The Emergence of The Unmarked in Galician Plural Formation*

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ABSTRACT. This paper examines the stress-dependent allomorphy of the plural suffix in Galician. Galician plural suffix has three allomorphs whose distribution is phonologically conditioned. Focusing on the plural forms of words ending in [l], I argue that the distribution of the allomorphs is accounted for as cases of the emergence of the unmarked in Optimality Theory: marked prosodic structures (uneven trochee and subminimal word) are not allowed in plurals, though they are allowed in singular forms.

Keywords: the emergence of the unmarked, allomorphy, stress, uneven trochee, subminimal prosodic word

1. Introduction

In Galician, a Romance language spoken in north western Spain, the plural suffix has three allomorphs whose distribution is phonologically conditioned. This paper examines the prosodic conditions on the Galician plural suffix allomorphy focusing on plural forms of words ending in [l]. It is argued that Galician plural forms avoid marked prosodic structures, such as uneven trochee and subminimal word, whenever it is possible, and these tendencies to unmarked prosody are accounted for as cases of the emergence of the unmarked (McCarthy and Prince 1994) in Optimality Theory (OT; Prince and Smolensky 1993).

2. Galician Plural Formation

In Galician, the plural suffix has three allomorphs: -s, -es, and -is (Castro 1989, Pérez Bouza 1996). The distribution of these allomorphs is segmentally and prosodically conditioned. Words ending in vowels and diphthongs take the allomorph -s regardless of whether the stem-final vowel is stressed or not:

(1) fóixa fóixas 'leaf/leaves'
páso pásos 'step(s)'
pé pés 'foot/feet'
bokój bokójs 'barrel(s)'

Words ending in n (pronounced as [ŋ] in coda position) also take the allomorph -s:

(2) káŋ káŋs 'dog(s)'
atúŋ atúŋs 'tuna(s)'

Words ending in [r, θ, s] take the allomorph -es:

(3) dór dóres 'pain(s)'
kalór kalóres 'heat(s)'
nóθ nóθes 'nut(s)'

Words ending in [l] take the allomorphs, -es and -is, according to the prosodic configuration of the singular form, as illustrated in (4): polysyllabic words stressed on the penultimate syllable take the allomorph -es (4a). Polysyllabic words with stress on the final syllable take the allomorph -is deleting the stem-final l (4b). Notice that -is is realised as [js] because sequences of non-high and high vowels are realised as diphthongs when a high vowel is not stressed (Freixeiro Mato 1998). If the singular form ends in il, il is replaced by -ís (4c). Finally, monosyllabic words take -es (4d).

(4) a. túnel  túneles  'tunnel(s)'
difiðil  difiðiles  'difficult'

b. aðúl  aðúls  'blue'
animál  animájs  'animal(s)'

c. kadríl  kadrís  'hip(s)'
ðíbíl  ðíbis  'civil'

d. bál  báles  'valley(s)'
kál  káles  'which'

Among the allomorphic alternations shown above, the prosodically-conditioned allomorphy in words ending in l is the main interest of this paper. In the rest of the paper, I propose an OT analysis which explains how stress affects the allomorphic alternations.

3. Analysis

3.1. Underlying representation of the plural suffix

Before analysing the allomorphic alternations, we must make an assumption about the underlying representation of the plural suffix. (5) shows that the different proposals for the lexical representation of the plural suffix involve the different phonological processes: if we assume /s/ for the underlying representation of the plural suffix, epenthesis of e is required in order to account for the allomorph -es (5a). On the other hand, if we assume /es/, e must be deleted in words ending in vowels and nasals (5b).

(5) a. /s/ requires epenthesis of e in words ending in [r, θ, s]:
/paso-s/  /atun-s/  /kalor-s/  /luθ-s/  /dews-s/
pasos  atun  kalores  luθes  dews

b. /es/ requires deletion of e in words ending in vowels and nasals:
/paso-es/  /atun-es/  /kalor-es/  /luθ-es/  /dews-es/
pasoës  atunës  kalores  luθes  dews

Of these two processes, the deletion in (5b) is rejected by following reasons: first, the deletion in words ending in nasals is not phonologically motivated, because it would create a more marked CVCC syllable from a less marked CV.CVC. Contrastively, the epenthesis
in (5a) changes a CVCC into a sequence of less marked syllables, namely CV.CVC. Second, although vowel epenthesis is a very common process in Galician (see note 1), vowel deletion is attested only marginally. In conclusion, I propose /s/ as the underlying representation of the Galician plural suffix:

