

Ministry of Scientific and Technical Research

PRELIMINARY INVESTIGATION INTO THE
FUNCTION OF TONE IN HEDI

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1.0 INTRODUCTION

1.1 Language Classification

According to the classification in the "Inventaire des Etudes Linguistiques," Daniel Barreteau with Paul Newman (1978) classifies Hedi as a Chadic language under Biu-Mandara, sub-branch A, Wandala group, Lamang sub-group. In the "Atlas Linguistique du Cameroun," Hedi belongs to the Afro-Asiatic phylum and the Central Chadic family under the Western sub branch of Wandala. It is classified as number 122. There are three languages under the Western sub branch of Wandala: Xədi (Hedi, Hədi), Gəvoko, and Mabas. Lamang, a related language, is a part of this language chain.

1.2 Language Location

The Hedi people live in Tourou and in the surrounding villages, which are located in the Mayo-Tsanaga Department in the Far North Province of Cameroon and in Borno State in Nigeria. The Hedi language is spoken by approximately 20,000 Cameroonians and 5,000 Nigerians. The neighboring ethnic groups are Ngosi (Gəvoko) to the North, Mafa to the East and the South, and Lamang (Waga) to the West in Nigeria.

2.0 LEXICAL TONE

Tonally the Hedi language features four contrasting classes: Lo Hi (LH $_ _$), Level (HH $_ _$), Lo Lo-falling (L Lf $_ _$), and Hi Lo (HL $_ _$). A number of phonetic tones can be observed within the phrase, but they are not relevant to the lexical distinction between words. The level class contains the surface melodies of: HH, MM, and LL; however, it is the HH melody which surfaces the vast majority of the time. These phonetic melodies vary in isolation from speaker to speaker, and are often quite difficult to discern, yet they function as one underlying class.

The pitch difference between Lo and Hi tone is relatively small in nature, viz. about a whole musical step. This combined with melodies which vary in isolation and, which are difficult to discern; give us the impetus for this investigation. Eventually it will be the author's attempt to understand the overall suprasegmental system, and what are the operational factors within it. It will be most important to ascertain which individual factor or combination of factors drive the whole system. Preliminary investigations indicate that the factors involved may include: differences in pitch, intensity, and vowel length, as well as the vowel quality of ə in relationship to the syllable structure. At this time it is unclear if one or more of these factors act alone

or in conjunction with the tonal perturbations. Wolff (1983) notes the effects of depressor consonants on tone in Lamang, a related language, but no evidence of this operational factor has been found in Hedi. This investigation will primarily look at the surface tone melodies in order to see the role that tone plays in the language.

2.1 Noun Classes

Among a selected sampling of 363 disyllabic noun roots, 32% of the words fell into the Lo Hi class, 31% were in the Level class, 19 % in the Lo Lo-falling and 18% in the Hi Lo class.

<u>LH</u> - -	<u>Level</u> - -	<u>L Lf</u> - -	<u>HL</u> - -
ɓida	bik ^w ir	duyof	ɓaɓax
blim	tili	baga	buna
di'iq	ɗuvul	kuma	digir
g ^w ada	ləmu	lewi	yovi
xiya	yozif	xuɟa	xasək
muxul	mənda	məta	lama
vudu	vilak ^w	viya	wawa

Very little tone perturbation can be observed for nouns in isolation.

2.2 Verb Classes

In this study a total of 143 disyllabic verbs were included in the analysis. Disyllabic verbs compose approximately 80% of all verbs in the language, monosyllabic verbs compose 15%, and trisyllabic verbs compose 5% of the total verbal inventory. Among this data 53% of the verbs belong to the level tone class, 25% to the LH tone class, 15% to the L Lf tone class and 7% belong to the HL tone class. An example of each disyllabic verb class is included in the table below: Level, Lo Hi, Lo Lo-falling, and Hi Lo.

<u>- -</u>	<u>- -</u>	
pəta	pətay	break
<u>-</u>	<u>- -</u>	
vəza	vəzay	throw
<u>- -</u>	<u>- -</u>	
gəra	gəray	measure
<u>-</u>	<u>- -</u>	
kuma	kumay	want

The examples on the previous page are indicative of Hedi verbs, as the vast majority of the attested verbs form their infinitive by adding the suffix *-y*. The infinitive form surfaces with a tone glide when pronounced in isolation.

