

Spanish rhymes: a challenge to constraints on syllable structure?

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A standard assumption in Onset/Rhyme theory is that, crosslinguistically, rhymes never license more than two position; the occurrence of additional segments is limited to word edges and licensing is carried out by higher prosodic units. Spanish three-positional word-medial rhymes seem to challenge this assumption. Furthermore, the third position in this transgressive syllable structure is systematically occupied by /s/, one of the only two segments of the Spanish phonemic inventory that can become invisible for matters of stress assignment. A closer look at the data reveals that this prima facie transgressive structure tends to occur at morpheme boundaries: few Spanish roots contain three-segmental rhymes. The systematic assignment of secondary stress on the prefix or the first member of compounds in which the transgressive rhyme is found, and the presence of primary stress on roots with three-segmental word-medial rhymes become crucial in an analysis that relies on a looser conception of extraprosodicity in order to account for the Spanish data: /s/ – the transgressing segment – is licensed by an available foot node projected by the stress bearing three-segmental rhyme.

“I inquire in order to know something, not to think it.”
Saint Augustine

1. Introduction

The main concern of theories claiming the existence of a universal grammar is to find principled accounts for linguistic phenomena across languages. In the realm of phonology, various systems have been developed in an attempt to make the correct predictions regarding universal constraints on syllable structure. One of these constraints refers to the fact that, crosslinguistically, rhymes never license more than two positions (see Kaye et al., 1990 below); the occurrence of additional segments is limited to word edges and licensing is carried out by higher prosodic units. However, the existence of three-positional word-medial rhymes in Spanish seems to challenge these generalizations. Since these syllable structures are apparently not uncommon in the language under consideration, a revision to the proposals on universal rhyme restrictions seems to be required.

The goal of this paper is to account for the marked behavior of Spanish rhymes under the perspective of Onset/Rhyme theory. Section 2 of this paper will present a succinct survey of two different approaches to Spanish syllable structure, focusing on rhymal representations. Section 3 deals with a set of theoretical assumptions to be used in an attempt to highly constrain my analysis of illicit three-segmental rhymes, in contrast with the stipulations observed in previous proposals (Section 2). An alternative analyses based on the framework assumed in the former section will be presented in Section 4. Section 5 will be devoted to a reinterpretation of the survey of Spanish rhymes offered in Harris (1983), which will turn to be crucial to my final proposal. Section 6 will present an improved version of the analysis introduced in Section 4, capitalizing on the revised version of the data, as well as on some facts about secondary stress in the problematic rhyme sequences and a looser conception of extraprosodicity; a combination of these factors will result in suggesting that /s/ – the transgressing segment – is *licensed by an available foot node to its left*. Some residual problems will be discussed in Section 7. Finally, the conclusions derived from my analysis, as well as lines for further research, will be presented in Section 8.

The segmental inventory of Spanish assumed in my analysis is presented in (1).¹ I am including only the segments that occur in all the dialects of Spanish, which is the assumption underlying Harris' (1983) analysis:

- (1)
- | | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|
| p | t | č | k | i | u | j | w |
| b | d | | g | e | o | | |
| f | s | | x | | a | | |
| m | n | ɲ | | | | | |
| | l | | | | | | |
| | r | | | | | | |

2. Traditional analysis of Spanish syllable structure. Two different attempts to capture the intricacies of Spanish syllabification within a generativist tradition are found in Harris (1983) and Hualde (1991). Subsections 2.1 and 2.2 will introduce their analyses, the stress put on the characterization of rhyme structure.

¹The inventory in (1) is from Harris (1983).

2.1. Harris (1983) is among the most comprehensive studies on Spanish syllable structure. Within a framework of onset/rhyme theory characterized by the absence of the concept of coda, he carries out a detailed survey of rhyme types in Spanish, strongly suggesting that this syllabic constituent can be maximally ternary branching – a rather suspicious feature of Spanish syllables since, as I will discuss later, current theories of syllabic constituency assume rhymes to be maximally binary branching structures cross-linguistically. However, this author points out to the fact that not any given string of segments constitutes a well-formed rhyme in the language under consideration. In a rhyme sequence starting with a vowel (V), the second element can be either a glide (G), a liquid (L), a nasal (N), or an obstruent (O), as the data in (2) illustrates:

(2)

a) V + G	b) V + L	c) V + N	d) V + O
<i>aw</i> tor “author”	<i>mar</i> “sea”	<i>pan</i> “bread”	<i>edad</i> “age”
<i>aj</i> re “air”	<i>merk</i> ado “market”	<i>temp</i> lo “temple”	<i>seg</i> mento “segment”
<i>lej</i> “law”	<i>tilde</i> “tilde”	<i>pint</i> or “painter”	<i>fiks</i> ji3n “fiction”
<i>ew</i> forja “euphoria”	<i>amor</i> “love”	<i>kom</i> pra “purchase”	<i>obt</i> uso “obtuse”
<i>soj</i> “I am”	<i>bulto</i> “bulk”	<i>atún</i> “tuna fish”	<i>suds</i> udeste “SSE”
—			

The only tautosyllabic segment allowed in a third position after a VC rhyme sequence is systematically restricted to /s/:

(3)

a) V + Gs	b) V + Ls
<i>klawstro</i> “cloister” <i>ajslar</i> “isolate” <i>axewstia</i> <i>klejstogamja</i> <i>egojstón</i> “really selfish guy” —	<i>alstroemerja</i> “a certain plant” <i>perspectiva</i> “perspective” — <i>solstisjo</i> “solstice” —
c) V + Ns	d) V + Os
<i>panspermja</i> “panspermia” <i>menstrwal</i> “menstrual” <i>inskrito</i> “inscribed” <i>monstrwo</i> “monster” <i>sirkunskripsjón</i> “circumscription”	<i>adskribir</i> “ascribe” — — <i>obskuro</i> “obscure” <i>subskrubir</i> “subscribe”

As can be appreciated in (3c) above, the only restriction that Spanish imposes on the second segment in a VCs sequence has to do with nasals, since homorganicity allows only /n/ to be placed before /s/, to the exclusion of the other nasal segments in the inventory.

There are, however, two exceptional rhyme sequences involving a VG sequence plus a third element in the rhyme. VGN tautosyllabic sequences constitute one of the exceptions; they are allowed only word internally and the Spanish lexicon attests only three instances of such a rhyme: *vejn.te* “twenty”, *trejn.ta* “thirty”, and *awn.que* “although”. VGO (O ≠ /s/) - the second exceptional sequence - is an oddity only found in the word *awk.si.ljo* “help”. Given the scarcity of both rhyme sequences, Harris assumes that they are lexicalized deviant forms. It is interesting, though, to observe that Harris’s criteria to designate a rhyme sequence as aberrant are rather inconsistent; this erratic classification will be crucial for my analysis, and I will deal with it in subsequent sections.

Word internally, GV sequences allow either a liquid, a nasal, or an obstruent occupy the third position in a rhyme sequence, as can be appreciated in the data presented in (4) below:

(4)

a) GV + L	b) GV + N	c) GV + O
Pred <i>jal</i> “predial”	gward <i>ján</i> “gardian”	<i>djagnosis</i> “diagnosis”
<i>kwarto</i> “room”	sag <i>wán</i> “doorway”	—
<i>fjeltro</i> “felt (n.)”	<i>sjempre</i> “always”	<i>mjektomía</i> “muscular scission”
<i>fwerte</i> “strong”	<i>kwento</i> “short story”	—
<i>prjor</i> “prior”	<i>edjondo</i> “stinky”	<i>bjóksido</i> “biooxide”
—	<i>lengwón</i> “gossiper”	<i>dwopsonjo</i> “duopoly (der)”

The data presented in (4) contrasts with VGC sequences (3a above), where the third element is systematically restricted to /s/.

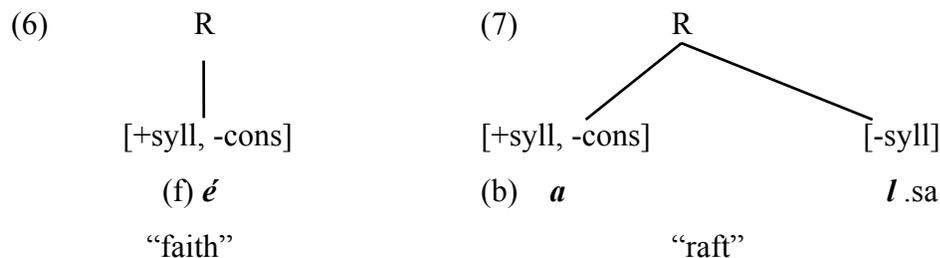
Harris points to some problematic cases of Glide-initial rhymes, in particular to the absence of **GVG** word internal rhymes and to the presence of four-segmental **GVGs** tautosyllabic sequences word finally. Instances of the first structure are attested only “in a few words of limited currency, mostly proper names [...] whose indigenous origin is strongly felt” (Harris, 1983: 16). Being loan words, Harris does not consider them to be part of the Spanish native lexicon. On the other hand, **GVGs** word final rhymes do exist, but their instantiation is restricted to European Spanish, always in the context of verb inflection. Furthermore, Harris points to the fact that “the final /s/, being inflectional, is extrametrical and thus cannot be seen to be counted”. Extrametricality, plus the fact that the author’s data are restricted to Mexican Spanish, rule out the problematic status of the rhyme sequence under consideration. Again, the criteria to assign a marked status to rhyme sequences seem inconsistent.

When dealing with the restriction that Spanish imposes on the maximum length of segments in a rhyme, namely three, Harris attempts to account for this constraint by appealing to the following rules (Harris 1983: 24, 25 and 28):

(5) **Rhyme Rule R1**

Construct a maximally binary branching tree of category R(hyme) whose obligatory left branch dominates [+syllabic, -consonantal] and whose optional right branch dominates [-syllabic].

Application of this rule allows for the following configurations:

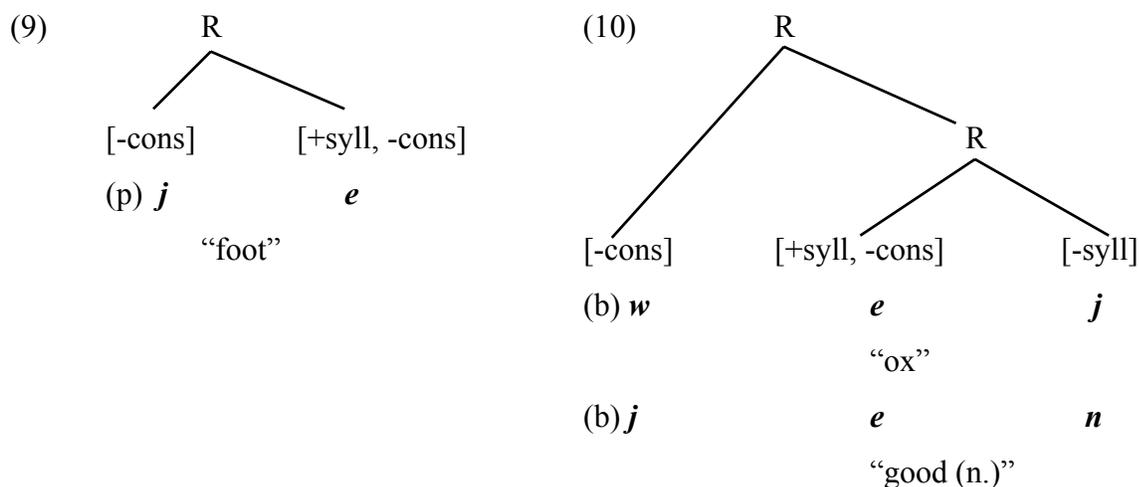


In order to account for glide-initial rhymes, Rhyme Rule 2 is required:

(8) **Rhyme Rule R2**

Adjoin a [-consonantal] segment to a rhyme.

