

# VERB FORMS AND VERB ASPECTS IN NGIZIM\*

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A COMPLETE description of the verbal system of Ngizim involves considerations of the underlying phonological form of the verb stem, the aspect, and optional verbal extensions. The present paper will be limited to verbs in their neutral form, i.e. verbs having neither the ventive extension (= Hausa 'o-verbs') nor the totality extension (roughly corresponding to Hausa 'e-verbs'). Only polysyllabic verbs will be considered. Disyllabic verbs are overwhelmingly the most common type, but rules given here will apply to verbs of more than two syllables as well. Monosyllabic verbs differ in certain respects from polysyllabic verbs and will not be discussed here.

Verb stems fall into two cross-cutting formal categories:<sup>1</sup> tone class (high and low tone stems)<sup>2</sup> and vowel class (depending on whether the verb stem in the perfective ends in *-ə* or *-a*). The vowel class a verb belongs to is not predictable though the *-ə* class is by far the larger.

The tone class a verb belongs to shows a strong correlation with the vowel in the first syllable of the stem. This correlation is accounted for by assuming that verb stems are not specified for tone in their dictionary entries, but rather that the tones of most verbs can be filled in automatically by the following Morpheme Structure Conditions:<sup>3</sup>

## MS: BASIC VERB TONE

$$\begin{array}{ccccccc} [C [\alpha\partial] & X & (V) & X & V] & \left[ \begin{array}{l} +\text{Verb} \\ +\text{MS: Basic Verb Tone} \end{array} \right] \\ \downarrow & & \downarrow & & \downarrow & & \\ [-\alpha\text{HI}] & [-\text{HI}] & [+ \text{HI}] & & & & \end{array}$$

The class of verbs specified [+ MS: Basic Verb Tone], which includes most native Ngizim verbs, have initial low tone if the vowel in the first syllable is *ə*, initial high tone otherwise. In all verbs, medial syllables are low and the last syllable is high. In the list of 400–500 items on which this paper is based, about 9% of those with *ə* in the first syllable have high tone in their underlying form, e.g. *dábsá* 'hide'. In all these verbs, the first syllable is closed. This is probably a significant factor in their having the unexpected high tone, but there are also numerous verbs with *ə* in an initial closed syllable which have low tone. This exceptional 9% may be either lexically marked with

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\* Ngizim is classified by J. H. Greenberg (*The Languages of Africa*. Bloomington, 1963) in group 1(b) of the Chadic language family. It is very closely related to Bade. It is spoken by about 25,000 people in the Northeast State of Nigeria in an area fanning out to the east from Potiskum. The data presented here are based on the speech of Maalam 'Dan Booyi Kwaana of Potiskum. These materials were collected during eleven months of field research supported by a National Science Foundation Grant, No. GS-2279, Paul Newman, Principal Investigator. I would like to thank Professor Newman for comments and suggestions on earlier drafts of this paper and Professor Paul Schachter for assistance on various questions concerning formalism. Needless to say, I am responsible for any shortcomings in the actual analysis.

<sup>1</sup> Verbs are also categorized depending on the type of verbal noun they take. Only one productive type of verbal noun will be discussed in this paper.

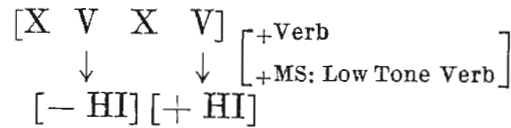
<sup>2</sup> Ngizim has two phonemic tones, high, specified [+ HI] and indicated by an acute accent, and low specified [-HI] and indicated by a grave accent. To distinguish tongue height of vowels from tonal specification, I will write [high] as a vowel feature and [HI] as a tone feature.

<sup>3</sup> For a discussion of the formal properties of MS Conditions see R. Stanley, 'Redundancy Rules in Phonology', *Language* 43: 393–437 (1967).

a high tone or have an MS Condition particular to them. In any case they will have to be marked [-MS: Basic Verb Tone].

There are Ngizim verbs with a vowel other than *ə* in the first syllable but which have an initial low tone. The following MS Condition will apply to these verbs:

MS: LOW TONE VERB



Verbs with the feature [+MS: Low Verb Tone] have low tone on all syllables except the last regardless of vowels. Such verbs will be redundantly specified [-MS: Basic Verb Tone]. Borrowed verbs invariably have low tone. A redundancy rule will thus give verbs with the feature [+Foreign] the feature [+MS: Low Tone Verb]. The feature [+Foreign] also triggers the addition of a suffix *-tə* to the borrowed root.

In addition to borrowed verbs, about 12% of presumably native verbs with a vowel other than *ə* in the first syllable also have underlying low tone, e.g. *dlámá* 'do'. These verbs do not share other correlates of [+Foreign] verbs, such as the addition of the suffix *-tə*. For this reason they will not be specified [+Foreign] and thus will not be redundantly supplied with the feature [+MS: Low Tone Verb]. Rather, they will have the latter feature as part of their lexical representation.