Consider the sampling of each verb class below:

<u>Level</u> --	<u>LH</u> _	<u>L Lf</u> --	<u>HL</u> --
pəta	vəza	gəra	kuma
maga	mbada	xana	bara
məna	ndana	vaya	mana
lili	gwada	mbəda	dala
tapa	mara	yoba	wawa
kurta	laba	kəda	bəna
bursa	basa	səga	tita

2.3 Verb Plurality

Langermann (1994:42) indicates that plural direct objects are often marked in the verb by an insertion of *a* into the middle of the word. In addition to *a*, the verb is also marked by a Hi tone. Thus *vəzay* (LH) becomes *vəzay* (HH) when its direct object is plural. Compare the following two sentences. (The object marker *ta* is labeled as OM, and the Imperfective aspect is labeled as Imp throughout this paper. The tone level for the clause is indicated to the right with the tone of the verbal form enclosed in brackets.)

_	_	--	_	_	L { LH } H H L
ta	vəzay	ka	ta	sk ^w i	
Imp	throw	you	OM	thing	

You can throw the thing

_	--	_	_	--	L { HH } H H LL
ta	vazay	ka	ta	sk ^w ixa	
Imp	throw (pl obj)	you	OM	thing-pl	

You can throw some things

The tonal perturbation may be seen in the other verbs belonging to the LH class below, where the Lo tone is perturbed to a Hi.

Sing	Plural	
nəya	naya	see
pəsa	pasa	break
fəsa	fasa	grill
ɣəla	ɣala	steal

Tones in the level class with ə in the initial syllable are realized as HH with a short duration on the first syllable. The syllable in the marked plural form assumes a more normal length, and the *a* is indicative of plurality.

— — — —
p^hta pa^hta dig, unearth

However, tones in the level class containing a in the first syllable surface with a Super Hi tone(SH). The pitch is raised by approximately 1/2 of a musical step.

— — — — H H → SH H
ɣara ɣara measure

In the future further analysis with instruments such as CECIL** needs to be carried out to: 1) determine the actual pitch of the raised tone, and 2) see if the plurality is not also marked by a slight vowel lengthening when the vowel is Hi, syllable initial.

3.0 TONE IN TENSE-ASPECT FORMS OF THE VERB

3.1 Introduction

As in most Chadic languages, the Hedi verb displays some of the most complex features of the language. The verbal morphology of Hedi involves two principal areas: 1) tense-aspect markings, and 2) directional extensions. The tense-aspect system is quite complex with at least 11 marked forms and many more possible combinations expected upon further research. In the section below we will examine the tonal perturbations found in four different tense aspect forms, which are representative of the tonal patterns found thus far in the verbal system. (Tonal variations due to the directional extensions has not yet been investigated.)

3.2 Potential (ta + verb -y)

This verbal form consists of the infinitival form of the verb (marked by the suffix -y), preceded by the imperfective marker ta. In this construction the tone melody of the verb corresponds to its basic lexical tone (as in 2.2) without perturbations.

Level

	— —	—	—		L { HH } H H L
tā	pəlay	ka	ta	sk ^w i	
Imp	break	you	OM	thing	

You can break the thing

This preceding example shows the regular pattern for the level tone class of verbs: as they consistently surface with HH tone melodies.

Lo Hi

	—	—	—		L { LH } H H L
tā	vəzay	ka	ta	sk ^w i	
Imp	throw	you	OM	thing	

You can throw the thing

Lo Lo-falling

	— — —	—	—		L { LL } H H L
tā	gəray	ka	ta	sk ^w i	
Imp	measure	you	OM	thing	

You can measure the thing

Here it can be seen that The L Lf pattern, which occurs when the verb is in isolation is modified to a LL pattern in the context of a full clause.

Hi Lo

	—	—	—		L { HL } H H L
tā	kumay	ka	ta	sk ^w i	
Imp	want	you	OM	thing	

You like the thing

3.3 COMPLETIVE I (Verb + Verb)

The completive I aspect is formed by a simple reduplication of the complete verb root. The reduplicated form is sometimes affected by two perturbations which occur on the second verb root: 1) The verb is downstepped, (which can be seen when the first syllable is Lo), and 2) the pitch on the last syllable is raised to Hi, (which can be observed when the lexical tone is Lo). The first verb root is unaffected and retains its original lexical tone. This downstep not only perturbs the verb melody, but it affects the constituents following the verbal phrase as well. (The symbol ↓ is to indicate downstepping of the tonal register.)