(9) and (10) below are a consequence of the application of (8):



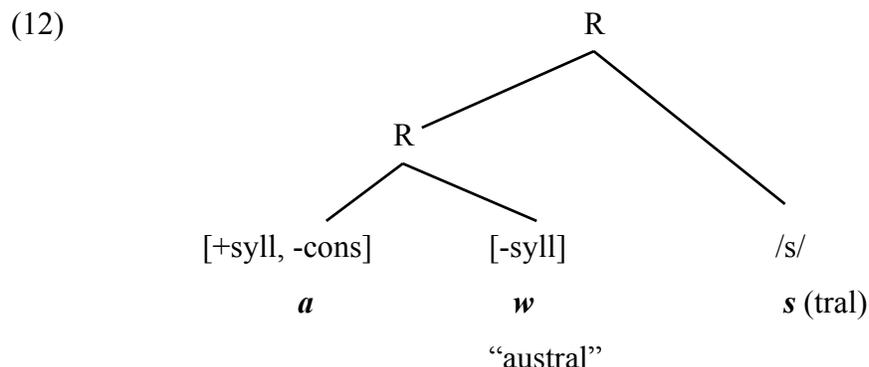
Harris considers to be no need to stipulate that the [-consonantal] segment has to be attached to the left side of an existing rhyme, since attachment to the right will produce an undesirable flat (e.g. VGG) or rising (e.g. VLG) sonority sequence within the rhyme.

A stipulation, Rhyme Rule 3, is required to account for the special behavior of /s/, the only Spanish consonant that systematically occupies the third position in VG/C tautosyllabic sequences:

(11) **Rhyme Rule R3**

Adjoin the segment /s/ to the right of an existing rhyme.

The structure depicted in (12) results from the rule above:



Additionally, Harris has to appeal to a further elaboration requiring a maximum of one embedding per rhyme. This stipulation comes at hand if one is to prevent four-segmental rhymes from occurring in the language under consideration. Harris assumes that this restriction, along with the three rules provided above, exhaustively account for all possible rhyme structures in Spanish, a repertoire illustrated in (13) below (slightly modified from the original data):

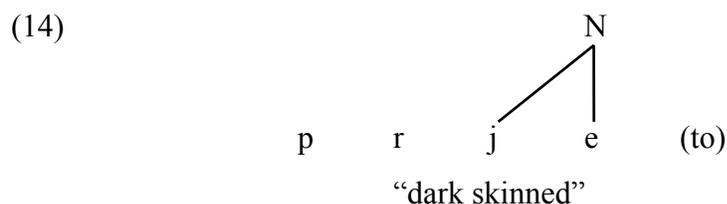
(13)

	Medial	Final		Medial	Final
V	pa.ta	ta.pa	Vs	pas.ta	res
VG	aw.tor	lej	VGs	klaws.tro	sejs
VL	sal.ta	mar	VLs	pers.pi.cas	bals
VN	kom.pra	a.tún	VNs	mons.trwo	Mayans
VO	seg.men.to	e.dad	Vos	abs.trak.to	Féliks
VGL	*	*	VGLs	*	*
VGN	(*)	*	VGNs	*	*
VGO	(*)	*	VGOs	*	*
GV	nwe.bo	a.pjo	GVs	fjes.ta	pwes
GVG	(*)	b.wej	GVGs	*	(*)
GVL	fwer.te	fjel	GVLs	*	*
GVN	sjem.pre	Xwan	GVNs	*	*
GVO	djag.no.sis	Go.ljat	GVOs	*	*
GVGL	*	*	GVGLs	*	*
GVGN	*	*	GVGNs	*	*
GVGO	*	*	GVGOs	*	*

A review of the representations provided in (10) and (12) above seems relevant in light of stress facts in the language under consideration. In the unmarked case, Spanish words are stressed on the penultimate syllable; however, if the last syllable is closed by a consonant, then it behaves as a heavy syllable and will attract stress.² The only exception to this pattern is observed in word final syllables that are closed by either /s/ or /n/: these structures behave systematically as open syllables for stress assignment, since – in the unmarked case – they never attract stress. Based on this fact, it seems tempting to assume that the parallel behavior of /s/ and /n/ with respect to stress assignment should be reflected structurally. The special status of /s/ is somehow captured in (12), a representation that singles out this segment with respect to other consonants of the Spanish inventory; however, (10) suggests that /n/ should pattern in every respect with any other [-syll] segment introduced in (1).

An alternative analysis of Spanish syllable structure, mainly based on the data described in Harris (1983), is introduced in Hualde (1991). The discussion of this proposal in the section below includes a representation reflecting the special status of both /s/ and /n/ with respect to stress assignment.

2.2. Hualde's (1991) rule based approach to syllabification considers the syllable to be a nuclear projection of nodes (Levin 1985): from each nuclear position (N), N' and N'' nodes are projected. After nuclear segments have been labeled under N, prevocalic glides are incorporated into syllabic structure through the application of the Complex Nucleus rule, requiring prevocalic glides to be adjoined under the N node; (14) below depicts the structure resulting from application of this rule:



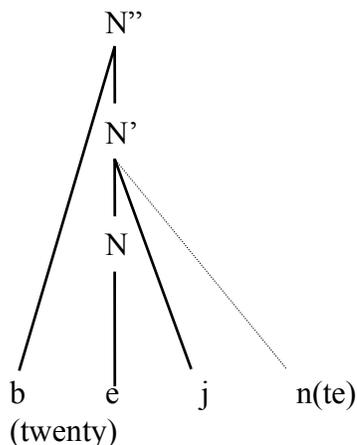
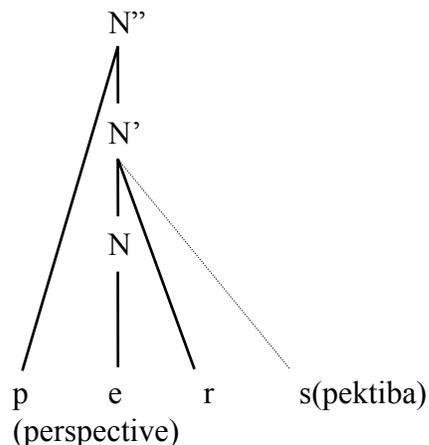
²I am being very cautious about generalizing the behavior of closed syllable in this instance to stress assignment in Spanish: in this language, closed syllable do not always attract stress. I will not get into details on this matter, since an account for this apparent lack of consistency goes beyond the scope of this paper.

The third step of syllabification implies the creation of onsets. Non-branching onsets are created via the application of the CV rule, which states that a consonant to the left of the nucleus should be adjoined under the N'' node; branching onsets will be the result of Complex Onset rule, which stipulates that a second consonant can be adjoined under the N'' node – provided that the result is a permissible onset cluster. The last step involves the application of Coda Rule, which by adjoining a segment to the right of the nucleus under N', allows for the representation of non-branching codas.

Instances of branching codas in Spanish are generated by means of two further stipulations, highly relevant for the present discussion. The first of them, *Complex coda rule*, allows for the adjunction of a consonant to the right of a glide under N'. Hualde specifies that the set of consonants undergoing this rule is rather restricted to three segments of the inventory in (1): /n/, /s/, and /θ/; this set can be further narrowed to apply only to the two coronals, since all the instances of Cθ coda clusters belong to proper names.³ Given the fact that Spanish systematically restricts the third segment of a VCC tautosyllabic sequence to /s/, Hualde has to come up with a further rule for complex codas under the label of */s/-Adjunction*; not surprisingly, this rule stipulates that, to the exclusion of any other segment in the inventory presented in (1), /s/ can be adjoin under N'.⁴ Application of these two rules would account for the representations provided in (15) and (16):

³ Actually, Hualde provides only one instance of such a coda cluster.

⁴ I assume that Hualde feels no need to specify the fact that /s/ has to be to the right of the nucleus for this rule to apply, since he is discussing the syllabification of unsyllabified segments to the right of the nucleus.

(15) *Complex coda*(16) */s/-Adjunction*

As I demonstrate in the following sections, neither the machinery developed by Hualde nor the system of rules provided by Harris are restrictive enough to successfully account for the Spanish facts. The following paragraphs introduce an alternative theoretical framework which will ultimately lead us to a better interpretation of the relevant data.

3. Theoretical framework. A closer look at the review of the analysis introduced in section 2 reveals that none of the apparatus developed so far offers a principled way to account for Spanish restricting rhyme sequences up to a maximum of three segments. The solutions provided are not likely to form part of a set of constraints generating only well formed syllable sequences across languages, a highly desirable goal for a true theory of syllable structure. However, a further problem arises with Harris' and Hualde's analysis, since both proposals assume that three-segmental rhymes constitute natural-occurring structures cross-linguistically. Recent developments of theories dealing with syllable structure offer a different, more restricted panorama of the phenomena under consideration. The aim of the subsections to follow is precisely to introduce such developments, in an attempt to constrain the analysis of the Spanish data within the limits of a universal theory of syllable structure.

3.1. On the status of Spanish prevocalic glides. In order to determine the restrictions on the maximum number of segments allowed in Spanish rhymes it is first necessary to decide what the

status of Spanish prevocalic glides in terms of syllabic constituency is: are they part of the rhyme or the rightmost element of a branching onset?

Place restrictions in a CG sequence are assumed to be indicative of the glide being part of the onset. For instance, the English glide /w/ can be preceded by any consonant as long as place structure is not identical in both segments; on the other hand, since Spanish imposes no restriction regarding place identity, a CG sequence like /bw/ is not disallowed in this language. It is possible, then, to conclude that this lack of restriction suggests that Spanish glides are not part of an onset cluster.

The existence of Spanish words like /krweldad/ “cruelty” and /tryunfo/ “triumph” offers further support to the assumption above. Ternary branching onsets are a highly marked structure cross-linguistically; assuming that the glide is part of the onset in /krweldad/ and /tryunfo/ would place Spanish among the few instances of languages that allow ternary branching onsets. Another parameter to determine the proper syllabification of Spanish glides comes from the well-formedness of three-segmental rhymes. If glides were part of the onset in the language under consideration, there would be no reason to ban a structure like **kjaws.tro*, since ternary branching rhymes are attested in Spanish (cf. *klawstro*).

Further evidence in favor of the syllabification of Spanish pre-vocalic glides in the nucleus comes from Harris (1983). Co-occurrence restrictions between glides and vowels, either in the place dimension or in the height dimension, are evidence to assume that glides are part of the rhyme in a given language. In Spanish, glides cannot occur adjacent to a vowel with the same specifications for both place and height, so sequences like **yi*, **iy*, **wu*, and **uw* are ruled out in GV and VG sequences.

