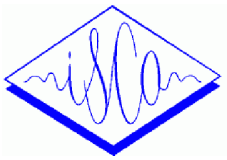

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Tone neutralization and tone spreading in the verb system of Samue (Niger-Congo, Gur)

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Abstract

This paper provides a presentation of tones in the verb system of Samue, a previously undocumented Gur language spoken in Burkina Faso. Our research shows that in Samue three lexical tones are contrastive: high (H), mid (M) and low (L). In the simplest morphological form of the verb, four tonal melodies are attested: H, M, L and MH. In the verb system, the lexical tone opposition is neutralized in the imperfective aspect and future tense, while the imperative mood and perfective aspect both bear the lexical tone. Our study further shows that tone spreading in Samue is regressive, although progressive spread is more common in tone languages. The process of regressive spreading of mid tone is a particularity of the Samue verbal tone system. Spreading occurs when some mid toned verbal particles are in direct contact with the preceding verb; the mid tone spreads to the verb. Spreading can be bounded concerning only one Tone Bearing Unit (TBU) leftwards, or unbounded concerning the whole verb. This depends on the verbal particle that triggers the spreading. Interestingly, our research also shows that in the case of different particles, the spreading concerns only high or only low toned verbs.

Index Terms: tone spreading, tone neutralization, Gur (Niger-Congo), verb phrase

1. Introduction

Tones in African languages are level tones creating a tonal register system in contrast to Asian contour systems, as Hyman [1] among others mentions. However, tonal systems on the African continent vary considerably, for example many Bantu languages' accentual systems restrict high tones to the prominent position of the word [2]. In this paper we examine the tonal system in a Gur language, and especially tone in the verb system.

Gur languages are a subgroup of the large Niger-Congo phylum. They are spoken in several West African countries and they are tonal, except for the Koromfe language [3], but tone in Gur languages has a heavier grammatical load than a lexical load [4]. Some studies have been conducted on tone in Gur languages, but to different extents, e.g. [5], [6] and [7]. Tonal systems attested in Gur vary from two-tone systems to four-tone systems [4]. Many analyses done in Gur have revealed two-tone systems, while three-tone systems are seen as unusual [8], although many Gur languages still lack a detailed analysis of tone system. Studies have also shown that the tonal processes of downstep [4] and of polarity [9] are frequent in Gur, and depressor consonants affecting tone are also attested [10]. Tone neutralization is found in Gur, when grammatical tone replaces the lexical tone, for instance in the case of different aspects or tenses in Dagbani [11].

Among other tonal processes, tone spreading is a very common phenomenon [12]. Hyman [12] considers spreading natural when it is progressive, moving from left to right. The author also argues that spreading often occurs when the spread tone is highly distinctive, i.e. being a low or high tone. In Gur, both high and low tone spreading is attested, e.g. a low tone spreading in a three-tone system of Buli [8] and both low and high tone spreading in a two-tone system of Dagbani [11]. In Kɔnni, high tone spreading can be both progressive and regressive [5]. So far as we are aware, mid tone spreading is not reported in Gur. In Gur languages, the extent of tone spreading varies from one [13] to several TBUs [5, 7].

In this study we show that the regressive spreading of mid tone is also attested, namely in the verb phrase of Samue. However, before presenting the tonal issues in the Samue verb, a very short overview of Samue language is given including language classification and segmental system. In section 3, we introduce lexical tonal melodies of the verb; after that the basic verbal morphology and the phenomenon of tonal neutralization are discussed. In the last section, spreading of mid tone to the preceding tone bearing unit(s) is examined between the verb and verbal particles.

