

## Overlapping phonological domains in Indonesian

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**Overview** In Standard Indonesian (SI; Lapoliwa 1981, Cohn 1989), suffixes seem ‘closer’ than prefixes to lexical roots for some phonological processes but for others, this relation is reversed. I argue that this kind of mismatch requires two types of morphosyntactic conditioning in phonology: representational (i.e. through reference to prosodic units) and procedural (i.e. through cyclic derivation), as originally proposed in the work by Booij & Rubach (1984; see also Booij 1988 and Booij & Lieber 1993). I propose an account of the Indonesian data couched in Stratal Optimality Theory, in which some processes are restricted to earlier derivational strata (encompassing roots and prefixes), while others to the prosodic word domain (encompassing roots and suffixes).

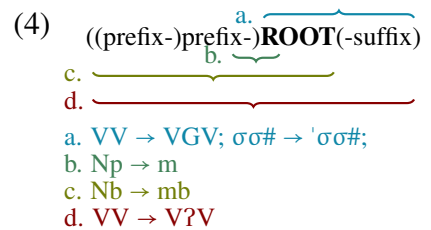
**Data** In SI, some phonological processes take as their domain the lexical root plus suffix but fail to apply across the prefix-root boundary. These include (i) intervocalic glide insertion, which applies within morphemes and across root-suffix boundaries (1a) but not across prefix-root boundaries, where a glottal stop is inserted (1b; Cohn 1989: 192); and (ii) stress placement, which falls on the penultimate syllable from the right edge of a suffixed word, (2a), unless the penultimate syllable is a prefix, in which case the root is stressed, (2b; Lapoliwa 1981: 128, Cohn 1989: 170, 176, 193).

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|-----|----|---------------|--------------|-----------|----|------------|------------|-----------|
| (1) | a. | /diam/        | [diʔam]      | ‘quiet’   | b. | /di+ambil/ | [diʔambil] | ‘taken’   |
|     |    | /hari+an/     | [haʔriʝan]   | ‘daily’   |    | /di+aʝari/ | [diʔaʝari] | ‘taught’  |
| (2) | a. | /masak/       | [masaʔ]      | ‘to cook’ | b. | /tik/      | [tik]      | ‘to type’ |
|     |    | /masak+an/    | [masaʔakan]  | ‘food’    |    | /di+tik/   | [diʔtik]   | ‘typed’   |
|     |    | /masak+an+ku/ | [masaʔakanu] | ‘my food’ |    |            |            |           |

Other processes, such as nasal place assimilation, take as their domain the prefix plus lexical root, (3a), but fail to apply across the root-suffix boundary, (3b; Lapoliwa 1981: 106–107).

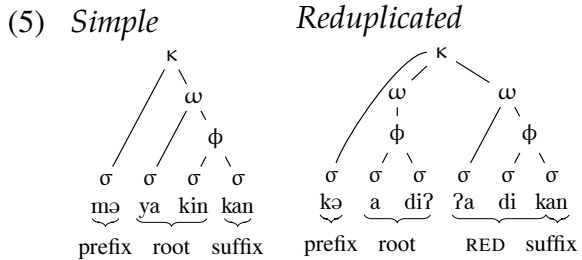
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|-----|----|-----------------|--------------|---------------|
| (3) | a. | /məŋ+ʝəmpʊt/    | [məŋʝəmpʊt]  | ‘to fetch’    |
|     | b. | /məŋ+yakin+kan/ | [məyakinkan] | ‘to convince’ |

Furthermore, nasal substitution (fusion of a nasal with a voiceless stop) applies at the prefix-root boundary, but not between prefixes, the root-suffix boundary or root-reduplicant boundary. Thus, the data pose two challenges. First, the domain of application of stress assignment and glide insertion (4a) partially overlaps with the domain of nasal assimilation (4c). The non-application of one of these processes cannot be attributed to the presence of a prosodic boundary, as this would require improper bracketing. The second challenge is that the language has two distinct, mutually bleeding, hiatus resolution strategies (4a vs. 4d). An attempt to restrict glide insertion and stress by cyclic derivation would preclude using this strategy to restrict nasal assimilation.