Following are examples of verbs as they would appear in their fully specified lexical representations. These are abstract forms from which forms in different contexts may be predicted, not citation forms:

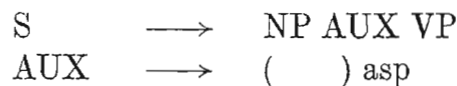
MS: BASIC VERB TONE

MS: LOW TONE VERB

High Tone	Low Tone	[+ Foreign]	$\left[ \begin{array}{l} - \text{Foreign} \\ + \text{MS: Low Tone Verb} \end{array} \right]$
<i>káasá</i> 'sweep'	<i>təfə</i> 'enter'	<i>gòodòotə</i> 'thank'	
<i>dánkə</i> 'sew'	<i>rəptə</i> 'open'	<i>pəltə</i> 'change'	<i>ràurə</i> 'call'
<i>kíidə</i> 'eat (meat)'			<i>səpdə</i> 'do first pounding'
<i>rávənə</i> 'trouble'	<i>mərtəkə</i> 'twist'	<i>kələktə</i> 'return'	<i>pìimə</i> 'look around'
<i>ráwá</i> 'run'	<i>zəbá</i> 'marry'	<i>təmbá</i> <sup>4</sup> 'help'	<i>ráwá</i> 'grow up'

*Verb Aspects*

The following simplified Phrase Structure Rules form the basis from which sentences having verbal predicates are derived:



In the first person, singular only, and in the second person, singular and plural, an 'AUX pronoun' (henceforth 'auxpro') is transformationally inserted immediately

<sup>4</sup> Though *təmbá* 'help' is a relatively recent borrowing from Kanuri, it is atypical of borrowed verbs in not adding the suffix *-tə*. It is also the only borrowed verb I know of with a stem ending in *-a*. On the other hand, it cannot be considered as a fully native verb because it has *-a-* in the first syllable yet has a low tone. Furthermore, it has an initial voiceless obstruent followed by a voiced obstruent in the second syllable, a pattern not found in native Ngizim words.

to the left of the aspect formative. In underlying representation the auxpros are *nà* 'I', *kà* 'you, sg. (m. or f.)', and *kwà* 'you, pl.'. These auxpros are not themselves aspect markers, though they undergo tonal changes triggered by the category asp and thereby serve at times to indicate aspect differences in surface sentences.

Ngizim has five verb aspects including the imperative. These aspects are indicated by the asp marker, tone of the verb, and vowel suffix on the verb. (This suffix replaces the underlying stem vowel in aspects other than the perfective.) The asp markers, verbal tone patterns, and suffixes characteristic of each aspect can be summarized as follows:

	asp marker	verb root	verb vowel suffix
Perfective:	high tone on auxpro	all low tone	{-ə} + <i>w</i> (vowel depends {-a} on verb class)
2nd Subjunctive:	Ø (auxpros remain low)	all low tone	-á
Subjunctive:	{ <i>a</i> (tone polar to verb)	all high tone or all low tone depending on underlying verb tone	-i (tone copied from preceding syllable)
Imperative:			
Imperfective:	<i>aa</i> (tone polar to verb)	verbal noun	suffix depends on verbal noun class

The first person singular and second person singular and plural are the only persons with AUX pronouns. Third person has no obligatory preverbal pronoun, though independent pronouns may be used to disambiguate gender and number if there is no noun subject. There are no auxpros for first person plural exclusive and inclusive either. Rather, these persons are obligatorily marked by the independent pronouns,<sup>5</sup> *jà* 'we (excl.)' and *wà* 'we (incl.)'. Although these two first person plural forms superficially resemble the auxpros by having *Cà* structure, they must be categorized differently because of different tonal behaviour. AUX pronouns in conjunction with the asp marker undergo a tone change in most aspects which can be characterized as a dissimilation of low tone to high when followed by a low.

A general feature of independent pronouns is that they retain underlying tone—low tone in most persons—in all environments. The first person plural pronouns used before verbs always have low tone. Rather than call them an aberrant type of auxpro which never raises its tone, it seems more reasonable to recognize them as independent pronouns with the concomitant features of these pronouns. The feature of independent pronouns relevant to the present discussion is [-AUX Tone Dissimilation] (henceforth [-ATD]) which prevents their tones from being raised by the rule which raises the tone of the auxpros.<sup>6</sup>

<sup>5</sup> The independent pronouns are used as objects of verbs and prepositions and as subjects or predicates of equational sentences. The entire paradigm is *iyù* 'me', *cì* 'you (m. sg.)', *kəm* 'you (f. sg.)', *ácì* 'him', *átú* 'her', *jà* 'us (excl.)', *wà* 'us (incl.)', *kùn* 'you (pl.)', *ákshí* 'them'. These pronouns can be used before the prefix pronouns for emphasis, and some speakers tend to use the third person forms in all cases when there is no noun subject.

<sup>6</sup> Regularization of the AUX pronoun pattern can be observed in action. Many speakers, especially younger people, now give first person plural the same tones as the auxpros in other persons. Malam Dan Boyi, who is about 45 years old, disdainfully brands this regularization as the speech of youngsters who don't know how to speak their language properly.

Although the category *asp* is generated by the Phrase Structure Rules while the *auxpro* is inserted by transformation, nevertheless, in surface structure the two always form an indivisible phonological unit. For several reasons the morphemically complex analysis of *auxpro* + *asp* has been chosen rather than a set of paradigms of 'person-aspect pronouns', similar to the traditional Hausa analysis. First, this morphemically complex analysis allows a more general statement requiring only one pronoun paradigm for the entire aspect system and a single *asp* marker for each aspect instead of a repetition of that marker six times for a given aspect, one for each person.

Second, it allows the imperfective marker, *aa*, and the imperative marker, *a*, to be analysed as bare aspect markers, not as pronouns (cf. discussion of these aspects below).

A general phonological rule of Ngizim accounts for the phonological unity of the *auxpro* (or independent pronoun in the first person plural) and the *asp* marker.

*Vowel Deletion* (= rule (8) in the last section of this paper)

$V \longrightarrow \emptyset/C \text{ --- } + V$

This rule states that across a morpheme boundary (+) a short vowel before another vowel is deleted.<sup>7</sup> The two AUX's affected by this rule are the subjunctive and the imperfective.

