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Phonological wordhood issues in Guro (South Mande)

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Guro, a richly tonal language of Côte d'Ivoir, presents some challenges for the Match Theory (a recent development of the theories of Prosodic Hierarchy) which implies a strict correspondence between prosodic and morphosyntactic units starting from the lexical level. Guro exhibits a 'featural' foot, which is not based on metrical stress. However, this is only an emerging prosodic domain: the language is characterised by ongoing intensive 'footisation' and monosyllabification processes which constantly change the shapes of morphosyntactic units. The degree of footisation depends on the degree of idiomaticity of a particular morphosyntactic construction, along a continuum from morpheme combinations to free phrases, i.e. essentially on a semantic parameter. There is also another prosodic domain relevant at the lexical level: the domain of morphonological tonal change. As shown by example of di- and trisyllabic nouns, the two prosodic domains tend to be aligned with each other and with the morphosyntactic word, but this is not a strict rule.

Keywords: Guro, prosodic hierarchy, wordhood, foot, tonal morphology

1. *Introduction*

The idea that the prosodic (or, more broadly, phonological) structure of language forms a parallel hierarchy to the syntactic one originates from the 1970s[1]. However, some functional linguists explicitly highlighted a possible and even frequent mismatch between the structure of the units at the phonological level and the units of the meaningful language components[2]. On the other hand, the two are still seen as tightly interrelated. The struc-

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[1] See e.g. E. Selkirk, *On prosodic structure and its relation to syntactic structure*, in *Nordic Prosody II: Papers from a symposium*, T. Fretheim ed., TAPIR, Trondheim 1981, pp. 111–140; E. Selkirk, *The prosodic structure of function words*, in *Signal to syntax: Bootstrapping from speech to grammar in early acquisition*, J.L. Morgan – K. Demuth ed., Psychology Press, New York 1996, pp. 199-226; M. Nespor – I. Vogel, *Prosodic phonology*, Foris Publications, Dordrecht 1986. In Russian linguistics, cf. also V.B. Kasevič, *Elementy obšʹej lingvistiki*, Nauka/Glavnaja redakcija vostočnoj literatury, Moskva 1977, pp. 18–21; V.B. Kasevič, *Fonologicheskie problemy obshchego i vostochnogo yazykoznaniya*, Nauka/Glavnaja redakcija vostočnoj literatury, Moskva 1983, pp. 248–261.

[2] J.K. Kuz'menko, *Fonologičeskaja evoľucija germanskih jazykov*, Nauka/Akademija nauk SSSR, Institut jazykoznanija, Leningradskoje otdelenije, Leningrad 1991, p. 117; I.A. Meľčuk, *Kurs obšʹej morfologii. Tom 3: Časť 3: Morfologičeskie sredstva, Časť 4: Morfologičeskie sintaktiki*, Jazyki russkoj kuľtury, Moskva/Vena 2000 (Wiener slawistischer Almanach Sonderband, 38, 3), p. 7.

tural properties of the phonological component are considered to be directly stipulated by its function in the expression of meaning in communication[3].

Formal phonologists, in turn, often describe prosodic phonology as being entirely dependent on syntax. The most recent development of the theories of Prosodic Hierarchy, the Match Theory, specifically proposes that the prosodic categories starting from the word level are grounded in syntactic constituent structure and, therefore, can be directly derived from the latter[4]. Most work in this vein, however, has been done on European languages with metrical stress. Even in these, the relationship between syntactic and prosodic categories is far from straightforward. Stronger challenges arise when similar methods are applied, for example, to polysynthetic languages[5].

Similar challenges are observed also in isolating languages with a rich tonal system, no metrical stress, and poor segmental morphology. Here, I address some phonological word-hood issues in Guro, an African language of Côte d'Ivoire[6] (< South Mande < Mande < Niger Congo), where both the foot and the phonological word are at most 'emergent' categories[7]. I will demonstrate a particular case of a mismatch between the morphosyntactic word, on the one hand, and the two prosodic domains (composed of one or two syllables) which generally but not entirely match both each other and the morphosyntactic word: (1) the 'featural' foot and (2) the domain of grammatical tonal change in nouns. Such a mismatch is likely challenging to be accounted for in the Match Theory.

2. Featural foot in Guro

2.1 Structure of a featural foot

Guro has a system of five tones (H – high, M – mid, L – low, F – falling, R – rising) which mark every syllable and fulfill numerous lexical and grammatical functions. It also has a

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[3] Kasevič, *Fonologicheskie problemy obshchego i vostochnogo yazykoznaniya*, pp. 234–236.

