Phono-semantic subordination*

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Ùjíchì mere ka íhyen jì fǫ́.[1]

Abstract

The device of "tonal morphemes" (Welmers 1959), a type of "featural affixation" (Akinlabí 1996), has been much applied in taxonomic and generative analyses of Niger-Congo languages, but it can't express nonlocal prosody. For example in Ìgbo object relative clauses, an obligatory and lexically spurious H tone marks the right edge of the crossed-over remnant subject: *íhe Ùgó* [LH] *mère* 'what Ùgo [LL] did' (Swift & *al.* 1962, 247*ff.*, 303*ff.*; Green & Ígwè 1963, 88; Welmers & Welmers 1968a, 152; Nwáchukwu 1976a, 102*ff.*). In a constructional analysis, this token of H has no conceivable morphological mechanism, but the matter appears differently in the architecture of Minimalism (Chomsky 1993), where representational levels are restricted to bare interfaces mapping internal syntax (i-language) to grammar-external modules of acoustic phonetics (PF), logical pragmatics (LF) and the lexicon (LRS), entailing that tonal morphology is completely undefined. Yet despite—or because of—such theoretical restraint, the phenomenon at hand is tractable under derivation-by-phase (Chomsky 2001, Dobashi 2003, Scheer 2008, Richards 2010) where it qualifies as direct phono-semantic SpellOut in the form of a cyclic accent, isomorphic to Germanic Nuclear Stress (Chomsky & Halle 1968, Bresnan 1971, Kiparsky 1979, Cinque 1993, Zwart 2004, Wagner 2005, Zubizarreta & Vergnaud 2006). This unexpected result has the further consequence to vindicate the reduction of tonemes to scalar (e-language) output (McCawley 1964, Clark 1978, Zubizarreta 1982, Odden 1985, Sietsema 1989, Purnell 1997, Kimenyi 2002, Dilley 2005), reinforcing the recent and reluctant retreat from tonal phonology by some leading autosegmentalists (Clements *&* *al.* 2010, 20*f.*, Hyman 2010). Nothing viable or necessary then remains, not just of tonal morphemes *per se*, but even of the traditional concept of tones as exotic, phonemic quanta of paradigmatic minimal pitch contrast (Jones 1928, Chao 1930, Pike 1948, Williams 1971, Goldsmith 1976, Poser 1984, Clark 1989, Odden 1996, Hyman 2009 among many others).

1. Typology meets blowback

> *It is at times objected that we do not know all the languages of the world, so that exceptions may exist. Neither does the zoologist know whether in the virgin forests of Brazil a freak such as a five-legged cat may not one day turn up. Nevertheless, if he says that cats have four legs, this at least carries considerable statistical value…* (Jakobson 1953, 312*f.*)

Typology—synchronic comparison—relies on reliable sampling of diverse languages, but in Niger-Congo the sample is blurred by blowback from missionary and colonial wordlists which underanalyzed native grammatical categories and birthed the stereotype of "tone languages" (Pike 1948, cf. Dediu & Ladd 2007, Everett *&* *al.* 2015), to enduring obscurantic effect.[2]

In Fè'é-fè'é (Benue-Kwa, NW Cameroun), translated English nouns choose among three levels of relative pitch, but sister languages make just a binary distinction and the respective high tones are etymologically mismatched (Hyman 1972, 129*f.*; 1976, 127). Confronting this problem, phonologists played the wildcard of "floating/juncture/hidden/extrasegmental" tones, conceived as pitch debris stranded by historically elided syllables (Voorhoeve 1965, 1967a,b, 1971, Hyman 1979). Less "magical" (Kaye 1992) solutions would arise if Fè'é-fè'é's notional noun-words had branching syntax, thus anchoring Voorhoeve's buoyant pitch operators as phrasal clitics and activating less exotic accentual mechanisms including the one behind the minimal prosodic contrast between attributive [$_{c1}$ *Ènglish* [*téacher*]] 'teacher from England' and compound [$_{c1}$ [$_{c2}$ *Énglish*] *tèacher*] 'teacher of English' where the latter predictably owes its stress shift to an extra cyclic node (Liberman 1975, 212, Cinque 1993, 274*f.*).[3] Available literature about Fè'é-fè'é lacks sufficient detail to test a metrical, nonmagical account of tone in that language, but descriptive grammars of Ìgbo (Benue-Kwa, SE Nigeria) are adequate to the task, thanks to decades of concerted efforts by a large scholarly community of speakers. The comparison is specially relevant because Ìgbo happens to have followed Fè'é-fè'é as the second trying ground for floating morphotonology (Voorhoeve *&* *al.* 1969, Hyman 1974).[4]

With honorable exceptions like Kimenyi (2002), phrasal accent remains rare in Africanist tone studies. Unsurprisingly it's hard to shake the foundational belief that tone is phonology, when this worldview is normalized by a nonuniformitarian taboo that "phonology is different" (Bromberger & Halle 1989) and by a related presumption of "non-isomorphism between syntactic constituency and phonological domain structure" (Selkirk 2011, 437, 440, cf. Selkirk 1972, Nespor & Vogel 1986). But under Minimalist architecture (Chomsky 1993), both taboos collapse and the game-theory "payoff table" (Kaye 1988) looks less rigged:

> [T]he question naturally arises how much of phonology (and phonetics) is done during spellout. …A grammar with a post-syntactic phonological component would give a restricted role to the syntactic derivation in determining sentence phonology, seeing the effect of syntax on phonology and phonetics as mediated by its effect on prosodic constituency and stress… Further research needs to investigate whether the phonological component should be fully integrated into phase-based spellout, where it could produce opaque 'cyclic' effects not capturable by a post-syntactic phonological interpretation.
> (Kratzer & Selkirk 2007, 35)

Minimalism welcomes accentual derivations of tone. In a framework with fewer interstices between representational "levels" for the intervention of "readjustment rules" (Chomsky & Halle 1968, 10, Halle & Marantz 1993, 124), the phonetic interface (PF) more transparently reflects phrasal constituency (Dobashi 2003, Richards 2010). As unmediated syntactic output, PF allows previously forbidden "direct" or "minimal indirect" mapping effects (Kaisse 1985, Kaye 1995, Seidl 2000, Wagner 2005, Pak 2008) and supports "inter-modular argumentation" (Scheer 2012), recalling the original idea of "systematic phonemics" as an abstract format "deeply determined by properties of both the syntactic and the phonological component" (Chomsky 1964, 68, cf. Halle 1959). The 60's are back in style.

Far from the "phonological component" being "fully integrated into phase-based spellout" (Kratzer & Selkirk above), Minimalism *slims down* phonology, with properly syntactic computations duly factored out and relieved of diacritic functions. This prospect is unhindered

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1. 'Nightfall caused things to remain [uncompleted/unconsumed]' (Green 1958, 160, 168).

2. *Blowback*, in the sense of unintended/own-goal feedback of disinformation from ostensibly external sources, is discussed by historians of espionage (Simpson 1988, Johnson 2000).

3. To appreciate the difference between generative (i-language) and taxonomic (e-language) approaches to accentuation in such data, it suffices to compare Liberman's analysis with Pike's (1945).

