A fonosyntactic parameter within Benue-Kwa and its consequences for Edó

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1 Tones or affixes, an inverse correlation

The term Benue-Kwa (Elugbe & Williamson 1977) denotes the union of Greenberg’s (1963) Kru/Kwa and Benue-Congo subgroups of the Niger-Congo family.1 Within it, two broad comparative trends can be observed. One is phonological: Benue-Kwa languages possess from 2 to 4 level ‘tonemes’, i.e. lexical pitch contrasts in the sense of Pike (1948), not counting underspecification. The other trend is morphosyntactic: the languages do, or don’t, possess obligatory affixes of various kinds. Juxtaposed as in (1), the two properties show an inverse correlation: the more tonemes, the less obligatory affixation. Languages with both obligatory prefixes and suffixes (1a) are limited to two tonemes (plus downstep); languages with neither (1c) contrast four level tones (without downstep); an intermediate

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1.J.M. Stewart’s (1973, 1993, 1994) sound shifts between Proto-Tano (= Macro-Ãkín) and Proto-Bantu have no known counterparts in the rest of Benue-Kwa. This provisional, negative result weighs against any linear bi- or tri-furcation of Benue-Kwa into contiguous areas ranged along the east-west, coastal axis, as variously proposed by Bennett & Sterk (1977), Williamson (1989) and Williamson & Blench (2000) mainly on the basis of lexical counts. This issue does not affect (1) if Benue-Kwa is interpreted as a controlled typological sample, rather than as a historical entity.
status for the morphosyntactic property (1b) implies likewise for the phonological one.²

(1) least tones, most affixes

a. 2 tonemes plus downstep:
   Bantu, Êtìk– Ibibio,
   ¿gbo, ¿dò, ¿kà
   3 tonemes plus downstep:
   Òkòm Yàlà (Armstrong 1968)

b. 3 tonemes, local downstep:
   Yorùbà (Bàngbòsé 1966)

3 tonemes, no downstep:
   Èòvà (Anré 1961)³

4 tonemes, no downstep:
   the Kru group⁴

most tones, least affixes

² Both dimensions of (1) can be refined, but subregularities don’t threaten the correlation. Type (1a) is clearly diverse: on the phonological side with respect to foot structure and the scope of downstep, and on the morphosyntactic side with respect to the feature content of affixes. Evidence for parametrised foot structure within (1a), consistent with the theory presented in this paper, is given in Excursus 1 infra. Also, suffixation may be more relevant than prefixation, if prefixes are generally analyzable as pronominal affixes (phonological affixes) rather than morphosyntactic affixes, following Kayne (1994).

³ Every derived Yorùbà N begins with a prefix (vowel or reduplicand); all onedervived nouns show phonological effects at the left edge.

⁴ Also apparently in the rest of Ògà. In Èòvà, Anré showed the complementary distribution of the mid and low tonemes, based on syllable type. Welmers (1973, 91) and Clements (1977, 174) report downstep in some Èòvà varieties.

⁵ The distributions of the high and superhigh tonemes are complementary, based on syllable features (Kaye 2001b, 11).

2 Analyses

2.1 History or typology

Most Africanists who have addressed the pattern in (1) have relied on phonological and historical reasoning. The standard view deploys the floating tone (J.M. Stewart 1965; Bàngbòsé 1966) as distinct from the tonal morpheme (Sharman & Meeussen 1955; Welmers 1959; Voorhoeve et al. 1969), the former being not necessarily a synchronic category. Floating tones can explain the transition from (1a) to (1b) via loss of tone-bearing segments in affixes and polysyllabic roots: if the pitch features of eroded material survive, their reattachment to surviving syllables can create more tonal contrasts (Hyman 1979; Williamson 1993). Such contrasts may remain syntagmatic, realised as pitch contours, or else assimilation rules can restructure them in paradigmatic terms, leading to the “phonologization” of new level tonemes, as apparently occurred in phrase-final position in àmala-Yamba (Voorhoeve 1971; Hyman & Tadadjeu 1976; Bird & Stegen 1995).

But a historical account is liable to accident: the loss of tone-bearing affixes or of root syllables could have left tonemic inventories untouched. Rephrased in terms of autosegmental phonology, the residual question is why pitch features resist erosion (as they do). Pending an answer to this question, the remaining possible source of explanation is Universal Grammar. Moreover, UG is plausibly responsible for the pattern in (1), because a similar implication holds across language families: loosely speaking, a human language is more likely to have lexical pitch contrasts, and to have more of these, if it has smaller words (cf. C.-W. Kim 1979, 283; Duanmu 1994, 1995).