[4] E. Selkirk, *The syntax-phonology interface*, in *The handbook of phonological theory*, J.A. Goldsmith – J. Riggle – A.C.L. Yu ed., Wiley-Blackwell, Malden, MA 2011, pp. 435–485; E. Elfner, *The syntax-prosody interface: current theoretical approaches and outstanding questions*, "Linguistics Vanguard", 4, 1, 2018 (https://doi.org/10.1515/lingvan-2016-0081 last accessed November 2021).

[5] K. Russell, *The "word" in two polysynthetic languages*, in *Studies on the phonological word*, T.A. Hall – U. Kleinhenz ed., Benjamins, Amsterdam 1999, pp. 203–221; B. Bickel – F. Zúñiga, *The "word" in polysynthetic languages: phonological and syntactic challenges*, in *The Oxford Handbook of Polysynthesis*, M. Fortescue – M. Mithun – N. Evans ed., Oxford University Press, Oxford 2017, pp. 158–185; E. Elfner, *Match theory and recursion below an above the word: Evidence from Tlingit*, invited talk at the conference *RecPhon2019: Recursivity in Phonology below and above the word*, Universitat Autònoma de Barcelona, Bellaterra, Spain, 22/11/2019, abstract available at: filcat.uab.cat/pagines_clt/recphon2019/abstracts/elfner.pdf (last accessed November 2021).

[6] The data used in this study were collected by myself during fieldwork in Abidjan, Côte d'Ivoir, in 2006-2008, with few recent additions collected online in 2021. All the speakers were males. Below they are referred to with a code which contains their first initial and birth year.

[7] R. Schiering – B. Bickel – K.A. Hildebrandt, *The prosodic word is not universal, but emergent*, "Journal of Linguistics", 46, 3, 2010, pp. 657–709.

rich vowel system: four [+ATR] vowels *i, e, u, o*, four [–ATR] vowels *ɪ, ɛ, ʊ, ɔ*, one neutral oral vowel *a*, and five nasal vowels *į, ɛ̨, ʊ̨, ɔ̨, ą*[8]. In Guro, like in other Mande languages, which do not have proper metrical stress, the foot is a featural[9] rather than a metrical prosodic unit. This means that segments and tones within the foot manifest closer phonetic and phonological interdependencies than across the foot boundaries. The main principles of foot formation in Guro[10] are listed below.

(1a) A foot is prototypically disyllabic (CVCV, CVV, very rarely VV), although it can be monosyllabic (CV, rarely V).

(1b) A prototypical foot contains either identical (*ɓúlù* 'bread') or harmonising vowels. Vowels harmonise either by nasality (*lɔ̨lɛ̨* 'mouse'), or by [±ATR] (*lōlū ~ lólú* 'fog', *lɔ́lɔ́* 'lip').

(1c) A prototypical intervocalic consonant in the CVCV foot is *l* (such a foot is coded below as CVLV).

(1d) In the foot, sonorants and implosives phonetically harmonise with vowels and other consonants. Nasal allophones [m, n, ɲ, ŋʷ] of the phonemes *ɓ, l, y, w* occur before nasal vowels: *ɓúlù* [ɓúlù] 'bread' but *ɓɔ̨́lɛ̨́* [mɔ̨́nɛ̨́] 'mouse'. Intervocalic *l* is pronounced as [l] if an oral foot CVLV starts with labial or dorsal consonants, while as [r] if it starts with dental and palatal consonants: *ɓúlù* [ɓúlù ~ ɓlû] 'bread', but *tɛ́lɛ́* [tɛ́rɛ́ ~ trɛ́] 'ground' (in case of two *l*s in the nasal foot, the second one can also be realised as [r], e.g. *lɔ̨̄lɔ̨̄* [nɔ̨̄nɔ̨̄ ~ nrɔ̨̄] 'milk'). Foot-initial *l* before oral vowels is often realised as [ɗ]: *lɔ́lɔ́* [ɗɔ̄rɔ́ ~ ɗrɔ́].

(1e) Foot-initially, H, M, and F tones typically occur before the 'tone-raising' (voiceless, sonorant, implosive) consonants: *lɔ́lɔ́* 'lip', *lōlū* 'fog', *la̋* 'on', while M, L, and R tones before the 'tone-depressing' (voiced) consonants: *ba̋* 'shed', *bāá* 'rice porridge', *bàá* 'far'.

(1f) Contour tones are typical of monosyllabic but not of disyllabic feet, e.g. *ba̋* 'shed'. Syllables of disyllabic feet usually carry only register tones, either identical (*tɛ́lɛ́* 'ground') or different (e.g. *ɓúlù* 'bread'), but a set of typical tonal combinations in the latter case is restricted.

