

# *Palatal vowels, glides and obstruents in Argentinian Spanish\**

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## **1 Introduction**

The goal of this article is to contribute to our understanding of glides – their properties and distribution in underlying and surface representations, the range and the features of their various phonetic manifestations, and their role in the assignment of syllable structure and stress. Spanish provides a rich opportunity for carrying out this study because of the special properties of high vocoids in this language, which are systematically realised as glides in particular contexts: they can function as both onsets and rhymes; they can occur in prepeak, peak and postpeak position; up to four can occur in a row; and they take on a wide range of surface realisations.

In the pursuit of our goal, we confront a problem in Spanish phonology that has tantalised investigators for the better part of this century, and rightly continues to do so. The conundrum involves the two sets of phonetic segments we transcribe as [i j y ɨ ʒ ʝ] and [u w ɥ<sup>w</sup> g<sup>w</sup>] (articulatory descriptions and feature characterisations are given below). Classical structuralist studies, and some current analyses as well, see the problem as the taxonomic exercise of assigning each of these segments to a particular ‘phoneme’ or ‘underlying segment’. Our study includes the notion of phonemic inventory, but considers it as only one of many intersecting

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issues involved in the attempt to elucidate aspects of the mental representations that native Spanish speakers employ in their phonological computations. We undertake to raise the level of discourse concerning the problem at hand not only by redefining it but also by enlarging the set of data and descriptive issues brought to bear on it and by situating the discussion in a rich theoretical context.

Our investigation begins with, and concentrates on, data from two dialects of Argentinian Spanish (AR): the colloquial standard *porteño* of Buenos Aires and that of Río Negro province, some 1300 kilometres to the southwest. Later, we add material from standard Castilian, the national prestige norm of Spain. AR is instantly recognisable by the conspicuous and systematic use of strident [ʒ] (as in English *azure*) in certain contexts where standard Castilian and all other major Spanish dialects use [j] (as in English *yes*) or the non-strident palatal fricative obstruent [y] (see §2.1); for example, AR *el[ʒ]a [ʒ]egó a[ʒ]ér* ‘she arrived yesterday’ (orthographic <ella llegó ayer>) *vs.* *el[j]a [j]egó a[j]ér* or *el[y]a [y]egó a[y]ér* in other dialects. Even more strikingly, many innovative AR speakers replace voiced [ʒ] with voiceless [š]: *el[š]a [š]egó a[š]ér*.<sup>1</sup> In AR, [ʒ] alternates systematically and obligatorily with [j] in both stems and affixes:

- (1) a. [j]–[ʒ] *alternation in stem*  
 Uruguá[j] ‘Uruguay’      Uruguá[ʒ]-o ‘Uruguayan’  
 lé[j] ‘law’      lé[ʒ]-es ‘laws’
- b. [j]–[ʒ] *alternation in affix*  
 crec-[j]éndo ‘growing’      cre-[ʒ]éndo ‘believing’  
 crec-[j]ó ‘s/he grew’      cre-[ʒ]ó ‘s/he believed’

The instances of [j] in (1) are common to all dialects, but those of [ʒ] are not: other dialects have [j] or [y] in these cases. The special contribution of AR can now be appreciated: thanks to the perceptual salience and obligatory distribution of AR [ʒ], it is easy to recognise and characterise accurately distinctions in AR that are more subtle, variable or non-existent in other dialects. Also, the phenomenon of aspiration in AR (roughly, realisation of /s/ as [h]), which many dialects lack, interacts in an instructive way – with slight but significant differences between the two dialects examined – with the processes that control the distribution of palatal vowels, glides and obstruents. For example, we show how the underlying phonological strings /deserto/ ‘desert’ and /deserba/ ‘weeding’ surface in AR with the strikingly different realisations *de[sj]érto* and *de[hy]érba*, respectively.

<sup>1</sup> Henceforth we transcribe both [ʒ] and [š] as [ʒ], on the understanding that many AR speakers variably or consistently realise this segment as voiceless. We generally write examples in standard orthography except for the segments under discussion, but we always mark primary word stress with an acute accent. Also, <h> marks silent orthographic *h*, as in <h>*iáto* ‘hiatus’, *a*<h>*í* ‘there’, etc.

We propose that all of the non-consonantal segments ('vocoids') [i j u w] and the consonantal segments that we transcribe as [y ɟ ž ʝ ɣ<sup>w</sup> g<sup>w</sup>]<sup>2</sup> are realisations of [–consonantal] segments in underlying representations in AR. In outline, the argument for this proposal is the following. On the one hand, we will see that the segments in question are [–consonantal] for derivationally early processes like stress assignment and diphthongisation. On the other hand, certain tests that distinguish between consonants and vocoids diagnose the classes of words that, say, *yéso* 'plaster' and <h>*iélo* 'ice' belong to in AR as having initial consonants – specifically, [ž] (or non-continuant [ʝ]) for the segment spelled <y> in *yéso* and [y] (or non-continuant [ɟ]) for the segment spelled <(h)i> in <h>*iélo*. One such test is this: in AR, as in other dialects (Lozano 1979: 32, Harris 1984), nasals in syllable rhymes assimilate in place to [+consonantal] segments but not to [–consonantal] segments. This is illustrated for /n/ in (2):

- (2) a. /n/ # [+cons]                      b. /n/ # [–cons]  
       co[n̥ ʝ]éso 'with plaster'<sup>3</sup>        co[n̥ ɟ]gos 'with figs'  
       co[n̥ ɟ]élo 'with ice'

We will see later that aspiration of /s/ in AR also diagnoses the initial segments of words like *yéso* and <h>*iélo* as [+consonantal]. We reconcile the conflict between early [–consonantal] and late [+consonantal] status by demonstrating that the consonantality and obstruency of [y] and [ɟ] are not underlying in AR but rather derived, as are the consonantality and coronality of [ž] and [ʝ]. On our analysis, all of [i j y ɟ ž ʝ] are realisations of [–consonantal] segments in underlying representations; the derived features of [y ž], etc., are supplied by rules of 'consonantalisation' and 'coronalisation' that are critically ordered with respect to each other and interspersed among the rules of syllabification, stress assignment, diphthongisation, voicing and aspiration of /s/, place assimilation of nasals, and other processes. Several of the generalisations at issue demand consideration of the phonological 'spell-out' of morphological features, stratal organisation of rules, and more – all of which we take into account in appropriate detail. Our framework is a modified version of Lexical Phonology that recognises sequential rule application in stem, word and word-sequence (phrasal) domains (Harris 1993 and references therein).

We hold that genuine understanding of particular grammars and of general phonological theory must be rooted in careful investigations of individual dialects and grows as insights from a number of such inquiries are consolidated. We provide explicit and detailed analyses of a coherent

<sup>2</sup> The labiovelars [u w ɣ<sup>w</sup> g<sup>w</sup>] are marginal to our concerns; from this point on we distinguish only [u] and [w], subsuming all of [w ɣ<sup>w</sup> g<sup>w</sup>] under the latter.

<sup>3</sup> [n̥], [ž] and [ʝ] are non-anterior coronals; [n̥], [y] and [ɟ] are non-back dorsopalatals. See §2.1 for further details.

body of data from AR (§3) and standard Castilian (§4). We conclude by pointing out difficulties that our analysis poses – especially the opaque rule interactions it reveals – for an Optimality Theoretic account of the data we examine. We take an explicit stand on crucial issues but remain non-committal where our data are neutral over alternative theories. Many – though not all – of the generalisations that we present could be insightfully captured in a number of different theoretical frameworks; readers are encouraged to explore the possibilities they believe to be promising.

Since the behaviour of [i j y ž] and related segments is tightly interwoven with so many basic topics in Spanish phonology, the exposition of this article necessarily involves a large amount of foundational material. In §2 we lay out certain working assumptions as well as background information on Spanish phonetics and phonology, especially lexical contrasts in syllabicity among high vocoids, the position of glides in syllable structure and the syllabification algorithm in Spanish. For readers who are not conversant with Spanish phonetics and the considerable literature on Spanish phonology that has been produced in the last decades, this material will be indispensable; those who are impatient to proceed to detailed discussion of AR and standard Castilian may wish to scan this section quickly and then refer back to it as the need arises.<sup>4</sup>

## 2 Background

### 2.1 Articulations and distinctive features

All of the segments [j y ɨ ž j] are stock in trade for investigators of Spanish phonetics.<sup>5</sup> Some of these segments, however, like the distinctions among them and the variety of symbols used in the literature to represent them, are not common knowledge among phonologists in general. We thus describe these segments in sufficient detail to make clear the phonetic and phonological substance of the claims made in subsequent sections. In (3) we place the set [j y ɨ ž j] in the context of the rich inventory of paired stop/continuant voiced obstruent phones of Spanish, and we provide distinctive feature characterisations for all of these segments. Articulatory and auditory details follow.

<sup>4</sup> In any event, the goal of §2 is to facilitate understanding of the proposals that follow; it is not intended as a comprehensive and/or critical review of issues and literature.

<sup>5</sup> Standard references include Martínez (1994), Monroy (1980), Navarro (1965), Quilis (1993), Quilis & Fernández (1985) and Real Academia Española (1973).

(3)	[+cont]	ð	ʒ	j	y	ɣ	ɣ
	[-cont]	d	ʝ		ɟ	ɣ̤	g
	[cons]	+	+	-	+	+	+
	[son]	-	-	+	-	-	-
	[voice]	+	+	+	+	+	+
	primary articulator <sup>6</sup>	COR	COR	DOR	DOR	DOR	DOR
	secondary articulator				COR		
	[ant]	+	-		-		
	[distr] <sup>7</sup>	-	+		+		
	[high]			+	+	+	+
	[back]			-	-	-	+

Investigators agree that the glide [j] is non-consonantal, while [y ɣ ʒ ʝ] are consonantal.<sup>8</sup> All Spanish phoneticians emphasise the consonantal constriction of [y ɣ], lacking in [j]. Martínez (1994: 333) points out that [j] has its own vocalic formant structure while [y], though voiced, is clearly consonantal because it presents no formants in the vocalic range other than the traces of those of the surrounding vowels.<sup>9</sup>

The obstruents [ʒ ʝ] do not differ substantially from their English equivalents; for example, Eng. *contu[ʒ]on*, AR *tú[ʒ]o* ‘yours’ and Eng. *con[ʝ]ugal*, AR *cón[ʝ]uge* ‘spouse’. More specifically, [ʒ] and [ʝ] are non-anterior coronal obstruents.<sup>10</sup> Spanish phoneticians describe [ʒ] and [ʝ] as *rehilado* ‘strident’. So-called ‘palatal’ [ʒ ʝ] differ primarily from [ð d] in that [ð d] are anterior and apical while [ʒ ʝ] are non-anterior and laminal.

[y] and [ɣ] are voiced palatal obstruents, sometimes made with weak fricative noise produced by a slightly turbulent airstream within the vocal tract, i.e. with a constriction characteristic of [+consonantal] sounds.<sup>11</sup> Spanish phoneticians describe [y ɣ] as *sin rehilamiento* ‘non-strident’ and call them *consonantes prepalatales sonoras (flojas)* ‘voiced (lax) prepalatal consonants’. They are generally said to be articulated with the *predorso de la lengua* ‘front part of the top of the tongue’ against the *región prepalatal* ‘hard palate’.<sup>12</sup> Navarro (1965: 132) describes the articulation of [ɲ] and

<sup>6</sup> By ‘primary articulator’ we mean the ‘major articulator’ of Sagey (1986) and the ‘designated articulator’ of Halle (1995) and Halle *et al.* (1998). The last work contains valuable discussion of articulator theory.

<sup>7</sup> We intend [+distributed] to encode laminal as opposed to apical articulation of coronal segments.

<sup>8</sup> Our symbol [j] subsumes Navarro’s *semivocal* (postpeak) [i] and *semiconsonante* (prepeak) [j] (1965: 48–49).

<sup>9</sup> The spectrograms of [y] in Quilis (1993: 262) support Martínez’s description.

<sup>10</sup> A spectrogram of AR [ʒ] can be seen in Quilis (1993: 315).

<sup>11</sup> While the fricative noise in [y] may be negligible, the same is true of the other voiced fricatives of Spanish [β ð ɣ]. Like these phones, [y] has the constriction of an obstruent and patterns phonologically like one, as is shown below.

<sup>12</sup> For more detailed articulatory descriptions, palatograms, spectrograms and x-ray tracings, see Martínez (1994: 173, 329, 334, 336), Navarro (1965: 127–130), Quilis (1993: 252–262), Quilis & Fernández (1985: 98, 108–109).

[j] more specifically as follows: *el dorso de la lengua se adhiere ampliamente al paladar duro, empezando el contacto en los alvéolos y extendiéndose más o menos hacia el postpaladar* ‘the top of the tongue makes extensive contact with the hard palate, starting at the alveolar ridge and continuing more or less to the postpalatal region’. (For continuant [y], substitute ‘constriction’ for ‘contact’.)

The difference in auditory impression between [y j] and [ž j] is unmistakable. In particular, Spanish [j] is perceptually and articulatorily quite different from [j] as in English *Joe* and AR *yó*.<sup>13</sup> Navarro (1965: 131) provides a clear description of the differences in articulation in Spanish, as follows: in [ž] the (laminal) linguopalatal constriction is primarily alveolar though it continues a little toward the hard palate (*más o menos hacia adentro*); in [y] the constriction is farther back and the body of the tongue is convex for [y] but *plana* ‘flat’ for [ž]. The friction noise (Navarro’s *rehilamiento*) is more *áspero* ‘harsh, strident’ in [ž] than in [y].

We call special attention to the contrast between [y j] and [y g].<sup>14</sup> The latter segments are the fronted allophones of velar /g/ before the non-back vowels /i e/ (also manifested in [k] vs. [k], cf. Navarro’s (1965: 137) *más que velar es propiamente postpalatal* ‘actually postpalatal rather than velar’). Since the fronted velars are the result of assimilation of velar (dorsal, [+high, +back]) [y g] to following [–back] vowels (i.e. leftward spreading of [–back]), they can hardly be other than [+high, –back] dorsals, as shown in (3). Obviously, [y j] must have a distinct representation since they look and feel very different from the fronted velars articulatorily and they sound very different even to non-specialist ears. Navarro’s descriptions (1965: 132, 137) provide the relevant evidence. Both [y j] and [y g] have a [+high, –back] dorsal constriction; in addition, [y j] – but not [y g] – have laminal *contacto en los alvéolos* ‘alveolar contact’ (constriction in the case of continuant [y]). In other words, [y j] are complex segments involving both CORONAL and DORSAL articulators.<sup>15</sup>

We also note that Navarro is careful to point out that [j] and [č] are not a homorganic voiced–voiceless pair (1965: 128). He notes, among other differences, that the primary constriction for [č] is made by the blade of the tongue at the alveolar ridge while in [j] the tongue blade points downward with the tip resting against the lower teeth; linguopalatal contact is more extensive and farther back in [j] than in [č]. These details provide additional support for the proposition that voiceless affricate [č], like voiced [ž j], is a non-anterior coronal while [y j] are non-back dorsals with coronal secondary articulation as detailed above. Although our

<sup>13</sup> Spanish [y] is evidently Ladefoged & Maddieson’s (1996: 15, 41, 165) ‘palatal non-sibilant fricative’ [j].

<sup>14</sup> The significance of this contrast for distinctive feature theory was first noted by Craddock (1973: 92, note 6), to the best of our knowledge.