	<i>auxpro</i>	<i>asp</i>	V-root	aspect suffix		
(subj)	<i>na</i>	<i>a</i>	<i>təf</i>	-i	→	[ <i>na təfi</i> ] 'that I enter'
(imperf)	<i>na</i>	<i>aa</i>	<i>təf</i>	-a	→	[ <i>naa təfa</i> ] 'I will enter'

A set of crucially ordered rules is needed to give proper aspect suffixes and derive the correct surface tones from the underlying tones so far described. Because of the necessity for ordering the rules, I have listed them all together in the final section of this article rather than present them piecemeal under the discussion of individual aspects. Illustrative derivations of surface forms from underlying forms in each aspect refer to these rules.

### *Perfective Aspect*

The surface forms of the preverbal pronouns in the perfective are *ná* 'I', *ká* 'you (sg., m. or f.)', *kwá* 'you (pl.)', *jà* 'we (excl.)', *wà* 'we (incl.)', and  $\emptyset$  for all third persons. The Perfective Tone rule (5) gives all verbs in the perfective initial low tone, which means that the low tone *auxpros*, /*nà*/ /*kà*/, and /*kwà*/ are always dissimilated from the low initial syllable of the verb. The perfective *asp* marker is thus the feature [+AUX Tone Dissimilation] (henceforth [+ATD]), which is added to the prefix pronouns, causing them to undergo AUX Tone Dissimilation (10). As was stated above, *jà* and *wà* have the feature [-ATD], which cancels the perfective *asp* marker [+ATD], so they retain low tone. By a general convention, we can say that all nouns (which should probably include the independent pronouns) are [-ATD] to prevent low tone noun subjects from dissimilating.

Verbs in the perfective retain the final lexical stem vowel, i.e. *ə* or *a* depending on

<sup>7</sup> The present discussion assumes the deletion of the entire feature matrix of the vowel. In a more complete statement, certain features such as tone and tongue height would be retained to account for some of the surface forms resulting from this and other rules. Deletion of the vowel features does not include deletion of syntactic features, so the feature [-ATD] on first person plural pronouns is retained.

the vowel class of the verb. In addition, if the verb is found before a pause, a perfective marker /w/ is added by rule (1). A late phonological rule changes the high vowels (*i, ə, u*) + *w* to [uu], so verbs of the *ə* class before pause always end in phonetic [uu].

Following are three derivations of verbs in the perfective. These derivations represent all the surface tonal possibilities for disyllabic verbs in the perfective. The numbers and rule names refer to the rules in the last section.

	‘ I ran ’	‘ we (excl.) ran ’	‘ you (sg.) cooked ’
underlying	<i>nà</i> [+ATD] <i>ráwá</i> [+perf]	<i>jà</i> [-ATD] [+ATD] <i>ráwá</i> [+perf]	<i>kà</i> [+ATD] <i>bənə</i> [+perf]

The asp marker [+ATD] is transferred to the AUX pronouns, but is cancelled by the feature [-ATD] in the first person plural pronouns.

(1) Perf. Marker Add.	<i>nà</i> [+ATD] <i>ráwá-w</i>	<i>jà</i> <i>ráwá-w</i>	<i>kà</i> [+ATD] <i>bənə-w</i>
(5) Perf. Tone	<i>nà</i> [+ATD] <i>ràwáw</i>	<i>jà</i> <i>ràwáw</i>	vacuous
(10) ATD	<i>ná</i> <i>ràwáw</i>		<i>ká</i> <i>bənəw</i>
(12) Tone Raising	<i>ná</i> <i>ràwáw</i>		
(14) + (15) Downdrift + Tone Levelling	<i>ná</i> <i>ráwàw</i> <sup>8</sup>		
Phonetic	[ <i>ná</i> <i>ráwáw</i> ]	[ <i>jà</i> <i>ràwáw</i> ]	[ <i>ká</i> <i>bənúu</i> ]

When the subject is third person there is no overt AUX, but the tone rules still apply, notably (12), which raises a low syllable beginning in a voiceless consonant (including glottalized consonants) or a sonorant after a high syllable, e.g. partially derived *Jálá dāasəw* becomes [*Jálá dāásúu*] or [*Jálá dāasúu*] ‘ Jala poured ’.

But the initial tone of the verb remains low in the first example below because it is preceded by low. In the second example the initial tone is not raised because the verb begins in a voiced obstruent.

<i>Dəmzà dāasəw</i>	—→	[ <i>Dəmzà dāasúu</i> ]	‘ Dəmza poured ’
<i>kèekée dləmàtəw</i>	—→	[ <i>kèekée dləmàtúu</i> ]	‘ the bicycle was ruined ’
<i>márdù dləmàtəw</i>	—→	[ <i>márdù dləmàtúu</i> ]	‘ the millet was ruined ’

### Second Subjunctive

The second subjunctive is used with a hortative force in first and third persons—the imperative is used in second person—and as an obligatory replacement for subjunctive

<sup>8</sup> The mark (‘) indicating step tone will be used to indicate downstep only directly following a high tone. When there is a downstep followed by the same tone level, a high tone mark will be used to indicate this ‘same’ tone. A high tone following a low in surface representation will be understood to be lower in pitch than any preceding high tone.

and imperative in negative sentences. It is also an optional replacement for imperfective or perfective in counterfactual conditional clauses.

This aspect is marked by low tone auxpros in all persons, low tones on the verb root, and an aspect suffix *-á*. The second subjunctive asp marker is  $\emptyset$ , so the underlying low tones of the auxpros remain as the surface tones.

In the second subjunctive, as in the subjunctive, there is an obligatory marker *dà* inserted when there is no preverbal pronoun, i.e. in the third person.<sup>9</sup> Although this marker shows tonal behaviour identical to that of the auxpros, it is not considered a pronoun itself. In the first place, *dà* is invariant for gender and number whereas both gender and number are normally distinguished in third person pronouns. Furthermore, third person pronouns in other contexts are never characterized by a /*d*/.