4. Benue-Kwa (BK), alias Tano-Congo (Stewart 1983, 20) or East Volta-Congo, is a "dialect continuum" (Williamson & Blench 2000, 17*f.*) whose substructure was debated at the 15th West African Languages Congress (Port Harcourt, 1982) "as a consequence of the abandonment of the Kwa/Benue-Congo dichotomy" (Williamson 1989, 17, cf. Westermann 1927, 20, Greenberg 1963, 39 *fn* 13, de Wolf 1971). Ìgbo and Fè'é-fè'é belong to the conservative side of BK, within the "Semi-Bantu" penumbra (Johnston 1917, Talbot 1926, 87).

by the millennial arrival of "Optimalty Theory" (OT), a grammar-external (e-language) procedure emulating outputs with lists of "static" (Cheng & Downing 2016) preference rules. OT is not a theory but a mere compiling procedure, computationally easier than Markovian derivations (E. Keenan *p.c.*, cf. Fodor & Pylyshyn 1988, Idsardi 2006, Scheer 2010b, 214). Its theory-neutrality permits the revival of lexical phonology (Pesetsky 1979) as "stratal OT" (Kiparsky 2015), recapitulating syntax in post-spellout epicycles with logical circularity (Giegerich 1985, Kaye 1988, 1995, Scheer 2012, Lowenstamm 2013). Output-only purists may be correct that some regularities of the speech signal dissolve elegantly into parallel processing as gradient, "emergent" epiphenomena (McCarthy & Prince 1994), but other sound patterns still need to be captured categorially, as *i-language*, and either way, tonemes play no part. Even some frontline autosegmentalists now deprecate tones to a more modest role of "monodimensional… scales… directly interpreted in the phonetics" where "observed patterns of alternation… are typically random and arbitrary (Clements & *al.* 2010, 20 *f.*, cf. Hyman 2010, *pace* Hyman & Schuh 1974).[5] Their retreat from tonemics belatedly vindicates McCawley's abstraction of tone as pitch accent (1964, *pace* Poser 1984, Hyman 2009).

The foregoing history echoes Jakobson's (1953) verdict quoted above against the proverbial butterfly collector romping blithely through foreign fields (cf. Leach 1959). Much subsequent research points in a similar direction. Long before Government Phonology posed "the notion of a possible phonological system" (Kaye *& al.* 1985, 327, cf. Kaye 1988), Greenberg had began to specify the limits of possible syntax, publishing 45 universals of a mainly statistical, implicational character (1966), presumptively reflecting a blend of formal and functional constraints (Kuno 1987, Keenan & Stabler 2003).[6] Anticipating the best possible result of such inquiry on the formal side, Kayne's *Antisymmetry of Syntax* concludes as follows:

> To a significant extent, the L[inear]C[orrespondence]A[xiom]-based theory of syntax proposed here allows us to have the all-too-infrequent pleasure of seeing the theory chose the analysis. (1994, 132)

The utopian outcome defines typology as an isomorphism between the structures allowed by a given theory and the actual analyses of individual languages. In these terms, dissolving "tone languages" into phrasal accent would amount to progress, and the job is half done already. Greenberg (1970) aligned the prosodies of Japanese, Karok (NW California) and Slavic (Indo-European), while McCawley proposed a derivational source for the many similarities of Japanese with Ìgbo, Tiv and other BK languages (1970a,b, 1973, cf. Clark 1978).[7]

5. Such concessions are still insufficient, because tones are inadequate even as raw acoustical models, whether in "tone languages" or in Pierrehumbert's (1980) *ad hoc* ToBI format for English intonation (Dilley 2005, 2008).

6. Doctrinally functionalist typology is self-limited to "surface structure… universals which require only a minumum of abstract analysis"—ostensibly because more abstract analysis is "not feasible" given "limitations on resources devoted to linguistic research", but more plausibly due to ideological "rejection" of generative grammar (Comrie 1981, 4). Such pessimism is belied by productive formal research conducted in African universities like Legon and Ìbàdàn by speakers of the languages under study.

7. Less insightfully, Greenberg repeated the urban myth that, in "a tonal language of the usual type, for example Yorùbá… [a]ny syllable in the word may have any tone…" (1970, 157). This was already disproved by Ward's finding that "no noun vowel-prefix occurs on a high tone" (1952, 37, cf. Stahlke 1975), soon followed by an open list of further counterexamples, all implicating phrasal syntax in the missionaries' translated "words" (see Akinlabí 1985, Manfredi 1995, Harrison 2000, Déchaine 2001, Akinlabí & Liberman 2001, 2013).

1.1 Tonemarking convention

To write surface tones, I adopt the *syntagmatic* system first invented for Àkan by Christaller (1875), later adopted and adapted for Ìgbo by non-Ìbàdàn scholars such as Swift, Welmers and Nwáchukwu. In this approach, pitch diacritics track, not isolated syllables or orthographic words, but the entire spans between punctuation marks. For each such sequence, an acute accent [◌́] indicates the start of an H domain, a grave accent [◌̀] begins an L domain and an unmarked syllable continues the domain to its left. A clausemate sequence of H marks is downstepped, whether or not L intervenes (cf. Stewart 1965).

Ìbàdàn-based linguists were influenced by the structuralist "tone language" mindset of which Christaller was innocent, and for this reason they chose a different convention for Ìgbo, treating each syllable individually so as to show only *paradigmatic* pitch contrasts. Accordingly each L syllable is individually marked grave [◌̀], while each H syllable is left unmarked, except that the first H syllable after a downstep juncture needs a special mark, which is either [◌̩] (for Green & Ígwè) or [◌̄] (for Williamson, Éménanjọ and Ụ̀waláàka). Unfortunately however, it's tricky to distinguish these special symbols from the grave accent in handwriting, and a second, more conceptual problem confronts users of this convention as well: how to mark the second H syllable after downstep. An imperative spelled *Alagha ahya!* meaning 'Don't leave the market!' has phonetic tones H!HH H!H, but learners of the Ìbàdàn system usually write **Alāghā āhyā!* or **Alāghā ahyā!* instead of the correct *Alāgha ahyā!* The same example is easier in the non-Ìbàdàn system with one acute per H span: *Álágha ahyá!* A third drawback of the Ìbàdàn system appears when an Ìgbo word appears in isolation, whether on a signboard or interspersed in English text, with no tone mark. Such a word can be read either as having *all high tones* or else as *not tonemarked at all*. This ambiguity doesn't arise in the non-Ìbàdàn system, for which every stretch of Ìgbo text necessarily starts with some tonemark, either acute or grave, otherwise we know that tones aren't marked at all.[8]

2. A relevant paradigm

In Standard Ìgbo, any L-final, finite subject that's descriptively 'crossed' by an A-bar path obligatorily adds a lexically spurious H tone at the end (Swift & *al.* 1962, 247*f.*, 303*ff.*; Green & Ígwè 1963, 88; Welmers & Welmers 1968a, 152; Nwáchukwu 1976a, 102*ff.*; 1995). Thus the name *Ùgo* ('eagle/chieftaincy title') keeps its LL citation pitch in (1), but in (2) its final syllable must be pronounced with either H or LH. (Lexically spurious tones are underlined).[9]

8. A hybrid approach enriches the syntagmatic system with a special paradigmatic symbol for post-downstep H: [◌̩] (Swift) or [◌̄] (Nwáchukwu 1976a,b). It's debatable if this amounts to the best or worst of both worlds.

9. In data like (2), Green & Ígwè transcribe mostly final LH but occasionally plain H (e.g. 1963, 88, 192). In the same context Swift and Welmers consistently write H and Nwáchukwu consistently writes LH. Clark treats the LH rising contour as abstractly "bimoraic" (1989, 213 *fn.* 2). The pitch of 'house' in (2a) is discussed below.

