọ]	/ọ/	'taro'

/u/	/ụ/	
[tu]	/du/	'fruit'
[t^{h}ụ]	/tụ/	'road'

1.5 Distribution of phonemes

1.5.1 Consonants

All consonants occur word initially except /l/.

/p/	paba	'mother's co-wife'
/t/	tabi	'abdomen'
/k/	kibu	'pig'
/b/	bidi	'man'
/d/	duba	'2 days hence'
/g/	gebo	'forehead'
/s/	sigi	'tall'
/h/	habu	'buttock'
/m/	mama	'red'
/n/	nogo	'hand'
/w/	waya	'pandanus'
/y/	yogo	'broom'

All consonants occur word medially except /p/, /t/, /k/, and /h/.

/b/	hobi	'bark string'
/d/	ida	'mother'
/g/	yogo	'broom'
/s/	sisi	'black'
/l/	bilibo	'moving'
/m/	mama	'red'
/n/	dinai	'mosquito'
/w/	sewa	'yellow'
/y/	ɐya	'father'

1.5.2 Vowels

All vowels and their nasalized counterparts occur initially, medially, and finally, with the exception of /ę/, /i̧/, and /u̧/ which have not been observed to occur initially.

/i/	ilinisi	'grey hair'
/i̧/	pisi̧li̧	'lower leg'
/e/	enebe	'didn't shoot'
/ę/	sęgę	'heavy'
/a/	aiyaba	'down'
/ą/	ągą	'his'
	tiąbi	'singsing'
/o/	olomo	'boy's name'
/ǫ/	ǫ	'taro'
	tǫli	'cassowary type'
	tǫ	'ground'

/u/	ulunu	'pig type'
/ụ/	sụgụ	'fish'

2. SYLLABLES

2.1 Interpretation

A syllable consists of a nucleus of one vowel or vowel glide with an optional consonant or labialized consonant onset. There are six syllable types: V and CV are the predominant types. Vowel glides produce VV and CVV types and labialization produces CCV and CCVV.

V	o	'sago'
VV	oi	'favorite'
CV	ba	'bird'
CVV	pai	'went'
CCV	hwą	'axe'
CCVV	dwai	'bad'

Words containing from one to seven syllables have been observed:

o	'sago'
gebeligipabosi	'when going for the purpose of clearing'

There is contrast between labialized consonants and their non-labialized counterparts.

pai	'went'
pwai	'named'

dai	'garden division'
dwai	'bad'
hi	'bird species'
hwị	'fight'
ge	'shell'
gwẹ	'bird's call'

Interpreted as a vowel, labialization could be symbolized as either /o/ or /u/ following the consonant, and would fit the allowable sequence pattern CVV. However, unless syllable division is symbolized in some way, this results in confusion with CV.V pattern which takes two beats (and two tones). For instance, there is contrast between [d^{w}ai] 'bad' and [du.a] 'later', and [tog^{w}a] 'cut!' and [togo.a] 'bird species'. In the investigation of vowel clusters it has been found that u + V constitute two syllables. There are also restrictions with o + V (see 2.2 following).

Considering labialization as a complex consonant unit would add five more consonants to the inventory, since it occurs with the phonemes /p/, /b/, /d/, /g/ and /h/. Economy of phonemes and literacy experiments have led to the consonant

sequence interpretation through CCV and CCVV syllable patterns. Consonant clusters have not been observed elsewhere in the language, but labialization treated as a consonant sequence causes less confusion in interpreting syllables.

2.2 Vowel Clusters

Vowel clusters occur within words across syllable boundaries and within syllables as glides. A cluster of two vowels may constitute two syllables (with two beats) or a glide in one syllable (with one beat).

V.V	pi.o	'afternoon'
VV	oi.bo	'liking'

A cluster of three vowels constitute two syllables.

VV.V	bai.a.na.bo	'ground name'
V.VV	tu.eo	'want to eat'

Four vowel clusters constitute two or three syllables.

V.V.VV	tu.i.ao	'you (pl) eat!'
VV.VV	pai.ai	'pinched'

It has been observed that /a/ in any vowel cluster begins a new syllable.

bai.a.na.bo	'ground name'
si.a	'fire'
su.ao	'look!'

