

Deriving syntax-phonology mismatches through cyclic spell-out

This paper explores apparent mismatches between syntactic and phonological domains through penultimate vowel lengthening (PVL) in Chicheŵa and the spell-out process. The domain of PVL has often been included as evidence for a separation of syntactic and phonological domains (e.g., Selkirk 2011, Cheng & Downing 2016, Bonet et al 2018). I argue, however, that by fully taking the syntax into account and elaborating on the spell-out process, the data in question can follow from cyclic spell-out without appealing to extrinsic constraints or intermediate structure.

Domain mismatches: In PVL the penultimate vowel of a particular domain undergoes lengthening. This domain can include embedded clauses, although adjuncts form separate domains, (1). This gives a surface appearance of a mismatch between syntax and phonology as PVL appears to ignore the syntactic domains marked in (1).

- (1) [CP A-ná-néna [CP kuti [DP Bándá] [vP a-ná-wóna [DP a-l[eé]ndó]] [AdvP dz[uu]lo]]]
 1SBJ-TAM-say that CL1.Banda 1SBJ-TAM-see CL2-visitor yesterday
 ‘S/he said that Banda saw the visitors yesterday.’ (Downing&Mtenje 2011:1977)

There is also variability regarding the phrasing of DPs. For one, subjects may phrase with the rest of the sentence (2) or it phrases separately (3).

- (2) [DP a-lendó] a-na-dyétsa [DP a-nyaní] [DP n-s[óo]mba]
 CL2-guest 2SBJ-TAM-feed CL2-baboon CL10-fish
 ‘The guests fed the baboons fish.’ (Downing & Mtenje 2011:1977)

- (3) [DP mw-[aá]na] a-na-pézá [DP galú] [XP kú-d[áa]mbo].
 CL1-child 1SBJ-TAM-find CL1.dog LOC-CL5.swamp
 ‘The child found the dog at the swamp.’ (Kanerva 1990:103)

Downing&Mtenje (2011:1975) suggest that the variation in the phrasing of subjects is the result of whether the subject is a high topic, and thus outside of the spellout domain, (4), or within the CP, (5), (cf. Cheng&Downing 2009 on Zulu). They assume that the right edges of phases align with the relevant domain. The left edge is only relevant when the preceding element is not in a selectional relationship with the phase head.

- (4) [CP SUBJECT || [CP VERB OBJECT/S]] *Break between subject and verb*
 (5) [CP SUBJECT VERB OBJECT/S] *No break between subject and verb*

Under this analysis phases do not line up with phonological domains in a uniform way. The left edges only matter when there is no selectional relationship between two pieces of structure and DPs either are not phases (cf. Cheng&Downing 2016), or are phases that do not have any effects at the syntax-phonology interface (cf. D’Alessandro&Scheer 2015). Another variation applies between modified and unmodified DPs (branchingness effects): When a DP contains a modifiers, PVL usually applies within each modifier independently to the DPs position in the clause, analogous to adverbials (Kanerva 1990, Downing&Mtenje 2011). In (5) the indirect object contains two modifiers, each being subject to PVL, in addition to the direct object.

- (6) a-lendó a-na-dyétsa [DP a-nyanó á-s[aa]nu á-á-k[úu]lu] n-s[óo]mba
 CL2-guest 2SBJ-TAM-feed CL2-baboon 2.five 2.L-2-big CL10-fish
 ‘The guests fed five big baboons fish.’ (Downing & Mtenje 2011:1977)

Such effects have been used as arguments against direct reference approaches for the syntax-phonology interface on the basis that such effects cannot be computed on the basis of syntactic domains alone (e.g., Selkirk 2011, Cheng&Downing 2016, Bonet et al. 2018). I argue, by taking Cheng&Downing’s (2009 et seq.) and Downing&Mtenje’s (2011) analyses farther and fully converging the syntactic and phonological domains, and taking DP-internal syntax into account, these effects can be derived via cyclic spellout without relying on extrinsic constraints or intermediate structure.