Level

--	---	--	--	{ HH ↓ HH } H H L
pə́ta	pə́ta	ka	ta	sk̄ ^w i
break	redup	you	OM	thing

You broke the thing (and the results of this action are known to all)

In this example we can see the results of the downstep as the H tones are lowered to M in the second verb root, and in the following constituents. The pitch of the last syllable is unchanged since the lexical tone is Hi.

Lo Hi

-	-	-	-	{ LH LH } H H L
və́za	və́za	ka	ta	sk̄ ^w i
throw	redup	you	OM	thing

You threw the thing

In the Lo Hi class the tone melody of the reduplicated element is not changed. This may be the result of accentuation on the first syllable bearing the Lo tone. Further analysis of the whole system may shed light as to why this form is tonally unperturbed.

Lo Lo-falling

--	-	-	-	{ LL H } H H L
gə́raf	gə́ra	ka	ta	sk̄ ^w i
measure-dir	redup	you	OM	thing

You measured the thing

In this L Lf form the downstep is unrealized, possibly as a result of accentuation of the initial syllable. The second perturbation; however, does affect the reduplicated verb by raising the pitch of the final syllable.

Hi Lo

-	---	--	--	{ HL ↓ HH } H H L
kuma	kuma	ka	ta	sk̄ ^w i
want	redup	you	OM	thing

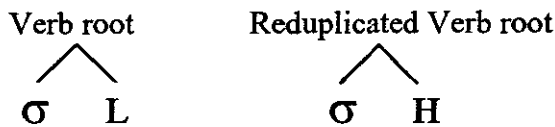
You wanted the thing

The Hi Lo verb class exhibits both perturbations: the downstep occurring at the juncture between the two verb roots, and the tone raising syllable final.

3.4 INCOMPLETEIVE (Verb-ŋ + Verb)

The Incompleteive form is characterized by a reduplication of the verb, and the suffix -ŋ on the first verbal element. In this construction the end of each verb root is

marked L and H respectively. To more clearly see this we can graphically label the unmarked syllable as σ , and the marked syllables as L and H respectively, as seen below:



Level

—	— —	—	—	—	{ HL HH } H H L
$\overline{p\acute{o}l\grave{a}ŋ}$	$\overline{p\acute{o}l\grave{a}}$	ka	ta	$\overline{sk^w\grave{i}}$	
break	redup	you	OM	thing	

You broke the thing

In the level class the first element, which ends in a Hi tone is perturbed to Lo, while the second element which already ends in a Hi tone remains Hi.

Lo Hi

— —	—	—	—	—	{ LL LH } H H L
$\overline{v\acute{o}z\grave{a}ŋ}$	$\overline{v\acute{o}z\grave{a}}$	ka	ta	$\overline{sk^w\grave{i}}$	
throw	redup	you	OM	thing	

You threw the thing

In the Lo-Hi class the first element is perturbed from Hi to Lo syllable final, and the second element remains Hi syllable final.

Lo Lo-falling

— —	—	—	—	—	{ LL LH } H H L
$\overline{g\acute{o}r\grave{a}ŋ}$	$\overline{g\acute{o}r\grave{a}}$	ka	ta	$\overline{sk^w\grave{i}}$	
measure	redup	you	OM	thing	

You measured the thing

In the Lo Lo-falling class the second element is tonally perturbed syllable final from Lo to Hi.

Hi Lo

—	— —	—	—	—	{ HL HH } H H L
$\overline{kum\grave{a}ŋ}$	$\overline{kum\grave{a}}$	ka	ta	$\overline{sk^w\grave{i}}$	
like	redup	you	OM	thing	

You liked the thing

In the Hi-Lo class, the Lo tone on the second element is perturbed.

3.5 COMPLETIVE II (Verb-*in* + Verb)

This form is distinguished by a reduplication of the verb and the suffix *-in* on the first verb root. In this construction the juncture between the verbs is marked by two tonal perturbations. These tone changes affect both verbal elements: 1) the second verb and the constituents that follow are affected by a downstep, which surface as MM(-- --), and 2) the first verb is contrastively accentuated syllable final so that a lexical Lo becomes a Hi and a lexical Hi becomes a Lo. This form shows the most complex tonal perturbation. This may be indicative of other suprasegmental factors acting in conjunction with the tonal perturbations.