<sup>15</sup> The choice in (3) of DORSAL and CORONAL as primary and secondary articulators, respectively, is more or less arbitrary on the evidence presented here. It is not crucial in the present context to resolve the issue.



by segmental context. Furthermore, as can be inferred from (5), it is not determined by morphological context, and it is not a matter of free variation. In short, the data in (5) reflect irreducible, underlying contrasts in syllabicity among otherwise identical high vocoids.

These contrasts have been recognised as a patent phonetic fact of life for as long as serious studies of Spanish phonetics and phonology have existed.<sup>16</sup> Their existence is not controversial; the only germane question is what descriptive and theoretical conclusions are to be drawn from them. This is a core concern in the present work. We propose that [j] and [w] are derived from /i/ and /u/, respectively, as are peak [i] and [u] in simple nuclei; we claim that this is the general case. In other words, unmarked high vocoids surface as peaks when there is no vocoid of greater sonority next to them; when adjacent to a non-high vocoid, they surface as glides. Syllabic [i u] in hiatus is the special case, which we represent for the moment with the notational expedients /i./ and /u./ – explicated just below in §2.4 – where the dots suggest lexically marked, underlying, contrastive peakhood. These proposals are summarised in (6):

- |                            |                          |
|----------------------------|--------------------------|
| (6) a. <i>general case</i> | b. <i>special case</i>   |
| /i/                        | /i./                     |
| p[í].so = p/i/so           | <h>[i.á].to = <h>/i.a/to |
| bo.n[já].to = bon/ia/to    |                          |
| <br>                       |                          |
| /u/                        | /u./                     |
| p[ú].so = p/u/so           | z[u.á].vo = z/u.a/vo     |
| s[wá].ve = s/ua/ve         |                          |

Lexical syllabicity contrasts in Spanish are often masked in surface representations. For example, pairs like *m[o.í]na vs. b[ó]jna* (5), *Mar[í.a] vs. Már[jo]* (personal names) and *[a.ú]lla ‘howls’ vs. c[áw]sa ‘causes’* (verbs) appear to differ primarily in the position of stress. This is an illusion, however, a secondary effect that results from contrastive syllabicity. On the one hand, *m/o.i/na*, *Mar/i.a/* and */a.u/lla* have high vocoids in hiatus before and after other vocoids; on the other hand,

<sup>16</sup> For example, see the 1918 edition of Navarro Tomás’s classic *Manual de pronunciación española* (we cite the 12th edition, 1965). These distinctions are amply documented in current phonetic studies like Martínez (1994), Quilis (1993), Quilis & Fernández (1985); by the Real Academia Española (1973); and by structuralist studies like Alarcos (1961), Bowen & Stockwell (1955, 1956), King (1952), Saporta (1956), Stockwell *et al.* (1956). They are discussed in the early generative work of Harris (1969: 20–37, 122–127) and Cressey (1978: 75–82). In more recent work, Hualde (1991, 1994, 1997) gives extensive exemplification and discussion of the facts of his dialect (standard Castilian, more on this below). Roca (1991, 1997b) presents further discussion and numerous examples from a different dialect. Strangely, Dunlap (1991: 184–187, 224–229) and Rosenthal (1994: 176, *passim*) hold that Spanish has no such contrast. We discuss their views in the Appendix, where we also allude to Hualde (1997) and Roca (1997b), whose exposition regarding the syllabicity contrast in question strikes us as cryptic in certain respects.



*b/oi/na*, *Mar/io/* and *c/au/sa* have high vocoids that form diphthongs with the adjacent vocoids. All these examples are stressed on the penultimate syllable: *í* in *mo.[í].na*, *rí* in *Ma.r[í].a*, *ú* in *a.[ú].lla*, *bój* in *bó[j].na*, *Má* in *Má.r[j]o*, *cáw* in *cá[w].sa*. This is the default case for Spanish words in general and the only possibility for the verbs illustrated (Harris 1995 and much other work). Stress assignment necessarily follows syllabification, since stress depends on syllable count in all words and syllable weight in words other than verbs. In short, despite surface appearances, syllabification – not stress – is lexically contrastive here. Another cause of masking (illustrated in §2.5 below) is that lexical syllabicity contrasts in Spanish can be neutralised by processes of syllable contraction (‘denuclearisation’) that are obligatory in some environments, tempo- and style-dependent in others, and whose conditions of application vary from dialect to dialect.

### 2.3 Well-formed and ill-formed syllables: the position of prevocalic glides

The segments of a well-formed Spanish syllable are sequenced according to sonority, as follows:

(7) O – S – G – V – G – C – /s/

(O = obstruent, S = sonorant consonant, G = glide, V = vowel, C = any consonant)

Conformity with (7) is a necessary but not a sufficient condition for well-formedness. A partial list of additional conditions on Spanish syllables is given in (8):

- (8) a. At most five segments may be chosen from (7).  
 b. One of the five is a vowel.<sup>17</sup>  
 c. There are no contrastively long vowels; more generally, rhymes do not contain sequences of identical segments.  
 d. Complex onsets are of the form obstruent–liquid; these must meet further conditions, some dialect-particular.<sup>18</sup>  
 e. Only /s/ can follow a tautosyllabic postpeak consonant or glide.<sup>19</sup>

A sample of well-formed Spanish syllables of increasing length is given in (9a), followed by a sample of ill-formed types in (9b):

<sup>17</sup> Syllabic consonants appear only in borrowings from indigenous languages; for example *Po.po.ca.té.pe.tl* (the volcano).

<sup>18</sup> For example, neither /s/ nor /ç/ clusters in an onset in any dialect; all dialects allow *tr-* and *dr-* as onsets, some allow *tl-* while others do not, and no dialect allows *dl-*.

<sup>19</sup> For example *abs.té.mio* ‘abstemious’, *s[é]js* ‘six’, *Z[é]ws* ‘Zeus’, and *cl[á]ws.]tro* ‘cloister’ are well-formed but \*[amp.], \*[awr.], \*[ojn.], \*[ejl.], etc., are not.

(9) a. *well-formed*

1 segment	V	o.[í.]a	's/he heard'
2 segments	OV	s[í]	'yes'
	SV	nó	'no'
	GV	[j]ó	'I'
	VG	<h>á[j]	'there are'
	VC	[í]r	'to go'
3 segments	OVC	pán	'bread'
	OGV	f[wí]	'I was'
	OVG	vó[j]	'I go'
	SGV	l[j]é.(bre)	'hare'
4 segments	OSVC	trén	'train'
	OSGV	tr[w]é.(no)	'thunder'
	OGVG	b[w]é[j]	'ox'
	OGVC	b[j]én	'well'
	GVCs	[juks].(taponér)	'to juxtapose'
5 segments	OSVGs	clá[w]s.(tro)	'cloister'
	OSVCs	trans.(formár)	'to transform'
	OSGVC	(pu.)dr[j]én.(do)	'rotting'

b. *ill-formed*

- \*OGVGs
- \*OGVCs
- \*SGVGs
- \*SGVCs

Though not exhaustive, the sample of syllable types in (9) is sufficient to prompt an interesting question: why are the strings of segment types in (9b) ill-formed *as syllables*? None exceeds the five-segment overall maximum syllable length (8a), and no substring violates any requirement of order or content in (7) and (8). Moreover, every substring in fact occurs in perfectly ordinary words. For example, \*OGVGs is impossible despite the well-formedness of OGVG in *buéy*, of VGs in *séis* and *cláus.tro*, and so on. The seemingly mysterious ill-formedness of the (9b) cases has a straightforward explanation. This explanation requires a proper understanding of the parsing of prepeak glides in Spanish: are they in the onset or the nucleus of the syllable? (We would like to know this even if (9b) were not a problem.)

The answer is 'it depends': when not preceded by a tautosyllabic obstruent or sonorant consonant, glides parse as onsets. In other words, glides are onsets if nothing better is available. But if a less sonorous segment *is* available to be the onset, glides join a following vowel to form a complex nucleus. Evidence that glides do not cluster in onsets with consonants in Spanish appeared in the literature long ago, for example in Harris (1983: 6–13) and Hualde (1989, 1991: 479–480). Rather than review this evidence here, we will present several less familiar arguments that prevocalic glides are conditionally members of onsets or complex nuclei.

Perhaps the most transparent argument that glides are onsets when not preceded by a tautosyllabic consonant is the fact that in most dialects both underlying and derived glides are optionally or obligatorily converted into obstruents in syllable-initial position. This has been alluded to above (see (1) for example) and is illustrated in (10):

- (10)  $\text{crec-}/\text{io}/ \rightarrow \text{cre.c}[\text{j}\acute{\text{o}}]$  's/he grew'
- $\text{cre-}/\text{io}/ \rightarrow \begin{cases} \text{cre}[\text{.j}\acute{\text{o}}] \\ \text{cre}[\text{.y}\acute{\text{o}}] \\ \text{cre}[\text{.j}\acute{\text{o}}] \\ \text{cre}[\text{.}\acute{\text{z}}\acute{\text{o}}] \\ \text{cre}[\text{.j}\acute{\text{o}}] \end{cases}$  's/he believed'

The verbal suffix */io/* is the inflection for 3rd person singular *preterit* (past tense, perfective aspect). When a verb stem like *crec-* supplies a consonant for the onset of the final syllable, suffix-initial */i/* is obligatorily realised as the vocoid [j]. On the other hand, after a vowel-final stem like *cre-*, suffixal */i/* is syllable-initial. In this case it is manifested phonetically either as vocalic [j] or as one of the palatal obstruents [y ɹ ʒ j]. The choice depends on dialect, style and context, but the obstruent pronunciations are the more common ones and are obligatory in many dialects.<sup>20</sup> Obstruents can hardly be nuclear segments in Spanish, which does not allow even consonantal sonorants as syllable nuclei ((8b), note 17). We thus conclude that when underlying prevocalic */i/* is syllable-initial it is parsed as an onset.

This conclusion is supported by an independent distributional argument. Compare, say, the well-formed four-segment first syllable of [juks].*taponér* (9a) with a five-segment syllable of the form \*[Cjuks]. The latter is decidedly unacceptable though it conforms to the overall five-segment limit on syllable length (8a). This contrast in grammaticality follows straightforwardly from the assignment of the underlying vocoid to the onset in the syllable [juks] but not in \*[Cjuks], since three-segment rhymes like [uks] are legal but four-segment rhymes like [juks] are not, as established in Harris (1983). The restriction of rhymes to a maximum of three segments can be implemented technically by permitting no more than two branching nodes within the rhyme constituent. It is difficult to find a satisfactory alternative account of the contrast. In particular, the problem with \*[Cjuks] does not lie in the segmental substring [Cju], which occurs in both stressed and unstressed syllables in ordinary well-formed words like *c[ju]dád* 'city', *v[jú]da* 'widow', etc.

Looking now at the other side of the coin, an argument for the nuclear position of postconsonantal glides is provided by the diphthongisation of

<sup>20</sup> Details can be found in most standard manuals of Spanish phonetics, for example Navarro (1965). Explicit rules of 'Consonantalisation' and 'Coronalisation' for AR and standard Castilian are formulated in §§3–4 below.

certain mid vowels under stress (more on this in §2.5), as in *v[jé]nen* ‘they’re coming’ *vs.* *v[e]nímos* ‘we’re coming’ and *tr[wé]na* ‘it’s thundering’ *vs.* *tr[o]nába* ‘it was thundering’. Any analysis of this phenomenon must posit some ‘breaking’ mechanism whereby the single segments /e/ and /o/ split into two segments [jé] and [wé].<sup>21</sup> Now, since diphthongisation is triggered by stress and stress is dependent on syllabification, the source vowels /e/ and /o/ must be nuclei when ‘breaking’ occurs. If the resulting glide remains in the nucleus with its parent segment in examples like *v[jé]nen* and *tr[wé]na*, nothing further need be said. On the other hand, if it is claimed that these glides move *out* of the nucleus to join the segment(s) *v-* and *tr-* already in the preceding onset, some additional process must be stipulated. No motivation for a process that moves a glide into an already filled onset is known.<sup>22</sup>

Evidence of a different sort is provided by examples like those in (11), which illustrate the effect of adding the suffixes *-íto* (DIM) and *-ísta* ‘-ist’ to stems of various types:

(11) <i>base</i>		<i>suffixed word</i>	
a. guitárr-a	‘guitar’	guitarr-[í]sta	‘guitarist’
triángul-o	‘triangle’	triangul-[í]to	‘triangle (DIM)’
b. tramó[j]-a	‘trick’	tramo[j-í]sta	‘trickster’
rá[j]-o	‘ray’	ra[j-í]to	‘ray (DIM)’
c. alquím[j]-a	‘alchemy’	alquim[-í]sta	‘alchemist’
		(*alquim[j-í]sta)	
escritór[j]-o	‘desk’	escritor[-í]to	‘desk (DIM)’
		(*escritor[j-í]to)	

The words in (11a) contain consonant-final stems followed by a vowel that marks inflectional class; these examples simply provide a baseline that illustrates the suffixes *-ísta* and *-íto* in a neutral environment. The interesting cases are (11b) and (11c), all of whose stems end in [j]. The question is: why is the output of suffixation X[j-í]Y in (11b) but X[-í]Y in (11c)? What happens to stem-final [j] in (11c)? The answer is provided by condition (8c), which disallows sequences of identical segments in rhymes; in particular, (8c) disallows \*/ii/ internal to a rhyme. This accounts for the contrast in well-formedness between *tramo[.j-í]s.ta* and *ra[.j-í].to* (11b), where [j] is syllable-initial, and *\*alqui.m[j-í]s.ta* and *\*escrito.r[j-í].to* (11c), where [j] follows a syllable-initial consonant. In the first case, /ii/ = [ji] is split between onset and nucleus; condition (8c) *on rhymes* is

<sup>21</sup> It is not an option to claim that the diphthongs at issue underlie the simple vowels. Among other evidence, [j] of alternating [jé] behaves differently from demonstrably non-alternating (underlying) [j] in AR, as we show in §3. For the same reason it is difficult to claim that morphemes with the alternating diphthongs under discussion simply have two (or more) lexically listed allomorphs.

<sup>22</sup> In §2.5, however, we discuss cases in which a nuclear glide moves to fill an empty onset. It emerges in the discussion of stress assignment in §3.4 that complex nuclei make heavy syllables in Spanish while syllable-initial glides and their surface reflexes do not.

thus irrelevant. In the second case, the onset consonant prevents [j] from being in the onset, but (8c) allows only one /i/ in the rhyme; the other one cannot be incorporated into syllable structure nor rescued in any way. Thus only one of the two instances of /ii/ appears in phonetic representations in the case of (11c). If (8c) did not affect /ii/ differently in the two cases as described, the account just suggested for the difference between (11b) and (11c) would be lost.

In sum, a number of arguments converge on the conclusion that Spanish prevocalic glides form onsets when no less sonorous segment is available to fill that position but are assigned to rhymes (complex nuclei) when a consonantal onset is available. These arguments hold *mutatis mutandis* in all the major dialects of Spanish, and no viable counter-arguments are known.

