

Galician Nasal Velarization as a Case Against Structure-Preservation

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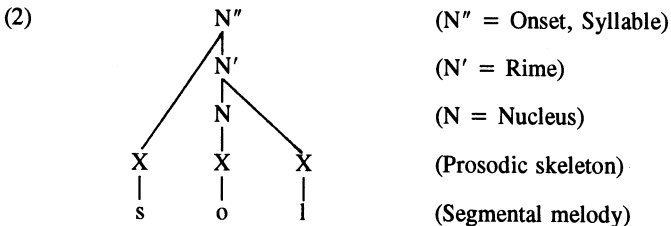
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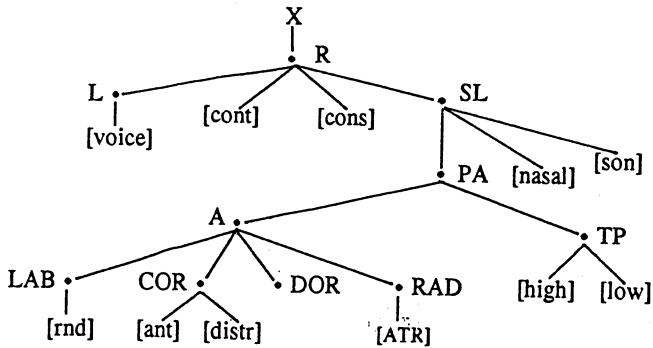
Mcfarland and Pierrehumbert argue that marking conditions such as (1) are subject to the *Linking Constraint* of Hayes (1986), which requires that association lines in structural descriptions of rules be interpreted as exhaustive. Condition (1) simply prohibits a one-to-one association of any value of the feature [back] to an obstruent. Interestingly, the *ich/ach-Laut* alternants arise through assimilation to the backness of the preceding vowel. Since assimilation rules normally involve autosegmental spreading of features they inevitably result in doubly-linked structures. In accordance with the Linking Constraint, such structures will not violate Structure Preservation because they fail to meet the one-to-one association stated in structural description of (1). The importance of this proposal, if empirically supported, can hardly be underestimated. For in appealing to an independently needed principle of autosegmental representation, it eliminates a substantial number of apparent contraventions to Structure Preservation, including that of southeastern Bantu, namely those that arise in the operation of lexical assimilation rules. It should be pointed out, however, Booij and Rubach's cyclic vs. non-cyclic distinction is still needed to account for non-structure preserving lexical rules which are non-assimilatory in nature (as, for example the French Canadian *i*-laxing rule). In short, both the status of Structure Preservation as a relevant principle of phonological theory, and the precise conditions that govern its enforcement in the course of lexical derivations largely remain an empirical issue, open to further evaluation. In fact, a genuine counterexample to the latter two weakened versions of Structure Preservation would be a non-assimilatory rule operating in a cyclic domain that creates a segment not present in underlying representations. In this paper, I present an instance of a demonstrably cyclic non-assimilation rule whose output is not structure-preserving. The evidence involves a process of nasal velarization in Galician, a Romance language closely related to Portuguese, spoken in northwestern Spain.¹

I will adopt here an N-bar theory of the syllable (Levin 1985) which generates representations such as that exemplified in (2) for the Galician word *sol* 'sun':



I further assume the universal feature hierarchy in (3), in which the Root (R) node branches into the Laryngeal (L) and the Supralaryngeal (SL) nodes. The Place of Articulation (PA) node is organized into two major nodes: the Articulators (A) the Tongue Position (TP) nodes (see Lahiri and Evers 1991). I follow Clements (1989a, 1989b) in distinguishing four major articulator nodes: Labial (LAB), Coronal (COR), Dorsal (DOR), and Radical (RAD). In this model, back vowels and velar consonants are specified with a Dorsal node.²

(3)



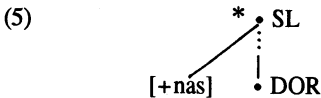
As in Spanish (James Harris 1985, 1992), the canonical form of underived nouns and adjectives in Galician consists of a root followed by an inflexional suffix (or *word marker*), which encodes grammatical gender. The overt gender markers are /-a/ for the feminine, and /-o/ for the masculine. In a fairly large number of cases (i.e., in consonant-final words) the gender desinence may be absent; in others, /-e/ marks both masculine and feminine gender. Word markers are always located on the rightmost edge of a word. And the derivational suffixes appear between the root and the word marker (if there is one).

