



"Dominant grammatical tone at the syntax/phonology interface"

Nicholas Rolle, Leibniz-ZAS, Berlin, Germany rolle@leibniz-zas.de

1 Introduction: What is dominant grammatical tone?

- (1) Virtually all African tone languages exhibit GRAMMATICAL TONE (Hyman et al. 2021)
 - Tonal change in specific morpho-syntactic environment that cannot be attributed to general phonology, and which functions to indicate specific linguistic meaning
 - Hereafter, simply called GT
- (2) **Two types of GT**
 - **DOMINANT GT**: systematically erases/replaces lexical tones (erasure *cannot* be attributed to phonological markedness)
 - **NON-DOMINANT GT**: standard floating tones which concatenate to a string of lexical tones (erasure/replacement *only* attributable to markedness)

(3) Kalabari [ijn]

- Ijoid language of Nigeria (Harry 2004, Harry & Hyman 2014, collaboration with Otelemate Harry)
- Tonal system has basic H vs. L distinction plus downstep

(4)
l	+)

Lex T	Noun		Lin	cing NP (DOMINANT GT) Verb			Imperative (NON-DOM)			
HL	bélè	'light'	\rightarrow	tùbò <mark>bélè</mark>	'child's light'	<u></u> bámà	'punish'	\rightarrow	bá⁺ <mark>máà</mark>	'punish!'
HH	námá	'meat'	\rightarrow	tùbọ̀ <mark>námà</mark>	'child's meat'	óló	'cough'	\rightarrow	ól <mark>óò</mark>	'cough!'
LL	pùlò	'oil'	\rightarrow	tùbò <mark>púlò</mark>	'child's oil'	lègì	'sit down'	\rightarrow	lè <mark>gî</mark> i	'sit down!'
LH	gàr <u>í</u>	'garri'	\rightarrow	tùbọ̀ <mark>gár</mark> ị	'child's garri'	dùkó	'tell, talk'	\rightarrow	dùk <mark>óò</mark>	'talk!'

(5) **Dominant GT observation 1**: The tone of all inwardly located structure is deleted

• When N₂ has more than two moras, HL melody targets two rightmost of first word

• Only later does tone spread rightward to remaining toneless moras

(6) Lexical tones for larger target: HLH /kúkàlí/ 'fruit'

- /tùbộ HL kúkàlí/ → tùbộ kụkálì → [tùbộ kùkálì] (cf. *[tùbộ kúkálì])
 child LINK fruit 'child's fruit'
- /féní HL kúkàlí/ \rightarrow féní kukálì \rightarrow [féní kúkálì]
 - bird LINK fruit 'bird's fruit'
- (7) Dominant GT deletes all tone of inward complex NP
 - /tùbộ HL àbàjì HL námá/ → tùbộ abájì nama → [tùbộ àbájì nàmà] child LINK ocean LINK animal 'child's ocean animal'
 - (cf. *[tùbò àbájì námá] ~ *[tùbò àbájì námà])

- (8) **Dominant GT observation 2**: Dominant GT can systematically delete/replace lexical tone *only if* the target is morpho-syntactically inward
 - Rolle (2018) calls this the **Dominant GT Asymmetry**
- (9) /tùbờ HL kúkàlí mế/ \rightarrow [tùbờ kùkálì mế] (cf. *[tùbờ kùkálì mề]) child LINK fruit D 'the child's fruit'
- (10) Outwardly-located definite marker /mé/ 'the' cannot be targeted by dominant GT
 All outwardly-located D/Q markers are equally unaffected, e.g. /má/ D.PL, /améě/
 - INDEF.PL, /mámgbà/ 'all', /ré/ 'rather, instead', inter alia
 - Parallel findings in the verbal domain (not discussed today)
- (11) This restriction on directionality corroborates previous work on GT (McPherson 2014)
 - Parallel findings for stress/'pitch accent' (Kiparsky & Halle 1977, *i.a.*)
 - Codified in the theoretical literature as principles of 'Strict Base Mutation' and 'Stem Scope' (Alderete 2001a,b; Inkelas & Zoll 2007)

2 Part I of analysis: The output of Syntax = The input to Spell-out

- (12) Basic syntactic structure consists only of syntactic features (**no phonological substance**)
- (13)/tùbò HL kúkàlí mé/ [tùbò kùkálì mé] child LINK 'the child's fruit' fruit D DP Syntactic output LinkP [D] nΡ Link' √CHILD][n] [Link] nP I [√FRUIT] [n]
- (14) At **Spell-out**, the syntactic features activate entries within the VOCABULARY Essentially stored syntax-phonology pairings familiar to **realizational models of morphology**
 - (E.g. Distributed Morphology Halle & Marantz 1993, Embick 2015; Scheer 2020; inter alia)



- (16) Each exponent has a unique morphological index to distinguish from other exponents

 (≈ morphological colour van Oostendorp 2006, Revithiadou 2007, Zimmermann 2017)
- (17) In total, the input of Spell-out are (i) syntactic output and (ii) activated vocabulary items



