

SPANISH TAPS AND TRILLS: PHONOLOGICAL STRUCTURE OF AN ISOLATED OPPOSITION

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ABSTRACT

The Spanish opposition of a tap [r] and trill [R] is unusual in several respects. Most contemporary phonological analyses postulate a single phoneme /r/, deriving the phonologically distinctive intervocalic trill from geminate /r-r/. This type of analysis fails to address several important issues. These include the fact that [r] is the only Spanish consonant which occurs onset-initially in word-internal position but cannot occur word-initially, and the fact that the intervocalic trill [R] is clearly onset-initial, thus requiring a derivation which radically changes the syllabic structure from an underlying heterosyllabic geminate to a superficial onset-initial trill. In the present study an attempt is made to unify surface [r] and [R] via reference to syllabic templates, which allow a maximum of two consonantal elements in the onset. Manifestations of [R] are analyzed as maximizing the syllabic template, while intervocalic [r] is derived from a more marked underlying structure, preattached to the prosodic skeleton. Non-preattached /r/ is expanded to a dual structure, which ultimately produces [R], in appropriate contexts. The relatively marked nature of the [r]-[R] opposition is demonstrated, and it is claimed that this opposition is not a carryover from Latin quantitative distinctions.

0. INTRODUCTION

While a majority of the world's languages have at least one rhotic phoneme, relatively few contain two or more, and even fewer oppose rhotic phonemes realized as flaps/trills solely on the basis of quantity: one vibration vs. several. A noteworthy exception to this trend is the subset of the Romance languages which includes Italian and the Ibero-Romance languages, apparently

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continuing an opposition already found in Latin. In Latin and Italian, quantitative differences among other consonants are well established, but in Ibero-Romance they have disappeared. Thus the analysis of a relatively uncommon opposition promises to be of theoretical significance. The present study examines data from Spanish, although many of the observations also apply *ceteris paribus* to other Ibero-Romance languages. Despite the detailed analysis of a specific test case, many of the conclusions extend beyond the Romance languages, and suggest a possible basis for the existence of a marked opposition in languages lacking a systematic quantitative distinction among less marked consonants.

Spanish possesses two rhotic phones, the single [r] (one tap) and a trill which will be designated as [R] (more than one vibration), which define numerous minimal pairs such as *cero* 'zero' vs. *cerro* 'mountain'.¹ Contemporary phonological analyses have dealt with this opposition either by postulating two phonemes, or by analyzing intervocalic [R] as dual /rr/. The present study offers an alternative analysis which has the additional advantage of accounting for a number of regional and occasional variants. Sections 1 and 2 present the basic data, including ambiguities in the analysis of [R]; Sections 3 and 4 summarize and evaluate recent analyses; Section 5 proposes that surface occurrences of [R] be analyzed in terms of syllabic templates; Sections 6 and 7 treat 'strengthening' of /r/ to [R] as adjunction of a slot to the syllabic template; Section 8 analyzes distinctive intervocalic [r] as a relatively marked case arising from lexical preattachment; Section 9 deals with regional variation in the pronunciation of [R]; Section 10 discusses apparent accentual restrictions, and Section 11 summarizes the results.

¹ Exceptional cases of partial erosion of the distinction between [r] and [R] are found in certain areas where African influence was pervasive (Granda 1969, 1977; Lipski 1984, 1985a, 1985b; Megenney, forthcoming; Montes Giraldo 1974; Núñez Cedeño 1987).

The ostensibly quantitative nature of the opposition [r]-[R] is unique within Spanish.² Other characteristics relevant to the present study include:

(1) Of all the consonants of Spanish, only [r] cannot appear word-initially. Only [R] appears in this position. The opposition [r]-[R] is operational only in intervocalic position.

(2) Only [R] occurs in syllable-initial postconsonantal position (e.g. *honra* [on-Ra] 'honor'). Only [r] can occur as the second element of the syllabic onset (e.g. *tres* 'three'), while in the syllable rhyme, [r] is more frequent, but [R] is possible as an emphatic or regional variant.