(6) The Galician plural suffix = /s/

3.2. Plural forms in words ending in segments other than l

Let us turn to the analysis of the plural formation. As a preliminary, the plural forms of words ending in segments other than l are addressed in this section. Among words ending in consonants, only n-ending words take the allomorph -s, while those ending in other consonants take -es. This suggests that the sequence of [ŋs] is allowed in Galician, while [ls, rs, θs, ss] are not. This difference is attributed to the continuancy of stem-final consonants: among the consonantal sequences created by the suffixation of /s/, only [ŋs] sequence is a stop-continuant sequence, while [ls, rs, θs, ss] are the sequence of two continuants. I assume that /l, r/ are [+continuant] in Galician, because these consonants trigger the approximantisation of adjacent voiced stops (e.g. *alba [alβa] 'daybreak'; *orde [ɔrde] 'order') in the same way as typical [+continuant] segments, such as fricatives and vowels (Freixeiro Mato 1998). In order to account for this, I propose that the OCP constraint against sequences of continuant consonants is dominant in Galician.

(7) OCP_coda[+cont]: Sequences of [+continuant] consonants are not allowed in coda. Epenthesis of e₁ in words ending in [r, θ, s] indicates that OCP dominates a faithfulness constraint DEP, which militates against epenthesis.

Tableau (8) also shows that DEP must be dominated by the anti-deletion constraint MAX and the anti-coalescence constraint UNIFORMITY (represented as UNIFORM), because epenthesis is an optimal resolution to avoid the OCP violation.

If the stem ends in a vowel or a nasal, OCP is not violated because the suffixation does not create a sequence of continuant consonants in coda. In this case, any violation of faithfulness constraints is not tolerated and the faithful candidate is an optimal candidate. This is illustrated in (9), which exemplifies the plural form of words ending in a nasal.
3.3. The emergence of the unmarked in plural forms of words ending in $l$

3.3.1. Avoidance of uneven trochees

Now let us turn to the analysis of the plural formation of words ending in $l$. As already shown in 2, polysyllabic words ending in $l$ take two allomorphs depending on its stress: words with final stress take -$is$, while those with the penultimate stress take -$es$. The question is why words with final stress take -$is$ but not -$es$. In other words, why does the allomorph -$es$ attach to words with penultimate stress but not to those with final stress?

In order to answer this question, the prosodic structures created by the plural suffixation are compared in (10):

(10) a. *a.ni.(má.les) b. a.ni.(májs) c. (ú.ti).les

Assuming that the stress in singular forms must be preserved in plural forms, the suffixation of -$es$ to words with final stress creates an uneven trochee, a foot consisting of a stressed light syllable followed by an unstressed heavy syllable. This is shown in the ungrammatical form (10a). In contrast, in the actual plural form (10b), -$is$ is syllabified with the stem vowel and the resulting CVVC syllable forms a moraic trochee. For words with penultimate stress, the suffixation of -$es$ does not affect the foot structure of the base, as shown in (10c).

Now, the proposal is that the allomorph -$is$ appears in order to avoid the marked uneven trochee created by the suffixation of -$es$. Uneven trochee is marked in quantity-sensitive stress systems, because a heavy syllable is parsed to a weak position of a foot headed by a light syllable (Kager 1992). The markedness constraint against uneven trochee and the faithfulness constraint against stress shift are presented in (11).

(11) a. *(LH): Heavy syllable is not in a weak position of a foot.

b. IDENTBD-STRESS: The base stress must be preserved in the derived form.

There are two possible analyses of the allomorph -$is$: e-raising analysis and l-vocalisation analysis. Castro (1989) proposes that the epenthetic vowel [e], which is inserted to avoid the $ls$ sequence, raises to [j] after the stem-final $l$ is deleted. On the other hand, in their analysis of Portuguese plural formation, Morales-Front and Holt (1997) proposes the l-vocalisation analysis. In their analysis, the stem-final $l$, which is syllabified as a syllable nucleus to avoid $ls$ in coda position, is vocalised to [j].

Of these possible analyses, the e-raising analysis is untenable because the l-deletion, a prerequisite for the analysis, cannot independently motivated: first, the deletion of intervocalic consonant creates a marked CVVC syllable from a sequence of less marked syllables and it never improve the markedness. Second, the process which deletes intervocalic consonants is not motivated independently in this language. Third, if there would be the l-deletion, OCP and *(LH) could be satisfied only by deleting the stem-final $l$ and there is no need to insert an epenthetic vowel. In other words, the l-deletion would make the epenthesis opaque.
Contrastively, the l-vocalisation is phonologically well-motivated: given that OCP and *(LH) are dominant, the stem-final l must be parsed into a syllable nucleus. Otherwise, the plural suffixation creates a sequence of continuants in coda or an uneven trochee. Being parsed as a syllable nucleus, the stem-final l cannot be [+consonantal], because elements in syllable nucleus must be vocalic ([-consonantal]). As a result, the stem-final l is realised as a glide [j]. Here, I adopt the vocalisation analysis. Relevant constraints are shown in (12).