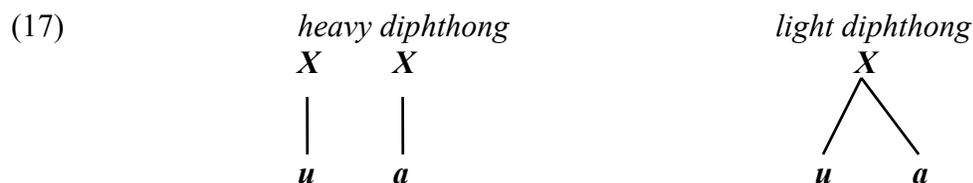
Carreira (1991) points to the existence of *s* + glide sequences in word initial position (e.g. *sweno* “I sound something”). In Spanish, the epenthetic vowel [e] precedes all other *s* + [-syllabic] sequences in word-initial position (e.g. *eslavo* “Slavic”). The epenthetic vowel does not surface when these roots are preceded by a vowel-final affix (e.g. *yugoslavo* “Yugoslavian”). In this context, the [s] closes the preceding syllable. *S* + [-syllabic] sequences, therefore, are only ruled out when the segments involved share the same onset. Since initial *s* + glide combinations are possible, it follows that such sequences must not constitute a complex onset.

It could be also possible to assume that Spanish glides are actually a second articulation in consonants (C^GV). However, Rose (1999) observes that languages disfavor secondarily-

articulated consonants; this restriction is so severe that even languages having C^w – the most commonly attested type – present place (velars and uvulars are preferred) and manner (stops are favored) constraints between the consonant and the appended glide. Furthermore, “palatalised consonants are marked across languages, with labial and coronal consonants being better targets for palatalisation than velar consonants” (1999: 34). The absence of such distributional constraints in Spanish strongly suggests that prevocalic glides are not secondary articulations to consonants in the language under study.

The evidence in favor of the nuclear syllabification of pre-vocalic glides in Spanish seems to be conclusive. This assumption being made, it remains to be explained why the position of the glide with respect to the syllabic nucleus does matter to rhyme length constraints, since prevocalic glides allow for three segmental rhymes unattested in instances of VG sequences. The following section will provide some insight on this concern.

3.2. Rising and falling diphthongs. Relevant for the purposes of this paper is the representation of rising (light) and falling (heavy) diphthongs. Numerous studies (Carreira 1991, Goldsmith 1990, Hayes 1989, Hualde 1991, Hyman 1985 (under a moraic perspective), Roca 1991, Schane 1987) agree that the representations given in (17) faithfully describe the actual differences between the two types of diphthongs referred to above. These representations are derived from the fact that, in general, falling diphthongs are rarely found in closed syllables, whereas light diphthongs yield well-formed rhymes with a tautosyllabic final consonant. As can be observed in (17), the difference between heavy and light diphthongs is represented in terms of the number of skeletal positions required for each structure; crucially, post-vocalic glides project their own skeletal position, whereas pre-vocalic glides share a single timing slot with the following vowel.



The representations above provide some insight with respect to the asymmetrical behavior of GV and VG observed in Section 2. Setting aside instances of three segmental rhymes where the third position is occupied by /s/, VG sequences do not allow further adjunction of a third element in

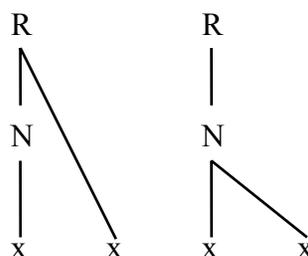
the rhyme; on the other hand, insertion of a third segment after a GV sequence is not problematic according to the data introduced in (13). As will be discussed in the next paragraphs, a combination of the assumption introduced in 3.1 with respect to the status of prevocalic glides, the different representations for heavy and light diphthongs introduced in (17), as well as a constraint on rhyme binarity, will prove to be crucial for the asymmetry between VG and GV sequences.

3.3 On the representation of rhymes. Current theoretical developments on syllable structure struggle to provide not only an accurate description of cross-linguistic patterns, but also to constrain their systems in such a way that no unattested syllable will be generated. Government phonology (Kaye et al., 1990) presents a highly constrained proposal on syllable structure, characterized by the notion of *maximally binary branching structures*. Under this system, syllabic constituents are defined in terms of a governing domain, where the government relation is characterized as strictly local and left-headed. The restriction on maximally binary branching constituents follows from these two conditions. Within this framework, well-formed rhymes are exhausted in the representations in (18):

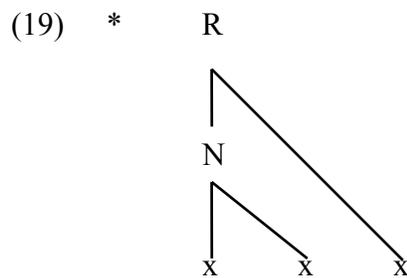
(18) Non-branching



Branching



The left branch of every rhyme is the nucleus constituent; furthermore, the head of the latter is also the head of the rhyme. This identity, along with locality condition, forbid the presence of branching nuclei in closed syllables, an ill-formed syllable structure depicted in (19):



When faced with the restrictions assumed within this framework, the analysis of Spanish syllable structure sketched in Section 2.1 evidences several problems. Harris himself was already aware that representations like the one in (12) involve a high degree of stipulation. In fact, a language-particular principle stating that Spanish rhymes have at most one embedding is a mere stipulation, required in order to guarantee a maximum of three segments rhyme internally. The author admits that “it would obviously be preferable to derive the length restriction entirely from general principles, avoiding stipulation altogether” (Harris, 1983: 23). Unfortunately, this is not the only language-specific proviso contained in the analysis under consideration; a further flaw is due to the quasi-gratuitous status of Rhyme Rule 3, a necessary step in order to account for the restriction on VCC tautosyllabic sequences. Harris argues for the validity of this stipulation, on the basis of the special status of /s/ in other areas of Spanish syllabification. According to this author, /s/ is the only nonpalatal obstruent that cannot occur before a liquid in an onset position; furthermore, /s/ is the only consonant in Spanish triggering vowel epenthesis in CC prevocalic clusters – where /s/ is the first member of the consonant sequence.⁵ It is true that (11) seems to capture the symmetrical behavior of GVs and VGs (cf. GVC vs. *VGC, where C ≠ /s/); however, the fact remains that the representations derived by application of Rhyme Rule 3 apply only to the specific case of Spanish rhymes, which renders the analysis a rather *ad hoc* proposal. Even more suspicious is Harris’s taking for granted the existence of three-segmental rhymes. As the representation in (19) suggests, the representation in (12) incurs a violation of what seems to be a cross-linguistic tendency, as discussed in Kaye et al. (1990).

A further problem in Harris’s analysis comes from the representation of GVC rhymes. He could have benefited from the representations in (17) in order to avoid the apparent violation of rhyme binarity present in (10) above; GVC sequences are not problematic, since GV sequences

count as a single unit at the skeletal tier, the relevant level for branching restrictions to apply. In contrast, the representations provided by Hualde in (14) and (15) above are somehow more faithful to the distinction between rising and falling rhymes illustrated in (17). However, Hualde's analysis does not only incur stipulations *à la Harris*, but also generates unattested rhymes. A combination of the Complex Nucleus Rule and either the Complex Coda or the /s/-Adjunction Rule could result in the generation of a wide range of non-existent four-segmental rhymes (e.g. *GVLs), a clear violation of the representations in (18). In order to avoid even longer sequences, Hualde has to stipulate for the Complex Coda Rule that *only one* consonant can be adjoined to the right of a glide; the same proviso is included in the statement of the /s/-Adjunction Rule, where the special segment appears after *one* tautosyllabic consonant. Furthermore, outside of the context of the proviso for /s/, /n/, and /θ/, the Complex Coda Rule wrongly predicts that any consonant can be adjoined to a post-vocalic glide; there is also no restriction as to what set of consonants can occupy a post-nuclear position before the /s/-Adjunction Rule applies.

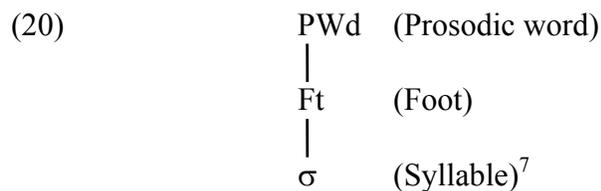
It should be clear at this point of the exposition that my analysis will consider rhyme binarity to be the unmarked option cross-linguistically. Along with this assumption, my representations are to be framed within the lines of Onset/Rhyme theory: syllable nodes “consists of two sister constituents: a left-hand constituent, the onset, and a right-hand constituent, the rhyme, both of which may or may not branch; if the rhyme branches we may further distinguish [...] between its subconstituents; the nucleus and the coda” (Kaye and Lowenstamm, 1981). In my representations, the coda position will be immediately dominated by the rhyme, in line with the structures provided in (18) and (19) above. Although post-vocalic consonants seem to attract stress in Spanish, and therefore be weight bearing units, I will set aside a moraic analysis due to expository reasons. Skeletal positions will be preferred over a C/V tier, since the features of the segments associated to the former already encode specifications regarding their consonantal or vocalic status.

The fact still remains that, in spite of rhyme binarity, Spanish seems to freely allow three-segmental rhymes – according to the data introduced in (13). In order to account for this *prima facie* evidence against the restriction illustrated in (19), sections 3.4 and 3.5 below will introduce

⁵I ignore why Harris does not realize that these two phenomena are actually manifestations of a single restriction,

two key concepts to my analysis: a hierarchical organization of prosodic units, and the existence of extraprosodic segments.

3.4 The Prosodic Hierarchy. The study of stress has been fruitful for theories of syllable structure in the sense that constituency has developed further as to postulate the existence of higher prosodic units beyond the syllable node. These units are organized into what has been called a *prosodic hierarchy* (Selkirk, 1984⁶; Itô, 1986), introduced in (20) below:



A strong constraint, the Strict Layer Hypothesis (Selkirk, 1984), holds in this hierarchical representation; it basically requires that “a category of level *i* in the hierarchy *immediately* dominates a (sequence of) categories of level *i - 1*” (: 26). It follows from this assumption that prosodic words have to immediately dominate at least one foot, which in turn dominates at least one syllable; any other possible combination is ill-formed.

The presence of a given constituent in such a hierarchical organization is the result of being *licensed* by a higher prosodic unit,⁸ in line with one of the basic principles of prosodic phonology stated by Itô (1986):

(21) **Prosodic Licensing**

All phonological units must be prosodically licensed, i.e. belong to higher prosodic structure (modulo extraprosodicity).

The parenthesized proviso in (21) is required in order to account for the special behavior of phonological units at domain edges. Relevant for the purposes of my analysis is the fact that, at

namely, that Spanish rules out sC “onset” clusters.

⁶For the sake of simplicity, I omit the representation of prosodic units above the prosodic word, namely the phonological phrase, the intentional phrase and the utterance.

⁷Since I am not assuming a moraic framework, I will not include the mora as a constituent of the prosodic hierarchy.

the level of syllabic constituency, word final consonant clusters often seem to violate the binary restriction assumed for rhymes. By exploring the concept of extrametricality, several researchers have attempted to provide a constrained representation to these marked structures. The section below will be devoted to a brief survey of the relevant literature on the matter.

3.5. Facts about segmental extraprosodicity. The existence of three-segmental rhymes in Spanish constitutes a problem for the restriction on binary branching structures presented in section 3.3. The following is a representative sample among several proposals struggling to structurally capture an adequate representation of the transgressive segment. In his analysis of English syllable structure Fudge (1969) refers to a proto-extraprosodic position labeled *termination* in his system. This constituent is *immediately dominated by the syllable*, a representation required in order to capture its isolation with respect to codas. In fact, a *termination* is a highly restricted position *found only in word-final syllables* and it usually implies the presence of a morpheme boundary. The set of elements occupying the position under consideration is also systematically restricted; in English, for example, only a subset of coronal obstruents are assigned the status of *terminations*. Borowsky's (1989) analysis of the syllable coda in English provides further support to Fudge's insight. In this system, violations of syllable structure *at word edges* are accounted for by the existence of the *appendix*, a position that "may contain a consonant, or a series of consonants, which is not normally permitted medially and which violates phonotactic constraints" (1989: 145). As in the previous proposal, appendices are *directly dominated by the syllable node*. Similar conclusions are found with respect to the role that the Ω -licenser plays in Goldsmith's (1990) analysis of syllable structure.