(3) Spanish phrase-level phonology includes a rule of resyllabification, in which a word-final consonant followed by a word-initial vowel is reattached to the onset of the following syllable. This, coupled with the fact that all Spanish consonants (except [r]) can occur word-initially, usually results in the phonetic obliteration of identifiable word boundaries in connected speech.³ When compounds are formed in which word-initial [R] is preceded by a vowel, the trill is retained: *Puerto Rico/puertorriqueño* 'Puerto Rico/-an.' However, word-final /r/, which may optionally be reinforced to [R] in emphatic speech, appears only as [r] when followed by a word-initial vowel (cf. Pensado 1984 for apparent counterexamples, which however involve spelling pronunciations

² Most available evidence suggests that in Latin, the distinction between the sounds represented by the graphemes *r* and *rr* was not the same as that existing in modern Spanish. It is frequently supposed that Latin *r* was a trill; *rr* may have been a substantially longer trill (a highly marked possibility), or the phonemic difference may have been reflected in the length of the preceding vowel; cf. Allen (1978: 32), Lindsay (1894: 90-109), Sturtevant (1975: 150-151), Lloyd (1987: 243-245).

³ The case of the velarization of word-final /n/, common in many dialects, provides a partial exception to this trend, since the single velar nasal [ŋ] occurs neither word-initially nor intervocalically in Spanish. The syllabification of word-final velarized /n/, which becomes putatively syllable-initial when followed by a word-initial vowel, is the subject of ongoing research in Spanish phonology, and is a prime candidate for true ambisyllabicity, a concept with a very debatable existence in other aspects of Spanish.

of foreign words ending in orthographic *-rr*). Thus [VrV] can never be analyzed *[V#rV], although it is indisputably syllabified [V-rV], and the non-occurrence of [r] in word-initial position represents a break with the otherwise exceptionless correlation between possible word-initial consonants in Spanish and possible syllable onsets (cf. Kahn 1976; Clements and Keyser 1983; Picard 1987; Vennemann 1988: 32).

(4) [r] exhibits different allophonic variation from that characterizing [R] (cf. Canfield 1981).

(5) Despite the fact that [r] may reinforce to [R] in the syllable rhyme, none of the other modifications affecting word-initial or intervocalic [R] occur in the rhyme.⁴

2. AMBIGUITIES IN THE ANALYSIS OF [R]

2.1. The trill [R] appears at times to group with single phonological units, and at other times with clusters. Among characteristics of [R] which suggest a 'dual' analysis as a cluster are:

(1) [R] is excluded from the final syllable of proparoxytones (e.g. *chinchorro* 'trawling net,' is a possible word, but not **chínchorro*; cf. Harris 1983: 68; cf. Pensado 1984 for possible counterexamples). It is well-established (cf. Harris: 1983: 12; García Bellido 1983) that antepenultimate stress is not allowed in Spanish words whose penultimate syllable contains a branching rhyme (**teléfosno*, **teléfono*, **teléfaino*), thus suggesting an analysis of [R] as heterosyllabic /r-r/.

(2) An argument in favor of a dual analysis for intervocalic [R] as /r-r/ comes from a subset of future/conditional tense stems in which vowel elision in the context /rVr/ results in [R]: *querer* + á > *querrá* 'he will want,' etc. (Harris 1983: 69). In popular speech of many regions, it is not unusual for this [R] to emerge as [dr]: *quedrá* or even metathesize to [rd] (cf. Rosenblat 1946: 234; Vidal de Battini 1949: 128; Espinosa 1946: 93). Combinations such as *[dR], i.e. containing a trill following the intrusive obstruent,

⁴ A partial exception is the groove fricative pronunciation [ž] in much of highland Ecuador, which not infrequently occurs in prepausal contexts, and may even carry over to word-final prevocalic positions (*ir ahora* [izaora]).

never occur, thus suggesting a simple replacement. Moreover, syllable-initial [R] is at times pronounced as [dr] (e.g. Alonso 1967: 148-9), and syllable-initial [dr] may be realized as [R] (e.g. Oroz 1966: 110). The 'intrusive' consonant is onset-initial (as is the original [R]). Similar behavior occurs in onset-initial postconsonantal position, where an intrusive obstruent is sometimes observed in words like *Enrique* [en-dri-ke] 'Henry,' in which case a trill is disallowed (e.g. Alonso 1967: 139-4). Once more, the intrusive consonant is onset-initial, reflected by the uniformly occlusive pronunciation after the syllable-final nasal, and by the homorganic (dental/alveolar) pronunciation of the rhyme-final nasal.

2.2. Characteristics of [R] which circumstantially suggest analysis as a single phonological unit include:

(1) [r] may optionally reinforce to [R] in the syllable rhyme, either rhyme-finally (*fuerte* 'strong') or (occasionally) preconsonantally (*superstición*). Spanish contains a 'three-segment rhyme rule' (Harris 1983:10), which excludes rhymes containing more than three elements: *supuesto* 'supposed,' vs. **supuersto*; this suggests that in the rhyme, optional reinforcement of [r] to [R] does not increase the number of elements on the skeletal tier.