Level

--	-- --	--	--	sk̄ ^w i	{ HH ↓ HH } H H L
pə ^h in	pə ^h ta	ka	ta	sk̄ ^w i	
break	redup	you	OM	tHing	

You broke the thing (*and the results are no longer remembered*)

The downstep is clearly evident by: the mid tones on the second root and on the following constituents in the clause. The contrastive perturbation occurring on the verb to the left of the juncture is not realized in this class; although, as previously stated the level class is sometimes variable.

Lo Hi

və ^h in	və ^h za	ka	ta	sk̄ ^w i	{ LL LH } H H L
throw	redup	you	OM	tHing	

You threw the thing

In this form the Hi tone to the left of the verb root juncture is contrastively accentuated so that the Hi tone is realized as Lo; however, the downstep is unrealized. It is unclear why the downstep does not affect the Lo Hi class as predicted, yet it affects the Lo Lo-falling class which also bears a Lo tone syllable initial.

Lo Lo-falling

gə ^h in	gə ^h ra	ka	ta	sk̄ ^w i	{ LH ↓ HH } H H L
measure	redup	you	OM	thing	

You measured the thing

The Lo Lo-falling class exhibits both tonal perturbations as expected. The second verb root, and the constituents following the verb are downstepped. The Lo Lo-falling tone on the second syllable first root is perturbed to Hi.

Hi Lo

--	-- --	--	--	sk ^w i	{ HH ↓ HH } H H L
kumiŋ	kuma	ka	ta		
like	redup	you	OM	thing	

You liked the thing

The Hi-Lo class behaves as predicted with both a downstep resulting in MM tone melody, and contrastive perturbation where the Lo becomes a Hi to the left of the verb juncture.

4.0 TONAL EFFECTS ON THE OBJECT IN THE VERB PHRASE

4.1 Introduction

There are two possible word orders within the hedi clause: VSO and VOS.

4.1 V S O word order

VSO is the order we have seen in all the forms considered so far (3.2-3.5). In the VSO constituent order the tone is perturbed to the tone melody indicative of each tense-aspect form. The following examples summarize the word order we have seen thus far. Note that the object is phrase final, and it is marked by the object marker *ta*.

Hi Lo class	V	S	O	
Potential	ta kumay	ka	ta ʒambak	You like the thing
Completive I	kuma kuma	ka	ta ʒambak	You liked the thing
Completive II	kumiŋ kuma	ka	ta ʒambak	You liked the thing
Incompletive	kumaŋ kuma	ka	ta ʒambak	You liked the thing

4.2 CONTINUATIVE (VOS)

The Continuous aspect construction of hedi is characterized by an altogether different word order, VOS. In this construction the direct object immediately follows the verb. Note that the object is unmarked by the object marker *ta*, as in the previous examples, and that both the verb and the object undergo tonal perturbation. The simplest way to characterize the tone change is to say that there is a Hi tone attached to the end of both the verb and noun object.

V	O	S
--	--	--
ta kuma	baga	ka
Imp like	roof	you

You like the roof

Note in the example above that the verb *kuma* belonging to the Hi-Lo verb class is tonally perturbed from Lo to Hi, syllable final. The tone of the object noun *baga*, which belongs to the Lo Lo-falling class is changed from Lo-falling to Hi syllable final.

In the following section we will look at examples exhibiting the tone patterns for each of the four verb classes. We will look at these verb classes in combination with the four possible noun class tone patterns. In this systematic manner we will see that the tone patterns of the both the verb and object nouns are perturbed to Hi syllable final. The tone levels of the verb phrase are indicated within brackets.

4.2.1 Level Verb class

There are no tone changes evident among the level class verbs, because the basic form ends in Hi.

Level verb, Level noun

--	--	--	{ L HH HH } H
ta pəta	ɣambak	ka	

You are breaking the wing

In the previous example no tonal changes are present, because both the verb and object noun end in a Hi tone.

Level verb, LH noun

--	--	--	{ L HH HH } H
ta pəta	dɔli	ka	

You are breaking(dividing) the sauce

Again no tonal changes are present in either the verb or object as they both carry a lexical Hi tone syllable final.