Two constant elements are present in the characterization of the extraprosodic position briefly discussed above: it is systematically restricted to word edges, and it is directly dominated by the syllable node, unlike regular codas. I will exploit this proposal in section 4, stretching it to its limits in an initial attempt to formally capture the Spanish facts.

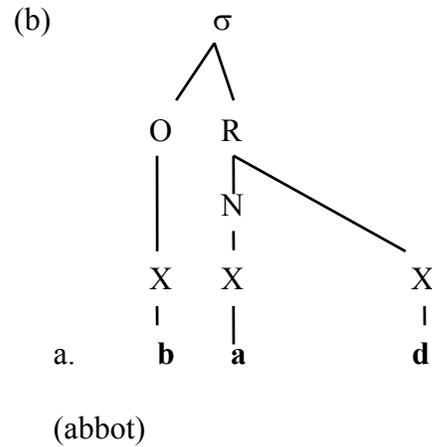
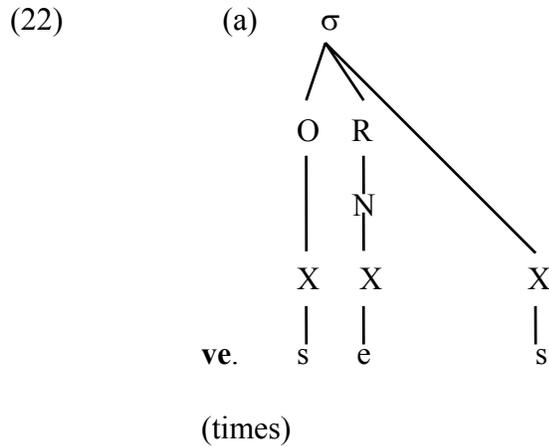
4. A preliminary analysis. A serious attempt to account for the rhyme restrictions in Spanish should begin with questioning why, in the first place, this language allows sequences of three

⁸Convincing arguments in favor of the very existence of prosodic units are found in McCarthy and Prince (1986), Nespor and Vogel (1986).

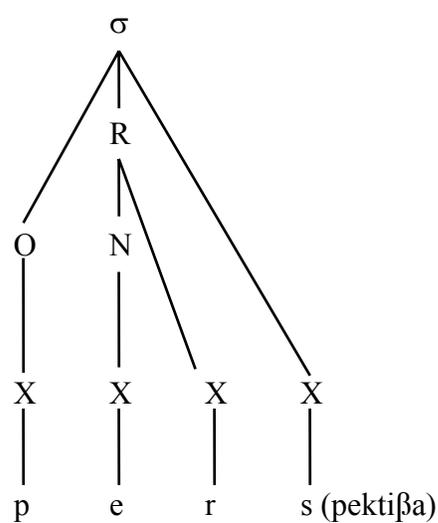
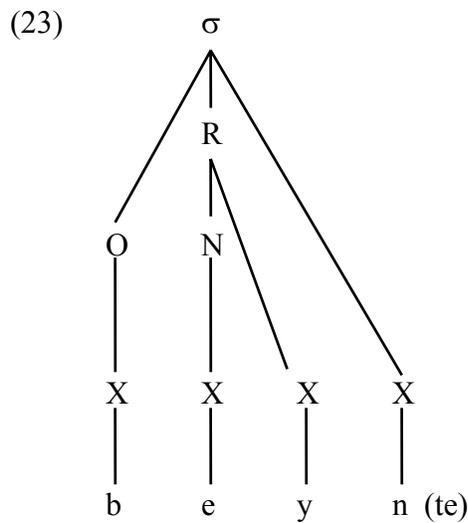
elements in word medial rhymes. The literature reviewed in section 3.3 points to the fact that, in the unmarked case, languages allow a maximum of two elements in their rhymes. If we assume the representation of heavy and light diphthongs in (17), and the representations provided in (18), then only V, VC, VG, GVC and GVG Spanish rhymes will be within the limits of what is crosslinguistically unmarked. As it was observed in the analysis presented in section 2, what is strikingly systematic is the fact that the third segment in GVC sequences can be filled with almost any consonant of the inventory presented in (1). This contrasts with VGC and VCC rhymes, which oddly enough do exist in Spanish word medially; in a VGC sequence, the third segmental position is systematically restricted to /s/ in the unmarked case, or – in a highly restricted set of items – /n/; VCC sequences apply a further restriction that requires the third element to be /s/.

The bizarre behavior of /s/, and arguably /n/, has a correlate with another aspect of Spanish phonology: stress assignment. In the unmarked case, Spanish words are stressed on the penultimate syllable; however, if the last syllable is closed by a consonant, then it behaves as a heavy syllable and will attract stress.⁹ The only exception to this pattern is observed in word final syllables that are closed by either /s/ or /n/: these structures behave systematically as open syllables for stress assignment, since – in the unmarked case – they never attract stress. This fact suggests that the two consonants under consideration are not part of the rhyme, since word-final syllables closed by /n/ or /s/ remain light syllables for stress assignment. The difference between syllables with extrarhymal positions (ERPs) and word-final syllables checked by consonants other than /n/ or /s/ can be appreciated in (22), where bold syllables are stressed:

⁹I am being very cautious about generalizing the behavior of closed syllable in this instance to stress assignment in Spanish: in this language, closed syllables do not always attract stress. I will not get into details on this matter, since an account for this apparent lack of consistency goes beyond the scope of this paper.



The notion of ERPs in Spanish is based on the assumptions introduced in Section 3.5. It seems plausible to assume that this representation can be extrapolated to word-medial syllables, given the fact that – as we have seen – the set of extrarhymal segments in word final closed syllables coincides with the set of segments that occupy the third position in word medial VGC and VCC rhymes. The latter sequences would be represented as in (23), where the extrarhymal segments are directly licensed by the syllable node:



Several problems arise with this analysis. At a descriptive level, it is wrong to assume that /s/ and /n/ behave in a parallel fashion in Spanish. First, as it was pointed out above, three-segmental rhymes closed by /n/ are extremely rare in Spanish, since there are only three lexical items with such a sequence; this contrasts with the abundant instances of three-segmental rhymes checked by /s/. Furthermore, the latter segment appears in word final GVGs rhymes to the

exclusion of any other segment in the inventory presented in (1). These facts further weaken the assumption of /s/ and /n/ being grouped as the only two extrarhymal segments in the language under consideration, an assumption hard to maintain since they do not constitute a natural class to the exclusion of other Spanish coronals. However, the greatest challenge for the representation in (23) comes from the fact that *ERPs are standardly assumed to be limited to word edges*, as discussed in section 3.5. How to formally capture, then, the ERP-like behavior of /s/ in Spanish in word internal position? A reinterpretation of the rhyme survey presented by Harris seems to constitute the first step towards a solution to this puzzle.

5. Reinterpreting the data. It seems that the analysis suggested so far can hardly be improved if one's goal is to stay within the limits of the framework assumed in section 3. How, then, could the present impasse be possibly solved? A closer look at the data seems to point towards a reinterpretation of the Spanish facts, rather than to a struggle to come up with a modified version of the current theory of prosodic phonology.

A closer look at the survey of Spanish rhymes presented in (13) reveals a misinterpretation of the data. If one is to be faithful to the facts, several erroneous assumptions can be identified; the list includes pseudo-problematic, and arguably natural-occurring rhyme sequences in Spanish.

If we are to ascertain that constituent binarity is a *sine qua non* universal constraint, Harris' assuming that **VLs** rhymes are perfectly natural tautosyllabic sequences in a bulk of Spanish words renders the data problematic. However, word medial VLs rhymes are actually not a cause for concern, since – contrary to Harris' implicit assumption – they are not morpheme internal sequences. In fact, these rhymes are the result of either compounding (e.g. *sol* 'sun' + *sticjo* 'to make stand', the only instance of compounding in the relevant data) or prefixation (*per* 'through' + *spectiba* 'look'). Furthermore, including the former two items, there are only twelve words in the whole Spanish lexicon with such a sequence: *al* + *storemeria*,¹⁰ *sol* + *sticial*, *volsco*, *imper* + *scrutable*, *per* + *spicacia*, *per* + *spicaz*, *per* + *spicuo*, *inter* + *sticio*, *super* + *stición*, *supér* + *stite*. Out of them, the only monomorphemic instance of a word medial VLs rhyme is actually an Italian loan, *volsco*. Word final sequences are systematically restricted to Catalan surnames (e.g. **Casals**), and to a single German loan, *vals* "waltz". I will, therefore, assume that these word final

¹⁰ Only relevant morpheme boundaries are shown.

VLs rhymes are not to be taken as members of the native lexicon. It is relevant to the present discussion to observe that Harris' criteria to rule out some sequences and favor others are not systematic. If we were to assume that word final VLs tautosyllabic clusters are licit sequences in Spanish *because* of the presence of a single item like *vals*, one should state – by the same token – that word final VLO (where O ≠ /s/) rhymes are naturally occurring native sequences, due to the presence of another loan word like *golf* – a rather undesirable generalization. Furthermore, when dealing with **GVG** word internal rhymes, Harris explicitly rules them out on the basis that the only instances of such a sequence are found “in a few words of limited currency, mostly proper names [...] whose indigenous origin is strongly felt” (Harris, 1983: 16). Being loan words, Harris does not consider them to be part of the Spanish native lexicon. If this author aims to be consistent, neither loan words nor proper names with word internal VLs rhymes should be entered as part of the relevant data.

Interestingly, word medial **VNs** rhymes are accounted for on the basis of the same arguments used for dealing with VLs tautosyllabic strings. Affixation of the prefixes *trans-* (*trans* + *plantar* “to plant”), *in-* (*in* + *scribir* “to write”), *con-* (*con* + *spirar* “to breathe”), *pan-* (*pan* + *spermia* “seed”), and *circun-* (*circun* + *scribir*), is the source of the almost totality of native words containing a VNs sequence. Again, this illicit rhyme is the result of morpheme concatenation. Regarding word-final VNs rhymes, Harris wrongly assumes that this structure is well attested in the Spanish lexicon. However, instances of word final VNs sequences are extremely rare: setting aside proper names, the corpus consists of only three loan words (*afrikaans*, *clarens*, and *siemens*), and to Latinate items (*delirium*, *tremens* and *gens*). Being loan words, none of them are truly part of the Spanish lexicon.

VOs rhymes in word internal position are also the result of affixation of either prefixes containing a VOs sequence (e.g. *abs-* like in *abs* + *traer* “to draw”; *e[ks]-* like in *ex* + *traer*), or VO prefixes followed by a root beginning with /s/ (e.g. *ad* + *scribir*). Regarding word final VOs rhymes, Harris assumes that such a sequence is well attested in Spanish; however monomorphemic instances of the rhyme under consideration are systematically restricted to words of Greek origin, with a close to nil productivity in modern Spanish (*tóra[ks]* “thorax”, *clíma[ks]* “climax”).