(2) In a similar fashion, two-consonant rhyme clusters are permitted word-internally only by adjunction of /s/ to the right of an already existing consonant (Harris 1983: 28); thus a combination such as /-rr/ in the syllable rhyme would violate a combinatorial restriction. Moreover, no two-element consonant clusters are permitted word-finally in native Spanish lexical items; thus word-final /-rr/ would also potentially violate this restriction.

(3) In the syllable onset, Spanish routinely permits clusters of the form /Cr/ only when C is an obstruent. Thus a combination such as /rr-/ would violate general restrictions on possible syllable onsets.

3. CONTEMPORARY ANALYSES OF SPANISH [r] and [R]

Phonological analyses of Spanish [r] and [R] have not been uniform in their treatment of phonological structure, nor of the features which distinguish the two units (cf. Brakel 1983). Most

recent studies postulate a single element /r/ at the phonological level, analyzing 'phonemic' [R] as a double or geminate /r/. This avoids the distributional irregularities and unexplained gaps that result by considering [R] as a unitary element on the timing tier (cf. Cressey 1978: 38-9). Harris (1983: 62-71) offers a rule strengthening word-initial /r/ to [R]; similar rules strengthen /r/ in onset-initial postconsonantal position, and optionally in the syllable rhyme:

$$(2) \quad r \rightarrow R / [+cons] \text{ ___}$$

|
R(hyme)

$$(3) \quad r \rightarrow R / X [\text{ ___ } ,$$

where X ranges over all word-level syntactic categories;

$$(4) \quad r \rightarrow R \quad (\text{in emphatic speech})$$

|
R(hyme)

In the case of intervocalic [R], where a phonological opposition with [r] exists, a solution is proposed based on the analysis of [R] as heterosyllabic /r-r/.⁵ First, rule (2) applies to the 'second' /r/, yielding [R]; the first /r/ is then deleted by another rule which automatically turns the combination /r+/rr/ (as in *ver Roberto* 'to see Robert') to a single [R]:

$$(5) \quad r \rightarrow \emptyset / \text{ ___ } R$$

4. SHORTCOMINGS OF CURRENT ANALYSES

Rule (5) is primarily a phonetic facilitation rule, which ensures that no additive properties obtain when a single tap is combined with a trill (2 or more vibrations). As such, (5) is probably superfluous, since no known language permits distinguishing trills by number of vibrations, nor permits phonetic combinations such as [rR] (cf. Catford 1977: 130).

⁵ An identical solution has frequently been proposed for (Brazilian) Portuguese [r] and [R], over the last several decades; cf. Brakel (1974) for a summary of some of these accounts.

As currently stated, (5) makes no reference to prosodic or syllabic structure, and yet by default a syllable boundary must intervene between the [r] and the [R]. Viewed in this fashion, (5) induces a reorganization of the skeletal tier, delinking (and subsequently eliding) a C-slot, and creating an open syllable in the process.

5. [r] AND [R] VIS-À-VIS SPANISH SYLLABIC TEMPLATES

There is a direct correlation between the duration of Spanish rhotic elements and the combinatory possibilities of the slots in which these elements occur. Only [r] occurs, never [R], as the second element of a syllabic onset, which in accordance with Spanish syllabic templates contains a maximum of 2 elements (Harris 1986; Núñez Cedeño 1985, 1986a). Word-initially, as well as onset-initially following a consonant, [R] occurs, again in keeping with syllabic templates which allow a maximum of 2 elements in onsets, the second of which must be a liquid.⁶ The maximal expansion of the syllabic template is realized; i.e. one slot in the case of the second member of a syllable onset, and two slots in the case of onset-initial [R] (word-initial and postconsonantal).

6. THE SPECIAL CASE OF RHYME-/WORD-FINAL [r]

6.1. Spanish exhibits asymmetrical behavior of syllabic rhymes, which word-finally have a maximum of one consonant, and word-internally have a maximum of two consonants, the second of which

⁶ This assumption must be qualified, since Spanish permits no onset-initial clusters beginning with [r]. This follows from the hierarchy of sonority, which requires an ascending value of sonority in the onset. Harris (1983: 34-5) has proposed that filters on possible syllable onsets are based on a requirement of dissimilarity, which would also rule out *rl-, without requiring that the second element have a higher degree of sonority than the first. Finally, there is a not inconsiderable body of evidence which regards single [r] as an obstruent, in which case *rr- would be a theoretically possible onset. Confusion is introduced by the Spanish orthographic representations: a trill is under no circumstances a 'long' [r], in that it is physiologically impossible to pass continuously from a series of [r]'s, articulated individually with ever increasing speed, to [R].