Level verb, HL noun

--	--	--	{ L HH HH } H
ta pəta	buna	ka	

You are breaking the pestle

In this combination we can see the tone perturbation on the object. The Hi-Lo tone melody is perturbed to Hi-Hi.

Level verb, L Lf noun

 -- - - { L HH LH } H
 ̄ta pə̄la baga ka

You are breaking the roof

Note that the Lo Lo-falling tone melody on the object noun is perturbed to Lo-Hi.

4.2.2 Lo-Hi Verb class

As with the level tone class (4.2.1) there are no observable tone perturbations on the verbs of the Hi-Lo verb class, as the basic lexical form ends in with a Hi tone.

LH verb, Level(HH) noun

 - -- - { L LH HH } H
 ̄ta və̄za gambak ka

You can throw the wing

Since the noun object ends in a Hi tone there are no observable tone perturbations.

LH Verb, LH noun

 - - - { L LH LH } H
 ̄ta və̄za dali ka

You are throwing the wing

There are no tone changes seen on the object noun.

LH Verb, HL noun

 - -- - { L HH HH } H
 ̄ta və̄za buna ka

You are throwing the sauce

The Hi-Lo tone is perturbed to Hi-Hi on the object noun.

LH Verb, Lf noun

 - - - { L LH LH } H
 ̄ta və̄za baga ka

You are throwing the roof

The Lo Lo-falling tone is perturbed to Lo Hi on the object noun, and as previously mentioned the verb tone pattern remains unchanged.

4.2.3 Lo Lo-falling Verb class

The tone changes marking the Continuative aspect form can be seen in the Lo Lo-falling verb class. The tone melodies of the verbs are perturbed from Lo Lo-falling to Lo Hi.

L Lf verb, Level noun

$\bar{t}a \quad \bar{g}əra$ $\bar{b}aga$ ka { L LH LH } H

You are measuring the roof

The tone melody of the verb is changed from Lo-Lo falling to Lo-Hi. The Hi Hi object noun is unperturbed.

L Lf Verb LH noun

$\bar{t}a \quad \bar{g}əra$ $\bar{d}ali$ ka { L LH LH } H

You are measuring the sauce

The verbal Lo-Lo falling tone is perturbed to Lo Hi, the Lo Hi object noun tonal pattern remains unchanged.

L Lf Verb, HL noun

$\bar{t}a \quad \bar{g}əra$ $buna$ ka { L LH HH } H

You are measuring the pestle

In the preceding example both the verb and object tones are perturbed to Hi syllable final.

L Lf Verb, L Lf noun

$\bar{t}a \quad \bar{g}əra$ $\bar{b}aga$ ka { L LH LH } H

You are measuring the roof

The tonal melodies of both the verb and object are perturbed from Lo Lo-falling to Lo Hi.

4.2.4 Hi Lo Verb class

The tonal perturbations marking the Continuative aspect (VOS) are evident in the Hi Lo verb class. The final syllable, which lexically bears the Lo tone is perturbed to Hi.

HL verb, Level(HH) noun

ta kuma ɣambak ka { L HH HH } H

You like the wing

The Hi Lo verb pattern is changed to Hi Hi. The tone on the object noun tone is unchanged.

HL Verb, LH noun

ta kuma d̄ali ka { L HH LH } H

You like the wing

The Hi Lo verb pattern is changed to Hi Hi. The tone on the object noun is unchanged.

HL verb, HL noun

ta kuma buna ka { L HH HH } H

You like the pestle

The tonal patterns for both the verb and object noun are perturbed from Hi Lo to Hi Hi.

HL verb, L Lf noun

ta kuma b̄aga ka { L HH LH } H

You like the roof

In the previous example the tone patterns for both the verb and object noun are perturbed. The tone melody on the verb is changed from Hi Lo to Hi Hi. The tone melody on the object is changed from Lo Lo-falling to Lo Hi.

One might ask if the subject is not also included in the verbal phrase, because in the previous examples *ka* always seems to bear a Hi tone. As stated the Continuative aspect is marked by the VOS construction, and a Hi tone on the end of each word in the verb phrase. Thus the subject appears that it could also be part of verb phrase since it also bears a Hi tone on the end of rthe word. However, this is not the case as subject nouns with a lexical Lo tone, such as *xəŋ* "they", are unperturbed in this construction as seen below:

ta kuma b̄aga xəŋ { L HH LH } L

They like the roof

Note that the basic lexical Lo tone on the *xəŋ* is retained. Thus in the Continuative construction only the verb and the object are included in the verb phrase, and the tone melody of the verb phrase is tonally marked with a Hi tone that is attached to the end of both the verb and noun object.