2. Overview of the Samue language

Samue, often called Wara in the literature according to the appellation used in the commercial language of the region, is a Gur language spoken in South-Western Burkina Faso by less than 10000 speakers [14, 15]. Along with the Natioro language, Samue forms the Wara-Natioro subgroup, which is unclassified in relation to other Gur languages [16]; according to Naden [4] Samue is an improbable Central Gur language. There is scarcely any research done about Samue. Prost [17] briefly studied Samue grammar and phonology, but did not study tone. Later, Samue noun classes were examined [15]. Besides these studies and an unpublished sociolinguistic survey report [14] as well as an unpublished grammar sketch [18], no detailed analyses of the language have been done, and no tonal analysis at all.

Data used in this study was collected during the fieldwork period in the village of Niansogoni, which is the most understood dialect among Samue speakers [14]. For tonal analysis of verbs, 370 verbs were analyzed in several types of frame sentences. Approximately 1900 lexemes were used as the base for the phonemic analysis of the language. Samue has fourteen contrastive consonant phonemes (see Table 1.) and a seven-vowel system with contrastive length and nasal oppositions (see Table 2.) as presented previously with slight differences [19]. Vowel harmony functions according to several features: Advanced Tongue Root [ATR] and [back].

Table 1. *Consonant phonemes.*

	Labial	Alveolar	Palatal	Velar
Stop	p b	t	c	k kp
Nasal	m	n		
Fricative	f	s		
Lateral		l		
Flap		ɾ		
Semivowel			j	w

Table 2. *Vowel phonemes.*

		Front		Central		Back	
Close [+ATR]	oral	i	ii			u	uu
	nasal	ĩ	ĩĩ			ũ	ũũ
Close-Mid [+ATR]	oral	e	ee			o	oo
Open-Mid [-ATR]	oral	ɛ	ɛɛ			ɔ	ɔɔ
Open [-ATR]	oral			a	aa		
	nasal			ã	ãã		

Tone has both lexical and grammatical function in Samue, although the grammatical load is heavier. Three level tones are contrastive, namely high (H), mid (M) and low (L). A minimal triplet illustrates the tone levels (see Table 3.); the verbs in the examples are in the imperative mood, which is the simplest morphological form of the verb. Tones in this paper are marked by accents: acute accent for high (á), macron for mid (ā), and grave accent for low tone (à). In nouns, tone forms eleven tonal melodies, whereas in verbs there are four tonal melodies, which are examined below.

Table 3. *A minimal triplet of tone levels*

Tone	Verbs	*Gloss*
High	síí	*be big*
Mid	sīī	*be old*
Low	sìì	*be good*

The Tone Bearing Unit (TBU) in Samue is the mora, as in some other Gur languages [20]. However, some studies have proposed that a characteristic of Gur languages is that the syllable is the TBU instead of the mora [5]. In Samue, for instance a tonal melody HL in nouns is realized in the first syllable, if the syllable is bimoraic, [tɔ̀ɔ̀.nă], *group*, while the same melody is divided into two syllables, when the first syllable has a short vowel: [cí.nă], *saliva*. In both cases, the second syllable is the noun class suffix. When the noun stem is disyllabic CV.CV and the third syllable is the noun class suffix, the same melody is realized as [fákà.nă], *manner*. If the melody ends with a low tone, the suffix will always have a rising LH tone.

3. Verb and tone

3.1. Syllable structures and tonal melodies

Verb stems in Samue are mainly mono- or disyllabic, but some trisyllabic verbs are also found. Most of the stems end in a vowel. However, some stems are consonant final; in inflected forms they receive a vowel, which varies depending on the aspect of the verb. The choice of the vowel is also dependent upon vowel harmony. The basic syllabic structures of verb stems are shown in the Table 4. below.

Table 4. *Syllable structures of verb stems*

Monosyllabic CV(V)		**Disyllabic CV(V).CV**		**Trisyllabic CV.CV.CV**	
nì	*to drink*	là.kà	*to open*	wúsúmǎ	*to shine*
céé	*to look at*	táá.ká	*to approach*		
		CV(V).C-		**CV.CV.C-**	
		tì.k-	*to put*	tɛ̀.rɛ̀.k-	*to apply*
		pɛ̀ɛ̀.k-	*to watch*		

Four tonal melodies are attested in verbs: H, M, L and MH (see Table 5.). The H and L melodies are the most frequent, whereas the MH melody is very rare. In disyllabic verbs, the tones of the two syllables are always identical, except for the infrequent MH melody.