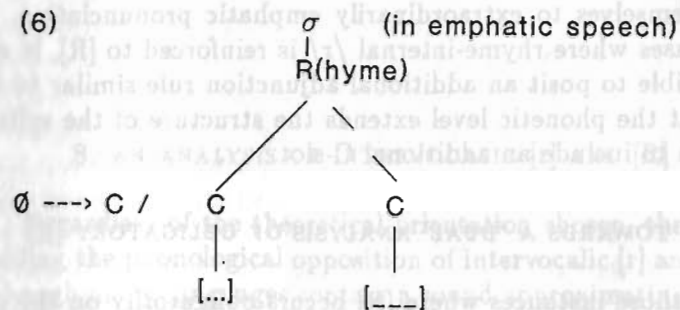
must be /s/ (*obstáculo* 'obstacle,' *solsticio* 'solstice,' *instante* 'instant,' *extra*, *perspectiva* 'perspective'). The exclusion of two-element word-final consonant clusters appears to be partially due to historical accident, and Latinate words (e.g. *Félix*, *bíceps*) and other borrowings, including names of Catalan origin (e.g. *vals* 'waltz,' *Magrans*, *Fornells*, *Benidorm*) are accepted by native Spanish speakers without difficulty. This suggests that the maximal syllabic template for Spanish is potentially operative in word-final position as well as word-internally.⁷

6.2. I suggest that emphatic reinforcement of word-final [r] to [R] represents a maximal utilization of the two potential C-slots in the syllabic rhyme.⁸ A proposal for treating an emphatic word-final consonant as a geminate appears to run against constraints which require two-element consonant clusters in the syllabic rhyme to end in /s/. Two possible answers immediately suggest themselves. The first is that syllable-building rules apply at deep phonological levels, and are demonstrably cyclic. Phrase-final emphatic lengthening/strengthening, on the other hand, is a non-cyclic rule which applies after all fully formed syllables are in place, and thus need

⁷ In nonstandard Dominican Spanish, where hypercorrect /s/ is frequently introduced nonetymologically in accordance with the general syllabic template (e.g. *yo* > *yos* 'I,' *fino* > *fisno* 'fine'), it is not infrequent for the intrusive /s/ to occur after a word-final consonant (*desviar* > *desviars* 'to divert'; cf. Núñez Cedeño 1986b, 1988).

⁸ This reinforcement may also affect other word-final consonants. For example, in dialects where syllable-final /s/ is weakened, it is common for this /s/ to be restored in emphatic speech, frequently in an exaggerated form which at times is reflected in popular literature (e.g. *muuuchas graciasss* 'thank you very much' as used by the Cuban writer Cabrera Infante 1971). Spanish speakers from these dialects refer to highly prominent [s]'s as *arrastradas* 'dragged out,' indicating subjective perception of lengthening. In a few Spanish dialects (e.g. Panama and Cartagena, Colombia; cf. Alvarado de Ricord 1971, Becerra 1985: 123), phrase-final /d/, normally given a weak fricative pronunciation or elided, is realized as [t] in emphatic speech. This may conceivably be analyzed as a gemination of /d/ in the syllabic rhyme, whose voicelessness is attributed to a common pattern of devoicing phrase-final syllables in emphatic speech, and which spreads leftward to the 'original' slot, thus resulting in a voiceless stop [t]. A similar process also results in syllable-final /b/ and /g/ emerging as [p] and [k] in emphatic speech: *digno* [dik-no] 'worthy,' *obtener* [op-te-ner] 'to obtain' (cf. Becerra 1985: 185).

not be subject to constraints on syllable building.⁹ It may also be the case that lengthening/gemination does not violate syllable-building rules because gemination is effected via adjunction of a completely unspecified skeletal slot. The features of the original matrix percolate to the empty slot through autosegmental spreading, again at a level which does not interfere with co-occurrence restrictions defined at deeper levels. The basic rule of unspecified slot-adjunction is:



Features spread rightward from the already filled matrix, while both universal and language/dialect-specific processes shape the output to produce a wide variety of emphatic speech phenomena.¹⁰

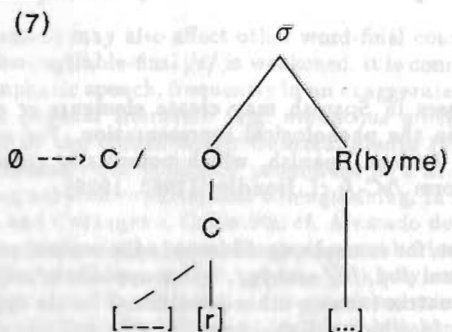
⁹ Other low-level processes in Spanish may create elements or even groups which are prohibited in the phonological representation. For example, unstressed vowel loss in Andean Spanish, which potentially creates syllable-initial clusters of the form /sC-/; cf. Hundley (1983, 1986).