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** CECIL: Computerized Extraction of Components of Intonation in Language, a speech analysis system developed by SIL, Inc.

References

- Barreteau, Daniel, in cooperation with Paul Newman. 1978. Inventaire des Etudes Linguistiques sur les pays d'Afrique noire d'expression française, et sur Madagascar, 291-307. Paris: Conseil International de la Langue Française.
- Dieu, Michel, and Patrick Renaud. 1983. Situation linguistique en Afrique centrale. Inventaire préliminaire : Le Cameroun (Atlas Linguistique du Cameroun). Paris-Yaounde: ACCT-CERDOTOLA-DGRST.
- Langermann, Cindy. 1994. A Phonological Description of Hedi. Ms., SIL, Yaoundé, Cameroon.
- Tadadjeu, Maurice, and Etienne Sadembouo. 1984. General Alphabet of Cameroon Languages, collection PROPELCA N° 1. Yaoundé: Université of Yaoundé.
- Wolff, Ekkehard. 1983. A Grammar of the Lamang Language. Glückstadt: Verlag J.J. Augustin GmbH.

Appendix A:

Noun list

The following nouns are written in their phonemic orthographic forms according to the "General Alphabet of Cameroon. Languages" It is helpful to note that phonemically /gh/ = [ɣ], /sl/ = [ʃ], /zl/ = [ʒ], and the vowel /ə/ is inserted between consonant clusters.

Lo Hi class

bəlim	indigenous baking	həga	home
	soda	hərdu	snore
bəlikwi	threshing floor	həva	cultivation of the
ʒida	tiny red millet		soil
dafi	plain, flatlands	hinzi	incisor tooth
dali	soup	hiya	sorghum, guinea
dzəvu	hand		corn
ghərđi	sorghum porridge	hi' i	grasshopper
dziidzi	father-in-law	hula	shame
rəda	scorpion	iri	eye
barum	grasshopper	kalam	stone wall
bisar	castrated animal	kurbut	muddy soil
daka	thickness at bottom	kuzəŋ	herb
	of beer	kwani	urine
dasu	copper	lagəŋ	game
dewdew	small drum	lanzəŋ	glowing embers
di' iŋ	far	ləghəf	bow
dughwəŋ	tree trunk	ləghəŋ	bull
dəgha	blacksmith	ləvu	leather strap to
fafaf	foreskin		attach baby
falak	wind	luku	tropical ulcer
frukwa	to squat down	luli	prickly pear cactus
gərhaŋ	jackal	muhul	wall
ghərzla	terrace	mama	mother
ghəzləŋ	bed	mandəŋ	stone deviation
ghurum	hole		tool
ghuzu	sorghum beer	mbəga	mouse
ghwavid	straw basket to	mbifi	wooden tool to
	carry sorghum		plant seeds
gugu	small cushion	mbu' a	abscess
guvur	granary storehouse	məgham	chief
gwadam	spear with one barb	minzil	insect that eats
gwerek	gourd for dancing		sorghum
gwi' aŋ	elephant	ŋamŋam	metal trap
hadik	soil, earth	ŋəbu	plant seedlings
hafu	breath, life	pəlis	horse
haghu	evening	rəmba	kitchen
hari	small intestines	rəvu	calf
hətsiŋ	nose	sagəŋ	your junior
hədzəŋ	army ant	səla	leg

sərdək	spit	vulu	war
slayaŋ	clairvoyant	vu' a	slave
slislik	egg	wati	which
slughul	salt	wirak	type of sorghum
sulkum	spirit	wubig	soot
swidi	hair	wudzu	wood
təvi	road	zəŋzəŋ	dance instrument
tsəzlər	Achilles tendon		like a sickle
turik	whirlwind	zəghu	okra
urna	peanuts	zəgun	male
uva	cat	zə' al	husband
vaghu	day	zlavak	grass mat wall
vaku	year	zlərdzi	spear with many
vazak	rooster		barbs
vədas	flea	zlizlam	palm tree
vədzi	monkey	zu'i	thread
vudu	sickle		