2.2 Reduction in Guro

My fieldwork in Guro[11] demonstrates that there is a strong tendency towards reduction, which brings morphosyntactic words and their combinations towards prototypical foot structures (especially to CVLV). This process transpires through the following main stages:

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[8] N. Kuznetsova, *Le status fonctionnel du pied phonologique en gouro*, "Mandenkan", 43, 2007, pp. 13–45.

[9] C. Green, *The foot domain in Bambara*, "Language", 91, 1, 2015, pp. e1–e26; V. Vydrin, *Featural foot in Bambara*, "Journal of African Languages and Linguistics", 41, 2, 2020, pp. 265–300.

[10] Outlined in J. Le Saout, *Notes sur la phonologie du Gouro (zone de Zuénoula)*, C.E.P.L.A.N., Nice 1979; N. Kuznetsova, *Le status fonctionnel du pied phonologique en gouro*.

[11] Reported in N. Kuznetsova, *Le status fonctionnel du pied phonologique en gouro*.

(2a)   intervocalic clusters turn into *l*: *pɛ́lɛ́pɛ́lɛ́* [plɛ́plɛ́] 'strong' > *pɛ́lɛ́lɛ́* [plɛ́lɛ́][12];

(2b)   single consonants turn into *l*, *w*, or are lost: *tâ-dɔ̄* <on-stop> > *tɔ̂lɔ̄* 'keep', *ɓɔ̄lú-lṵ́* <friend-pl.> > *ɓɔ̄ɔ̄lṵ́* 'friends';

(2c)   adjacent vowels assimilate first by series, then entirely, and finally merge into one short vowel: *cīēlé* 'numerous' > *cêlé*;

(2d)   vowels separated by a consonant harmonise and later tend to become identical: *cīēlé* 'numerous' > *cɛ̂lɛ́* > *cɛ̂lí* > *cɛ̂lí*, *ɓōlī gɔ̄lɛ̰̄* <goat male> > *ɓōō-wɛ̰́lɛ̰́* 'he-goat';

(2e)   the tonal pattern of the original sequence tends to be preserved (with some natural limitations): *zḭ̄ɓázḭ̄ɓá* 'good.pl.' > *zḭ̄ɓá*.

Reduction does not stop at the level of disyllables. Prototypical CVLV feet with identical vowels are phonetically realised in spontaneous speech as monosyllables [CLV]: *ɓúlù* [ɓlû] 'bread'. CVV feet in which the first vowel is labial are often realised as [CʷV]: *kɔ̄ā* [kʷā] 'old', and when both vowels are identical, as [CV]: *káà̰* [kâ̰] 'it is not'. Disyllabic feet are not the final target of reduction, then, but are rather a pivotal intermediate stage in the transformation into monosyllables. Guro can be said to be on its way towards a monosyllabic language type[13]. Reduction brings sequences of morphemes and morphosyntactic words to the following three prototypical foot structures: CVLV, CVV, (C)V:

(3a)   CVLV > [CLV]: **kɛ̄lɛ̄-ā* <do-ipfv.> > *kálá* > [klá];

(3b)   CVV > [CV]: **lɛ̄ kʊ́* <it.is here> > *lɔ̌* 'here is', **ká à yā̰* <not him with> > *káà̰* 'it is not' > [kâ̰];

(3c)   CV₁ʷV₂ > CʊṼ ~ Cɔ̃Ṽ > [CwV]: *ɓú ɓōī* <mother elder.brother> 'maternal uncle'> *ɓúwī, ɓʊ́wī* > *ɓúī* > *ɓʊ́ī* [ɓʷî], **bɔ̀ jɛ̄* <source kill> > *bɔ̀ɛ̄* [bʷɛ̌] 'disperse'.

2.3 'Footisation' and monosyllabification in Guro

Disyllabic sequences which can undergo phonetic reduction to a monosyllable [CLV] or [CʷV] are indisputably feet. Other types of morphosyntactic words (both simplex and compound) and their combinations can be said to be on their way to the foot. Synchronically, morphosyntactic units at any stage of this 'footisation' process can be found in the language. At the intermediate stages of footisation, as a challenge to Match Theory, all kinds of mismatch between the simplex morphosyntactic word and the prototypical foot are attested in the language, for example:

(4a)   more than two syllables in a simplex word: *ɓɔ̰̄ɔ̰̄lɔ̰́* 'wound', *yúòù* 'soon', *séɓáá* 'widow', *jàmàlàdì* 'chief of a tribe';

(4b)   vowels of different series in the word: *súɛ́* 'tooth', *gṵ̄ɓɛ̂* 'rabbit';

(4c)   intervocalic consonants other than *l*: *jàɓá* 'onion', *l̰̄āwà* 'pocket', *ɓāyà̰* 'fight';

(4d)   more than two tonal registers within a disyllable: *séě* 'shrimp', *gbàú* 'kitchen', *kôô* 'haemorrhoids';

(4e)   violations of the tonal distribution after 'tone-raising' vs. 'tone-depressing' consonants: *lɛ̌* 'exactly this', *kà* 'you.him' (a contractive pronoun); *báǎ* 'sweet potato'.