(12) a. *Nucleus/C (*N/C): Consonants are not parsed as a syllable nucleus.
b. Ident[F]: Corresponding segments have identical feature values.

Among the constraints in (11-12), the appearance of the allomorph -is for words with final stress indicates that Ident[F] is dominated, because l is vocalised to [j] to avoid an uneven trochee. This is illustrated in the tableaux in (13-14).

(13) Suffixation of -is to polysyllabic words ending in ‘Vl’:

<table>
<thead>
<tr>
<th>I: /aθul-s/ B: [a.θul]</th>
<th>OCP</th>
<th>*N/C</th>
<th>Id-Stress</th>
<th>*(LH)</th>
<th>Ident</th>
<th>Dep</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. a.(θuʌls)</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. a.(θuʌl).es</td>
<td></td>
<td></td>
<td>!</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. a.θuʌ.l(és)</td>
<td></td>
<td></td>
<td>!</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>d. a.(θuʌls)</td>
<td></td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. a.(θuʌjs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

(Elements in relevant syllable nucleus are underscored.)

(14) Suffixation of -es to polysyllabic words ending in ‘Vl’:

<table>
<thead>
<tr>
<th>I: /túnel-s/ B: [tú.nel]</th>
<th>OCP</th>
<th>*N/C</th>
<th>Id-Stress</th>
<th>*(LH)</th>
<th>Ident</th>
<th>Dep</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (tú.neʌls)</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. (tú.ne).es</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. tu.ne.(lés)</td>
<td></td>
<td></td>
<td>!</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>d. (tú.neʌls)</td>
<td></td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. (tú.neʌjs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

As in the previous cases, the faithful candidates (a) are ruled out due to their OCP violation. The epenthetic candidates (b) avoid the OCP violation by inserting a vowel between the consonantal sequence. This candidate is evaluated as optimal when the base is stressed on the penultimate syllable, as shown in (14b). However, when the base has a final stress as in (13), the epenthetic candidate (13b) violates another dominant constraint, *(LH), and is ruled out. Other candidates (c-e) avoid violations of the aforementioned constraints by shifting stress to the final syllable (c), parsing the stem-final l as a syllable nucleus (d), and vocalising the stem-final l to [j] (e). Among these candidates, the vocalisation candidate (13e) fares better than the others because it satisfies all dominant constraints. As a result, candidate (13e) with the allomorph -is is selected as optimal.
The analysis presented so far argues that the allomorph -is appears to avoid a ('LH) foot. However, readers may notice that singular forms with penultimate stress are free to have ('LH) foot:

(15)  ú.til) 'useful' di.(fi.θil) 'difficult'

This fact suggests that the ban of ('LH) is an emergent property of plural forms. In other words, *(LH), which is inactive in I(nput)O(utput)-mapping, becomes active in B(ase)D(erived form)-mapping. The emergence of *(LH) in plural forms is accounted for by relativising relevant faithfulness constraints to IO- and BD-correspondence.

Since uneven trochees are allowed in singular forms, *(LH) must be dominated by IO-faithfulness constraints. By contrast, the avoidance of ('LH) in plural forms indicates that *(LH) dominates BD-faithfulness constraints. This is shown in tableaux (16-17).

(16)  ('LH) is possible in singular forms:

<table>
<thead>
<tr>
<th>/ú.tí₁₂/</th>
<th>DEP&lt;sub&gt;IO&lt;/sub&gt;</th>
<th>IDENT&lt;sub&gt;IO&lt;/sub&gt;</th>
<th>*(LH)</th>
<th>DEP&lt;sub&gt;BD&lt;/sub&gt;</th>
<th>IDENT&lt;sub&gt;BD&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>ðp (ú.tí₁₂)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ú.tí₁).l₂e</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(ú.tí₁₂)</td>
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</table>

(17)  ('LH) is not allowed in plural forms:

<table>
<thead>
<tr>
<th>I: /aθúl-s/</th>
<th>DEP&lt;sub&gt;IO&lt;/sub&gt;</th>
<th>IDENT&lt;sub&gt;IO&lt;/sub&gt;</th>
<th>*(LH)</th>
<th>DEP&lt;sub&gt;BD&lt;/sub&gt;</th>
<th>IDENT&lt;sub&gt;BD&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.(θú.les)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ðp a.(θús)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

In words ending in -íl, the sequence -íl is apparently replaced by the plural suffix. This is accounted for as a process of coalescence: the vocalised l coalesces with the preceding vowel due to *V<sub>i</sub>V<sub>i</sub>, a markedness constraint against sequences of identical vowels within a syllable. *V<sub>i</sub>V<sub>i</sub> dominates the anti-coalescence constraint UNIFORMITY, as shown in (18):

