Tone in the Bobo Madare North Noun System

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Abstract

This paper researches tone in Bobo Madare North, a Niger-Congo, Mande language (ISO 639-3: bbo), spoken in Mali and Burkina Faso, closely related to Sya. After examining its basic principles regarding tone, a limited overview of tone in the verb system is given. The paper proceeds to investigate tone in the noun system. Morphologically simple nouns, inflection (pluralisation), some compounding and derivation, as well as tone processes happening across word boundaries (definite and possessive constructions) are investigated. The author makes use of her own research data, applying principles of autosegmental phonology for her analysis. Bobo Madare North has three underlying tones with automatic and non-automatic downstep, tone spreading and (local?) upstep.

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I am very grateful to Prof. Dr. Maarten Mous for all his helpful questions and comments.

African proverb: Un seul bras ne peut pas entourer le baobab.

(African baobab trees can live longer than 6000 years and can have a circumference of more than 45 meters.)

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List of abbreviations and symbols

[ ]	phonetic representation
/ /	phonological representation
< >	orthographic representation
ˡ	downstep
ˈ	upstep
á	high tone on vowel
ā	mid tone on vowel
à	low tone on vowel
ȁ	low-mid tone on vowel
Adj	adjective
C	consonant
COP	copula
DEM	demonstrative
H	high tone
IPFT	imperfective
L	low tone
M	mid tone
N	homorganic nasal
N_1, N_2	first noun, second noun
Num	numeral
PART	particle
pl./PL	plural
PFT	perfective
sg./SG	singular
TAM	time, aspect, modality
TB	low tone (ton bas)
TBU	tone bearing unit
TH	high tone (ton haut)
TM	mid tone (ton moyen)
V	vowel
v	verb
vd	voiced
vl	voiceless
xH	extra high tone
xL	extra low tone

Abbreviations for names of language informants and researchers:

CB	Carin Boone
NC	Nassin Coulibaly
DD	Djélé Diarra
KD	Koitéré Diarra
DK	Dieudonné Kiénou
WW	Wilma Wolthuis

1. Introduction

This paper researches tone in the noun phrase in Bobo Madare North, a Niger-Congo, Mande language (ISO 639-3: bbo), spoken in Mali and Burkina Faso. Bobo Madare North has three underlying tones with automatic and non-automatic downstep, tone spreading and (local?) upstep.

After introducing the language and its speakers in section 2, I will briefly describe the phonology and orthography of the language in section 2.1.

In section 3 the basic principles regarding tone are examined, including the basic tones, the occurrence of automatic and non-automatic downstep and the tone bearing unit (TBU).

Next, a limited overview of tone in the verb system is given in section 4.

The paper proceeds in section 5 with an investigation of tone in the noun system. Details of the research are explained in section 5.1. I have made use of my own research data. Morphologically simple nouns (5.2), inflection (pluralisation, 5.3.1), some compounding and derivation (5.3.2), as well as tone processes happening across word boundaries (definite and possessive constructions, 5.4) are analysed according to the principles of autosegmental phonology in the remainder of section 5.

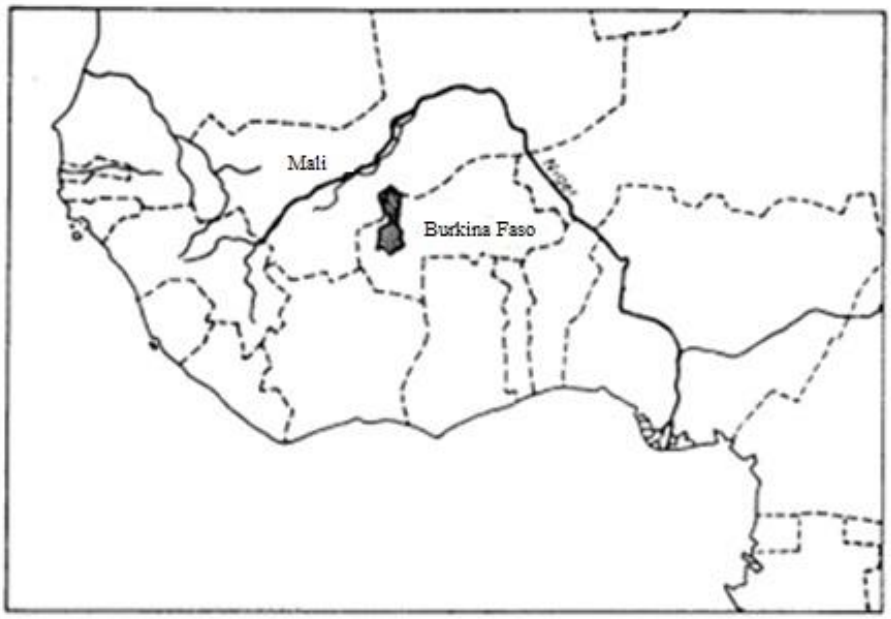
The paper ends with general conclusions, a list of references and appendices.

The research for this paper has been a team effort. Therefore, whenever I use the word '*we*', I refer to a team achievement. Whenever I use the word '*I*', I refer to my own analysis or interpretation.

2. Bobo Madare North: the language and its speakers

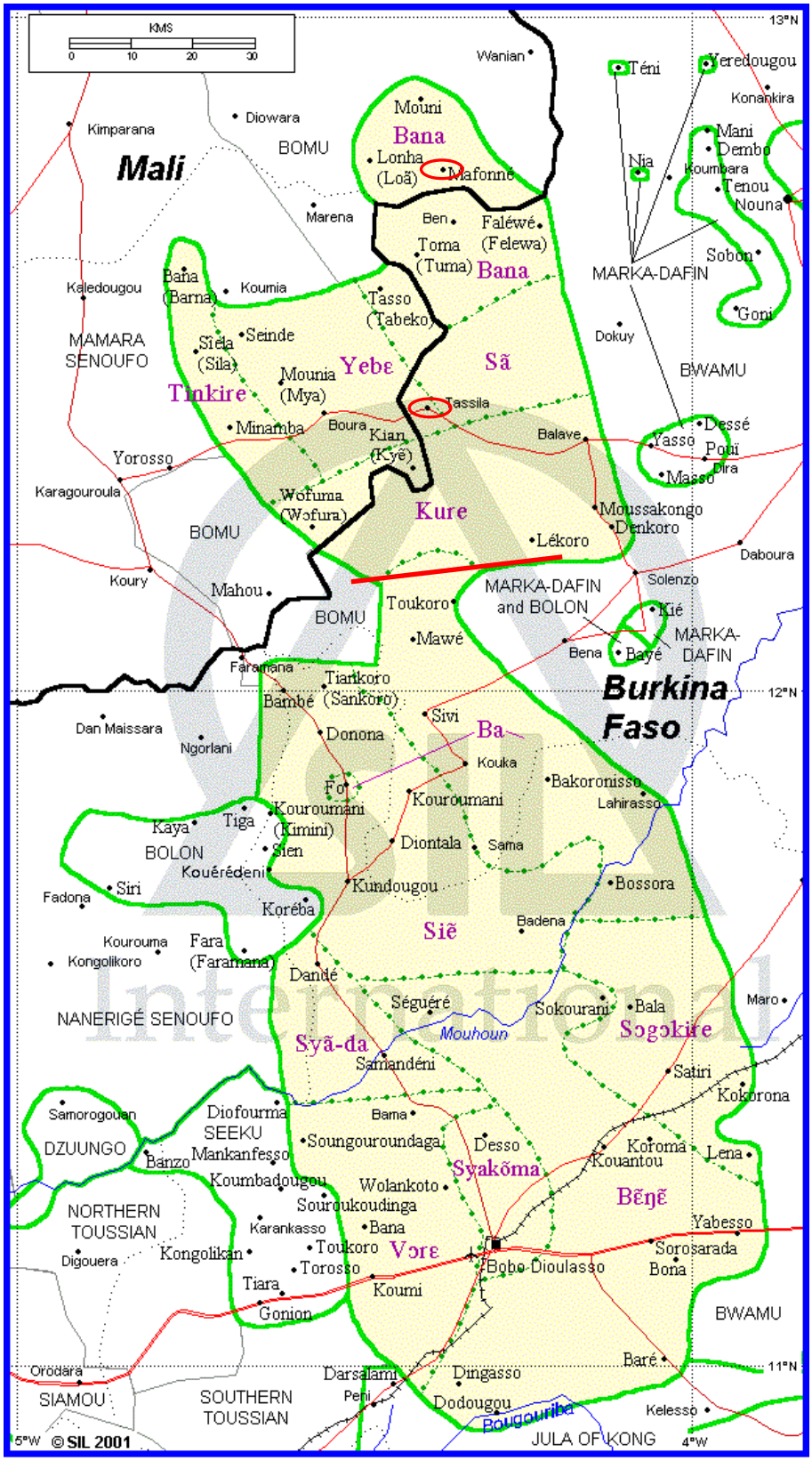
In this section some general information about the language is given, such as where it is spoken, its classification, the number of speakers, some typological information, dialect information and intelligibility with Bobo Madare South, Jula and French. After this I will give a brief overview of its phonology and orthography.

Bobo Madare North is a cross-border language spoken in Mali and Burkina Faso, West-Africa. In Mali it is referred to as Konabéré, while in Burkina Faso it is referred to as Bobobéré (*bʊrɪ* meaning 'language'). It is one of two Bobo Madare varieties. Map 1 indicates the location of the Bobo Madare area in West-Africa. Map 2 indicates the division between Bobo Madare North and Bobo Madare South, which is also known as Sya.[1]



Map 1. The Bobo Madare area in Mali and Burkina Faso - map adapted from Le Bris and Prost 1981:13.

[1] Sya(béré) in Bobo Dioulasso region is the prestige dialect of Bobo Madare South. Other dialects are Benge, Sogokiré, Voré, and Zara (Bobo Jula), according to the Ethnologue (Lewis et al., 2016/bwq). According to Map 2, Ba is also a dialect of Bobo Madare South. Syã-da, Syakõma and Siẽ are assumed to be different names for the Sya dialect.



Map 2. Detailed map of the Bobo Madare area, showing the line between Bobo Madare North and Bobo Madare South (approximately). The little circles in the Bobo Madare North area indicate the towns of Mafouné and Tansila (line and circles added by CB).

There are quite a number of publications on Bobo Madare South, possibly due to the fact that it is spoken in the town of Bobo Dioulasso, the second largest city of Burkina Faso. In contrast, Bobo Madare North is often not even recognised or mentioned at all in any literature. The only publications on Bobo Madare North, to my knowledge, are the *Essai de description grammaticale du dialecte bobo de Tansila, Haute-Volta* by André Prost, published in 1983 and the *Rapport sociolinguistique sur la langue bobo madaré* by Beatrice Tiendrébéogo, published in 1998 (revision of a 1995 publication). Phil Davison includes Bobo Madare North in his brief *Compte rendu d'une enquête au pays bobo-fing* in 1992. A publication which unfortunately I have been unable to lay hands on is *Approche phonologique de bobo - dialecte de Tansila* by Tinouigou Zoungrana.[2]

Tiendrébéogo reports that speakers of Bobo Madare North have difficulty understanding Bobo Madare South: in several locations comprehension is less than 30% (1998:17, 21). The reverse is also true.[3] The language varieties are different enough to warrant separate Ethnologue codes, BBO and BWQ respectively.

Bobo Madare North is spoken in the Segou and Sikasso regions in the South of Mali and in the Banwa province of Burkina Faso. It is classified in the Ethnologue as Niger-Congo, Mande, Western, North-western, Soninke-Bobo, Bobo (Lewis et al. 2016). Dwyer, however, classifies Bobo Madare as an early off-split from the Eastern Mande branch (Dwyer, 1989:50, and 1994:30).[4] Bobo Madare North speakers refer to themselves as Konakuma (plural Konakama). They are often referred to by others as Bobo-Fing ("Black Bobo"), but this term is felt to be derogatory (Tiendrébéogo 1998:4). Tiendrébéogo estimates the number of Bobo Madare North speakers at 45.000 to 55.000 (1998:7). The Ethnologue estimates their number at 60.000. Both sources mention that about 35.000 speakers are found in Burkina Faso. The remainder would be in Mali. The majority of the people are farmers. The Ethnologue reports that the language is "unstandardized and in vigorous use among all generations" (Lewis et al., 2016/bbo).

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[2] Zoungrana, Tinouigou. 1981. *Approche phonologique du bobo. Dialecte de Tansila.* Mémoire de maîtrise, Université de la Sorbonne Nouvelle (Paris III).

[3] Pr. Elie Sanon, personal communication, no figures available.

[4] According to Morse (1976:3), writing about Bobo Madare South, "Welmers places Bobo in the South-Eastern group, and Greenberg places it in his Western group." Morse's own comparison of a Swadesh 200-word list with several other Mandé languages leads her to put Bobo Madare South in the Western group.

The language is not to be confused with Bomu or Bwamu, which are sometimes called Bobo-Wule (“Red Bobo”, Ethnologue codes BMQ, BOX) and which are Gur languages.

Bobo Madare North has SOV word order and uses postpositions:

(1)	*a*	*ɲɪnɪ*	*a*	*svrv*	*kaa*	*a*	*dvv*	*rɪ*
	3SG	AUX	3SG.POSS	hand	put	DEF	mouth	in

She has put her hand into her mouth. (Example from: La Manchote: 52)

Map 2 shows 5 dialects within Bobo Madare North: Tinkire, Yebɛ, Bana, Sã and Kure. These correspond with Davison’s Tankre, Yaba or Yabe, Sankuma and Kure (1992:3). Davison’s Kukoma (east of Tansila) is Kure. In addition, Davison mentions the Jèrè dialect (also known as zèrè or zara), which denotes Bobo-Dioula (Davison 1992:4), and which Tiendrébéogo proves to be Sya (Tiendrébéogo 2001:11).

Tiendrébéogo 1998 researched dialect intelligibility of Bobo Madare North. She identified the Tansila dialect as the one which is best understood by the speakers of Bobo Madare North. The Tansila dialect has therefore been chosen as standard for literature development. The Malian dialects were not included in this research.

Bilingualism figures for Jula and French are below 5% (Lewis et al. 2016/bbo).

2.1. Phonology and orthography

Bobo Madare North has 21 consonants. It has nine vowels, unlike most other Mande languages which have five or seven. There is ATR vowel harmony, which except for a small number of suffixes, does not carry across morpheme boundaries. Bobo Madare North has three level tones. Tone plays a role both lexically and grammatically.

2.1.1. Consonants

Table 1 gives the consonant phonemes for Bobo Madare North.

		labial	alveolar	palatal	velar	labio-velar	laryngeal
stops	vl	p	t		k	kp	
	vd	b	d	(j)	g	gb	
fricatives	vl	f	s				(h)
nasals		m	n	ɲ	ŋ	ŋm	
laterals			l				
vibrants			r				
approximants		w		y			

Table 1. Consonant phonemes for Bobo Madare North.

Prost (1983:6) overall has the same consonants. He mentions */ɣ/* as an allophone of */g/*. Instead of */ŋm/* he has */ŋw/*.

The phonemes are indicated by their orthographic representations: */j/* is phonetically [ɟ], */y/* is phonetically [j], */kp, gb, ŋm/* are phonetically [k͡p, g͡b, ŋ͡m]. */h/* is only used in some loanwords and in a small number of words which contain voiceless nasals.[5]

Phonologically, [*c*] is in free variation with [*k*] before front vowels. [*k*] always precedes central and back vowels.[6] In writing, <*k*> is used for both [*c*] and [*k*]. [ɟ] and [*g*] are in complementary distribution. [ɟ] always occurs in word initial position, [*g*] in word medial position, with the exception of a very small number of loanwords in which [*g*] appears in word initial position. Since in the prestigious vehicular languages Bambara and Jula these two sounds are contrastive and since

[5] See section 2.1.2 on syllabic nasals.

[6] Wolthuis and Diarra, in progress.

people are used to the symbols <*j*> and <*g*> for these sounds, [ɟ] is written as <*j*> and [*g*] is written as <*g*> in Bobo Madare North.[7]

2.1.2. Syllabic nasal

To date, 16 words have been found which contain a syllabic nasal. All of them are velar, except for one, which is bilabial. In seven words, the syllabic nasal is preceded by a velar plosive, in four words by a homorganic voiceless nasal. The five remaining words consist of a syllabic nasal only.[8] An example is [ŋ̩̊ŋ̩] '*sun*', pronounced on high tone. These words have most likely evolved from CV words, in which in the case of [ŋ̩̊ŋ̩] 'sun', C was a fricative and V was nasalised. Compare Bobo Madare South: [*sĩ́*] 'sun'. Orthographically, [ŋ̩̊ŋ̩] 'sun' is written as <*húun*>, with <*h*> representing the fricative quality, <*u*> representing the lost vowel, and <*n*> representing the remaining nasal. Compare also the plural of 'sun' which can be either [*humo*] or [*sumo*], meaning 'day' or 'season' (period of sunshine).