A preliminary UG-based analysis of (1) is given in (2), quoted from Manfredi (1991, 93; 1993, 177).

(2) Prosodic linking parameter: The units which project metrical structure attach are: {tones}, {rimes}.

Note that (2) is neutral with respect to affixation versus syllable weight, both of which are represented in terms of the rimal constituent of prosodic structure (Halle & Vergnaud’s rime projection).⁶ I consider syllable weight in section 3 below.

The terms “project” and “attach”, which (redundantly) occur in the formulation of (2), assume that nonlinear phonological architecture

⁶ (2) is formulated within Government Phonology (Kaye, Lowenstamm & Vergnaud 1985, 1990), which adopts the concept of parameter from generative syntax, where since the 1980’s it is understood as “a finite array of options” in the initial state of the cognitive system, which yield “language differences and typology” and whose fixing allows language acquisition to occur within the constraints of “Plato’s Problem” (Chomsky 1986), cf. Boooj (1983), Dresher (1989), Haraguchi (1991, 1-3). In current Government Phonology (Lowenstamm 1996; Kaye 2001a), rimes are technically not constituents, but licensed sequences of nucleus plus onset, this may complicate the statement of (2).
imposes a competition between pitch features and other prosodic marks like accents. This is plausible. The interchangeability of tones and rimes with respect to metrical licensing is indirectly supported by redundancies between tone contrasts and syllable type; well known Benue-Kwa examples occur in Gbè and Kru (see footnotes 4 and 5 above). More strikingly, Kaye reports a direct illustration of the parameter in (2): “The differences between Japanese and Brazilian Portuguese reduce to the differences between using headless/headed [syllable nuclei] versus toneless/toned [syllables i.e. rimes] for marking accentual domains” (1997, 218).

If (2) is correct, tone and accent are not associated to the timing tier independently, e.g. on separate planes à la Halle & Vergnaud 1980), because if the notion of autosegmental planes has any content, a restriction across planes can only be stipulated, hence is not learnable in the technical sense (Dresher & Kaye 1990). With respect to this point, standard autosegmental-metrical theory as in (3a) differs from the alternatives sketched in (3b-c), and any evidence for the reduction of tone to accent supports any/all the latter as against the former. What matters in (3) is not the graphical notation, but just the claim depicted in (3a), that the only interaction of accent and tone is to determine the location in the skeletal timing tier where the tonal melody associates. By contrast, in all the other theories depicted in (3), accents directly “license” or “are realized as” tones in various ways.

(3) a. autosegmentalized features (Goldsmith 1984)7
    diacritic accent(s)
    skeleton
    tone(s)

b. serial modules (McCawley 1970)8
    accents → tones
    skeleton
    skeleton

e. fonosyntactic tone (Déchaine 2001)11
    phrase structure
    metrical trees
    \[ \emptyset \rightarrow \text{tone(s)} \]
    skeleton

With respect to the claim in (2), the choice between (3a) and the rest is more than notational: there are empirical consequences if natural languages are indeed constrained in terms of the relative complexity of rimes and pitch features. The metrical competition between tones and rimes, observed in (1) and provisionally captured in (2), follows directly from or is at least consistent with (3b-c), but is not even stateable in (3a). Thus (3a) can be true iff (2) is false. Certainly, (3a) is consistent with the mainstream view of tone typology presented in a standard technical article which lists the properties in (4) as “parameters” of “tone systems” (Clements 1981, 95f.):

(4) a. “number of tone levels
b. “presence or absence of (systematic) downdrift
c. “presence or absence of downstep
d. “presence or absence of upstep
e. “partial vs. total register shift”

7 Also Halle & Vergnaud (1987).
9 After a critique of Clark (1980a) by Clements & Goldsmith (1980), Clark (1989) recanted (3c) and returned to the framework of (3a).
11 Déchaine’s analysis of Yorùbá metrical tone is illustrated in Excursus 2 infra.
A similar list is offered in a recent Africanist handbook as “parameters of African prosodic systems” alongside the statement that “African tone languages tend to reshuffle the properties … in many different combinations and with infinite variations” (Clements 2000, 157):

(5) a. number of lexical tones
   b. type of tone association
   c. “function of floating tones” e.g. “lexical, phonological, grammatical, or syntactic”
   d. the presence of downdrift
   e. and/or downstep.