However, the further the reduction transpires, the more the newly formed units tend to comply once more with the foot formation principles[14]. However, a morphosyntactic word in Guro does not always strictly correspond to a disyllabic or a monosyllabic foot. Morphosyntactic words of three syllables are relatively frequent, and in rare cases the length of a simplex word can even reach four to five syllables: *ɓāɓàlàà* [ɓāɓlàà] 'big', *sééɓáá* 'widow', *ɓṵ̄lṵ̀ɔ̀* [mnṵ̄ɔ̀ɔ̀] 'dark', *lēɓēlēēlɛ́* [lēɓlēēnɛ́] ~ *lēlēēlɛ́* 'feeble'.

As an additional challenge to Match Theory, the level of reduction of a morphosyntactic sequence in Guro closely correlates with its level of idiomaticity. The more idiomatic the sequence, the stronger the reduction it manifests. There is no clear delimitation between feet and non-feet in Guro, as the *continuum* of footisation closely follows the continuum of the idiomaticity of morphosyntactic units, from morphemes to free phrases. Consider the following example where a sequence started as a collocation of two words corresponding to two CVLV feet. By now, this sequence is a monomorphemic word with the phonological structure close to a single prototypical CVLV foot (the most frequent current variants are marked as 'frequent'):

(5)   **ɓā̰lɛ̄ gɔ̄lɛ̄* \<hen male\> 'rooster'[15] > *ɓā̰gɔ̄lɛ̄* (speakers T-1968, D-1969) > *ɓā̰wɔ̄lɛ̄* (frequent)[16] > *ɓā̰wɛ̄lɛ̄* [mā̰wnɛ̄] (speaker I-1976) > *ɓɔ̰̄wɛ̄lɛ̄* [mɔ̰̄wnɛ̄] (speaker I-1976) > *ɓɔ̰̄ɔ̄lɛ̄* (speaker I-1976; frequent).

The change from *ɓā̰lɛ̄ gɔ̄lɛ̄* to *ɓɔ̰̄ɔ̄lɛ̄* has apparently occurred within a short span of 30-40 years. The further development of this sequence would likely see it develop into a prototypical foot: *ɓɔ̰̄ɔ̄lɛ̄* → (expected) **ɓɔ̰̄lɛ̄* → (expected) **ɓɛ̰̄lɛ̄* [mnɛ̄].

3. *Morphological tonal classes of Guro nouns*

3.1 Length of the tonal change domain

Another prosodic domain relevant for the lexical level is the domain of grammatical tonal change. The systems of tonal change differ across various parts of speech; only nouns are considered below. Guro nouns, primarily distinguished on the basis of a set of morphosyntactic

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[14] See numerous examples in N. Kuznetsova, *Le status fonctionnel du pied phonologique en gouro*.

[15] Attested in H.-C. Grégoire, *Etude de la langue gouro (Côte-d'Ivoire)*, Université d'Abidjan, Institut de linguistique appliquée, Abidjan 1976 (Université d'Abidjan, Institut de linguistique appliquée, 54); J.-P. Benoist, *Dictionnaire gouro-français*, Zuénoula 1977, but not anymore in modern Guro.

[16] J.-P. Benoist, *Dictionnaire gouro-français*; also speakers T-1968, D-1969.

parameters[17], can exhibit morphonological modifications of their initial one or two tones in certain contexts. Tonal change is either fixed (independent of the last tone of the previous word) or variable (or mobile, marked as $_M$ below). Consider examples of the fixed change in one or two first syllables in nouns (the domain of tonal change is marked with braces {}):

(6a) 1-syllable word:
      bã̄ 'bat' → {*bã̀*};
(6b) 2-syllable words:
      gbōwūō 'bucket' → {*gbò*}*wūō*;
      bḛ̄lḛ̄ 'dog' → {*bḛ̀lḛ̀*};
(6c) 3-syllable word:
      zībēlì 'mushroom (sp.)' → {*zìɓè*}*lì*.