**Assumptions** I adopt the framework of Stratal Optimality Theory (Kiparsky 2000, 2015; Bermúdez-Otero 2011, 2012, 2018), which proposes that the phonological component consists of ordered strata with potentially different constraint ranking. The output of one level of evaluation serves as input to the following level. I make two departures from the standard assumptions of Stratal OT: (i) I assume weighted, rather than ranked, constraints and (ii) in addition to the three commonly accepted strata (Stem, Word, Phrase), I assume a Root stratum, following Trommer’s (2011: 75) *Stratal Preprocessing Hypothesis* according to which roots and affixes are evaluated on their own at the level prior to the one at which they are brought together. I follow Trommer (2011: 64) and Bermúdez-Otero (2012: 77) in limiting the access of phonology to morphological features to con-

straints that align morphological and prosodic units and I restrict their application to the Root level. I adopt the prosodic structure of Indonesian words proposed by Cohn (1989), where the left edge of the lexical root coincides with the left edge of the prosodic word ( $\omega$ ), with prefixes adjoined to the clitic phrase ( $\kappa$ ) and suffixes incorporated into the leftmost  $\omega$ , (5). Finally, I combine Pater's (1999) and (2001) analyses of nasal substitution, viewing it as the cumulative effect of \*NC and CRISPEGE (CE; Itô & Mester 1999).



**Analysis** At the ROOT LEVEL, a  $\omega$  (dominating a right-aligned foot) is built over the entire lexical root, due the ALIGN(RT,L, $\omega$ ,L) and ALIGN(RT,R, $\omega$ ,R) constraints (Trommer 2011: 64).

At the STEM LEVEL, prefixes are added. They are adjoined directly to the  $\kappa$ -node, due to a high-ranked faithfulness constraint, FAITH( $\omega \leftrightarrow [\bullet]$ ) protecting the left edge of a prosodic word. A SHARE(PLACE)<sub>NC</sub> constraint triggers nasal place assimilation. Across prefix-root boundaries, this incurs a violation of CE, whose cumulative interaction with \*NC causes nasal substitution when the lexical root begins with a voiceless segment. It is also at the stem stratum that subminimal (monosyllabic) roots are optionally repaired: [mem'bom] ~ [meŋə'bom] 'to bomb'; suffixation does not bleed vowel epenthesis (Kao 2015): [pem'boman] ~ [peŋə'boman] 'bombing'.

At the WORD LEVEL, suffixes and (some) reduplicative morphemes are added. With the right-edge equivalent of FTH( $\omega \leftrightarrow [\bullet]$ ) low-ranked, the prosodic word can be extended rightwards to include suffixes. The position of the foot is readjusted, resulting in penultimate primary stress. SHR(PL)<sub>NC</sub> is demoted, which correctly predicts the lack of nasal assimilation or nasal substitution across root-reduplicant and root-suffix boundaries (c.f. /tər+potəŋ+potəŋ/ → [tərpotəŋ potəŋ] 'to be cut into pieces'). With nasal substitution having applied at the previous stratum, its overapplication in reduplication forms (e.g. /məŋ+karaŋ+karaŋ/ → [məŋkaraŋ ŋaraŋ] 'to make up') follows automatically. Glide insertion repairs NOHIATUS violations within  $\omega$ s but not across prefix- $\omega$  boundaries due to CE.

At the SENTENCE LEVEL, CE is demoted and the constraints favouring glide insertion over ?-insertion are reversed, resulting in the remaining vowel sequences being broken by glottal stops.

**Conclusion** The effects of morphological boundaries on phonological alternations in Indonesian constitute a prima-facie problem for any restrictive approach to the phonology-morphology interface. The complex set of data receives a natural account in an approach in which segmental processes are limited by both prosodic and cyclic domains.

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