Following are sample derivations of verbs in the second subjunctive. The rule inserting *dà* is a syntactic transformation applying prior to the rules formulated in the final section.

	‘ he/she/they should cook ’	‘ let’s dig up (peanuts, etc.) ’
Underlying	$\emptyset$ <i>bàn</i> $\acute{s}_{[+subj_2]}$	<i>wà</i> $\emptyset$ <i>kwàrb</i> $\acute{s}_{[+subj_2]}$
Insertion of marker <i>dà</i>	<i>dà</i> $\emptyset$ <i>bàn</i> $\acute{s}_{[+subj_2]}$	
(2) 2nd Subj.	<i>dà</i> <i>bàn-á</i>	<i>wà</i> <i>kwàrb-á</i>
Vowel Suf.		
(5) 2nd Subj. Tone	vacuous	<i>wà</i> <i>kwàrbá</i>
Phonetic	[ <i>dà</i> <i>bàná</i> ]	[ <i>wà</i> <i>kwàrbá</i> ]

Following are examples of the second subjunctive used as negative imperatives.

<i>kà</i> <i>rèptá</i> <i>bái</i>	‘ don’t open! ’ (sg.)
<i>kwà</i> <i>dàasá</i> <i>bái</i>	‘ don’t pour! ’ (pl.)

### Subjunctive

The subjunctive is used in embedded sentences of various types (especially purpose clauses and complements to verbs of volition) and in indirect discourse to report or question a command or exhortation. It is further used as a sequential in conjoined sentences, following various kinds of adverbial clauses, in narratives.

The subjunctive is indicated by an asp marker,  $\acute{a}_{[+ATD]}$ , all high or all low tones on the verb copied from the underlying tone of the initial syllable, and a verb suffix *-i*.

Because of the vowel dropping rule discussed above, the marker *á* never appears as a separate syllable in subjunctive constructions. However, it does appear in imperatives. By saying that imperatives redundantly have the feature [+subj], a single set of rules can account for the similar characteristics of subjunctive and imperative tones and also for the use of the marker *á* with imperatives.

Following are derivations illustrating all the surface tone possibilities for disyllabic verbs in the subjunctive. All dental consonants except lateral fricatives and liquids palatalize before *i*. This includes /*d*/, which becomes [*y*].

<sup>9</sup> The first person plural pronouns *jà* and *wà*, though not auxpros, are obligatory preverbal pronouns. Hence, they prevent insertion of *dà*.

	‘ that I sweep ’	‘ that we (excl.) sweep ’	‘ that he/she/they climb ’
Underlying	<i>nà</i> à <sub>[+ATD]</sub> <i>káasá</i> <sub>[+subj]</sub>	<i>jà</i> <sub>[-ATD]</sub> à <sub>[+ATD]</sub> <i>káasá</i> <sub>[+subj]</sub>	à <sub>[+ATD]</sub> <i>gáayá</i> <sub>[+subj]</sub>
Insertion of marker <i>dà</i>			<i>dà</i> à <sub>[+ATD]</sub> <i>gáayá</i> <sub>[+subj]</sub>
(3) Subj. Vowel Suf.	<i>nà</i> à <sub>[+ATD]</sub> <i>káas-í</i>	<i>jà</i> <sub>[-ATD]</sub> à <sub>[+ATD]</sub> <i>káas-í</i>	<i>dà</i> à <sub>[+ATD]</sub> <i>gáay-í</i>
(8) Vowel Deletion	<i>nà</i> <sub>[+ATD]</sub> <i>káasí</i>	<i>jà</i> <i>káasí</i>	<i>dà</i> <sub>[+ATD]</sub> <i>gáayí</i>
(9) Optional Tone Lowering		( <i>jà</i> <i>kàasí</i> )	
(13) Tone Lowering			<i>dà</i> <i>gàayí</i>
Phonetic	[ <i>nà káashí</i> ]	[ <i>jà káashí</i> ] or [ <i>jà kàashí</i> ]	[ <i>dà gàayí</i> ]
	‘ that I do ’	‘ that we (incl.) do ’	‘ that you (sg.) open ’
Underlying	<i>nà</i> à <sub>[+ATD]</sub> <i>dlámá</i> <sub>[+subj]</sub>	<i>wà</i> <sub>[-ATD]</sub> à <sub>[+ATD]</sub> <i>dlámá</i> <sub>[+subj]</sub>	<i>kà</i> à <sub>[+ATD]</sub> <i>rə̀ptá</i> <sub>[+subj]</sub>
(3) Subj. Vowel Suf.	<i>nà</i> à <sub>[+ATD]</sub> <i>dlám-ì</i>	<i>wà</i> <sub>[-ATD]</sub> à <sub>[+ATD]</sub> <i>dlám-ì</i>	<i>kà</i> à <sub>[+ATD]</sub> <i>rə̀pt-ì</i>
(8) Vowel Deletion	<i>nà</i> <sub>[+ATD]</sub> <i>dlámì</i>	<i>wà</i> <i>dlámì</i>	<i>kà</i> <sub>[+ATD]</sub> <i>rə̀ptì</i>
(10) ATD	<i>ná</i> <i>dlámì</i>		<i>ká</i> <i>rə̀ptì</i>
(12) Tone Raising			<i>ká</i> <i>rə̀ptì</i>
(15) Tone Levelling			<i>ká</i> <i>rə̀ptì</i>
Phonetic	[ <i>ná dlámì</i> ]	[ <i>wà dlámì</i> ]	[ <i>ká rə̀pèì</i> ]

The verb *káasá* ‘ sweep ’ shows the operation of the optional rule (9), which lowers the initial syllable of a high tone verb in the subjunctive after first person plural. That this lowering can take place only after first person plural is another indication that *jà* and *wà* are not auxpros. Note furthermore that a later phonological rule, (13), also lowers a high tone after a low, but only if the high tone begins in a voiced sound, as in [*dà gàayí*] ‘ that he climb ’. Rule (9) operates no matter what the initial consonant of the high syllable.