The typological lists in (4) and (5) allow that the correlation in (1) is accidental, i.e. they are consistent with the standard historical view. But whatever the position of historical linguistics may be with respect to language acquisition, no synchronic theory incorporating (4) or (5) can escape the learnability problem (Dresher 1989, 184). For tone, this problem is nontrivial because the acoustic cues of stress and tone overlap in F-zero information (Ko 2001). I revisit this point in the concluding section.

2.2 Phonology or fonosyntax

Typology aside, the standard historical-phonological view of the pattern in (1) also faces the criticism that syntax cannot be excluded in principle from a phenomenon involving affixation. Of course such a critique begs the “interface” question of the relationship of syntax to morphology. The 1980’s witnessed a consensus among syntacticians that overt affixation and non-string-vacuous head movement are operations of the syntactic component—expressed in derivational terms, that they appear in S-structure (Fabbr 1984; Baker 1988). This consensus excluded those generative phonologists who treated affixation within Lexical Phonology (e.g. Pulleyblanc 1983; Clark 1989), but even then, the only way to exclude head-movement from the data in (1) is by requiring a “syntax-free” phonology (Nespìr & Vogel 1986). Absent such a stipulation, the effects in (1) which involve affixation fully merit the label fonosyntactic (Rizzi & Savoia 1992).

Independently supporting a fonosyntactic analysis of prosody, Martin (1978, 1981), Ladd (1988) and Kubozone (1992) argue in various ways that intonation is computed on syntactic trees and not on flat auto-segmental ToBI melodies à la Pierrehumbert (1980). Ronat (1982) makes the converse point, that syntax is itself constrained by prosody. In her data, the anaphoric phrases in square brackets, obligatorily destressed, are islands for overt movement (6c) and for quantifier scope (7b).\footnote{Minimalism, to be sure, lacks a representational level corresponding to S-structure, and Minimalist affixation may entail movements of other kinds such as covert affix licensing (Lasnik 1995) or purely phonological displacement (Halle & Marantz 1993; Zwart 2001). Antisymmetry further recognizes the boundary between overt and covert movement by enriching movement types (Kayne 1994).}

(6) a. Paul avait comme ami uniquement des gens qu'il croyait capables de tuer le roi.  
   b. Mais tout le monde était $\{_{\nu} \text{capable de ça.}\}
   c. * Mais tout le monde en\text{t} était $\{_{\nu} \text{capable } t\text{i.}\}$

(7) a. Pour avoir ce job, il faut connaître deux langues.  
   b. Tout le monde ici parle couramment $\{_{\nu} \text{deux langues.}\}$

Interpretation: $\forall \exists \exists \forall$, $\forall \exists \exists \forall$.

The same conclusion is supported if prosodic type plays a determining role in the acquisition of syntax (Nespìr et al. 1996), or indeed if syntactic movement itself can be triggered by prosody (Zubizarreta 1998).

Consistent with Déchaîne’s (2001) analysis of Yorùbá incorporating the tonal theory in (3e), section 5 below makes a prima facie case for the fonosyntactic character of some tonal effects in Èdò.\footnote{Cf. Williams (1980, 1997), Hakk (1981) and Ruwe (1990).}

3 Tone or weight

Hyman (1982, 28) identifies a phenomenon in some Bantu languages of “incomplete tonification” with four “accent-like characteristics” as

\footnote{Fonosyntax potentially contradicts the claim that “phonology is different” (Bromberger & Halle 1989), but this depends on some meta-theoretical considerations, specifically that it’s hard to argue against a richer theory with respect to particular cases, i.e. without taking typology and learnability into account (Kayne 1988).}
in (8). Similarly, Odden 1988 has described “predictable tone” in Bantu as in (9). 16

(8) a. “linear constraints ... at most one * [accent] per morpheme and at most one HL melody per word.”
   b. “hierarchical constraints ... accent subordination as in compounding processes and focus ...”
   c. “[lack of] mobility constraints [e.g. presence of tone shift ] ...”
   d. “globality constraints [e.g. accent is diacritic ] ...”

(9) a. “The fundamental property of [predictable tone] systems is that, at least in the verbal system, the location of H is predictable by reference to the phonological shape of the verb and the morphological (tense-aspect) category ...” (Odden 1988: 226).

b. “In contrast to the situation with lexical nouns and adjectives, verbs and deverbal nouns and adjectives have no underlying tonal information. Here, the placement of H-tone is totally predictable from syllabic structure and morphological information ... A number of Bantu languages (generally spoken in southern Tanzania and northern Mozambique) have a similar bipartite tonal system, which allows lexical contrasts in position (and possibly number) of H-tones within nouns, but have no lexical prosodic contrasts in verbs; examples include Kikuria, Kikhehe, Kinga, Safwa, Makua, Makonde and Yao” (Odden 1996, 191).