We can return now to the issue of the ill-formedness as syllables of the strings in (9b), in which the status of prevocalic glides is a crucial factor. The five-segment length limit (8a) is not an ad hoc primitive; rather, it follows from three independently motivated premises contained in the exposition above, which we summarise as follows: (i) the restriction that onsets contain at most two segments (8d), the second of which cannot be a glide, as we have just established; (ii) the restriction that rhymes branch at most twice, i.e. are at most three segments long; and (iii) the fact that glides form complex nuclei with a following vowel in consonant-initial syllables. Given (i)–(iii), the ill-formedness of all the cases in (9b) is due to their illegal four-segment rhymes \*[GVGs]<sub>R</sub> and \*[GVCs]<sub>R</sub>.<sup>23</sup>

If the G following O or S in (9b) were parsed as a member of the onset, it would be difficult to find a good account for the fact that these strings are well-formed as purely linear sequences but ill-formed as syllables. If postconsonantal prepeak G were not part of the rhyme, the three-segment limit for rhymes would have to be stated essentially as ‘Spanish rhymes may have at most three segments, *except* when the preceding onset is of the form CG, in which case the maximum number of rhyme segments is two’. Alternatively (still assuming for the sake of argument that postconsonantal prepeak Gs are onset segments), the statement of the five-segment length limit for syllables could be cast along the following lines: ‘Spanish syllables may have at most five segments, *except* when the first two segments are CG, in which case the maximum number of segments is four’. The ‘except’ clauses are a dead give-away that the real generalisation is lost in these formulations: their premise (that postconsonantal G is in the onset) is false.

In conclusion, the evidence is quite strong that Spanish prevocalic glides form onsets when no less sonorous segment is available but are

<sup>23</sup> Four-segment surface rhymes like that of e.g. *cr[jájs]* (in certain verb forms used only in Iberian dialects) are derived from the initial syllabification *cri.a.is* by the late contraction (‘denuclearisation’) processes discussed in §2.5, whereby the high nuclei flanking stressed [á] lose their status as syllable peaks. Rhymes of this type thus do not violate the restriction of rhymes to three segments in word-domain syllabification.

assigned to rhymes (complex nuclei) when a consonantal onset is available. We have belaboured this point not because the facts or the generalisations are unclear but because the conclusion is not self-evident prior to examination of evidence, which has been insufficiently weighed in the literature. The issue is highly relevant for the analyses of AR and standard Castilian that follow.

Before moving on, it is worthwhile to compare the syllabification of prevocalic high vocoids in Spanish with that of other languages that also have ongliding diphthongs. Such diphthongs are comparatively rare, and the syllabic position of their glides is not transparent, as we have seen. We look at their behaviour in Slovak and French, where tests for onset *vs.* nuclear position are relatively well established. It turns out that Spanish is not alone in differentiating between postconsonantal and syllable-initial vocoids. Slovak (Rubach 1993, 1998, personal communication) behaves remarkably like Spanish, while French presents an interesting divergence.

In Slovak, several tests converge to show that syllable-initial glides are in the onset. Slovak has a variety of processes that refer to heavy syllables. A glide–vowel sequence preceded by a tautosyllabic consonant is heavy, as it can both trigger and undergo shortening processes. Rubach (1998) argues that such a sequence is entirely nuclear. He shows, however, that the sequence [ji] neither triggers nor undergoes shortening when syllable initial. In this case, the [j] lies in the onset. Indeed, the generalisation is broader (personal communication): just as in Spanish, no glide–vowel sequence is heavy if it is not preceded by a tautosyllabic consonant. We can dub Spanish and Slovak ‘onset-opportunistic’ languages. A high vocoid underlyingly unspecified for syllabicity fills an onset if and only if there is no better candidate to do so; otherwise, it forms the ongliding portion of a rising diphthong, or (in the absence of a more sonorous neighbour) it forms a syllable peak itself.

French, on the other hand, appears to have an underlying contrast between high vocoids that must fill an otherwise empty onset *vs.* high vocoids that must not. We find minimal pairs like *le whiskey* [læ wiski] ‘the whisky’ *vs.* *l’oiseau* [lwazo] ‘the bird’ and *le yod* [læ jød] ‘the yod’ *vs.* *l’iode* [ljød] ‘the iodine’ (Tranel 1987: 117). Words like *whiskey* act like normal consonant-initial forms, with a filled onset, and thus show no deletion of the /æ/ of the article /læ/. Words like *oiseau*, on the other hand, behave like true vowel-initial forms, with empty onsets. Since there is no phonetic difference between the [w] of *whiskey* and that of *oiseau*, or between the [j] of *yod* and that of *iode*, we follow Scullen (1993) in assuming that French high vocoids must be lexically distinguished as to whether they opportunistically fill onsets or obligatorily shun them.

## 2.4 The syllabification algorithm

We consider now how syllabic constituents are formed from unsyllabified strings of phonemes. As a concrete baseline for discussion, we follow







*í.ra* ‘anger’, medially as in *pi.pa* ‘pipe’ and finally as in *cá.si* ‘almost’. Otherwise, high /i u/ occupy other positions in the syllable – specifically, the coda (rhyme) as in *doy* [dój] ‘I give’, the (complex) nucleus as in *dió* [djó] ‘s/he gave’ and the onset as in *yod* [jód] ‘yod’.<sup>28</sup>

Several lines of evidence converge on the conclusion that the hiatus case is marked with respect to those in which /i u/ are satellites to the peak.<sup>29</sup> The simplest and most straightforward formal implementation of this case is to mark unpredictable syllabic /i u/ as syllable heads (N) in underlying representations, that is, to replace the temporary notation /i. u./ employed in (6) with that illustrated in (15):

(15) <i>unmarked syllabicity</i>		<i>vs.</i>	<i>marked syllabicity</i>	
p /i/ so	[i]			
bon /ia/ to	[ja]		/ia/ to	[i.a]
			N	
b /oi/ na	[oj]		m /oi/ na	[o.i]
			N	
p /u/ so	[u]			
s /ua/ ve	[wa]		z /ua/ vo	[u.a]
			N	
c /au/ sa	[aw]		/au/ lla	[a.u]
			N	

The proposals introduced in (15) agree in essentials with Guerssel (1986, for Berber), Blevins (1995: 221, for English and other languages) and Roca (1997b, for Spanish), who mark unpredictably syllabic high vocoids as obligatory nuclei in underlying representations. On the other hand, Hualde (1994, for Spanish) and Pulleyblank (1994, for Yoruba) propose marking vowels, but not glides, as underlyingly moraic. Since Spanish glides in syllable rhymes are relevant for stress assignment (§3.4 below), Hualde’s and Pulleyblank’s approach entails unmotivated manipulation of the moraic status that Hualde proposes for glides in Spanish. The approach we share with Guerssel, Blevins and Roca is preferable in that it appeals to no such ad hoc operations.

Given underlying representations like those in (15), (12) operates

<sup>28</sup> Or [yód], [jód], [žód], [jód], depending on dialect and context. These variants of syllable-initial [j] will be taken for granted from now on.

<sup>29</sup> This evidence is reviewed in Harris (1989). Because of a perceived theory-internal technical difficulty, however, Harris reluctantly designates obligatory non-hiatus as the lexically marked case. As will be seen, the present analysis gets to have its cake and eat it too: hiatus can be maintained as the marked case, with no technical glitch.

straightforwardly in the cases illustrated in (16), where obvious notational shortcuts are taken to save space:

(16) piso                      iato                      moina                      *underlying representation*

p i s o                      i a t o                      m o i n a                      (12a,b)

p i s o                      i a t o                      m o i n a                      (12d)

The syllabification of prevocalic high vocoids (as in *dio* [djó] ‘s/he gave’ and *yo* [jó] ‘I’) is illustrated in (17), again with innocuous notational shortcuts:

(17) dio                      io                      *underlying representation*

d i o                      i o                      (12a,b)

d i o                      (12c)

d i o                      i o                      (12d)

In such cases the high vocoid is not identified by (12a) as a nucleus, because it is not a sonority peak: it is flanked by a segment of greater sonority, namely the non-high vocoid on its right, which is a sonority peak and hence a nucleus. After projection, Complex Nucleus (12c) applies to the high vocoid in /dio/ but not to that of /io/, because the former has a segment of less sonority on its immediate left while the latter does not.



vocoid, are structurally identical. But the adjunction structure itself does not explain how the rightmost rather than the leftmost of two high vocoids of equal sonority is selected as the peak of the syllable. The desired result follows if the syllabification algorithm scans the string of unsyllabified phonemes from right to left, thus: the rightmost permissible N is identified in accordance with (12a), whereupon N' and N'' are automatically projected (12b) and additional segmental material is associated to this structure subject to the conditions expressed as Complex Nucleus (12c), Attach Onset (12d), Attach Rhyme (12e) and Adjoin /s/ (12f). The parse then shifts left and starts over until the domain of scansion is exhausted. At any one point, the procedure examines at most two segments to compare their sonority.

The relevant difference between, say,  $f[wí]$  'I went' and  $v[ój]$  'I go' is that in  $f[wí]$  the first candidate vocoid for peakhood, namely rightmost /i/, passes the test (it is not flanked by a segment of greater sonority) and is thus identified as a nucleus, to which /u/ and /f/ are added in turn in the now familiar way. In  $v[ój]$ , on the other hand, rightmost /i/ fails as a peak (it has more sonorous /o/ on its left); thus the scan slides left to find /o/ as the rightmost nucleus, to which the flanking segments are added as expected. In short,  $f/ui/ \rightarrow f[wí]$ , but  $v/oi/ \rightarrow v[ój]$ . The right-to-left parsing procedure just sketched has numerous additional (correct and surprising) consequences; we forego discussion of them, however, since an adequate foundation to pursue our core concerns has been laid at this point.

## 2.5 Epenthesis, Resyllabification, Diphthongisation, Denuclearisation

Syllabic constituency generated by (12) can be adjusted in the course of a derivation. In this section we briefly outline five such cases: Epenthesis, Resyllabification, Diphthongisation (introduced just above (11)) and two processes of Denuclearisation (alluded to in note 23). Some of these involve glides directly; others are necessary for understanding the behaviour of aspirated /s/ and its interaction with high vocoids in AR.

Epenthesis of /e/ in Spanish before /s/ not incorporated into syllable structure (among other environments) is one of the best-known and least controversial phonological phenomena in Spanish phonology. It is seen in *in+spirar* 'to breath in' but *espirar* 'to breathe', whose surface syllabification is *ins.pi.rár* and *es.pi.rár* – and hundreds of similar examples. These representations come about as shown in (20); irrelevant details omitted:

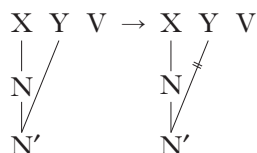
(20) in+spirar	spirar	<i>underlying representation</i>
ins.pi.rar	s .pi.rar	<i>Syllabification</i> (12) <sup>31</sup>
	e s .	$\emptyset \rightarrow e / \_  s $
	es.pi.rar	(12a,b,e)

<sup>31</sup> |x| = segment not incorporated into syllable structure.

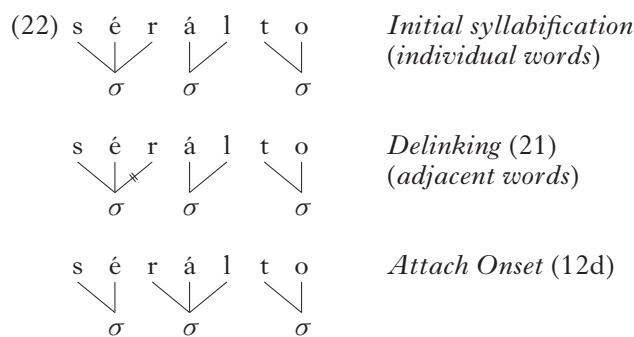
All of the segments in /in + spirar/ can be syllabified at the outset. The initial /s/ of /spirar/, however, remains initially unparsed because \*sC is not a possible onset in Spanish. Unincorporated |s| triggers insertion of /e/, which sets off a new round of application of algorithm (12). This must be a *second*, mid-derivational iteration of the algorithm: a first iteration is necessary to distinguish syllabified /s/ in *ins.pi.rár* (no epenthesis) from stranded |s| in |s|*pi.rár* ( $\rightarrow$  *es.pi.rár*).<sup>32</sup>

Resyllabification is also a familiar phenomenon. We follow Harris (1983: 43–44) and Hualde (1991: 485–486) for data, but give the novel formulation in (21):

(21) *Resyllabification (delinking)*



Resyllabification, in conjunction with Attach Onset (12d), moves coda segments into a following empty onset. (Word-final codas must first be parsed in individual words for primary word-stress assignment and other generalisations (Harris 1991, 1995).) The process typically takes place in sequences of words; in certain cases it occurs between prefix and stem. As indicated by the contextual V in (21), Resyllabification does not transfer a coda consonant into an already-filled onset, even if the result would be permissible in initial syllabification; for example, *chéf. Lo.rén.zo* ‘chef Lorenzo’  $\rightarrow$  \**ché.f Lo.rén.zo*, despite well-formed *Flo.rén.cia* ‘Florence’. A derivation illustrating legitimate resyllabification, for *sér álto* ‘to be tall’, follows:



Resyllabification, both between words and between prefixes and stems, figures prominently in the arguments that follow, so we will give some

<sup>32</sup> Although there is no epenthesis after the ‘stem-level’ prefix in *in-spirar*, this process does occur after ‘word-level’ prefixes, for example *in-estable* ‘unstable’. Harris (1999) gives a detailed analysis.

motivation now for derivations like (22). In many dialects, the alveolar flap [r] can ‘strengthen’ to [R] – a cover symbol for various realisations depending on dialect, e.g. a voiced alveolar trill, a voiceless retroflex fricative – in syllable codas.<sup>33</sup> ‘Strengthening’ occurs within a word (*ser.món* ‘sermon’), over sequences of words (*ser.bájo* ‘to be short’) and utterance finally (*¿ser o nó ser?* ‘to be or not to be?’). *Ser.món*, *ser.bájo* and utterance-final *ser* can have [R] as well as [r]. But *se.rán* ‘they will be’, *ser.áto*, *¿ser o nó...*, where *r* is prevocalic, can have only [r], not [R], in connected speech. The conclusion is that *r* is not in coda position in *ser.áto*, *ser o nó...*: in the appropriate phrasal contexts it is delinked from the coda by (21) and reincorporated as an onset by (12d), thus bleeding the ‘strengthening’ process, which applies across the board, as noted just above.

Diphthongisation involves instances of /e/ and /o/ that surface as [je] and [we], respectively, under stress. As explained in Harris (1985), Carreira (1991) and other work, not all stressed /e o/ diphthongise; those that do are lexically marked. We use the informal notation /e! o!/ to identify them. Consider the examples *qu[jé]re* ‘s/he wants’ and <h>[yé]re ‘s/he wounds’ in (23):<sup>34</sup>

(23)	ke!re	e!re	<i>underlying representation</i>
	ke!.re	e!.re	<i>Syllabification (12)</i>
	ké!.re	é!.re	<i>Stress assignment</i>
	kjé.re	jé.re	<i>Diphthongisation</i>
		yé.re	<i>Consonantalisation, etc.</i>
		jé.re	

Syllabification must precede stress assignment in Spanish, which is sensitive to syllable structure. Syllabification rules (12) of course identify the /e!/ in /ke!re/ and /e!re/ as nuclei. Diphthongisation of this /e!/ yields the string *jé*, of which *é* obviously remains in the nucleus. In cases like *kjé.re*, where a consonant precedes the diphthong, the new *j* is also parsed as a nuclear element in agreement with Complex Nucleus (12c). On the other hand, in cases like *jé.re*, where the diphthong is syllable- (and word-)initial, derived *j* is realised phonetically as obstruent [y ɟ] in most dialects of Spanish (including AR and standard Castilian) by virtue of an independently motivated Consonantalisation process discussed in detail in §3. These realisations are compatible only with onset position in Spanish (see discussion of (10)). Therefore, syllabic status must change in the course of the derivation: in syllable-initial position, the *j* and/or its reflexes resulting from Consonantalisation must leave the N-node of parent /e!/ and surface in the onset. Every analysis must recognise this

<sup>33</sup> Descriptions of the articulation and distribution of [r] and [R] can be found in standard sources, e.g. Navarro (1965).

