

THE APPLICATION OF TONAL RULES IN THE DUALA VERB

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In Duala, a narrow Bantu language spoken in Cameroon, the initial root vowel as well as the final vowel of the stem that may be followed by post-final vowel material are the privileged positions for the surfacing of tones in the verb. This article mostly concentrates on the tonal processes in the past tense. It is proposed that irregular cases of the past tense are derived at stratum one and the regular cases at stratum two of the lexical phonology. In addition, the author proposes that within the Duala verb stem, the final vowel together with the verbal extensions constitute a phonological domain.

En duala, une langue bantou du Cameroun, la voyelle initiale du radical ainsi que la voyelle finale du thème verbal sont des positions privilégiées comme porteuses de tons dans le verbe. Cette étude se concentre particulièrement sur les processus tonaux du perfectif. Il est notamment proposé que les cas irréguliers de ce temps sont dérivés à la première strate tandis que les cas réguliers sont dérivés à la seconde strate de la phonologie lexicale. Il est en outre proposé que, dans le thème verbal du duala, la voyelle finale ainsi que les extensions verbales constituent un domaine phonologique.

0. INTRODUCTION

One striking observation about Duala, a narrow Bantu language spoken in Cameroon, is that the root vowel as well as the final vowel of the stem that may be followed by post-final vowel material are the privileged positions for the surfacing of tones in the verb. Although the language has three level tones, H (high tone), M (mid tone), and L (low tone) that are clearly manifested in the noun (Mutaka and Ebobissé 1993, Ittmann 1939), only the L and H tones and their combinations into contour tones ever surface in the verb. This paper seeks to account for the behavior of tone in the Duala verb stem. The paper is organized as follows. The introduction deals with preliminaries in which the structure of the Duala verb as well as a survey of the crucial data and a laying out of the theoretical assumptions to deal with these data are presented. The first section treats the tonal rules in the disyllabic verbs and the second section looks at peculiarities encountered in the monosyllabic verb stems.

Like most narrow Bantu languages, a simple Duala verb consists of a subject marker (SM), a tense marker (TM) and a stem that consists of a root (RT), and a final vowel (FV) as illustrated in (1). (The H is represented by an acute accent and the L tone is not represented in the examples and derivations.)

- (1) a. **di-ma-pul-a** [dimapula] we are drilling
SM TM RT FV from pul-a
b. **dí-ma-pul-a** [dímapula] it is drilling
SM TM RT FV
c. **na-Ø-búk-i** [nabúki] I surpassed
SM TM RT FV from búk-a
na-Ø-timb-í [natimbí] I returned
SM TM RT FV from timb-a

The tones on the SM are lexically marked: they are either H or L, depending upon the class with which they are affiliated. Thus, **di** in (1a) that belongs to class 1 is L whereas **dí** in (1b) that belongs to class 5 is H. Similarly, the tones in the TM are also lexically marked. The tones in both the SM and TM are not discussed extensively in this paper. Of interest for this paper are the tones exemplified in the stems of (1c) to indicate the past tense.¹ These stems derive from **búk-a** 'to surpass' and **timb-a** 'to return'. As is clear from these infinitive forms, the FV in the past tense is replaced by

¹Throughout the paper, I use the term "past" tense as a broad term for what could be called the perfective tense or the narrative past. The morpheme -i is thus a perfective marker.

-i- with a H tone in verbs whose root vowel has a L tone and with a L tone in verbs whose root vowel has a H tone. Several exceptions to this pattern for the formation of the past tense will be discussed in §1.

As is the case in narrow Bantu languages, one or more extensions (EXT) can be inserted between the root and FV in the Duala verb. This is exemplified in (2).