Along the same lines, in Kinyarwanda “there are not that many verb stems which are differentiated [solely] by tones. Only vowel length seems to play a very important role in words differentiation. Even when speakers assign a high tone wrongly to a verb, it doesn’t affect communication” (Kimenyi in press). Of interest is Kimenyi’s further observation that the set of Kinyarwanda verb roots span four different rimal structures (VC, VVC, VNC and VN), but lacks simple V, the unmarked rime structure of other categories. This fact, taken together with Odden’s observation in (9a) that “the location of H is predictable

by reference to the phonological shape of the verb”, constitutes a second, independent class of evidence for (2), namely the correlation of tonelessness with a paradigmatic weight contrast in rimes.

For historical phonologists, the tonelessness of verb roots, as well as the weight contrast in verb roots, are just two independent accidents17, and presumably the standard typology of African “tone languages” as in (4) -(5) carries no expectations about these facts one way or the other. From the perspective of (2), however, both phenomena, and their correlation, amount to language-internal parametric variation which is learnable, i.e. capable of explanation, presumably again on a fonosyntactic basis, as follows. Given the existence of obligatory suffixes for verbs (but not for nouns), perhaps based on an inflectional parameter like V-to-T, the presence of more marked syllable types in verb roots follows because lexical verbs (unlike lexical nouns) are not pronounceable in isolation. Then the tonelessness of the same set of items follows from (2), assuming plausibly that the presence of marked syllable weights invokes metrical licensing.18

Èdò provides another relevant case.19 Èdò may have less obligatory affixation than the Bantu languages20 but it does have numerous singular-plural alternations in noun prefixes, and at least some finite verb forms in the language bear obligatory segmental suffixes (e.g. in (11) below; cf. Aikio 1988; this contrasts with the situation in Yorùbá). Now there is a consensus in the descriptive literature that Èdò verb roots support no tonal contrasts.21 Moreover,


17 Meesussen (1979, 6f.) notes that distinctive vowel length in Proto-Bantu is restricted to verb roots, although “without further data it is impossible to decide whether this is indicative of a contrast in the process of being lost or whether it reflects an incipient development.”

18 This reasoning recalls, and partially motivates, the following observation by Kaye (2001b, 3): “Phonological strings that are not phonological words cannot license tonal patterns and are always toneless.”

19 This language is often referred to in linguistic literature as “Èdò (Benin)”; in Nigerian English it is informally called “Biiri”.


21 “[S]ince we cannot elicit any minimal tone contrasts on verb stems independent of their grammatical contexts, we have no basis for representing tone on verb stems in the lexicon. We are, in effect, in agreement with the conclusion reached by Wescott and Elugbe that ... they acquire tonal representation at the syntactic level” (Amaighi 1975, 22). Dissenters to this view include Melzian (1943) and Ogurinuihi (1973); cf. Siertsem (1959), Spears (1974).
with respect to the issue of syllable structure, Ẹdọ (unlike Yorùbá for example) massively contrasts CV and CVV in verb roots, but remarkably not in undervived nouns, for example the contrast between [lọ] ‘to grind (something)’ and [lọọ] ‘to iron (something)’, as shown in the habitual form in (10a-b) as well as in the default past form in (11a-b).

  3S grind  3S iron
  ‘S/he grinds habitually’  ‘S/he irons habitually’
  /is grinding (something)’  /is ironing (some cloth)’

c. O kpọlọ.
  3S sweep
  ‘S/he sweeps habitually’
  /is sweeping (somewhere)’

  3S grind-AFF  3S iron-AFF
  ‘S/he ground (something)’  ‘S/he ironed (some cloth)’

c. O kpọlọ- rè.
  3S sweep-AFF
  ‘S/he swept (somewhere)’

Phonetically, (10a) and (10b) differ in two properties: pitch and rime weight. In these examples the two factors are redundant, so in principle either one could derive from the other. Inclusion of (10c) and (11c) in the paradigm helped Àmáyó to decide that [lọọ] contains a basic long or double vowel, because as shown in (11) it inflects exactly like an uncontroversial bisyllabic root such as [kpọlọ] ‘to sweep (some place)’, in contrast to the inflection of the uncontroversially monosyllabic [lọ].