The rule Subjunctive Verb Tones (6), which assures that tones of the verb in the subjunctive are all high or all low, applies vacuously to the disyllabic verbs illustrated above. It is needed for medial syllables of verbs having more than two syllables.

*kə̀rìinákáú* *dà* *kátər-í*      —>      [*kə̀rìinákáú* *dà* *kátə̀rì*]      ‘ that the toad hop ’  
*báktà* *dá* *tlə̀mpìy-ì*      —>      [*báktà* *dá* *tlə̀mpìyì*]      ‘ that the cloth tear ’

In the first example, rule (6) has raised the medial syllable of the verb *kátàrís* 'hop' to high tone. In the second example, rule (6) applies vacuously to the second syllable, but Tone Raising after High (12) has applied to raise the tone of the initial syllable of the verb after the high tone AUX.

There are a few low tone verbs which unexpectedly raise their final syllable to high tone in the subjunctive, e.g.

<i>dá gènyí</i>	'that he receive'
<i>ná vèjí</i>	'that I lie down'

These verbs will have the rule feature [+Rule 7] causing them to undergo rule (7), which is needed to raise the final syllable of all verbs in the imperative.

### Imperative

Imperatives use the bare subjunctive asp marker  $\acute{a}_{[+ATD]}$  with no prefix pronoun. They have the same tones as the subjunctive with the addition of rule (7) which raises the final syllable of all imperatives. Singular imperatives have the verb suffix *-i*, plurals, the verb suffix *-a*.

Disyllabic verbs in the imperative have one of four possible surface tone patterns. Derivations of verbs illustrating each of these patterns is given here. Only the singular imperative is given. The plural derivation would be exactly the same except for the final vowel and related palatalization of the final consonant.

	'sweep!'	'bury!'	'open!'	'learn!'
Underlying	$\acute{a}_{[+ATD]}$ <i>káasé</i> <sub>[+imp]</sub>	$\acute{a}_{[+ATD]}$ <i>dábgé</i> <sub>[+imp]</sub>	$\acute{a}_{[+ATD]}$ <i>rèpté</i> <sub>[+imp]</sub>	$\acute{a}_{[+ATD]}$ <i>gùgzé</i> <sub>[+imp]</sub>
(3) Imper. suffix	$\acute{a}_{[+ATD]}$ <i>káas-i</i>	$\acute{a}_{[+ATD]}$ <i>dábg-i</i>	$\acute{a}_{[+ATD]}$ <i>rèpt-i</i>	$\acute{a}_{[+ATD]}$ <i>gùgz-i</i>
(7) Imper. Tone	vacuous	vacuous	$\acute{a}_{[+ATD]}$ <i>rèptí</i>	$\acute{a}_{[+ATD]}$ <i>gùgzí</i>
(10) ATD			<i>á</i> <i>rèptí</i>	<i>á</i> <i>gùgzí</i>
(12) Tone Raising			<i>á</i> <i>rèptí</i>	
(13) Tone Lowering		<i>à</i> <i>dàbgí</i>		
(14) + (15) Downtdrift + Tone Levelling			( <i>á</i> <i>rèptì</i> )	
Phonetic	[ <i>à káashí</i> ]	[ <i>à dàbgí</i> ]	[ <i>á rèpci</i> ] or [ <i>á ræpci</i> ]	[ <i>á gùgzí</i> ]

A few illustrations of plural imperatives follow:

<i>à dánk-á</i>	→	[ <i>à dánká</i> ]	'sew!'
<i>à mázám-á</i>	→	[ <i>à mázámá</i> ]	'groan!'
<i>á bàdrit-á</i>	→	[ <i>á bàdritá</i> ]	'start!'
<i>á tlèmpìy-á</i>	→	[ <i>á tlèmpìyá</i> ]	'tear!'

*Finite Verbs Before Objects*

No special rules are needed to account for the behaviour of finite verbs before objects.<sup>10</sup> Tone Lowering after Low (13) will lower the final syllable of verbs with final tone pattern low-high before high if the last syllable of the verb begins in a voiced consonant. This rule will apply to all perfectives, second subjunctives, and low tone imperatives. The following examples give derived sentences immediately before the application of (13) and then the phonetic forms resulting from the application of (13) and other low level rules. The third example shows that application of (13) is not dependent on the grammatical category that follows the verb. (*bái* is the negative marker.)

(perf)	<i>ná gàuná gádlà</i>	→	[ <i>ná gàunà gádlà</i> ]	‘ I plaited a granary ’
(subj <sub>2</sub> )	<i>wà dàbá máayìm</i>	→	[ <i>wà dàbà máayìm</i> ]	‘ let’s send a boy ’
(subj <sub>2</sub> )	<i>kà cì má bái</i>	→	[ <i>kà cì mǎ bái</i> ]	‘ don’t open! ’
(imper)	<i>á dlámí wánà</i>	→	[ <i>á dlàmì wánà</i> ]	‘ do work! ’

Direct objects beginning in low tone and having an initial voiceless or sonorant segment undergo (12) which raises their initial syllable after verbs ending in high tone.