<sup>34</sup> Compare *qu[e]rer* ‘to want’ and <h>[e]rir ‘to wound’, in which stem /e!/ does not diphthongise because it is not stressed.

fact, but opinions differ as to the exact nature of the reparsing. For present purposes it is sufficient to establish that an alteration of assigned syllabic constituency is a fact of phonological life.<sup>35</sup>

We turn now to ‘denuclearisation’. An unstressed high vowel to the left of another vowel may or must lose its syllabicity in every dialect of Spanish, so far as is known. Thus contrasts like <h>[u.i]da vs. c[wɪ]da and others illustrated in (5) and (6) merge as <h>[wɪ]da and c[wɪ]da under conditions of tempo and register that vary among dialects. This process is stated semiformaly in (24):

(24) *Prevocalic denuclearisation* (PreD)



Decapitation of a constituent destroys constituency. Since the nucleus is the head of the syllable, delinking the nucleus automatically delinks the onset as well, if one is present. The segments delinked by (24) are reincorporated into syllable structure by the normal parsing rules in (12). Illustrative (but incomplete) derivations are provided with Argentinian data in (25), for *yeti abominable* ‘abominable yeti’ and <h>iáto ‘hiatus’, where |x| indicates delinked segments:

(25) <i>yeti abominable</i>	<h>iáto	
ieti abominable	i.ato	<i>underlying representation</i>
je.ti .a.bo.mi.na.ble	i.a.to	<i>Syllabification</i> (12)
jé.ti .a.bo.mi.ná.ble	i.á.to	<i>Stress assignment</i>
žé.ti		<i>Coronalisation</i> <sup>36</sup>
žé. tj .a.bo.mi.ná.ble	j .á.to	<i>PreD</i> (24)
žé. tj ja.bo.mi.ná.ble		<i>Ident N/Project/Comp N</i> (12a–c)
žé.tja.bo.mi.ná.ble	.já.to	<i>Attach Onset</i> (12d)

It is noteworthy that PreD counterfeeds Coronalisation; that is, under the same conditions of segmental environment, register, etc., at which /ieti/ yields [žé.ti], etc. (note 36), /i.ato/ cannot yield \*[žá.to] instead of [já.to].

So far as is known, all dialects of Spanish have in addition to (24) a

<sup>35</sup> We return to the topic of diphthongisation of /e!/ in §3.4.3, where it figures in our discussion of the source of the palatal segment in words like <h>iéndo ‘I split’ [yéndo] and <h>iélo ‘ice’ [yélo] in AR.

<sup>36</sup> Other outputs are [y ɿ], depending on dialect, etc.

process of Postvocalic Denuclearisation (PosD), which can be formulated for present purposes as in (26):

$$(26) \textit{Postvocalic denuclearisation (PosD)}$$

$$\begin{array}{ccc} \text{V [+high]} & \rightarrow & \text{V [+high]} \\ | & & | \quad \dagger \\ \text{N} & & \text{N} \end{array} \quad ([+high] \text{ is unstressed})$$

Despite their similarity, PosD (26) is not simply the mirror image of PreD (24) in all dialects: the two processes apply under different conditions in some dialects. For example, in standard Castilian PreD (24) applies optionally according to dialect-particular conditions on register and tempo, without regard to morphological constituency or word boundaries ('postlexically'). In contrast, the properties of PosD (26) are characteristic of a word-domain ('lexical') rule: it applies obligatorily within stems but optionally in larger domains such as over the boundary between prefix and stem. For example, *r[e.i]nstála* 's/he reinstalls' (5a) is a possible realisation because it contains the prefix *re-*, but [e.i] is not a possible morpheme-internal surface realisation. In short, PosD (26) applies both in stems (obligatorily) and in larger domains (optionally) while PreD (24) applies (optionally) only in the phrase domain (i.e. across the board). The highly condensed derivations in (27) illustrate these details of application with standard Castilian data; underlying phonological representation and relevant aspects of morphological structure are shown in the first line:

(27) [[pai.sano]]	[[pre [i.ato]]]	<i>inner word</i>
pa.i.sa.no	.i.a.to	<i>Syllabification (12)</i>
pa.i.sá.no	.i.á.to	<i>Stress</i>
paj.sá.no		<i>PosD (26): obligatory</i>
		<i>outer word</i>
paj.sá.no	pre .i.á.to	<i>Input</i>
	pre.i.á.to	<i>Syllabification (12)</i>
		<i>phrase domain</i>
	(pre.já.to	<i>PreD (24): optional</i>

The words in (27) are *paisáno* 'countryman' and *pre<h>iáto* 'prehiatus'. The marked syllabicity of /i./ in *paisáno* is established by disyllabic *p[a.i]s* 'country' (not monosyllabic *\*p[áj]s* in standard dialects). The crucial point illustrated in (27) is that *p[aj]sáno* is the only possible output for /pai.sano/; *\*p[a.i]sáno* is not possible, despite the fact that *pr[e.i]áto* is one of the possible outputs for /prei.ato/. This subtle contrast is due to the fact that PosD applies obligatorily to [a.i] in *paisáno*, though PreD applies only optionally to [i.a] in *pre<h>iáto*.

In sum, the material in this section leaves no doubt that syllabic constituency is adjusted in the course of a derivation in numerous ways and under numerous conditions.



As a postscript we comment on the formal operation carried out by the resyllabification rules (21), (24) and (26). Older treatments (e.g. Harris 1983: 43–44, 1993: 182, Hualde 1991: 481–482, 485–486) stipulate every aspect of the structural changes involved in these processes. Our resyllabification rules, on the other hand, remove existing structure but do not build anything back. The latter task is carried out by the same algorithm that builds the original structure. The older treatments thus involve an otiose repetition of generalisations; our treatment does not. We believe that our apparatus is superior in another way. Fully stipulative rules could, in principle, specify outputs other than the correct ones. But our formal machinery, in which a delinking phase is followed by reapplication of the usual steps of the syllabification algorithm, necessarily yields only correct output structures, namely those produced by the syllabification algorithm. Our proposals are thus consistent with and support the general principle that structure-changing processes consist of separable structure-removing and structure-building phases (Poser 1982, Kiparsky 1993).

### 3 Argentinian Spanish (AR)

The strident fricative [ʃ] and its variant [ʃ̺] are unmistakable shibboleths in AR, as explained in §1.<sup>37</sup> In this section, after a brief orientation, we propose that these segments are surface reflexes of underlying /i/. We motivate two rules, Coronalisation and Consonantalisation, that account for productive alternations of [j] with the obstruents [ʃ̺] and [y], respectively. We then uncover surprising stress contrasts that bolster our proposals regarding underlying /i/. Several aspects of our proposals are integrated in an analysis of aspiration in the *porteño* dialect of Buenos Aires (PO) and in the dialect of Río Negro (RN). The section closes with a summary of rules and rule interactions and a brief excursus on alternative analyses.

#### 3.1 Orientation to AR

Surface contrasts of [ʃ̺] (or [j]) with [y] (or [ɹ]) word-initially and of [ʃ̺] with [j] (or [y]) word-medially are illustrated in (28):<sup>38</sup>

<sup>37</sup> Lozano (1979) is an indispensable reference for AR, to which we add our own observations gathered while teaching at the Universidad Nacional del Comahue, Río Negro, in 1994 (EK), 1995 (JH) and 1996 (EK). We gratefully acknowledge the help of colleagues and students too numerous to mention individually, among whom we give special thanks to Jorge Alende, Marta Baduy, Elvio Bompadre, María Rosa Fracassi, Dolores Geymonat, Carmen Lozano, Pascual Masullo, Rosa Montes, Elena O'Connell de Alende, Silvia Rivero, Margarita Suñer and Graciela Tesan for answering questions about their idiolects of AR.

<sup>38</sup> Some Argentinian dialects have a contrastive palatal lateral /ʎ/, spelled <ll>; but PO and RN have no /ʎ/, and their orthographic <ll> is pronounced the same as y, usually [ʃ̺].

(28) a. <i>initial</i>	[ʒ̥] or [j]	≠ [y] or [ɟ]
	yéndo ‘going’	<h>iéndo ‘I split’
	yérba ‘maté’ <sup>39</sup>	<h>iérba ‘herb’
	yáte ‘yacht’	<h>iáto ‘hiatus’
	yó ‘I’	ión ‘ion’
b. <i>medial</i>	[ʒ̥]	≠ [j] or [y]
	clarabóya ‘skylight’	paranóia ‘paranoia’
	cebólla ‘onion’	secuóia ‘sequoia’
	uruguáya ‘Uruguayan’	Usuáia (toponym)
	Mayagüéz (toponym)	Vaiolét (brand of toilet paper)

Lozano (1979) discusses the initial contrast (28a) and its phonetic realisations, but the medial contrast (28b) has not been previously noted, so far as we know.<sup>40</sup> Both contrasts are unmistakable in PO and RN, where the phonetic implementations illustrated in (28) are a distinctive signature.

The class of words illustrated on the left side of (28a) has initial [ʒ̥] or [j]. These segments never contrast with each other in AR. It is solidly documented (Lozano 1979) that affricate [j] replaces continuant [ʒ̥] after /l/ and /n/; [ʒ̥] is the default case. For example, *el* [j]áte ‘the yacht’, *si*[ñ j]áte ‘without a yacht’, but *ése* [ʒ̥]áte ‘that yacht’. Similarly, in words like those on the right in (28a), initial continuant [y] varies non-contrastively with non-continuant [ɟ] under the same conditions. For example, *el* [ɟ]áto ‘the hiatus’, *si*[ñ ɟ]áto ‘without hiatus’, but *ése* [y]áto ‘that hiatus’. These data, which can be multiplied endlessly, motivate the rule of [–cont]-spreading, which we state semiformally as in (29), where the specification [+voice] correctly blocks spreading in strings like *ns* (↯ *nt*):

(29) [–cont]-spreading	
	X [COR, –son, +voice] (domain: phrase)
	-----
	[–cont]

Targets of (29) occur systematically only in syllable-initial position, and triggers occur only in syllable-final position. Non-continuant obstruents are rare in the latter position, but the natural AR pronunciation of examples like *Rut*<h> *Yañez* (an unremarkable name) with [t.j] supports the formulation of (29) as a general assimilation (spreading) rule, not limited to the usually cited triggers /l/ and /n/.<sup>41</sup> Moreover, although this detail is not incorporated into (29), some AR speakers require that the

<sup>39</sup> More precisely, the leaves used to make the beverage *mate*.

<sup>40</sup> Harris (1983: 61) mentions *paranó[j]a*, but mistook it for a unique anomaly rather than a member of a small class of more or less learned items, indigenous toponyms, and the like – about which AR speakers nonetheless have very clear intuitions.

<sup>41</sup> Thus /l/ patterns here like other [–continuant] segments (see Clements 1987, Kaisse 1998, Kenstowicz 1994: 34–38, 480–488 and references therein on this disputed feature specification).

segment X from which [–continuant] spreads be Coronal; for other speakers not only Coronal but Labial and Dorsal stops as well spread [–continuant] rightward, as shown by examples like *el jee[p̄j]éga* ‘the jeep is arriving’ (*llega*) and *el coñá[k̄j]éga* ‘the cognac is arriving’. AR shares this rule (though not its input [ž]) with most if not all other dialects of Spanish. Analogous variation is found in reflexes of labiovelar /w/, which we ignore in our focus on palatal segments.<sup>42</sup>

AR shares Prevocalic Denuclearisation (24) and Postvocalic Denuclearisation (26) as well as (29) with most if not all other varieties of Spanish. Recall that the stylistic conditions and domain assignments under which PreD (24) applies vary from dialect to dialect. In AR, PreD applies more often than not within words, but there are well-formed instances of hiatus in surface representations and phonetically minimal pairs differing only in syllabicity. For example, the consultants we have worked with most closely on this point can clearly distinguish ⟨*h*⟩[u.ɪ](*mos*) ‘s/he (we) fled’ from *f*[wɪ](*mos*) ‘s/he (we) went’, *l*[u.ɪ]s ‘you rub off’ from *l*[wɪ]s ‘Louis’, *p*[i.é] ‘I chirped’ from *p*[jé] ‘foot’, and so on. The same speakers may also neutralise these distinctions by eliminating hiatus (i.e. by denuclearising the unstressed high vocoids). Over sequences of words, PreD tends not to apply in AR in colloquial speech delivered at a normal rate. For example, both *yé.t*[i.a].*bomináble* and *yé.t*[ja].*bomináble* (25) are natural pronunciations in AR, as are *cá.s*[i.o].*bligatório* and *cá.s*[jo].*bligatório* ‘almost obligatory’, etc. However, hiatus between words is the norm for most speakers except in the most casual registers. It is not crucial to our main proposals for us to specify precisely the conditions under which PreD (24) applies in AR, and we will not do so. Suffice it to say that different conditions govern application within words and over word boundaries, which suggests that (24) applies both in the word domain (‘lexically’) and in the domain of the phrase (‘postlexically’). It is important to bear in mind that this process often obscures in surface representations a lexical distinction between /i/ and /i./, in AR as in other dialects.

We are now ready to address in general terms the question of what phonological representations underlie the surface segments illustrated in (28) and their variants.

### 3.2 Underlying representations of palatal segments

The examples in (28a) illustrate an underlying contrast in AR between the source of initial [ž] and that of [y] (and of their respective variants [j] and [ɟ]). Those in (28b) illustrate an underlying contrast between the source of medial [ž] and that of [j] and its variant [y] due to ‘Consonantalisation’ (§3.4.3). To these we can add contrasts like *p*[jé] *vs.* *p*[i.é]. Since the [–cont]-spreading rule (29) accounts for the non-contrastive distribution of [ɟ] as a variant of [y] and [j] as a variant of [ž], we can disregard

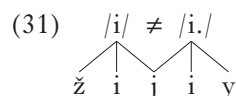
<sup>42</sup> Although we cannot develop the issue here, we suspect that much of the notorious dialect variation in the distribution of stop [b d g] *vs.* continuant [β ð ɣ] (‘Spirantisation’; cf. Lozano 1979 for the facts of AR) is due to the variable requirement for coronality in the trigger and/or the target of rule (29).

[–continuant] [j] and [ʝ] for the moment. There remain surface manifestations in AR of all of the potential contrasts shown in (30):

- (30) a. ʒ vs. y (word-initial)  
 b. ʒ vs. j ~ y (word-medial, syllable-initial)  
 c. j vs. i (in rhyme)

We must ask: are all four elements {ʒ y j i} lexically contrastive, or are most of these elements predictable variants of others? If the latter, which are contrastive and which are not, and under what conditions?

As illustrated in (1) and developed in detail immediately below, there are productive alternations between [ʒ] and [j] in AR in which the distribution of these two phones is plainly predictable in purely phonological contexts; we may therefore tentatively assume that [ʒ] and [j] are reflexes of a single phoneme – call it /J/; [ʒ] is the syllable-initial realisation of this phoneme. Thus all the elements on the left side of (30) can be provisionally replaced with /J/. But we established in §2.2 that [j] and [i] are related as non-peak/peak variants of /i/. We know that the contrasting phoneme in (30c) is /i./, and in the following subsections we establish that the other righthand elements are realisations of /i./. Thus the final conclusion is that there is only one irreducible lexical contrast among the palatal (high non-back) segments at issue in AR. This is diagrammed in (31):<sup>43</sup>



In sum, we identify the AR contrast in question as the independently motivated pandialectal contrast between /i/ and /i./. We now proceed to justify (31) in detail, starting with an examination of the productive, predictable, phonologically conditioned alternation between *j* and *ʒ* in AR.