/a/ plus any vowel constitutes a glide. /o/ and /e/ plus any vowel other than /a/ constitutes a glide.

a + V = glide

si.sae	'reed'
pi.ao	'sleep!'
ke.dau	'cold'
pai	'went'

o + V (other than a) = glide

boi.si.a	'creek name'
gǫu	'animal young'

(only /i/ and /u/ observed.)

e + V (other than a) = glide

tu.eo	'want to eat'
meo	'wait'
su.eu	'sees'

(only /ɵ/ and /u/ observed)

u + V = two syllables

du.a	'later'
su.e	'want to see'
tu.i.nao	'let's eat!'

i	+ V	=	two syllables
	pi.o		'afternoon'
	ti.ą.bi		'singsing'
	pi.eo		'want to sleep'
	pi.u		'goes'

3. WORDS

Our initial analysis of tone centered on the syllable. However, unexplainable fluctuations and stress presented problems. Length and tempo were also involved with the problem. Since shifting our emphasis from syllable to word tone where it is more pertinent, the description is much simpler and the picture regarding related problems is clearer.

A phonological word in Dadibi consists of one obligatory nuclear syllable with a high or low tone and from zero to 6 marginal syllables.

3.1 Description

When the nuclear syllable of the word is high tone, it has extra intensity (sometimes very slight). High nuclear tones tend to pull following pitches to high and the words have a very quick tempo. When a low tone falls on the nuclear syllable, it has extra length. Low nuclear syllables tend to pull following pitches toward low, and the words are much slower

in tempo. Preceding syllables tend to fluctuate. Low tones tend to be stronger in their effect on the environment than high tones.

In the speech of some speakers it is difficult to distinguish between the allophones of /d̆/ [ř] and /l/ [l̥]. It has been observed through this study that the /d/ phoneme tends to occur following low tones or in low nuclear syllables where the tempo is slower, and the /l/ phoneme tends to occur following high tones or in high nuclear syllables where the tempo is much faster, although clear contrast between the two does occur. The speakers with a very pronounced /l/ phoneme are in general much faster speakers and the other speakers tend to be slower, thus causing the /l/ phoneme to sound more like the /d/ phoneme. This explains why some speakers <u>seem</u> to have a /d/ phoneme and a very strong retroflexed /l/ phoneme and other speakers seem to have a very lenis retroflexed or flapped /l/ phoneme or only a /d/ phoneme.

The contrastive intensity of the nuclear syllable seems to be of more importance than the correct tone on that syllable. However, by knowing the correct nuclear tone one is able to determine the appropriate tempo, the overall pitch and rhythm, and, in the case of the similar allophones of /d/ and /l/, the identity of their phonemes.

3.2 Contrasts

3.2.1 One syllable words:

Low tone contrasts with high:

wà	'string bag'
wá	'edible greens'
nà	'shoulder'
ná	'aunt'

3.2.2 Two syllable words:

High on the first syllable contrasts with high on the second:

kálí	'kaukau'
kalí	'tree type'

High on the first syllable contrasts with low on the first:

pínì	'bird type'
pìnì	'small bat'

High on the second contrasts with low on the second:

kebá	'axe'
kebà	'canoe'

Low on the first syllable contrasts with low on the second:

àga	'his'
agà	'his own'

3.2.3 Three syllable words:

Minimal pairs in words beyond two syllables have not been found. In three syllable nouns, contrast between high and low on the first and second syllables shows up readily. However, it is difficult to find examples of nouns with contrast between high and low on the third syllable. When the nuclear syllable is the final syllable, the tone seems to vary and one time it seems to be a low and other times it seems to be a high.

High contrasts with low on the first syllable:

bílibo	'moving'
bìdibo	'staying'

High contrasts with low on the second syllable:

sílaga	'bush food'
medàbu	'bone needle'

High contrasts with low on the third syllable:

masalú 'scar'

hanamù 'soot'

(Note: When the nuclear syllable falls on the third syllable of a poly-syllabic word the patterning seems to be more like the patterning of Samon (Shaw's) stress patterns in that there seems to be secondary stress on the first syllable.