- (2) a. **di-Ø-pik-íméd-i** [dipikímédi] we squeezed in
 SM TM RT EXT FV from **pik-a** to drill
 di-Ø-lókó-méd-i [dilókómédi] we became quiet
 SM TM RT EXT FV from **lókó** to be quiet
 b. **di-Ø-sib-ís-e** [disibíse] we descended
 SM TM RT EXT FV from **sib-a** to descend
 di-Ø-lónd-ís-e [dilóndíse] we filled
 SM TM RT EXT FV from **lónd-a** to inflate

These forms are also in the past tense. Unlike the forms presented in (1), the tone of the past form does not surface on the FV. What we observe is that if the root vowel has a L tone, the H surfaces on the vowels of the extensions as shown in (2a). Notice that, in **lókómédi**, the antepenultimate vowel is the FV of the base form as shown in the infinitive form. What I indicated as EXT + FV in this form can thus be considered as post-final vowel suffixes. Of interest for this paper is why and how the H tone of the past tense surfaces on this FV of the base form as well as the penultimate vowel in the post-final suffix. As to the forms in (2b), notice that a H surfaces on the penultimate vowel irrespective of the presence or absence of a H on the root vowel. The assignment of tones in such forms will also be treated in §1.

Before presenting an analysis of these data, a brief presentation of the theoretical assumptions to deal with these data is in order here. In this paper, I assume the theory of lexical phonology (Mohanen 1982, Kiparsky 1982, 1985, Pulleyblank 1986), more particularly, I assume the interleaving of phonological processes with morphological ones and I also assume that these processes can take place on different strata. With respect to Bantu languages, it has been assumed that the stem level is derived at stratum one whereas the prestem material that typically consists of the subject marker (SM) and tense markers (TM) is derived at stratum two of the lexical phonology (Goldsmith and Sabimana 1984, Mutaka 1990, Hyman 1989). Following Mutaka (1990), I also assume that, in a stratally organized phonology, bracket erasure is not automatic: later strata may still refer to brackets established earlier in the derivation as long as they delimit major phonological domains. In the case of Duala, it will be seen that the FV together with the post-final vowel constitute a phonological domain to which phonological rules refer.

As was mentioned earlier, Duala has three level tones: the H, the M, and the L. Assuming the theory of underspecification, one would expect this language to have M as the default tone like in Yoruba (Pulleyblank 1986). However, since the M tone is extremely rare in the language and sporadically appears mostly in nouns, I assume that L is the default tone in this language.² However, as has been observed by a number of phonologists (Pulleyblank 1986, Yip 1987, Snider and van der Hulst 1993), such tones like the H, the low and the M are in fact bundles of features. It should be remarked that these features are autosegmental in nature, that is, they appear on a separate tier and get associated to tone bearing units, following the association conventions as discussed for example in Pulleyblank (1985). In this paper, I assume the analysis in Mutaka and Eboissé (1993) that Duala actively uses the feature [+upper] as the underlying H and [-upper] as the default L tone. [-raised] is also used as an

²Where the M tone surfaces in nouns, I assume that it is basically a combination of the lexical tone features [+upper] and [-raised] as proposed in Mutaka and Eboissé (1993). Robert Hedinger has raised the possibility that the M tone in Duala might be a case of downstepped H (personal communication). I leave this for future investigation.

underlying L tone. In this paper, H stands for the [+upper] feature and underlying L stands for the [−raised] feature. The surface L will basically be the spell out of either [−raised] [−upper] if it derives from an underlying L (i.e., [−raised]) or [−upper] only if it results from the default tone assignment. Given these assumptions, let us look at the treatment of tones in the disyllabic verb stems.

1. THE TONAL RULES IN DISYLLABIC VERBS

The majority of verb stems in Duala are disyllabic and they can be divided into two groups: the H tone verb whose H tone appears on the first root vowel and the L tone verb. They are illustrated in (3).

- (3) a. **-kén-a** to bar
-bé-a to get soft
-bí-a to know
-bús-a to get out
-tɔ́nd-ɔ to like
 b. **-lak-a** to lend
-til-a to write
-ton-a to neglect
-tɔ́nd-ɔ to increase

Since the position of the H in the H tone verb is predictable in that it only appears at the initial root vowel position, it is not necessary to represent this H as pre-associated to the initial root vowel underlyingly. This H is floating and it links to the initial root vowel, following the association conventions (Pulleyblank 1985, Goldsmith 1976). To obtain its association to the root vowel, we must assume that this floating H links at the stem level, more precisely at the first stratum before the prestem material has been prefixed to the verb. This is shown in the following derivation.