### 3.3 The [j]–[ʒ] alternation

The examples in (28b) show that [ʒ] contrasts with [j] in intervocalic position in some words. Still, [ʒ] alternates predictably with [j] in stems, derivational morphemes and inflectional endings in a host of cases. In the following examples, the alternation is in the final segment of the stem:

- (32)
- |             |           |                 |              |
|-------------|-----------|-----------------|--------------|
| U.ru.guá[j] | ‘Uruguay’ | u.ru.guá.[ʒ]-o  | ‘Uruguayan’  |
| con.vó[j]   | ‘convoy’  | con.vó.[ʒ]-es   | ‘convoys’    |
|             |           | con.vo.[ʒ]-ár   | ‘to convoy’  |
| bué[j]      | ‘ox’      | bue.[ʒ]-é.ro    | ‘ox driver’  |
| ré[j]       | ‘king’    | re.[ʒ]-e.zué.lo | ‘king (DIM)’ |
| lé[j]       | ‘law’     | lé.[ʒ]-es       | ‘laws’       |

<sup>43</sup> The possibility that [i] and [j] might be overlapping realisations of both /i./ and /i/ caused a vexing and contentious analytical problem among the structuralist analyses listed in note 16.

The same alternation is illustrated in regular inflectional and derivational morphemes in the following examples:

- (33) a. cre.c-[j]é.ron ‘they grew’ (past perfective)  
           cre-.[ž]é.ron ‘they believed’  
       b. cre.c-[j]én.do ‘growing’ (gerund)  
           cre-.[ž]én.do ‘believing’  
       c. cre.c-[j]én.te ‘growing, crescent’ (adjective, noun)  
           cre-.[ž]én.te ‘believing, believer’  
       d. cre.c-[j]ó ‘s/he grew’ (past perfective)  
           cre-.[ž]ó ‘s/he believed’

The stems in (33) are consonant-final *crec-* ‘grow’ and vowel-final *cre-* ‘believe’, whose dictionary citation forms are the infinitives *crec-e-r* ‘to grow’ and *cre-e-r* ‘to believe’. In these, final *-r* is the infinitive morpheme and the *-e-* before it is the ‘Theme vowel’ of the ‘2nd conjugation’. Other phonological instantiations of this morphological element and of its counterpart in the ‘3rd conjugation’ are illustrated in (34a–d). The phonological ‘spell-outs’ of the relevant morphological features are supplied by Vocabulary entries that can be stated with some innocuous simplification as in (34e):<sup>44</sup>

- (34) a. crec-[j]ó (33d) 2nd conj  
           luc-[j]ó ‘s/he excelled’ 3rd conj  
       b. crec-[j]éron (33a) 2nd conj  
           luc-[j]éron ‘they excelled’ 3rd conj  
       c. crec-[í]mos ‘we grew’ 2nd conj  
           luc-[í]mos ‘we excel(led)’ 3rd conj  
       d. crec-[é]mos ‘we grow’ 2nd conj

e. *Vocabulary entries*

$$\text{Theme} \Leftrightarrow \begin{cases} i / [2/3 \text{ conj}] \_ \text{ [PERF, 3SG]} \\ ie / [2/3 \text{ conj}] \_ \text{ (certain suffixes)} \\ \vdots \\ i / [2 \text{ conj}] \_ \text{ [+past]}^{45} \\ \quad [3 \text{ conj}] \_ \\ \vdots \\ e / [2 \text{ conj}] \_ \end{cases}$$

The distribution of 2nd and 3rd conjugation Theme variants *i/ie/i./e* is

<sup>44</sup> AR shares these entries with all other major dialects of Spanish. The theory of vocabulary entries presupposed by (34e) is articulated in Harris (1997) and references therein.

<sup>45</sup> The fact that this entry is syllabically marked /i./ rather than unmarked /i/ is shown by forms like 2nd conjugation *crec[í.a]mos* ‘we grew’, 3rd conjugation *o[í.a]mos* ‘we heard’ (both past imperfective) and *[o.í.]mos* ‘we hear’ (present indicative).

determined morphologically, as shown in (34e); purely phonological conditions are inadequate. For example, the diphthong [je] occurs in a stressed open penult followed by a sonorant consonant in *cre.c[jé].ron* (33b), but [e] occurs in this phonological context in *cre.c[é].mos*, as does [i] in *cre.c[i].mos* and *lu.c[i].mos*. The diphthongal variants of thematic /e/ and /i/ cannot be due to the well-studied phonological process which yields [je] as the predictable reflex of lexically marked stressed /e/ (cf. §2.5). This is obvious from the fact that the thematic diphthongs appear in contexts that are phonologically random but morphologically regular. Not only the [j] of thematic /ie/ but also that of 3rd person singular perfective *j+ó* in the first case of (34e) is provided by Vocabulary entries in the morphological component of the grammar.

We place special emphasis on the distinction between (a) surface [j] from underlying /i/ provided by the spell-out of inflectional features or occurring in the lexical entries of stems and (b) [j] derived by PreD (24) and by diphthongisation of /e/. Only [j] from underlying /i/ alternates with [ž]; [j] derived by PreD and diphthongisation does not. In §3.4.3 we account for the fact that the latter instances of [j] do not participate in this alternation.

The distribution of [j] and [ž] in (32) and (33) is storable in purely phonological terms. The process in question, which we dub ‘Coronalisation’ – an inelegant word that nonetheless has the virtue of suggesting a radical change of primary articulator – is stated in (35). (35a) simply shows the net effect of the rule and (35b) is a more explicit statement in terms of the distinctive feature assignments given in (3).

(35) *Coronalisation*

- a.  $j \rightarrow ž / \sigma[ \_ ]$  (domain: word)
- b.  $\begin{bmatrix} -back \\ +high \end{bmatrix} \rightarrow \begin{bmatrix} +cons \\ -son \end{bmatrix} / \sigma[ \_ ] N$  (domain: word)
- |
- PLACE
- |
- $\begin{bmatrix} cor \\ -ant \end{bmatrix}$

As shown perspicuously in (35a), [j] is replaced by [ž] in syllable-initial position in AR; [j] is the default realisation. More formally (35b), Coronalisation requires that a syllable-initial prenuclear [–back, +high] (‘palatal’) segment be realised as a [–anterior] coronal obstruent. We assume that [+voice], [+continuant], [–nasal] and other properties of the output segment either are carried over unchanged from the input or are due to principles of markedness and redundancy along the lines suggested in Lahiri & Evers (1991), Kaisse (1992), Calabrese (1995) and

much other work.<sup>46</sup> We revisit the formulation of Coronalisation twice below, first in §3.4.3 where we compare Coronalisation and Consonantalisation and again in §3.7 where we consider alternative formulations.

We will return to the question of why Coronalisation does not affect words like those in the righthand column of (28). First we insert a comment on a popular but incorrect claim regarding the relationship of [y] and other segments to stress placement. We belabour the point because it is important to understand this relationship, obfuscation of which continues to appear in the literature (see note 48). We saw at the end of §2.2 that the syllabicity contrasts /i u/ vs. /i. u./ are crucial to stress placement in certain forms; we will see below that stress placement in other items is similarly subject to underlying contrasts that are not transparently reflected in phonetic representations.

### 3.4 Stress and palatal segments

3.4.1 *Excursus on stress and history.* As is well known, stress on the penultimate syllable of vowel-final words is overwhelmingly the predominant stress pattern in Spanish. Antepenultimate stress is possible in such words as a marked option. However, native speakers of Spanish robustly judge this contour to be strongly deviant if the penult is heavy. For example, *li.bé.lu.la* ‘dragonfly’ is possible though unusual while *\*li.bé.lur.la* is impossible.<sup>47</sup> It has been claimed – incorrectly, we argue – that antepenult stress is also disallowed when the penult is light in words of the form XCV.CV.[P]V#, where [P] is the syllable onset consisting of one of the palatal segments [y ɟ ñ č], plus [ʎ] and (velar) [x] in dialects that have the latter two.<sup>48</sup>

The putative exclusion of antepenult stress in words of this form is said to be a residual consequence of the fact that the segments in question have bisegmental historical sources that interact with some version of the Latin stress rule. Thus the ancestor of XCV.CV.[P]V# is supposedly XCV.CVC.CV#, whose heavy penult excludes stress on the antepenult. This reference to history is a red herring. Not all of the etymological sources of [P] are bisegmental,<sup>49</sup> thus multisegmental underlying representations for [P] segments in modern Spanish could hardly be justified by

<sup>46</sup> Coronalisation falls under the familiar rubric of ‘strengthening’ in syllable onsets; recall from note 25, however, that we use the term ‘onset’ informally.

<sup>47</sup> The cluster *rl*, as in *búr.la* ‘mockery’ and myriad other examples, is impeccable. The literature on Spanish stress is extensive. Dunlap (1991), García-Bellido (1997), Harris (1995), Lipski (1997) and Roca (1997a) are recent accounts.

<sup>48</sup> The most recent version of this account we have seen is in Roca (1997a: 635–638). Other versions appear in Carreira (1988), Dunlap (1991: 35–53), Roca (1988: 416–417), among other works.

<sup>49</sup> For example, [x] has such diverse one-segment (and non-palatal) Latin etyma as labial /f/ ([x] *amelgo* < *famelicu*), coronal /s/ ([x] *ugo* < *sucu*) and velar /g/ ([x] *ente* < *gente*), not to mention other single-segment sources in other donor languages. The other [P] segments [y/ɟ], [ʎ], [ɲ] and [č] also have a variety of monosegmental historical sources.

history even if – counterfactually – such evidence were accessible to and utilised crucially by children acquiring language in the normal way.

The claim that XCV.CV.[P]V# words cannot have antepenult stress is evidently based solely on the paucity of such cases that turn up in dictionary searches. But they do exist; for example, *cón.[j]u.[x]e* ‘spouse’ is a word (inherited from Latin) that virtually every mature native speaker knows and – more importantly – does not consider ill-formed or foreign. The fact that words like *cón.[j]u.[x]e* are statistically infrequent is presumably of interest to historians and lexicographers. The object of our investigation, however, is not history or lexicography but rather the internalised knowledge of contemporary native speakers. Over the course of decades, informal probes of the judgements of dozens of Spanish speakers from a variety of countries carried out by the first author (see §3.4.2 for Argentina) have consistently yielded the results summarised in (36) regarding XCV.CV.[P]V# proparoxytone nonce forms like *tá.ma.[y]a*, *tá.ma.[č]a*, and so on:

- (36) a. They are less natural than their paroxytone counterparts (e.g. *ta.má.[y]a*, *ta.má.[č]a*) – exactly as for actual words like *pis.tó.la* ‘pistol’ vs. *e.pís.to.la* ‘epistle’.
- b. They are *not* judged less acceptable than their proparoxytone counterparts with segments other than [P] in the onset of the final syllable (e.g. *tá.ma.na*, *tá.ma.ga*, *tá.ma.ta*).
- c. They *are* judged more acceptable than their proparoxytone counterparts with heavy penults (e.g. *\*tá.mas.na*, *\*tá.man.ga*, *\*tá.mal.ta*).

These judgements are subtle and tenuous for some speakers. This is not surprising, since the attempted comparisons are with and within the relatively infrequent and less-than-fully-embraced proparoxytone stress contour. What is surprising given the subtlety of the judgements in (36) is the consistency with which they are reported.

Focusing now on the penult rather than the final syllable, consider *cón.[j]u.[x]e* again. This and other words like *o.no.ma.to.pé.[y]i.co* ‘onomatopoeic’, *Plé.[y]a.des* (the stars), *Sá.[y]a.go*, *Zú.[ñ]i.ga* (surnames) have a [P] segment in the onset of the penult but stress on the antepenult. More importantly, native speakers regard nonce forms like *tá.[y]a.ma* to have the same status as items like *tá.ma.[y]a*: they are not as good as their paroxytone counterparts (or words like *pa.[y]á.so* ‘clown’) but not clearly ill-formed either. In short, penult-initial [P] does not make that syllable heavy. This point is not directly germane to the historical origin of [P] segments in final syllables, but we see in the next subsection that a surprising result in AR hinges on it.

All of the facts adduced above support the conclusion that the internalised grammatical system of Spanish speakers accords no special status to XCV.CV.[P]V#, XCV.[P]V.CV# or XCV.[P]V.[P]V#. Despite the cited claims to the contrary, there exists no compelling evidence that segments of the [P] class make heavy rhymes when initial in either the



penult or the final syllable or that onsets affect stress placement in any way in Spanish.<sup>50</sup>

3.4.2 *Palatals and stress in AR.* The AR speakers we have consulted generally agree with (36) – on the understanding, of course, that AR [ʒ] replaces [y] in examples that other speakers realise as *tá.ma.[y]a*, *tá.[y]a.ma*, etc. We emphasise: AR speakers do not reliably discriminate between P-forms like *tá.ma.[ʒ]a*, *tá.[ʒ]a.ma* on the one hand and non-P-forms like *tá.ma.sa* on the other with respect to acceptability of antepenult stress.

On the other hand, our AR consultants do distinguish these cases from nonce forms like *\*tá.ma.[j]a*. That is, AR speakers judge words like those in the right column of (28b), but with antepenult stress, to be deviant. As expected, nonce forms like *ta.má.[j]a* are fully acceptable, just like the paroxytones in the right column of (28b). Our AR consultants also distinguish acceptable forms like *ta.[j]á.ma* from deviant *\*ta.[j]a.ma*. In short, palatal [j] affects stress in penultimate as well as final syllables in AR, though [ʒ] does not.<sup>51</sup>

This distinction in AR between well-formed *tá.ma.[ʒ]a* and *tá.[ʒ]a.ma* vs. unacceptable *\*tá.ma.[j]a* and *\*tá.[j]a.ma* is doubly surprising. First, even linguistically sophisticated AR speakers are astonished to discover that they have in their own speech a prosodic restriction forbidding forms like *\*tá.ma.[j]a* and *\*tá.[j]a.ma*. Second, the well-formed and ill-formed configurations under discussion are patterns that AR speakers never hear or utter in their normal linguistic experience. It is thus not self-evident how they might have learned to discriminate between the metrically ungrammatical pattern and the well-formed one. Yet the dozen or so AR consultants we have subjected to detailed interrogation have given us ample evidence that they do just this. As in the case of (36), and for the same reasons, judgements are subtle for one or two of our subjects; but for the rest, whose discrimination is consistent and clear, decisions regarding well-formedness are uniform.

There is an instructive parallel in all dialects: words whose final or penultimate syllable is of the form *.C[j]V* – where [j]V is a complex nucleus according to (12c); that is, [j] is not in the onset – can be stressed on the penult but not on the antepenult. A few examples are given in (37):

- (37) a. *final* *.C[j]V*  
           cal.ví.c[j]e ‘baldness’      *but* \*C $\bar{V}$ X.CV.C[j]V#  
           au.dá.c[j]a ‘audacity’  
           ne.gó.c[j]o ‘business’
- b. *penultimate* *.C[j]V*  
           tra.v[j]é.so ‘mischievous’   *but* \*C $\bar{V}$ X.C[j]V.CV#  
           me.d[j]ó.cre ‘mediocre’  
           a.c[j]á.go ‘ominous’

<sup>50</sup> Similar remarks are placed in a slightly broader context in Harris (1988: 17–20).