(perf)	<i>kìidá thùwái</i>	→	[ <i>kìidá thùwái</i> ]	‘ he ate meat ’
(imper)	<i>à kíidá thùwái</i>	→	[ <i>à kíí’yí thùwái</i> ]	‘ eat meat! ’
(subj <sub>2</sub> )	<i>kà kíidá thùwái bái</i>	→	[ <i>kà kíidá thùwái bái</i> ]	‘ don’t eat meat! ’

*Imperfective*

Ngizim has only one verb aspect corresponding to both Hausa continuative and future. This aspect, the imperfective, may be translated by either Hausa aspect. The imperfective asp marker is *àa*<sub>[+ATD]</sub>. The verb in the imperfective is a verbal noun rather than a finite verb form. In a complete grammar, verbal nouns might be derived in the lexicon and enter the phonological rules specified in their entirety rather than as stems to which vowel suffixes are added by aspect sensitive rules. For the purposes of this paper, a rule of the type used for other aspects is provided for verbal nouns. This rule replaces the stem vowel of the verb with a low tone -*à* in a verb specified as being a verbal noun (rule (4)). Apart from the suffix verbal nouns retain the underlying tones of the verb stem, i.e. low or high tone initial syllable followed by low medial syllables. There are classes of verbal nouns other than the -*à* class. These classes are either semi-productive or non-productive and will be marked [-Rule 4] and [+ . . . ] whatever rule will properly derive them. The class of verbal nouns in no way affects the general rules giving surface forms, hence, only the productive -*à* class will be used in examples.

	‘ he will run ’	‘ we (excl) will run ’	‘ I will return ’
Underlying	$\emptyset \text{ àa}_{[+ATD]} \text{ ráwá}_{\left[ \begin{smallmatrix} +\text{Verb} \\ +\text{N} \end{smallmatrix} \right]}$	$\text{jà}_{[-ATD]} \text{ àa}_{[+ATD]} \text{ ráwá}_{\left[ \begin{smallmatrix} +\text{Verb} \\ +\text{N} \end{smallmatrix} \right]}$	$\text{nà} \text{ àa}_{[+ATD]} \text{ kálàktà}_{\left[ \begin{smallmatrix} +\text{Verb} \\ +\text{N} \end{smallmatrix} \right]}$

<sup>10</sup> There is one minor exception to this statement. In all aspects but the subjunctive, pronoun direct objects (= independent pronouns) retain their lexical tone. For example, in the perfective we find *ná ndèmá áci* ‘ I greeted him ’ (which becomes [*ná ndèm áci*] by the vowel deletion rule.) In the subjunctive, after low tone verbs all pronoun objects have low tone, e.g. *ná ndèmí àci* ‘ that I greet him ’ (which becomes [*ná ndèm áci*]). This fact will be accounted for by incorporating pronoun objects into the verb stem before the rule Subjunctive Verb Tones (6).

(4) Verbal Noun Suf.	$\grave{a}a_{[+ATD]} r\acute{a}w-\grave{a}$	$j\grave{a}_{[-ATD]} \grave{a}a_{[+ATD]} r\acute{a}w-\grave{a}$	$n\grave{a} \grave{a}a_{[+ATD]} k\grave{a}l\grave{a}k\grave{t}-\grave{a}$
(8) Vowel Deletion		$j\grave{a}a r\acute{a}w\grave{a}$	$n\grave{a}a_{[+ATD]} k\grave{a}l\grave{a}k\grave{t}\grave{a}$
(10) ATD			$n\acute{a}a k\grave{a}l\grave{a}k\grave{t}\grave{a}$
(12) Tone Raising			$n\acute{a}a k\grave{a}l\grave{a}k\grave{t}\grave{a}$
Phonetic	$[\grave{a}a r\acute{a}w\grave{a}]$	$[j\grave{a}a r\acute{a}w\grave{a}]$	$[n\acute{a}a k\grave{a}l\grave{a}k\grave{t}\grave{a}]$

Note especially that in the two left-hand derivations, rule (13), which lowers high tone after low, does not apply because the high tone that would otherwise be lowered is followed by low, not high as required.

### *Transitive Verbs in the Imperfective*

A verbal noun of a transitive verb and a following direct object form a surface genitive construction. There are two characteristics of genitive constructions: a noun ending in a low tone raises that tone before a noun beginning with a low tone (rule (11)); and a linker /*k*/ ([*k*] before voiceless sounds, [*g*] before voiced sounds) is transformationally placed between the two nouns. The linker can optionally be deleted.

The following examples illustrate derived structures immediately before and after Genitive Tone Dissimilation (11).

$j\grave{a}a v\acute{a}ik\grave{a}-k \grave{d}\acute{a}a$	→	$[j\grave{a}a v\acute{a}ik\grave{a}-k \grave{d}\acute{a}a]$	‘ we will surround the town ’
$\acute{a}a b\grave{e}n\grave{a}-k dl\grave{u}gw\grave{a}n$	→	$[\acute{a}a b\grave{e}n\grave{a}-g dl\grave{u}gw\grave{a}n]$	‘ she will cook sauce ’

In order of application, Genitive Tone Dissimilation (11) must precede Tone Raising after High (12). A direct object noun beginning in low tone and having an initial voiceless or sonorant segment is raised after high, whether the high is underlying or derived by (11).

Partially derived	$n\grave{a}a k\acute{i}id\grave{a}-k tl\grave{i}w\acute{a}i$	‘ I will eat meat ’
(11) Gen. Tone Dissimilation	$n\grave{a}a k\acute{i}id\grave{a}-k tl\grave{i}w\acute{a}i$	
(12) Tone Raising	$n\acute{a}a k\acute{i}id\grave{a}-k tl\acute{i}w\acute{a}i$	
After (14) + (15)	$[n\acute{a}a k\acute{i}id\grave{a}-k tl\acute{i}w\acute{a}i]$	

In the imperfective, transitive verbs require an overt mark of  $\emptyset$  anaphora (a deleted deep structure object). This marker is /'w/,<sup>11</sup> which is also the referential marker used with nouns, e.g.  $d\grave{i}w\acute{u}k\grave{a}-w$  (derived from  $/d\grave{i}w\acute{u}k\grave{a} + 'w/$  ‘ the horse in question ’).