[7] A complete orthography proposal is not available yet, as the research on which this should be based has not been finalised. However, the catholic church has taught literacy classes in the past (2005) which probably constituted the first time the language was written by the Bobo Madare North community. Recently, SIL (Société Internationale de Linguistique) has worked with one of the catholic literacy teachers, the ANTBA (Associaton Nationale pour la Traduction de la Bible et l'Alphabétisation) Bible translation team and the community to find solutions to a number of problems that were encountered in the classes. This has resulted in the writing system as it is used in this paper.

[8] Among the 16 words are nine nouns, two verbs, two adjectives, one numeral and two adverbs. One of the verbs has a noun derived from it: ŋun HM 'smell, perceive an odour' > ŋun H 'smell, odour'. The HM tone on the verb ŋun is exceptional. See section 4 on tone in the verb system. We often see nouns being derived from a verb by tone change. Could this be a case of a verb being derived from a noun? The proposed orthography for these words is too complicated to explain here in full. See Wolthuis 2014 and appendix 1.

2.1.3. Vowels

Table 2 gives the vowel phonemes for Bobo Madare North.

	front	mid	back
close	i ɪ		u ʊ
mid-close	e		o
mid-open	ɛ		ɔ
open		a	

Table 1. Vowel phonemes for Bobo Madare North.

Prost does not distinguish */ɪ/* and */ʊ/*. He does however mention a */ə/*, which he says “est sans doute un affaiblissement d’une autre voyelle” (Prost 1983:5).

All vowels are written according to the IPA system, with exception of */**ɪ**/* and */**ʊ**/*, which are written as <***ɪ***> and <***ʊ***>. All vowels can be lengthened and all vowels can be nasalised. Lengthened vowels can also be nasalised. A sequence of two vowels indicates either a long vowel or a diphthong: <*baa*> [*baa*] L ‘to harvest the maize’, <*sʊɔ*> [*sʊɔ*] MM ‘tree’. Nasal vowels are written as Vn: <*finin*> [*finĩ*] ML ‘to trouble’, <*ɪan*> [*ɪãã*] LM ‘truth’. Note therefore that syllables ending in <*n*> are open syllables of CV or CVV structure. This in contrast to syllables written with a final <*ŋ*>, which are closed syllables of CVC structure (see section 2.1.5 on syllable structure).

2.1.4. Vowel harmony

Bobo Madare North has ATR vowel harmony. See the +ATR and −ATR vowel sets below.

(2)

i		u		ɪ		ʊ	
	e		o		ɛ		ɔ
		a				a	
	+ATR				−ATR		

The ATR vowel harmony does not carry across the word boundary, barring a small number of inflectional and derivational suffixes (such as the plural and the diminutive suffixes) which harmonise with the vowels in the main word. Compound words do not require nor allow harmonisation of the vowels between the words of which the compound exists. Examples:

No harmonisation across morpheme boundaries:

(3)	*yɛɛ-tee-ɲaa*	shea.nut-collect-woman	'woman who collects shea nuts'
	dʋ.dvɔ-ko.li	door.PL-hole	'entry'
	fo.li-nʋ	sesame-unit	'sesame seed'

Harmonisation across morpheme boundaries:

(4)	*dɛ.gɪ-lɛ*	feather.PL-DIM	'small feather'
	fi.re-le	exit.PL-DIM	'small exit'

Prost does not mention vowel harmony and in fact uses + and −ATR vowels in one morpheme: *dɛge* 'feather' (1983:5). In our database 'feather' is *dɪgɪ*.

2.1.5. Syllable structure

The following syllable structures are found: V, CV, CVV and CVC.

The V structure is rare. It occurs only in some personal pronouns, the logophoric pronoun, the definite articles and demonstratives.

As a full word, the CV structure is rare. It occurs in predicate markers (auxiliaries), demonstrative pronouns, conjunctions, postpositions, various particles and less than a dozen verbs. The 16 words mentioned in the section on syllabic nasals also have been analysed to have CV structure, but phonetically these words do not contain a vowel. It is the syllabic nasal in these words which is interpreted as an underlying nasalised vowel.

In disyllabic and multisyllabic words the CV syllable structure is widely used. In fact, it is the most frequently used syllable structure in the language.

The CVV syllable structure is the second most frequently used syllable structure in the language.[9] It can be used as a full word or as one of the syllables in a multisyllabic word.

The final consonant of the CVC syllable structure is always [ŋ]. About 7 % of the nouns included in this tone research have CVC syllable structure.

[9] Interestingly, Dienst (2004:36) states that in Bobo Madare South long vowels occur only marginally.

3. Tone in Bobo Madare North

This section describes the tone system of Bobo Madare North. Generalities like the basic tones, automatic and non-automatic downstep and the tone bearing unit (TBU) are treated. This is followed by a brief overview of tone in the verb system (section 4) before tone in the noun system is described (section 5).

3.1. Basic tones

Bobo Madare North has three contrastive level tones: high, mid and low (H, M, L). While this three-way contrast is evident in the noun system, only two contrastive tones are lexically present in the verb system. The tones in the verb system correspond in height with the mid and low tones in the noun system. Consonant and vowel quality does not have an influence on tone, neither in nouns, nor in verbs.

The contrast between the three tones in the nouns can be proved by the following words:
H-M-L contrasts for CVCV nouns:

(5)	*fi.ri*	H.H	‘exit’				*fi.ri*	L.L	‘flesh’
	kpi.ri	H.H	‘tortoise’				*kpi.ri*	L.L	‘beehive’
	kʋ.rʋ	H.H	‘albatross’				*kʋ.rʋ*	L.L	‘elephant’
				kɪ.wɪ	M.M	‘cymbal’	*kɪ.bɪ*	L.L	‘peel’

H-M-L contrasts for CVV nouns:

(6)	*kuu*	HH	‘reason’	*kuu*	MM	‘lower back’	*kuu*	LL	‘debt’
	sii	HH	‘cord’				*sii*	LL	‘nest’
				tɪɪn	MM	‘tomb’	*tiin*	LL	‘shrub’
	tou	HH	‘parrot’	*tɔʋ*	MM	‘tamarind’			
				tʋɔ	MM	‘place’	*tuon*	LL	‘blood’
				suu	MM	‘medicine’	*suo*	LL	‘horse’
				sʋɔ	MM	‘tree’			

H-M-L contrasts for CVC nouns:

(7)	*sɔŋ*	HH	'agriculture'		*suŋ*	LL	'excrement'
	tɔŋ	HH	'association'	*tɔŋ*	MM	'palm rat'	

The contrast between the two tones in the verbs can be proved by the following words:

(8)	*bɛɛ*	M	'say'	*bɛɛ*	L	'fall'
	tire	M	'fly'	*tire*	L	'talk'

3.2. Automatic and non-automatic downstep

Bobo Madare North has automatic downstep: after a low tone, the next high tone is realised on a lower frequency than an earlier high tone. In the verb system also a mid tone may undergo downstep.[10] This has not yet been attested in the noun system.

Downstep is shown in the following phrase, in which the high tone *kúó* 'courtyard' is clearly pronounced at a lower pitch than the high tone *dúrú* 'well':

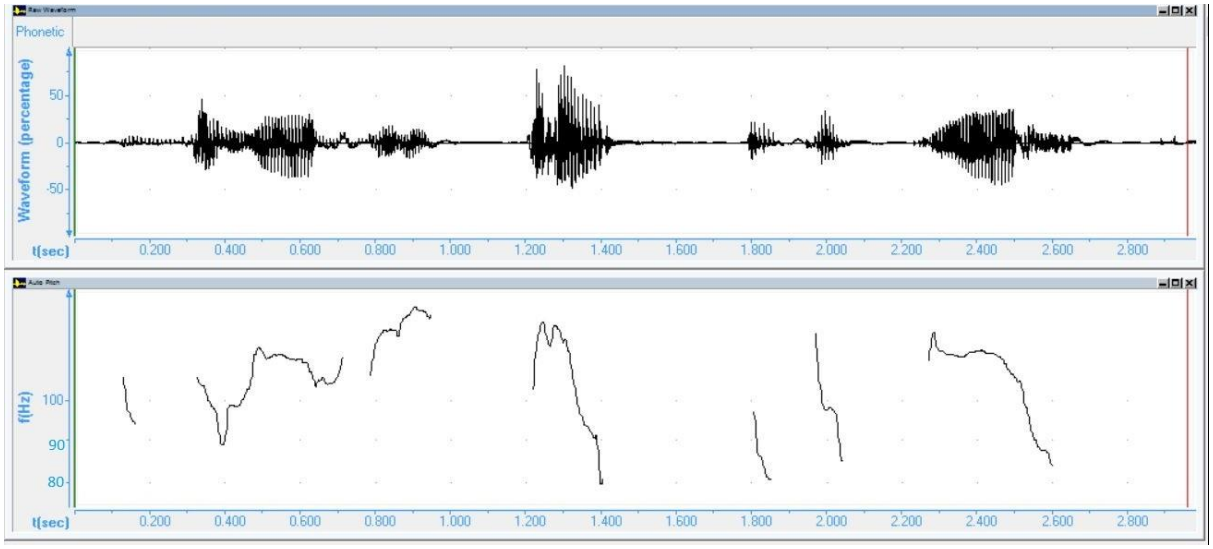
(9)

Jèlē	dúrú	párà	à	kā	kúó	rì
Djélé	well	dig.PFT	he	his	courtyard	in

Djélé has dug a well in his courtyard.

Double-click on the icon to listen to the phrase here: Phrase.wav

[10] But see footnote 18 on page 23.



Jèlē dúrú párà à kā kúó rì

Figure 1. Pitch waveform for sentence "Jele duru para a ka kuo rɪ."

Apart from automatic downstep, there is also non-automatic downstep. In non-automatic downstep the tone register is lowered after a floating L tone. It is found both in the verb system and in the noun system.

Furthermore, occasionally a raised or upstepped tone is found. These are possibly cases of local upstep. Their nature cannot be fully explained as yet.

3.3. Tone bearing unit (TBU)

In this section I will show that the TBU in Bobo Madare North is the mora.

In order to find out what the TBU is, I have looked at tone patterns on monomorphemic nouns and verbs of CVCV, CVV, CVC and CV syllable structure.[11] CVCV and CVV words have two moras, namely the two vowels in the word. CVC words also have two moras, namely the vowel and the word final /ŋ/. Words of CV structure are either made up of a consonant and a vowel or a consonant and a syllabic nasal.[12] CV nouns and verbs containing a syllabic nasal are left out of consideration as these words might not be monomoraic after all.[13] CV nouns made

[11] V structured words are left out of consideration, as they are never nouns or verbs.

[12] see the paragraph on syllable structure, p. 15.

[13] The speakers claim there is length on these words, except on the numeral *hum* 'ten' and the adverb *hun* 'immediately'. WW, e-mail communication, 29 February 2016, following an orthography workshop in the area. More research is necessary.

up of a consonant and a vowel do not exist, which leaves us with a mere nine monomoraic CV verbs consisting of a consonant and a vowel.

The tables below show which tone melodies are found on the respective syllable patterns and number of moras. Table 3a gives the overview for nouns, table 3b for verbs.

Syllable pattern and total number of words found in nouns	Tone melodies found	Frequency	Percentage[14]
CVCV (2 moras) (208 words)	HH	48	23%
	HM	1	<1%
	HL	5	2%
	MM	5	2%
	ML	36	17%
	LH	28	13%
	LM	24	12%
	LL	52	25%
	LML	9	4%
CVV (2 moras) (154 words)	HH	30	19%
	MM	23	15%
	ML	26	17%
	LH	23	15%
	LM	19	12%
	LL	22	14%
	LML	11	7%
CVC (2 moras) (34 words)	HH	10	29%
	MM	2	6%
	ML	5	15%
	LH	3	9%
	LM	2	6%
	LL	10	29%
	LML	2	6%

Table 3a. The number of tones on moras in nouns.

[14] Percentages do not always add up to 100%, because of rounding.

Syllable pattern and total number of words found in verbs	Tone melodies found	Frequency	Percentage[15]
CVCV (2 moras) (193 words)	MM ML LM LL LML	42 74 57 18 2	22% 38% 30% 9% 1%
CVV (2 moras) (119 words)	MM ML LM LL LML	16 50 44 5 4	13% 42% 37% 4% 3%
CVC (2 moras) (28 words)	MM ML LM LL	6 12 8 2	21% 43% 29% 7%
CV (1 mora) (9 words)	M	10	100%

Table 3b. The number of tones on moras in verbs.

As there are three basic tones in the noun system we expect to see up to nine different tone melodies on bimoraic words. On the CVCV nouns we do indeed find nine melodies. On the CVV and CVC nouns we find seven. The HM and HL melodies are exclusively found on the CVCV nouns. Both patterns are rare. Contrary to what could be expected, a MH melody is absent in all noun syllable patterns. LML is a melody which is found on nouns of all syllable structures, but one we would not expect to see. The distribution of these syllable patterns will be further discussed in the section on tone in the morphologically simple noun (section 5.2).

As mentioned in section 3.1 only two basic tones are found in the verb system, corresponding in height to the M and L tones in the noun system. As there are two basic tones we would expect to find up to four different tone melodies on bimoraic verbs. In both the CVCV, CVV and CVC structures we find the four expected melodies: M, L, ML and LM. In addition, we find a LML melody on the CVCV and

[15] Percentages do not always add up to 100%, because of rounding.

CVV structured words.[16] This melody is not found in the CVC verbs, but this might be due to the fact that the number of verbs of this structure in our database is limited. We would expect to see two melodies on monomoraic CV verbs: M and L. Only one melody however is found: a level M tone.

From the findings above it is clear that if we leave the unexpected LML melody aside, bimoraic nouns and verbs have melodies consisting of two tones, monomoraic verbs have a one-tone melody. Thus each mora carries exactly one tone. I conclude therefore that the tone bearing unit in Bobo Madare North is the mora. Only level tones have been found on monomorphemic mono- and bimoraic nouns and verbs. I consider the LML tone pattern on mono- and bimoraic words to be exceptional. On three-moraic words this melody spreads out over all three moras, e.g.: *jìsīlì* 'string'. Therefore I postulate that contour tones are sequences of level tones.

In the next section I will describe tone in the verb system.

[16] This is reminiscent of the LHL melody found besides the H, L, HL and LH melodies in Mende, a two-tone Mande language, see for instance Conteh et al. 1983.

4. Tone in the verb system

Before describing tone in the noun system, a brief overview of tone in the verb system is given. The research was done in 2012 by two SIL researchers, Constance Kutsch Lojenga and Wilma Wolthuis. The material in this section is adapted from a non-published presentation by Wolthuis.

Despite the fact that Bobo Madare North has three contrastive level tones, verbs in isolation show only two contrastive tones. The low tone on verbs corresponds to the low tone on nouns, the 'higher' tone on verbs corresponds in height to the mid tone on nouns. The tones combine into five different tonal melodies for verbs in isolation: L, M, LM, ML and LML. The LML pattern is rare in its occurrence.[17]

Minimal pairs showing the contrasting tone melodies:

(10)	*bɛɛ*	M	'say'	*bɛɛ*	L	'fall'			
	bɛɪ	ML	'pray'	*bɛɪ*	LM	'adorn'			
	baa	ML	'climb'	*baa*	LM	'be silent'	*baa*	L	'harvest'
	buo	ML	'take'	*buo*	LML	'shout'			
	wɔɔ	LM	'trap'	*wɔɔ*	LML	'flow'			

It was found that certain TAM categories cause a M[18] to be either raised or lowered, depending on the lexical tone of the verb.[19] The researchers hypothetically formulated two tone rules:

[17] See the distribution of tonal melodies on a total of 250 monomorphemic verbs:

2nd tone → / 1st tone ↓	M	L
M	MM 73 (21%)	ML 136 (39%)
L	LM 109 (31%)	LL 25 (7%)
LM		LML 7 (2%)

Distribution of tonal melodies on CV, CVV, CVC and CVCV verbs

[18] When this research was done, tone melodies on verbs were considered to be H, L, HL, LH and LHL. While researching the nouns, the tone on verbs was compared to the tone on nouns and levels were aligned. The original proposed tone rules concerned upstep and downstep of a H tone. They have been adapted for this paper.