<sup>51</sup> We discuss the variant *\*tá.ma.[y]a* below under Consonantalisation (43).

All studies that take a stand on the question fundamentally agree on why antepenult stress is ungrammatical in the cases illustrated in (37). Two basic elements of stress placement in Spanish are stated in (38):<sup>52</sup>

- (38) a. In XV.CV.C[j]V# and XV.C[j]V.CV#, all of the vocoids, including [j], are counted in the computation of stress placement.  
 b. The ‘window’ for stress placement contains no more than *three* such computational units at the right edge of the word.

For convenience, let us refer to the segments that are relevant to the computation of the placement of primary word stress as ‘s-counters’. In Spanish, all segments in rhymes (other than the final consonants of most inflectional morphemes) are s-counters; segments in onsets are not. A word like, say, *de.pó.si.to* ‘deposit’ is metrically well-formed because stress falls no farther left than the third s-counter from the end while *\*dé.po.si.to* is ill-formed because stress falls outside the three-counter window.<sup>53</sup> The examples in (37) obey this generalisation. So do nonce forms like *ta.má.[j]a*, *ta.[j]á.ma* in AR and words like *pa.ra.nó.[j]a* in (28b). But AR *\*tá.ma.[j]a*, *\*tá.[j]a.ma* and *\*pa.rá.no.[j]a* are ungrammatical if their [j] and flanking vowels are all s-counters (rhyme elements) since stress falls illicitly on the fourth s-counter from the right edge of the word.

Since both /i./ and /i/ in rhymes are s-counters, either could in principle account for the stress properties in the cases under discussion. Fortunately, evidence is available that points to syllabically marked /i./ as the source of [j] in *paranó.[j]a*, *ta.má.[j]a*, *ta.[j]á.ma*, etc. First, /i./ is a possible source since it is word-internal and not stressed in the cases at hand – thus subject to Denuclearisation in AR (§§2.5, 3.1). Furthermore, if the source were /i/ then Coronalisation (35) would yield [ʒ] since the instances of [j] in question are plainly syllable-initial. But this does not happen. We thus conclude that these instances of [j] are reflexes of syllabically marked /i./. Unmarked /i/ occurs in the contrasting cases on the left side of (28), in nonce forms like *tá.ma.[ʒ]a*, etc., and in general in words with segments that do undergo Coronalisation.

The initial syllabification of words like *paranó[j]a* is thus *pa.ra.nó.i.a*. The surface forms are derived essentially as illustrated in (39):

<sup>52</sup> Here ‘stress’ refers to primary word stress, not to subsidiary prominences. Agreement on (38) in Dunlap (1991), Harris (1995), Roca (1988, 1991) and other work is somewhat camouflaged by different notations and theoretical commitments, not to mention disagreement on much else.

<sup>53</sup> In (uninflected) consonant-final words, stress can fall no farther to the left than the penult; for example, *su.tíl* ‘subtle’ and *ú.til* ‘useful’ are grammatical, but forms like *\*dé.su.til* are not.

(39) <i>paranoi.a</i>	<i>underlying representation</i>
pa.ra.no.i.a	<i>Syllabification</i> (12)
$\begin{array}{cccc}   &   &   &   \\ \text{N} & \text{N} & \text{NNN} & \end{array}$	
pa.ra.nó.i.a	<i>Stress assignment</i> <sup>54</sup>
pa.ra.nó j a	<i>PosD</i> (26)
$\begin{array}{c} \dagger \\   \\ \text{N} \end{array}$	
pa.ra.nó.ja	<i>Attach Onset</i> (12d)

Postvocalic Denuclearisation is stress-sensitive; it must therefore follow stress assignment, which must in turn follow initial syllabification. Stress cannot be assigned outside the three-counter ‘window’ at the right edge of the vowel-final words (38). The grammar fragment illustrated in (39) thus strongly explains the ill-formedness of surface antepenult (erstwhile preantepenult) stress in XCV.CV.[j]V#, as well as that of strings of the form XCV.[j]V.CV# in AR. Since every relevant property of the words in question is thereby automatically predicted, the postulation of underlying /i./ in them receives empirical support from several convergent sources. An intervocalic unstressed /i./ could not be realised phonetically in any way other than as [j] in AR according to the grammar we have developed thus far.<sup>55</sup>

Since our proposals entail that words like *paranóia*, *secuóia* and so on are assigned stress on the antepenultimate syllable before PosD, a recessive pattern in Spanish, one would expect to find corresponding words with the dominant pattern; specifically, words with stressed intervocalic [í] in the penult. Such words exist, for example *ba<h>[í]a* ‘bay’, *bo<h>[í]o*, ‘hut’, *o[í]a* ‘s/he heard’. More cogently, native speakers readily accept nonce forms like *gre[í]o* as well-formed.

Our proposals also account for the rejection of nonce forms like \**tá.[j]a.ma* by AR speakers while *tá.[ž]a.ma* – not to mention words like *cón.[j]u.[x]e*, *Sá.[ž]a.go*, etc. – is judged acceptable. In the former case, the underlying string would have to be /tai.ama/, syllabified *ta.i.a.ma*, in which all the vocoids are nuclei, hence s-counters, the leftmost of which is outside the three-counter stress window. On the other hand, underlying /taiama/, /coniuxe/ and /saiago/ are syllabified *ta.ja.ma*, *con.ju.ge* (see (46) below) and *sa.ja.go* by algorithm (12), which parses syllable-initial /i/ as an onset. Since onset segments are not s-counters, the initial syllable lies inside the stress window; antepenult stress is thus possible in *tá.[ž]a.ma*, *cón.[j]u.[x]e*, *Sá.[ž]a.go*, etc.

<sup>54</sup> *Pa.ra.no.i.a* is assigned the minority stress pattern of *de.pó.si.to*, etc.

<sup>55</sup> The AR variant XCV.CV.[y]V (e.g. *pa.ra.nó.[y]a*) is derived by Consonantalisation (43), discussed below.

3.4.3 *Consonantalisation*. We now have the basis for an account of the fact that Coronalisation (35) does not affect words like *paranóia* and others illustrated in the right column of (28b): the input to Coronalisation is [j] while the words in question have [i] at the stage at which this rule operates. The surface contrast between the left and right columns in (28b) is straightforwardly captured if the class of words illustrated in the left column, like those in (32) and (33), have underlying /i/, unmarked for syllabicity, as we propose. Illustrative (but incomplete) derivations are given in (40):

(40) <i>tramóya</i>	<i>paranóia</i>	<i>léyes</i>	
tra.mo.ia	paranoi.a	leies	<i>underlying representation</i>
tra.mo.ja	pa.ra.no.i.a	le.jes	<i>Syllabification</i> (12)
N N N	N N NNN	N N	
tra.mó.ja	pa.ra.nó.i.a	lé.jes	<i>Stress assignment</i> <sup>56</sup>
tra.mó.ža		lé.žes	<i>Coronalisation</i> (35)
	pa.ra.nó j a		<i>PosD</i> (26)
	‡		
	N		
	pa.ra.nó.ja		<i>Attach Onset</i> (12d)

This proposal extends directly to the classes of words illustrated in (28a), e.g. *yáte* vs. <h>*iáto* and so on: words like *yáte* have underlying /i/ while words like <h>*iáto* present initial syllabic /i./ to Coronalisation (35):

(41) <i>yáte</i>	<h> <i>iáto</i>	
iate	i.ato	<i>underlying representation</i>
ja.te	i.a.to	<i>Syllabification</i> (12)
N N	NN N	
já.te	i.á.to	<i>Stress assignment</i> <sup>57</sup>
žá.te		<i>Coronalisation</i> (35)
	j á.to	<i>PreD</i> (24)
	‡	
	N	
	.já.to	<i>Attach Onset</i> (12d)

<sup>56</sup> *Tra.mo.[ž]a* is assigned the predominant pattern of stress on the penult; disyllabic *le.[ž]es* obviously cannot have antepenultimate stress.

<sup>57</sup> The contour of *i.á.to* is the general one, as is that of disyllabic [ž]*á.te* by default. When /i./ receives stress it is immune to PreD (24) and thus must surface as [í], as in *r[í].o* ‘river’, *fonolog[í].a* ‘phonology’, *Í.o* ‘Io’, <H>*i.a.des* ‘Hyades’, etc.

The only relevant difference between (40) and (41) is that PreD rather than PosD applies in (41).

The case of *yéndo* vs. words like  $\langle h \rangle$ *iéndo* and  $\langle h \rangle$ *iérba*, also illustrated in (28a), is minimally different in that the string [jé] in the latter two does not involve underlying /i./, but is rather the product of diphthongisation under stress of lexically marked /e/ (that is, the /e!/ introduced in §2.5 and alluded to at other points above). Illustrative (incomplete) derivations are given in (42):

(42)	<i>yéndo</i>	$\langle h \rangle$ <i>iéndo</i>	
	iendo	e!ndo	<i>underlying representation</i>
	jen.do	e!n.do	<i>Syllabification (12)</i>
	jén.do	é!n.do	<i>Stress assignment</i>
	žén.do		<i>Coronalisation (35)</i>
		jén.do	<i>Diphthongisation</i>

The underlying initial /ie/ of the gerund *yéndo* (infinitive *ir* ‘to go’, a highly irregular verb with a null stem in several forms) is the phonological spell-out of the 3rd conjugation Theme vowel in accordance with (34e). The initial underlying /e!/ of  $\langle h \rangle$ *iéndo* surfaces as [e] when unstressed in such forms as  $\langle h \rangle$ [e]*ndía* ‘was splitting (PAST IMPF)’,  $\langle h \rangle$ [e]*ndidúra* ‘split (NOUN)’, etc. Coronalisation cannot apply to words like  $\langle h \rangle$ *iéndo*, because they contain no [j] at the time this rule applies, that is, before Diphthongisation derives [je] from underlying stressed /e!/.

As illustrated in the righthand column of (28b) and elsewhere above, syllable-initial surface [j] varies with [y] in AR. This variation is governed by the rule we call ‘Consonantalisation’, which we state informally in (43a) and more explicitly in (43b):

(43) *Consonantalisation*

a.  $j \rightarrow y / \Sigma [ \_ ]$  (domain: word)

b.  $\begin{bmatrix} -\text{back} \\ +\text{high} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{cons} \\ -\text{son} \end{bmatrix} / \Sigma [ \_ ] \text{N}$  (domain: word)

PLACE

DOR	cor
+high	-ant
-back	

We first explain the subscript  $\Sigma$  in the environment of (43), whose intended interpretation is ‘syllable and/or word’. Our AR consultants

uniformly use [y] and not [j] word-initially in citation forms (in agreement with Lozano 1979). In medial position, however, some of our consultants insist on [j], some prefer [y] and some are uncertain. We are unsure about what factors (or combinations thereof) are responsible for this variability; we must leave the question open at this point. We note, however, that variability in medial position but not initially is consistent with the observations of Fougeron & Keating (1997) concerning hierarchies of strengthening environments.

Turning to the phonetic/phonological content of (43), the segment-structure tree of the output reflects the discussion of the auditory and articulatory properties of [y] in §2.1, especially the distinctive feature characterisation in (3).<sup>58</sup> As in the case of Coronalisation (35), we assume that [+voice], [+continuant], [−nasal] and other properties of the output segment are either carried over from the input or are supplied by universal principles. Like Coronalisation, Consonantalisation is a ‘strengthening’ process in the sense that an obstruent replaces a syllable-initial vocoid, thus increasing the dispersion of sonority between first segment of the affected syllable and its head. Coronalisation and Consonantalisation are similar in that both introduce a coronal [−anterior] articulation; they are different in that Coronalisation replaces the dorsal articulation of the input while Consonantalisation retains it, thus creating a complex doubly articulated segment.

Phonetically, the segments [j], [y], [ž] form an ordered sequence. Articulatorily, [j] is dorsal, [y] is dorsal-coronal, [ž] is coronal; [y] is thus articulatorily intermediate between [j] and [ž]. Auditorily, this sequence is a progression from less to more ‘noisiness’ or ‘fricativity’. Be that as it may, [y] is not phonologically intermediate between [j] and [ž]: the alternating morphemes in (32) and (33), for example, have [ž] in syllable-initial position and [j] elsewhere; there is no [y] in between. Furthermore, there is no possible derivational path [j] → [y] → [ž] in which Coronalisation takes a ‘free ride’ on the prior application of Consonantalisation; that is, in which [y] is an intermediate step produced by Consonantalisation, which Coronalisation takes the rest of the way to [ž] in the appropriate contexts. This is not possible because Coronalisation is obligatory for all speakers in word-medial position, but Consonantalisation is not. Thus the ‘free ride’ proposal fails to account for the word-medial [ž] in cases like *Gó[ž]a* (surname), which is obligatory for all AR speakers. The putative derivation would be *Gó/i/a* → *Gó[j]a* (→ *Gó[y]a*) → *Gó[ž]a*. On this proposal there is no path to the obligatory output [ž] except through the stage [y], which many speakers disallow intervocalically. The ‘free ride’ proposal also fails to account for the fact that [j] as a reflex of /i/ alternates with [ž] while [j] derived from diphthongised /e!/ and denuclearised /i./ alternates with [y] (but not in medial position for all speakers), as we have seen. We account for this fact by ordering Coronalisation before, and

<sup>58</sup> As a mnemonic, uppercase ‘DORSAL’ and lowercase ‘coronal’ in (43) reflect their status as primary and secondary articulators, respectively. See also notes 6 and 15.

Consonantalisation after, diphthongisation and denuclearisation, a move obviously not available to the ‘free ride’ proposal.

Derivations that illustrate the effect of (43) and recapitulate the main points of the section so far are given in (44):

(44) <i>paranóia</i>	<h> <i>íáto</i>	<i>yéndo</i>	<h> <i>iéndo</i>	
paranoi.a	i.ato	iendo	e!ndo	<i>underlying rep.</i>
pa.ra.no.i.a	i.a.to	jen.do	e!n.do	<i>Syllabification</i> (12)
pa.ra.nó.i.a	i.á.to	jén.do	é!n.do	<i>Stress assignment</i>
		žén.do		<i>Coronalisation</i> (35)
			jén.do	<i>Diphthongisation</i>
pa.ra.nó j a	j á.to			<i>PreD</i> (24), <i>PosD</i> (26)
pa.ra.nó.ja	já.to			<i>Attach Onset</i> (12d)
(pa.ra.nó.ya)	yá.to		yén.do	<i>Consonantalisation</i>

We close this subsection with a remark on the interaction of Resyllabification (21) with Coronalisation (35) and Consonantalisation (43). In the speech of the AR consultants we have observed most closely, resyllabified [j] does not undergo either Coronalisation or Consonantalisation. For example, in normal connected speech the word-final [j] in phrases like *ré[j] odióso* ‘hateful king’, <h>*á[j] algo* ‘there’s something’, *só[j] Ernesto* ‘I’m Ernesto’ resyllabifies (*ré.[j] o.dió.so*, <h>*á.[j] ál.go*, *só.[j] Er.nés.to*) but is not then realised as [ž] or [y], as might be expected of syllable-initial [j]. In other words, both Coronalisation and Consonantalisation are counterfered by Resyllabification. This opaque relationship is a natural consequence of our analysis of AR, in which Coronalisation and Consonantalisation both apply in the domain of the word (and only there), while Resyllabification over word boundaries (as in the examples just cited) cannot in principle apply before the domain of the phrase is reached.