In Melzian (1937), I count 80 minimal pairs of the type [lọ] vs. [lọọ], out of a total of 400 monoconsonantal verb roots, i.e. nearly half the possible examples participate in a length contrast. This meets the requirements of learnability even if children don’t know how to compute chi-squared! To be sure, in many of the CV – CVV pairs, impressionistic translation-semantics suggest an inchoative/causative or affecting/antipassive aspectual relationship between the two items, for example with respect to [lọ] vs. [lọọ] above, to iron is to perform a certain manual activity in a location, whereas to grind is to affect something by means of that activity (a repeated pressing motion).22

At least some CVV forms in Melzian’s collection derive historically from *CVrV, where -r is a notoriously weak consonant and the -rV part was conceivably a derivational affix. If this were true for all examples, then potentially the phenomenon in (10) would reduce to that in (1). Otherwise, based on the observations in (8) - (11) taken as such, the parameter in (2) can still be restated as in (12):

(12) Tone is (just) the option of lexically prelinked—i.e. phonologically unpredictable—metrical structure. In acquisition, this option is blocked wherever metrical structure must be assigned on a predictable basis, i.e. on the basis of distinctive contrasts in syllable weight and/or by position within complex word domains created through obligatory affixation.

The idea is that the length contrast in (10a-b) and (11a-b) prevents children from lexically prelinking metrical structure in Ẹdọ verbs.

Note also that (12) contradicts both (13a), which represents the autosegmental position on the acquisition of metrical structure, and also (13b), which restates the autosegmental view that tone and accent are formally independent.

(13)a. “[M]etrical structure plays a role in the organization of language in a large number of cases in which there is no phonetic evidence of alternating stress or overt rhythm. If this is correct, as I am convinced that it is, it is more appropriate to say that metrical structure arises not when the data of a language permits it, but rather when the data of the language does not forbid it.” (Goldsmith 1992: 92)

b. “Ladd does not give explicit rules for labeling trees, but it is crucial that the H/L labeling must not correspond to the s/w labeling of metrical stress trees at least in some cases, since otherwise the two systems would be isomorphic and the metrical structures alone would be sufficient for pitch interpretation.” (Clements 1990, 61)

22 Traditional Ẹdọ grinding (e.g. of plant material, between stones) doesn’t employ a wheel, so the semantic similarity of grinding to ironing may be greater for an Ẹdọ speaker than it might be for the speaker of an Indo-European language.
As against (13a), (12) holds that it is lexical tone, and not accent, which arises “when the data of the language do not forbid it.” As against (13b), (12) has no choice but to treat tone as isomorphic to metrical structure with respect to pitch interpretation.

Phrasal contexts in Edo provide another instance in which to test autosegmental assumptions.

4  \( \xi \text{do} \) autosegmentally

Alongside the precise descriptions by Melzian (1942) and Wescott (1962-3), to my knowledge there exists to date only one full, formal phonological analysis of Edo phrasal tone: Amayó (1976), summarized in Amayó (1981/83). Besides the standard, theory-internal assumptions in (14) and the independently motivated phonetic processes in (15), Amayó posits two necessarily global rules (16a-b) to account for the Genitive phrases in (17). For illustration, (18) restates Amayó’s derivations of these forms in autosegmental notation.

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23 In Tokyo Japanese, in nouns of over three syllables, accent is predictably assigned to “the antepenultimate mora” (Hiraguchi 1991, 11). This supports (2) and (12), as opposed to (13a), assuming that a word of four syllables forces the metrification of its rimes.

24 Elimelech (1978) treats similar phenomena in the closely-related language Etsako. Melzian was one of Westermann’s students, equally absorbed in phonetics, lexicography and morphosyntactic typology. His death “on the last day of the Battle of Berlin” (Armstrong 1967, i) held back the analysis of Edo grammar by decades, not least because his 1942 monograph was literally buried in a late-Third Reich series on “Die deutsche Mundarten.”

25 Called “the associative construction” by West Africanists like Welmers (1963), following Tervuren Bantuists like Meeussen (1959). Kinyarwanda (2002) maintains the “associative” label on the grounds that the construction does not involve Genitive Case.