[19] How these raised and lowered tones in the verbs compare to the tone levels of the noun system has not been researched yet.

1. Two consecutive L tones cause a preceding M tone to be elevated (MLL → ˥M).

2. A L tone between two M tones merges with the following M tone and causes it to be lowered (MLM → M˩M).

Most, but not all tone changes on the verbs could be explained with these rules. An example of each rule is given below.

Ad 1: The verb *dābà* 'borrow' in the Imperfective is an example of raising a M tone. The verb was found to have ML tone in isolation. The tone of the verb in isolation is the same as the tone of the verb in the Perfective, except for LM verbs. To form the Imperfective, a floating M tone is added before the verb and a floating L tone is added after the verb. The floating M tone merges with the M tone of the verb. The floating L tone, in combination with the L tone on the verb, causes the M tone of the verb to be raised (tone rule 1). This raised M then spreads over the whole verb. In the following example, first the surface forms of the Perfective and Imperfective are given. Below those, the process of tonal change in the Imperfective is shown.

(11)	*à*	*dābà*	*à*	*˥dābā*
	3SG	borrow.PFT	3SG	borrow.IPFT
	he has borrowed		he borrows	

The tonal changes of the imperfective can be represented as follows:

(12)	L	Ⓜ	ML	Ⓛ		L	M	ML	L		L	˥ML	L		L	˥M			
	|	|	| \	|		|	ǂ \	| \	|		|	| ⩙	ǂ		|	∧			
	a	*Ø*	*daba*	*Ø*	→	*a*	*Ø*	*daba*	*Ø*	→	*a*	*daba*	*Ø*	→	*a*	*daba*			

Ad 2: The verb *tàmā* 'get up' is an example of tone lowering. The verb was found to have LM tone in isolation. The floating M tone of the Imperfective attaches itself to the pronoun, causing a LM tone on the 3SG pronoun. The verb's own L tone on the first syllable causes the M tone on the second syllable to be lowered. This lowered M is realised on the first syllable of the verb. The floating L of the Imperfective now attaches to the second syllable of the verb. In the following example, first the surface forms of the Perfective and Imperfective are given. Below those, the process of tonal change in the Imperfective is shown.

(13) *à* *ˈtāmā* *ǎ* *ˈtāmà*
3SG get_up.PFT 3SG get_up.IPFT
he has got up he gets up

The tonal changes of the Imperfective can be respresented as follows:

(14) L (M)LM (L) L M LˈM L LM ˈML
| | | \ | | ⟋ ǀ ǀ ⟋ ⟋ ǀ |/ | |
a Ø tama Ø → *a Ø tama Ø* → *a* *tama*

Incidentally, the low tone of the verb also causes a lowering in the Perfective.

A number of questions remain, such as: Why does LM behave differently in the Perfective than other verbs? Why does rule 1 apply in the Imperfective for the LM verbs, but not for the LML verbs? Why does the floating M of the Imperfective sometimes attach to the pronoun and sometimes to the verb? The latter question can be answered by a more careful observation of the data: when the verb starts with a M tone, the floating M attaches to the verb and merges with the tone on its first syllable. When the verb starts with a L tone, the floating M merges with the pronoun, thus causing a LM modulated tone on L pronouns before verbs starting on a L tone. It turns out that the floating L tone after the verb replaces the tone on the second syllable of the verb unless tone rule 1 applies. See Appendix 2 for an overview of tone changes on Perfective and Imperfective verbs.

The next section describes tone in the noun system.

5. Tone in the noun system

In this section I describe tone in the noun system. Details of the research are explained in section 5.1. Morphologically simple nouns are described in section 5.2, inflection (pluralisation) in section 5.3.1, some compounding and derivation in section 5.3.2, and some tone processes across word boundaries (definite and possessive constructions) in section 5.4. The tone melodies are analysed according to the principles of autosegmental phonology.

Prost mentions tone in his *Description Grammaticale* (1983), but unfortunately his comments on tone are not very systematically laid out and rather sparse. Several constructions are sometimes treated in one and the same paragraph and may even be laid out in one and the same line. Most of the time, he shows the resulting tone melodies without giving the lexical tone. This makes it hard to see which tonal changes occur. Apart from this, his findings are sometimes different from ours. Where applicable, I will point out the differences and similarities between his and our findings.

5.1. Particularities of the research

In January 2012 two SIL linguists, Constance Kutsch Lojenga and Wilma Wolthuis, conducted three weeks of initial tone research in Bamako, Mali, with two speakers from the village of Mafouné, which is in Mali. The research focussed on establishing lexical tone for about 750 words, mainly verbs and nouns. Initial work on verb conjugation was likewise conducted. I was not part of this team. In January 2013, in Bamako, a month was planned to investigate tone in the noun phrase. This was done by me with the same informants of the year before. Due to political unrest, this research had to be abandoned prematurely after two weeks. The remainder of the research for this paper was conducted by Wilma Wolthuis and me in Bobo Dioulasso, Burkina Faso, in January 2014, in a three-week time span.

The language informants in 2012 and 2013 were Nassin Coulibaly (born 1975 in Mafouné, Mali, MA in socio-anthropology) and Koitéré Diarra (born around 1985 in Mafouné, Mali, student of history and geography). In 2014 we worked with Nassin Coulibaly and Dieudonné Kiénou (born in 1967 in Tansila, Burkina Faso, trained in technique, animator and coordinator of literacy activities). Nassin Coulibaly and Dieudonné Kiénou are part of the Bible translation team which works on the Bobo

Madare North New Testament. For this purpose they have been trained in translation skills by the Malian Bible Society. They also received 2 months of linguistic training by SIL Mali in phonology and grammar analysis.

Since we worked with two speakers from Mafouné in 2012 and 2013, it wasn't until 2014 while working with a speaker from Tansila, that we realised there are some tonal differences between the two dialects. In general, it seems that the Mafouné dialect is somewhat simpler. For this reason, and because the research of the first two years was done on this dialect, I will take this as my point of reference. Where relevant, I will point out differences with the Tansila pronunciation.

In 2013, lexical tone for singular and plural nouns in isolation was established. We then looked at nouns in combination with the definite article. We investigated possessive phrases and short SOV sentences. However, as this turned out to be rather complicated, we decided to research some forms of compounding. At this point we had to leave Mali.

In 2014 we continued the research on compounding and derivation after verifying the data of the year before. We looked into possessive constructions again and added demonstrative articles to our list of items in the noun phrase. Since tone on the sentence level had proved complicated, all of this was done in isolation.

In the remainder of this paper, tone on morphologically simple nouns will be described, followed by tone on morphologically complex nouns and in short noun phrases.

5.2. Tone in morphologically simple nouns

Prost (1983:15) mentions that Bobo Madare North nouns have three different forms: a singular, a plural and a root form which is only used in compounds. Morse mentions the same for Bobo Madare South. Morse adds that "these short forms are bound forms and never occur in isolation" (1976:160). In this section I treat tone on the singular noun. Plural forms are treated in their own section under morphologically complex nouns. I will make mention of the short bound form when we come across it.

This part of the research is based on a total of 394 monomorphemic nouns (207 CVCV, 153 CVV and 34 CVC nouns). In addition, 68 monomorphemic CVCVCV nouns were checked for tone in isolation.

There are three contrastive level tones in the noun system: high, mid and low (H, M, L). These three basic tones give rise to a total of nine tonal melodies on nouns in isolation:[20] HH, HM, HL, MM, ML, LH, LM, LL and LML. A MH pattern has not been found in our data. Prost (1983:9, 12) however, did find words with a MH melody. In our findings these words get HH or MM tone[21].

In our data, the HM and HL patterns have only been found in the CVCV nouns. Their occurrence is rare (<1% and 2% of CVCV nouns respectively).

[20] On the 68 monomorphemic CVCVCV nouns fourteen different tone patterns were found. As this is quite a variety, we have left these nouns out of further consideration at this stage in the research. However, if we look at the overall melody on these words rather than at the exact distribution per syllable, the melodies on the three-syllable words are similar to those found in the one- and two-syllable words. In this interpretation, a L.L.H distribution and a L.H.H distribution are both comprised in an overall L.H tone pattern. See the table below. Of the 68 nouns, 64 fit the patterns that were found in the one- and two-syllable nouns. Four nouns show different patterns from these overall melodies. These are M.L.H (1), M.M.HB (2) and xH.H.HB (1). It is very well possible that further research of tone on three-syllable words would reveal additional tone patterns that have not been found to date.

2nd +3rd syll. → / 1st syll. ↓	H	M	L
H	+H.H (11) *cf. HH* *sʋ.gʋ.rʋ* quarrel	+M.M (1) *cf. HM* *ko.ko.ro* skin disease	+H.L (3) *cf. HL* *ko.to.gi* baboon +L.L (3) *cf. HL* *ma.sɛ.nɪ* needle
M	+M.H (1) *cf. MH* *lo.ri.ko* cricket	+M.M (6) *cf. MM* *pɛ.lɛ.bɪ* shoulder	+M.L (1) *cf. ML* *sa.gɪ.rɪ* varan
L	+H.H (12) *cf. LH* *ba.tu.ma* club +L.H (4) *cf. LH* *jʋ.ba.lɪ* mirror	+L.M (5) *cf. LM* *ka.ba.la* calebasse	+L.L (6) *cf. LL* *di.fi.ri* cobra
L			+M.L (11) *cf LML* *ka.di.li* heel

Apart from ML, which seems to be underrepresented, and HL which seems to be overrepresented, this overview confirms the melodies which have been found in the CVCV, CVV and CVC nouns (see tables 4a-c and 5).

[21] Here are some examples (first in Prost's orthography with tone marks, then in ours with capitals indicating the tone we found): *sēgé – sɪgɪ* HH 'goat'; *tɔ̄ɣ́ – tʋgʋ* HH 'fire'; *tēŋ́ – tɛŋ* HH 'basket'; *kōŋ́ – kɔŋ* MM 'granary'.

According to Prost (1983:10), MM is only found when the sentence continues. He states that phrase finally these words are realised as ML.[22] This is different from our observations. Although we have found only a handful of CVCV patterned MM nouns, we have found ample examples of CVV patterned MM nouns.

A number of words which we have found to have LML tone, are described by Prost as "Cas particuliers : CVV ou CVŋ de tonèmes BB le 2ême B un peu plus bas que le premier" ('particular cases of CVV or CVŋ words of LL tone in which the second L is a little bit lower than the first', 1983:14).[23]

HH nouns are pronounced HxH in Tansila. This is a phonetic difference only. There is no phonological contrast between HH and HxH.

The LML tone group shows a different distribution in Mafouné and Tansila: *yɩ.lɩ* 'crocodile' is LM.L in Mafouné and L.ML in Tansila.

See tables 4a-c for an overview and examples of tone melodies in CVCV, CVV and CVC words successively. The numbers the between brackets indicate how many nouns of a particular melody are included in our data. Table 5 gives the total number of occurrences which are found for the different tone patterns in the various word structures.

[22] "[L]es tonèmes MM ne se trouvent que si la phrase continue - MM + .. - mais en fin d'émission on a un abaissement : MB/."

[23] Prost found four of these words: They are (Prost's orthography, followed by ours with capitals indicating the tone; note that Prost does not write a tone mark): *moŋ – mɔŋ* LML 'mango tree'; *sow – sou* LML 'cooking-pot'; *fuu – fuu* LML 'blind person'. The fourth word that Prost mentions is *gbei* 'dog'. The word which comes closest to this in our database is *gbanaa* B.HH 'spotted dog'. Obviously, the number of LML nouns we found are much more numerous than these four special cases Prost mentions. It would be interesting to see which tones our other LML nouns have in Prost's findings, but there is no wordlist in his *Essai*.

2nd syll.→ / 1st syll. ↓	H	M	L
H	H.H (48) *kʉ.rʉ* age group *kʊ.rʊ* albatross *wi.ri* hunchback	H.M (1) *wɪ.rɛ* gazelle	H.L (4) *ga.nɪ* world *sɪ.ra* tobacco
M		M.M (5) *ba.sɪ* mead *kɪ.wɪ* cymbal	M.L (36) *kɪ.bɪ* wing *kʊ.rʊ* canoe *wʉ.rʉ* navel *wʊ.rʊ* liver
L	L.H (28) *wi.ri* hyena *wɪ.rɪ* light *wʉ.rʉ* hole	L.M (24) *ba.sɪ* couscous *bo.li* village entry *kʉ.rʉ* pardon	L.L (52) *bo.li* goitre *kɪ.bɪ* peel *kʊ.rʊ* elephant *sɪ.rɪ* leftovers *wʉ.rʉ* day *wʊ.rʊ* sound
LM			LM.L (9) *ja.nɪ* reception room *wʊ.rʊ* dog

Table 4a. Tone melodies on CVCV nouns (207 in total).

2nd tone → / 1st tone ↓	H	M	L
H	HH (30) *kuu* reason *sii* cord *tou* parrot *tuu* forest *wu* limit		
M		MM (23) *kuu* lower back *tu* smoke *tun* tomb *tɔv* tamarind *tvɔ* place	ML (26) *tvv* name *wu* village
L	LH (23) *kuu* river *tii* thigh *tun* co-wife	LM (19) *kvv* five (Num.) *sii* race *tun* scorpion *tvv* partridge	LL (22) *kuu* debt *sii* nest *tiin* shrub *tuon* blood
LM			LML (10) *kuu* varan *tou* gnu

Table 4b. Tone melodies on CVV nouns (153 in total).

2nd tone → / 1st tone ↓	H	M	L
H	HH (10) *gbɔŋ* enclosure for cattle *sɔŋ* agriculture *tɔŋ* association		
M		MM (2) *kɔŋ* granary *tɔŋ* palm rat	ML (5) *bɔŋ* bamboo *sɔŋ* thorn
L	LH (3) *dɛŋ* neighbour *suŋ* man	LM (2) *paŋ* force *sɔŋ* vice	LL (10) *ɲaŋ* cow *puŋ* odour
LM			LML (2) *mɔŋ* mango tree *gbɔŋ* cobra

Table 4c. Tone melodies on CVC nouns (34 in total).

If we add up the numbers for the CVCV, CVV and CVC nouns, the following number of occurrences are found for the different tone patterns:

2nd syll.→ / 1st syll. ↓	H	M	L
H	HH 88 (22%)	HM 1 (<1%)	HL 4 (1%)
M		MM 30 (8%)	ML 67 (17%)
L	LH 54 (14%)	LM 45 (11%)	LL 84 (21%)
LM			LML 21 (5%)

Table 5. Tone melodies on CVCV, CVV and CVC nouns, accumulated (394 in total).

From the tables we can see that LH, LM and LL patterns are well represented. It is interesting to see the distribution of the remaining melodies. MM and ML patterns are well represented, but the MH pattern is absent. On the other hand, HM and HL patterns are rare, whereas the HH pattern is well represented. One could almost be

tempted to collapse the groups starting with a M tone and the groups starting with a H tone to make the picture more balanced.

David Dwyer, in his article on tone splitting in Bobo (1994), suggests that the present-day three tone system in Bobo Madare South has developed from an originally two tone system. He shows that an original H tone split into a M and a H tone. Even though Bobo Madare South and Bobo Madare North are quite different in tone and other aspects (Prost 1983:3[24] and personal observation), a glance at the above table suggests that the development from two into three tones, and more specifically the split from a H into a M and a H tone, might be a plausible one for Bobo Madare North too. Dwyer writes that nouns in compounds "show that the initial [noun] element of such compounds displays the more restricted range of tonal variation found in pronouns and verb stems: (M)M, LM and (L)L, while the corresponding citation forms show a wider range of tonal types" (Dwyer 1994:38). From the section on tone in morphologically complex nouns it is clear that comparable observations can be made about Bobo Madare North. Dwyer continues: "The derivation of these new tonal types from an underlying two tone system is not at all straightforward; that is, given the tonal pattern of the first element of the compound (which I take to be the most basic form), one cannot predict the tonal pattern of its citation form" (1994:39). I venture that this statement is equally valid for Bobo Madare North.

The LML pattern seems to be an odd one out, but there are too many nouns of this melody (5%) in all three word structures (CVCV, CVV and CVC) to brush them aside as exceptions. More research on this is needed.