In words with a so-called mobile tonal paradigm, the first one or two tones copy the last tonal level of the previous word. Guro nouns exhibit two main types of mobile paradigms illustrated below:

– paradigm F_M (mobile falling tone): the tone is phonologically falling /F/ (phonetically mid-low [ML] after a mid tone and high-low [HL] after a high or rising tone) and low /L/ after a low or falling tone:

(7a) 1-syllable word:
      ɓĩ̄ 'person' → H {*ɓḭ̂*} [HL] / M {*ɓ$\underset{\sim}{î}$*} [ML] / L {*ɓḭ̀*};
(7b) 2-syllable word:
      súɛ́ 'tooth' → H {*sû*}*ɛ* [HL] / M {*sû*}*ɛ* [ML] / L {*sù*}*ɛ́*;
(7c) 3-syllable word:
      sāɓílí 'soap' → H {*sâ*}*ɓílí* [HL] / M {*sâ*}*ɓílí* [ML] / L {*sà*}*ɓílí*;

– paradigm M_M (mobile mid tone): the mobile tone is high /H/ after a high or rising tone, mid /M/ after a mid tone, and low /L/ after a low or falling tone; exists in the models of tonal change M_M, $M_M L$, and $M_M M_M$:

(8a) 1-syllable word:
      tā 'surface' → H {*tá*} / M {*tā*} / L {*tà*} (model M_M);
(8b) 2-syllable word:
      dũ̄ã̄ 'spider web' → H {*dúà*} / M {*dũ̄ã̀*} / L {*dùà*} (model $M_M L$);
(8c) 3-syllable word:
      lāàlê 'lock' → H {*láà*}*lê* / M {*lāà*}*lê* / L {*làà*}*lê* (model $M_M L$);
      tīɔ̄ɓ̀ 'white man' → H {*túɔ́*}*ɓ̀* / M {*tīɔ̄*}*ɓ̀* / L {*tìɔ̀*}*ɓ̀* (model $M_M M_M$).

3.2 Contexts of tonal change in nouns

Tonal change in a noun can happen if the latter occupies the head position in a so-called genitive noun phrase, where the noun modifier directly precedes the head, without any additional segmental markers[18]. There are two principal types of tonal change:

– a noun changes tone in any genitive noun phrase in an assimilative manner (cf. below);
– a noun changes tone in a genitive noun phrase if it is used in a so-called 'generic' sense.

In the first case, nouns assimilate their first tonal level to the last tonal level of the previous word and their second tonal level becomes low, i.e. they acquire a tonal model F_M or M_ML (cf. Table 1). This happens in such nouns in any noun phrase irrespective of meaning and could be defined as 'tonal compactness'[19]. In Guro, such tonal assimilation is apparently just a phonological marker of the syntactic relation between the head and the modifier in a noun phrase. For example, the word *lāwà* 'pocket' changes its tone into H *láwà* / M *lāwà* / L *làwà*:

> (9)   *lāwà → tí* {*láwà*} / *ɓị̄* {*lāwà*} / *zạ̀* {*làwà*} 'pocket of a father / person / master'.

The second case is more complex, both formally and semantically. Nouns of this kind have more variation in tonal paradigms, which generally includes not only tonal assimilation to the previous word but also tone lowering (cf. a list of models in Table 1). The semantics of the 'generic' sense expressed by the tonal modification in this case, is also complex. It typically implies that the head noun signifies a category with multiple possible values and the attribute signifies a particular value taken by the category. In a homonymic noun phrase where the head noun carries lexical tone, the relationship between the head and the attribute is often possessive, cf. pairs with and without the 'generic' tone on the head:

> (10a) *lí* {*wị̂*} <woman hair.generic> 'female hair' — *lí wị̃* <woman hair> 'hair of a/ the woman;
> (10b) *gòlò* {*ɓị̂*} <Guro person.generic> 'person of an (anthropological) type of Guro' — *gòlò ɓị̄* <Guro person> 'Guro person' ('person belonging to the Guro people');
> (10c) *ɓálálǐ* {*yị̂*}*lí* <morning sun.generic> 'morning sun' — *ɓálálǐ yīlí* <morning sun > 'sun of morning'.

In such a noun phrase, the attribute is often non-referential but this is not always the case, cf. a pair where the attribute is expressed by a personal pronoun:

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[18] Such change is attested in many other Mande languages, although the system of the nominal tonal change in Guro seems to be the most complex one, as reported in C. Green – M. Konoshenko, *Tonal head marking in Mande compounds: endpoint neutralization and outliers* (submitted).

[19] *Compacité tonale*, known also in other Mande languages, viz. D. Creissels, *A propos de la tonologie du bambara: réalisations tonales, système tonal et la modalité nominale "definie"*, "Afrique et Langage", 9, 1978, pp. 5–70; C. Green, *Compacité tonale and the Bamana prosodic word domain*, "Indiana University Linguistics Club Online Working Papers", 11, 2011, online publication: https://citeseerx.ist.psu.edu/viewdoc/download? doi= 10.1.1.410.6951&rep=rep1&type=pdf (last accessed November 2021).