- (4) **-kén-a** to bar

Stratum 1: (i.e., stem level)

ken-a

H (H association)

Output: **kéna** (after postlexical assignment of the default tone)

As shown in this derivation, the tone associates left to right. What about the L tone verb stem? Since Duala has three level tones, i.e., H, M, and L, one would assume that M would be the default tone and that both H and L should be represented underlyingly. If we assume that the initial stem vowel must have a tone, one could posit L on the root vowel of the L tone verbs. While the necessity of positing such a L will be seen in the monosyllabic verb stems, nothing seems to indicate that there is an underlying L in the disyllabic verb stems. In fact, the L tone verbs starting with a vowel seem to indicate that the initial root vowel of a L tone verb is rather toneless underlyingly. This is illustrated in (5).

- (5) a. **á-angweé [ángwě]** to jump, to project oneself
á-atéleé [átelě] to convert oneself
á-ombweé [ombwě] to repent oneself
á-umweé [úmwě] to wake up oneself
 b. **angwa** to project
atele to turn
ombwa to consider
umwele to wake up

The *á-* in (5a) is the reflexive pronoun and it is underlyingly associated with a H. When it coalesces with a L tone verb with an initial stem vowel, the resulting vowel bears a H tone and not a falling tone as would be expected if the initial stem vowel had a L tone. Because of this, I assume that the disyllabic L tone verbs have a toneless root vowel underlyingly. They acquire their L tone through the assignment of the default L which, as mentioned in the introduction, is the [–upper] tonal feature.

So far, we have looked at the root vowel and have concluded that it may be H or toneless underlyingly. What about the final vowel? I also assume that it is toneless underlyingly and that it acquires its L as the result of default L tone assignment. Evidence that this FV is toneless underlyingly is provided by the forms in (6).

- (6) a. **bol-a** to give
wunj-a to untie
sáw-a to pay
wán-a to carry
 b. **bolá múto** to give the woman
wunjá múto to untie the woman
sáwá múto to pay the woman
wáná múto to carry the woman

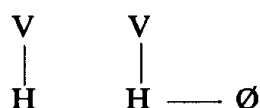
The forms in (6a) are in the infinitive and those in (6b) in the infinitive followed by an object. In (6a), the FV ends with a L tone but in (6b) it ends with a H tone. The forms in (6b) show that a H is assigned to the final vowel of the infinitive when the form is followed by an object. Since the FV of the infinitive does not surface with a rising tone, that is, a LH sequence, we must conclude that it is toneless underlyingly and this explains why it surfaces with a H that is inserted when the verb is followed by an object.

Let us now look at the regular past tense forms, as illustrated in (7).

- (7) a. **na-nɔŋg-í** I took from **nɔŋg-ɔ** to take
 SM RT FV
na-timb-í I returned from **timb-a** to return
na-lak-í I lent from **lak-a** to lend
 b. **na-búk-i** I surpassed from **búk-a** to surpass
na-sís-i I rubbed from **sís-a** to rub

As illustrated in these forms, the past tense is characterised by the suffixal vowel *-i* that replaces the FV. In addition, this vowel surfaces with a H tone in a L verb stem and a L in a H verb stem. I propose that this vowel is prelinked to the H underlyingly and that, in a H tone verb, the H gets deleted because of the application of Meeussen's rule formulated in (8).

- (8) Meeussen's Rule



This rule says: when two H tones are adjacent, the second H tone deletes. In a number of examples that will be discussed later, it will be shown that Meeussen's rule does not apply wherever its environment is met. It will be proposed that its application obtains within the lexical stratum where the regular past tense is derived. In the following derivation that illustrates the application of Meeussen's rule, let us assume for the moment that it applies at stratum one.

- (9) a. **na-lak-í** I lent b. **na-búk-i** I surpassed

Stratum one: Stem level

Root cycle

lak-a

buk-a

H

Suffixation of the past tense morpheme -i

lak-i

buk-i

H

H H → ∅

Meeussen's Rule

Stratum two: affixation of prestem material

na-lak-i

na-buk-i

H

H

Postlexically:

na-lak-i

na-buk-i

L L H

L H L

Default tone assignment

Output: **nalakí**

nabúki

That the suffixal -i is prelinked to a H tone is also supported by the formation of the past forms of the following verbs.