As shown in (4), underlying nasals in Galician exhibit a three-way contrast in place of articulation: labial, coronal, and palatal.³

| (4) | | <i>Underlying</i> | <i>Surface</i> | |
|-----|---------------|-----------------------------------|----------------|------------------------|
| a. | <i>mora</i> | /mɔr+a/ | mɔ.ra | 'blackberry' |
| | <i>nora</i> | /nɔr+a/ | nɔ.ra | 'daughter in law' |
| | <i>ñopa</i> | /ñɔp+a/ | ñɔ.pa | 'short-sighted (fem.)' |
| b. | <i>cama</i> | /kam+a/ | ká.ma | 'bed' |
| | <i>cana</i> | /kan+a/ | ká.na | 'cane' |
| | <i>caña</i> | /kañ+a/ | ká.ña | '(type of) brandy' |
| | <i>camiño</i> | /kamiñ+o/ | ka.mf.ñu | 'path, road' |
| | <i>aneco</i> | /anɛk+o/ | a.né.ku | 'piece, fragment' |
| | <i>cuñado</i> | /kuñad+o/ | ku.ñá.ðu | 'brother-in-law' |
| c. | | */kaŋ+a/, */pɔŋ+a/ | | |
| | | */ŋak+a/, */ŋɔp+a/, | | |
| | | */kamiŋ+o/, */aŋɛk+o/, */kuŋad+o/ | | |

All three distinct nasals surface phonetically as such in prevocalic position: (i) root-initially, as in (4a); (ii) root-finally before the word marker, as in 6b); and (iii) root-internally, as in (4c). In all three cases, the nasal is predictably assigned to onset position in syllabic structure. Now, although velar nasals do occur in the language, there is unequivocal evidence that justifies their exclusion from the set of underlying segments. Perhaps the most compelling reason is that, unlike the other nasals, they are subject to severe distributional restrictions. Namely, *prevocalic* velar nasals are systematically excluded from appearing in

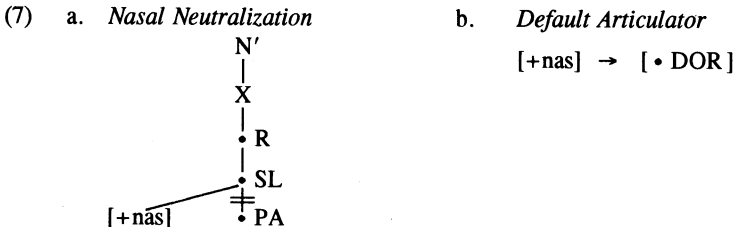
any of the three mentioned positions within the root (with only *one* exception, to which I will return shortly), while the other nasals occur freely, as shown in (4). Thus an explanation as to why the hypothetical forms in (4c) are not well-formed can solely be attributed to the fact that the velar nasals do not occur in underlying representations. It must be the case, then, that the lexical phonology of Galician must contain the condition in (5) prohibiting the association of Dorsal to a Supralaryngeal node if the latter is also specified as [+nasal].



The facts, however, are more complex, because in Galician rhyme nasals are neutralized, surfacing with a velar point of articulation. The process has been described in standard grammars and dialectal studies of particular regions.⁴ From a descriptive point of view, the simplest instances of the velarization process occur in word-final position before pause, that is, when no other segment follows, as illustrated in (6a) (where *word-final*, of course, is cotextensive with syllable-final position). All documented dialects of Galician velarize syllable final nasals, so that the surface forms in (6b) are not possible words.

| | | | | |
|-----|-------------------|----------------|----------|--|
| (6) | <i>Underlying</i> | <i>Surface</i> | | |
| a. | <i>lan</i> | /lan/ | lán | 'wool' |
| | <i>son</i> | /son/ | són | 'sound' |
| | <i>ben</i> | /ben/ | bén | 'well' |
| | <i>xoven</i> | /ʃoben/ | ʃó.βiŋ | 'young' |
| | <i>irmán</i> | /irman/ | ir.mán | 'brother' |
| | <i>saíron</i> | /saíron/ | sa.f.ruŋ | 'they left' |
| | <i>fervín</i> | /ferbin/ | fir.βiŋ | 'I boiled' |
| | | | | b. *lám, *lán, *láñ *sóm, *són, *sóñ *béñ, *bén, *béñ (..., etc.) |

In order to capture the fact that nasal places of articulation other than velar do not occur in rhymes, I follow James Harris' analysis of Spanish nasals (1984a, 1984b), and propose that nasal neutralization involves delinking of the Place node, as in (7a). Nasals thus deprived of Place features are subject to a language specific default rule, which assigns them a Dorsal articulator, as in (7b).⁵ Both operations in (7) will be referred to as *Nasal Velarization* (henceforth, NV).