26 Adopting the tonal OCP in (18) would not by itself suffice to eliminate the global character of the rules in (16). However, as pointed out to me by Prof. Akadlabi, the OCP applied to tones makes it easier to express metrical generalizations; presumably this is so because tonal representations constrained by the OCP express in effect the immediate constituents of tonal feet (cf. the references in footnote 10 above). Of course metrical tone theory is not wedded to constituent structure; its role in prosodic representations is explicitly denied by Simplified Bracketed Grid theory (Ishardi 1992; Halle 1997), as applied to tone by Ishardi & Purnell (1997) and Purnell (1998). Similarly, Akadlabi (1996) reanalyzes the relevant Edo (as well as Etsako) data in terms of alignment constraints, without making explicit reference to metrical structure, but at least assuming the OCP. Since Akadlabi’s analysis is not phonosyntactic, naturally it makes no predictions about the distribution of the genitive H tone, e.g. its absence in (17b, d).

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(14a) Floating genitive H tone

“In the associative construction we would need to posit a floating high tone between the two nominal.”

b. Tone shifting

“We postulate that a floating tone shifts onto the immediately preceding vowel and literally covers up its tone. ... In all instances of tone shifting in Edo, the floating tone moves leftwards.”

(15a) Downdrift

“[III] two high tones are separated by one or more lows, the second high is lower than the first.”

b. High tone spread

“[W]henever a [nonfloating] L occurs immediately following a H, the L is realized as a fall from H to L.”

c. Tonal simplification

“When a H-L which is borne by the second vowel in a sequence is followed by another syllable, the H-L gets simplified to a segmental H followed by a floating L.”

d. Regressive vowel assimilation

\[ V_i[V_j \rightarrow V_j V_j] \]

e. Vowel contraction

\[ V_i[V_j \rightarrow V_i] \] unless tonally distinct.

(16a) Low tone raising

“We therefore require a rule which can raise all but the initial L of a head noun [of a genitive construction] with an all-L tone pattern. This rule will have to be constrained to raise only a L preceding a H derived from an underlying L.”

b. Derived H lowering

“A word-final H derived from L will become L when collocating with an L-initial word...in the associative construction.” Nb, does not apply in bisyllabic words.
(17)a. [ówo'zó]27 ‘Ózó’s leg’ cf. [leg/foot’

b. [ábabózó] ‘Ózó’s witchcraft’ cf. [ábabá]‘witchcraft’

c. [ákóbózó] ‘Ózó’s iron trap’ cf. [akóba]‘iron trap’

d. [ékúyózó] ‘Ózó’s spoon’ cf. [ékúyó]‘spoon’

e. [úkpókózó] ‘Ózó’s cane’ cf. [úkpó]‘cane’

f. [úgbaletózó] ‘Ózó’s headwrap’ cf. [úgbale]‘headwrap’

Without the globality of (16a), derivation (18d) would merge with (18b), incorrectly. Without the globality of (16b)—and setting aside the binarity stipulation that saves (18a)—derivation (18d) would give the bad output *[ékúyózó]. Also note that the effect of (16b) in (18b) is to wipe out the effect of (14a), making abstract the floating H which (14a) has inserted, an example of absolute neutralization.

27 A raised exclamation point indicates downstream a lowering juncture between H tones where no overt L. tone intervenes. In Òdó, a stray (phrase-fina) downstreamed syllable is lowered an extra interval, to the pitch where a L would be expected to be realised, but because it is categorically H, rule (15b) does not apply. The downstreams in (17a,d,e) follow automatically from the right-hand column of (18a,d,e).

28 For Dr. Cyi Stewart (p.c.), this noun has no underlying H tone, hence his paradigm merges (17b) with (17c). I don’t know if this gap is systematic, but note that the two cases have identical prosodic outputs even for Òmýà. Even for Dr. Stewart’s paradigm, the globality problem in (18) remains.
5. Ṣèdọ fonosyntactically

It is an open question whether autosegmental theory (3a), deploying formally independent tones and accents, can avoid globality in the analysis of (17). I believe that such an attempt can succeed only by introducing extra assumptions which are stipulative from the point of view of (3a), but which are deducible from the architectures in (3b-e). Here I deploy a radicalized version of (3e) which, consistent with the parameter in (12), is ‘tone-free’. (19) gives the required rules of pitch interpretation in Ṣèdọ.

(19)a. linked s ↔ crico-thyroid laryngeal gesture/high F₀ acoustic ‘target’

b. linked w ↔ sterno-hyoid laryngeal gesture/low F₀ acoustic ‘target’

c. trochaic feet [sw] (cf. Excursus 1 below)

d. catalexis (Poser 1985, i.e. persistent, cumulative downstep/downdrift) between feet.