Glosses in this paper include the following. [!] = downstep. CL = a toneless argument-type clitic, sensitive to aspectuo-temporal structure (cf. Manfredi 2005b). Q = a yes/no polarity operator pronounced as lexically spurious L. FIN = prosodic finite inflection, sometimes pronounced as lexically spurious L (cf. §3 below).

Pitch tracks and audio of all examples will be posted at *people.bu.edu/manfredi/PhonosemSubord.html*.

(1)a. Ùgo wu-ru úlọ̀. [LL L̲L HL]
U. establish.FIN-CL house
'Ùgo built [a/the] house'

b. Ùgo me-re íhe. [LL L̲L HH]
U. do.FIN-CL thing
'Ùgo did something [positive]'

(2)a. úlọ́/ùlọ Ugó wù-ru [HL/L̲L LH L̲L]
house/house.L U.-H establish.FIN-CL
'the house that Ugo built'/'the fact that Ùgo built a house'

b. (úlọ́) kè Ugó wù-ru [(H!H̲) L LH L̲L]
house-H the.*pro* U.-H establish.FIN-CL
'(the house,) the one that Ugo built'

c. Òléé ihe Ùgó mè-re? [LH HH LH̲ L̲L]
which.*one*.Q thing U.-H do.FIN-CL
'What did Ugo do?' ('Which is the thing that Ùgo did?')

d. Kè-dú ihe Ùgó mè-re? [LH!H HH LH̲ L̲L]
Q.*pro*-BE thing U.-H do.FIN-CL
'What did Ugo do?' ('Which is the thing that Ùgo did?')

e. Gíní kà Ugó mè-re? [H!H L LH̲ L̲L]
what.Q that U.-H do.FIN-CL
'What did Ugo do?'

f. (Ọ́ bù) úlọ́ áhù ka Ugó wù-ru. [(H L) HL HL L LH̲ L̲L]
3S be house DEIC that U.-H establish.FIN-CL
'It's that house that Ugo built'
'That's the (only relevant) house Ùgo built'

This nonlexical H̲ is not some trivial, local morpheme: it appears uniformly, across dialects, whether the dislocation crosses a relative clause (2a-d) or a cleft (2e-f).[10] To insist willy-nilly on a morphological treatment means accepting coincidental homophony of the two markers as "a tolerable result" (Williams 1971, 481), but the coincidence is less tolerable in the most thorough autosegmental study to date, where the harvest of H̲ tone "affixes" in Ìgbo jumps from two to five (Clark 1989, 10). A second morphological mystery in (2) is why extraction of a direct object (or other internal argument) has an audible effect on the subject it crosses over. Conversely, if no internal argument is displaced, *Ùgo* LL as an *in situ* subject gets no final H̲, whether it's inside a clausal argument (3a-b) or under narrow focus marked by a copula (3c).[11]

10. For the distinction in Ìgbo, cf. Robinson (1974) and Goldsmith (1981a). Some Niger-Congo languages have been argued to allow only one or the other but not both (Adésọlá 2004, Torrence 2013) cf. *fn.* 11 below.

11. (3a) is modeled on Nwáchukwu (1976a, 257, cf. 1985). (3c) contrasts with subject cleft, a structure that's ungrammatical in Ìgbo with or without a resumptive clitic:

(i) *Ùgo ka (ọ́) wù-ru úlọ̀.
U. that 3S establish.FIN-CL house

By contrast with Ìgbo, subject cleft is OK in Yorùbá and Vatà with or without resumption (Carstens 1986, 24; Koopman 1983, 24, *pace* Koopman 1984, 37, 145, Koopman & Sportiche 1982, 142; 1986, 360, 371). For Fɔ̀ngbè, cartographic theory assumes no subject resumption, but that could be an artefact of treating *wɛ̀* as a focus head. The fact that *wɛ̀* is optional iff an internal object is focused *ex-situ* (Ndayiragije 1992, 64) is easier to understand if *wɛ̀* is a copular resumptive after all.

(3)a. [Nà Ugo wu-ru úlọ̀] ba-ra úrù. [L LL LL HL LL HL]
that U. establish.FIN-CL house grow.FIN-CL profit
'The fact that Ugo built a/the house is useful'

b. [Íhe bá-ra urù] bụ [na Ugo wu-ru úlọ̀]. [HH !H̲H H L L L LL LL HL]
thing grow.H.FIN-CL profit be that U. establish.FIN-CL house
'What's useful is (the fact) that Ugo built a/the house'

c. Ọ́ bù Ugo wu-ru úlọ̀. [HL LL LL HL]
3S be U. establish.FIN-CL house
'It's Ugo (and nobody else) who built a/the house'

To my knowledge and with one brief exception—see §3 below—the prosody of Ìgbo object relatives has never been contemplated as syntax. Subject relatives are a different matter.[12]

(4) M̀gbadan rị-rị úgwu. [LLL LL HH]
antelope crawl.FIN-CL hill
'The antelope climbed uphill'

(5)a. m̀gbadán rí-rị ugwú [LLH̲ !H̲H H!H̲]
antelope-H crawl.H.FIN-CL hill-H
'the antelope that climbed uphill'

b. (m̀gbadán) ké rị-rị ugwú [(LLH̲!) H̲ HH H!H̲]
antelope-H the.one.H crawl.H.FIN-CL hill-H
'(the antelope,) the one that climbed uphill'

c. Òléé m̀gbadán rí-rị ugwú? [LH!H LLH̲ !H̲H H!H̲]
which.one.Q antelope-H crawl.H.FIN-CL hill-H
'Which antelope climbed uphill?'

Each example in (5) shows three tone changes at once: (i) subject LLL→LLH̲, (ii) predicate head L→!H̲, (iii) internal argument HH→H!H̲.[13] Observing the same rules *ceteris paribus* in the genitive phrase alias "associative construction", Nwáchukwu (1976a, 154-61) unifies both patterns as restrictive adnominal modification, but reduction to a single format is incomplete without identifying a shared motivation for the triple prosody.[14] The issue is complicated further because the same H̲ hallmarks show up optionally in a nonsubject relative (6a) yielding (6b), "an intonational variant" conveying "added emotional force" (Green & Ígwè 1963, 89) or—more concretely perhaps—a narrow interpretation of manner (C. Úchèchúkwu *p.c.*).

(6)a. ọ́sọ/ọ̀sọ Àdḥá chù-rụ anyí [HH/L̲L LH L̲L HL]
race/race.L A. chase.FIN-CL 1P
'the fact of A.'s having pursued us'

b. ọ́sọ/ọ̀sọ Àdḥá chú-rụ ányị [HH/L̲L LH !H̲H !H̲H]
race/race.L A. chase.H.FIN-CL 1P.H
'A.'s frenetic manner of pursuing us'

12. In (5) as in (2)—cf. *fn.* 9 above—final LH̲ is a dialect variant of (downstepped) final H̲ on an L-final subject.

13. The ! of rule (ii) deletes following !*ké* as in (5b), cf. Swift *& al.* (1962, 380*ff.*). The shift *kè→ké* fits the general pattern that the right edge of the head/possessum of a genitive phrase, if not lexically H, becomes H̲ before any tone other than *lexical* H i.e. before either lexical L or derived H̲ (Williamson 1986). Mysterious as phonology, the shift evokes banal syntax that a genitive modifier occupies a separate cyclic node (DP or KP).