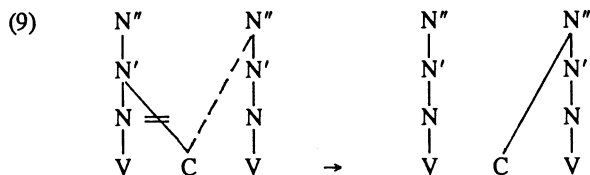


A plausible alternative to (7) would be to appeal to phonetic underspecification (cf. Keating 1988), so that after the application of (7a) rhyme nasals remain

unspecified in phonetic representations, velarity simply being the surface manifestation of the lack of an overt articulator.⁶ However, other facts of the language suggest that this explanation is untenable. In particular, nasals undergo a rule of homorganic assimilation to a following consonant, both word-internally and across word boundaries, a process to be captured autosegmentally by leftward spreading of the triggers's Place features onto the nasal's Supralaryngeal node. Interestingly, in these instances the nasal is actually coarticulated; its production involves a velar constriction simultaneous with whatever Place of articulation is borne by the following consonant, as illustrated in (8).⁷ Clearly, if nasal velarization is analyzed as an instance of phonetic underspecification, the coarticulation facts would be difficult to explain.

| (8) | <i>Underlying</i> | <i>Surface</i> | |
|--------------------|-------------------|----------------|---------------|
| <i>can parvo</i> | /kan parbo/ | káŋmpárβu | 'silly dog' |
| <i>can ferido</i> | /kan ferido/ | káŋmfiríðu | 'wounded dog' |
| <i>can tolo</i> | /kan tolo/ | káŋptólu | 'crazy dog' |
| <i>can san</i> | /kan san/ | káŋnsán | 'healthy dog' |
| <i>can xoven</i> | /kan ʃɔben/ | káŋñsɔβiŋ | 'young dog' |
| <i>can choucho</i> | /kan ʃoučo/ | káŋñčowču | 'senile dog' |
| <i>can cativo</i> | /kan katibo/ | káŋkatíβu | 'small dog' |

On the other hand, when a rhyme nasal is followed by a vowel, it undergoes a general process of resyllabification, so that it is shifted from the coda of the preceding syllable to the onset of the following one. This rule can be stated along the lines of (9). As it will be shown later, resyllabification applies not only at the postlexically, but also at the lexical level to the output of morphological operations such as (productive) prefixation and compounding.



In the remainder of this paper, I will attempt to demonstrate that NV is a lexical rule, and that it furthermore applies in a cyclic domain. We may start by observing that NV interacts with two postlexical rules of Galician. First, there is an optional rule of vowel epenthesis which inserts [i] ([e] in other dialects) after a consonant in word-final position (see Hualde and Martínez-Gil 1993). This rule is conditioned by both phonological and syntactic factors. The phonological condition prohibits the application of epenthesis to consonant-final words bearing final stress; the rule is blocked whenever its output would be a proparoxytonic stress pattern (e.g., *fácil* 'easy' does not become **fácil[i]*). The basis for this restriction seems clear: epenthesis generates an additional syllable; its application to paroxytonic words would automatically shift the locus of stress to the

antepenult, an occurring, although clearly marked stress pattern in the language.⁸ The rule is further subject to two general syntactic conditions: (i) the target word is either the last in a syntactic phrase, as in (10a), or it is topicalized, as in (10b). When the word is sentence-medial, the rule is blocked, as in (10c). Since vowel epenthesis is (partly) determined by syntactic factors, it must be postlexical.

- (10) a. *hoxe comprei papel ~ papél[i]* 'I bought (some) paper today'
 today I bought paper
 b. *o papel ~ papél[i] comprei-no hoxe* 'I bought (some) paper today'
 the paper I bought-it today
 c. *comprei papel ~ *papél[i] bó hoxe* 'I bought (some) good paper today'
 I bought paper good today

The second rule is the postlexical version of resyllabification (9). As the examples in (11) and (12) show, a word-final nasal is resyllabified to the onset of the final syllable, created by vowel epenthesis. Clearly, NV must apply prior to both epenthesis and resyllabification, since otherwise the asterisked forms in (11)-(12) would be obtained.

- (11)
- | | <i>Underlying</i> | <i>Surface</i> | |
|---------------|-------------------|--------------------------|-------------|
| <i>cen</i> | /sɛn/ | sé.ŋi ~ *sé.ni | 'a hundred' |
| <i>tren</i> | /trɛn/ | tré.ŋi ~ *tré.ni | 'some, any' |
| <i>alemán</i> | /aleman/ | a.li.má.ŋi ~ *a.li.má.ni | 'German' |
- (12)
- | | <i>Underlying</i> | <i>Surface</i> | |
|--------------------|-------------------|---------------------------------|-------------------|
| <i>cen horas</i> | /sɛn # ɔras/ | sé.ŋɔ.ras ~ *sé.nɔ.ras | 'a hundred hours' |
| <i>tren alemán</i> | /trɛn # aleman/ | tré.ŋa.li.má.ŋ ~ tré.na.li.má.ŋ | 'German train' |

Having established that NV is ordered before both postlexical epenthesis and resyllabification, we may inquire now as to whether NV is a lexical rule, and if so, in what lexical domain it operates. Consider the examples in (13).