- (10) a. **na-duń** I scolded from **dum-a** to scold
 na-duń I became old from **dun-a** to become old
 na-pań I glowed from **paŋ-a** to glow
 b. **na-dím** I extinguished from **dím-a** to extinguish
 na-wáŋ I brought from **wáŋ-a** to bring
 na-ńóm I dodged from **ńóm-a** to dodge

In these forms, the -i past tense morpheme does not surface as a result of a rule in the language that deletes a H front vowel in final position after a nasal. Of interest for this paper is the docking of the H tone on the preceding nasal in the forms in (10a) which correspond to the L tone verbs where we rightly expected the surfacing of the suffixal -i with a H tone. In (10b), the nasal surfaces with a L tone, which shows that Meeussen's rule also applied in these forms by deleting the H tone of the suffixal past tense morpheme -i before it got deleted.

Consider also the following data:

- (11) a. **na-ti-í** [natĩ] I took a rest
 SM RT FV from **ti-a** to take a rest
 na-bi-í [nabĩ] I followed from **bi-a** to follow
 na-di-í [nadĩ] I found from **di-a** to find
 na-si-í [nasĩ] I ground from **si-a** to grind
 b. **na-bí-i** [nabî] I knew from **bí-a** to know
 na-dí-i [nadî] I burned from **dí-a** to burn
 na-sí-i [nasî] I cleaned from **sí-a** to clean
 na-tí-i [natî] I cracked from **tí-a** to crack (nuts)

Although the stem in these forms surfaces as monosyllabic, it derives from a disyllabic morpheme. In (11a) the final vowel -i surfaces with a rising tone, that is, a LH sequence. Since these forms belong to the L tone verb group, the rising tone is the one predicted in this analysis, that is, the H of the rising tone is the H of the past tense morpheme -i. In (11b), the forms end in a falling tone, that is, a HL sequence. This

shows that Meeussen's rule correctly applied here, deleting the H of the past morpheme -i: the deleted H surfaces into a default L which, in combination with a preceding H forms a falling tone. This default L is presumably assigned in these forms before the vowel coalescence that renders the sequence of two adjacent vowels into a single vowel applies. The LH sequence on this single vowel in (11a) and the HL in (11b) are thus produced as a rising and falling tone respectively.

Meeussen's rule also applies in the following data.

- (12) a. **na-ou** [nou] I washed from **o-a** to wash
 b. **na-bou** [nabou] I was sick from **bó-a** to be sick
 na-ou [nou] I matured from **ó-a** to mature
 na-lou [nalou] I insulted from **ló-a** to insult
- (13) a. **na-su** [nasu] I snatched from **su-a** to snatch
 b. **na-bu** [nabu] I broke from **bú-a** to break
 na-tu [natu] I was poor from **tú-a** to be poor

In these forms, instead of the past tense morpheme -i, what surfaces is -u. The fact that the preceding vowel is a round vowel suggests that the past tense morpheme -i gets a round feature when it follows a round vowel. Of interest for this paper is the tone that surfaces. In (12a) and (13a) which are L tone verbs, the expected H tone surfaces on the FV; in (13a), it surfaces as the second tone of the rising tone. In (12b) and (13b), a L tone surfaces on the FV as a result of the application of Meeussen's rule as expected. In (13b) it surfaces as the second part of the falling tone.

To sum up, we have identified the morpheme -i as the past tense morpheme that is suffixed to a stem and we have argued that it is underlyingly associated with a H tone. This H is subject to deletion by the application of Meeussen's rule if it is preceded by an adjacent H tone. In the following data, we will see that this past tense formation has irregular cases. Consider first the forms in (14).

- (14) a. **na-nangâ** I laid down from **nang-a** to lie down
 na-panê I suspended from **pan-ε** to suspend
 na-ipê [nipê] I cooked from **ip-ε** to cook
 b. **na-bélê** I called from **bél-ε** to call
 na-bálê I lent from **bál-ε** to lend
 na-léê I taught from **lé-ε** to teach

The forms in (14a) are L tone verbs and those in (14b) are H tone verbs. Contrary to what we would expect, that is a FV -í in (14a) and -i in (14b), both forms end with the vowel they have in the infinitive and this vowel surfaces with a falling tone. To account for these forms, I propose that the past tense formation is the result of two morphological rules: one that lengthens the FV and the other that assigns a HL melodic tone to the form. The derivation in (15) illustrates how this HL melodic tone associates to the tone bearing units.