5.3. Tone in morphologically complex nouns

In this section, I will successively treat processes like inflection (pluralisation), compounding and derivation. For some processes (specifically: adding *-nv*, *-sina/-saa*) it is hard to say whether we are dealing with compounding or derivation. For instance, when the independent noun *nvv* LML 'child' is added to a noun, it can either denote a young (e.g. of an animal) or a fruit (e.g. of a tree), or it can denote a unit of a larger (sometimes non-count) entity (e.g. denoting a grain of sesame

[24] "Lexicalement, ces dialectes sont très semblables, bien qu'il y ait un contingent de termes particuliers à chacun. Grammaticalement, on peut considérer que le dialecte nord a été altéré par rapport à celui du sud. La plus grande différence porte sur la tonologie."

instead of sesame seed in general), depending on the meaning of the noun to which it attaches. Its form becomes short: *-nv*, and its tone changes to ML. It is hard to say whether the attached *-nv* should still be considered as a noun and thus we are dealing with compounding, or whether it has become a suffix and we are dealing with derivation.[25] Of course this question does not prevent us from investigating the tonal processes that take place.

To keep things as simple as possible, we tried to limit the examination to CVCV nouns. Where there were too few of these, we also investigated CVV and CVC nouns.

Prost (1983:18) makes a general statement that compound forms have particular tones, different from the ones of their components.[26] He says no more about it than that. In the subsequent paragraphs I will describe these 'particular tones' in more detail, first for pluralisation, then for compounding and derivation.

5.3.1. *Pluralisation*

Tone on plural forms was researched for the Mafouné dialect only.

Pluralisation in Bobo Madare North is not straightforward. Whereas in other Mande languages the plural is often formed by simply adding a suffix, in Bobo Madare North there are several ways to form plurals.

One way is by adding a low tone suffix -rV (allomorphs -NV, -lV, -dV),[27] which shows ATR vowel harmony with the other vowels in the word. In some cases there is a long vowel at the end of the word. This might well be a reduction of the above mentioned plural suffix, as both Morse and Prost suggests for Bobo Madare South (Morse:162, Prost 1981:25). Another common strategy is vowel change, in which for CVCV nouns either both or just the last vowel of the word may change. In these cases the lexical tone of the singular noun is retained. Some words undergo vowel

[25] Morse ranges all the morphemes that are treated in this section as suffixes. She adds that neither inflectional nor derivational suffixes can stand on their own in normal speech (1976:132). This is different from Bobo Madare North in which *-nv*, *-sina/-saa* and *diri* can stand on their own.

[26] "Le composé a son identité propre et ses tonèmes particuliers, différents de ceux de ses composants." (Prost 1983:18)

[27] A rough count in the database shows that in the case of suffixation, *-rV* is used in almost 70%, *-NV* in almost 20% (following a nasalised syllable), *-lV* and *-dV* are accounted for more or less evenly in the rest of the words. As for the following vowel, about 58% consists of −ATR front vowels (*ɪ* or *ɛ*). About 35% of the remaining vowels are more or less evenly divided between *e*, *o* and *a*. *i* and *ɔ* rarely occur and *ʊ* and *u* have not been attested at all in plural endings in our database.

change as well as suffixation. Incidentally two different plural forms exist for one singular form.[28]

Neither the syllable shape of the singular word nor the vowels or consonants which form the singular, nor the tone give any indication as to what pluralisation strategy will be used: it is lexically determined.[29] Below are some examples of the various strategies.

Some examples of plurals formed by suffixation:

(15)	Singular	Plural	Gloss
	kuo	*kuo-ro*	court yard
	kɪ.wɪ	*kɪ.wɪ-dɛ*	cymbal
	kɪ.bɛ	*kɪ.bɛ-lɛ/kɪ.bɛ-rɛ*	side
	yie	*yie-re*	in-law
	ɲɯ	*ɲɯ-na*	chameleon

Some examples of plurals formed by vowel change:

(16)	Singular	Plural	Gloss
	bi.ri	*bi.re*	trace
	kʊ.rʊ	*kɔɔ*	albatross
	di.ni	*da.nɪ*	hill

Some examples of plurals formed by suffixation as well as by vowel change:

(17)	Singular	Plural	Gloss
	ko.li	*kʊɔ-lɪ*	hole
	gba.rɪ	*gbɛ.rɛ-ɛ*	leper
	ɲaŋ	*ɲɛ.ŋɛ-ɛ*	cow

The tables below show the plural melodies for the different tone groups. Table 6 gives the tonal melodies for pluralisation formed by suffixation, table 7 gives the tonal melodies for pluralisation formed by vowel change. After this overview an explanation of the tonal processes follows.

[28] Morse (Morse:167) further mentions pluralisation through tone change only. So far, this strategy has not been attested in our Bobo Madare North data.

[29] Dienst (2004:8) finds the same for Bobo Madare South: “Welches der verschiedenen Pluralbildungsmuster zur Anwendung kommt, ist lexikalisch determiniert, …”

Lexical tone of the sg. noun		Plural formed by suffixation	Mafouné and Tansila	Gloss
pɛ.lɪ	HH	*pɛ.lɛ-ɛ*	H.H-L	upper arm
ɲɪ.mɪ	HH	*ɲɪ.mɪ-nɛ*	H.H-HL	scorpion
wɪ.rɛ	HM	*wɪ.rɛ-rɛɛ*	H.H-LL	gazelle
sɪ.ra	HL	*sɪ.rɛ-ɛ*	H.H-L	tobacco
kɪ.wɪ	MM	*kɪ.wɪ-dɛ*	M.M-L	cymbal
ba.sɪ	MM	*ba.sɪ-ɛɛ*	M.M-ML	mead
kɪ.bɪ	ML	*kɪ.bɛ-lɛ*	M.M.ML	side
bɪ.rɪ	ML	*bɪ.rɛ-ɛ/bɪ.rɪ-rɛ*	M.M-ML	language
ku.bu	ML	*ku.bu-o*	M.M-ML	camp
li.re	LH	*li.re-e*	L.H-L[30]	brother/sister
da.tu	LH	*da.tu-o*	L.H-L	spice
ko.ri	LM	*ko.ro-o*	L.M-L	mask
ja.mɪ	LM	*ja.mɛ-ɛ*	L.M-L	name
kɪ.kɪ	LL	*kɪ.kɪ-rɛ*	L.L-xL	weevil
bɛ.lɪ	LL	*bɛ.lɛ-ɛ*	L.L-xL	back
ja.nɪ	LM.L	*ja.nɛ-ɛ*	L.M-L	livingroom
sɔ.gɪ	LM.L	*sɔ.gv-rɔ*	L.M-L	agric. instrument

Table 6. Melodies for plurals formed by suffixation.

[30] There is one exception in the LH tone group: *ko.li* LH 'hole', plural: *kvɔ-lɪ* LL-H, has an aberrant melody.

Lexical tone of the sg. noun		Plural formed by vowel change	Mafouné and Tansila	Gloss
kv.rv	HH	*kɔɔ*	HH	albatross
tou	HH	*tɑa*	HH	parrot
du.ru	HH	*dɪ.ra*	H.H	well
	HM	-	-	-
	HL	-	-	-
	MM	-	-	-
wu.ru	ML	*wu.ro*	M.L	navel
kv.rv	ML	*kɔɔ*	ML	canoe
kv.bv	LH	*ka.ba*	L.H	large calabash
pɪ.rɪ	LH	*pɛɛ*	LH	silk-cotton tree
	LM	-	-	-
ki.li	LL	*ki.le*	L.L	chest
sii	LL	*sie*	LL	gall bladder
tv.rv	LL	*tɔɔ*	LxL	type of spice
yɪ.lɪ	LM.L	*yɪ.la*	LM.L	crocodile

Table 7. Melodies for plurals formed by vowel change.

From the tables above it can be seen that when a plural suffix is added or when the plural ends in a long vowel (assumed to be the reduced form of a suffix), the tone on the suffix is L when the final tone on the singular noun is not L. The distribution of the resulting melody on the plural noun is not always the same: sometimes it is realised as a glide on the suffix, sometimes the suffix has a level L tone. When the melody on the word is a level LL tone the tone on the suffix drops to xL. In most cases the noun keeps its lexical tone. Exceptions are the HM, HL and ML tone groups where the tone on the first syllable of the noun spreads to the whole noun.

I conclude that the plural suffix has a lexical L tone and that by default it simply attaches itself to the singular noun. As for the varying distribution of the tones on the plural forms, I have no explanation. If we compare the plurals of the HH tone group, we see that *pɛ.lɛ-ɛ* 'upper arm-PL' (reduced suffix) has a H.H-L pattern (level tone on suffix), whereas *ɲɪ.mɪ-nɛ* 'scorpion-PL' (full suffix) has a H.H-HL pattern (glide on suffix). Clearly, syllable pattern cannot explain the difference in

distribution, since in the MM group they are the reverse: *kɩ.wɩ-dɛ* ‘cymbal-PL’ (full suffix) gets a M.M-L pattern (level tone on suffix) whereas *ba.sɩ-ɛɛ* ‘mead-PL’ (reduced suffix) gets a M.M-ML pattern (glide on suffix). Neither does consonant or vowel quality seem to explain the variation.

Another phenomenon that cannot be explained is the tone spreading on the HM, HL and ML nouns. For the HM and HL groups, only one noun was available for pluralisation, which is a very narrow base to draw conclusions on. For the ML tone group however, a total of 11 nouns was included. More research on this would be useful.

Plurals which are formed by vowel change keep the same tone patterns as the singular noun, except for CV_iV_i singular LL nouns, which have a CV_jV_j plural. These plurals get a LxL melody. CV_iV_j plurals have LL tone on the plural form.

5.3.2. Compounding and derivation

We looked at a number of reasonably productive forms of compounding and derivation, namely the addition of *-nv* ML ‘child, fruit, unit’, *-sini/-saa* ML ‘male, female’, *-lV* M (H in Tansila) ‘diminutive’, *-diri* HH ‘lack of …, shortage of …’ and *-pɩ* HH ‘…-ness, state of …, fact of being …’. Section 5.3.2.1 introduces the different morphemes, saying something about the meaning of the resulting noun. Section 5.3.2.2 shows that compounds and derivations with these morphemes are generally formed by adding the morhpheme to the plural form of the noun. Section 5.3.2.3 gives some examples of the various compounds and derivations. Section 5.3.2.4 discusses the tone processes which play a role in compounding and derivation. We will see that the noun receives a level tone while the added morpheme keeps it own tone. The rules will be illustrated with examples later on in the same section. All of this will be followed in section 5.3.2.5 by tables showing the tone patterns for the compounds and derivations.

5.3.2.1. The different morphemes and their meaning

Nvv (pl. *nama*) ‘child, fruit’ exists as an independent noun. Its lexical tone is LML. When the word attaches to another noun to form a compound, its vowel becomes short: *-nv*. Its tone becomes ML. In a compound, *-nv* can either mean ‘child’, ‘young’

(of animal), ‘fruit’ or ‘unit’. The latter meaning is often used to individualise non-count nouns or things that can be counted but are generally not.[31]

In Tansila the form for ‘male’ (of an animal) is *sina*, whereas in Mafouné it is *sini* (pl. *sine*). For both locations, the form for ‘female’ (of an animal) is *saa* (pl. *sɛɛ*). In Tansila the forms *sina* and *saa* can be used as independent nouns. As such, *sina* and *saa* have LL tone:

(18) *À* *sìnà/sàà* *yɔ̄ɔ̀* *saga*
Art male/female go.PFT bush
‘the male/female has disappeared into the bush’.

In Mafouné *-sini/-saa* cannot be used independently, they are always attached to a noun indicating an animal. When used in compounding/derivation, *sini/saa* have ML tone.

Diri (pl. *darɪ*) ‘lack, shortage’ exists as an independent noun. Its lexical tone is HH.

In contrast with the morphemes *-nv*, *-sini/-saa*, and *diri*, the diminutive *-lV* is clearly an affix: it does not exist on its own. According to Morse (1976:156), apart from diminutivity, the affix can also indicate singularity. I have not yet noticed this use of *-lV* in Bobo Madare North.

Like *-lV*, *-pɪ* is clearly an affix: it does not exist on its own. It is a nominalising affix, which can be attached to nouns as well as verbs, adjectives, numerals and possibly other lexical categories as well. Its meaning is not always easy to describe. *Dagɪpɪ* (based on *dɪgɪ* ‘feather’) may indicate the usefulness of a particular feather for certain purposes, e.g. cleaning ones ears, as not all feathers are equally good for that. *Magɪpɪ* (based on *mugu* ‘hare’) indicates that someone is clever like a hare or can run as fast as a hare.

[31] The equivalent of *-nv* in Bobo Madare South is *-nõ*. Dienst mentions a tonal difference between *-nō̄*, mid tone, in the sense of ‘child, young, fruit’ and *-nṍ*, high tone, in the sense of ‘unit’ (Dienst 2004:12). We researched these two senses separately, but did not find a similar difference for Bobo Madare North. Neither Dienst nor Morse describes what happens to the overall tone pattern of the compound word.

5.3.2.2. Formation of the compound/derivation

Generally, the morphemes just mentioned attach to the plural form of the noun. Sometimes they attach to the short root form of the noun. *-Nv* is often seen to attach to the singular form.

Morse mentions the same for Bobo Madare South (p. 150). She writes that "[w]hile the terms 'singular' and 'plural' are used for simplicity and convenience, the meaning here is much more than just number. The singular form of a noun also indicates the idea of particular, specific or one-ness. The plural form also includes the idea of generic or indefinite." She continues that the "suffix is always added to the plural form of a noun (where one exists) even though the plurality of number is not part of the meaning" (p. 160). In a footnote she mentions that "[c]omparisons with cognate languages seem to indicate that the plural form of the noun is the base form and the singular form the derived form" (p. 165), although she does not mention on which cognate languages she bases this statement. It may well be that in Bobo Madare North too the plural form is the base form of the noun.

The suffix vowel of the diminutive suffix *-lV* harmonises with the noun it attaches to, along both an +/−ATR and a front/back division. Front +ATR vowels are followed by *-le*, back +ATR vowels are followed by *-lo*, front −ATR vowels are followed by *-lɛ*, back −ATR vowels are followed by *-lɔ*, nouns which contain an [a] are followed by *-la*. In our data, if there are other vowels besides [a] in the noun and the noun is followed by *-la*, the noun's vowels are all −ATR. When the final syllable contains a nasal consonant (either a CV(V) syllable starting with a nasal or a CVC syllable) the affix consonant [*l*] assimilates to [*n*], thus the noun is followed by *-nV*. Occasionally, the diminutive forms for Mafouné and Tansila are based on different forms of the noun (see examples below).

Unlike in *-lV*, the vowel of the suffix *-pɪ* '…-ness, state of …, fact of being …' remains unchanged.

In order to not overly complicate the research, we restricted ourselves to investigating compounding and derivation on the basis of plural forms which are formed by vowel change only. These plurals do not undergo a tone change to mark the plural: they retain the lexical tone of the singular form. We excluded the plurals which are formed by suffixation to avoid the interference of the plural suffix tone. We strived to use CVCV and CVV plural forms where possible. In a few cases the

CVCV plurals were reduced to their short bound form. Where there were too few CVCV and CVV items available, we included these short forms in our research.