¹⁰ The presence of this slot, for example, could impede the normal process of spirantization of rhyme-final /b/, /d/ and /g/, which appears to require contact with a heterogeneous matrix (among other conditions) for its application. In those Spanish dialects in which syllable-final /r/, /l/ and occasionally /s/ elide after gemination of the following consonant, the resulting geminate is usually a stop: *algo* [ag-go] 'something,' *verdad* [bed-dá] 'truth,' *curva* [cub-ba] 'curve' (Harris 1985; Guitart 1982). The retention of occlusivity occasionally happens even when no superficial geminate consonant appears. For example, the Las Palmas dialect of Canary Island Spanish is noted for pro-

6.3. The problematic case is rhyme-internal [r], as in *perspectiva*, which presumably can be lengthened to [R] in emphatic speech. As noted by Harris (1983: 65–66), positing /rr/ for [R] in this position would lead to a four-element rhyme, also a violation of the limitation of rhymes to three elements. Once more this objection may be met in one of several ways. Spanish contains very few words with /rs/ in the syllable rhyme (García Jurado 1985: 143 places the estimate at around .001%), and it is unusual for this [r] to be realized as [R], in contrast with syllable-/word-final [r]. Most of the words in question are semi-erudite, and do not lend themselves to extraordinarily emphatic pronunciation. In those cases where rhyme-internal /r/ is reinforced to [R], it may be possible to posit an additional adjunction rule similar to (6), which at the phonetic level extends the structure of the syllabic skeleton to include an additional C-slot.

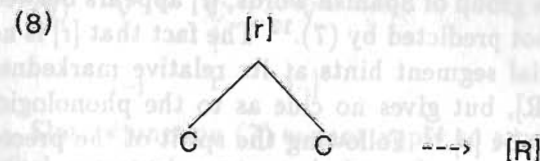
7. TOWARDS A 'DUAL' ANALYSIS OF OBLIGATORY [R]

In those instances where [R] occurs obligatorily on the surface (word-initially and onset-initially following a consonant), it is proposed that the phonological representation contains a single skeletal slot, linked to the features that define /r/. An independent rule then adjoins another skeletal slot to the left of the slot dominating /r/, just in case the syllabic template is not already filled:



nunciation of the combinations /sb/, /sd/ and /sg/ as [b], [d], [g], respectively, thus forming minimal pairs such as *la vaca* [labaka] vs. *las vacas* [labaka] 'the cow(s)' (Trujillo 1980, 1981; Almeida Suárez 1982; Oftedal 1985).

The adjoined matrix is filled in through autosegmental spreading. A phonetic interpretation rule will convert the dually-linked structure to the trill [R]:



8. AN ANALYSIS OF INTERVOCALIC [r] AND [R]

8.1. Regardless of the theoretical orientation chosen, there is no avoiding the phonological opposition of intervocalic [r] and [R].¹¹ Although many languages contain a sound approximating [r], relatively few oppose [r] and [R] in intervocalic position, or present allophonic variation similar to that found in Spanish (Brakel 1983, Maddieson 1984, Lindau 1985, Crothers et al. 1979). It is not infrequent for intervocalic alveolar/dental stops [t]/[d] to be opposed to a flap/trill which is variably single or multiple (e.g. some dialects of Scottish English; Aitken 1984: 102, Wells 1982: 410). A parametric difference may exist among languages containing a tap/trill, as to the default expansion (attached to one or two skeletal slots). In Spanish, I have claimed that the default result (onset-initially) is a dually linked [R], arising from a single fea-

¹¹ The following argument has been offered: word internally, intervocalic [r] is linked to a single skeletal slot, while intervocalic [R] is linked to two skeletal slots, a reflection of its original putatively geminate status in Latin (cf. Núñez Cedeño 1988: 330). By making a one-to-one assignment between intervocalic [r] and a single timing slot in the syllabic onset, the fact remains that a consonant which cannot occur word-initially is possible as a word-internal syllable onset. Implicit in the analysis of Harris (1983) is the claim that [r] is possible as a syllabic onset between vowels (word-internally) but not postconsonantly or word-initially (regardless of the presence or nature of the preceding segment). No other Spanish consonant exhibits this type of alternation.

ture matrix at the phonological level. A language such as Scots English (where there is no flapping of intervocalic /t/ and /d/) apparently uses a single (flapped) [r] as the default, with expansion to a dual structure possible as an option.