- (15) **na-panê** I suspended **na-bálê** I lent

Stratum one:

Root cycle: **pan**

bal
 H

H tone association

Past tense formation and HL assignment:

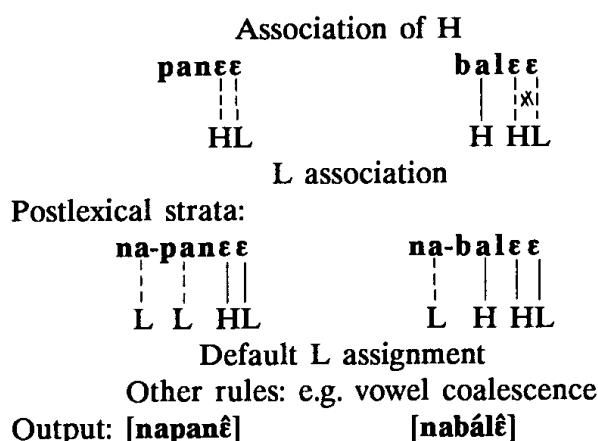
panee

HL

balee

H

HL



As shown in these derivations, the H links first to the FV. It is then delinked by the L, presumably because, lexically, a tone bearing unit can be associated to a single tone lexically (Goldsmith 1990, Mutaka and Ebobissé 1993). Postlexically, vowel coalescence that renders the sequence of two adjacent vowels into a single vowel applies. This single vowel is thus associated to two skeletal slots onto which the HL sequence is also linked. This HL sequence associated with this single vowel is thus produced as a falling tone.

At this point, one might ask why the H does not target the initial root vowel of a L tone verb instead of linking to the FV. This is probably due to the fact that this suffixal H associates within a restricted domain whose left bracket includes the FV of the root. More supporting evidence for this proposal will be given later in this section.

Another question concerns the past tense formation. Since the irregular past tense is derived at stratum one, could it be the case that the regular past tense is derived at the same stratum? Following a proposal by Kiparsky (1982) about the assignment of the irregular and regular English plural formation in the first and second stratum respectively, I propose that the regular past tense with the morpheme *-í* is rather derived at the second stratum which is lexical as well. This means that the two past tense formations are in an elsewhere relation: a verb may have it at the first stratum when it is an irregular past or at the second stratum if it is a regular past tense. I would like to point out that there are cases where certain verbs derive their past formation in both strata as exemplified in (16).

- (16) a. **na-lelê** I tamed from **lel-ε** to tame
 b. **na-lelí** I tamed
- (17) a. **na-éngê [néngê]** I poured (oil) from **éng-ε**
 na-kékê [nakékê] I hatched from **kék-ε**
 b. **na-éngi [néngi]** I poured (oil)
 na-kéki [nakéki] I hatched

The (b) forms in (16) and (17) are the regular cases where the FV is the past tense morpheme *-i* with a H tone in the L tone verb in (16) and with a L tone in the H tone verb in (17).

Consider also the cases in (18).

- (18) a. **na-alô [nalô]** I left from **al-a** to leave
 na-kolô I grew from **kol-a** to grow
 na-salô I was short from **sal-a** to be short
 b. **na-kúlô** I revealed from **kúl-a** to reveal a secret
 na-ólô [nólô] I was red from **ól-a** to be red
 na-wútô I was short from **wút-a** to be short
 c. **na-wutí** I hid from **wut-a** to hide
 na-wúti I discovered from **wút-a** to discover

The past tense formation of the forms in (18a,b) is with a FV *-ô* with a falling tone in both the L and H tone verbs. Notice that this *ô* cannot be attributed to some kind of vowel harmony from a preceding round vowel as clearly shown in the form *wuta* which, for the meaning 'to be short' uses *ô* and for the meanings in (18c) uses the FV *-i*. Therefore, I propose that the suffixal vowel *ô* is suffixed to the base form and that, like the irregular verbs discussed earlier, the past tense assigns a melodic HL tone to these verbs. Before giving an illustrative derivation, let us look at the forms in (19).