5.3.2.3. Examples of the various compounds and derivations

Compounding with *nv*:

Examples of *–nv* attached to CVCV plurals:

(19)	*tɪgɪ*	(pl. *tagɪ*)	‘pig’	*tagɪ-nv*	(pl. *tagɪ-nama*)	‘piglet’
	foli	(pl. *foloo*)	‘sesame’	*foli-nv*	(pl. *foli-nama*)	‘grain of sesame seed’

In some cases the compound form is lexicalised into a different meaning:

(20)	*kvrv*	(pl. *kɔɔ*)	‘door’	*kɔɔ-nv*	(pl. *kɔɔ-nama*)	‘door key’

Compounding with *sini/saa*:

Examples of *–sini/saa* attached to CVCV and CVV plurals:

(21)	*tɪgɪ*	(pl. *tagɪ*)	‘pig’	*tagɪ-sini*	‘boar’	*tagɪ-saa*	‘sow’
	tou	(pl. *tɪa*)	‘parrot’	*tɪa-sini*	‘male parrot’	*tɪa-saa*	‘female parrot’

Example of *–sini/saa* attached to a short form:

(22)	*wvrv*	(pl. *wvra*)	‘dog’	*wv-sini*	‘male dog’	*wv-saa*	‘bitch’

Derivation with *-lV*:

Examples of *-lV* attached to CVCV plurals:

(23)	*furu*	(pl. *furo*)	‘field’	*furo-lo*	‘small field’
	firi	(pl. *fire*)	‘exit’	*fire-le*	‘small exit’
	dibi	(pl. *dɔgɪ*)	‘rock’	*dɔgɪ-lɔ*	‘small rock’
	dɪgɪ	(pl. *dagɪ*)	‘feather’	*dagɪ-lɛ*	‘small feather’
	svrv	(pl. *sɪra*)	‘arm’	*sɪra-la*	‘small arm’

Example of *-nV* attached to a CVCV plural:

(24)	*dvvn*	(pl. *dvma*)	‘plastic bag’	*dvma-na*	‘small plastic bag’

Examples of *-lV* attached to short forms:

(25)	*fii*	(pl. *fire*)	'termite hill'	*fi-le*	'small termite hill'
	jɔŋ	(pl. *janɪ*)	'roof'	*ja-na*	'small roof'

Example of different forms for Mafouné (M.) and Tansila (T.):

(26)	*yɪɪ*	(pl. *yɪra*)	'sand'	*yɪ-lɛ* (M.)*/yɪra-la* (T.)	'small (amt. of) sand'

Compounding with *diri*:

Examples of *diri* attached to CVCV and CVV plurals:

(27)	*siri*	(pl. *sarɪ*)	'paddle'	*sarɪ-diri*	'lack of a paddle'
	yɪɪ	(pl. *yɪra*)	'sand'	*yɪra-diri*	'lack of sand'
	sou	(pl. *sɪa*)	'cooking-pot'	*sɪa-diri*	'lack of a cooking-pot'

Examples of *diri* attached to a short form:

(28)	*wʋrʋ*	(pl. *wʋra*)	'dog'	*wʋ-diri*	'lack of a dog
	daa	(pl. *daarɪ*)	'leaf'	*da-diri*	'lack of leaves'

In a few cases the compound has lexicalised into a different meaning :

(29)	*kuu*	(pl. *kuro*)	'lower back'	*ku-diri*	'back-ache'

Derivation with *-pɪ*:[32]

Example of *–pɪ* attached to a CVCV plural:

(30)	*bugɪ*	(pl. *bagɪ*)	'deaf person'	*bagɪ-pɪ*	'deafness'

Example of *-pɪ* attached to a short form:

(31)	*ɲaa*	(pl. *ɲaanɪ*)	'woman'	*ɲa-pɪ*	'femininity'

[32] Examples of *-pɪ* attached to other lexical categories:

mʋrʋ	*mʋrʋ-na-pɪ*	'compassion'
love (V)	love-PART--ness	
banɪban	*banɪban-pɪ*	'poverty'
poor (Adj)	poor—ness	
taalɪ	*sa-talɪ-pɪ / sɔ-talɪ-pɪ*	'uniqueness'
one (Num)	man-one--ness	

5.3.2.4. Tone processes in compounding and derivation

The general tone rules for compounding and derivation in Bobo Madare North that have been found in our research are as follows:

1. N_1 receives a level tone. Whether this level tone is H, M or L depends both on the lexical tone of N_1 and on the lexical tone of the noun or suffix following it. The specifications according to which the tones are assigned are schematically represented in the table below and explained verbally in rules 1a-c:

Rule	N_1 starts with	N_2/suffix starts with	Entire N_1 becomes
1a	H/M/L	H	H/M/L
1b	H/M	M/L	M
1c	L	M/L	L

Table 8. Overview of tone changes in compounding and derivation.

1a. When a noun is followed by a noun or suffix (of) which (the first syllable) has lexical H tone, the tone of the first syllable of N_1 spreads to the entire N_1.

1b. When a noun is followed by a noun or suffix (of) which (the first syllable) has lexical M or L tone, and the first syllable of N_1 is H or M, the tones of the entire N_1 are replaced by M tones.

1c. When a noun is followed by a noun or suffix (of) which (the first syllable) has lexical M or L tone, and the first syllable of N_1 is L, this L spreads to the entire N_1.

2. Following a noun of which the final lexical tone is L, a H tone N_2 or a H tone nominalising suffix undergoes downstep.

Rule 1 needs a few qualifying remarks. Whether rule 1a pertains to the tone on the entire N_2 and suffix or only to the tone on its first syllable is a matter for further research. The reason for this is that we have not investigated compounds in which the N_2 or the suffix has HL or HM tone. Further, compounds with an attached LH, LM, LL and LML N_2 or suffix were not included in this research. Therefore the inclusion of these in rules 1b and 1c has the status of a hypothesis.

I will now explain the rules with some examples. These will be followed by tables showing the tone patterns for the various compounds and derivations. The

tables will bring to light some exceptions as well as some differences between Mafouné and Tansila.

Exemplification of rule 1:

When a noun is followed by a noun or suffix (of) which (the first syllable) has lexical H tone (such as *diri* or *-pɪ*) tone rule 1a applies:

(32) M.L + H.H → M.M (L) H.H (intermediate form)

| |		| |	→	|\ ǂ	| |
dɔ.gɪ	+	*di.ri*	→	*dɔ.gɪ*	*di.ri*
rock.PL	+	lack of		rock.PL	lack of

After this, rule 2 causes a downstep on *diri* (see below).

When the first noun starts with H or a M tone and is followed by a noun or suffix (of) which (the first syllable) has lexical M or L tone (such as *-nʊ*, *-sini/-saa* and *-lV*) tone rule 1b applies:

(33) H.H + M.L → H.H + M.L → surface form: M.M-M.L

| |		| |	→	ǂ ǂ		| |	→		| | | |
kpɪ.ra	+	*si.ni*	→	*kpɪ.ra*	+	*si.ni*	→		*kpɪ.ra-si.ni*
tortoise		male							male tortoise

When the first noun starts with L tone and is followed by a noun or suffix (of) which (the first syllable) has lexical M or L tone (such as *-nʊ*, *-sini/-saa* and *-lV*) tone rule 1c applies:

(34) L.H + M.L → L.H + M.L → surface form: L.L-M.L

| |		| |	→	|\ ǂ	| |	→		| | | |
tɛ.nɪ	+	*si.ni*	→	*tɛ.nɪ*	+	*si.ni*	→		*tɛ.nɪ-si.ni*
rat		male							male rat

Exemplification of rule 2:

Diri ('lack of…') and *-pɪ* ('…-ness') have lexical H tone. When they are preceded by a noun which ends in a L tone, their H tone is downstepped:

(35) M.L + H.H → M.L - ˡH.H → surface form: M.M-ˡH.H

| | | | → | | → | | | |

dɔ.gɪ + *di.ri* → *dɔ.gɪ* - *di.ri* → *dɔ.gɪ-di.ri*

rock.PL lack lack of a rock

Note that for Tansila this results in the surface tone M.M-ˡH.xH as the H.H is realised as H.xH there.

5.3.2.5. Tables showing the tone patterns for the compounds and derivations

This paragraph gives the tables for the various compounds and derivations.

Where tone patterns differ for Mafouné and Tansila the differences are indicated. When there is no difference, the data are put together in the same column.

We tried to limit the research to CVCV nouns to keep the syllable structure as simple as possible. Since compounding and derivation mainly make use of the plural forms of nouns, we excluded the plurals which are formed by suffixation and only used the ones that are formed by vowel change. Where the CVCV plurals were too few in number, we also researched CVV, CVC and even CVCVCV nouns, as well as compounds and derivations with the short CV root. Where necessary, this will be shown in the tables. We found that these other syllable patterns received the same tone melodies as the compounds and derivations based on a CVCV pattern.

The restriction to CVCV plural forms caused us to omit the tone groups HL, HM and LML on the *-lV* derivation. On the *-pɪ* derivation we omited the tone groups HL, HM, MM and LML. For the HL, HM, and MM groups we were unable to find any CVCV plurals at all. However, there would have been enough CVCV nouns in the LML tone group. I have no explanation for why this group was left out.

Figures between brackets indicate the number of examples that were checked for a particular structure.

Any deflection from the tone rules given above, will be addressed after the tables.

Table 9 below gives an overview of the tones found on CVCV nouns plus ***-nʊ***.

Lexical tone of the sg. noun		+ *-nʊ* (ML)	Mafouné and Tansila		Gloss
fo.li	HH	*fo.li-nʊ*	M.M-ML	(11)	sesame
wɪ.rɛ	HM	*wɪ.rɛ-nʊ*	M.M-ML	(1)	gazelle
ji.na	HL	*ji.na-nʊ*	M.M-ML	(3)	spirit, demon
gbu.nu	MM	*gbu.nu-nʊ*	M.M-ML	(14)	lion
dɪ.gɪ	ML	*da.gɪ-nʊ*	M.M-ML	(18)	feather
wi.ri AND	LH	*wi.ri-nʊ*	L.L-ML	(10 out of 15)	hyena
da.tu	LH	*da.tu-nʊ*	L.M-ML	(5 out of 15)	spice
ko.ri AND	LM	*ko.ri-nʊ*	L.L-ML	(7 out of 11)	mask
ba.sɪ	LM	*ba.sɪ-nʊ*	L.M-ML	(4 out of 11)	couscous
mugu	LL	*ma.gɪ-nʊ*	L.L-ML	(15)	rabbit
yɪ.lɪ AND	LM.L	*yɪ.la-nʊ*	L.L-ML	(3 out of 6)	crocodile
wʊ.rʊ	LM.L	*wʊ.ra-nʊ*	L.M-ML	(3 out of 6)	dog

Table 9. Tone patterns on CVCV nouns plus *-nʊ*.

We also investigated tone patterns on CVV, CV (short form) and CVCVCV nouns. These are the same as for CVCV nouns plus *-nʊ*. Some examples:

(36) *pʊ.rʊ* ML *pɔɔ-nʊ* M.M-ML ‘gravel’
kpii LH *kpi-nʊ* L-ML ‘dove’
wa.la.lɪ MMM *walalɪ-nʊ* M.M.M-ML ‘tamarind’

It can be observed that when the noun to which *-nv* attaches itself has a modulated melody *and* starts with a L tone (i.e. the LM, LH and LML groups), the noun becomes LM instead of LL in about a third of the cases, followed by the usual ML tone for *-nv*. This happens too often to simply discard these cases as 'exceptions'. The nouns which show this different tone pattern are found both among compounds with the 'child, young, fruit' sense and the 'unit' sense. Neither the syllable structure of the singular or plural noun, nor the phonological segments, nor the sense of *-nv* can explain the different tonal patterns. According to Snider (non-published work, Ch.1, p. 12), in such cases the words must have different underlying tones, since their surface pitches are different in comparable environments. More research is needed.

Table 10 below gives an overview of the tones found on CVCV, CVV and CV noun forms plus ***-sini/-saa***. The melodies for *-sini* are the same as those for *-saa.*[33] There are no exceptions in the melodies with *–sini/-saa.*

[33] In January 2013 the plural forms *-sine* 'males' and *-sɛɛ* 'females' were researched for the Mafouné dialect. It was found that the singular *-sini* and *-saa* and the plural *-sine* and *-sɛɛ* invoked the same tone patterns on the nouns. In January 2014 we only worked with the singular forms for both dialects.

Lexical tone of the sg. noun	+ *-sini /-saa* (ML)	Maf. and Tans. CVCV/CVV	Maf. and Tans. CV	Gloss
kpɪ.ra HH	*kpɪ.ra-si.ni*	M.M-M.L[34] (4)	-	tortoise
wɪ.rɛ HM	*wɪ.rɛ-si.ni*	M.M-M.L (1)	-	gazelle
HL	-	-	-	
gbu.nu MM	*gbu.nu-si.ni*	M.M-M.L (1)	-	lion
bi.ni ML	*bi.ni-si.ni*	M.M-M.L (2)		duck
-	*na-saa*[35]		M-ML (1)	chicken
tɛ.nɪ LH	*tɛ.nɪ-si.ni*	L.L-M.L (2)		type of rat
kpii LH	*kpi-si.ni*		L-M.L[36] (2)	dove
tvv LM	*tv-si.ni*	-	L-M.L (1)	partridge
tɪ.gɪ LL	*ta.gɪ-si.ni*	L.L-M.L (7)		pig
suo LL	*so-si.ni*		L-M.L (1)	cheval
yɪ.lɪ LML	*yɪ.la-si.ni*	L.L-M.L (1)		crocodile
wv.rv LML	*wv-si.ni*		L-M.L (2)	dog

Table 10. Tone patterns on CVCV nouns plus *-sini/-saa*.

Tables 11a and b below gives an overview of the tones found on noun plus ***-lV***. The melodies for Tansila are slightly different from those for Mafouné. Table 11a shows the CVCV plural forms + *-lV*, table 11b shows the short CV form + *-lV*.

[34] There is one exception: *sɪ.gɪ* 'chèvre' > *sa.gɪ-si.ni/sa.gɪ-saa* is L.L-M.L.

[35] **nasina* 'male chicken' does not exist in Tansila. The word *kokori* 'rooster' is used instead. In Mafouné the word *nasini* **is** used, but its tonal melody is different from the other nouns of the ML tone group. Whereas the general pattern is M-M.L, for *na-si.ni* it is H-H.H. The word *na-saa* 'female chicken, hen' follows the general M-ML tone melody.

[36] Mafouné uses *sɪn-si.ni/sɪn-saa* for 'male/female rat'. Its tonal melody is L-M.L, in accordance with what is found in the other syllable structures. In Tansila *sɪ.na-sina/sɪ.na-saa* is used, with a different melody: LL.M-ML.

Lexical tone of the sg. noun		CVCV form + *-lV*	Mafouné (*-lV* is M)	Tansila (*-lV* is H)	Gloss
dvvn	HH	*dv.ma-na* (15)	M.M-M	M.M-H	plastic bag
	HM	-	-	-	-
	HL	-	-	-	-
kvv	MM	*kv.kv-la* (T. only)	-	M.M-H (1)	public square
dɪ.gɪ	ML	*dɛ.gɪ-lɛ* (12)	M.M-M	M.M-MH	feather
kv.bv AND	LH	*kv.ba-la*	L.L-M (2)	L.L-MH (3)	calabash
ŋmɪɪ	LH	*ŋmɪ.na-na*	L.M-M (4)	L.M-H (5)	razor
	LM	-	-	-	
jv.gv	LL	*jv.gɔ-lɔ* (16)	L.L-M	L.L-H	foot

Table 11a. Tone patterns on CVCV nouns plus *-lV*.

Lexical tone of the sg. noun		CV form + *-lV*	Mafouné (*-lV* is M)	Tansila (*-lV* is H)	Gloss
fii	HH	*fi-le* (4)	M-M	M-H	termite hill
kuu	MM	*ku-lo* (2)	M-M	M-H	back
	ML	-	-	-	
paan	LH	*pan-na*	L-M (4)	L-MH (1)	frying pan
svv	LM	*sv-la* (3)	L-M	L-H	road
jɔŋ	LL	*ja-na* (1)	L-M	L-H	roof

Table 11b. Tone patterns on CV forms plus *-lV*.

We see from these tables that apart from the number of syllables, the tone melodies are the same for CVCV and CV noun bases.

We also see that in Mafouné, the affix *-lV* gets a M tone, whereas in Tansila it gets a H tone, with exception of the tone groups ML and LH, where the affix gets an MH tone on CVCV nouns in Tansila. I have no explanation for these differences. Moreover, if the suffix has lexical H tone in Tansila, we would expect the melody for the HH group to be HH-H, according to rule 1a (i.e. when followed by a H tone suffix, the tone of the first syllable of N_1 spreads to the whole N_1), and we would expect the H tone on the suffix to be downstepped following nouns of the ML and LL tone groups, following rule 2 (i.e. downstep following a lexical L tone). Neither of these expectations materialises. This raises questions as to the real underlying tone of the *-lV* suffix in Tansila.

The LH tone group has two different melodies on the diminutives based on a CVCV plural. The division is neatly based on the syllable pattern of the singular noun: in both locations, the CVCV plurals of CVCV singulars get LL tone. The CVCV plural of CVV singulars get LM tone. The affix retains its M, respectively (M)H tone for each separate location. This is reminiscent of what we saw happening when *-nv* attaches to a noun with a modulated melody, starting with a L tone (see p. 46), except that for compounds with *-nv* the singular noun syllable patterns could not explain the difference of the resulting tone melodies. In compounds with *-nv* the differing tone melodies were seen on LM and LML nouns too. Unfortunately, our data for he LM group are limited and the LML group was not researched at all for the diminutive derivation. It would be interesting to see whether these tone groups show a similar division when *-lV* is attached.

Tables 12a and b below give an overview of the tones found on nouns plus ***diri***. The melodies on these compounds are slightly different for Mafouné and Tansila. Table 12a shows the CVCV and CVV plural forms + *diri*, table 12b shows the CVC singular and the short CV form + *diri*.