$\acute{a}a l\acute{a}un\grave{a} 'w$	→	$[\acute{a}a l\acute{a}un\acute{a}w]$	‘ he will see (it) ’
$\acute{a}a nd\grave{e}m\grave{a} 'w$	→	$[\acute{a}a nd\grave{e}m\acute{a}w]$	‘ he will greet (him) ’

Complex Tone Levelling (15) gives the step tone on the first example above in the same way it gives a step tone to the imperative verb in  $\acute{a} r\acute{e}p\acute{c}i$  ‘ open! ’. Rule (15) drops

<sup>11</sup> The referential mark /'w/ is not to be equated with the /w/ used with verbs in the perfective. The latter marker is used with all verbs, transitive or intransitive, and is found only before pause. The marker /'w/ is used only with transitive verbs and is retained in all phonological environments.

a low tone whenever a low and a high co-occur on a syllable, whether the low tone is second as in *á rə̀pɕi < á rə̀pɕi* or first as in *áa láundw < áa láundw*. The step in both cases is a result of Downdrift (14), which gives a relatively lower pitch to a high tone following a low tone than the pitch of the high tone preceding the low.

*List of Rules*

The first four rules below are unordered with respect to one another. Beginning with (5), the rules are strictly ordered phonological process rules. I haven't closely investigated questions of cyclic application or recurrent applicability. For the purposes of this article, rules may be taken as having only a single application in a given string.

*Aspect Suffix Addition Rules*

Illustrations of the effects of these rules can be found in the discussion of the individual aspects.

(1) *Perfective Marker Addition*

$\emptyset \longrightarrow w / \dots \text{---}]_{[+\text{perf}]} \#$  where # marks pause  
 Verbs in the perfective add the marker *w* when pre-pausal.

(2) *Second Subjunctive Suffix Addition*

$V \longrightarrow á / \dots \text{---}]_{[+\text{subj}_2]}$   
 Verbs in the second subjunctive replace the stem vowel of a verb with *-á*.

(3) *Subjunctive and Imperative Vowel Suffix Addition*

$V \longrightarrow \left[ \begin{array}{c} i \\ \langle a \rangle \\ \alpha\text{HI} \end{array} \right] / [C[\alpha\text{HI}] X \text{---}]_{\left[ \begin{array}{c} +\text{subj} \\ \langle +\text{pl imperative} \rangle \end{array} \right]}$

Subjunctives and singular imperatives change the stem vowel to *-i*. Plural imperatives change it to *-a*. The new vowel takes the same tone as the underlying initial syllable of the verb.

(4) *Verbal Noun (Imperfective Aspect) Vowel Suffix Addition*

$V \longrightarrow á / \dots \text{---}]_{\left[ \begin{array}{c} +\text{Verb} \\ +\text{N} \end{array} \right]}$

'Regular' verbal nouns replace the final stem vowel of the verb with *-á*. Other classes of verbal nouns are not covered here.

*Aspect Tone Rules (5)–(10)*

(5) *Perfective and Second Subjunctive Tones*

$V \longrightarrow [-\text{HI}] / [C \text{---} X]_{\left\{ \begin{array}{l} [+perf] \\ [+subj_2] \end{array} \right\}}$

Verb stems in the perfective and second subjunctive have all low tone except for the final syllable. For example, the high tone stem *ráwá* 'run' is lowered, giving perfective

*ràwá-w* 'he ran' and second subjunctive *dà ràw-á* 'he should run'. In verbs of more than two syllables, medial syllables are low in their lexical form, so rule (5) need apply only to the initial syllable.

(6) *Subjunctive Verb Tones*

$$V \longrightarrow [\alpha HI] / [C [\alpha HI] X \text{ --- } X]_{[+\text{subj}]}$$

Verbs in the subjunctive copy all high or all low tone from the underlying tone of their first syllable. With disyllabic verbs this rule applies vacuously since rule (3) would already have provided the final syllable with copy tone. However, with verbs of more than two syllables, the present rule is needed to raise the middle syllable(s) of verbs with basic high tone, e.g. *dà kátér-í* 'that he hop' from the underlying stem *kátèr-á* 'hop'. Verbs in the imperative, both singular and plural, also undergo this rule.

(7) *Final Tone Raising of Imperative Verbs*

$$V \longrightarrow [+ HI] / \dots \text{ --- } ]_{[+\text{imperative}]}$$

The final syllable of all verbs in the imperative is raised to high, for example *á vèrí* 'go out!' (cf. the subjunctive *ná vèrì* 'that I go out').

(8) *Vowel Deletion*

$$V \longrightarrow \emptyset / C \text{ --- } + V$$

A short vowel before a vowel across a morpheme boundary is deleted. This is a general phonological rule which was discussed and illustrated earlier in the paper.

(9) (optional) *Tone Lowering after Low (1st Plural)*

$$[+ HI] \longrightarrow [-HI] / \left[ \begin{array}{c} -HI \\ + \text{1st} \\ + \text{pl} \end{array} \right] + [C \text{ --- } X]_{[+\text{subj}]}$$

Optionally, the first syllable of a high tone subjunctive verb can be lowered after the first person plural pronouns. For example, 'that we sweep' may be *jà káashí* or, by rule (9), *jà kàashí*. No other person may trigger this rule, e.g. 'that she sweep' is *dà káashí*, never *\*dà kàashí*.