Concerning **VGN** word-medial rhymes, Harris claims that the existence of this sequence is limited to three items: *vejn.te* ‘twenty’, *trejn.ta* ‘thirty’, and *awn.ke* ‘eventhough’. He concludes

that “the three words ... are lexicalized deviant forms, like English *svelte*, *vroom*, etc.” It is interesting to observe, however, that the third item is the result of compounding *aun* ‘even’ + *que* ‘that’; furthermore, native speakers often reduce the vowel-glide sequence in favor of the former, resulting in a regular binary branching rhyme (e.g. *an.ke*). The two first items, on the other hand, are arguably the result of suffixation: *ve* + *inte* (*vi* ‘two’ + (*g*)*inti* ‘x times ten’), *tre* + *inta* (*tri* + *ginta*); I will, however, refer with further detail to these two specific items in my analysis. Actually, a dictionary survey revealed that there are more instances of word-medial VGN rhymes, almost all of them being the result of prefixation (*re* + *insidir* “to repeat an offense”), and one instance of compounding (*guarda* + *infante* “farthingale”); only three out of them are instances of morpheme internal rhymes (*awn.če*, *cawn.se*, *cawn.ča*), but, again, these are loan words of Quechua and Araucanian etymology.

VGs sequences constitute a highly restricted set of items in Spanish, a fact ignored in Harris’ survey. In word final position, there is only one native token out of a set of three items. Word medially, 9 out of the 28 items attested (plus related words) are either loans or cases resulting from affixation. I will, however, consider the remaining two thirds to be enough as to include word medial VGs as part of my data.

This new interpretation of the data is reflected in the improved version of (13) provided in (24). It is necessary, however, point to the fact that some data still remains – or seems to be – problematic; in the next section I will provide an analysis that aims to account for all the facts within the limits of a constrained theory of syllable structure a prosodic phonology.

(24)

	Medial	Final		Medial	Final
V	pa.ta	ta.pa	Vs	pas.ta	res
VG	aw.tor	Lej	VGs	klaws.tro	*one token: sejs
VL	sal.ta	Mar	VLs	tokens result from prefixation or compoun- ding	*
VN	kom.pra	a.tún	VNs	four mono syllabic, root internal sequences; most tokens are the result of prefixation	*
VO	seg.men.to	e.dad	VOs	tokens are the result of prefixation	Greek, non- productive words
VGL	*	*	VGLs	*	*
VGN	tokens result from affixation or compounding	*	VGNs	*	*
VGO	*one token: awk.siljo	*	VGOs	*	*
GV	nwe.bo	a.pjo	GVs	fjes.ta	pwes
GVG	*	*only one token: bwej	GVGs	*	tokens result from suffixation
GVL	fwer.te	fjel	GVLs	*	*
GVN	sjem.pre	bwen	GVNs	*	*
GVO	tokens are the result of prefixation	*	GVOs	*	*
GVGL	*	*	GVGLs	*	*
GVGN	*	*	GVGNs	*	*
GVGO	*	*	GVGOs	*	*

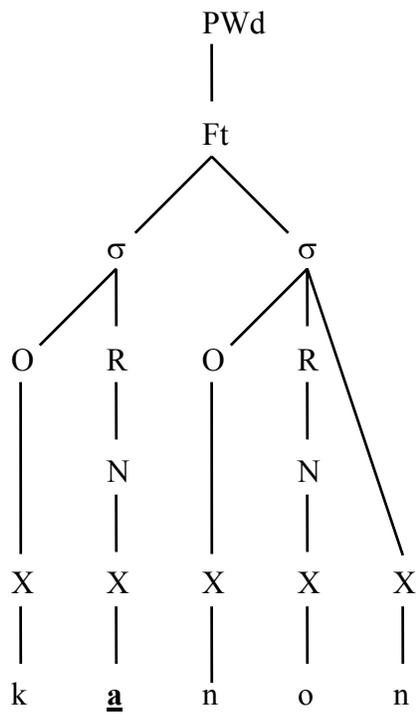
6. An alternative analysis. As was discussed in section 4, Spanish stress seems to assign extraprosodic status to /s/ and /n/, since both segments do not behave as “regular” codas and are invisible for effects of stress; however, it has also been said that the segments under consideration do not constitute a natural class to the exclusion of other coronals. Furthermore, /n/ behaves like a regular ERP, its marked status being systematically restricted to word edges; on

the other hand, /s/ is still a transgressor of universal rhyme constraints in *word-medial* VGs and VNs sequences, a pattern that calls into question the assumption that this segment is a regular ERP. The asymmetrical behavior of both segments needs to be captured in structural terms, crucially, in a representation different from the one provided in (22a).

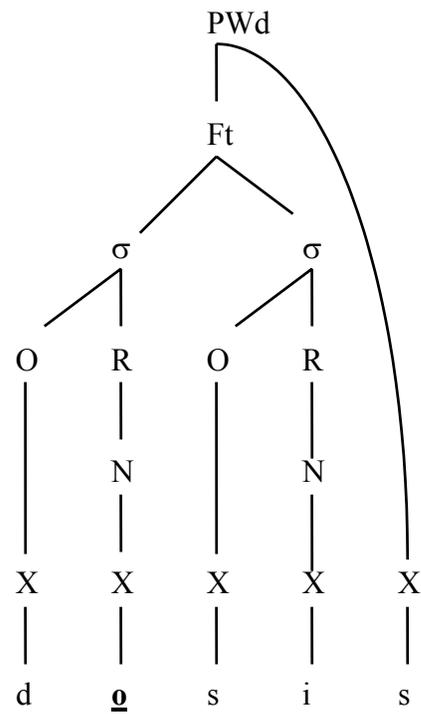
Before I proceed with my analysis, it is necessary to address the issue of ERP and appendix licensing. Goad (1998) points our attention to the fact that, in English, an additional position is available after an extrarhymal segment; this appendix is not only outside of the domain of the rhyme but it is also outside of the domain of the syllable. This special status is reflected in Goad's account by the fact that appendices never trigger vowel shortening when occupying the second position in a CC tautosyllabic "coda" cluster. Structurally, this difference is captured by the fact that, unlike ERPs, an appendix is a position directly licensed by the Prosodic Word.

Assuming the validity of this hypothesis, I will capture the differences between /s/ and /n/ in terms of different licensing mechanisms. It seems tempting at this stage of the analysis to assume that, when extraprosodic, /n/ is directly dominated by the syllable node, whereas /s/ occupies an appendix position and it is therefore licensed by the Prosodic Word. The representations below illustrate this analysis; (27) is included just to show the contrast between extraprosodic segments and regular codas (underlined segments are stressed):

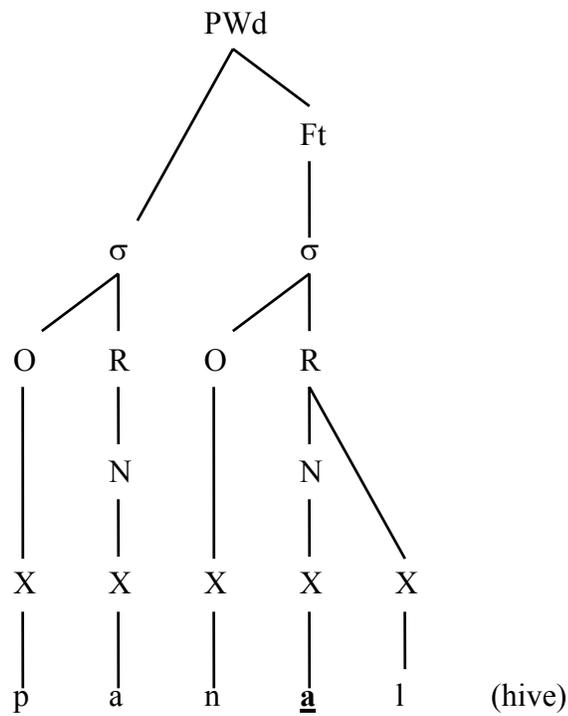
(25)



(26)

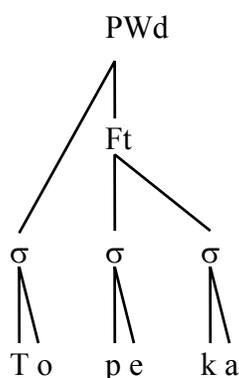


(27)

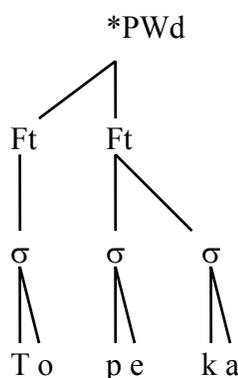


A careful reader will notice a pseudo-problem with the representations above, since phonological units are not always being directly licensed; this situation will allow me to introduce a looser notion of the Strict Layer Hypothesis, crucial for my present analysis. Itô and Mester (1992) seriously question the inviolability of this constraint on the basis of Japanese trimoraic word clippings. These authors suggest a weaker definition of layering that generates structures like the one in (28), which are preferred over those structures allowing degenerate feet, as depicted in (29):

(28)



(29)



As for the representation of word-internal, three-segmental rhymes in polysyllabic (> 2 syllables) items, a looser definition of the Strict Layer Hypothesis is also required. In line with the insights of Itô and Mester (1992), Goad (1998) points to the fact that in the definition of Prosodic Licensing offered by Itô (1986), phonological units are required to be prosodically licensed by a higher prosodic structure, not by a specific higher level unit; as Goad points out, the definition of prosodic licensing so stated “opens up the possibility of indirect licensing” (1998: 8). In fact, Selkirk (1996) presents a decomposed version of the monolithic definition of the Strict Layer Hypothesis. This revised proposal suggests that the original hypothesis ought to be factored out in a series of constraints on prosodic domination, reproduced in (30):

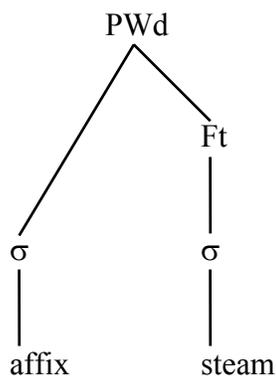
(30) *Constraints on Prosodic Domination* (where C^n = some prosodic category)

a) *Layeredness*: No C^i dominates a C^j , $j > i$, e.g. “No σ dominates a Ft”.

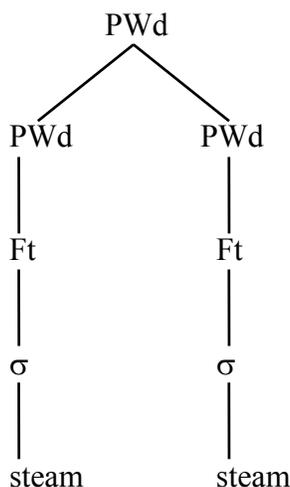
- b) Headedness:* Any C^i must dominate a C^{i-1} (except if $C^i = \sigma$), e.g. “A PWd must dominate a Ft”.
- c) Exhaustivity:* No C^i immediately dominates a C^j , $j < i-1$, e.g. “No PWd immediately dominates a σ ”.
- d) Nonrecursivity:* No C^i dominates C^j , $j = i$, e.g. “No Ft dominates a Ft”. (1996: 190).