Lexical tone of the sg. noun		CVCV/CVV form + *diri* (HH)		Mafouné	Tansila	Gloss
duru	HH	*dɪ.ra-di.ri*	(7)	H.H-H.H	H.H-H.xH[37]	well
dvvn	HH	*du.ma-di.ri*	(1)	H.H-H.H	H.H-H.xH	plastic bag
	HM	-		-	-	
	HL	-		-	-	
maa	MM	*maa-di.ri*	(3)	H.H-H.H	M.M-ˈH.xH	hero
di.bi	ML	*dɔ.gɪ-di.ri*	(5)	M.M-ˈH.H	M.M-ˈH.xH	rock
kou	ML	*ka.gɪ-di.ri*	(2)	M.M-ˈH.H	M.M-ˈH.xH	bran
kv.bʊ	LH	*kv.ba-di.ri*	(2)	L.L-H.H	L.L-H.xH	calabash
AND						
yɯ	LH	*yɪ.ra-di.ri*	(3)	L.H-H.H	L.H-H.xH	sand
	LM	-		-	-	
siri	LL	*sa.rɪ-di.ri*	(11)	L.L-ˈH.H	L.L-ˈH.xH	paddle
jɔŋ	LL	*ja.nɪ-di.ri*	(1)	L.L-ˈH.H	L.L-ˈH.xH	roof
yɪ.lɪ	LML	*yɪ.la-di.ri*	(7)	L.L-H.H	L.L-H.xH	crocodile
sou	LML	*sɪa-diri*	(2)	L.L-H.H	L.L-H.xH	cooking-pot

Table 12a. Tone patterns on CVCV and CVV nouns plus *diri*.

[37] There is one exception: *sɪgɪ* 'chèvre' > *sa.gɪ-di.ri* is L.L-HH for both locations.

Lexical tone of the sg. noun		CVC/CV form + diri (HH)		Mafouné	Tansila	Gloss
taŋ	H	*taŋ-di.ri*	(1)	H-H.H	H-H.xH	basket
fii	H	*fi-di.ri*	(1)	H-H.H	H-H.xH	termite hill
daa	MM	*da-di.ri*	(14)	H-H.H	M-ˡH.xH	leaves
paan	LH	*pan-di.ri*	(1)	L-H.H	L-H.xH	frying pan
svv	LM	*sv-di.ri*	(3)	L-H.H	L-H.xH	road
wvrv	LML	*wv-di.ri*	(4)	L-H.H	L-H.xH	dog

Table 12b. Tone patterns on CVC nouns and short forms plus *diri.*

From the tables we see that the overall melody of the compound is the same for all syllable patterns.

The difference between Mafouné and Tansila is to a large extent due to the phonetic realisation of HH. In Tansila this is HxH. When downstepped, following tone rule 2, this results in ˡHH for Mafouné and in ˡHxH for Tansila.

Three exceptions to the general tone rules are found. The first concerns a violation of rule 1b in the MM tone group. According to this rule we would expect a M.M-H.H pattern for Mafouné, but we find H.H-H.H. In Tansila the first noun conforms to rule 1b (i.e. the tones of a M or H tone N_1 are replaced by M tone when N_1 is followed by a M or L tone noun) by becoming M.M, but here we find that the H.xH tone on the attached noun is downstepped to M.H, despite the fact that there does not seem to be a L tone to cause the downstep. I have no explanation for why the words in this tone group behave differently for Mafouné and Tansila nor why they both violate the proposed tone rules. All 17 researched words in this tone group have a CVV syllable pattern on the singular noun as no CVCV or CVC nouns were available. It would be interesting to see if singular nouns with a different syllable pattern result in different tone melodies when *diri* is attached.

Secondly, in the LH group we see a splite between CVCV singular and CVV singular nouns. Compounds based on the CVCV singulars get the expected LL-HH melody, compounds based on the CVV singulars get a LH-HH melody. This is reminiscent of the derivation with *-nv*.

Finally, according to rule 2 we would expect to see a downstep on *diri* in the LML group, caused by the final L tone of the first noun. However, *diri* retains its original HH and HxH tone. More research is necessary to find out why this is so.

Table 13 below gives an overview of the tones found on nouns plus ***-pɪ***. The melodies on these compounds are slightly different for Mafouné and Tansila.

Lexical tone of the sg. noun		CVCV and CV form + *-pɪ* (HH)		Mafouné	Tansila	Gloss
dɯ.ru	H.H	*dɯ.ra-pɪ*	(4)	H.H-HH	H.H-HxH[38]	well
dʊvn	HH	*dʊ.ma-pɪ*	(1)	H.H-HH	H.H-HxH	plastic bag
fii	HH	*fi-pɪ*	(1)	H-HH	H-HxH	termite hill
	HM	-		-	-	-
	HL	-		-	-	-
dɪ.gɪ	M.L	*dɔ.gɪ-pɪ*	(5)	M.M-ˈHH	M.M-ˈHxH	feather
ki.ri	L.H	*ka.rɪ-kʊ.ma-pɪ* (M.)	(1)	L.L-H.H-HH[39]		laziness
		ka.rɪ-pɪ (T.)	(1)		L.L-ˈHxH AND	razor
ŋmɯ	LH	*ŋmɪ.na-pɪ*	(3)	L.H-HH	L.M-ˈHxH	
svʊ	LM	*sʊ-pɪ*	(2)	L-HH	L-LH	road
bu.gu	L.L	*ba.gɪ-pɪ*	(7)	L.L-HH	L.L-HH	deaf person
jɔŋ	LL	*ja.nɪ-pɪ*	(1)	L.L-HH	L.L-HH	roof

Table 13. Tone patterns on CVCV and CV nouns plus *-pi*.

From the table it is clear that *-pɪ* has a HH tone, which is realised as HxH in Tansila.[40]

[38] There is one exception: *sɪ.gɪ* 'chèvre' > *sa.gɪ-pɪ* is L.L-HH in Mafouné and L.L-HxH in Tansila.

[39] karɪ-kʊma-pɪ: laziness.PL-people-state. The lexical tone of *kʊma* is hard to determine.

There are two violations of the tone rules, namely in the LH, LM and LL tone groups. We have seen before that the N_1 in the LH group sometimes splits into a group of nouns getting LL tone, while other nouns get LH or LM tone. The compound based on a CVCV singular noun seems to follow the proposed rules, getting a LL tone. The compounds based on a CVV singular noun form get a LH and LM tone on the noun for Mafouné and Tansila respectively. In Mafouné *-pɪ* retains its lexical HH tone. In Tansila *-pɪ* receives a downstep despite the fact that the final tone on the noun is not L but M. Another interpretation for Tansila might be that the resulting M tone on N_1 is in reality a downstepped H, caused by the L tone of the noun. I would deem this option less likely, since so far I have not seen downstep within a morpheme in the noun system.[41]

Contrary to our expectation based on tone rule 2 the LL group does not show a downstep of *-pɪ*. In Tansila the tone on *-pɪ* in the LM group is LH, and thus totally different from anything we would expect to hear.

The general conclusion from this section is that in compounding and derivation N_1 undergoes tone changes (levelling) through spreading and tone replacement. N_1s starting with a M or H tone get a level M tone, N_1s starting with a L tone get a level L tone. N_2 or the suffix is simply attached to N_1, unless it is preceded by a lexical L tone on the final syllable of N_1 (which may be floating after the tone spreading and replacement) in which case N_2 or the suffix undergoes downstep.

I will now proceed to look at tone in noun phrases, across word boundaries.

5.4. Tone in noun phrases

In this section I investigate tone in a number of definite and possessive noun phrase constructions. Section 5.4.1 treats the noun preceded by the definite article while section 5.4.2 treats the noun preceded by the near and far demonstratives. Section 5.4.3 deals with a type of possessive construction involving the noun 'possessor' while the associative noun plus noun construction is discussed in section 5.4.4.

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[40] The modulated HxH tone on *-pɪ* in Tansila leads me to think that *-pɪ* must be long. DD claims that it is short, "like *-lV*", but that all nouns are 'drawn' word finally. (e-mail communication, 13 April 2016).

[41] In the verb system it was seen in the LM tone group in the PFT and IPFT tense (see p. 24-5).

5.4.1. Definite article + noun

Bobo Madare North has a definite article. It is *a* for singular and *ɪ* for plural. Both have low tone. There is no indefinite article. Data are available for the Mafouné dialect only. See the examples in table 14 below.

Lexical tone of the noun	Singular		Plural		Gloss
HH	*a duːru*	L H.H	*ɪ dɪːra*	L H.H	well
	a pɛːlɪ	L H.H	*ɪ pɛːlɛɛ*	L H.HL	upper arm
HM	-		-		
HL	*a sɪːra*	L H.L	*ɪ sɪːrɛɛ*	L H.HL	tobacco
MM	-		-		
ML	*a wuːru*	L M.L	*ɪ wuːro*	L M.L	navel
	a kɪːbɛ	L M.L	*ɪ kɪːbɛːlɛ*	L M.M.ML	side
LH	-		-		
LM	*a koːri*	L L.M	*ɪ koːroo*	L L.ML	mask
LL	*a kiːli*	L L.L	*ɪ kiːle*	L L.L	chest
	a kɪːkɪ	L L.L	*ɪ kɪːkɪːrɛ*	L L.L.xL	weevil
LML	*a yɪːlɪ*	L LM.L	*ɪ yɪːla*	L LM.L	crocodile
	a sɔgɪ	L LM.L	*ɪ sɔːgʊːrɔ*	L L.M.L	agric. instrument

Table 14. Tone patterns on definite article plus noun.

From the table above it seems that the low tone on the definite article and the lexical tone of the noun do not influence each other, neither in the singular, nor in the plural. The tone changes which happen in pluralisation (see section 5.3.1) are preserved when a definite article is used.

Although automatic downstep is one of the tone processes in Bobo Madare North, and we would therefore expect it to occur here, we did not notice it in these phrases. This may be due to the fact that we have investigated the article + noun construction exclusively in isolation. It needs verification in a phrase in which a H tone precedes the article plus a H tone noun to see whether downstep is happening or not.

5.4.2. Demonstratives agɪ *and* ŋman + *noun*

Bobo Madare North has a number of demonstratives. Some of them can be used independently only, such as *aŋ* 'that' (tone hard to establish), some of them can be used as modifiers as well, like *àgì* 'this'. Prost (1983:23, 24) lists *àɣè* (our *agɪ*), pl. *ɔ̀ɣɔ̀* as modifier and *kɔ́* (pl. *kɔ́rɔ̀*) which can be used both as a modifier and independently. Our language informants mention *kɔɔ* (tone unknown) as plural of *àgì*, which too can be used both as a modifier and independently. Prost further mentions *ŋwón* (only used as a pronoun) and *ŋwàn* (used both as a pronoun and as a modifier). Bearing in mind that Prost writes */ŋw/* for our */ŋm/*, these must correspond to our demonstrative *ŋmán* and the relative pronoun *ŋmàn*.[42]

We researched the tone changes when a noun is combined with the near and far singular demonstratives *àgì* 'this' and *ŋmán* 'that'. We restricted this research to singular CVCV nouns.

The tables 15 and 16 below give an overview of the tones found on the demonstrative plus noun constructions for the various tone groups.

Lexical tone of the noun	*a.gɪ* (LL) + noun	Mafouné	Tansila	Gloss
HH	*a.gɪ tv.gv*	L.L H.H	L.L H.xH	this fire
HM	*a.gɪ wɪ.rɛ*	L.L H.M	L.L H.M	this gazelle
HL	*a.gɪ sɪ.ra*	L.L H.L	L.L H.L	this tobacco
MM	*a.gɪ kɪ.wɪ*	L.L M.M	L.L M.M	this cymbal
ML	*a.gɪ dɪ.gɪ*	L.L M.L	L.L M.L	this feather
LH	*a.gɪ tv.lv*	L.L L.H	L.L L.H	this hill
LM	*a.gɪ kɛ.rɪ*	L.L L.M	L.L L.M	this hammock
LL	*a.gɪ kv.rv*	L.L L.L	L.L L.L	this elephant
LML	*a.gɪ sɛ.nɪ*	L.L LM.L	L.L L.ML	this orphan

Table 15. Tone patterns on the NEAR demonstrative plus noun.

From table 15 it is clear that *agɪ* has L tone, and that the L tone of the demonstrative and the lexical tone of the noun do not seem to influence each other. This is similar to the definite article + noun. As I remarked in the section on the definite article, here too we would expect downstep to occur, but having

[42] Compare*: ŋmán nɔ̄ɔ̀…* 'that child…' and *ŋmàn nɔ̌ɔ̀…* 'the child who…' Data provided by DD, e-mail communication, 13 April 2016.

investigated the demonstrative + noun construction in isolation only, we have no way of telling whether it is or not.

The difference between Mafouné and Tansila in the HH group is due to the phonetically different realisation of HH in Tansila. It is not phonological.

Lexical tone of the noun	*ŋman* (H) + noun	Mafouné	Tansila	Gloss
HH	*ŋman tv.gv*	H H.H	xH H.xH	that fire
HM	*ŋman wɪ.rɛ*	H H.L	H M.L / H H.L[43]	that gazelle
HL	*ŋman sɪ.ra*	H H.L	H H.L	that tobacco
MM	*ŋman kɪ.wɪ*	H H.L	H M.M	that cymbal
ML	*ŋman dɪ.gɪ*	H H.L	H M.L	that feather
LH	*ŋman tv.lv*	xH H.H[44]	xH xH.H	that hill
LM	*ŋman kɛ.rɪ*	H M.M	H H.M	that hammock
LL	*ŋman kv.rv*	H (x)H.L[45]	H xH.L	that elephant
LML	*ŋman sɛ.nɪ*	H M.L	H M.L	that orphan

Table 16. Tone patterns on the FAR demonstrative plus noun.

The table above shows quite a lot of different tone realisations in the *ŋman* + noun construction. It is clear that *ŋman* has a H tone. We see that in Mafouné, the tone on the first syllable of the noun changes to (x)H or M when it is not already H. The second syllable of the noun retains its lexical tone except in the HM and MM tone groups.

My hypothesis about what is happening is as follows: the H tone of *ŋman* spreads to the right, merging with the tone on the first syllable of the noun. Some remarks

[43] DK informed us that this word gets a different tone when it is in isolation and when it is used in a sentence. In isolation its tone is H HL, in a phrase it becomes H ML. This is the only instance where he indicated such a difference. There is a very small number of HM nouns (only one CVCV noun (*wɪrɛ* 'gazelle' and two CV nouns (*kun* [*kŋ̩*] 'market' and *ŋun* [*ŋ̍ŋ̩*] 'oil'). We did not investigate tone patterns on these latter nouns.

[44] Could it be that the tones on *ŋman tvlv* 'that hill' should be H MM instead (and H HM for Tansila)? This would better fit the analysis and would be like the tone patterns found in the N + N construction for the HH + LH tone groups (see p. 66).

[45] According to NC, the tone on *ŋman kvrv* for Mafouné should be H HL. WW and I however heard H xHL.

as to how the tones merge need to be made: a H plus a H tone merge to a H tone; a H plus a M tone also merge to a H tone; a H plus a L tone merge to a M tone. This assumption satisfactorily explains the tone on the first syllable of the noun in all tone groups except LH and LL.

In the LH group we would expect to see a H MH melody, but instead we find an xH HH melody. In view of the fact that MH does not exist as a lexical tone pattern for CVCV words I wonder if there is a general prohibition of MH tone patterns.[46] In the LL group we would expect to see a H ML melody, but instead we find a H (x)HL melody, which I cannot explain.

The process in the LML group may be as follows: the H tone of *ŋman* merges with the initial L tone of the noun to a M tone, which merges with the lexical M tone of the LML noun, thus resulting in a ML tone on the noun.

As for the tone on the second syllable of the noun in the HM and MM tone groups, I cannot explain why they surface as HL melodies following *ŋman*.

In the LH (and possibly LL) tone groups we see H being raised to xH. This may be a local raise rather than an upstep of the whole register. The upstep rule that applies in the verb system, in which two consecutive L tones cause an upstep on a preceding H tone (see p. 21) cannot explain the upstep we see here.

The tones for Tansila cannot be explained to satisfaction by the above hypotheses. Particularly the merging of the H tone with the tone on the first syllable of the noun poses some questions, as well as the cases of upstep.

5.4.3. Tee *and* na tee, *'possessor'*

Tee (pl. *kama*) 'possessor' can be used as an independent noun (for instance: *tee bɔ naa*: 'possessor' 'any' 'come': 'whichever possessor has come'). *Natee* (pl. *nakama*) 'possessor' is found as a noun in the database and used for instance to denote God, as the owner of everything. Nevertheless, *natee* as used in the construction here should be analysed as two words: the noun *tee* preceded by the postposition *na*.