Table 5. *Tonal melodies in verb.*

Tone	Verb	*Gloss*	Verb	*Gloss*
High	kpáá	*to open*	tóókó	*to send*
Mid	pā	*to come*	bēlē	*to be ready*
Low	nì	*to drink*	fàmà	*to fan*
Mid-High	kɪ̃ɪ̃	*to write*	kpērɛ́	*to poison*

3.2. Verb inflection and tone

This section introduces verb inflection and tonal behavior according to tense, aspect and mood. The imperative mood (IMP) is morphologically the simplest verb form in Samue and it bears the lexical tone of the verb. The main distinction in the verbal system is between imperfective (IPFV) and perfective (PFV) aspects, as in Gur languages in general [4]. Perfective aspect also has the lexical tone of the verb, and in most cases also the segmental form is the same as for IMP, except for 23 monosyllabic verbs, where the vowel length changes between imperative (CV) and perfective (CVV).

The imperfective aspect on the other hand is expressed by morphology and by tone. There is no suffix that would clearly mark the IPFV in Samue, but vowel lengthening, suffixation and tone change all coexist, as studies in other Gur languages have also revealed [4]. In tonal level, IPFV is always expressed by a M tone, which is realized on the IPFV suffix or on both the stem and the suffix. Verbs can be divided into three different classes depending on the IPFV suffixing: 1) vowel lengthening, 2) vowel addition and 3) addition of the syllable **-nnee** or **-see**. In all IPFV forms, the final vowel is long. In Table 6. below, the suffixation of the IPFV form is illustrated with some examples. With syllable addition in disyllabic verbs, only the tonal melodies H and L are attested.

Table 6. *Examples of IPFV forms.*

IMP / IPFV	*Gloss*	IMP / IPFV	*Gloss*
Vowel lengthening			
kà / kāā	*to crunch*	fùkù / fūkūū	*to turn*
cá / cāā	*to offend*	sáká / sākāā	*to wash*
Vowel addition			
nì / nīāā	*to drink*	pɛ̀ɛ̀kɛ̀ / pɛ̄ɛ̄kāā	*to watch*
tū / tūāā	*to wash (oneself)*	pīlī / pīlāā	*to sweep*
lí / līēē	*to kill*	jííbí / jīībēē	*to fill*
Syllable addition			
nā / nāāsēē	*to miss*	jìlè / jīlēnnēē	*to entry*
kpá /kpānnēē	*to dry*	púló/pūlōnnēē	*to cook*

There is a group of about 20 H-toned verbs, where the H stays in the verb stem, and the suffix will have the IPFV mid tone (see Table 7.). All these verbs take the suffix **-nnee**. The same kind of pattern is found with MH-verbs, although MH-verb melody has some other alternations. In the imperative and perfective, the tone is MH, but in the imperfective the M tone of the stem becomes L, creating a LH-melody on the stem. The mid tone of IPFV is realized on the suffix. In the future tense, the stem of MH-verbs also becomes LH, but the suffix bears a high tone. This exceptional behavior is yet to be explained. In other conditions, future tense in Samue is tonally low (see Table 8.). Segmentally, the future tense has a shortened final vowel in comparison with the imperfective form, where the final vowel is always lengthened.