(10d) *à {sù}ú lǒ* <his cushion.generic here.is> 'here is his type of a cushion' — *à sûú lǒ* 'here is his cushion'.

However, there can also be other types of a semantic contrast between the noun phrases with and without the 'generic' tone, for example:

(10e) *sɔ̄ {ɓālì}* <cloth(es) rope.generic> 'rope (made) of cloth' — *sɔ̄ ɓālì* <cloth(es) rope > 'rope of (i.e. belonging to) clothes';

(10f) *ạ̄ zạ̀ {wì}* <my master meat/animal.generic> 'my master's flesh' — *ạ̄ zạ̀ lē wī* <my master possessive meat> 'my master's animal' (a difference between inalienable and alienable possession, where the latter is additionally marked by a possessive marker *lē*);

(10g) *lɛ́ {gɔ̀lɛ̀}* <child male.generic> 'boy' (lit. 'a male of the child's age') — *lɛ́ gɔ̄lɛ̄* <child male> 'boy' (lit. 'a child of the male gender') (a reverse relationship between the category and its value);

(10h) *ɓī {yậ}lɛ́* <person meanness.generic> 'misanthropy' — *ɓī yậlɛ́* <person meanness> '1) meanness of a person; 2) mean person' (i.e. 'meanness towards a person' vs. 'meanness of a person');

(10i) *ɓī {wṳ̂}* <person sending.generic> 'human mission' — *ɓī wṳ̄* <person sending> 'sending of a person'.

The same kind of tonal change exists also in noun phrases where the attribute is expressed by a verbal infinitive (in this case it can also participate in the subject-object marking):

(10j) *ạ̄ lạ̄ zɔ̰̄ {fɔ̰̂}* <my wife grind foutou.generic> 'foutou of a kind that my wife has ground / grinds (always)' — *ạ̄ lạ̄ zɔ̰̄ fɔ̰̄* <my wife grind foutou> 'foutou which my wife has ground / grinds (always)';

(10k) *ɓī jē {lû}* <person kill herb.generic> 'type of herb which kills / killed a person' — *ɓī jē lû* <person kill herb> 'herb which kills / killed a person';

(10l) *ɓạ̄ {fɛ̂}* <cook thing.generic> 'a thing which can be cooked' vs. *ɓạ̄ fɛ̄* <cook thing> 'thing which cooks';

(10m) *ɓī dìá {yílì}* <person fall/fell tree.generic> 'tree felled by a person' — *ɓī dìá yílì* <person fall/fell tree> 'tree which made a person fall'.

There are also few nouns which change tone as the head of a noun phrase according to two different models depending on whether they are used in the 'generic' sense or not, cf. *lāàlê* 'lock':

(11a) 'non-generic' (in phrases below, possessive) sense – model M$_M$L:
kɔ̰́ {láàlê} / fɛ̄ {lāà}lê / dùòlì {làà}lê 'lock of house / of thing / of door';

(11b) 'generic' sense – model LL:
kɔ̰́ {lààlê} / fɛ̄ {làà}lê / dùòlì {làà}lê 'house / thing / door lock'.

3.3 Tonal classes of nouns

The general structure of the nominal tonal classes in Guro is presented in Table 1.

Table 1 - *Guro tonal classes of nouns*

Tonal class	Sub-class	Nr of attested roots	Model of tonal change in the first one or two syllables	'Generic' tones attested in the head noun after a H / M / L tone	Tones marking tonal compactness in the head noun after a H / M / L tone
I		618	—	—	—
II	a	98	F_M	F [HL] / F [ML] / L	—
	b	89	$M_M L$	HL / ML / LL	—
	c	16	LL	LL	—
	d	17	L	L	—
	e	3	$M_M M_M$	HH / MM / LL	—
III	a	34	F_M	F [HL] / F [ML] / L	
	b	44	$M_M L$	HL / ML / LL	
IV		3	LL / $M_M L$	LL	HL / ML / LL

Unchangeable nouns form the most populated class I. Nouns which can change tone only in the 'generic' sense enter the tonal class II. Nouns which change tone in any noun phrase irrespective of meaning belong to the tonal class III. Nouns which have two different models of tonal change for 'generic' and 'non-generic' sense enter class IV.