(*ǹ*)*ke ḿ*(*ụ*) 'mine'	[(L) L H]	cf. *mụ́* '1s'	[H]
(*ǹ*)*ké ányị* 'ours'	[(L)H̲ !H̲H]	cf. *ányị* '1pl'	[LH]
(*ǹ*)*ké òbodo* '*pro* of the community'	[(L)H̲ LLL]	cf. *òbodo* 'community'	[LLL]

14. Published analyses, assuming indirect syntax, deploy great phonological legerdemain to derive observed patterns from lexical tones plus floating tones/tonal morphemes (Voorhoeve & *al.* 1969, Carrell 1970, Welmers 1970b, Williamson 1970, 1986, Williams 1971, Hyman 1974, Goldsmith 1976, Clark 1978, 1989).

The SVO order of (5) leaves triple nonlexical H as the sole audible cue of modifier syntax.[15] In (2) by contrast, the linear order O_i…[S V __ $_i$] makes spurious H strictly redundant in functional or taxonomic terms, nor is it the only pitch redundancy that object relatives display. In a pregnant footnote, Green & Ígwè disclose a decision to "conventionalize"—descriptively suppress—a tone change that's heard in topic positions including object relative antecedents:

> In constructions of this type, an inherent high tone final syllable of the first noun [sc. dislocated object] will have the same tone level as an inherent low tone initial syllable of the second noun [sc. subject of the relative clause]. Thus if *jí* is the first noun and *ùbḥé* the second we get:
>
> jì ubḥé kwù-gbu-ru [L LH L-L-L], cf. *jí* [H]
> yam.L pear cover-cut.FIN-CL
> 'the yam plant that the peartree smothered'
>
> …For convenience of tone notation, however, we conventionalize by writing the final syllable of the first noun and the initial one of the second with their inherent [sc. citation/lexical] tones. …Analogous examples will be found on p. 106, 134 *sq*. and pp. 192, 194, 196…
>
> Òfe o dị utọ́? [LL L-L LH], cf. *ófe* [HH]
> sauce.L 3S.Q be.L tastiness
> 'The sauce, is/was it delicious?'
>
> àbọ Ughó wè-la-ra [LL LH L-L-L], cf. *ábọ* [HH]
> farm.basket.L U-H take-return.FIN-CL
> 'the farm basket that U. brought back' (Green & Ígwè 1963, 88*f*. *fn*. 2; 91; 196)[16]

All A-bar pitch effects are not equal: the spurious Ls above are absent "[i]n slow speech" (Green & Ígwè 1963, 91) whereas the spurious H in (2) is obligatory at any tempo. This asymmetry is mysterious if couched in terms of tonemes, but easier to comprehend if high tone is the phonetic output of a pitch accent, while spurious L is deaccenting.[17]

In sum, the spurious H of (2) is neither construction-specific morphology, nor an edge effect of local phrasal boundaries. Instead, it appears reliably on the end of any "non-root" subject (cf. Emonds 1970) that's not the highest argument expression in its spellout domain. In tandem, a dislocated topic is optionally deaccented before subject-initial L. The cyclic nature of these phenomena is revisited below (§4) after considering the PF structure responsible.

3. The complementary context

Green & Ígwè hint that the obligatory prosodic signal in (2) is not arbitrary:

> *Subject verb form I, Subordinate, Relative B*…
> Noun subjects of tone group I [= ending in H] keep their inherent tones and those of tone group II [= ending in L] have non-inherent tones in which their final syllable is high relatively to the tone of the verb. The tonal behaviour of noun subjects [sc. in object relative clauses] is thus the reverse of that for the main [nonrelative] form. In the main form… we had *Éghu-ù rìrì jí* 'The goat ate the yams'. In this form we have *Jí eghu rìrì hyìrì ńne* 'The yams the goat ate were many'. (1963, 87*f*.)

To restate: obligatory, spurious final H on the subject of an object relative clause blocks anticipatory spreading to the subject of the surface L of a finite verb. The latter rule is not

15. In Ḿbàisén, intransitive subject relatives add a segmental cue: toneless final *nị* (Nwáchukwu 1976a, 353 *fn*5).

16. In Green & Ígwè's "analogous examples" above, both syllables of a dislocated HH argument are lowered. The spurious LL of *ófe* 'stew' is explicitly flagged by them, while the LL of *ábọ* 'farm basket' is implied by their quoted text. Presumably also, *úlọ* 'house' in (2a) and *ósọ* 'race' in (6a) lose their H tones in fast speech.

17. "Privative tone" (Hyman 2001) being accentual in all but name. Clark keeps track of the L data (1989, 48-51) but makes no intrinsic connection to syntax or to relational prominence of information structure in discourse.

uniform across the Ìgbo-speaking area, but is observed in many localities including Ìgboụ́zọ̀, Òwerí, Ǹnéèwi and Ọ̀nị cha (Émènanjọ 1985, 79, 121, 155, as well as Ígwè's own Ọ́màáhyá, although not in Ḿbàisén (P. Nwáchukwu *p.c.* to Clark 1989, 214).[18]

(7)a. Ékwe-è wu-ru úlọ̀. [HH-L LL HL] (Ọ́màáhyá = colonial "Umuahia")[19]
E.-L establish.FIN-CL house
'E. built [a] house'

b. Àmáka-à li ńni wọ̀ọ̀. [LHH-L L HH HL] (Ìgboụ́zọ̀ = "Ibusa/Ibuzo")
A.-L eat.FIN food DEIC
'A. ate that food'

c. Díḳẹ́-è za-ra úyò. [H!H-L LL HL] (Òwerí = "Owerri")
D.-L skim.FIN-CL house
'D. swept [the] house'

If the phenomenon in (7) is phonology, the most elegant notation conceivable is Goldsmith's "1 Root Flop Rule' (1976, 125, cf. 24, 45).

(8) CV [$_{VP}$ -CV
T

But such neatness is illusory, because crucial inflectional features are only covertly smuggled in with Green & Ígwè's paradigm label of "1 Main".[20] If (8) was really phonology, how would it not also apply in (2) and (6a) where its structural description is duly met? Assuming for concreteness an autosegmental formula like (9) covering the data in (2), the question is what principle of grammar ensures that (9) and (8) are disjunctively ordered in an "elsewhere" blocking relation (Kiparsky 1975). Somehow or other, phonetic complementarity is obtained from the morphosyntactic labels themselves—a dead giveaway to direct mapping.

(9) CV [$_{VP}$ -CV … [$_{DP}$ t_{WH}] …]
Ⓗ (where a circled tone represents a floating tone or tonal morpheme)

(8) faces more difficulties. Goldsmith (1976, 128-33) cites Green & Ígwè (1963, 75*ff*.) to prove that the feature geometry in (8) ignores the particular tone content of the cover symbol "T". Tone flop applies not only if copular *-dí* is pronounced L (10a) but also if it's pronounced !H when compounded with *-rị* 'remote past' (10b). Similarly, it's indifferent whether *-jí* 'grip' is pronounced L (11a), or !H as triggered by the L-initial complement *ànyí* '1P' (11b).

18. In Ọ̀nị cha (= colonial "Onitsha"), the anticipated finite L is salient in hypocoristic names like *Chúùma* and *Chúùdị* , reduced from *Chúkwu-ù ma* 'C. knows' and *Chúkwu-ù dị* 'C. exists' (Nwáchukwu 1976b, 138).

19. Much of the literature copies Green's colonial-era practice of naming the geographical Ọ́màáhyá dialect after an ethnic fraction, in this case Rev. Ígwè's own *Ọ̀hụ́nhụn* maximal lineage or "clan" (Ígwè 1999, 657).