Although the notion of constraints – at least within an OT framework – allows for their violability, Selkirk assumes that the first two given in (30) are universally inviolable constraints; on the other hand, both Exhaustivity and Nonrecursivity are susceptible to be violated. Transgression of the latter two constraints renders feasible the representations for instances of prefixation – as a consequence of violation of (30c) – and compounding – resulting from violating (30d). Both structures are instantiated in (31) and (32) below, respectively:

(31) Prefixation



(32) Compounding

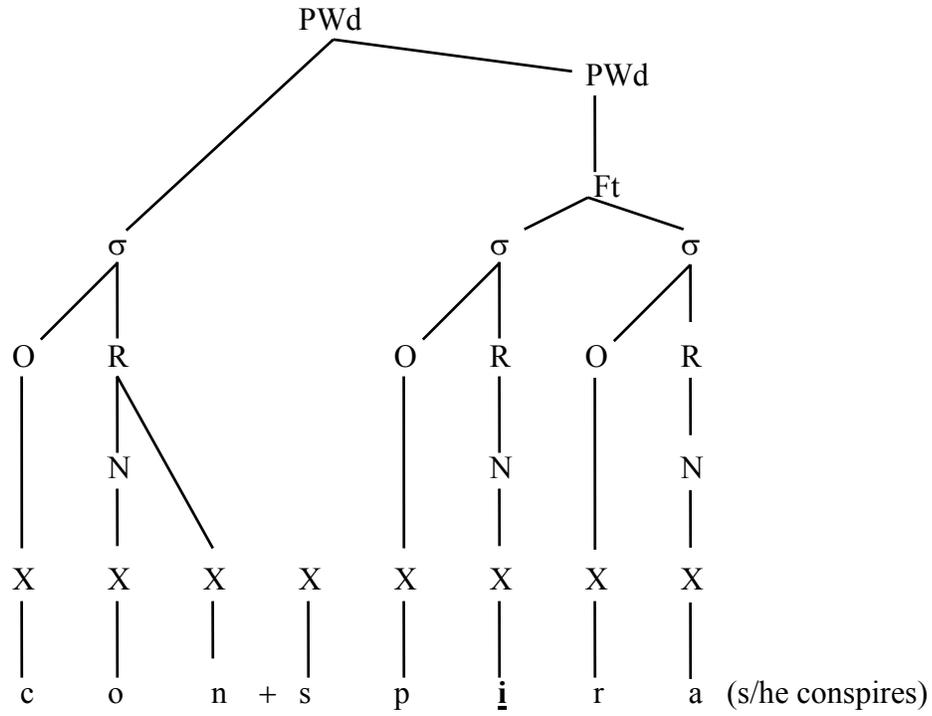


The representations provided in (34) and (35) below will correspond to the Spanish data reproduced in (33), as a consequence of the assumptions above (bold segments are stressed; “+” indicates morpheme boundaries):

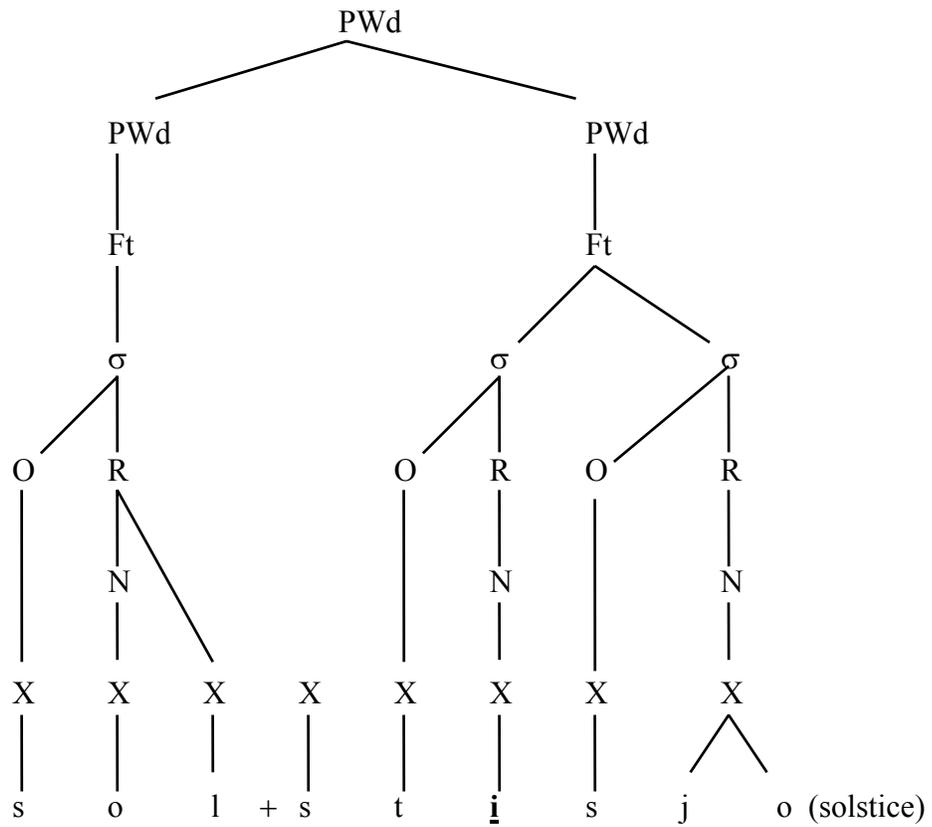
(33)

Prefixation	Compounding
<i>per-</i> (per + spektiba) <i>trans-</i> (trans + plantar) <i>con-</i> (con + spira) <i>abs-</i> (abs + traer) <i>ad-</i> (ad + scribir).	sol + stisjio

(34)

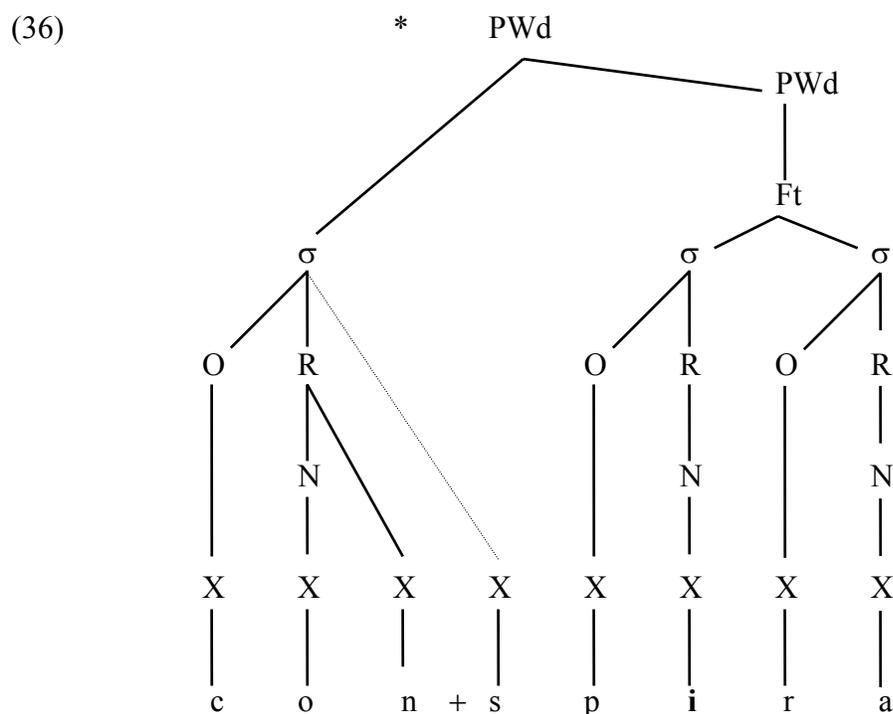


(35)

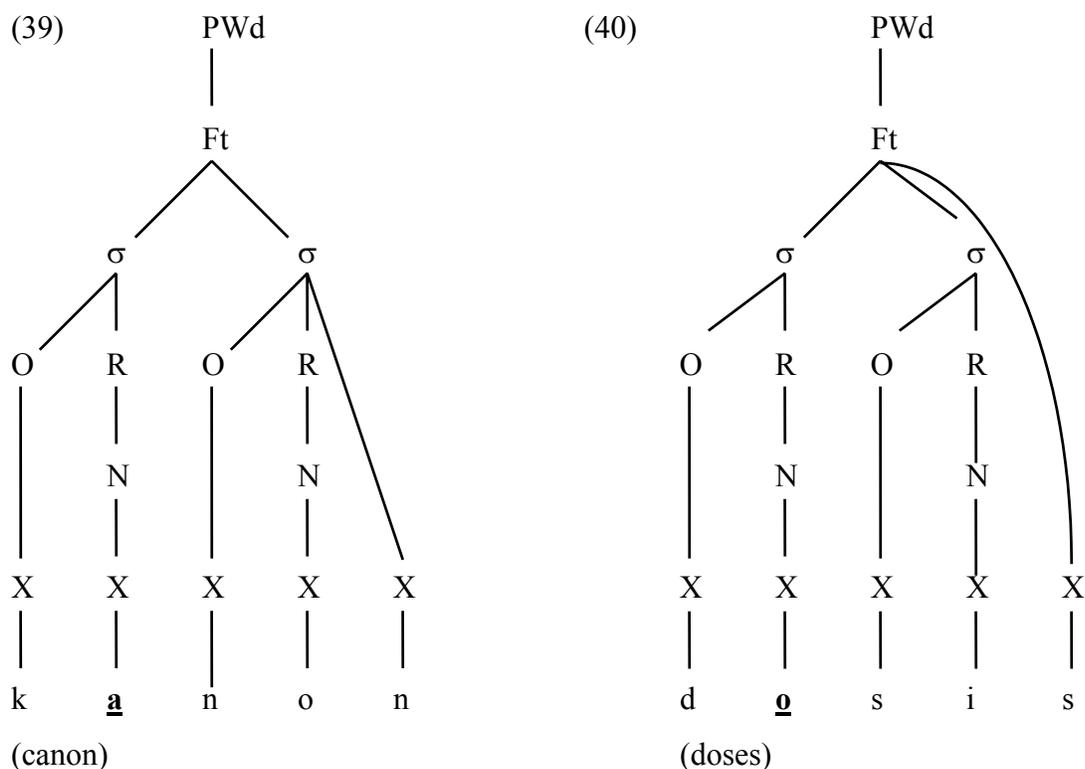


The stem initial /s/ in the representations above have been left stranded since it is crucial to establish the directionality of licensing at this point of the analysis. It seems tempting to look for a potential licenser within the domain of the stem; therefore, /s/ could potentially be licensed by any of the phonological units to its right (i.e. the onset, the syllable node, the foot, or the prosodic word). However, it is a well-known fact that Spanish bans sC clusters in domain-initial position (Harris, 1983); wherever such a sequence could potentially result, it is repaired by the insertion of an epenthetic vowel – always /e/: *skri.bir → es.kri.bir. Furthermore, morpheme boundaries do not necessarily have to coincide with prosodic boundaries (Nespor and Vogel, 1986); this assumption opens up the idea that the licenser to /s/ could be outside of its morpheme domain. Both in (34) and (35) above, the licenser should then be a phonological unit to the left of /s/.