Apart for the subclasses mentioned in the second column, there exist also a few exceptional models of tonal change typical of just one or two nouns each. Some of them are discussed below; see also a remarkable exceptional model in the class IV word *fálá* 'village', where the tone in a 'non-generic' sense becomes mid instead of assimilating to the tone of the previous word: *gòlò / ɓī / yūlɛ́* {*fālā*} <Guro / person / pygmy village> 'village of Guros / people / pygmies'. In 'generic' sense, a regular model IIa is used, e.g. *ɓī tī* {*fà*}*lá* <person black village.generic> 'traditional African village'.

Given that the domain of tonal change in nouns contains one or two syllables and that the morphosyntactic word often corresponds to a mono- or disyllabic foot, the three are often aligned. However, this is not always the case. Some possible types of match and mismatch between the morphosyntactic word, the featural foot, and the domain of nominal tonal change are discussed in the next section.

4. *A bracketing paradox in Guro*

The alignment between the di- and trisyllabic morphosyntactic word, on the one hand, and the disyllabic domains of the featural foot and the nominal tonal change, on the other hand, is addressed below. For the latter, the subclasses IIb, IIc, IIe, IIIb and IV, which have a

disyllabic domain of tonal change, are considered. Only di- or trisyllabic words are attested in my database for these subclasses (the number of roots in each subclass is given in Table 1).

First, consider a case where the domain of a disyllabic featural foot, marked with parentheses (), corresponds both to the disyllabic domain of tonal modifications, marked with braces {}, and to the boundaries of a morphosyntactic word (the most frequent case: 62 out of 89 roots in subclass IIb, 13/16 roots in IIc, and 34/43 roots in IIIb):

(12)   *yílì* [yrí] 'tree' → H {(*yílì*)} / M {(*yīlì*)} / L {(*yìlì*)} (subclass IIb).

Second, consider the trisyllabic nouns where the domain of a disyllabic foot coincides with the domain of tonal modifications (the first two syllables) but does not correspond to the boundaries of a morphosyntactic word (the third syllable is left outside of both prosodic domains; a relatively frequent case: 23/89 in IIb, 10/43 in IIIb, 2/3 in IIe, 2/3 in IIc, 3/3 in IV):

(13)   *fàlālì* [flàlì] 'a Guro mask personifying joy' → H {(*fàlá*)}*lì* / M {(*fàlā*)}*lì* / L {(*fàlà*)}*lì* (subclass IIe).

One could in principle parse this word into two feet (a disyllabic one and a monosyllabic one) or analyse it as a disyllabic foot followed by an unparsed syllable.

Consider, however, the third case where a trisyllabic morphosyntactic noun contains a prototypical disyllabic foot in its 2nd and 3rd syllables, but a domain of tonal change in its 1st and 2nd syllables (a rare case: 4/89 in IIb, 1/3 in IIe, 1/3 in IIc):

(14)   *sɔ́ɓálá* [sɔ́ɓlá] 'mongoose' → H {*sɔ́*(*ɓà*}*lá*) [sɔ́ɓlǎ] / M {*sɔ̄*(*ɓà*}*lá*) [sɔ̄ɓlǎ] / L {*sɔ̀*(*ɓà*}*lá*) [sɔ̀ɓlǎ] (subclass IIb).

Such words manifest a so-called bracketing paradox[20], as the boundaries ('brackets') of the two disyllabic prosodic domains associated with the lexical level in Guro intersect. In this case, there is a mismatch between all the three units: the morphosyntactic word, the featural foot, and the tonal change domain.

Finally, consider two exceptional cases which show that the featural foot and the domain of the tonal change are not entirely mutually independent prosodic domains either.

The first case is represented by a word *ɓã̀wòló* 'mango'[21], which seems to follow two parallel paths of footisation in modern Guro:

(15a)   *ɓã̀wòló* > (*ɓã̀ã̀*)*ló*, where the first two syllables form a CVV foot (speaker I-1976);

[20] R. Sproat, *Bracketing paradoxes, cliticization and other topics: The mapping between syntactic and phonological structure*, in *Morphology and modularity: In honour of Henk Schultink*, M. Everaert – A. Evers – R. Huybregts – M. Trommelen ed., Foris, Dordrecht 1988, pp. 339–360.

[21] Attested in J.-C. Benoist, *Dictionnaire gouro-français*, and in the speech of a speaker D-1969.

(15b) *ɓa̰wòló* > *ɓa̰*(*wóló*) [ma̰wló], where the last two syllables form a CVLV foot undergoing phonetic reduction to a monosyllable (speakers M-1981, I-1976).