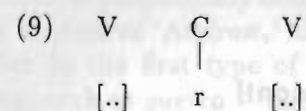
8.2. In a rather large group of Spanish words, [r] appears between vowels in a fashion not predicted by (7).¹² The fact that [r] is not a possible word-initial segment hints at its relative markedness as compared with [R], but gives no clue as to the phonological structure of intervocalic [r].¹³ Following the spirit of the preceding analysis, a possible sequel might be based on the observation that a skeletal slot associated with [r] could not undergo (7) if it were **already** the **second** element in the syllabic rhyme, but the mechanism for achieving such a configuration is not clear (for some ideas, cf. Steriade 1982: 367f). A more feasible solution involves **preattaching** the skeletal slot associated with /r/. Spanish intervocalic [r] constitutes an idiosyncrasy, not predictable from independent principles of Spanish phonology; lexical pre-empting of slot association thus follows naturally. Rule (8) can only apply to a dually linked (geminate) /r/, as a consequence of the Linking Constraint: that association lines in a rule be interpreted as exhaustive.¹⁴ In onset-initial position, this geminate

¹² Only very occasionally is intervocalic [r] realized as [R], and this may be a simple performance error (e.g. Payán Sotomayor 1983: 135).

¹³ Preliminary data from Spanish child language acquisition point in the same direction. In many languages, [r] is acquired first as part of consonant clusters, and only later in intervocalic position. The analysis of Stoel (1974) on the acquisition of liquids in (Mexican) Spanish shows that children at first have a single rhotic element to represent [r], [R] and [d]. The opposition between [r] and [d] in intervocalic position is particularly difficult to acquire, and intermediate stages are characterized by all three elements being pronounced variably as [r], [R] and [dr].

¹⁴ Cf. Hayes (1986a, 1986b); McCarthy (1986); Schein and Steriade (1986). The Obligatory Contour Principle forbids a tautomorphic sequence of two identical phonological matrices. Allowable morpheme-internally are only true geminates, i.e. a multiply linked matrix. The description of Harris (1983) suggests that he regards intervocalic (phonologically distinctive) [R] as individually associated matrices, what Hayes (1986a) calls a 'fake geminate'. However, the OCP would not permit such a configuration, unless it could be argued that the content of the two matrices was not identical at the point(s) in the derivation where the OCP applies. The other possibility left open by

structure is created by (7), which if not additionally constrained will not allow singly linked /r/ as a possible syllable onset. The required constraint is lexical preattachment of /r/ to the skeletal slot (where r abbreviates the feature(s) needed to specify /r/):



Slot adjunction (7) cannot apply to a preattached /r/, since lexical preattachment precludes subsequent modification of preattached configurations by rules making critical reference to association lines. In previous work (e.g. Pulleyblank 1986, Lieber 1987), preattachment/pre-specification has been used to represent lexical idiosyncrasies that impede spreading of other features, given that spreading past a preattached segment would violate the constraint against crossed association lines. In the present analysis, preattachment blocks action of rules which, if applied to a preattached matrix, would result in a violation of the Linking Constraint.

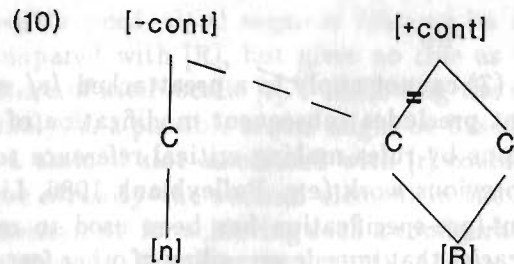
9. ACCOUNTING FOR PHONETIC VARIATION OF [R]

9.1. The dually-linked matrix resulting from (8) reflects the behavior of [R] in several contexts. For example, the 'preaspirated' word-initial element frequently heard in the Caribbean dialects is in phonetic terms a trill the first part of which is devoiced. This may be represented by delinking of the first element of the dual structure from the laryngeal tier.¹⁵

Harris's designation (1983: 69) of [R] as a 'heterosyllabic geminate r' is that of a multiply linked structure, as explicitly proposed by Núñez Cedeño (1988: 330).

¹⁵ Núñez Cedeño (1988) analyzes word-internal preaspirated [R] in Dominican Spanish in a fashion similar to Harris (1983), claiming that what is heard is an aspiration (representing weakening of syllable-final /r/) followed by a single [r] (onset-initial). This analysis does not account for the fact that onset-initial /r/ usually strengthens to [R], nor does it account for 'preaspirated' trills in word-initial position. Núñez Cedeño (1988: 330) also claims that the pronunciation [hr] 'shows that the phonetic trill is indeed a sequence of taps...' a conclusion which does not follow from this pronunciation.