DP structure: The default order of elements in the Chicheŵa DP is shown in (7) (e.g., Mchombo 2004, Downing & Mtenje 2011). Following recent reinterpretations of Greenberg’s Universal #20 as a condition on hierarchical structure, (e.g., Abels & Neeleman 2009), I assume that this order is achieved by the noun, which is universally base generated in a position below the modifiers, moves to a position above them. Following, e.g., Downing & Mtenje (2011:1983), I assume that this position is above D, (8).

(7) NOUN >> NUMERAL >> ADJECTIVE >> DEMONSTRATIVE

(8) $[_{DP} \text{NOUN}_i [_{D'} D [_{XP} \text{NUMERAL ADJECTIVE DEMONSTRATIVE } [_{NP} t_i]]]]$

Assuming that DP is phase (e.g., Bošković 2014), the absence of PVL within unmodified DPs follows. The noun always moves out of the complement of D and is not spelled out within this domain. Hence there is no reason to assume a special status of D in this language. D is a phase but the noun phrases with the rest of the sentence as it escapes the complement of D. The branchingness effects also lend themselves to a syntactic explanation. The order of modifiers is relatively free in Chicheŵa (Mchombo 2004:24–25), which indicates that they are adjuncts, and may well be headed by phases themselves (see, e.g., Talić 2015 on adjectival phases). Thus it is expected that PVL applies within each modifier, as that is a general property of adjuncts in Chicheŵa (Downing & Mtenje 2011:1971ff).

Spell-out: To reconcile the syntactic and phonological domains, I assume an approach to spell-out argued for by Harðarson (2020a,b), which interleaves phonology and syntax. This is illustrated through the spell-out of (6). As argued above, the nouns escape the complement of D, and hence we expect no effects within the DP in the absence of modifiers, (9). When the DP contains modifiers, (10), the merger of D will trigger spell-out of the structures within the modifiers (FIVE and BIG). PVL applies within each modifier. This is also analogous to what occurs in the verbal domain when multiple adjuncts are present but no object.

(9) $[_{DP} \text{FISH}_i [_{D'} D [_{XP} t_i]]]$

(10) $[_{DP} \text{BABOONS}_i [_{D'} D [_{XP} [_{YP} /ásaa\underline{nu}/] [_{YP} /áák\underline{úu}lu/] t_i]]]$

At the next cycle, triggered by *v*, the complement of D is spelled out. In the absence of modifiers this has no effects, as there is no overt material within the domain. When modifiers are present, the two phonological strings created at the previous cycle are concatenated, forming a new string, (11). Application of PVL to this string would not yield any effects as the potential target has already undergone lengthening at a previous cycle. Note that it is possible for the two strings to interact at this point despite belonging to separate cycles. Only the structures they were derived from are inaccessible.

(11) $[_{DP} \text{BABOONS}_i [_{D'} D [_{XP} /ása\underline{anu}/\wedge /áák\underline{úu}lu/]]]]$

At the next cycle, the complement of *v* is spelled-out. Assuming the verb has at least moved to *v*, this will include the two object DPs. The two nouns are assigned phonological form and concatenated with each other and the string created at previous cycles. The penultimate vowel of the resulting string is then targeted for PVL.

(12) $[_{VP} \text{FED} [_{VP} /anyanó/\wedge /ása\underline{anu}-áák\underline{úu}lu/\wedge /ns\underline{oo}mba/]]$

Finally, the complement of C is spelled-out, which includes the subject, the verb, and the string created during the previous cycle. The vowel targeted for PVL at this stage has already undergone lengthening at a previous cycle and hence no effects are visible from the current cycle.

(13) $[_{CP} C [_{TP} /alendó/\wedge /anadyétsa/\wedge /anyanó-ása\underline{anu}-áák\underline{úu}lu-ns\underline{oo}mba/]]$

Conclusion: Neither the multiple domains problem for PVL nor the branchingness effects in Chicheŵa constitute arguments against deriving phonological domains via cyclic spell-out. Through interleaving syntax and phonology, i.e., including the string created at a previous cycle in the computation of subsequent cycles, it is possible to account for the patterns without assuming disparate properties for different phases at the interface with phonology. Furthermore by taking into account DP-internal syntax, both the phrasing of nouns and the branchingness effects follow: the noun is outside the spell-out domain of D, and the modifiers are adjuncts and/or constitute phases themselves.