LEVEL class

baku	dance during full moon	hulam	wine jar
bikwir	black kite bird	hulfa	grain, seed
budzaŋ	muzzle for goats	hul' wa	cactus-type tree
dəməŋ	credit	hupu	flour
duli	horn	huta	skin
dzidzal	rib	hutor	tail
dzuma	straw	kəda	last year
dāhəŋ	claw, fingernail	kəfur	iron
dəkdek	forever	kələŋ	frog
difil	intelligence	kəram	crocodile
dikwi	boil	kudum	gourd spoon
dimbis	gourd spoon	kulu	tomb
duvul	leftovers	kumtur	tomato
gəra	male friend	kuruk	father's corn
ghalam	dry season	kwemblem	cutting board
ghali	thief	ləmu	to fight
ghərbu	dove	luma	market
ghudzif	bone	luwa	sky
ghuma	enemy	madəl	wisdom
ghumay	chin, goatee	maku	sesame
ghunu	traditional salt from animal feces	mala	tendon in hand
ghwayak	cloud	maya	hunger
ghwazim	large mountain	mayəm	foreigner from far away place
	lizard	mbəlaam	everyone but blacksmiths
gudakw	sweet potato	mbəsa	to roll
gwadzaŋ	wasp	mənək	liver
gwagwam	eyebrow	mivid'	scar
hətsiq	nose	miyawŋ	mosquito
hudfi	abdomen	mudək	heat

muta	sorcerer	sun	dream
nasa	wet area	su' it	indigenous broom
ndala	to be thirsty	təʃaŋ	three-stranded cord
ndali	storage room	titi	sparrow
ndəfin	finger	tsəmək	rival
nimtak	wild animal	tsitsi	louse
ŋulaŋ	shell	tsuhwal	bracelet
ŋuŋsuk	spider	vəgha	body
paka' w	panther	viha' w	harmless snake
papla	hail	vilakw	hare
raya	hunt	wutak	sand
rəfu	joy	zala	stream
rənu	intercourse	zalam	shield
seda	witness	zarwa	peacock
sarak	stick	zəghwi	right
səti	hip	zəvnək	guinea hen
silwa	east	zighi	nephew
sləka	stalk	zimbid'	naval
sləməŋ	ear	ziŋa	leopard
sləna	work	zivir	descendant
slərəŋ	root	zlambak	wing
sli' iŋ	tooth	zlibi	sack
slivdzi	cotton	zlimbir	armpit
sluhwa	leaf	zluzluk	feather
slu'i	meat	zudum	honeybee

Lo Lo-falling class

baga	festival	hərna	ladybug
kuma	before	huzla	utensils
batak	grasshopper	kəma	face
dīyak	bird	kəri	dog
bətbət	in vain	kuda	testicles
ʃəli	leather	kusay	harmatton
dəʃəl	mousetrap	ləwi	voice
dərəf	lake	lugut	clothes
dimbikw	porcupine	maŋa	knife
dughusl	log	marakw	woman
duwak	termite	mazlam	cold season
fəsək	bed bug	mbəghu	amulet necklace
gamak	animal shed	mbəlam	tamarind tree
gərnday	toad	mbəli	corpse
ghubu	neighborhood	mbəzleh	look of contempt
ghudzif	bone	mbuzluh	angry look
ghuraf	fig tree	mbudu	second plowing
gupa	spear	məndər	buttock
gurma	poison	məndu	man
gurum	darkness	mətak	wilderness
həgu	name	mətasl	cold
hənw	unbaked pottery		

ndandal	nine-stranded cord	rəgha rəkuf	deaf mute thigh
ndəfan	seven	rəmak	social area
ɲədək	garbage	səkwi	something
ɲəlu	slope	taba	tabacco leaves
ɲəzlu	to belch	tuwak	sheep
ɲuduf	heart	u' a	milk
ɲurzikw	cricket	vara	bean
ɲwadak	grub worm	vəli	place
pəta	mat	viya	rainy season
rəbisl	clay	vwani	charcoal
rədək	filth	wuda	large clay pot
rədi	oil	zera	climbing mouse