- (13)
- | | <i>Underlying</i> | <i>Surface</i> | |
|----------------------------|-------------------|--------------------------------|-----------------|
| a. <i>cana</i> | /kan+a/ | ká.na ~ *ká.ŋa | 'cane' |
| <i>cano</i> | /kan+o/ | ká.nu ~ *ká.ŋu | 'pipe, gutter' |
| <i>pano</i> | /pan+o/ | pá.nu ~ *pá.ŋu | 'cloth' |
| b. <i>can</i> | /kan/ | kaŋ | 'dog' |
| <i>pan</i> | /pan/ | paŋ | 'bread' |
| <i>lambón</i> ⁹ | /lamb+on/ | laŋm.bóŋ | 'sweet-toothed' |
| c. <i>canil</i> | /kan+il/ | ka.níl ~ *ka.ŋíl | 'doghouse' |
| <i>panadeiro</i> | /pan+ad+eir+o/ | pa.na.déj.ru ~ *pa.ŋa.déj.ru | 'baker' |
| <i>lambonada</i> | /lamb+on+ad+a/ | laŋm.bu.ná.da ~ *laŋm.bu.ŋá.da | 'tidbit' |

In (13a), the base is followed by the gender marker. The fact that NV does not apply to the root-final nasal can be explained by assuming that it is assigned to an onset position by initial syllabification. Accordingly, at no subsequent point in the derivation will the nasal meet the structural description of NV, which is

only satisfied by a rhyme nasal. The same is true for the items in (13c), formed by suffixation of derivational morphemes to the respective roots in (13b) (of course, in *lambonada* the base is the stem /lam+bon/). There is, then, a lexical stratum in which both inflexional and derivational suffixes are attached. Once these morphological operations are carried out, the resulting string are subject to core syllabification. The only exception to this sequence is shown in (14b).

| | <i>Underlying</i> | <i>Surface</i> | | |
|------|-------------------|----------------|------------------------|---------------------|
| (14) | | | | |
| a. | <i>un</i> | /un/ | ún | 'a, one (masc.)' |
| | <i>algún</i> | /alx+un/ | al.xún | 'some, any (masc.)' |
| | <i>nengún</i> | /neng+un/ | niŋ.gún | 'none (masc.)' |
| | <i>d'un</i> | /de un/ | dún | 'of a (masc.)' |
| | <i>c'un</i> | /kon un/ | kún | 'with a (masc.)' |
| | <i>n'un</i> | /en un/ | nún | 'in a (masc.)' |
| b. | <i>unha</i> | /un+a/ | ú.ŋa ~ *ú.na | 'a, one (fem.)' |
| | <i>algunha</i> | /alx+un+a/ | al.xú.ŋa ~ *al.xú.na | 'some, any (fem.)' |
| | <i>nengunha</i> | /neng+un+a/ | niŋ.gú.ŋa ~ *niŋ.gú.na | 'none (fem.)' |
| | <i>d'unha</i> | /de un+a/ | dú.ŋa ~ *dú.na | 'of a' (fem.)' |
| | <i>c'unha</i> | /kon un+a/ | kú.ŋa ~ *kú.na | 'with a (fem.)' |
| | <i>n'unha</i> | /kon un+a/ | kú.ŋa ~ *kú.na | 'in a (fem.)' |

The masculine of the indeterminate article *un* in (14a) (shown together with its derivatives and contracted forms) serves as the base for the feminine forms in (14b). However, in order for the root-final nasal to undergo NV, as required by the data in (14b), the root /un/ must undergo initial syllabification *prior* to suffixation of the feminine marker, since this operation will assign the nasal in question to a rhyme position, at which point it meets the structural description of NV. Exceptional suffixation of the feminine marker must, then, operate in a subsequent level, thus providing the conditions for the application of lexical resyllabification. In short, the derivation of the feminine forms in (14b) would appear to require two cycles. Initial syllabification and NV apply in the first cycle; exceptional inflexional suffixation (and resyllabification) in the second.¹⁰

An analysis entirely analogous to the one just sketched is required by the data related to prefixation and compounding. The most productive among the nasal-final prefixes in Galician are *in-* (which negates the semantic content of the root) and, to a lesser extent, the inchoative *en-*. When these prefixes are added to vowel-initial roots, the nasal surfaces as an onset velar, as in the examples *inhumano* 'inhuman', *inhabitable* 'uninhabitable' in (15a), and *enhebrar* 'to thread', *eneixar* 'to install a wheel's axels' in (15b).¹¹

| | <i>Underlying</i> | <i>Surface</i> | |
|------|--------------------|-----------------|----------------------------------|
| (15) | | | |
| a. | <i>inhumano</i> | /in+uman+o/ | i.ŋu.má.nu ~ *i.nu.má.nu |
| | <i>inhabitable</i> | /in+abit+abl+e/ | i.ŋa.βi.tá.bli ~ *i.na.βi.tá.bli |
| b. | <i>enhebrar</i> | /en+ebr+a+r/ | i.ŋi.βrár ~ *i.ni.βrár |
| | <i>eneixar</i> | /en+eiš+a+r/ | i.ŋej.šár ~ *i.nej.šár |