9.2. Similarly, the intrusive [d] or [ɖ] which at times appears in postconsonantal position represents delinking of the feature [continuant] from the first slot and spreading of continuancy from the preceding consonant, for example:¹⁶



This consonant may occur both word-internally (*honra* 'honor') and between words (*con Roberto* 'with Robert'), which demonstrates the postlexical application of (10).

9.3. The intrusive [d] also provides indirect evidence for the postulated dual intermediate structure of onset-initial [R]. Wetzels (1985) and Clements (1987) analyze intrusive consonants in a number of languages, and conclude that two different processes are involved: true epenthesis (adding of a slot on the timing tier), and contour formation (spreading two values of a single autosegment across a single timing slot). Wetzels further speculates (p. 315) that true epenthetic consonants should exhibit no phonetic differences as compared with identical underlying combinations, and should have a stable pronunciation. Contour consonants, on the other hand, should be expected to show some subphonemic differences at the idiolectal level, as well as higher

¹⁶ This is essentially the converse of Clements (1987), in which intrusive postnasal stops in English (e.g. in *dance*) are regarded as two linearly ordered autosegments linked to a single skeletal slot; cf. also Hayes (1986a: 476). For an analysis of occasional interchange of [d] and [r] in Spanish, cf. Núñez Cedeño (1987), who uses the feature [vocalic] to define [r].

interspeaker variability. In the case of Spanish [R] being realized as [dr] (and vice versa), this occurs precisely where a dual structure has been postulated, and the overall duration of the combination is not increased. A word like *Enrique* pronounced with [dr] is phonetically indistinguishable from the same combination in *Andrés* 'Andrew,' albeit the idiolectal variability is often higher in the first type of case. With some nonstandard verb forms, such as *querrá* > *quedrá*, speakers who use the latter variant normally do so consistently, at least in areas where normative counterpressures do not prevail.

9.4. In Puerto Rico and less frequently in other Caribbean dialects, a velar or uvular fricative sometimes appears in place of [R] as a (sociolinguistically stigmatized) variant. This shift has been attributed to borrowing (e.g. Megenney 1978; Rosario 1956: 8-9; Beardsley 1975), and as a result of internal phonological evolution (e.g. Granda 1966). In the latter vein, it has frequently been suggested that the 'preaspirated' trill commonly heard in the same region provided the initial impetus for eventual 'posteriorization' of the entire segment (e.g. Zlotchew 1974; Granda 1966). If we postulate that devoicing of the first matrix associated with onset-initial [R] eventually leads to delinking of all supralaryngeal features, it would be possible for the supralaryngeal node of the rightmost matrix to also be deleted, resulting in a maximally unspecified posterior fricative, i.e. aspiration (cf. Goldsmith 1981).¹⁷

¹⁷ The sound resulting from 'velarization' of [R] in Caribbean Spanish is never a simple aspiration, despite jokes that Puerto Ricans cannot distinguish, for example, *Ramón* 'Raymond' and *jamón* 'ham' (but cf. Dillard 1962), but rather a velar or uvular fricative, phonetically distinguished from the realization of the posterior fricative phoneme /x/, which in the Caribbean is merely a weak aspiration. Since a uvular trill is perceptually similar to [R], simple acoustic equivalence may be at the root of the shift from [R] to a posterior continuant, but it remains tempting to suggest that a trill whose first element approximates a posterior fricative could result in eventual rightward spreading over the entire two-matrix structure. Brazilian Portuguese has converted [R] to a velar fricative [x] in all positions, including the syllable rhyme. This could reflect a parametric difference with respect to Spanish, in which an originally trilled rhyme-final [R] in Brazilian Portuguese devoiced from the left, paralleling onset-initial developments, whereas in Spanish only devoicing from the right is possible in the rhyme, resulting in a sibilant pronunciation in some dialects.