Hi Lo class

buna	mortar stone		door
burbur	corn	mazu	west
digir	red headed lizard	mbəzləm	mentally
dzagha	home		handicapped
gavak	garden	mbiza	cooked white
ghanik	tongue		beans
karam	knee	mbizim	owl
ɬabəh	shoe	mbuli	self-centered
dzidzi	grandfather		person
laha	song	məsi	respectful term of
dzɪɲisl	three-legged		address
	cooking pot	midzi	grandmother
dzugwa	leather hat	ɲabu	hippopotamus
dɪwir	skink	ɲərma	goodness
gafgal	grinding stick	ɲighim	male termite
ghuvi	feces	paka	traditional razor
ghwadzi	quiver	pala	stone
hasək	poisonous snake	papah	foot
kadəŋ	trap made of net	rini	animals
ka' u	baobab tree	runi	flat spear old men
kətsiŋ	snare		use
kuku	turtle dove	sasal	sieve
kula	pipe	sərdək	spit
lada	father's side of the	sigə	cooking pot
	family	sləvda	neighbor
lama	mother's side of	teki	thorn
	the family	tsedi	money
lika	brook	tsinik	caicedrat tree
litik	three stone	tsital	fried meat
	cooking area	tsuhwa	a cough
madza	uncultivated field	yawi	chatter
mahu	yawn	warga	nape of the neck
makwa	daughter	zida	chain
malir	wooden cow hut	zivak	wilderness

Appendix B

Verb list

LEVEL class

bata	to flatter	ndəra	to steal
bukwa	to cover	ni' a	to lick
bursa	to show affection	nzeghwa	to fall
ɓadza	to spoil	ŋəla	to climb
ɓaza	to miscarry	pəda	to store
ɓəha	to arrive	pəla	to untie
ɓəla	to smash	pəsla	to break
ɓisa	to suck	raya	to hunt
dəda	to drop	rəta	to weed
dəga	to share	səha	to become skinny
dəra	to burn	səna	to hear
dzəŋa	to read	səska	to sieve by shaking
dzəwa	to buy, to sell		
dzəgha	to try	sləha	to rub
dəga	to thrash grain	sli' a	to get up
daha	to sew	slu' a	to peel
dawa	to ask	sula	to fry
difa	to hide	sunə	to eaves drop
difa	to pour	su' a	to dry up
diza	to filter	tagha	to learn
gala	to raise	tapa	to taste
gəla	to grow	tawa	to cry
guna	to open	təda	to pull
guya	to join	təfa	to remove sorghum from pan
həsla	to inflate		
hətsa	to shave	təha	to criticize
hu' a	to bite	tsəha	to pull
hwaya	to run	tsəɓa	to bow down
kəla	to take	vəra	to return
kəsa	to catch	viha	to winnow
kuhwa	to tear up	viya	to fan
kurta	to skin	vusla	to blow
ləma	to prohibit	wada	to throw
maga	to do	zada	to lose
mama	to love	zləra	to begin
mana	to make fun of	zləda	to discuss
mbera	to support	zlu' a	to take away by force
mbuwa	to sit on eggs		
məna	to say		

Lo Hi class

basá	to suffer	ndana	to think
dəva	to scold	nəgha	to look
dza' a	to go	nzəda	to stay up
datsa	to cut up	raza	to insult
dəga	to beat	rəka	to decorate
dəva	to want	sawi	to come
ditsa	to squeeze	tala	to sharpen
fida	to peel	tsəgha	to dispatch
ghərba	to boast	tsufa	to add layer of mud to wall
gwada	to speak		
hala	to grow old	vala	to leap
hava	to remember	vəza	to throw
həba	to attach	vinda	to write
hədzá	to scratch	waha	to cry
hərda	to pile up	wuda	to throw
həva	to cultivate	yay	to give birth
lafa	to mix	zi'a	to smell
mbada	to walk		

Lo falling class

fəsa	to grill	məta	to die
gəra	to measure	ndəgha	to fill
ghuba	to glorify	səga	to increase
ghuna	to send someone	sləga	to sow
hana	to sleep	tsəma	to choose
kəda	to finish	tsu' a	to accept
kəzla	to wait	vəgha	to spend the day
mbəda	to transform	vakwa	to spend the year
mbəgha	to drink together	zləgha	to answer
mbəza	to drip	zləmba	to knock down
mənda	to twist		

Hi Lo class

bara	to seduce	səgha	to come
dala	to nail	tsisla	to hatch
kuma	to like	tsuhwa	to cough
nana	to deceive	wawa	to walk
sabi	to exit	zləŋa	to fear