20. Clark obtains the effect of (8) by adding a *moraic* floating L "clitic" (1989, 190) under Infl in the "1 Main" form (= Welmers' "factative"), but she must then coincidentally delete the mora of this clitic just in case the preceding subject ends in L. Her analysis does explain the failure of (8) to apply just in case the verb has a morphologically specified, overt vowel prefix as in Green & Ígwè's "2 Main" form, cf. (16) below. This may be the best that can be done under the standard, indirect architecture of syntax-phonology mapping.

(10)a. Há-à di n'ọ́rụ. [H-L L HH] (Ọ́màáhyá)
3P-L BE.located.FIN at farmwork
'They [inanimate] are in the farm'

b. Há-á di-rì n'ọ́rụ. [H-!H HL HH]
3P-!H BE.located.FIN-remote at farmwork
'They [inanimate] were in the farm'

(11)a. Óyi-ì ji únù. [HH-L L HL]
cold-L grip.FIN 2P
'You [pl.] suffer from fever'

b. Óyi-í ji ányị. [HH-!H H !HH] cf. *ànyí* [LH] '1P'
cold-!H grip.FIN 1P
'We suffer from fever'

Extrapolating this pattern, Goldsmith says "the prediction is clear" that (8) should also apply to *-ká* 'surpass' and *-wụ́* 'identity copula'—roots which are unsuffixed in the *1 Main* form and which are pronounced with invariable !H in Ọ́màáhyá (Green & Ígwè 1963, 74). Relevant Ọ́màáhyá data are not at hand, but in nearby Òwéré the "clear" prediction is clearly false: tone flop occurs as expected by (8) with finite roots that are pronounced L (7c), but not with a root of the invariant !H class like *-rí* 'eat' (12), as Éménanjọ explicitly observes (1985, 120).[21]

(12) Íkẹ̀ẹ (*-é) ri-ri rin à. [HH!(*-H) HH H L] (Òwéré)
I. eat.FIN-CL food DEIC
'I. ate this food'

In Òwéré the number of roots inflected like *-rí* 'eat' is unknown, but probably not less than in neighboring Ḿbàisén where they comprise 40 out of a total 105 sampled (Swift & *al.* 1962, Déchaine 1993, 504). Most of the 'eat' class of roots of Òwéré and Ḿbàisén merge in Ọ́màáhyá into the 'give' class, leaving only 'surpass' and 'identity copula', cf. (13).

(13) *inflection classes of CV roots*

	'surpass'	'eat'	'give'	'skim'
infinitive (all dialects)	*í-ká* H!H	*í-rí* H!H	*í-nyé* H!H	*í-zà* HL
Òwéré/Ḿbàisén finite *1 Main*	*ká* !H	*rí-ri* !HH	***nyè**-re* LL	*zà-ra* LL
Ọ́màáhyá finite *1 Main*	*ká* !H	***rì**-ri* LL	***nyè**-re* LL	*zà-ra* LL

The only autosegmental analysis to date of the Òwéré/Ḿbàisén 'eat' class sets them aside as stray remnants "descended from an earlier, three-toned system" operating special "redundancy rules" on the tone features [±UPPER, ±RAISED] (Clark 1989, 37-41, cf. Pulleyblank 1986). That's implausible however, for two reasons. First, the 'eat'-type roots don't really form a "small class" in the "modern system" of Ḿbàisén, as Clark hazards. On the contrary they're actually more numerous than either the 'give' or the 'skim' class, as noted above. Second, Clark is unable to cite any "historical basis" for a distinction of three *surface* tones in any ancestor of modern Ìgbo. On the contrary, all known Benue-Kwa languages which contrast three surface tones for items of the same category are innovative—not archaic—with respect

21. (12) copies the manuscript datum (Éménanjọ 1981, 223), conforming also to the precise prose statement of the rule on the preceding page. Unfortunately the retyped, unproofread, published version is typographically garbled (1985, 121), but the manuscript tonemarking is repeated eight times by Williamson (1983, 9*f.*).

to known binary systems (Manfredi 2009a). Specifically for Ìgbo, neither Òwéré nor Ḿbàisén nor any other variety separating the three root classes in (13) distinguishes more surface tones than any dialect in which a three tone-class distinction of roots is not made.[22] Therefore the appeal to tone features to separate the three classes in (13) is both diacritic and speculative.[23]

Remarkably, however, (12) *can* be separated from (10) and (11) in derivational terms:

(14) The !H that flops (10b, 11b) is derived from spurious L (10a, 11a), whereas the !H that fails to flop (12) has no history as either L or L (13). Therefore, tone flop correlates with—is epiphenomenal to—whatever causes a root to be pronounced with L or L in the finite form.

If so, the surprise in (13) is not the prosodic consistency of roots like *-rí* 'eat' bearing the same tone in both infinitive and finite forms, but the *in*consistency of roots like *-nyé* 'give' with infinitive H but finite L. To obtain lowering with the latter set, Welmers posited a "low tone replacive" process morpheme (1970a, 51), harbinger of DM-style post-syntactic "realization rules" (Halle & Marantz 1993), while Goldsmith indexed the "1 Main" label to an L "melody", one of a laundry list of inflectional tone formulas (1976, 122) amounting to "precompiled" outputs *à la* Hayes (1990). These analyses founder on dialects like Òwéré and Ḿbàisén where, as just noted, exceptions to finite H→L (i) constitute an *open* lexical class and (ii) are also *systematic* exceptions to (8). Encountering similar puzzles elsewhere in Benue-Kwa, tone mavens prefer to accept non-Markovian "globality" (Hyman 1982, Hyman & Valinande 1985) than to contemplate direct syntax mapping. But even granting to tones such generous allowances of theoretical opportunism, it's still mysterious why the *1 Main* H→L rule is not the inverse (L→H) not to mention why syntactic configurations should be so finicky about tonemes when they're so indifferent to vowel and consonant quality. In retrospect, the multiple failure of rule (8) is an unanswerable argument against the alleged "autonomy" of tone and the autosegmental notation into which that premise is hard-wired.

In direct syntax-prosody architecture, McCawley's accentual theory applies to good effect. Suppose that Ìgbo phonetic L is neither an autosegmental atom nor a categorial specification of tone features but the e-language output in F_0 (perceived pitch) of a metrically weak timing slot. Then the spurious L that replaces citation H in the *1 Main* form of a root like *-rí* 'eat' (Ọ́màáhyá) or *-nyé* 'give' (all dialects) qualifies as VP-initial de-accentuation, motivated as a

22. All known varieties of Ìgbo are prosodically binary: only H and L contrast after L, and only H, !H and L contrast after H. Antidownstep (downstep reset) is possible only in the same phrase as a preceding downstep (Manfredi 1992) and this makes nonsense of SIL "upstep" (Pike & Wistrand 1974, Meir *& al.* 1975). More confusion arrived with the resurrection of an Ìgbo "mid(dle) tone" (Íkẹ̀kẹọnwú 1982, 6; Ányaanwú 1998) long after its burial by Winston (1960) in Èfí k, a language tonally isomorphic to Ìgbo (Green 1949), and by the great grammars and dictionaries of Swiff, Welmers, Williamson, Nwáchukwu, Ụ́walááka, Éménanjọ and Ígwè. Green & Ígwè insist that their "mid" is a "relative tone" and scold Pike for botching the Ìgbo facts:

> Dr. Pike has unfortunately failed to grasp the *relative nature of the mid toneme in Ìgbo* and has altered the tone notation of the examples he has quoted from Ida Ward in his book and has thus misrepresented the tonal system of the language. Nor does he in his book envisage the possibility of such a *relative tone*, see Pike (1948, 31). (Green & Ígwè 1963, 7 *fn.* 1, italics added)

23. Prosodic invisibility in the domain of certain suffixes, affecting the Òwéré/Ḿbàisén 'give' class, also seems to hold for the Class 3 roots of Gĩkũyũ (Harries 1952) and for the "changing verbs" of the Chadic language Màrgí (Hoffmann 1963, 116, 169, cf. Williams 1971, 463, Archangeli & Pulleyblank 2014).