3.4.4 *The distribution of [ž]: further details.* One aspect remains to be clarified regarding the distribution of AR [ž]: it is skewed in a peculiar way, especially with respect to its closest voiceless partner, non-anterior coronal [č], spelled <ch>. The latter appears systematically (a) morpheme-initially: (i) at the beginning of a word (e.g. *chárco* ‘puddle’, *Chína*), (ii) after V-final and C-final prefixes (e.g. *re-chiflár* ‘to boo’, *des-chalár* ‘to husk corn’); (b) morpheme-medially after both vowels and – notably – consonants (e.g. *mécha* ‘wick’, *ócho* ‘eight’, *áncho* ‘wide’, *colchón* ‘mattress’, *párche* ‘patch’).<sup>59</sup> Like [č], [ž] is found morpheme-initially, regardless of whether a vowel or a consonant precedes; but unlike [č], [ž]

<sup>59</sup> Word-final [č] in foreign words like *clóch* ‘clutch’ and spelling pronunciations of Catalan surnames like *Samaránch* are exceptional (like word-final voiceless obstruents in general).

does not occur morpheme-medially after a consonant. The distribution of [ʒ] can thus be summarised as in (45):

- (45) AR [ʒ] is found
- a. morpheme-initially
    - (i) word-initially (*yó*, *yáte*, etc.)
    - (ii) after a prefix (*cón-yuge*, *des-yemár* ‘to separate the yolk from the white of an egg’, *dis-yunción* ‘disjunction’, *pro-yección* ‘projection’, *sub-yacente* ‘underlying’, *in-yección* ‘injection’, etc.)
  - b. morpheme-medially: V\_\_ (*ayér* ‘yesterday’, *uruguáya*, etc.)

Our analysis – in which [ʒ] arises only as the reflex of [j] in syllable-initial position by virtue of Coronalisation (35) – accounts for (45), as follows. First, the syllabification algorithm (12) guarantees that syllable-initial [j] precedes a vowel. Second, /VCiV/ is syllabified V.CjV while /ViV/ is syllabified V.jV in AR, as in other dialects of Spanish (§§ 2.2, 2.3). Given Coronalisation (35), these properties of syllabification account for the fact that [ʒ] cannot follow a consonant morpheme-medially. Third, the occurrence of [ʒ] after a prefixal consonant follows from the independently established fact that syllabification is cyclic in certain domains in Spanish.<sup>60</sup> This is illustrated in (46):

(46) *cónyuge*

[kon[iuxe]]	<i>morphological structure, underlying representation</i>
	<i>stem domain</i>
ju.xe	<i>Syllabification (12)</i>
	<hr/> <i>word domain</i>
kon.ju.xe	<i>Input, Syllabification (12)</i>
kón.ju.xe	<i>Stress assignment</i>
kón.ʒu.xe	<i>Coronalisation (35)</i>
	<hr/> <i>phrase domain</i>
kón.ʒu.xe	<i>[-cont]-spreading (29)</i>

In [kon[iuxe]] the stem constituent is syllabified first, as [.ju.xe.]. Given application of Attach Onset (12d) in the stem constituent, the next pass of the syllabification algorithm in the word domain cannot produce \**ko.nju.xe*, with prefixal *n* in the onset of the second syllable, since the

<sup>60</sup> Harris (1983, 1993, 1995), Hualde (1991). As stated in §1, we assume that the phonological component of the grammar recognises stem, word and word-sequence (phrasal) domains. Phonological rules access constituents according to the domain specifications of the rules, at least once per word and once per phonological phrase – more than once if the relevant constituent structure is present. See Harris (1993) for further discussion.



initial onset in the stem is already occupied.<sup>61</sup> If \**ko.nju.xe* were the correct syllabification at this stage, then the complex nucleus in the penult would block correct stress placement on the antepenult (see (38)) – primary stress in Spanish is not assigned in domains smaller than the word (Harris 1983, 1995). The only possible result is *kon.ju.xe*, ultimately [kón.ɟu.xe], given correct stress assignment and Coronalisation (35) in the word domain and [–cont]-spreading in the phrase domain.

Summarising, our analysis appeals only to independently motivated underlying segments and phonological processes to derive the correct outputs. We explain all the distinctions in (28) and (30) on the basis of the single underlying contrast /i./ ≠ /i/, as schematised in (30)–(31). The correspondence between these underlying segments and their surface segments on our proposals is displayed in (47), which reproduces the layout of (28):

- (47) a. /i/ → [ž ~ ʝ] ≠ /i./ → [y ~ ɟ]      /e!/ → [ye ~ ɟe]  
           yéndo                      <h>íáto                      <h>íéndo  
       b. /i/ → [ž]              ≠ /i./ → [j ~ y]  
           cebólla                      paranóía

Any other analysis must multiply underlying entities and complicate the grammar with ad hoc rules as well.

### 3.5 Aspiration in AR

Aspiration is a characteristic of many dialects of Spanish.<sup>62</sup> It is obligatory in both PO and RN varieties of AR, where it is a prestige feature, not stigmatised in either colloquial or elevated styles of speech.<sup>63</sup> Following Goldsmith (1981), Trigo (1988) and other studies, we take the articulatory phenomenon (roughly /s/ → [h]) to be an instance of ‘debuccalisation’, that is, suppression of supralaryngeal constriction.<sup>64</sup> Our interest here, however, is not the articulatory nature of aspiration but rather its triggering contexts in PO and RN.

When we understand aspiration in these two dialects, we are able to identify with confidence the derivational stages at which Coronalisation (35) changes [j] from /i/ to [ž] and Consonantalisation (43) changes [j]

<sup>61</sup> Hualde (1991) and Harris (1993) show that prefixes do not restructure existing syllabification in Spanish. We dwell on this topic in the next section.

<sup>62</sup> Aspiration rivals stress in Spanish for acres of forest felled to print the germane literature. We rely here on Kaisse (1996, 1999), which contain useful bibliography.

<sup>63</sup> Cosmopolitan Buenos Aires sets the style for the rest of the country in many ways. Some PO speakers tend to look down their noses at RN-type aspiration, which occurs in more environments than in PO, as shown immediately below.

<sup>64</sup> As argued in Kaisse (1996), the process involves spreading of [–consonantal] from the preceding segment onto the affected /s/. In AR [h] occurs only as the result of aspiration; unlike certain aspirating dialects elsewhere, AR has no independent phoneme /h/.

resulting from diphthongisation of /e!/ to [y]. Aspiration in RN gives strong evidence that these conversions occur within the word-level phonology. It was illustrated in (40)–(41) above that Coronalisation precedes PreD (24) and PosD (26), in (42) that Coronalisation precedes Diphthongisation, and in (44) that PreD and PosD produce [j] early enough to undergo Consonantalisation. In this subsection, we establish that Coronalisation, Diphthongisation, PreD and Consonantalisation precede aspiration in RN and are word-level rules. In AR every syllable-initial glide, whatever its source, interacts with segmental rules as a consonant if it previously undergoes Coronalisation or Consonantalisation.<sup>65</sup> That is why we find initially perplexing evidence of both vocalicity and consonantality in AR vocoids.

Representative examples of aspiration are given in (48), where arrows point to the cases in which the two dialects differ and ‘...’ indicates a pause:

(48)	/s/ = [s]/[h]	PO	RN	
	a. ca.sa	[s]	[s]	‘house’
	b. ca.s.pa	[h]	[h]	‘dandruff’
⇒	c. ca.s...pa	[s]	[h]	‘dan...druff’
	d. de.s-ar.mar	[s]	[s]	‘to disarm’
	e. de.s.-car.gar	[h]	[h]	‘to discharge’
⇒	f. ve.s u.no	[s]	[h]	‘you see one’
	g. ve.s dos	[h]	[h]	‘you see two’
⇒	h. ve.s...dos	[s]	[h]	‘you see...two’
⇒	i. ¡ves!	[s]	[h]	‘you see!’

It is easy to see that aspiration occurs in more contexts in RN than in PO. Also, closer inspection of (48) shows that [s] appears in PO in both onsets (*ca*.[s]*a*, *ve*.[s u].*no*) and codas (*ca*[s]...*pa*, *ve*[s]), [h] only in codas (*ca*[h].*pa*, *ve*[h]. *do*[h]). In RN just the opposite is true: it is [h] that appears in both onsets (*ve*.[h] *u.no*) and codas (*ca*[h].*pa*, *ve*[h]. *do*[s]), [s] only in onsets (*ca*.[s]*a*, *de*.[s]*ar.mar*).

Examination of the segmental strings in (48) reveals the basis for this reversal. In PO /s/ is aspirated before another consonant whether the sC string falls within a morpheme (*ca*[h]*pa*), within a word across a morpheme boundary (*de*[h]-*cargar*), or across a word boundary (*ve*[h] *do*[s]). Aspiration does not occur before a vowel (*ca*[s]*a*, *de*[s]-*armar*, *ve*[s] *uno*) or before a pause or break in phonation, no matter how slight, regardless of what follows (*ve*[s]...*do*[s]) – even in mid-word (*ca*[s]...*pa*). The generalisation that emerges is thus that /s/ is aspirated in PO always and only to the left of a consonant not separated by pause. We thus formulate the

<sup>65</sup> The only syllable-initial glides in AR that escape Coronalisation and Consonantalisation are (i) intervocalic ones, for speakers who do not apply Consonantalisation in medial position, and (ii) those that become syllable-initial by virtue of Resyllabification in the phrasal domain (e.g. *só*[j] *.Ana* ‘I’m Ana’ → *só*.[j] *Ana*, not \**so*.[ž] *Ana* or \**só*.[y] *Ana*).

process of aspiration in PO as in (49), which differs from the formulation of Kaisse (1996):

- (49) *Aspiration in PO*  
 $s \rightarrow h / \_ C$  (*domain*: phrase)

Let us look more carefully at the behaviour of aspiration in prefixes in PO, as illustrated with *des-* in (48d, e).<sup>66</sup> Given (49), underlying representations and derivations like the following are strongly motivated, where aspiration in prefixes can be compared with aspiration at word boundaries:

(50) PO

$[des[armar]]$	$[des[cargar]]$	$[ves][uno]$	$[ves][dos]$	<i>morphological structure, underlying rep.</i>
				<i>inner word</i>
$.ar.mar$	$.car.gar$	$ves. u.no$	$ves. dos.$	<i>Syllabification (12)</i>
				<i>outer word</i>
$des.ar.mar$	$des.car.gar$			<i>New input</i>
$des.ar.mar$	$des.car.gar$			<i>Syllabification (12)</i>
				<i>phrase domain</i>
$de s .ar.mar$		$ve s .u.no$		<i>Resyllabification (21)</i>
$de.sar.mar$		$ve.s u.no$		<i>Attach Onset (12d)</i>
	$deh.car.gar$		$veh.dos.$	<i>Aspiration (49)</i>
$de.sar.mar$	$deh.car.gar$	$ve.su.no$	$veh.dos.$	<i>output</i>

Nothing in the data examined so far suggests that aspiration operates before the phrase domain. The relevance of this observation becomes clear when we examine the corresponding derivations in RN and other data below.

As can be seen at a glance in (48), aspiration applies more freely in RN than in PO. Specifically, there is aspiration in RN – but not in PO – in word-final position when the following segment is a vowel (*ve[h] uno*) and when there is no articulatorily adjacent following segment (*ca[h]...pa*, *ve[h]...do[h]*, *ve[h]*). The keys to RN-type aspiration are these: (a) it targets /s/ in all codas, preconsonantal or not;<sup>67</sup> (b) it applies in the word domain, prior to phrase-domain resyllabification. We thus formulate the process of aspiration in RN as in (51):

- (51) *Aspiration in RN*  
 $s \rightarrow h / \_ ]_{\sigma}$  (*domain*: word)

<sup>66</sup> *Des-* is a ‘word-level’ prefix – its bases are independent words, the meaning of *des-X* is compositional, etc. – but this detail is not crucial; PO aspiration is the same in root-level prefixes.

<sup>67</sup> The coda environment of aspiration in RN is the typologically more common one that is found in many parts of the Spanish-speaking world. The preconsonantal environment in PO is unique so far as we know.

Now consider the RN version of the PO derivations shown above:

(52) RN

	[des[armar]]	[des[cargar]]	[ves][uno]	[ves][dos]	<i>morphological structure, underlying rep. inner word</i>
	.ar.mar	.car.gar	ves. u.no	ves. dos.	<i>Syllabification (12)</i>
	<hr/>				<i>outer word</i>
	des.ar.mar	des.car.gar			<i>New input</i>
	de s .ar.mar				<i>Resyllabification (21)</i>
	de.sar.mar				<i>Attach Onset (12d)</i>
		deh.car.gar	veh. u.no	veh. doh.	<i>Aspiration (51)</i>
	<hr/>				<i>phrase domain</i>
			ve h .u.no		<i>Resyllabification (21)</i>
			ve.hu.no		<i>Attach Onset (12d)</i>
	de.sar.mar	deh.car.gar	ve.hu.no	veh.doh.	<i>output</i>

These derivations show, among other things, why aspiration does not occur in prefixes before a vowel-initial stem (*de[s]-armar*) in RN (just as in PO) but does apply word-finally before a vowel-initial word (*ve[h] uno*) in RN (unlike in PO): in RN (but not in PO), Aspiration (51) applies in the word domain after word-internal resyllabification of prefix-final /s/. Thus prefixal /s/ is no longer in a coda when aspiration applies in the word domain.<sup>68</sup>

We have taken pains to sketch a fairly explicit analysis of the basic facts of aspiration in two AR dialects in order to have an adequate foundation for our next topic, namely, the interaction of aspiration with the material of the previous subsections. The following examples are valid for both PO and RN:

(53)	<i>/s/ = [s]</i>	<i>/s/ = [h]</i>	
	a. des-iguál ‘unequal’	deh-[y]érba ‘weeding’	
	b. des-écho ‘réfùse’	deh-[y]élo ‘thaw’ <sup>69</sup>	
	c. des[j]érto ‘desert’	deh-[ž]ugár ‘to unyoke’	
	d.	lah [y]érbas ‘the weeds’	
	e.	lah [ž]émas ‘the yolks’	

<sup>68</sup> Dialects exist elsewhere in the Spanish-speaking world in which prefixal /s/ does aspirate before a vowel (e.g. *de[h]-armar*, *de[h]-agradable* ‘disagreeable’). In these dialects, there is no word-domain resyllabification; thus prefixal /s/ is still in the coda when aspiration applies in this domain. Following Kaisse (1999), we assume that within a given domain (re)syllabification processes universally apply before segmental processes like aspiration. It is thus not an option for (52) to transpose Aspiration (51) to the phrase domain.

<sup>69</sup> Cf. *des-⟨h⟩[e]rbár* ‘to weed’, *[e]chár* ‘to throw away’, *⟨h⟩[e]lár* ‘to freeze’, *⟨h⟩[y]élo* ‘ice’. These show that the [y] in *de[h]-[y]érba* and *de[h]-[y]élo* in (53a, b) is derived via diphthongisation of /e!/ and Consonantalisation (43).