(10) *AUX Tone Dissimilation*<sup>12</sup>

$$V \longrightarrow [+ HI] / \text{ --- } (V)_{[+\text{ATD}]} + [C [-HI] X]$$

The subjunctive (= imperative) and imperfective asp markers have the feature [+ ATD]. The asp marker for the perfective is itself [+ ATD]. Hence, the asp markers for these aspects (or the portmanteau auxpro + asp form resulting from Vowel Deletion (8)) will be dissimilated by rule (10) to high tone if followed by low tone, e.g. *ná vèrì* 'that I go out' (subj), *á vèrí* 'go out!' (imperative), *ná vèríu* 'I went out' (perf).

<sup>12</sup> Rule (10) does not specify categories such as AUX or Verb since there are a few other morphemes in the languages with the feature [+ ATD], e.g. the preposition *nàa* 'with'.

(11) *Genitive Tone Dissimilation*

$$V \longrightarrow [+ \text{HI}] / \text{---} ]_N + k + [ (\text{C}) [-\text{HI}] \text{X} ]_N$$

A noun ending in a low tone raises that tone before a noun beginning with a low tone when in a genitival construction with it. *K* is the linker which is transformationally inserted in these constructions. This rule will give the proper form to imperfective aspect constructions since the verb form used in the imperfect is the verbal noun and is linked to a following direct object just as the first of any two nouns in a genitive construction is linked to the second, e.g. [*áa bâná-g dluwàn*] 'she will cook the sauce', from *bâná* 'cooking'.

(12) *Tone Raising after High*

$$[-\text{HI}] \longrightarrow [+ \text{HI}] [-\text{HI}] / [+ \text{HI}] + \left\{ \begin{array}{l} [-\text{voice}] \\ [+ \text{sonorant}] \end{array} \right\} \text{---}$$

When a low tone syllable is preceded across a morpheme boundary by a high tone, and when that low syllable begins with a phoneme other than a voiced obstruent, it *adds* a high tone. This high tone is added to the left of the low tone and the low tone is retained. This results in a falling tone on the affected syllable when that syllable is long, e.g. *ná káasów* 'I swept' becomes *ná káásów* by rule (12). A later rule, Complex Tone Levelling (15), may alter this sentence further.

(13) *Tone Lowering after Low*

$$[+ \text{HI}] \longrightarrow [-\text{HI}] / [-\text{HI}] ([+ \text{voice}]) \text{---} (\text{C}) \text{C} [+ \text{HI}]$$

A high tone in a syllable beginning in a voiced sound (obstruent, sonorant, or vowel) is changed to low when preceded by a low tone and followed by a high tone. This rule has been formulated as being applicable to any string of syllables Lo-Hi-Hi where the middle syllable begins in a voiced sound. It invariably applies if the middle syllable is preceded or followed by a word boundary. In this paper, rule (13) accounts for lowering of the final syllable of verbs before high tone direct objects (e.g. *zìidá gwámák* 'he slaughtered a ram' becomes [*zìidá gwámák*]), and lowering of the initial tone of verbs after a low tone AUX (e.g. *dà záarí dírúkà* 'that he overburden the horse' becomes [*dà záarí dírúkà*]). Rule (13) also seems to characterize a constraint on tone sequences within a word, i.e. there are only a few words, such as *káanádi* 'patience', to which (13) could apply but does not. Almost half of these words are borrowings.

(14) *Downdrift*

The rule Downdrift describes the phenomenon in which a high tone following a low tone is lower in pitch than a high tone preceding that low tone. This rule is assumed at this point in the sequence of rules but is not formalized.

(15) *Complex Tone Levelling*

$$[-\text{HI}] \longrightarrow \emptyset / [+ \text{HI}] \quad \text{when both tones are on the same syllable}$$

Conditions: Optional if sequence [+ HI] [-HI] occurs on a long syllable (CVV or CVC)

Obligatory on a short syllable or when the sequence is [-HI] [+ HI]

This rule deletes a low tone which co-occurs on a syllable with a high tone. The lack of an environment bar on the right indicates that this rule applies to the low tone whether it precedes or follows the high.

By Tone Raising after High (12), certain low tone syllables add a high tone. Hence, *ná kàasáw* 'I swept' becomes *ná káàsáw*. Downdrift (14) gives a pitch to the syllable *-sáw* which is lower than the pitch of the first part of the syllable *káà-* because of the intervening low tone. The syllable *káà-* fits the structural description of Complex Tone Levelling (15). Thus, if (15) is applied to the sentence in question, the result is [*ná káàsáw*] (after application of a rule /əw/ → [uw]), i.e. the low tone on *káà-* is deleted leaving the step tone on *-sáw* as the surface manifestation of its presence.

Actually application of (15) is optional on long syllables, so [*ná káàsáw*] is also a possible surface form. However, had the verb been *kátá* 'return', the only possible surface form would have been [*ná kátáw*] 'I returned'.

In the above examples, the low tone on the affected syllable lies to the right of the high tone. Rule (15) must also apply if the low is to the left of the high tone. We see this in imperfective constructions such as [*nàa kíidáw*] 'I will eat (it)'. This comes from the partially derived *nàa kíidà 'w*, where *kíidà* is the verbal noun of *kíidá* 'eat (meat)' and /'w/ is the mark of a deleted deep structure object. Here, a high tone is added to a syllable which already has a low tone, giving *nàa kíidáw*. Rule (15) drops the low tone giving the surface form above. Note that the high tone must follow the low here because the last tone is a step resulting from application of the Downdrift rule (14) after the intervening low.

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