Compounds exhibit precisely this behaviour. Thus, items representative of this class whose first member ends in a nasal consonant, such as those in (16a), the

nasal also surfaces resyllabified to onset position, as illustrated in (16b).

| | | |
|---------|------------------------|--|
| (16) a. | <i>benestar</i> | 'well-being' |
| | <i>castelán-aronés</i> | 'Castilian-Aragonese' |
| | <i>San Ignacio</i> | 'Saint Ignatius' |
| | <i>Underlying</i> | <i>Surface</i> |
| b. | /bɛn estar/ | bé.ŋis.tár ~ *bé.nis.tár |
| | /kastɛlan araxones/ | kas.tɛ.lá.ŋa.ra.xu.nés ~ *kas.tɛ.lá.na.ra.xu.nés |
| | /san ignasio/ | sá.ŋi.ná.sju ~ *sa.ni.ná.sju |

Again, these facts suggest that prior to prefixation and compounding there must be an initial level in which NV is fed by core syllabification rules, and a second level where the appropriate conditions for lexical resyllabification are satisfied by morphological concatenation.¹³ It is worth noting at this point that for some forms containing the prefixes *in-*, *en-* followed by a vowel-initial root, the particular realization of the prefix nasal is subject to a certain degree of variation. In other forms, the phonetic value is consistent. The list in (17)–(19) is representative (although by no means exhaustive) of three general patterns:

- (17) As an onset velar:
- | | | | | |
|----|---------------------|--------------------------------|---------------------|----------------|
| a. | <i>inhabitable</i> | 'uninhabitable' | <i>inhabilitade</i> | 'inability' |
| | <i>inhibido</i> | 'shy' | <i>inhalar</i> | 'to inhale' |
| | <i>inhumano</i> | 'inhuman' | <i>inhonesto</i> | 'dishonest' |
| | <i>inhóspito</i> | 'inhospitable' | <i>inalterable</i> | 'unchangeable' |
| | <i>inodoro</i> | 'odorless' | <i>inapelable</i> | 'unappealable' |
| | <i>inestimable</i> | 'inestimable' | <i>inadmisibile</i> | 'inadmissible' |
| | <i>inactividade</i> | 'inactivity' | <i>inadecuado</i> | 'inadequate' |
| | <i>inoportuno</i> | 'untimely' | <i>inoxidable</i> | 'stainless' |
| b. | <i>enhebrar</i> | 'to thread' | | |
| | <i>enherbar</i> | 'to cure livestock with herbs' | | |
| | <i>eneixar</i> | 'to install a cart's axels' | | |
- (18) As an onset velar or alveolar:
- | | | | | |
|--|---------------------|-----------------|----------------------|----------------|
| | <i>inesperencia</i> | 'inexperience' | <i>inasequible</i> | 'unreachable' |
| | <i>inesplorado</i> | 'unexplored' | <i>inofensivo</i> | 'inoffensive' |
| | <i>inestable</i> | 'unstable' | <i>inace(i)table</i> | 'unacceptable' |
| | <i>inesquecente</i> | 'unforgettable' | <i>inequívoco</i> | 'unequivocal' |
- (19) As an onset alveolar:
- | | | | | |
|----|-------------------|-----------------|-----------------|--------------|
| a. | <i>inimigo</i> | 'enemy' | <i>inicial</i> | 'initial' |
| | <i>inocente</i> | 'innocent' | <i>inorme</i> | 'enormous' |
| | <i>inaugurar</i> | 'to inaugurate' | <i>inaudito</i> | 'unheard of' |
| | <i>inexorable</i> | 'inexorable' | <i>inédito</i> | 'unheard of' |
| | <i>inepto</i> | 'inept' | <i>inerte</i> | 'inert' |
| b. | <i>enadir</i> | 'to add' | | |
| | <i>enerxia</i> | 'energy' | | |
| | <i>enamorado</i> | 'in love' | | |
| | <i>enoxar</i> | 'to annoy' | | |

In (17), the prefix-final nasal always surfaces as an onset velar. In (18), however, the prefix nasal can be variably realized as a velar or an alveolar. This fact may seem somewhat puzzling, since these items, just as those in (17), clearly involve productive prefixation.¹² In any event, the crucial observation is that in the examples shown in (19) the nasal in question can only surface as an (onset) alveolar, never as a velar. With respect to NV there is, then, a clear distinction between the items in (17)-(18) on the one hand, and those in (19) on the other. The key factor here seems to be that the former the morphological composition of the word is transparent. A word such as *inhabitable*, for example, can be readily decomposed into the prefix *in-* plus the word *habitable*. In (19), however, the prefix is attached to a bound morpheme; stems such as **imigo*, **ocente* in *inimigo*, *inocente* do not enjoy independent status as words.