Prost (1983:3), pointing out some of the main differences between Bobo Madare North and Bobo Madare South, claims that unlike in Bobo Madare South and other Mande languages, Bobo Madare North does not differentiate between alienable and inalienable possession. Following a third person singular or plural possessive

[46] There are MH sequences in tables 10a, 10b and 18b, but these might be cases of a run-up to the H tone.

pronoun the particle *kā* is used, but irrespectively of whether there is alienable or inalienable possession.[47] [48]

Our language informants explain that *kā* is used in order to be able to distinguish between the possessive pronoun and the definite article which both have low tone: *à* in the singular and *ì* in the plural. In other words: whereas *á tiri* cannot mean anything else but 'my gourd', *à tiri* could mean either 'the gourd' or 'his/her gourd' and *ì tiri* could mean either 'the gourds' or 'his/her gourds'. When the particle *kā* is used, this ambiguity is removed: *à kā tiri* can only mean 'his/her gourd'. The particle *kā* is indeed used irrespectively of alienable or inalienable possession.

However, we see that when *tee* 'possessor' follows a noun, we do get a kind of alienable/inalienable dichotomy. Body parts, relationships and characteristics (such as for instance laziness) are followed directly by *tee* in an inalienable relationship. Objects in an alienable relationship are followed by *na tee*.

The postposition *na* is a variant form of *ma* which signifies 'on, for, to'.[49] An example of the use of *na* is the following sentence:

(37) *Pɛɛnʋ ti a jubala na.*
cord COP the bag on 'There is a cord on the bag.'[50]

The construction *tiri na tee* means something like 'the possessor on the gourd'.

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[47] "Neutralisation de la différence entre rapports nécessaires (parenté, partie d'un tout) et rapports contractuels. Ceux-ci sont distingués en sia-da (Tounouma) (=Bobo Madare South, CB) par la présence ou non d'une particule d'annexion ka, ce qui est un procédé caractéristique des langues mandé. A Tansila, on trouve cette particule uniquement après les pronoms personnels 3 sg et pl. et cela du reste, quel que soit le rapport entre les deux termes du syntagme. On a ainsi : à kā nōn, son fils, à kā sēgé, sa chêvre - en sia-da on a : à nōn, son fils, à tā sɛgé, sa chêvre, avec les correspondances ta/ka comme particule d'annexion."

[48] Morse (1976:157-8) is not totally unambiguous in her explanation of this issue. She writes that "nouns in Bobo are subject also to a different kind of dichotomy: a. Dependent (inalienable), b. Independent (alienable). […] Mande languages […], where an informant could not say a word such as a body part without making it 'my head', 'my eye', etc. However, this is not the case in Bobo, where the main morphological difference between these two types of nouns is apparent when put into a phrase or construction with a possessor. Alienable possession is formed by juxtaposition of the possessor and the possessed, or by using the possessive particle tà. Inalienable possession employs a different set of possessive pronouns accompanied by tone change in the possessed noun."

[49] Djélé Diarra, e-mail communication, 13 April 2016.

[50] Elicited with the Topological Relations Picture Series, Bowerman and Pederson (1992).

Tee cannot always be translated as ‘possessor’. Between people, as for instance in *you tee* ‘enemy’ ‘possessor’ it may just express the fact that there is a relationship between a person and his enemy rather than someone ‘possessing’ his enemy.

Sometimes the presence or absence of *na* brings about a difference in meaning. For example: *ɲɛŋɛɛ tee* (*ɲɛŋɛɛ* ‘cow.PL’) indicates a boy who herds the cows but doesn’t possess them, whereas *ɲɛŋɛɛ na tee* signals the real owner of the cows. Likewise, *digi tee* (*digi* ‘belly’) indicates someone who has a big belly, or a pregnant woman, while *digi na tee* points to the one who got the woman pregnant.

For Mafouné, both CVCV, CVV and CVC nouns were investigated, although CVV and CVC nouns were checked in small numbers only. For Tansila, only CVCV nouns were researched.

Table 17 below shows the melodies for noun phrases with *tee*. The melodies are somewhat different for Mafouné and Tansila. The figures between brackets indicate the number of CVCV nouns checked.

Lexical tone of the sg. noun		+ *tee* (HL)	Mafouné		Tansila	Gloss 'possessor of …'
di.gi	HH	*di.gi tee*	H.H HL	(7)	H.H xHL	belly
you	HH	*you tee*	HH HL			enemy
	HM	-	-		-	
	HL	-	-		-	
baa	MM	*baa tee*	MM ˈHL		-	abdomen
wu.ru	ML	*wu.ru tee*	M.L ˈHL	(8)	M.M ˈHL	navel
dʋʋ	ML	*dʋʋ tee*	ML ˈHL			mouth
tɔŋ	ML	*tɔŋ tee*	ML ˈHL			father
di.ni	LH	*di.ni tee*	L.H HL	(5)	L.L HL	joint
ŋmɪan	LH	*ŋmɪan tee*	LH HL			hair
dɛŋ	LH	*dɛŋ tee*	LH HL			neighbour
paŋ	LM	*paŋ tee*	LM ˈHL		-	strength
jʋ.gʋ	LL	*jʋ.gʋ tee*	L.L ˈHL	(7)	L.L ˈHL	foot
kuu	LL	*kuu tee*	LL ˈHL			debt
yɪa	LML	*yɪa tee*	LML ML		-	nerve

Table 17. Tone patterns on nouns plus *tee*.

In the construction *N + tee* the tone on N_1 for Mafouné remains unchanged. *Tee* has HL tone when the noun finishes in a H tone. It has ML tone when the noun finishes in a M or L tone.

My hypothesis is that HL is the underlying tone of *tee*. In the juxtaposition of two nouns the tone on the first noun remains unaffected, while the second noun (*tee*) undergoes downstep when the final tone on the first noun is M or L.

The situation in Tansila is slightly different. Unlike in Mafouné, N_1 does undergo some changes. HH tone on a noun is normally realised as HxH in Tansila. In the

construction with *tee* N_1 is changed to HH and *tee* becomes xHL. Furthermore, ML becomes MM and LH becomes LL. The noun in the LL group does not change.

My hypothesis is that, contrary to Mafouné, Tansila has a spreading rule which causes the tone of the first syllable of the noun to spread to its second syllable. The tone of the second syllable of the noun now becomes floating. When this floating tone is an xH tone or a H tone, it merges with the H tone of *tee* and results in an xH and H tone on *tee* respectively. When the floating tone is a M or L tone, it causes *tee* to undergo downstep. The floating H tone of the LH noun in Tansila blocks downstep on *tee.*

I will first illustrate the process for the HH tone group (realised as HxH in Tansila):

(38)

H.xH	+	HL	→	H.xH		HL	→	H.H	(xH)		HL	→	H.H		xH.L								
|	|		||	→	|⋱╪		||	→	|	|	⋱	||	→	|	|		||			
di.gi	+	*tee*	→	*di.gi*		*tee*	→	*di.gi*			*tee*	→	*di.gi*		*tee*								

Here is an illustration of the process for the ML tone group for Mafouné (no spreading), followed by the process as it occurs in Tansila (including spreading):

(39)

M.L	+	HL	→	surface form:	M.L		ˡHL			
|	|	||	→		|	|	||		
wu.ru	+	*tee*	→		*wu.ru*		*tee*			

(40)

M.L	+	HL	→	M.L		HL	→	M.M	(L)		HL	→											
|	|	||	→	|⋱╪		||	→	|	|	⋱	||	→									
wu.ru	+	*tee*	→	*wu.ru*		*tee*	→	*wu.ru*			*tee*	→											

surface form: M.M ˡH.L

|	|	||
wu.ru		*tee*

Finally, an illustration for the blocked downstep in the LH group in Tansila:

(41)

L.H	+	HL	→	L.H		HL	→	L.L	(H)		HL	→											
|	|	||	→	|⋱╪		||	→	|	|		||	→									
di.ni	+	*tee*	→	*di.ni*		*tee*	→	*di.ni*			*tee*	→											

surface form: L.L HL

| | | |

di.ni *tee*

Table 18 below shows the melodies for noun phrases with *na tee*. The melodies are somewhat different for Mafouné and Tansila.

Lexical tone of the sg. noun		+ *na tee* (L HL)	Mafouné	Tansila	Gloss ‘owner of …’
du.ru	HH	*du.ru na tee*	H.H M ˈHL (10)	H.H xH ˈHL	well
paa	HH	*paa na tee*	HH M ˈHL		pool
wɪ.rɛ	HM	*wɪ.rɛ na tee*	H.M L ˈHL (1)	M.M L ˈHL	gazelle
sɪ.ra	HL	*sɪ.ra na tee*	H.L L ˈHL (2)	H.H L ˈHL	tobacco
ba.sɪ	MM	*ba.sɪ na tee*	M.M L ˈHL (6)	M.M L ˈHL	mead
tɪɪn	MM	*tɪɪn na tee*	MM M ˈHL		tomb
kɔŋ	MM	*kɔŋ na tee*	MM M ˈHL		granary
fɔ.gɪ	ML	*fɔ.gɪ na tee*	M.L L ˈHL (10)	M.M L ˈHL	flour
kpɪa	ML	*kpɪa na tee*	ML L ˈHL		toad
bɔŋ	ML	*bɔŋ na tee*	ML L ˈHL		palm nut
kʋ.bʋ	LH	*kʋ.bʋ na tee*	L.H L ˈHL (10)	L.L H ˈHL (8) AND L.M H ˈHL (2)	large calabash
kɪan	LH	*kɪan na tee*	LH M ˈHL		residue
sɔŋ	LH	*sɔŋ na tee*	LH M ˈHL		man
kɛ.rɪ	LM	*kɛ.rɪ na tee*	L.M L ˈHL (10)	L.L M ˈHL (6) AND	hammock
bɯɯ	LM	*bɯɯ na tee*	LM L ˈHL	L.M L ˈHL (4)	hut
ti.ri	LL	*ti.ri na tee*	L.L L ˈHL (10)	L.L L ˈHL	gourd
tiin	LL	*tiin na tee*	LL L ˈHL		shrub
wʋ.rʋ	LML	*wʋ.rʋ na tee*	LM.L L ˈHL (8)	L.ML L ˈHL	dog
sou	LML	*sou na tee*	LML L ˈHL		cooking-pot
gboŋ	LML	*gboŋ na tee*	LML L ˈHL		cobra

Table 18. Tone patterns on nouns plus *na tee*.

In the construction *N + na + tee* the tone on the noun stays the same throughout for Mafouné. *Na* has a L tone, which causes a downstep on the HL tone of *tee.*

We find a few exceptions: in the HH tone group *na* receives a M tone, while *tee* keeps its downstepped HL tone. Furhtermore, in the MM and LH tone groups *na* receives M tone following CVV and CVC nouns while following CVCV nouns it has a L tone. *Tee* keeps its downstepped tone throughout. I cannot explain the M tones on *na.*

The situation in Tansila again is slightly different from the one in Mafouné, but similar to what happened in the construction with *tee*. The tone on the first syllable of N_1 spreads to the right, replacing any other tones on N_1. There are a number of exceptions: Firstly, N_1 in the HM tone group gets a MM tone. Secondly, in the LH group two out of ten nouns have LM tone instead of the expected LL tone. In the LM group four out of ten nouns have LM tone instead of the expected LL tone. We saw similar divisions in the section on compounding and derivation.[51] Possibly the LH and LM groups split into two groups with underlying different lexical tones. More research on this is necessary. Finally, there is no spreading on N_1 in the LML tone group.

Throughout, *tee* has a downstepped HL tone in Tansila, caused by the lexical L tone on *na*, but *na* has varying tones. We would expect *na* to have a L tone, but find that it gets an xH tone in the HH group, a H tone in the LH tone group and a M tone in the six entries which get level LL tone on N_1 in the LM group. The nouns which retain their LM tone in the LM group have L tone on *na*.

My hypothesis regarding the tone rules which are at work is as follows:

In Mafouné, the tone on the first noun remains unaffected. The L tone on *na* causes a downstep on *tee*.

In Tansila, a spreading rule is added:

1. The tone of the first syllable of N_1 spreads onto its second syllable.
2. The tone of the second syllable of N_1 is pushed onto *na*, and the L tone of *na* becomes floating.
3. The floating L tone of *na* causes a downstep on *tee*.

There are a number of melodies that this hypothesis cannot explain. For Mafouné this concerns the M tone on *na* in the HH group (all syllable structures) and in the MM and LH groups (CVV and CVC syllable structures only). For Tansila

[51] See section 5.3.2.5, tables 9, 11a, 12a and 13.

the division between LL and LM tones on N_1 in the LH and LM tone groups as well as the L tone on *na* in the HM, MM and half of the LM group are counter expectation. Possibly other underlying lexical tones are at the basis of these melodies. More research on this is needed.

5.4.4. Possessive construction: N + N

In the possessive construction with two nouns juxtaposed, N_1 is the possessor and N_2 is the object possessed. As our time was limited, we only used H, M and L in the N_1 position. In N_2 position we used nouns from all nine tone groups. This resulted in 27 tonal combinations of N_1 + N_2. The research was done with two-syllable CVCV words, except for the N_1 of the MM melody, where a three-syllable CVCVCV word was included as well. We aimed to find 5 constructions in every group, but we were not successful in this for all groups.

We varied the words in the N_1 slot while in the N_2 slot we used the same word for each separate tone group (e.g. a rabbit's hammock, a monkey's hammock, an elephant's hammock). Afterwards we realised that it was the noun in the N_2 slot where the tonal changes take place[52] so it would have been better to have kept N_1 constant and to have changed N_2 (e.g. a rabbit's hammock, a rabbit's mask, a rabbit's couscous). Unfortunately, by then there was no time left to redo the exercise. Therefore the findings below are based on just one single item in N_2 position per tone group.

Table 19a-c presents an overview of the tones in the N + N possessive construction. As it is N_1 which causes the changes on N_2, the tables are organised according to the tone of N_1. Below the tables I will give some hypotheses as to which tonal processes take place.

[52] This is as Prost writes: "[L]e substantif complément garde ses tonèmes, mais le substantif complété voit les siens modifiés, suivant certaines règles." (1983:17)

Lexical tone of N_1 + N_2	N_1 + N_2 Mafouné	N_1 + N_2 Tansila	Gloss
tɪ.rɪ tu.ru H.H + H.H	xH.xH H.H	H.H xH.H	a slave's ear[53]
tɪ.rɪ wɪ.rɛ H.H + H.M	H.H H.M	H.H xH.M	a slave's gazelle
tɪ.rɪ sɪ.ra H.H + H.L	H.H H.L	H.xH H.L	a slave's tobacco
tɪ.rɪ ba.sɪ H.H + M.M	H.H H.L	H.H xH.L	a slave's mead
tɪ.rɪ ki.ri H.H + M.L	H.H H.L	H.H xH.L	a slave's village
tɪ.rɪ di.ni H.H + L.H	H.H M.M	H.H xH.H	a slave's joint
tɪ.rɪ kɛ.rɪ H.H + L.M	H.H M.M	H.H xH.M	a slave's hammock
tɪ.rɪ ti.ri H.H + L.L	H.H xH.L	H.H xH.L	a slave's gourde
tɪ.rɪ wɔ.rɔ H.H + LM.L	H.H LM.L	H.xH L.ML	a slave's dog

Table 19a. Tone patterns for N + N possessive construction (N_1 has HH tone).

[53] According to Morse (1976:158, 184-5), alienable possessive constructions involving possessive pronouns do not cause tone change on N while inalienable possessive constructions involving possessive pronouns **do** cause tone change on the following noun. Morse does not mention N + N possessive constructions.

In our research, using a N plus N possessive construction, the tone patterns do not indicate a tonal distinction between alienable and inalienable possession. Both alienable and inalienable constructions follow the same tone rules laid out in this section. *Turu* HH 'ear', and *dini* LH 'joint' would be in an inalienable relationship with their possessor if this distinction were made. The remainder of the nouns would be in an alienable relationship.