(18)  I: /kadří₁₂-s/ | DEP<sub>IO</sub> | IDENT<sub>IO</sub> | *(LH) | DEP<sub>BD</sub> | IDENT<sub>BD</sub> |
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>ka.(drí₁₂s)</td>
<td></td>
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<td></td>
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<tr>
<td>ka.(dríj₁₂s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ðp ka.(drí₁₂s)</td>
<td></td>
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</tbody>
</table>

3.3.2. Avoidance of subminimal prosodic words

Monosyllabic words take the allomorph -es violating the constraint against uneven trochee. This indicates that, although monosyllabic words are stressed on the final syllable, they pattern with words stressed on the penultimate syllable. I claim that this is an another case of the emergence of the unmarked: plural forms must be minimally bisyllabic, while singular forms can be monosyllabic. The emergent minimal word condition in plural forms
is accounted for by the ranking where the constraint on minimal prosodic word (19) is ranked between DEPIO and DEPBD.

(19) $[\sigma \sigma]_{PrWd}$: Prosodic word must be minimally bisyllabic.

(20) Suffixation of -es in plural forms of monosyllabic words:

<table>
<thead>
<tr>
<th>I: /bal-s/</th>
<th>B: [bál]</th>
<th>DEPIO</th>
<th>$[\sigma \sigma]_{PrWd}$</th>
<th>*(‘LH)</th>
<th>DEPBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(bájs)</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>——</td>
<td>(báj.les)</td>
<td></td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

(21) Singular forms can be subminimal:

<table>
<thead>
<tr>
<th>/bal/</th>
<th>DEPIO</th>
<th>$[\sigma \sigma]_{PrWd}$</th>
<th>*(‘LH)</th>
<th>DEPBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>——</td>
<td>(bál)</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>——</td>
<td>(bá.le)</td>
<td></td>
<td>*</td>
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</tr>
</tbody>
</table>

Because $[\sigma \sigma]_{PrWd}$ dominates *(‘LH) and DEPBD, e is inserted in plural forms in order to satisfy the bisyllabic template, although it results in an uneven trochee, as shown in (20)$^4$. By contrast, singular form cannot have an epenthetic vowel to satisfy the bisyllabic template, because DEPIO dominates $[\sigma \sigma]_{PrWd}$, as shown in (21).

As a summary, the constraint ranking argued in this paper is shown in (22):

(22) OCP, *N/C, *ViVi, MAX, IDBD-STRESS >> UNIFORM >> DEPIO, IDENT[F]IO

$>> [\sigma \sigma]_{PrWd} >> *(‘LH) >> IDENT[F]BD >> DEPBD$

4. Concluding Remarks

This paper examined the Galician plural suffix allomorphy focusing on plural forms of words ending in l. It has been shown that plural forms in Galician show the tendencies to avoid marked prosodic structures, such as uneven trochee and subminimal prosodic word, if possible, and these tendencies are accounted for as cases of the emergence of the unmarked in OT: marked prosodic structures that are generally allowed in the language are prohibited in plural forms.

There are some residual issues for complete understanding of the Galician plural formation. First, as opposed to l-ending words, words ending in [r, ð, s] take the allomorph -es without respect to the base stress and violations of *(‘LH) is also found in these forms. This *(‘LH) violation is not avoidable because vocalisation of non-lateral consonants is prohibited by a dominant IDENT constraints. So the question of what kind of constraints are relevant must be addressed. Second, contrary to the prediction of the proposed analysis, monosyllabic words ending in vowels and nasals have monosyllabic plural forms. These are the issues that must be addressed in the future research.

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Notes

-23-
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1 \([e]\) is the least marked vowel in Galician and the epenthesis of \([e]\) is also attested in resolution of word-initial \(sC\) clusters (e.g. \textit{espacio} [espa\(\text{o}\)jo] 'space') and word-internal \(dm\) clusters (e.g. \textit{admirar} [a\(\text{\text{a}}\)demirar] 'admire') (Freixeiro Mato 1998).

2 In Galician, stress falls on one of the last three syllables of a word. According to Castro (1989), the default stress is paroxytone in vowel-ending words and oxytone in consonant-ending words. Here I assume quantity-sensitive trochaic system for Galician. I also assume that words with non-default stress are lexically stressed.

3 In this paper, OO-correspondence relations proposed by Benua (1995) are assumed.

4 The candidate, such as \textit{ba.le}, is ruled out by the dominant \textit{Realise Morpheme} because it does not realise the plural morpheme.

References