Before revisiting (17), it is relevant to note that restricted tone distribution in the Ṣèdọ lexicon may provide independent evidence for accentual structure, along the lines of Kaye (2001b). Ṣèdọ underived trisyllabic nouns do not exploit the whole geometric product of tonal melodies, cf. (20) and discussion in Ogieiriakhi (1973, 187). The status of the pattern in (20b) is unknown at present; if it is not marginal but just accidentally sparse, then the restriction can be crudely stated as in (21a); otherwise (21b).

undervived trisyllabic nouns in .

(20)a. [HHH], [HLH], [LHL], [LLH], [LLL], [HLL]

b. ![LHH] (two items from the dictionary, both probable loanwords: ọkọrọ ‘prince’, ọkụta ‘stone’)

c. ![HHL]

(21)a. *Doubly prelinked [s].

b. *Doubly prelinked [s] in a complete foot.

The distribution of H before genitive complements—one cause of globality in the autosegmental account—has a nonglobal analysis in a tone-free accentual framework, assuming that prosody has access to phrasal syntax not just edges (Odden 1990). In terms of a moderately articulated theory of the extended projection of N (Fukui 1986, Abney 1987), the head of a genitive phrase is not a lexical noun but a functional element, which we can label K, and which the Ṣèdọ child sets parametrically as null, based on the absence of obligatory morphological content. ²⁹ The pattern in (17) is predicted, assuming that null K governing a genitive complement is pronounced as a strong position, just in case it is not prosodically governed by the head noun (separated from a preceding s by at most w). This result follows from a version of the ECP; the formulation in (22) is quoted from Déchaine (2001), cf. Kaye, Lowenstamm & Vergnaud (1990, 1998). ³⁰

(22)a. syntactic ECP: A non-pronominal empty category must be properly head-governed.

b. prosodic ECP: A null position must be prosodically governed.

c. fonosyntactic ECP:  If a null F-head is not properly head-governed, then it must be prosodically governed.

The other theory-internal assumptions in (14) are also derivable. In (23c, e, f), when the ECP requires a syntactic (non-prelinked) strong position, it is pronounced on the maximal span of weak rimes in the governing noun, not including the initial one. In the fonosyntactic analysis, this follows if structure preservation holds for feet: an initial weak position is preserved in the head noun.

The independent phonetic effects in (15a,b) are also captured in an accentual, tone-free framework: (15a) = (19c), while (15b) follows if foot structure defines the relevant concept of locality (cf. Akinlabi & Liberman 2001, 2002).

²⁹ I.e. the examples in (17) contain no overt Ṣèdọ counterpart for English of; this difference may be one reason why “associative” terminology has stuck with West Africans, as opposed to “Genitive” Ṣèdọ D may in general be null, i.e. bare N arguments can be interpreted as definite, as in Igbo (Déchaine & Manfredi 1998) or Yorùbá (Ajiboye 2001). Ṣèdọ requires overt D just in adjuncts such as the head of a relative clause—an ECP-type effect expected under the assumptions of Longobardi (1994).

³⁰ Cf. Excursus 2 for supporting data in Yorùbá. I assume that the head noun of a genitive phrase does not properly govern its genitive complement syntactically, although of course this question was not resolved in the pre-Minimalist era, when it could still be asked.
no syntactic strong position is ever invoked (24), and in the latter the subject and predicate cannot share a foot, the subject being in effect an adjunct, hence the absence in (25) of the tone-spreading effect.

As controls, Ámáyo discusses two more phrasal contexts: VP (where an Accusative KP is presumably properly governed) and TP (assuming that T0 is ungoverned in finite main clauses). In the former,
Angas which contrasts H, M and L tones could not be treated as simply having stress.” (Odden 1999, 193)

b. Secondary stresses in English are also intermediary levels; moreover, a 3-tone system can be analyzed metrically, e.g., given Akinlabi’s theory that Yorùbá M is unmarked, i.e. weak. Manfredi (1995) and Déchaine (2001) treat Yorùbá L as an adjunct to a strong position. At least within Benue-Kwa, I know of no examples of 4 tonemes where there is no complementarity between two of them (cf. footnote 5 above).

(27)a. “[T]ones spread, and stresses do not.” (Odden 1999, 194)


(28)a. “[S]stress is a property of syllables, whereas tone is at least often a property of moras.” (Odden 1999, 195)

b. The difference is negligible, so long as tone never links to codas; if borne out, this situation conforms to the parameter in (12).