Lexial tone of N_1 + N_2	N_1 + N_2 Mafouné	N_1 + N_2 Tansila (when different from Mafouné)	Gloss
gbu.nu tu.ru M.M + H.H	M.M L.H		a lion's ear
gbu.nu wɪ.rɛ M.M + H.M	M.M L.L		a lion's gazelle
gbu.nu sɪ.ra M.M + H.L	M.M MH.L †	M.M M.HM	a lion's tobacco
gbu.nu ba.sɪ M.M + M.M	M.M L.L		a lion's mead
gbu.nu ki.ri M.M + M.L	M.M L.L		a lion's village
gbu.nu di.ni M.M + L.H	M.M L.H		a lion's joint
gbu.nu kɛ.rɪ M.M + L.M	M.M L.L	M.M L.M	a lion's hammock
gbu.nu ti.ri M.M + L.L	M.M L.L		a lion's gourd
gbu.nu wʊ.rʊ M.M + LM.L	M.M LM.L		a lion's dog

Table 19b. Tone patterns for N + N possessive construction (N_1 has MM tone).

Lexial tone of N_1 + N_2	N_1 + N_2 Mafouné	N_1 + N_2 Tansila (when different from Mafouné)	Gloss
fa.na tu.ru L.L + H.H	L.L L.H		a monkey's ear
fa.na wɪ.rɛ L.L + H.M	L.L LH.M †	L.L L.xL	a monkey's gazelle
fa.na sɪ.ra L.L + H.L	L.L LH.L †	L.L H.L (/M)	a monkey's tobacco
fa.na mi.ri L.L + M.M	L.L L.L		a monkey's rice
fa.na ki.ri L.L + M.L	L.L L.L		a monkey's village
fa.na di.ni L.L + L.H	L.L L.H		a monkey's joint
fa.na kɛ.rɪ L.L + L.M	L.L L.M		a monkey's hammock
fa.na ti.ri L.L + L.L	L.L L.L		a monkey's gourd
fa.na wʊ.rʊ L.L + LML	L.L LM.L		a monkey's dog

Table 19c. Tone patterns for N + N possessive construction (N_1 has LL tone).

From the tables above it is clear that in the Mafouné dialect N_1 retains its lexical tone, with one exception in the HH tone group: when a HH noun is followed by a HH noun, the first HH noun is raised to xHxH.

When N_1 has a MM or a LL tone, the first syllable of N_2 gets a L tone.[54] This is not downstep, since N_2s starting with a H tone also receive a L tone on their first syllable. In most cases this L tone seems to replace the original tone of the first syllable of N_2[55] but in three cases the lexical tone of the first syllable of N_2 remains audible on that syllable, resulting in a modulated tone (indicated by †). I cannot explain this different behaviour.

The second syllable of N_2 largely keeps its lexical tone. There are a few exceptions: When N_1 has MM tone and N_2 ends on a M tone, the second syllable invariably gets a L tone, making the whole of N_2 LL, which is contrary to our expectation based on the above mentioned observations. A similar thing happens when N_1 is LL and N_2 is MM. The construction as a whole gets LL LL tone, while one would expect the final syllable to have a M tone. Interestingly, the other instances of N_2 following a LL noun and finishing in a M tone do retain their lexical M tone on the second syllable. I have no explanation for this variation.

When N_1 has a HH tone the tonal changes are less transparent. The patterns in Tansila are more regular than the ones in Mafouné, reason why I will look at these first. It should be kept in mind that a noun of HH lexical tone is realised as HxH in Tansila. This is merely a phonetical difference (see p. 29). In Tansila, the HxH tone of N_1 becomes HH.[56] The xH tone of the second syllable of N_1 spreads onto the first syllable of N_2, replacing the original tone of that syllable. There are two exceptions: when N_2 has lexical HL or LML tone, the xH of N_1 does not spread onto the first syllable of N_2. I cannot explain what might block the tone spreading in these instances.

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[54] This is like Prost found: "[S]i le complément est un substantif autre que substantif à finale TH (…) les tonèmes (ou celui de la première syllabe) du complété sont abaissés au TB (1983:17)."

[55] Obviously, when the lexical tone of the first syllable of N_2 is already L, it is impossible to discern whether the resulting L tone on the first syllable of N_2 in the possessive construction is simply a replacive L tone or whether the L tone from N_1 has merged with the lexical L tone of the first syllable of N_2.

[56] This is contrary to the first part of Prost's findings: "Si le complément est un substantif à finale TH de base, le TH est remplacé par TM ou TB et passe sur le substantif complété (1983:18)."

The second syllable of N_2 retains its original tone, with one exception: when N_2 has MM level tone the second syllable of N_2 receives a L tone. This is similar to what we saw happening in the MM tone N_2s when following a MM or LL N_1. As we have very few MM nouns of CVCV structure, it would be interesting to see what happens with the tone on nouns of a different syllable structure.

On the whole, from the Tansila data it can be inferred that the lexical tone on the first syllable of N_1 spreads onto the second syllable of N_1, thereby pushing the lexical tone of the second syllable of N_1 onto the first syllable of N_2, replacing *its* lexical tone. The second syllable of N_2 retains its lexical tone.

I will now look at the tone changes for Mafouné. Whether or not the spreading from the first syllable to the second syllable of N_1 happens in Mafouné is impossible to tell, since both tones are realised at the same pitch.[57] Apart from this, based on the findings from Tansila, I assume the following tone rules for the N + N construction for Mafouné:

a) H tone spreading from the second syllable of N_1 onto the first syllable of N_2, replacing the original tone of that syllable.

b) The second syllable of N_2 retains its lexical tone.

Ad hypothesis a): It seems that the tone on the second syllable of N_1 merges with the lexical tone on the first syllable of N_2, rather than replacing it. The tones merge in the same way they did in the construction with *ŋman*: a H plus a H tone merge to a H tone; a H plus a M tone also merge to a H tone; a H plus a L tone merge to a M tone (see p. 59).

There are three exceptions to this: When N_2 has lexical HH tone the resulting melody is xHxH HH, where HH HH would be expected. When N_2 has lexical LL tone, the whole phrase gets HH xHL tone, while we would expect HH ML tone. As yet I have no explanation for the raised tones. The tone on a LML N_2 does not undergo any change at all.

Ad hypothesis b): There are two exceptions: When N_2 has lexical MM tone and follows a HH noun, N_2 gets HL tone where a HM tone would be expected. This is similar to the tone realisation in Tansila. In fact, contrary to expectation, the MM

[57] In the construction with *tee/na tee* the spreading from the first syllable to the second syllable of N_1 happens in Tansila, but not in Mafouné. It is possible that in this construction too, the spreading happens in Tansila, but not in Mafouné. More research, using first nouns of two dissimilar tones (i.e. HM, HL, ML, etc.) is necessary in order to find out about this.

second nouns always finish in a L tone, whichever tone N_1 may have. Maybe the MM tone group has a different underlying tone. More research on this is needed.

The other exception is when N_2 has a LH tone. We would expect to find a HH MH melody but instead we find a HH MM melody. There may be a general prohibition of MH tone patterns. We found a similar exception in the construction with *ŋman* (see p. 59).

In the next section I will formulate general conclusions that can be drawn from the data which were investigated in the previous sections.

6. Conclusion

The general conclusion from the section on compounding and derivation is that N_1 undergoes tone changes (levelling) through spreading and tone replacement. N_1s starting with a M or H tone get a level M tone, N_1s starting with a L tone get a level L tone. N_2 or the suffix is simply attached to N_1, unless it is preceded by a lexical L tone on the final syllable of N_1 (which may be floating after the tone spreading and replacement) in which case N_2 or the suffix undergoes downstep.

The main difference between compounding and derivation and the noun phrases that were discussed in section 5.4 is that in the noun phrases it is N_2 which undergoes tone changes. There are some differences between Mafouné and Tansila.

With regard to the L tone definite articles and near demonstrative we did not establish an influence (e.g. downstep) on the following nouns, but this may be due to the shortness of the phrases.

In Mafouné, N_1 remains unchanged in noun phrases. In the construction with *tee, tee* is downstepped after a M or L tone (including the L tone on *na*).

In the constructions with the H tone far demonstrative and in the associative construction the tone on the final syllable of the first word spreads rightward across the word boundary and merges with the tone on the first syllable of N_2. When merging with a H or M tone, it becomes a H tone, when merging with a L tone, it becomes a M tone. The second syllable of N_2 retains its lexical tone.

Whereas in Mafouné the tone on N_1 remains unchanged, in Tansila rightward tone spreading takes place from the first to the second syllable of N_1, causing the tone on the second syllable to spread onto the next word.

This happens in the constructions with *tee* and *na tee* and in the associative construction. In the construction with *tee* a spreading xH tone from N_1 merges with the first syllable of *tee* to an xH tone while a spreading M or L tone causes a downstep on *tee*. In the associative construction the tone on the second syllable of N_1 replaces the tone on the first syllable of N_2 rather than merging with it. In this construction the second syllable of N_2 retains its lexical tone.

The tone changes in the construction with the far demonstrative in Tansila are difficult to explain.

A large number of questions remain for further investigation. Among them are the following:

What is the status of the MM and LML tone groups? Why are there so few MM CVCV nouns? Why would Prost say they only happen “when the phrase continues”? Where does the unexpected LML melody come from? These words make up 5% of the total number of nouns and 2% of verbs and occur in all syllable patterns.

Why does the MH melody not exist?

Why are there so few HM nouns?

It would be interesting to more deeply investigate the glides in the plural suffix and the xL tone following L nouns as well as the tone spreading on the noun in some tone groups.

What determines whether a suffix or a noun is added to the singular, plural, or short form of a noun?

Why do the LH, LM and LML tone groups sometimes split into two subgroups in compounding, derivation and in noun phrases?

More research is needed on the definite noun phrases by putting them in larger contexts.

Why do N_2s finishing in a M tone in the N + N possessive construction always end in a L tone in the investigated noun phrases, when a M tone would be expected?

What causes H tone raising? Is it local only or does it constitute an upstep of the whole register?

More extensive research is needed on compounding and derivation with nouns and suffixes of different tone groups.

More research is needed on the construction with *tee* and *na tee* and in the associative construction, including the tone groups that were left out in this research project.

More research is needed on other constructions, such as constructions with possessive pronouns, adjectives, numerals, postpositions, and with combinations of all of these.

Hopefully this additional research will be able to shed some light on the many exceptions that were found in this paper.

In closing I would dare to say that even though compounding and derivation as well as tone in noun phrases have not been researched exhaustively, and not all the

tone changes can be explained in full yet, the proposed rules seem to be a good start for further tone analysis in Bobo Madare North.

Appendix 1. Table of CV words containing a syllabic nasal:

Phonetic representation	Tone	Orthographic representation	Plural	Gloss	Part of speech	Bobo Madare South (from Le Bris and Prost)
gn̩	LML	*gun*		black	adjective	dūngū / sīì
gn̩	H	*gun*	*gumo*	oven for shea nuts	noun	dûn
gn̩	M	*gun*		yesterday	adverb	dúgú
m̥m	M	*hum*		ten	cardinal number	fū̄
n̥n̩	M	*hun*		immediately	adverb	súú
n̥n̩	B	*hun*	*sine*	male	adjective	sǒ̌
n̥n̩	H	*hun*	*humo/sumo*	sun, time period	noun	sí́
kn̩	L	*kun*	*kumo*	war	noun	kǔ̀
kn̩	HM	*kun*	*kumo*	market	noun	tǔ́
kn̩	H	*kʋn*	*kʋma/kama*	malaria	noun	kó̌
kn̩	L	*kʋn*	*kʋma/kama*	body, skin	noun	kɔ̀̌
ŋ̩	HM	*ŋun*	*ŋunno*	oil, butter, grease	noun	ɲī
ŋ̩	H	*ŋun*	*ŋunno*	smell	noun	ŋwúnú
ŋ̩	LML	*ŋun*		sleep	verb	ɲì̀
ŋ̩	HM	*ŋun*		smell	verb	ŋwūnū
ŋ̩	LML	*ŋʋn*	*ŋʋnma*	head	noun	ŋwɔ̀̃

Appendix 2. 1SG and 3SG Perfective and Imperfective verb forms

Tone group	Person and Tense	Underlying tones	Phonological surface form
tara MM 'answer'	1SG.PFT	M MM	M MM ā tārā
	3SG.PFT	L MM	L MM à tārā
	1SG.IPFT	M (M) MM (L)	M ML ā tārà
	3SG.IPFT	L (M) MM (L)	L ML à tārà
dige LL 'eat'	1SG.PFT	M LL	M LL ā dìgè
	3SG.PFT	L LL	L LL à dìgè
	1SG.IPFT	M (M) LL (L)	M LL ā dìgè
	3SG.IPFT	L (M) LL (L)	LM LL ǎ dìgè
daba ML 'borrow'	1SG.PFT	M ML	M ML ā dābà
	3SG.PFT	L ML	L ML à dābà
	1SG.IPFT	M (M) ML (L) (rule 1)	M ˥MM ā ˥dābā
	3SG.IPFT	L (M) ML (L) (rule 1)	L ˥MM à ˥dābā
tama LM 'get up'	1SG.PFT	M LM	M ˩MM ā ˩tāmā
	3SG.PFT	L LM	L ˩MM à ˩tāmā
	1SG.IPFT	M (M) LM (L) (rule 2)	M ˩ML ā ˩tāmà
	3SG.IPFT	L (M) LM (L) (rule 2)	L ˩ML a ˩tāmà
yɛlı LML 'break'	1SG.PFT	M LML	M ˩ML ā ˩yɛ̄lì
	3SG.PFT	L LML	L LML à yɛ̀lì
	1SG.IPFT	M (M) LML (L) (rule 1)	M L˥M ā yè˥lī
	3SG.IPFT	L (M) LML (L) (rule 1)	L L˥M ǎ yè˥lī

The Imperfective is formed by a floating M tone preceding the verb and floating L tone following the verb. The arrows indicate the direction in which the floating tones attach. The M tone merges with the tone it attaches to. The L tone replaces it unless tone rule 1 applies (see the section on tone in the verb system).

References

Bowerman, Melissa and Pederson, Eric. 1992. Topological Relations Picture Series (TRPS). In Stephen C. Levinson (ed.), *Space stimuli kit 1.2*: November 1992, 51. Nijmegen: Max Planck Institute for Psycholinguistics. Online version: http://fieldmanuals.mpi.nl/volumes/1992/bowped, download date 17-12-2012.

Conteh, Patrick et al. 1983. A reanalysis of Tone in Mende. In Current Approaches to African Linguistics, 5 (2) 127-137.

Davison, Phil. 1992. *Compte rendu d'une enquête au pays bobo-fing.* Bamako: SIL Mali.

Dienst, Stefan. 2004. *Nominalmorphologie und Numerus im Bɔbɔ (Mande)*. Mainz: Institut für Ethnologie und Afrikastudien, Working Papers nr. 34. (MA thesis)

Dwyer, David J. 1989. Mande. In J. Bendor-Samuel (ed.). 1989. *The Niger-Congo Languages*. (pp. 46-65.) Dallas: SIL and Lanham: University Press of America.

Dwyer, David J. 1994. Internal Evidence for Tone Splitting in Bobo. *Journal of African Languages and Linguistics,* 15, 29-45.

La Manchote, n.d. unpublished Konabere text.

Le Bris, P. and Prost, A. 1981. *Dictionnaire bobo français*. Paris : SELAF.

Lewis, M. Paul, Gary F. Simons, and Charles D. Fennig (eds.). 2016. *Ethnologue: Languages of the World,* (19th ed.) Dallas, Texas: SIL International. Online version: http://www.ethnologue.com. Pages visited:
http://www.ethnologue.com/language/bwq, accessed 08-03-2016.
http://www.ethnologue.com/language/bbo, accessed 08-03-2016.

Morse, Mary Lynn Alice. 1976. *A Sketch of the Phonology and Morphology of Bobo (Upper Volta),* New York: Columbia University.

Prost, André. 1983. "Essai de description grammaticale du dialecte bobo de Tansila, Haute-Volta". *Mandenkan* 5, 3-101.

Snider, Keith. n.p. *Tone Analysis.* Version February 2016.

Tiendrébéogo, Beatrice. 1998. *Rapport Sociolinguistique sur la Langue Bobo Madaré.* (revision of 1995 publication). Ouagadougou: SIL/ANTBA.

Tiendrébéogo, Beatrice. 2001. *Rapport Sociolinguistique sur la langue bobo jula (zara)*. SIL International. SIL Electronic Survey Reports 2001_002. Dallas: SIL International. http://www.sil.org/resources/publications/entry/9151, download date 08-03-2016.

Wolthuis, Wilma M.C. 2014. *Suggestion pour l'orthographe des mots avec des nasales sourdes et des mots de structure CN en bobobéré/konabéré.* Unpublished manuscript.

Wolthuis, Wilma. M.C. and Diarra, Djélé. n.d. *Une esquisse de la phonologie de BoboKonabéré, Bobo Mandaré Nord.* Work in progress.