Table 7. *Exceptional tonal behavior of H and MH verbs.*

IMP	IPFV	FUT	*Gloss*
H-Verbs			
tóókó	tóókó-nnēē	tóókó-nné	*to send*
cólǒkó	cólǒkó-nnēē	cólǒkó-nné	*to be healthy*
MH-verbs			
kūkú	kùkú-nnēē	kùkú-nné	*to groan*
pālá	pàlá-nnēē	pàlá-nné	*to surprise*

Table 8. *Examples of future forms.*

Lexical tone	IMP	IPFV / FUT	*Gloss*
Low	kà	kāā / kà	*to crunch*
High	cá	cāā / cà	*to offend*
Low	nì	nīāā / nìà	*to drink*
High	lí	līēē / lìè	*to kill*
Mid	nā	nāāsēē /nààsè	*to miss*
High	kpá	kpānnēē/kpànnè	*to dry*

To summarize, we can say that lexical tone opposition is neutralized in the imperfective aspect and in the future tense, while the lexical tone remains in the imperative and in the perfective aspect. This phenomenon is found also in other Gur languages, e.g. in Dagbani [11]. In the following section we will see how tone spreading functions between verb and verbal particles.

3.3. Verb phrase and tone spreading

3.3.1. Affirmative

A basic affirmative sentence in Samue ends with the obligatory mid-toned affirmative particle **nā**. This type of sentence final affirmative particle is often attested in Gur languages [4]. In Samue, the M tone of **nā** affects the preceding L-toned verbs, either perfective L-verbs, or the verbs in the future tense, which are tonally low. The spreading concerns all the verbs mentioned previously: verbs in the future tense and L-perfective verbs (see examples i. and ii. to iv., respectively, in Table 9.). The spreading is unbounded on the domain of verb, as all the TBUs of the di- or trisyllabic verbs are realized with the mid tone (examples iii. and iv. in Table 9.). No tonal alternations are attested with M- or H-verbs. Objects or other sentence constituents placed between the verb and the particle block the tone spreading (example v. in Table 9.). Thus, the regressive M tone spreading occurs only when the verb and the particle are adjacent, suggesting an interface between syntax and phonology.

Table 9. *Mid tone spreading illustrated.*

	/Phonological form/ [Phonetic form]	Gloss
	Verb in FUT	
i.	/ì kà nā/ L L M [ì kā nā]	*3s. crunch(FUT) AFF* *He will crunch.*
	Verb in PFV	
ii.	/ì kà nā/ L L M [ì kā nā]	*3s crunch(PFV) AFF* *He crunched.*
iii.	/ì wɔ̀lɔ̀ nā/ L L M [ì wɔ̄lɔ̄ nā]	*3s sleep(PFV) AFF* *He slept.*
iv.	/ì kɛ̀lɛ̀kɛ̀ nā/ L L M [ì kɛ̄lɛ̄kɛ̄ nā]	*3s caress-PFV AFF* *He caressed.*
v.	/ì kà námá nā/ L L H M [ì kà námá nā]	*3s crunch(PFV) meat AFF* *He crunched meat.*

3.3.2. Past tense

Two past tense particles are found in Samue: **ntē** and **lɔ̄**. **Ntē** refers to the distant past, while **lɔ̄** is employed to express immediate past. Both particles can be combined with a verb in both the PFV and IPFV aspects. The past tense particle follows the PFV verb, and the meaning refers to an event accomplished in the past. As seen with the affirmative particle **nā**, the past tense particle **ntē** also affects the tone of the preceding verb, but differently. The M tone of the **ntē** spreads regressively only to the last TBU of the preceding verb affecting only H-toned verbs. The mora being the TBU, the consequence is that a disyllabic verb and a monosyllabic CVV-verb will have a contour tone HM because of the M spreading, whereas a monomoraic CV-verb will have a M tone (see the third column in Table 10. in comparison with the PFV verb alone in the second column). This regressive spreading is bounded. However, the M tone of the **lɔ̄** particle does not spread, as the rightmost column in Table 10. illustrates.