"relational" corollary of VP-final nuclear stress (Liberman 1975, 51).[24] Support for this idea includes the fact that *1 Main* inflection—the stated, crucial context for Welmers' "low tone replacive" morpheme as well as for Goldsmith's "melody" of listed L—demands a surface branching VP. Comparing (15) with (7) shows that, if the free internal argument of a *1 Main* predicate is elided anaphorically in discourse, an echo copy of the CV root inside a bound expression—called BVC by Ìgbo linguists—is obligatory in absolute clause-final position (Émènanjọ 1984, Íhìọ́nú 1989). No surface branching requirement holds for the *2 Main* form (16), which is built on a "nomino-verbal" agglutination like the BVC (Émènanjọ 1985, 27).

(15)a. Ékwe-è wu-ru *(e-wú). *1 Main*
E.-L establish.FIN-CL NOM-establish
'E. did build [something contextually given]'

b. Àmáka-à li *(e-lí).
A.-L eat NOM-eat
'A. did eat [something contextually given]'

c. Díkẹ́-è za-ra *(a-za/á-zà).
D.-L skim.FIN-CL NOM-skim
'D. did sweep [someplace contextually given]'

(16)a. Ékwe è-wú-o-le. *2 Main*
E. NOM-establish-OVS-PRESPERF
'E. has built [something contextually given]'

b. Àmáka è-lí-gea.
A. NOM-eat-PRESPERF
'A. has eaten [something contextually given]'

c. Díkẹ́ a-zà-á-la.
D. NOM-skim-OVS-PRESPERF
'D. has swept [someplace contextually given]'

For phonology it's a mere coincidence that (15) has—and (16) lacks—the same three things: (i) surface branching VP, (ii) root H→L, (iii) tone flop onto the subject, but the circumstance is less arbitrary as direct syntactic spellout. Massive evidence shows that Ìgbo does not split TP and VP into separate prosodic domains.[25] Restating this in Minimalist terms: Ìgbo T^0 is a defective phase head, so C^0 spells out its entire TP complement all at one gulp. This has many observable consequences. By themselves, uninflected Ìgbo predicates (verbs or VPs) are

24. Applications of the nuclear stress tradition (Chomsky & Halle 1968; Bresnan 1971, Cinque 1993, Zubizarreta & Vergnaud 2006, Wagner 2005) to stereotypical "tone languages" include Ishihara (2004), Duanmu (2005), Manfredi (2008), Cheung (2009) and Zubizarreta (2010). The BVC in (15c) carries different pitches under different focus interpretations (Manfredi 2005a). The suffix glossed OVS in (16) is discussed directly below.

25. I ignore the difference between VP and vP shorthand labels for l(exical)-syntax (Hale *& al.* 1995, Manfredi 2012). The status of T^0 as a phase head rests on two PF and two LF diagnostics (Manfredi 2009a, 331). All four hold in an innovative, contiguous area of Benue-Kwa, call it BK2, comprising the Gbè, Nupe, Yorùbá and Ìdọmà clusters, but all four are absent in the noncontiguous remnant BK1, including Ìgbo. This follows if T^0 and VP are phase-mates in BK1, but not in BK2. This bifurcation is consistent with neogrammarian sound shifts (Stewart 1993, 2002) but not with lexicostatistic calculations (Bennett & Sterk 1977, Williamson 1989, Kropp-Dakubu 2012), cf. *fn* 4 above. Further consequences of the defectiveness of T^0 as a phase head in Ìgbo include some quirks of subject inflection (Goldsmith 1981a, Íhìọ́nú 1985, Ézè 1995), cf. Appendix below. More *prima facie* instances of predicate deaccenting are found throughout BK1 (e.g. v.d. Wal 2006), but the traditional Bantuist commitment to tonemes, and the mainstream phonology taboo to relate prosodic and syntactic phrasing, makes so-called "after verb focus" (cf. v.d. wal & Hyman 2017) eternally exotic.

famously unpronounceable—causing headaches for lexicographers in search of handy lemma headwords (Welmers & Welmers 1968b, *iv*; Úchèchúkwu 2005). Ìgbo finite paradigms are sharply asymmetric: *1 Main* is not directly negatable and has no Reichenbachian denotation of Priorian time, but *2 Main* has a present perfect implicature.[26] *1 Main* is resolutely transitive as just noted in (15), but *2 Main* affirmative is formally intransitive (16), and any overt notional direct object like *n ́ni* 'food' needs the H!H prosody of an adnominal modifier (17a), whereas the same lexical item in a 1 Main construction keeps its citation HH tones (17b).[27]

(17)a. Àmáka è-lí-gea nní. [LHH L-H-HH H!H] *2 Main*
A. NOM-eat-PRESPERF food-H
'A. has eaten (some/the) food'

b. Àmáka-à li n ́ni. [LHH-L L HH] *1 Main*
A.-L eat.FIN food
'A. ate (some/the) food'

Tone flop onto the finite subject (in dialects that flop) goes hand-in-hand with surface transitivity and VP-initial deaccentuation: in no Ìgbo variety does rule (8) ever apply in the *2 Main* form.[28] In Òwèrè, roots of the 'eat' class are exempt from both H→L and rule (8). To mark the same class (in Ḿbàisén), Clark adds a feature [+UPPER] which is otherwise redundant, but which is phonetically abstract in Ìgbo (Déchaine 1993, 505). Even if invariant H tone can be set apart with a non-tonal feature like metrical strength, a special realization rule is still needed in order to ensure that the other ("weak") H maps to L in suffixed verbs but remains H elsewhere, including in the (prefixed) *2 Main* form (Déchaine 1993, 511). Neither phonological analysis therefore accomplishes more than an abstract restatement of the facts.

The remaining possibility is to treat the pattern in (13) as direct spellout of syntax. Under McCawley's (1964) accent hypothesis, PF knows nothing about tones, so metrics *alone* must distinguish three classes of bare roots. This is possible if an accent is either binary/branching, singleton/degenerate or null as illustrated in (18), a tone-free lexical representation of the roots included in (13) above. A branching accent is footed, i.e. in grid terminology it "projects" to visibility for syntagmatic parsing (Halle & Vergnaud 1987, 6). With these assumptions, a clause inflected in the *1 Main* form, containing a root of the 'eat' class, spells out as in (19).

26. The *1 Main* form achieves temporal reference via the pragmatics of *Aktionsart* (event composition) eked out by time adverbs (Welmers 1970a, Ụ̀walá̀ka 1981, Williamson 1983, Déchaine 1991, 1992, cf. Dowty 1986). Some of these latter can be morphological heads, like Ìgbọ́ụ̀zọ̀'s *tè* auxiliary and the toneless suffixes *-bu* and *-naana* in Nnéèwì and Òwèrè respectively (Émènanjọ 1985, 82-84, 124-26, 157-60). The contrary view, that Ìgbo codes tense morphologically (Winston 1973, Nwáchukwu 1976b), founders in taxonomic homophony.