- (19) a. **na-abô** [nabô] I climbed from **abw-a** to climb
na-kumô I began from **kumw-a** to begin
na-paô I cleared a bush from **paw-a** to clear a bush
 b. **na-sâô** I paid from **sâw-a** to pay
na-pâô I separated from **pâw-a** to separate

Like the forms in (18), these forms end with *-ô* in the past tense. Notice that, in the base form, the FV is preceded by the glide *w* which disappears in the past tense form. Since it was proposed earlier that the vowel *o* is suffixed to the base, there must be two segmental rules applying in these forms: a vowel deletion rule and a glide deletion rule. These rules are informally stated in (20) and (21).

- (20) Vowel deletion

V — Ø / — V
 [+lo]

This rule says: a L vowel deletes when it precedes another vowel.

- (21) w — Ø / — V
 [+rd]

This rule says: the glide *w* deletes when it precedes a round vowel in final position.³ (22) is an illustrative derivation of these forms in *-ô*.

- (22) **na-wûtô** I was short **na-kumô** I began

Stratum one:

Root cycle **wut-a** **kumw-a**
 H
 H association

Irregular past tense formation

wut-a-o **kumw-a-o**
 H HL HL
 H association
wut-a-o **kumw-a-o**
 H H L H L
 L association

³This rule may be morphological in that it may apply only in the past tense. Ittmann's dictionary lists such words that are exceptional to this rule: *wí* 'thai', *wô* 'there', *wuu* 'progressively', *ewô* 'loan', *ewô* 'one', *bowô* 'trees'. In addition, I would like to point out that I have not found the sequence *-lw-* in Duala which could be found on a hypothetical word like **kûlw-a*. Such a word could be contrasted with *kûl-a* in (18b). It would then be interesting to see whether it would form its past tense as *kûlô* just as the word for 'I revealed' in (18b) or whether this past tense would be blocked. I am indebted to the JWAL referee for drawing my attention to the necessity of contrasting *-lw-a* to *-l-a* in these forms.

Postlexical strata:

na-wut-a-o

L H H L

Default tone assignment

Other rules: Vowel deletion, Glide deletion

Output: **[nawútô]**

na-kumw-a-o

L L H L

Output: **[nakumô]**

As shown in these derivations, the falling tone on the FV results from the deletion of the preceding vowel and the re-association of the H on the remaining tone bearing unit.

Consider also the following forms:

- (23) a. **na-sibíse** I descended from **sib-a** to make someone lower
(infinitive = **sib-ise**)
na-tándise I increased from **tánd-a** to multiply
b. **na-lóndise** I filled from **lónd-a** to fill oneself
(infinitive = **lónd-ise**)
na-wútise I shortened from **wút-a** to become short

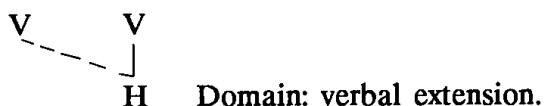
The suffix **-ise** in these forms indicates the causative. Notice their irregular past form in that they do not use the past morpheme **-í**, rather the last two vowels end in H and L. Like the previous irregular cases, I propose that the past tense assigns the HL melody to these forms, that the H first links to the final vowel and is then delinked when the L associates to the FV as well. The delinked H then re-associates to the penultimate vowel.

One last irregular case is provided by disyllabic stems using long extensions as illustrated in the forms in (24).⁴

- (24) a. **na-lókómédi** I became quiet from **lók-a** to quieten
(= past of **lókameye** to become quiet)
na-pikímédi I entered by force from **pik-a** to drill
(= past of **pikimeye** to enter by force)
na-sekémedi I shook violently from **sek-ε** to shake
(= past of **sekemeye** to shake violently)
b. **na-lóndómédi** I inflated from **lónd-a** to get full
(= past of **lóndomeye** to inflate)
na-wéng-éméd-i I dodged from **wéngεle** to spare
(= past of **wéngemeye** to dodge)
na-tútúmedi I got big from **tútú** tumor, swelling
(= past of **tútumeye** to swell up, to get big)

Like the previous irregular past tense cases, the last two vowels end in H and L tones irrespective of the fact that the verb stem is H tone or toneless. To account for the tones on these last two vowels, we can simply assume that the HL assigned by the past tense are the ones that surface onto them as was demonstrated for the past tense forms ending in **-ô** and **-ise**. Of more interest here is the fact that what would appear to be the FV of the base which now belongs to the extensions, i.e., the antepenultimate vowel, also gets a H. To account for this H, I propose the rule in (25).