Table 10. *Bounded mid tone spreading with PFV verb.*

Verb	**3s V AFF**	**3s V ntē AFF**	**3s V lɔ̄ AFF**
kpásá *to escape*	/ì kpásá nā/ L H M [ì kpásá nā]	/ì kpásá ntē nā/ L H M M [ì kpásā ntē nā]	/ì kpásá lɔ̄ nā/ L H M M [ì kpásá lɔ̄ nā]
kpáá *to open*	/ì kpáá nā/ L H M [ì kpáá nā]	/ì kpáá ntē nā/ L H M M [ì kpáā ntē nā]	/ì kpáá lɔ̄ nā/ L H M M [ì kpáá lɔ̄ nā]
cí *to sew*	/ì cí nā/ L H M [ì cí nā]	/ì cí ntē nā/ L H M M [ì cī ntē nā]	/ì cí lɔ̄ nā/ L H M M [ì cí lɔ̄ nā]

4. Discussion

The aim of this study is to provide information about the verbal tone system in Samue, while giving a further insight to tonal system varieties in Gur. Tonal melodies and their alternations in inflected forms of the Samue verbs were examined in the function of aspect and tense. The results show that three lexical tones are found in Samue and these contrastive tones form four melodies in the verbal system. However, tonal contrast is neutralized in the imperfective aspect and in the future tense, while imperative mood and perfective aspect bear the lexical tone. This tonal replacement is typical in languages where tone has a grammatical function [21].

Also, the tonal process of regressive spreading and its bounded and unbounded variants were presented. The spreading occurs when the particle and the verb are adjacent to each other, suggesting a syntax-phonology interface that will be examined in more detail in the future. In the case of the **nā** particle, the M tone spreads only to the preceding L-toned verb completely replacing the lexical tone, while the M of **ntē** spreads only to the final TBU of the preceding H-toned verb. There is no proof of a floating tone in Samue, and also, since the spreading occurs only in direct contact with the verb and the particle, it is not a plausible explanation to think that a floating M-tone would cause the tonal alternation of the verb. Nevertheless, it can be suggested, that the alignment restriction of the spread is a lexical property of the verbal particle in question. In Optimality Theory [22] analysis this could be accounted for by an ALIGNMENT constraint. In the case of non-bounded spreading that covers the whole verb, the alignment of spreading is extended to the left-edge of the domain, i.e. the verb. However, in bounded spreading, only the last TBU is concerned, creating tone sequences that are not prohibited in Samue. In that case, LOCAL constraint restricts spreading only to the adjacent TBU. In the bounded spreading, LOCAL dominates ALIGNMENT constraint, as Yip [9] illustrates.

It is more challenging to explain, why spreading concerns only L-verbs with **nā** particle and only H-verbs with **ntē** particle. In general, the high tone in Samue is very constant, and after a L it stays in a clearly higher level than a M, although automatic downdrift is attested in Samue. According to the Register Tier Theory, Snider [23] distinguishes Mid_1 and Mid_2, which belong to different tonal registers, namely low register and high register. The author's proposition was firstly aimed to explain downstepped high tone in contrast to mid tone. It could be possible to propose that the high register Mid_2 could raise the L-toned verbs, while the low register Mid_1 would lower the H-toned verbs in Samue. Another hypothesis is to state that H is more prominent in comparison with L in Samue, and for that reason the lexical high tone cannot be completely deleted in the case of spreading. This lexical property could be analyzed in Optimality Theory terms by suggesting, for example, that MAX(H) constraint, which prohibits deletion of high tones, restricts the spreading of mid tone preserving the lexical high tone as much as possible.

However, this interpretation does not explain why the M tone of the **ntē** does not spread to L-toned verbs; it could be a lexical property of the **ntē** particle. Another problematic issue is to explain why the M of **ntē** spreads, but not the M of **lɔ̄**, although both are past tense particles. That may be due to an initial nasal in **ntē** that might bear a distinct M tone. Until further research gives more insights, we suggest that the more probable analysis is that both the tone prominence and lexical properties of the particles control the tone spreading in the Samue verb phrase.

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