27. (17) is drawn from Ìgbọ́ụ̀zọ̀, but the same contrast holds in almost the whole Ìgbo cluster. One exception is Ágbọ̀ (Agbor"), which lacks a *1 Main* form, while all suffixes are optional in its *2 Main* correspondent.

28. As hinted in *fn* 20 above, Clark accounts for the absence of tone flop in *2 Main* by treating tone flop itself as an empty mora attached to an L tone inserted specially in the *1 Main* form (1989, 190). This analysis 'works' mechanically, so long as there is no theoretical cost attached to deleting the same abstract mora just in case (i) the subject ends in L tone or (ii) the CV predicate begins on a nonderived !H, plus (iii) changing the L to !H in case the CV predicate begins on *derived* !H, while also deleting the immediately following downstep.

(18) *-ri* ‘eat’ (Òweré, Ḿbàisén) *-ka* ‘surpass’ | *-ri* ‘eat’ (Ọ́màáhyá) *-nye* ‘give’ | *-za* ‘skim’

(19) [$_{TP}$ Subject T^0 [$_{VP}$ CV$_{ROOT}$… Object]]

Seen through the prism of (19), non-application of H→L to the ‘eat’ root in (12) looks like phase impenetrability (Scheer 2010a), a kind of structure preservation: feet can’t be erased. This blocks VP-nonfinal destressing for roots of the ‘eat’ class. Furthermore, it happens that, in Ìgbo, feet are trochaic [*s w*], so a footed VP is necessarily foot-initial, and so preceded by a downstep if the subject ends in H, as is the case in (12).[29] But if the root lacks a branching accent, VP-nonfinal destressing applies and nothing stops T^0 from being footed together with the subject. This possibility is exploited in dialects that operate tone flop.[30]

Goldsmith noticed Green & Ígwè’s cases of tone flop from a VP that begins on downstepped H (10b, 11b), but Éménanjọ’s counterexample (12) shows that the downstepped H must be derived from a root which is pronounced L or L, then raised just because it is monosyllabic and followed immediately by L. This conditioning factor is not easily expressed in phonology, both because syllable-counting is an exotic restriction for an autosegmental rule—interactions on the tone tier can’t count association lines—and because a stratal ordering framework will need to strain mightily to ensure that phrasal sandhi precedes a word formation rule.

The accent of the ‘eat’ class in (18) is not a mere notational variant of Clark’s abstract tone feature [+UPPER] or Déchaine’s strong H representation. It differs from these in its branching property, which remarkably enough has independent support from a covert lexical property that has long puzzled the Ìgbo literature. In the subjunctive (alias “imperative” or “hortative”) and/or *2 Main* forms, a subset of CV roots require a so-called Open Vowel Suffix (OVS) :

> Ìgbo is rich in suffixes… The suffixes are lexical, or compounding elements and neither derivational nor, as has sometimes been thought, inflexional. They are not constitutive of parts of speech as are the derivational affixes which are found, for instance, in nouns. Nor are they distinguishing characteristics of the various verbforms, as is the inflexional verbal vowel prefix. […]
>
> Just as we found with the *-ra* (non-time) suffix being used to differentiate homonymous verbs, so we find the open vowel suffix being used, apparently for the same purpose. For instance with the two [homophonous] verbs *ị́ hụ́n*—in ‘deep’ Ọhụ́nhụn, which is itself *Ọhwụ́nhwụ́n*, we find *ị́ hwụ́n*—which mean respectively ‘to see’ and ‘to roast’, we get usually, though not exclusively
>
> *Ị̀ hụ́n-la yá?* ‘Have you seen it?’, but
> *Ị̀ hụ́n-ọ-la yá?* ‘Have you roasted it?’ (Green & Ígwè 1963, 53, 57*f.*, cf. Ígwè 1973)

29. Ìgbo’s trochaic prosody is reflected in four independent traits: (i) strong F$_0$ raising of domain initial L, (i) strong F$_0$ drop in automatic and nonautomatic downstep, (iii) rightward spread of H onto L (in western Ìgbo and in Ẹ̀dó, cf. Àmayo 1983) and (iv) some downsteps are nonrecoverable from elided L. All four of these characteristics are jointly absent in iambic ‘two tone’ languages like Àkan and Hausa (Manfredi 1993, 2004).

30. Thus at worst, tone flop is an optional ‘parameter’ distinguishing Òweré (yes) and Ḿbàisén (no) as a near minimal pair. But further research could still find a reason for the differing choice of these two dialects.

Not only is the OVS obligatory—independently meaningless—in the present perfect (*2 Main*) form of roots like *-h*(*w*)*ụ́n* ‘roast’, but with roots like like *-h*(*w*)*ụ́n* ‘see’ for which it’s optional, its presence in this same inflectional context adds an entailment of ‘already’:

> It will be observed that this [open] vowel suffix is consistently taken by verbs like *ígbú* and *írí*…; *ị́ hwụ́n* on the other hand, consistently does not take it. But when in the [present] perfect tense and [present] perfect tense only, *ị́ hwụ́n* takes an open vowel suffix, a new element of meaning emerges thus:
>
> *Ị̀ hwụ́n-ọ-na yá (tḥ aà)?* ‘Have you ever seen him (today)?’
> *Éẹ. Á-hwụ́n-ọ-na ḿ ya.* ‘Yes. I have once seen him’
>
> […T]here is nothing random or optional about the occurrence of these or any other Ìgbo suffixes.
> (Nwáchukwu 1976a, 70, cf. Ọ́gwụ̀élẻ́ka 1978)

Swift & *al.* record that OVS is *not* obligatory for the following eleven roots in Ḿbàisén:

(20)

-bḥà	‘enter’	*-jí*	‘hold’	(1962, 191, cited by Déchaine 1993, 520)
-byá	‘come’	*-kwé*	‘agree’	
-dị́	‘locative copula’	*-nyé*	‘give’	
-gá	‘go’	*-nú*	‘hear’	
-gwá	‘tell’	*-yọ́*	‘return’	
-hụ́n	‘see’			

None of these falls in the invariant H of the ‘eat’ class. The following hypothesis then occurs:

(21) CV roots which are lexically footed (*x x*) require OVS in the present perfect (*2 Main*) form.

At first glance, (21) holds for all 40 roots listed in the ‘eat’ class by Swift *& al.*, but it would be falsified by any invariant H root in a 3-class dialect for which OVS is *not* obligatory.[31] Pending disproof, the generalization in (21) supplies a second convergence cue for the branching accent analysis of the ‘eat’ class in (18), and vindicates McCawley’s radical insight that phonemic tone—an inductive taxonomy of paradigmatic pitch contrasts—masks the more systematic, linguistically significant coding of prosody as syntagmatic accent.

In the *2 Main* paradigm (23a), the object relative has the prosody in (23b).[32]

(23)a. Ùgo e-wú-o-le úlọ̀. [LL LHHH HL]
Ụ. NOM-establish-OVS-PRESPERF house
‘Ugo has (now) built (a/the) house’

b. úlọ̀/ùlọ Ugó è-wu-o-le [HL/LL LH LLLL]
house/house.L Ụ.-H establish.L-OVS-PRESPERF
‘the house that Ugo has (now) built’

Summing up, multiple prosodic parallels are observed between Ìgbo’s two finite affirmative paradigms under A-bar extraction. (i) *1 Main* (2a) and *2 Main* (23b) object relatives show the same spurious H after the embedded subject. (ii) In both inflectional types, the dislocated internal argument is optionally deaccented in allegro speech if the subject is L-initial (Green & Ígwè 1963, 88*f. fn* 2). (iii) Obligatory deaccenting of the *2 Main* predicate in an object relative

31. A counterexample to (21), not listed by Swift, is *-zhín* ‘show’, although the related compound *-kụ́-zhi* ‘teach’ is well behaved. Thanks to Ụ. Íhiọ́nú for the spot check. (21) also poses the question of why OVS patterns differ, as noted by Nwáchukwu, between the *2 Main* (present perfect) and the subjunctive (imperative).