(29)a. “Culminativity… (a word has only a single main stress)” (Odden 1999, 196)

b. (9) predicts such restrictions to arise more in tone languages which are more agglutinative; Odden himself cites North Kyungsang Korean.

(30)a. “Stress Clash vs. the OCP” (Odden 1999, 199)

b. Reexamined in fonosyntactic terms, OCP exceptions in tone languages, like Meussen’s Rule in Bantu, may reduce to structure preservation. Manfredi (1991/93) gives a fonosyntactic analysis of OCP violations in Igbo genitive phrases (see also Clark 1989).

(31)a. “[S]stress can generally be assigned by general rules, whereas in the canonical tone system, tones are in large part unpredictable.” (Odden 1999, 200)

b. This may be true, but it follows directly from the parameter in (12).

(32)a. “[B]inary alternating pattern … There is no tone language which assigns H tone to every other syllable …” (Odden 1999, 208)
b. Binarity is not absent in tone languages, but it is expressed in tonal foot effects like catathesis, rather than in rime-counting operations. Again this division of labor is accounted for by (12), so it need not be stipulated separately.

Excursus 1. Parametric foot structure:

\[ \text{Akán, Hausa vs. trochaic } \}

In Akán, but not in the other languages in (1a), downstep is always recoverable as an elided, L-bearing syllable (Schachter & Fromkin 1968). This may correlate with an independent phonetic difference: phrase-initial L is phonetically raised in all the languages of (1a) except Akán. Both properties may reduce to the headedness of tonal feet: [LH]=[ws] in Akán (and Hausa, cf. Inkelas & Leben 1990), and [HL]=[sw] in the others. Bamba's theory of tonal feet generalizes to the 3-tone languages Yorùbá and Ìkòm Yálà, cf. Manfredi (1995).

(i)
Excursus 2. Fonosyntactic ECP effects in ū.

Déchaine (2001) derives the appearance of “grammatical H tone” in Yorùbá from the fonosyntactic ECP as formulated in (22c) above. In Standard Yorùbá, each of the null functional heads in (i) has two possible realizations: as a strong position pronounced with the H toneme, illustrated in (ii) below, or else as some lexical content of the appropriate category, illustrated in (iii). In the functional domain of V, the two options are in complementary distribution: in (ii-a), the lexical content is the overt complementizer kẹ̀kẹ̀; in (iii-b) it is the negative auxiliary kọ́, which Déchaine (1992) analyzes as base-generated in T. In the functional domain of N, the lexical material can cooccur with the H tone (in fact it can’t occur without it), suggesting that the former is adjoined: (ii-c) it is the third-person clitic exponent of the plural feature; in (iii-d) it is a copy of the initial consonant of the verb root, plus a default vowel (Akinlabi & Oyèbádé 1987; Pulleyblank & Akinlabi 1988; Awóyá 1997). Yorùbá Genitive has no tonal realization: in the appropriate syllabic context, it is realised as a toneless (i.e. M-bearing) dummy syllable, cf. (iv); this is presumably an adjunction structure rather than a Genitive KP.

(i) a. Olú fẹ́ ẹ̀ lọ́. [C 0] → H
O. want C go
‘Olú wants to go’

b. Ọgbẹ́ ẹ̀ wẹ̀. [T 0] → H
farmer T swim / bathe
‘The farmer bathed’

(iii) a. Olú fẹ́ láti lọ́.
O. want for to go
‘Olú wants to go’

b. Ọgbẹ́ kọ́ wẹ̀.
farmer T swim / bathe
‘The farmer did not / will not bathe’

(c) Bá Ọ̀ká 3S.K
buy 3S.K
‘buy it’

(d) Olú kọ́ aṣọ́ ọ̀rí-wí wá. [D 0] → H
c. rà wón
O. learn cloth D-buy
‘Olú learned [the skill of] cloth-buying’

(iv) a. ori Olú
head O.
‘Olú’s head’

31Negative future is normally periphrastic in Yorùbá (Awóyá 1991:209), however bare main clause negation as in (iii-b) can also be nonpast (Awóyá 1996), e.g. in conditional contexts (O. Adeypá p.c.):

(i) Ori kọ́ nà, sọ́rọ́ kọ́ je.
head NEG sprout mouth NEG eat
‘If the head doesn’t carry (something), the mouth won’t eat (anything).’
b.ori i Tolú
head Ø T.
‘Tolú’s head’

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