Implications of affix-protecting junctural underapplication

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Background. It is not unusual for a phonological rule/process of a language to fail to apply just in case the environment to which it would normally apply arises at a certain type of morphological juncture. For example, in many of the English dialects of Northern Ireland (Harris 1990, Borowsky 1993, Benua 1997), /t d l/ are dentalized before a tautomorphemic /(ə)ɹ/ (*ladder* [læd̪əɹ], *[lædəɹ]) but not before suffixal /-əɹ/ (*louder* [laʊdəɹ], *[laʊd̪əɹ]). Most recognized cases of this sort are of the base-identity variety: the process which underapplies is one which would have changed the base of affixation, not the affix itself. The two main proposals about how to deal with these effects both restrict underapplication to the base. In OT, output-output faithfulness constraints (Benua 1997) require identity between a derived word and its base; application of a process can be blocked in derived environments by ranking OO-faithfulness constraints above the markedness constraint that favors making the change (see (1)). In the phonological application of the theory of phases (e.g. Marvin 2002), the Phase Impenetrability Condition (Chomsky 2001) forbids operations triggered on a higher phase from modifying material from a lower phase. Assuming that the two /-əɹ/ suffixes of English are on a separate phase from the root, failure of dentalization to apply at this juncture is expected. ***Problem***. Because they only forbid making phonological changes to the base to which an affix is added, both OO-faithfulness and the PIC rule out the possibility of a conceivable type of junctural underapplication where joining *base* to *affix* would create the environment for a phonological change to *affix*, but the change nevertheless fails to occur. The problem for both theories is that such effects turn out to be robustly attested. Some examples (see (2) for data): (a) In English, nasal place assimilation is obligatory at 'level 1' junctures, but not at 'level 2' junctures. (b) In English, geminates are banned morph-internally, but can arise at junctures (*unnatural*): deleting either the base or affix [n] could eliminate the derived 'fake geminate', but neither is deleted. (c) In Agar Dinka, vowels in the citation form of verb roots may be either mono- or bi-moraic, but certain verbal affixes contain a floating mora which lengthen the root vowel to trimoraic. The restriction which bans trimoraic vowels from the language's inventory fails to induce deletion of the affix mora. (d) In German, the allophonic replacement of /ç/ with [x] after back vowels fails to apply to the diminutive suffix /-çən/. See (e) for some further cases. ***Proposal***. More success can be had in a model based on derivational ordering rather than base-identity. Both base-protecting and affix-protecting underapplication can be regarded as cases of counterfeeding opacity (following a suggestion in Blumenfeld 2003): a process, regardless of whether it would affect a root or an affix, can be blocked from applying when it would be crucially preceded by affixation. I show that this can be implemented easily using a version of OT-CC (McCarthy 2007) to which is added the assumption that morphological spellout (i.e., affixation) occurs as a step in the chains (an assumption which also can be used to model underapplication in *non*-derived environments, something that ordered rules can't do: Wolf 2008). As seen in (3)-(4), both root- and affix-protecting underapplication of process *P* in environments derived by adding affix *A* straightforwardly arise from ranking Prec(P, A) ('assign a * if A occurs and is followed in the chain by P'). The ability to generalize to affix-protecting underapplication suggests that OT-CC is the best framework in which to model derivational interactions between phonology and morphology.

(1)

/laʊd-əɹ/ base of OO-correspondnece: [laʊd]	OO-Ident (distributed)	*Alveolar-Rhotic	*Dental	OO-Ident (distributed)
a. ☞[laʊdəɹ]		*		
b. [laʊd̪əɹ]	*!		*	*

(2)

a. Obligatory, categorical assimilation at 'level 1' juncture: *impossible* /ɪn-pɑsəbl/ → [ɪmpɑsəbl], *[ɪnpɑsəbl]; optional, gradient assimilation at 'level 2' juncture: unbelievable /ʌn-bəlijvəbl/ → [ʌnbəlijvəbl] ~ [ʌmbəlijvəbl] (Kiparsky 1985)
b. /ʌn$_1$-n$_2$ætʃɹəl/ → [ʌn$_1$n$_2$ætʃɹəl]. Affix is protected in that surface form is not *[ʌn$_2$ætʃɹəl]. (Benus, Smorodinsky & Gafos 2004, Martin 2007)
c. [lḛ̀:r] 'roll', [lḛ̀::r] 'roll-3p.sing', [lḛ̂::r] 'roll-centrifugal' (Andersen 1995, Flack 2007)
d. *tauchen* [taʊçən], *[taʊxən] 'little rope'; *kuhchen* [ku:çən], *[ku:çən] 'little cow' (Hall 1989, Macfarland & Pierrehumbert 1991, Borowsky 1993, Benua 1997)
e. Other examples in Ancient Greek (Blumenfeld 2003), Javanese (Dudas 1976), Arammba, Arawa, Guambiano (Parker to appear), Irish, Welsh, Applecross Gaelic, Hebridean Gaelic (Gnanadesikan 1997)

(3)

//√loud-comp//	Prec (Id[dist], insert-comp)	*Alv-Rho	*Dent	Ident [dist]
a. ☞ <√loud-comp, laʊd-comp, laʊdəɹ>		*		
b. <√loud-comp, laʊd-comp, laʊdəɹ, laʊd̪əɹ>	*!		*	*

(4)

//not-√natural//	Prec (Max-C, insert-*un*)	*Geminate	Max-C
a. ☞ <not-√natural, not-n$_2$ætʃ.ɹəl, ʌn$_1$.n$_2$ætʃ.ɹəl>		*	
b. <not-√natural, not- n$_2$ætʃ.ɹəl, ʌn$_1$.n$_2$ætʃ.ɹəl, ʌ.n$_2$ætʃ.ɹəl>	*!		*