10. PROPAROXYTONIC RESTRICTIONS INVOLVING [R]

Harris (1983) has interpreted the exclusion of Spanish proparoxytones whose final syllable begins with [R] as additional evidence in favor of an analysis of [R] as underlying /r-r/, with a syllable boundary intervening. In the analysis outlined above, [R] is at no point split by a syllable boundary. The matter of proparoxytonic restrictions thus cannot fall under the case of branching penultimate rhymes. In fact, no special explanation is called for; the apparent restriction in contemporary Spanish is but a carryover of originally structural characteristics of Vulgar Latin (cf. Roca 1988: 417-8). Latin contained some type of geminate /rr/, either heterosyllabic or ambisyllabic; the 'quantity rule' would then exclude geminate consonants straddling the last two syllables of proparoxytones. When Spanish evolved this geminate to onset-initial [R], the original motivation for the limitation disappeared, but there was no stock of proparoxytones containing [R] in the final syllable which could enter the language under the new situation. Harris (1983: 68) observes that native speakers reject forms such as **chínchorro* but a subsequent note (p. 144) regarding informants' explanations of their rejection suggests that lack of familiarity with such words may be an important factor (cf. Pensado 1984).¹⁸

¹⁸ I have informally surveyed a number of native Spanish speakers from different countries and social strata, and while all find words like **chínchorro* to be odd, none rejects such a combination with the vehemence provoked by segment-level combinatorial violations. The issue, however, should not be resolved by a tug of war among informants faced with the uncommon task of preferring judgements on previously unattested combinations. Spanish contains other consonants which are excluded from the onset of proparoxytones by virtue of their origins in Latin. Although it may be possible to propose an analysis of some of these elements as dual structures, there is no convincing evidence that any of these elements is ambisyllabic or heterosyllabic; their exclusion in the onset of final syllables in proparoxytones is a historical accident, whose consequences are occasionally overridden by foreign borrowings, place names, etc., without greatly disrupting the phonotactic system of the language. Thus, although the circumstantial evidence in favor of a dual structure underlying [R] is considerable, the case of proparoxytonic restrictions is orthogonal to these considerations, and must be ranked as a simple synchronic curiosity.

11. SUMMARY AND CONCLUSIONS

The obligatory presence of [r] or [R] in certain environments, the optional variation in others, and the phonological contrast [r]-[R] intervocalically, has been handled by the following postulates:

(a) Only one bundle of distinctive features underlies both [r] and [R] in all positions. This feature bundle is originally associated with a single slot on the skeletal tier.

(b) Surface manifestations of onset-initial [R] are analyzed as resulting from an intermediate dual structure. The geminate structure is converted to a trill by rule (8), which affects only multiply linked structures by virtue of the Linking Constraint.

(c) The geminate structure which produces [R] results from a rule which adjoins a skeletal slot to (the left of) the feature matrix representing /r/. This slot is automatically assigned in any position where the Spanish syllabic template permits a dual structure whose second element is [r]: in onset-initial position.

(d) Optional reinforcement of rhyme-final [r] to [R] is accounted for through a rule of slot adjunction which occurs generally in emphatic speech. Rhyme-final slot adjunction is presumed to occur to the right of the existing segment.

(e) Intervocalic [r] is relatively more marked, in that slot adjunction does not apply to produce [R]. The feature matrix associated with intervocalic [r] is lexically preattached to the corresponding skeletal slot. Slot adjunction, which creates a geminate structure, cannot operate on a preattached matrix, since this would result in a violation of the Linking Constraint (the dual assignment of association lines).

The apparently quantitative nature of the opposition between [r] and [R] results incidentally from a phonetic implementation rule (8), but there is nothing in the history of Latin or the behavior of contemporary Italian which suggests that these two rhotic phones were ever analyzed as true geminates, on a par with consonants which from an articulatory point of view are unambiguously either continuants or noncontinuants. The marked status of the intervocalic [r]-[R] distinction, as reflected by lexical preattachment of the former, embodies the prediction that elimination of the preempting factor of preattachment is a likely diachronic development, while choice of [r] or [R] as the eventual

outcome of such an event is independent of markedness considerations. Romance data support this line of thought: the [r]-[R] opposition has disappeared in French, Rumanian and Romance-based creoles and quasi-creoles, but the phonetic result varies widely. Also implicit is the hypothesis that should a correlation of consonantal quantity come about through other means, /r/ would not necessarily become involved. 'Expressive gemination' of consonants in Italian and Sicilian dialects appears to bear out this prediction, which at present, is still highly speculative.

The previous analysis represents a step, probably not the final one, in the direction of a unified analysis of Spanish [r] and [R]. Within the framework of current phonological theory, the behavior of Spanish [r] and [R] reflects a relatively marked configuration, represented as lexical preattachment. This type of approach accounts for both the inherent similarity of [r] and [R], and the unpredictable behavior in intervocalic contexts. Future research is required not only to verify many of the particulars of the Spanish analysis proposed here, but also to determine the applicability of this model to other languages exhibiting a [r]-[R] opposition.

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