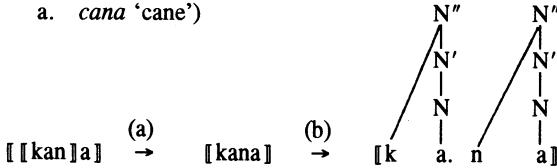
The morphophonological conditions that govern the derivation of Galician velar nasals are strikingly similar to those of the Spanish Nasal Depalatalization (ND) rule discussed by James Harris (1983: 52-55), and therefore a comparison is instructive. In Spanish we find alternations such as *des.dé[n]* 'disdain (noun)' *des.de.[n]es* 'disdains' vs. *des.de.[ñ]es* 'you disdain (subj.)', *des.de.[ñ]o.so* 'disdainful'. James Harris argues that these contrasts can be naturally explained in terms of the interaction between syllabification and morphological structure. The derivation of the singular form *desdé[n]* is straightforward if we assume that the underlying root-final palatal is depalatalized in the domain of the root [[desdeñ]]. This rule can be motivated in Spanish in a fashion almost identical to that adduced for Galician NV in (7). In Spanish palatal nasals do not occur syllable-finally (except, of course, when derived by nasal assimilation). When the underlying /ñ/ is assigned to a rhyme position by core syllabification, its Place features will be delinked. The only difference is that instead of Dorsal, as in Galician, in standard Spanish the default Articulator for nasals is Coronal (cf. fn 5; see also James Harris 1984a, 1984b). The derivation of the plural *desdenes* (morphologically [[desdeñ]es]) proceeds in two cycles. The root is syllabified in a first cycle, where the root-final /ñ/ is assigned to a rhyme. ND becomes applicable at this point, turning /ñ/ into [n]. The plural morpheme /-es/ is added in a second cycle, where lexical resyllabification will shift it to the onset of the final syllable. By contrast, the derivation of the verb form *desdeñes* and the adjective *desdeñoso* involves only one cycle, namely [[desdeñ+a+es] (the theme vowel /a/ is deleted by a general rule of Spanish) and [[desdeñ+os+o], where the underlying /ñ/ is initially assigned to an onset position by core syllabification rules, and therefore it will fail to meet the structural description of ND. In terms of the lexical phonology framework, two implications can be drawn from James Harris' analysis of the Spanish data. First, the lexical stratum in which plural suffixation takes place must be different from the stratum in which the derivational suffixes and the other inflexional morphemes are attached. And second, Nasal Depalatalization must be a cyclic rule, since it operates between two cyclic syllabification domains: the root cycle, and the plural suffix cycle.

The Galician data considered so far also support the organization of the lexical phonology into at least two strata. In fact, arguments similar to those advanced by James Harris for Spanish can be forwarded, *mutatis mutandis*, to account for

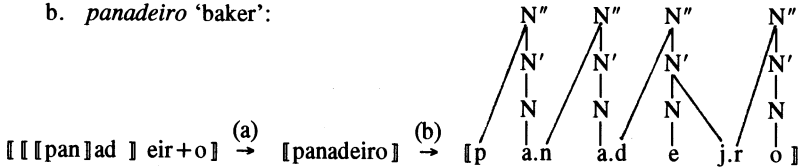
the contrast between two pairs of representative examples in Galician: *cana* in (13a) and *panadeiro* in (13c) on the one hand, and *unha* in (14b) and *inhumano* in (15a)) on the other.¹³ In the first pair, regular inflexional and derivational suffixation occurs in Level 1, followed by syllabification. Hence, the derivation proceeds in one cycle, as shown in (20) (where step (a) is regular derivational and inflexional suffixation, and step (b) reflects the application of core syllabification). Nothing else of interest occurs in the derivation of these items.