The following tonal morphology of the 'generic' sense was recorded for the two variants of this noun from the speaker I-1976:

(16a) (*ɓa̰a̰à*)*ló* → H {(*ɓá̰á̰*)}*ló* / M {(*ɓa̰a̰à*)}*ló* / L {(*ɓà̰à̰*)}*ló* (regular tonal subclass IIb, model M$_M$B);

(16b) *ɓa̰*(*wóló*) [ma̰wló] → H {*ɓá̰*}(*wóló*) [má̰wló] / M {*ɓa̰*}(*wóló*) [ma̰wló] / L {*ɓà̰*} (*wóló*) [mà̰wló] (an exceptional type of tonal change M$_M$).

The second type of a nominal paradigm is exceptional because the second syllable tone does not become or remain low, as expected for the model M$_M$B (cf. with *sɔ́ɓálá* and *ɓa̰a̰lo* above). Instead, it assimilates with the high tone of the last syllable. In this way, not only the vowels, but also the tones of the last two syllables become identical and the process of the foot formation in the 2nd and 3rd syllables of the word is complete. However, the footisation of the last two syllables breaks the regular disyllabic domain of tonal change expected here. The word receives an exceptional model M$_M$, otherwise attested only in two monosyllabic words. In this way, however, the bracketing paradox in the tonal forms of the variant *ɓa̰wóló* becomes resolved.

The second case is found in another exceptional tonal paradigm attested in words *zōkōlōlɛ́* 'small copper bell (put on child's leg as an amulet against diseases)' (-*lɛ́* is a diminutive suffix) and *gʷɛ̄ɛ̄ɪ̄* 'money'. These words in 'generic' sense change their first three tones:

(17a) *zōkōlōlɛ́* [zōklōnɛ́] → H / M / L {*zòkòlò*}*lɛ́* [zòklònɛ́];

(17b) *gʷɛ̄ɛ̄ɪ̄* [gʷɛ̄ɪ̄] → H / M / L {*gʷɔ̀ɛ̀ɪ̀*} [gʷèì].

An exceptional spread of the tonal change to the third syllable could be also linked to the footisation process going on in both words, during which they lose their second or first syllable, respectively. In the first word, the situation is similar to the one of *ɓa̰wòló* 'mango'. The second and the third syllables form a prototypical foot where both syllables receive the same tones and the bracketing paradox is resolved: {*zò*(*kòlò*)}(*lɛ́*), although this comes at a cost of breaking the general restrictions for the tonal change domain length. Actually, in a current phonetic realisation of these words, the domain of tonal change already becomes disyllabic i.e. regular: [{zòklò}nɛ́] and [{gʷèì}]. Moreover, alternative, prosodically more advanced, phonetic variants are also attested for both words: *zōōlōlɛ́* and *gʷɔ̄ɪ̄*. In the latter, the length of the domain of tonal change already fully complies with general restrictions. For the first word, the expected path of further prosodic development would be towards **zōlōlɛ́* > [*zlōlɛ́], where the domain length would also become regular again. These two words present additional examples of how the restrictions on the phonological shape of words are first broken and later restored in Guro in the course of footisation. In synchrony, however, both the bracketing paradox and the general mismatch between the featural foot,

the tonal change domain, and the morphosyntanctic word still exist in the language, which makes a strict application of the Match Theory challenging.

5. *Conclusion*

Guro, a tonal language of Côte d'Ivoire, presents a number of challenges for a strict application of Match Theory, the most recent development of Prosodic Hierarchy, at the word level. First, due to ongoing 'footisation' and monosyllabification, it is extremely challenging to parse morphosyntactic words into feet in a non-contradictory fashion. Second, Guro nouns present two different types of prosodic domains which correspond to the lexical level and so are expected to match the morphosyntactic word: the featural foot and the domain of the morphonological tonal change. However, the two domains neither exactly match the morphosyntactic word, nor perfectly align with each other, although there is a tendency for all the three units to match. Besides, the degree of footisation rises together with the degree of idiomaticity of a particular morphosyntactic construction, along a continuum from morpheme combinations to free phrases. In other words, the values of a phonological parameter essentially depend here on a semantic parameter.

In general, Guro provides little evidence for the relevance of any categories of the Prosodic Hierarchy higher than the phonological word. Pitch modifications are already so heavily engaged in the expression of lexical and grammatical tones that there is little space for the use of pitch for intonational categories. There is no downstep or downdrift in Zuénoula Guro, and most functions which are often carried out by intonation in other languages are assigned here to phrasal particles[22]. It is still to be clarified whether phrase-final lengthening and pauses are sufficient for delimiting the postlexical prosodic units which would correspond to syntactic phrases and sentences in Guro. Other than that, there seems to be few or any of the typical exponents of the levels of the Prosodic Hierarchy levels which would clearly match the syntactic constituents.

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[22] Cfr. N.V. Kuznecova – O.V. Kuznecova, *Guro jazyk*.