- (25) High Tone Spreading:



⁴These long extensions are the result of multiple suffixes as observed in Ittmann (1939:116).

This rule says: a H spreads right to left within the verbal extension domain. Alternatively, one could imagine that the H of the melodic HL assigned by the past tense directly targets the first TBU (tone bearing unit) of the verbal extension domain and the L links to the last vowel. The spreading of the H would then apply left to right on the remaining penultimate toneless vowel. This would then be a case where the tones apply, following an edge-in algorithm (Yip 1987, Mutaka 1990, Hewitt and Prince 1990).⁵ One potential problem for this alternative is that the association of H creates the environment for the application of Meeussen's rule in a H tone verb. However, this problem can be remedied by assuming that Meeussen's rule applies at stratum two, that is, at the stratum where the regular past tense is derived. As both alternatives are very plausible, I leave it for future research to determine which alternative is more appropriate for the Duala data.

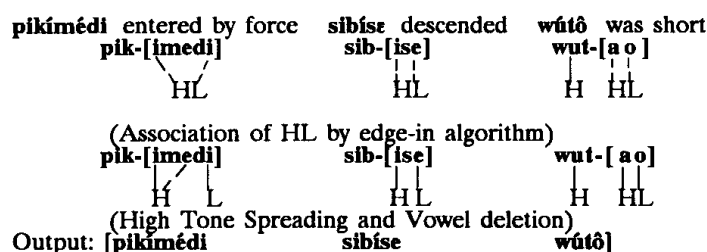
Before winding up this section on disyllabic verb stems, let us look at the negative formation of the past tense.

- | | | | |
|------|----|------------------------|---------------------|
| (26) | a. | na-sí-woli | na-wolí |
| | | I did not get tired | I got tired |
| | | na-sí-putedi | na-putédi |
| | | I did not get caught | I got caught |
| | | na-sí-lókómedi | na-lókómédi |
| | | I did not get quiet | I got quiet |
| | b. | na-sí-pépele | na-pépéle |
| | | I have not visited | I visited |
| | | na-sí-lóndómedi | na-lóndómédi |
| | | I did not inflate | I inflated |

The forms in (26a) belong to the L tone verb stems and those in (26b) to the H tone ones. The positive past tenses are listed in the right hand column for comparison. Notice that, with the use of the negative marker **-sí-** that precedes the root vowel, the H assigned by the past tense fails to surface. To account for this, I propose that the negative marker triggers a morphological rule that deletes the H in the verbal extension of a past tense form.

To sum up, we have seen that the disyllabic verb stems in Duala can be divided into two groups: the H tone verb stems and the L tone ones. The first group has an underlying H floating tone that associates to the first root vowel on the root cycle at the first stratum. The low tone verbs are toneless underlyingly. We have also seen that the past tense operates in two ways: the regular cases form their past tense by a suffixation of the morpheme **-i** prelinked to a H tone and the irregular cases are assigned a HL melodic tone that surfaces on the last two vowels of the verb stem. We have also identified a verbal extension domain in which the suffixal H of the past HL melodic tone spreads. In the following section, we look at some peculiarities that occur in the monosyllabic stems.

⁵Notice that an edge-in association is more preferable in that one would not need to link and then delink the H of the melodic HL assigned by the past tense to the last vowel as it directly associates to the first vowel of the verbal extension domain. This edge-in association can also be extended to the other irregular cases, i.e., with **-ise**, **-ô**, and **-ê** endings discussed previously. The only difference is that the H tone spreading does not apply in these cases as there is no TBU left without tones in the verbal extension domain. This is briefly shown in the following derivation.