One syllable and three syllable words contrast in only one way but bi-syllabic words contrast with two other patterns:

Initial high contrasts with final high and initial low:

1. ˊ – – contrasts with – ˊ ˋ –

Final high contrasts with initial high and final low: 2. – ˊ contrasts with ˊ – – ˋ

Initial low contrasts with initial high and final low: 3. ˋ – contrasts with ˊ – – ˋ

Final low contrasts with final high and initial low: 4. – ˋ contrasts with – ˊ ˋ –

3.3 Distribution

Initial low tone nuclear syllables tend to make

following suffixes low whether the suffix is normally high or low.

dòmu	+	dè	domude	(ˋ _ _)
dòmu	+	bá	domuba	(ˋ _ _)

A low nuclear tone on the final syllable tends to pull following suffixes to low and the nuclear syllable is not as distinguishable. This pattern seems less frequent.

kebà	+	dè	kebade	(_ ˋ _)
kebà	+	bá	kebaba	(_ ˋ _)

An initial high nuclear tone tends to cause the tone on the second syllable to glide to a following low tone suffix or go to a mid tone, sometimes pulling the low tone to mid.

púli	+	dè	pulide	(˝ ˋ _) ~ (˝ ˋ –)
púli	+	bá	puliba	(˝ – –)

A high nuclear tone finally drops sharply to a low suffix.

nomá	+	dè	nomade	(– ˝ _)
nomá	+	bá	nomaba	(– ˝ –)

It has been observed that in some long compound words there is a nuclear syllable shift. It is not known whether this is due to a high tone word being combined with a low tone word or is being influenced by the phrase timing feature described in 4.

Examples:

kébele	+	bìdi	>	kebelébidi
kánima	+	bìdi	>	kanimábidi
yówi	+	nùgai	>	yowínugai
yábi	+	nùgai	>	yabínugai

In these preceding examples a high tone word has been compounded with a low tone word. However, when two low tone words are together the nuclear syllables stay the same: gènoai + bìdi and we are writing them as two words.

4. PHRASE

A phonological phrase in Dadibi is a sequence of words which occurs between pauses. Since any word may be uttered in isolation, it may constitute a phrase.

The phonological phrase has a timing feature which generally makes each phrase take approximately the same amount of time to be uttered. Thus if the phrase consists of only one word it is spoken more slowly to make this one-word phrase take about the same amount of time as a multi-word phrase. This is

within the limitations set by the tone of the word as discussed in 3.

Five intonation patterns have proven distinctive in Dadibi: statement, vocative, sequence, anger and interrogative. Further investigation will no doubt clarify more patterns.

Statement intonation features an overall decrescendo and lowering of pitch toward the end of the phrase. Within the drift there are ranges of high and low depending on the tone of the nuclei of the words within the phrase.

In the vocative phrase there is a downglide phrase finally. If the vocative consists of a person's name, an o is attached. This produces length and thus emphasis and the vocative o takes the final downglide.

Sequence intonation consists of a rising pitch on the final syllable of each item in the sequence.

Anger intonation is generally much higher and may go up or stay level. The tempo of anger phrases is usually stepped up.

Interrogative intonation is generally level and may have a slight lowering of pitch on the end syllable.

8. ORTHOGRAPHY

/p/	[p^h]	p
/t/	[t^h]	t
/k/	[k^h]	k
/b/	[p] [b] [p̚] [b̚]	b
/d/	[t] [d] [ɾ]	d
/g/	[k] [g] [g̚] [ŋ]	g
/s/	[s] [z]	s
/h/	[h]	h
/m/	[m]	m
/n/	[n]	n
/l/	[l] [l̥] [n̥]	l
/w/	[w]	w
/y/	[y]	y
/i/	[i]	i
/e/	[e]	e
/a/	[a]	a
/o/	[o]	o
/u/	[u]	u
/ˊ/	high tone	
/ˋ/	low tone	
/ı/	nasalization	

We feel that it is best not to use n to symbolize nasalization because Dadibi has a regular n phoneme contiguous to oral vowels: bono 'vine', ona 'flute'.

Underlining could be used but we feel this would be confusing for the reader when it is also used for other things such as chapter headings, etc. It would not make it any more regular looking in such an environment.

We prefer using the present symbolization since recent study of texts reveals less nasalization frequency than originally thought. Although there are minimal contrasts as in Fasu we may follow their leading of not marking nasalization. (At present we feel that only minimals need be marked.)

Because of much fluctuation in tone, and following the lead of our informant, we feel also that tone only needs to be marked on minimal sets.