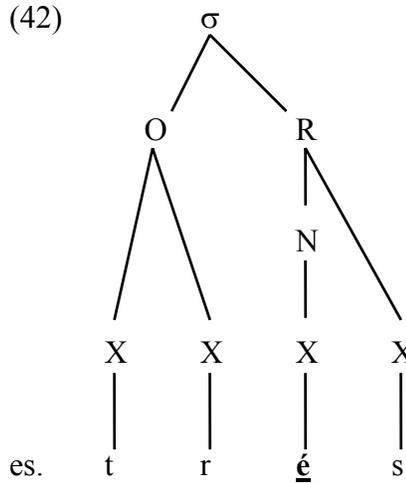
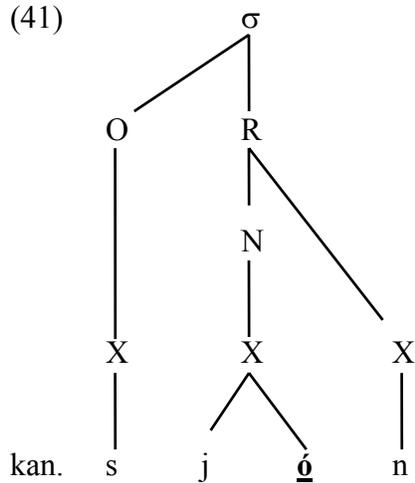
A potential analysis implies a movement towards a previous representation, where /s/ behaves as a regular ERP dominated by the syllable node. This, however, is a problematic move, since such a licensing relation is ignoring the asymmetrical behavior of /s/ with respect to an authentic ERP in Spanish, i.e. /n/. Moreover, as has been already discussed, ERPs are positions limited to word edges; therefore a representation like the one provided in (36) is ill-formed since it implies that ERPs are available word internally:



The licensing relation depicted in the representation above is in line with the loose conception of prosodic licensing found in Goad (1998); I will, therefore, assume that the existence of a segment is guaranteed by its being licensed by a higher prosodic constituent. ERPs are licensed by the syllable, Appendices by the prosodic word; there is nothing in the system that could prevent us from assuming that /s/ – as an extrasyllabic segment – is licensed by the foot. Consistent with the representation provided in (38), word-final extrasyllabic /s/ will be also dominated by the foot node. This reinterpretation of the facts, as well as the new contrast between ERPs and appendix-like positions in Spanish are represented in (39) and (40) below:



The representations above contrast with instances of both /n/ and /s/ displaying a regular coda-like profile. Compare the representations above with the ones provided in (41) and (42), where only the relevant structure is provided:



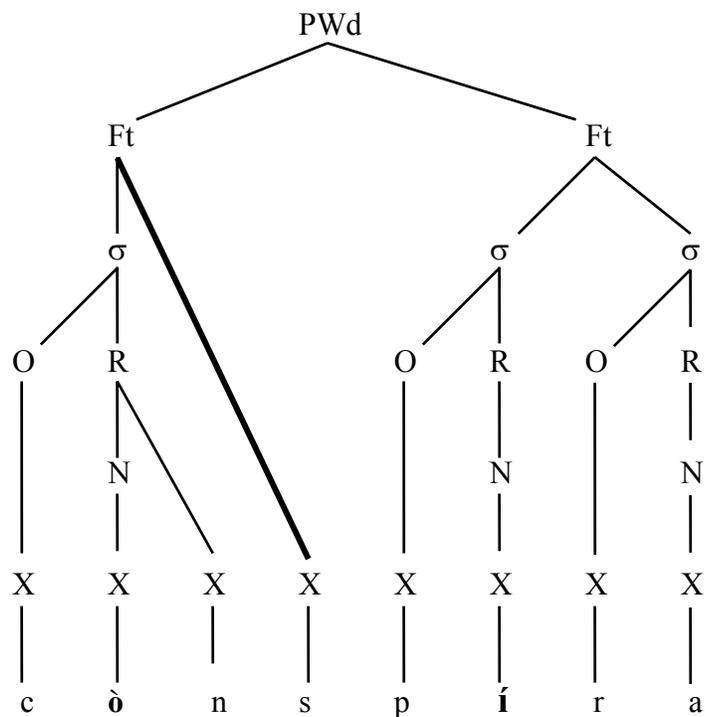
A new look at the cases of prefixation reveals that these data do not constitute a challenge for my analysis; as in the cases above, stress facts offer an alternative possibility for licensing. It is interesting to observe that native speakers of Spanish often simplify Cs clusters resulting from morpheme concatenation. This is a well attested phenomenon in the language under consideration, not only in dictionaries (VOX online dictionary provides both the complex and the simplified version of these rhymes), but also in prestigious grammars (Quilis, 1993). More strikingly, when those clusters are preserved, native speakers assign secondary stress to the relevant prefix; the data in (43) illustrate this pattern:

(43)

òb + skúro	c òn + spíra	s ùb + stánsja	à d + scribír
ì n + struír	è ks + ponér	trà ns + plantár	à bs + traér

The presence of secondary stress – as a result of the first consonant of the cluster being incorporated into the rhyme – provides to the stress bearing syllable the possibility of projecting a foot; as a consequence, an appendix-like position is available to the only segment in the Spanish consonant inventory that shows up in this position: /s/ – unsurprisingly. The representation provided in (36) is replaced by the one illustrated in (44):

(44)

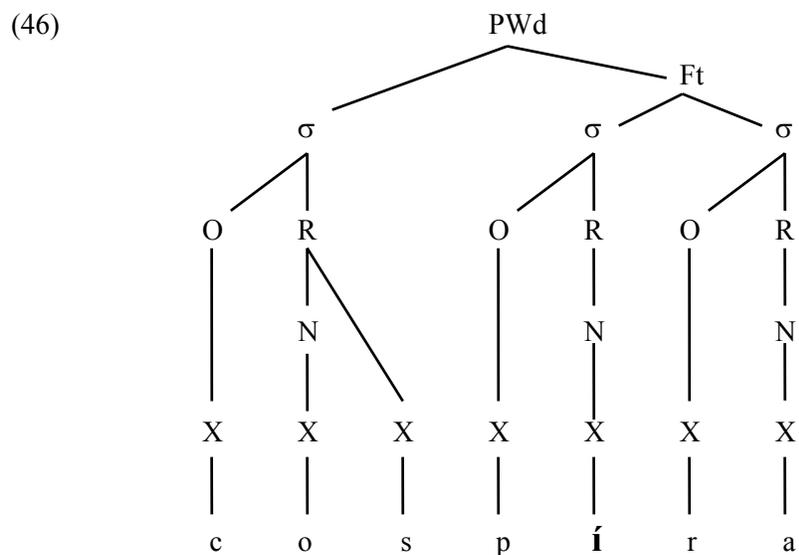


In contrast, when cluster simplification takes place, the word will retain only primary stress, a pattern illustrated in (45) below:

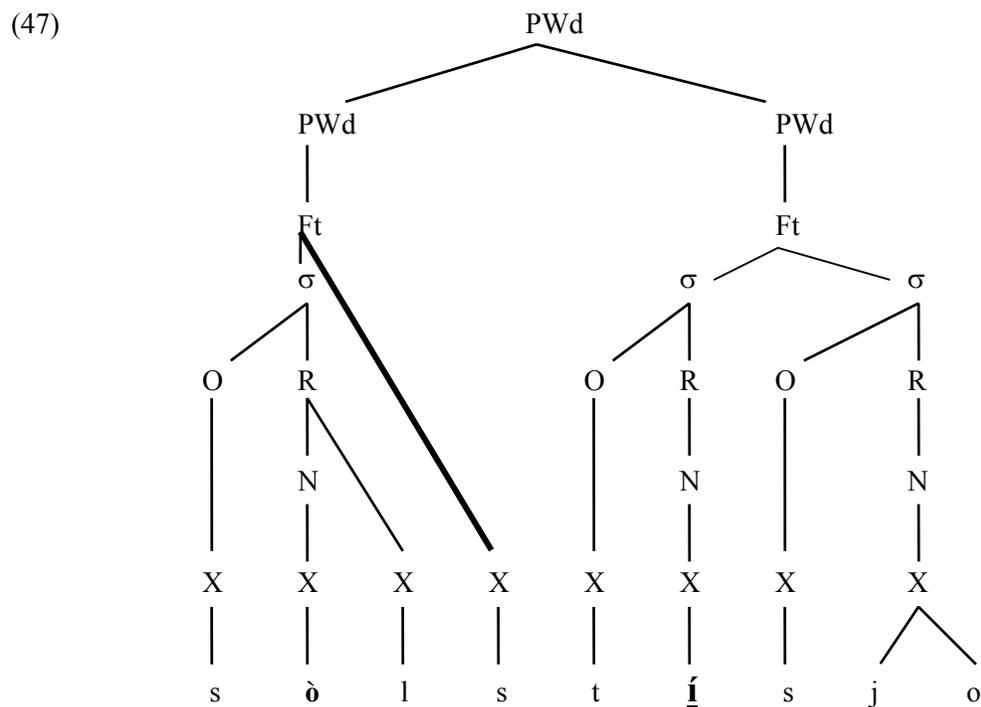
(45)

o ∅ + skú ro	co ∅ + spí ra	su ∅ + stá nsja	a ∅ + skribí r
----------------------------	-----------------------------	-------------------------------	------------------------------

Since secondary stress is absent in the prefix, this will no longer be able to project a foot. However, these instances of unstressed prefixes are not problematic, since it will always be the case that they will systematically correspond to cases of cluster reduction resulting in binary rhymes. The representation in (46) illustrates my point:



The case of a word-medial three-segmental rhyme in the compound referred to in (33) above can be reinterpreted in the light of these facts, since secondary stress is present in the first member of the compound (i.e. *sòl* + *stísjò*). As a consequence, the same licensing mechanism that accounts for three-segmental rhymes resulting from prefixation is at work in this case of compounding. (47) below shows how /s/ is licensed to its left by the foot of the previous prosodic word:



By incorporating stress and the notion of the foot as a viable licenser for /s/ in three-segmental rhymes, the analysis introduced above accounts for pseudo-problematic VGs (e.g. *klawstro*), VLs (e.g. *sòl + stísjø*), VNs (e.g. *còn + spíra*), and VOs (e.g. *àd + scribír*) word-internal sequences. In this sense, the present framework minimizes the role of stipulation required in previous analysis in order to account for apparent cases of ternary branching rhymes. There are, however, some areas of the data that remain problematic under the analysis just outlined; a discussion on this matter is the topic of the next section.

7. Residual problems. The analysis outlined in the section above seems to give an appropriate answer to the problematic cases of three-segmental Spanish rhymes. I should, however, point to the fact that its main advantage is, at the same time, its main potential weakness. Since I am assuming that word internal appendix-like /s/ is systematically licensed by a foot to its left, the availability of such a position greatly depends on the previous syllable being stressed. The examples of such a licensing mechanism described above are feasible due to the presence of *secondary stress* on the syllable preceding the extraprosodic /s/, at least in cases of prefixation and compounding. However, neither primary nor secondary stress seem to be present in some (approximately 11 items out of a total of 19) of the monomorphemic, word internal VNs and VGs rhymes. The relevant data is presented in (48) below:

(48)

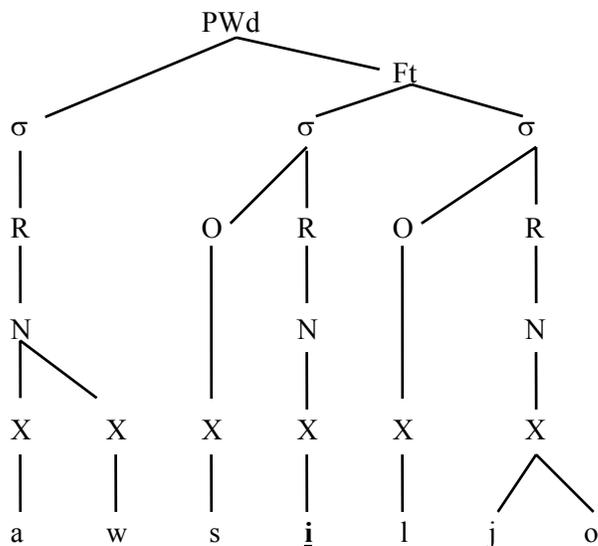
Monomorphemic, word internal VNs and VGs rhymes	
Stressed	Unstressed
móns.trwo “monter”	mens.trwál “menstrual”
kláws.tro “cloister”	mins.trál “mistral (wind)”
enkáws.te “red ink”	pre.mons.tra.tén.se “belonging to a monastery”
baláws.ta “balausta” (bot.)	aws.cul.tár “to auscultate”
pláws.tro “wagon”	aws.pi.sjár “to sponsor”
eksáws.to “exhausted”	aws.té.ro “austere”
káws.ti.ko “caustic”	aws.trál “austral”
fáws.to “splendor”	pleis.to.sé.no “pleistocene”
	klejs.tó.ga.mo “cleistogamic”
	ba.raws.tár “to aim”
	pro.se.lews.má.ti.co “proceleusmatic”

The representation for these words is problematic given the analysis assumed above, and at this point I am being tempted to accept them as aberrant sequences entered as such in the Spanish lexicon; giving up an analysis that is able to account for almost the entire data just because of these 11 oddities would be like throwing the baby out with the bath water.