2. PECULIARITIES IN THE MONOSYLLABIC VERB STEMS

Although the disyllabic verb stems have been presented as belonging to either toneless or H tone verbs, a case can be made for verb stems with an initial underlying L tone in the monosyllabic verbs as illustrated by the data in (27).

- (27) a. **ba** to cut in small pieces
sa to blame
jɔ to bewitch
kwe to grab
 b. **baá [bǎ] múto** to cut the woman in small pieces
saá [sǎ] múto to blame the woman
jɔ́ [jǒ] múto to bewitch the woman
kweé [kwě] múto to grab the woman

As was observed earlier, a floating H is suffixed to the verb when an object follows it. If the root vowel was underlyingly toneless, we would expect the floating H to dock onto this vowel. To account for these forms, I propose that these verbs have two vowels underlyingly: a root vowel with a prelinked L tone and a FV similar to the root vowel. The floating tone docks onto the FV and postlexically, when vowel coalescence occurs, a LH surfaces on the remaining single vowel.

I would also like to point out that these monosyllabic verb stems form their imperative with a rising falling tone (i.e., LHL sequence): e.g. **bǎ** 'cut into small pieces', **kwě** 'grab'. Assuming that the imperative is like the irregular past tense in that it assigns a HL melodic tone to the verb, one can nicely account for this contour tone by positing the following underlying representation and derivation:

- (28) **bǎ** cut into pieces

Stratum one:

Root cycle **ba-a**

↓
L

imperative formation

ba-a a

↓ ↓
L HL

(HL association by edge-in algorithm)

ba-aa

↓ ↓
L HL

→

ba

↓ ↓
LHL

(other postlexical rules: vowel coalescence)

As is shown in this derivation, the monosyllabic verb stem has two underlying vowels: the root vowel and the FV. The imperative formation has the effect of lengthening the FV and assigns the melodic HL tone. Postlexically, when vowel coalescence occurs, the LHL tone sequence ends up surfacing on a single vowel. See also Ittmann (1939) who observes that this series of L tone monosyllabic verbs probably derives from disyllabic stems.

Consider also the past tense of the monosyllabic verbs.

- (29) a. **na-saí** I have blamed from **sa-a [sa]** to blame
na-jɔ́ I have bewitched from **jɔ-ɔ [jɔ]** to bewitch
 b. **na-bái** I got married from **bá-a [bǎ]** to get married
na-lói I pounded from **ló-ɔ [lɔ́]** to pound
 c. **na-sí-bái** I did not get married
na-sí-lói I did not pound

na-sí-sai I did not blame
na-sí-jɔi I have bewitched

The use of the past tense morpheme **-i** in these forms supports our contention that the monosyllabic verb stems have two underlying vowels. Here, the past tense morpheme **-i** merely replaces the FV. Notice also that the tones surface as expected. In the L tone verb in (29a), **-i** surfaces with its prelinked H tone and in the H tone verb in (29b), **-i** surfaces with a L tone, due to the application of Meeussen's rule as was demonstrated earlier. The negative forms in (29c) are also regular in that, as observed earlier, the deletion of the H tone triggered by the negative prefix **-sí-** in the past tense form only affects the Hs in the verbal extension domain. The root vowel of a monosyllabic H tone is thus immune to this H deletion. This is why it surfaces in (29c).

3. CONCLUSION

The examination of the tones in the verbal stems of the Duala verb has led us to the following conclusions. First, although Duala has three level tones, H, M, and L, the verbal system predominantly opposes H vs Ø in its underlying representation of the disyllabic verb stems and uses L in monosyllabic verb stems. The underlying H tone has been analysed as being associated to the first root vowel on the root cycle at the first lexical stratum. Secondly, the different behaviour of tone in the regular and irregular cases of the past tense formation has led us to posit two strata in which the past tense is derived. For the irregular cases, it has been argued that the past tense assigns a HL melodic tone whose domain of application is the verbal extension. The verbal extension includes the final vowel of the verb and the post-final vowel suffixes. For the regular cases, it has been argued that its suffixal past morpheme is underlyingly prelinked to a H and that this H deletes through the application of Meeussen's rule when it is preceded by a H tone. The regular cases of the past tense have been proposed to be derived at stratum two whereas the irregular cases are derived at the first stratum.

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