

## Morphosyntactic conditioning in phonology: cyclic domains vs prosodic spans

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Stratal Optimality Theory imposes tight restrictions upon cyclic effects in phonology. Notably, each cyclic domain must be exactly coextensive with a grammatical constituent (cf. Inkelas 1989): indeed, each grammatical word must define a word-level phonological domain. Similarly, phonological processes applying within smaller cyclic domains must serially precede processes applying within larger domains. From these restrictions it is often possible to deduce precise empirical predictions about the division of labour between cyclic and prosodic effects in instances of morphosyntactic conditioning in phonology. This paper pursues this line of enquiry by developing general criteria for distinguishing between cyclic and prosodic effects. Four criteria are proposed:

- (i) gradient phonetic phenomena can be conditioned prosodically, but not cyclically;
- (ii) environments displaying different rates of application of a variable phonological process cannot have identical cyclic and prosodic characterizations;
- (iii) cyclic effects are local in line with the Bracket Erasure Theorem (Orgun and Inkelas 2002);
- (iv) each cyclic domain is exactly coextensive with a morphosyntactic constituent.

The correctness and usefulness of these criteria is then illustrated with a case study in the phonological behaviour of functional morphs in European Portuguese.

Morphosyntactic evidence shows that, in European Portuguese, a pronominal enclitic cluster belongs to the same grammatical word as its verbal host, whereas a pronominal proclitic cluster lies outside the grammatical word containing the verb (Luís forthcoming): enclitics, but not proclitics, trigger arbitrary allomorphy in the verb; proclitics, but not enclitics, take wide scope over coordination; and proclitics, but not enclitics, can be separated from the verb by certain  $X^0$  constituents. This entails that enclitics combine phonologically with the verb at the word level, whereas proclitics do so at the phrase level.

However, the phonological behaviour of enclitics differs markedly from that of word-level suffixes like diminutive *-inho*: unlike the latter, enclitics are stress-neutral, fail to block nasal glide insertion, fail to trigger front vowel centralization before palatals, and violate phonotactic conditions on the distribution of [ʎ]. In a strictly tristratal model (e.g. Kiparsky 2000, Bermúdez-Otero forthcoming), this leaves no alternative to postulating a prosodic difference between word-level suffixes and pronominal enclitics: suffixes like *-inho* incorporate into the prosodic word ( $\omega$ ), whereas pronominal enclitics Chomsky-adjoin to  $\omega$  (Luís 2006).

Gratifyingly, this result can be verified independently. Evidence from stress demonstrates that, like enclitics, word-level prefixes like *re-* and *des-* Chomsky-adjoin to  $\omega$  (Vigário 1999a). This entails that, except for their direction of phonological attachment, prefixes and enclitics should exhibit identical junctural properties, and indeed they do so. At prefix-stem and verb-enclitic boundaries, a hiatus between [i] and a following vowel is always resolved by gliding to [j]; [i]-deletion does not apply. In contrast, gliding to [j] competes with variable [i]-deletion at the boundary between two content words, between a pronominal proclitic and the following verb, or between a forward-leaning function word like the preposition *de* ‘of’ and its host. This fact bears out the prediction that prefixes and enclitics should behave identically, and in addition reveals that hiatus resolution by gliding at the word level bleeds variable [i]-deletion at the phrase level.

Remarkably, this last result provides phonological confirmation for the assignment of pronominal proclitics to the phrase level, which we established above on morphosyntactic grounds. Evidence from relative rates of [i]-deletion diagnoses a contrast between the

complementizer *que* ‘that’, on the one hand, and proclitics and prepositions, on the other (Vigário 1999a). Since all these elements are phrase-level, their difference must be prosodic: *que* attaches under a  $\varphi$ -node, whereas proclitics and prepositions Chomsky-adjoin to  $\omega$ . But, in turn, if both prefixes and proclitics Chomsky-adjoin to  $\omega$ , then their junctural differences must be explained cyclically: prefixes cannot trigger phrase-level [i]-deletion because they undergo obligatory gliding at the word level, whereas proclitics can because they do not attach until the phrase level.

The analysis afforded by Stratal Optimality Theory enjoys several advantages. First, it relies on a restrictive version of prosodic theory: appeal to the clitic group is obviated (cf. Vogel 2007); reference to  $\omega$ -projections suffices (Itô and Mester 2007). Secondly, it exactly converges with the morphosyntactic evidence on the demarcation of grammatical words in European Portuguese (cf. Vigário 1999a, 1999b). Thirdly, it does not require the recognition of so-called ‘special clitics’ (Zwicky 1977) as a separate grammatical category distinct from words and affixes (Bermúdez-Otero and Payne forthcoming; cf. Anderson 2005).

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