Also problematic is the analysis of the only instance of a VGO (where $O \neq /s/$) word internal rhyme, i.e. **awk**.si.ljo. Here secondary stress is irrelevant, since even if it were present, grouping /k/, a velar, with /s/ as the only instances of extraprosodic consonants licensed by the foot, would be even worse than the original assumption where /n/ and /s/ - both coronals - were grouped together. However, it is worth noticing that native speakers systematically reduce the aberrant cluster by applying /k/ deletion, in casual style. Assuming that this is the correct surface manifestation of the word *auxilio*, then the representation in (49) is not problematic for my analysis:¹¹

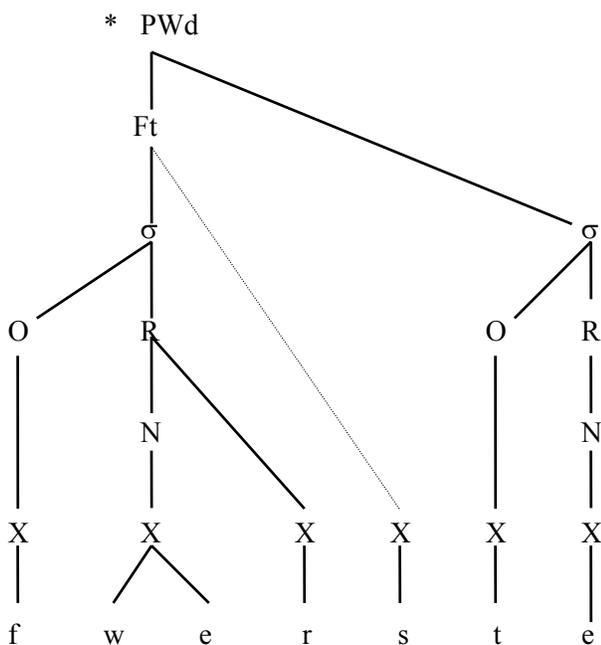
¹¹I have already discussed that the status of post-vocalic glides and consonants (other than /n/ and /s/) as mora bearing units (MBU), is debatable in Spanish. For the representation in (49), I could have assumed that the post-vocalic glide behaves as an MBU, allowing for the syllable to project its own foot. However, I will assume that the segments under discussion cannot be said to be MBU unless there is evidence that the syllable that contains them actually attracts either primary or secondary stress.

(49)



A further residual problem comes from the fact that the present analysis still predicts rhyme sequences not attested in Spanish, although their representation does not violate any of my assumptions. As shown in (13) and (24), GVL, GVN, and GVO are perfectly well formed and well established word medial rhymes. However, the representation of a word like *fuerte* “strong”, leaves room for a potential instance of appended /s/, as (50) illustrates:

(50)



If one is to pursue a more constrained account of the facts, it is necessary to find a structural way of representing the absence of word-medial GVCC sequences, like the hypothetical representation provided above. I will, however, ignore it for the time being, since I believe that the answer to this puzzle requires further research on the representation of rising diphthongs, a subject for future personal work.

GVG and GVGs rhymes are also problematic. In the first case, the skeletal representation assigns – under the standard assumption – only two slots to the three-segmental sequence; therefore, no further machinery is required in order to guarantee their well-formedness. However, as discussed in sections 2 and 5, not a single instance of such a rhyme in word medial position is attested in the native lexicon; in word final position, such a rhyme sequence is restricted to a single instantiation. With respect to GVGs rhymes, their absence in word medial position contrasts with the presence of such a sequence at word edges. In the former context, their presence should be expected at least in stressed syllables, since the foot projected constitutes a potential host for the fourth segment, /s/. Why, then, does Spanish lack instances of both rhymes? It has been suggested (Heather Goad, personal communication) that tautosyllabic, three segmental vowel sequences are disfavored cross-linguistically; therefore, the absence of GVG(s) rhymes is due to phonotactic restrictions (i.e. a bad sonority profile resulting from the presence of three vocalic nodes in a row), rather than to a violation of universal syllable structure.

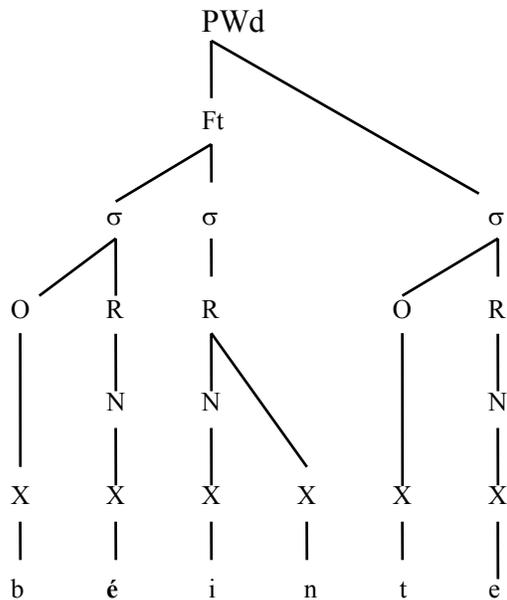
A final puzzle comes from the analysis of word internal VGN rhymes. These sequences are the result of morpheme concatenation, as the data in (51) shows:

(51)

a)	b)
be “two”+ in.te “10 times X”	re + in + skri.bir “register again”
tre “three” + in.ta “10 times X”	co + in + si.dir “to coincide”
	pre + in + sta.lar “to install in advance”

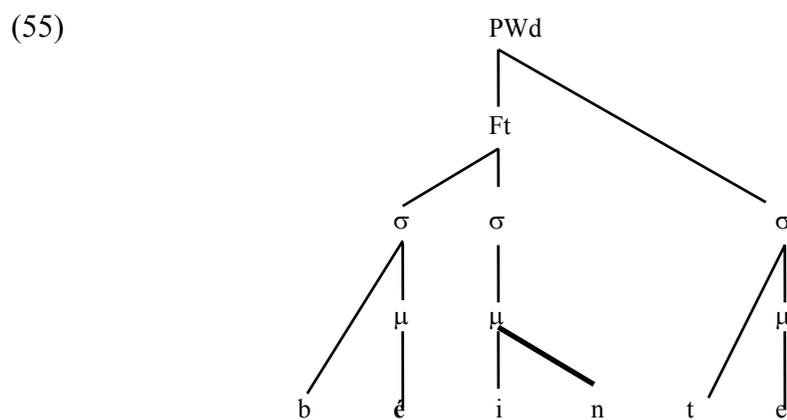
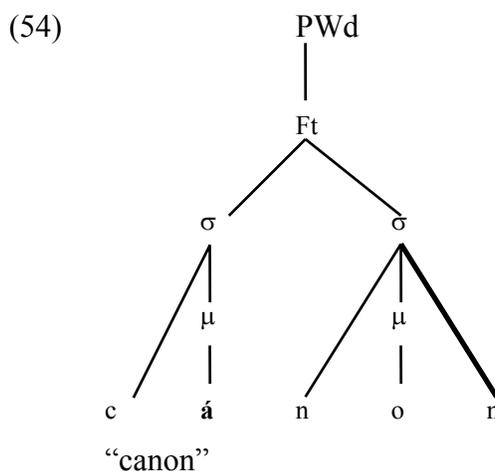
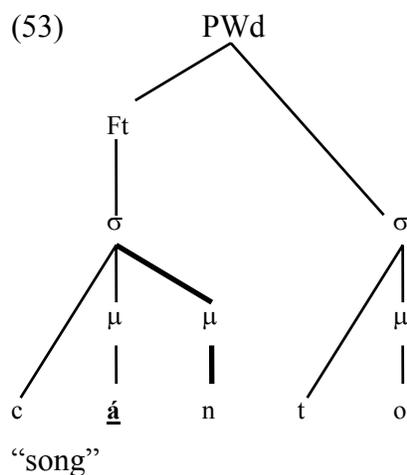
At the lexical level, rhyme binarity is respected in all cases. Primary stress is assigned post-lexically to the root vowel in column (a); since stress is initial, the final syllable has to be exceptionally extraprosodic. The resulting foot is illustrated in (52):

(52)



The problem with the representation above has to do with the fact that the foot so constructed is headed by a light (L) syllable (bé), and has as a dependent a heavy (H) one (in). In order to avoid a LH profile, we should have to assume that the coda in the heavy syllable is actually weightless. Unfortunately, this will lead to the assumption that within the very same language, a segment can bear weight and attract stress (53), can be extraprosodic at word edges and be invisible for stress assignment (54), and be invisible word internally for stress assignment by virtue of its lacking weight (55); the representations below assume moraic theory merely for expository reasons:¹²

¹²In anticipation to the comments in my conclusion, I do not feel at this point the need to attach to either an Onset/Rhyme or Moraic framework for my representations. I deeply believe that more research on stress patterns in Spanish is required before any choice is made.



The situation with the items in (51b) is similar. Secondary stress is required on the leftmost prefix in order for /s/ to have an appropriate licenser, i.e. the foot to its left. However, the latter will again require the /n/ of the second prefix to be weightless, in order to avoid the LH foot profile.

8. Conclusion and lines for further research. The analysis proposed in section 6 presents an account of rhyme restrictions in Spanish that is derived from universal constraints on syllable structure, setting aside stipulation altogether. The introduction of the concept of word medial extraprosodicity seems to be justified, given the status of /s/ – the appendix-like segment – in another area of Spanish phonology, namely, stress assignment; furthermore, the asymmetric behavior of /s/ with respect to /n/ – a regular ERP – in word internal three-segmental rhymes, accounts for the different licensing mechanisms for both segments introduced above. This

assumption, along with the reinterpretation in section 5 of the original rhyme survey presented in Harris (1983), provides a set of representations that meet the requirements of a theory of syllable structure in prosodic phonology.

As the discussion in section 7 shows, the representation of light diphthongs assumed in my analysis is problematic given the unexpected gaps in the data. The cases under consideration strongly suggest that more research is required on the actual structure of light diphthongs crosslinguistically. Spanish stress patterns also require deeper study, especially in the area of secondary stress. These two topics will be the subject of future personal research.

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