3 <u>Part II of analysis: The output of Spell-out = The input to Phonology</u>

- (18) The output of Spell-out equals the input to the phonological module, consisting of
 - (i) linearised exponents composed of the phonological primitives
 - (*ii*) initial prosodification (e.g. assigning ω , φ constituency)
 - (iii) recursive MORPHOLOGICAL LAYERING of morphs based on their syntactic position

(19) **Morphological layering** acts as a record of the three-dimensional hierarchical structure of syntax, which must be compressed into two-dimensional linear string

• Way to **manage the tension** between global effects (clause-level prosodic constituents e.g. intonational phrases; long-distance allomorphic selection) and cyclic/inside-out effects (cyclic stress assignment; **phonological scope effects**)



(Cf. nautical depth charts)





(20) Recall one special type of exponent, at right:

- PHANTOM STRUCTURE, in gray (Rolle & Lionnet 2020)
- "Phantom structure is phonological structure that is needed for the full realization of the lexical entry, but which the lexical entry cannot provide itself it is a 'desire' for missing structure, so to speak."
- Phantom structure acts like a **primitive template** (cannot be deconstructed to markedness constraints)
- The LINK morpheme's exponent has substantive tones which are predetermined to dock to the final two moras of an adjacent phonological word
- All other moras present (i.e. μ^*) should remain toneless



(21) The two planes in a multi-plane structure – linked via trans-planar association



(22) Ultimate input to phonological module
In context, the phantom structure is parallel with the inner layered structure



4 Part III of analysis: Input-output mapping in the phonological module

- (23) This phonological input must be mapped to an optimal phonological output
- (24) CORRESPONDENCE THEORY (McCarthy & Prince 1995)
 - Strings in the input correspond to strings in output candidates $(O_1...O_n)$
 - Indicated via subscripting along two dimensions (the two planes)
 - The SUBSTANTIVE PLANE (S) has one set of correspondence relations (numbers)
 - The PHANTOM PLANE (P) has another set of correspondence relations (letters)



(26)

- The multiple planes of the input must be **collapsed into a single plane** in the output
- Tone replacement is due to **faithfulness to** the tonal specification of moras in the **phantom string** correspondence
- This favors output O_1 moras μ_d and μ_e maintain association to tones H_a and L_b

- (27) Scope of dominance: Constrained by these correspondence relations
 - Because the outer determiner /mé/ is *not* co-extensive with the phantom plane in the input, its mora (μ₁₃) does not correspond to phantom structure, and therefore its lexical tone is unaffected by the GT
 - In other words, phantom structure is **parasitic** on morphological layering



(29) Part of long history of **competing faithfulness**

- Standard Input-Output Correspondence (IO-Corr) (McCarthy & Prince 1995)
- Base-Reduplicant Correspondence (BR-Corr) (McCarthy & Prince 1995, Ussishkin 1999)
- Agreement By Correspondence (ABC) (Rose & Walker 2004)
- Output-Output Correspondence (OO-Corr) (Benua 1997, Alderete 2001a,b, Rolle 2018a,b)
- Matrix-Basemap Correspondence (Mx-Bm-C) (Rolle 2018c)
- Sympathy Theory (Candidate–Candidate Correspondence) (McCarthy 1999)
- Output-Variant Correspondence (Kawahara 2002)
- Template-Text Correspondence (Blumenfeld 2015)
- Output-Underlying Representation Correspondence (Hauser & Hughto 2020)

5 <u>Conclusion</u>

- (30) Core of analysis: The Dominant GT Asymmetry emerges from
 - (i) **Recursive layering** of morphs at Spell-out derived from (but not identical to) hierarchical morpho-syntactic position
 - Plus (*ii*) **Phantom structure**, a kind of templatic faithfulness formalized via Correspondence
- (31) This analysis is modular (Scheer 2011:523-527, citing Segal 1996:145; also Fodor 1983, Selkirk 1984, Levelt 1989, Jackendoff 1997, Bermúdez-Otero 2012)
 - Representations consist solely of syntactic primitives, or solely of phonological ones
 - Syntax has no sensitivity to phonology before Spell-out (e.g. sensitivity to tone)
 - Phonology has no sensitivity to syntax after Spell-out (e.g. sensitivity to c-command)

6 <u>References</u>

Alderete, John. 2001a. Morphologically governed accent in Optimality Theory. New York: Routledge.

Alderete, John. 2001b. Dominance effects as transderivational anti-faithfulness. Phonology 18: 201-253.

Benua, Laura. 1997. Transderivational identity: Phonological relations between words. Retrieved from https://rucore.libraries.rutgers.edu/rutgers-lib/38308/

Bermúdez-Otero, Ricardo. 2012. The architecture of grammar and the division of labour in exponence. In Jochen Trommer (ed.), *The morphology and phonology of exponence*, 8-83. Oxford: Oxford University Press.