(20) *First (only) cycle:*

a. *cana* 'cane'

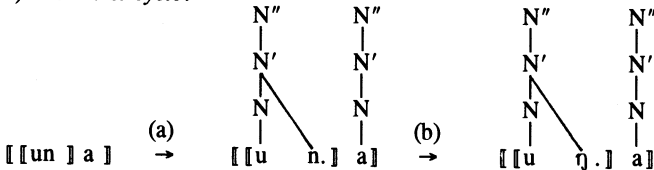


b. *panadeiro* 'baker':

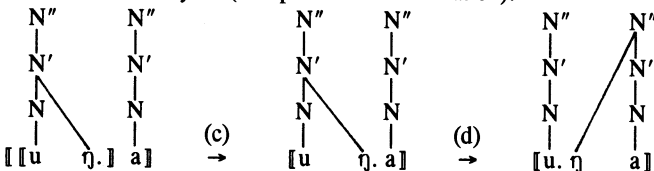


By contrast, in order to explain the root-final velar nasal in the indefinite feminine article *unha*, it must be assumed, as stated earlier, that it bears some special mark which prevents it from undergoing regular inflexional suffixation at Level 1. This operation will apply exceptionally at Level 2. The relevant portions of such derivation are shown in (21):

(21) a. *First cycle:*



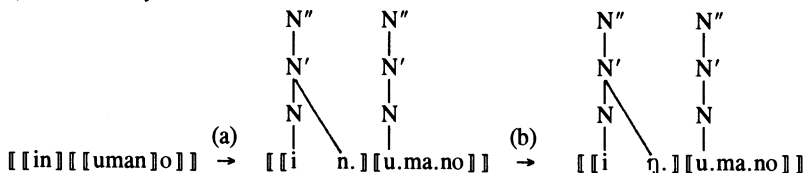
b. *Second cycle (exceptional /-a/-suffixation):*



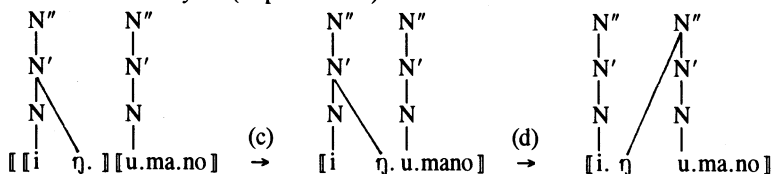
In (21a), syllable structure rules applying in the first cycle assign the underlying nasal to a rhyme position by step (a), thus allowing NV to apply in step (b). Step (c) is exceptional inflexional suffixation. Finally, lexical resyllabification in step (d) shifts the velar nasal to the following syllable.¹⁴ Assuming now that

prefixation also operates at Level 2, the derivation of *inhumano* will be as in (22) (only the relevant syllable structure is shown):

(22) a. *First cycle*:



b. *Second cycle (in-prefixation)*:



Step (a) subsumes regular suffixation of the masculine gender morpheme /-o/ and initial syllabification. The remaining steps are just as in (21), except that step (c) now indicates the attachment of the prefix *in-*. Finally, compounding must also be placed in Level 2, so that the derivation of items such as those in (16) would be analogous in all relevant details to those in (21) and (22). The phonetic forms in (20)-(22) have the illustrative derivations in (23) (where (a) = derivational and regular inflexional suffixation; (b) = initial syllabification; (c) = NV; (d) = prefixation and exceptional inflexional suffixation; (e) = lexical resyllabification; and (f) = other rules (i.e., stress assignment and unstressed vowel raising). The Underlying representations are given with their morphological bracketings):

| (23) | <i>cana</i> | <i>panadeiro</i> | <i>unha</i> | <i>inhumano</i> |
|----------|-------------|-------------------|-------------|---------------------|
| U.R.'s: | [[[kan]a] | [[[[pan]ad]eir]o] | [[[un]a] | [[[in][[uman]o]]] |
| Level 1: | | | | |
| (a): | [[kana] | [[panadeiro] | (exception) | [[[in][[uman]o]]] |
| (b): | [[ka.na] | [[pa.na.dej.ro] | [[[un.]a] | [[[in.][[u.ma.no]]] |
| (c): | — | — | [[[uŋ.]a] | [[[iŋ.][[u.ma.no]]] |
| Level 2: | | | | |
| (d): | — | — | [[uŋ.a] | [[iŋ.u.ma.no] |
| (e): | — | — | [[u.ŋa] | [[i.ŋu.ma.no] |
| (f): | ká.na | pa.na.déj.ru | ú.ŋa | i.ŋu.má.nu |

In sum, as ND in the Spanish examples discusses earlier, NV in Galician must be cyclic, since it is both fed and followed by syllable structure rules, which are themselves cyclic. This takes us back to the claim made at the outset of this paper. NV is not structure-preserving, since its output, the velar nasal η , does not belong to the underlying set of Galician consonants, thus violating the lexical marking condition in (5).

To conclude, the predictions made by the three weaker versions of Structure Preservation mentioned at the outset of this paper may now be briefly assessed in the light of the analysis of NV presented here. Macfarland and Pierrehumbert (1991) appeal to Haye's Linking Constraint in order to exempt structures from the scope of Structure Preservation when such structures are created by lexical assimilation rules. This condition is clearly irrelevant here, since NV does not involve assimilation. On the other hand, it is not immediately obvious as to why the output of lexical default rules such as (7b), should be exempt from Structure Preservation. Furthermore, insofar as my analysis of NV is justified, it openly contradicts the claim by Booij and Rubach (1987) that lexical cyclic domains are structure-preserving. The logical conclusion that can be drawn at this point concurs with Mohanan's position (1986) that Structure Preservation represents some sort of default parameter, not an absolute universal.