32. (23b) is modeled on Green & Ígwè (1963, 106).

clause (23b) is only other instance reported in Green & Ígwè's grammar of Ọ́màáhyá, apart from *1 Main* inflection, where a predicate root loses lexical H.[33]

In both paradigms (2a) and (23a), the spurious H of an object relative clause coincides with T^0. This is unlikely to be a phonological, tonal accident, given the finding of this section that the prosody of lexically spurious tones in object relatives is syntactic and accentual under a direct mapping regime of PF spellout. With the last piece of the puzzle—the fact that a 2 Main predicate is deaccented if crossed by an A-bar chain (23b)—the superficial tone rule dissolves into the syntactic interface:

(24) $XP\ [_{TP}\ \text{Subject}\ \ T^0\ \ [_{VP}\ V_{ROOT}\ldots\ \mathbf{t}_{XP}\ ]\ ]$
PF: $T^0 \rightarrow x$ (= phonetic H) if its complement VP is nonbranching and deaccented.

In effect, the lexically spurious H of object relatives is a last-resort spellout operation, ensuring that the remnant of movement is prosodically visible.[34]

(24) is presumably not the only generalization of this type across the grammars of the Benue-Kwa zone. It can be compared to the cyclic accent in Yorùbá, whose denser pattern of accents alias "grammatical H tones" would follow from the smaller size of the phase in BK2, with VP spelled out separately from TP (cf. *fn.* 19 above and Manfredi *in press*).

4. Cyclic spellout and the phrasing of subjects

The cyclic character of the pattern in (2) was established by Tada (1992) who elicited a doubly embedded object cleft (25a) containing three instances of spurious H on the three crossed subjects. He compared this to French (25b) 'stylistic' inversion (Kayne & Pollock 1978, 606, cf. Goldsmith 1981b and the Appendix below), though a closer analogue is (25c) in Castillian register (Torrego 1984, 109), where only the topmost subject is necessarily affected.

(25)a. Ònyé kà Úché chè-re na Ógú sị̀-rị́ na Ézé nyè-re ákwà?
who.Q that U.-H think.FIN-CL that O.-H say.FIN-CL that E.-H give.FIN-CL cloth
'Who did U. think that O. said that E. presented with cloth?'
[LH L H!H LL L H!H LL L H!H LL HL]

b. ?les filles avec qui tu disais [que pretendait [que sortirait son mari] la pauvre femme dont je viens de te parler…
'the girls who you were saying that the poor woman I've just told you about was claiming that her husband would go out with…'

c. Con quién sabía Juan [que había admitido Ana [que había hablado Pedro]]?
'With whom did J. know that A. admitted that P. had spoken?

Zubizarreta links the French and Spanish phenomena in a modular analysis:

> [P]reverbal (nonfocused) subjects in Romance are in the Spec of a Cl[itic]-operator, and this Cl creates minimality effects when… a *wh*-phrase moves to the Spec of a *wh*-projection through the Spec of a Q-projection… But because the Cl operator is closer to the *wh*-variable than is the Q-operator, a minimality violation thus arises. [Fn: An exception is Brazilian Portuguese. In effect the preverbal subject constraint is absent in Brazilian interrogatives. This is expected: Brazilian Portuguese lacks Cl because… it has a weak subject agreement system…] (2001, 199)

33. The literature does not report if root deaccenting applies to *-ká*, whether in Ọ́màáhyá or in Òwerí/Ḿbàisén.

34. Mainstream syntax references not PF visibility (audibilty?) but "agreement" (v. Urk & Richards 2015). As a working compromise: some "boundaries… in narrow syntax" are "prosodically active" (Richards 2016, 77).

The bad binding configuration (26b) does not arise in embedded left-peripheral interrogatives, which are grammatical in French without subject inversion (26c), thanks to a parametric deficiency in *wh*-words e.g. French *que* as compared to Spanish *¿qué?* Embedded interrogatives are excluded in Ìgbo (26d), as noted by Goldsmith (1981a).

(26)a. *Que Jean a acheté?
what J. AUX buy.PARTICIPLE

b. $*[_{WH}\ que_{\mathbf{i}}\ \ [\ Q_{\mathbf{i}}\ [_{CL}\ Jean_{\mathbf{j}}\ [_{T}\ a_{\mathbf{j}}\ [\ acheté\ t_{\mathbf{i}}\ ]\ ]\ ]\ ]\ ]\ ]$

c. Je me demande que Jean a acheté.
1S 1S ask what J. AUX buy.PARTICIPLE
'I wonder what J. bought'

d. Ànyí-ì jụ-rụ *(maka) íhe Ùgó gò-ro. [LHL LL [HH LH LL]]
1P-L ask.FIN-CL about thing U.-H buy.FIN-CL
'We inquired as to what Ugo bought'

Appendix: Subject inversion in root sentences (Goldsmith 1981b; Íhiọ́nụ́ 1985; Ézè 1995)

(i) Ányí-ì ga-ra áhịa. [LH-L LL HH]
1P-L go.FIN-CL market
'We went to [the] market'

(ii) Á gà-ra áhịa. [H LL HH]
*pro*ANIM-go.FIN-CL market
'People went to [the] market'

(iii) Á-gà-ra m(ụ) áhịa. [H LL L HH]
*pro*ANIM-go.FIN-CL 1S.L market
'I went to [the] market' *clitic inversion plus de-accentuation*

(iv) Á-nà m(ụ) a-gá ahịá. [H L L LH H!H]
*pro*ANIM-DUR 1S.L NOM-go market.H
'I am /was going to [the] market'
'I usually go/went to [the] market' *clitic inversion plus de-accentuation*

(v) Mụ́ a-má á-ga ahịá. [H H!H LH H!H]
1S NEG-NEGFUT NOM-go market.H
'I won't go to [the] market' **inversion*

Goldsmith (1981b, 544, ex. 10a) gives "*Mụ́ ma*…" without the *pro* proclitic subject *á*, but the auxiliary *má* requires a subject from (ix-c) below (Éménanjọ 1985, 93; C. Uchèchúkwu *p.c.*)

(vi) Ọ́ sị̀ na [mụ́ gà-ra áhịa]. [H L L H LL HH]
3S say that 1S go.FIN-CL market
'S/he said that I went to [the] market' **inversion*

(vii) áhịa [mụ gà-ra] [HH H LL]
market 1S go.FIN-CL
'the market I went to'/'my having gone to the market' **inversion*

(viii) Èbéé kà [mụ́ gà-ra]? [LH!H L H LL]
where.Q that 1S go.FIN-CL
'Where did I go?' **inversion*

(ix)a. VCV: caseless, noninverting *ànyí* '1P', *ụ́nụ̀* '2P'

b. CV: caseless, inverting *mụ́* '1S', *há* '3P'

In Ọ́màáhyá, inversion of *há* '3P' is optional (Green & Ígwè 1963, 75, 94).

c. V: nominative, harmonizing, noninverting *é/á* 'pro_{ANIM}', *ḿ* '1S', *í/ị́* '2S', *ó/ọ́* '3S'

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