Blumenfeld, Lev. 2015. Meter as faithfulness. Natural Language & Linguistic Theory 33(1). 79–125.

Embick, David. 2015. The Morpheme: A Theoretical Introduction. Vol. 31. Walter de Gruyter GmbH & Co KG.

Fodor, Jerry A. 1983. The Modularity of Mind: An Essay on Faculty Psychology.

Halle, Morris & Alec Marantz. 1993. Distributed Morphology and the Pieces of Inflection. In *The View from Building* 20, ed. Kenneth Hale and S. Jay Keyser. MIT Press, Cambridge, 111-176.

Harry, Otelemate. 2004. Aspects of the Tonal System of Kalabari-Ijo. Stanford, CSLI Publications.

- Harry, Otelemate, & Larry M. Hyman. 2014. Phrasal Construction Tonology. *Studies in Language* 38(4): 649–689.
- Hauser, Ivy & Coral Hughto. 2020. Analyzing opacity with contextual faithfulness constraints. Glossa: A Journal of General Linguistics 5(1).
- Hyman, Larry M., Hannah Sande, Florian Lionnet, Nicholas Rolle, & Emily Clem. 2021. Prosodic systems: Niger-Congo and adjacent areas. In Carlos Gussenhoven & Aoju Chen (Eds.), <u>The Oxford Handbook of Language</u> <u>Prosody</u>. Oxford: OUP.

Inkelas, Sharon, & Cheryl Zoll. 2007. Is Grammar Dependence Real? A Comparison between Cophonological and Indexed Constraint Approaches to Morphologically Conditioned Phonology. *Linguistics* 45(1): 133–171.

Jackendoff, Ray. 1997. The Architecture of the Language Faculty. Cambridge, Massachusetts: MIT Press.

Kawahara, Shigeto. 2002. Faithfulness among variants. Phonological Studies 5. 47-54.

Kiparsky, Paul, & Morris Halle. 1977. Towards a Reconstruction of the Indo-European Accent. In Larry Hyman (ed.), *Studies in Stress and Accent*, 209–238. Los Angeles: University of Southern California Press.

Studies in Stress and Accent, 209–238. Los Angeles: University of Southern C

- Levelt, W.J.M. 1989. Speaking: From intention to articulation.
- McCarthy, John J. 1999. Sympathy and phonological opacity. Phonology 16(3). 331–399.

McCarthy, John J., & Alan Prince. 1995. Faithfulness and reduplicative identity. University of Massachusetts Occasional Papers in Linguistics 18: Papers on Optimality Theory, edited by J. Beckman, L. Walsh Dickey & S. Urbanczyk, 249-384. Graduate Linguistic Student Association, University of Massachusetts, Amherst.

McPherson, Laura. 2014. Replacive grammatical tone in the Dogon languages. PhD Dissertation. UCLA.

- Oostendorp, Mark van. 2006. A theory of morphosyntactic colours. Ms., Meertens Institute, Amsterdam. Available at: http://egg.auf.net/06/docs/Hdt%20Oostendorp%20coulours.pdf.
- Revithiadou, Anthi. 2007. Colored turbid accents and containment: A case study from lexical stress. Freedom of analysis?, ed. by Sylvia Blaho, Patrik Bye, and Martin Krämer, 149–74. Berlin: Mouton de Gruyter.
- Rolle, Nicholas. 2018a. Transparadigmatic output-output correspondence: A case study from ese ejja. In Proceedings of the Annual Meetings on Phonology, Vol. 5.
- Rolle, Nicholas. 2018b. Output-Output Correspondence via Agreement by Projection. NELS Proceedings.
- Rolle, Nicholas. 2018c. Grammatical tone: Typology & theory. PhD Dissertation. University of California Berkeley.
- Rolle, Nicholas, & Florian Lionnet. 2020. Phantom structure: A representational account of floating tone association. *Proceedings of the Annual Meetings on Phonology*. Vol. 8.
- Rose, Sharon & Rachel Walker. 2004. A typology of consonant agreement as correspondence. Language 80(3). 475–531.
- Scheer, Tobias. 2011. A guide to morphosyntax-phonology interface theories: how extra-phonological information is treated in phonology since Trubetzkoy's Grenzsignale. Walter de Gruyter.
- Scheer, Tobias. 2020. On the lexical character of intermodular communication. *Radical: A Journal of Phonology* 1: 183-239.
- Segal, Gabriel. 1996. The modularity of theory of mind. Theories of Theories of Mind 141–57.
- Selkirk, Elisabeth. 1984. Phonology and Syntax: The Relation between Sound and Structure. Cambridge, Mass.: MIT Press.
- Ussishkin, Adam. 1999. The inadequacy of the consonantal root: Modern Hebrew denominal verbs and output–output correspondence. Phonology 16(3). 401–442.
- Zimmermann, Eva. 2017. Morphological length and prosodically defective morphemes. Oxford University Press.