Notes

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1. The dialect under study is spoken in the coastal areas across the bay of the city of Vigo, in the Pontevedra province, about twenty-five miles north of the Portuguese border. This dialect differs from standard (normative) Galician in that it lacks the voiceless interdental /θ/ but contains the voiceless velar fricative /x/ absent in other Galician dialects, including the normative variety. Furthermore, there is a general rule in this dialect that raises unstressed tense mid-vowels. The underlying vowel and consonantal systems are as follows:

| | | | | |
|--------------------|-----------|-----------|---------|---|
| <i>Vowels:</i> | front | back | back | |
| | unrounded | unrounded | rounded | |
| high | i | | u | |
| mid-high | e | | o | |
| mid-low | ɛ | | ɔ | |
| low | | a | | |
| <i>Consonants:</i> | p | t | ç | k |
| | b | d | ʝ | g |
| | f | s | š | x |
| | m | n | ñ | |
| | | l | | |
| | | r | | |
| | | ɾ | | |

2. The feature [back] is therefore dispensed with. It should be noted that the particular models of syllabic and segmental structure in (2) and (3) have been chosen for the sake of explicitness but they do not play any crucial role in my analysis.

3. Here and in subsequent examples Galician words are given in their standard orthographic form, followed by their underlying representations showing (whenever relevant) the morphological composition of the word, and these are followed in turn by their surface realizations (where syllable boundaries are indicated by periods).

4. See, for example, Santamarina (1973), Couceiro (1976), Veiga Arias (1976), Porto Dapena (1977), Carballo Calero (1979), Taboada (1979), Alvarez et al. (1986), and Fernández Rei (1990). However, I have not been able to find any systematic study of this phenomenon in any variety of Galician. NV also occurs in a considerable number of

Spanish dialects (cf. Hualde 1989, Martínez-Gil 1991, and references therein).

5. By contrast, in standard Spanish dialects, the default value is Coronal, the universally unmarked articulator (cf. the collection of essays in Paradis and Prunet 1991).

6. This suggestion was made by a member of the audience at the Berkeley Linguistics Society Conference during my presentation.

7. The coarticulated segments in (8) are represented by a sequence of two nasals linked by a top ligature. Nasal coarticulation also occurs in a variety of Spanish dialects; cf. James Harris 1969: 15-16, Navarro Tomás 1977: 113; see Martínez-Gil 1991 for further details).

8. In dialects that insert [e] this condition is apparently not observed, so that epenthesis in items such as *fácil[e]* is, in fact, possible (cf. Caballo Calero 1979: 123). For further details on [i]-epenthesis in the dialect described here, see Hualde and Martínez-Gil (1993).

9. Literally 'licker' (cf. *lamber* 'to lick').

10. It is worth noting that the exceptional suffixation of the feminine marker in *unha* accounts for some apparent lexical contrasts involving a fourth point of articulation, as shown by the minimal pairs *una* 'I unite (subj.)' - *uña* 'nail' - *unha* 'a, one (fem.)', *cuma* '(just) as' - *cuna* 'cradle' - *cuña* 'wedge' - *c'unha* 'with one (fem.)', and *duna* 'dune' - *d'unha* 'of one (fem.)'.

11. The symbol *h* in Galician is merely orthographic, with no phonetic realization.

12. When presented with two alternative pronunciations of items in (18), most speakers of this dialect I have consulted showed considerable hesitation, and no clear preference was given to one or the other (it should be mentioned that some of the speakers surveyed do not have all the words listed in (18) in their lexicon). Thus in an item such as *inoxidable* (/in+oksid+abl+e/), the prefix-final nasal may surface either as an onset velar ([i.ŋo.si.ðá.βli]), or as an onset alveolar ([i.no.si.ðá.βli]). It may well be that the dialect in question is undergoing a stage of change in progress, where variable realizations would seem to indicate that NV is gradually expanding its domain into higher levels of the lexical phonology. This issue is interesting in its own right, but the type of discussion its merits cannot be undertaken here for lack of space.

13. There is a critical difference, however, between the two: ND in Spanish is structure preserving, Galician NV is not.

14. In the dialect I am describing, whether or not the (velar) nasal is delinked by the resyllabification rule (9) from its original rhyme position in the preceding syllable is optional and apparently determined by style. In fact, in rapid speech, the velar nasal is actually ambisyllabic, forming a sort of interlude between the preceding and the following vowel. This has also been observed by Santamarina (1973) in other varieties of Galician.

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