We saw above that morpheme-internal, prefix-final and word-final /s/ is aspirated (a) before an articulatorily contiguous consonant in PO and (b) in a coda in RN. We see in (53) that aspiration occurs before [y] and [ʒ] in the same contexts in both dialects though stem-initial vowels do not trigger aspiration in prefixes (53a, b) in either dialect. This is no surprise since [y] and [ʒ] are both [+consonantal] (relevant for PO) and /s/ preceding them is in a coda in all cases (relevant for RN). By the same token, it is no surprise that there is no aspiration in words like *de.[sj]ér.to* (53c) since [j] is [−consonantal] (relevant for PO) and the preceding /s/ is an onset (relevant for RN). But how does the difference between [−consonantal] [j] in *de.[sj]ér.to* and [+consonantal] [y] in *de[hy]érba* and *de[hy]élo* arise in the first place, and how does the syllabification algorithm parse /s/ correctly in the two cases?<sup>70</sup>

The answer lies in morphological structure: the phonological string /des/ is a prefix in words like *de[h]-yérba* and *de[h]-yélo* but not in *de[sj]érto*. Underlying representations and derivations like the following are thus strongly motivated:

(54)	<i>desierto</i>	<i>des&lt;h&gt;ierba</i>	
	[dese!rto]	[des[e!rba]]	<i>morphological structure, underlying rep.</i>
			<i>inner word</i>
	de.se!r.to	.e!r.ba	<i>Syllabification</i> (12)
	de.se!r.to	.é!r.ba	<i>Stress assignment</i>
	de.sjér.to	.jér.ba	<i>Diphthongisation</i>
		.yé.r.ba	<i>Consonantalisation</i> (43)
			<i>outer word/phrase</i> <sup>71</sup>
		des.yér.ba	<i>New input</i>
			<i>Resyllabification</i> (21)
		deh.yér.ba	<i>Aspiration</i> (49) or (51)
	de.sjér.to	deh.yér.ba	<i>output</i>

The different morphological structures illustrated result in different syllabification of the phonological string /...ese!.../, which is contained within the stem in /dese!rto/ but split between prefix and stem in /des-e!rba/. Resyllabification does not apply to *des.yér.ba* in the outer word because *y* occupies the onset of the medial syllable. (The *j* in *de.s[j]ér.to* is not consonantalised because it is syllable-medial.) Aspiration cannot apply to the /s/ in this word in either PO (/s/ is not preconsonantal)

<sup>70</sup> The adjective *des[é]rtico* ‘desert-like’ suggests that the diphthong in *des[jé]rto* is derived from /e!/ due to special lexical marking of the stem of the latter word. There would be no consequences for our analysis, however, if the diphthong in *des[jé]rto* were a non-alternating, underlying one.

<sup>71</sup> Recall from the discussion just above that both Resyllabification and Aspiration are phrasal in PO but in the word domain in RN (where Resyllabification can also apply phrasally).

or RN (/s/ is not in a coda), but it does apply in *de[h.y]ér.ba*, where /s/ is preconsonantal and in a coda. Thus the output *de[h.y]ér.ba* emerges in both dialects.

In sum, every detail of (54) is as expected: every step is independently motivated, as is the order of the steps. (The derivational steps of the ‘inner word’ in *des-⟨h⟩iérba* are also those of the independent, free-standing word *⟨h⟩iérba*.) Derivations like (54) elucidate the dual behaviour of [j] in AR: at early stages of derivation it is a [–consonantal] rhyme element and thus an s-counter; after Consonantalisation, however, it behaves like any garden-variety consonant in blocking resyllabification, triggering aspiration and place assimilation of nasals, and so on. The connection between the Consonantalisation of [j] and aspiration in AR is thus explicated.

### 3.6 Summary of rules and rule interactions

In (55) we list the phonological rules that play a role in our discussion of AR. In order to make the complex orderings among them easy to see, the rules are segregated according to the domain(s) in which each rule applies (see note 60 regarding such domains), and crucial precedence relations are indicated in the righthand column (each rule is given a nickname for ease of reference). The rules of the syllabification algorithm (12) are not listed individually. ‘RN’ after Resyllabification and Aspiration in (55b) indicates that these rules do not apply in the word domain in PO; ‘PO’ after Aspiration in (55c) indicates that this rule applies in the phrase domain only in PO. Otherwise, all rules are shared. Additional comments regarding domain specifications and crucial precedence relations follow (55).

(55)			<i>must precede</i>
a.	<i>stem domain</i>		
	Syllabification	Syl	Resyl, Stress
b.	<i>word domain</i>		
	Syllabification	Syl	Resyl, Stress
	Resyllabification (21)-RN	Resyl	Asp, r-str
	Stress assignment	Stress	Diph, PreD, PosD
	Coronalisation (35)	Coron	Diph, PreD, PosD, Cons, Sprd, Resyl (in phrase domain)
	Diphthongisation	Diph	Cons
	PreV Denuclearisation (24)	PreD	Cons
	PosV Denuclearisation (26)	PosD	Cons
	Consonantalisation (43)	Cons	Asp, Sprd, Resyl (in phrase domain)
	Aspiration (51)-RN	Asp	Resyl (in phrase domain)

c. *phrase domain*

Syllabification	Syl	Resyl
Resyllabification (21)	Resyl	Asp (49), <i>r</i> -str
PreV Denuclearisation (24)	PreD	
Aspiration (49)-PO	Asp	
[–cont]-spreading (29)	Sprd	
<i>r</i> -strengthening in coda	<i>r</i> -str	

*Remarks on domains*

- (i) We assume that (re)syllabification rules universally precede segmental rules in a given domain (cf. note 68). Syllabification rules are otherwise opportunistic: they apply in every domain whenever their structural description is met.
- (ii) PreD (24) applies both within words and between words; different conditions control application in word and phrase domains (§3.1).
- (iii) As noted in §3.4.3, we do not understand what conditions govern word-medial application of Consonantalisation.

*Remarks on precedence relations* (A ≫ B = A precedes B)

- (i) Syllabification
  - ≫ Resyllabification, which manipulates the structures created by Syllabification.
  - ≫ Primary word stress assignment, which is sensitive to syllable structure. Extensive discussion is available in Harris (1995) and references therein.
- (ii) Resyllabification
  - ≫ Aspiration (51) in the word domain in RN: Resyllabification bleeds aspiration of prefix-final /s/ before a stem-initial vowel (*de*[.s]*armar*); in the phrase domain, word-final /s/ is aspirated before a vowel in the following word (*ve*[.h] *uno*), cf. (52).
  - ≫ *r*-strengthening in coda: Resyllabification bleeds strengthening in cases like *sé*.[r]*álto*, \**sé*.[R]*álto*, cf. (22).
- (iii) Stress assignment
  - ≫ Diphthongisation: only stressed instances of potentially diphthongisable vowels actually diphthongise (*qu*[jé]*re*, but *qu*[e]*ría*), cf. (23), (42), (44), (54).
  - ≫ Prevocalic and Postvocalic Denuclearisation: stressed vowels do not denuclearise: *paranó*.*ia* → *paranó*.[j]*a* but *o*.*i*.*a* ‘s/he heard’ → \**o*.[j]*a*. Further, reduction in the number of s-counters by denuclearisation would predict incorrect stress placement, for example \**pará*.*no*.*ja* (s-counters underlined), cf. §3.4.2.
- (iv) Coronalisation
  - ≫ Diphthongisation: Coronalisation is counterfered by diphthongisation (*<h>**érba* → *<h>*[j]*érba* → \**<h>*[ž]*érba*), cf. (42), (44).
  - ≫ Prevocalic and Postvocalic Denuclearisation: Coronalisation is counterfered by denuclearisation (*/i*.*/ón* → [j]*ón* → \*[ž]*ón*), cf. (40), (41), (44).





words do undergo Lozano's obligatory Consonantalisation rule (24), the counterpart to our (43).

Where Lozano's analysis and ours coincide in empirical coverage, the two are extremely similar. For example, both posit a lexical distinction between words like *yéndo* and *yérba* (with initial [ž]) *vs.* words like <h>*iéndo* and <h>*ierba* (with initial [y]) that prevents the latter from undergoing Coronalisation. For Lozano this distinction is a diacritic feature that marks special items as exceptions to rule (40). For us it is the unmarked syllabicity of /i/ *vs.* special diphthongising /e!/. Similarly, both analyses account plausibly for the minority status of other words sampled in the right column of (28a) – and also (28b) for us.<sup>72</sup> These are Lozano's exceptions, which we expect to be less numerous than the regular cases; they are our words with lexically marked syllabicity, which we expect to be outnumbered by words with normal syllables. But we claim superiority for our proposals in that our /i./ ≠ /i/ contrast allows us to unify our account of purely segmental phenomena with that of the stress phenomena we have discussed. Again, we cannot speculate what position Lozano might have taken with respect to the latter, but it is difficult to imagine how this material might be naturally related to the rule-exception feature postulated by Lozano, an arbitrary diacritic mark rather than the independently motivated element of prosodic structure that we employ. There thus seem to be aspects of native speakers' internalised competence that our analysis captures naturally though Lozano's in principle cannot.

Consider now another analysis – call it 'Alt X' – which readers have asked us about, though no-one has actually proposed it so far as we know, despite its ostensible plausibility. On Alt X, instances of [ž] that alternate with surface [j] (for example, *cre-žó* *vs.* *crec-[j]ó* (§3.3)) are derived just as we and Lozano claim, from underlying /i/ for us and the glide written /y/ by Lozano. But contrary to both our analysis and Lozano's, all cases of non-alternating [ž] (*yó*, *cebólla* and so on) correspond to underlying /ž/.<sup>73</sup> We now examine Alt X.

<sup>72</sup> Foreign words like English *yankee* and the German name *Jungeman* are typically assimilated into AR with initial [ž]. Similarly, as we noted just below (28), the class of words represented by *paranóia*, *secuóia*, etc., in the right column of (28b) is comprised largely of borrowings and native toponyms. On the other hand, the class of words with medial [ž] illustrated in the left column of (28b) is virtually unbounded. Incidentally, it has been said that the pronunciations [ž] and [j y] correlate with the spellings <y> and <(h)i>, respectively. The observation is incorrect (e.g. *kayak* is spelled with *y* but pronounced [j] by some speakers; Lozano gives other examples) and phonologically irrelevant in any event.

<sup>73</sup> This is not required by the Alternation Condition (Kiparsky 1973) or its descendants (see Kiparsky 1993, Cole 1995 for more recent discussion). This condition and its variants are applicable only to the distribution of phonemes and the application of neutralisation rules; they do not prevent a non-neutralising rule from applying to every instance of a morpheme. Since it is precisely whether or not *ž* is a phoneme and Coronalisation a neutralisation rule that is at issue here, appeal to versions of the Alternation Condition would be circular. If, as we argue, [ž] is always derived from /i/ and hence Coronalisation is not a neutralising rule, the Alternation Condition has no bearing on the underlying representation of [ž].

The inventory of underlying obstruents in AR is shown in (56) with and without /ž/:

(56)	LABIAL	CORONAL	DORSAL	
		[+ant]    [-ant]		
	p	t	č	k    [-cont, -voice]
	b	d		g    [-cont, +voice]
			(ž)	([+cont, +voice])
	f	s	x	[+cont, -voice]

Where does /ž/ fit? If it belongs with the distinctive continuants /f s x/, then its voicing is anomalous.<sup>74</sup> If it belongs with voiced /b d g/, then its continuancy is anomalous. Even if what we write as /b d g/ are underlyingly unspecified for continuancy (as Lozano argues at length) and what we write as /ž/ is similarly unspecified, the continuant and non-continuant realisations of /b d g/ do not have the same distribution as those of /ž/. For example, stop realisations of /b d g/ predominate in utterance-initial position, where fricative realisation of /ž/ is favoured (though the opposite values of continuancy are not excluded in either case, as Lozano explains). Also, continuant allophones of /b d g/ do not devoice like [ž̥]. In short, inclusion of /ž/ does not result in a more symmetrical inventory of underlying segments or a more orderly set of variants.

Perhaps more importantly, the segment [ž̥] has a skewed distribution in AR, as discussed in connection with (45), which is not explained by the proposal that /ž/ is an underlying segment in AR: if there were an independent phoneme /ž/ in AR underlying non-alternating [ž̥], it would inexplicably have the same skewed distribution as the instances of [ž̥] that patently alternate with [j] and, we claim, are derived from /i/. On our proposals, on the other hand, [ž̥] has the expected phonotactics for /i/ in all dialects of Spanish, as explained below (45).

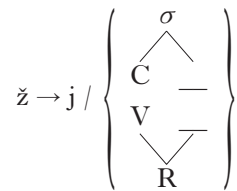
We do not claim that any of our criticisms of the Alt X, taken one by one, necessarily constitutes a fatal flaw. At the same time, we see no reason why Alt X should be considered superior to our analysis, or even of equal merit.

Let us push this alternative a step further, to ‘Alt Y’ (suggested by a reader). Alt Y differs from Alt X only in that alternating [ž̥] as well as non-alternating [ž̥] are reflexes of an independent phoneme /ž/. For example, the noun *lé*[j] is underlying *lé/ž/*, and the gerund *com*[jé]ndo is *com/že/ndo* because the spell-out of the verbal thematic second case of (34e) is /že/ on Alt Y. Consequently, the distribution of the reflexes of /ž/ is determined by an ‘Anticoronalisation’ rule whereby /ž/ is realised as [ž̥] in syllable-initial position but as [j] elsewhere, specifically after a tautosyllabic

<sup>74</sup> Speakers who tend to devoice [ž̥] to [š̥] (cf. §1) have a phonetic series [f s š̥ x], but [š̥] is still anomalous in that /f s x/ do not have voiced analogues like [ž̥]. Even for speakers who always devoice [ž̥] to [š̥], devoicing affects all instances of [ž̥] equally, including those that alternate with [j].

syllable-initial consonant and after a tautosyllabic peak (nucleus). Anticoronalisation thus has essentially the form shown in (57):

(57) *Anticoronalisation*



The comments above regarding Alt X carry over to Alt Y. In addition, Alt Y entails the problem that the disjunction in (57) required to state the environments in which [j] appears instead of [ž] is extremely unnatural, if not unprecedented. On the other hand, the environment ‘syllable-initial’ in our Coronalisation rule (35) is anything but unnatural or unprecedented.<sup>75</sup>

We conclude that the weight of evidence favours deriving all instances of [ž] in AR from underlying /i/ as we propose. In any event, even if underlying /ž/ did exist, there would be no significant consequences for our analysis, every element of which would still be required to account for all of the data we deal with. In particular, absent a palatable substitute for (57), Coronalisation (35) is still necessary to account for the instances of [ž] that alternate regularly with [j].

#### 4 Palatal segments in standard Castilian Spanish

In this section we examine the realisation in standard Castilian Spanish (SC) of virtually the same set of words we treat in AR. We do so for several reasons. Firstly, phonologists familiar with Spanish dialects whose palatal phenomena are less innovating and better studied than in AR may want to see how we account for the behaviour of palatal vocoids in SC. And, not surprisingly, the understanding of vocoids we have gained from AR allows us to propose a more explicit and unified account of the phonology of those vocoids than has appeared in previous descriptions of SC. In addition, we find that an intimate comparison of palatal-related phonology in AR and SC gives insight into the ways the grammars of superficially different dialects vary. Finally, the comparison with SC gives us a way to approach, on a small and manageable playing field, the question of how different languages may vary with respect to the syllabification and feature specification of glides.

We have picked standard Castilian Spanish (SC), the prestige norm of Spain, not because of its social status in some quarters but (more

<sup>75</sup> We leave it as an exercise for the reader to ascertain that a modicum of ingenuity can get around the environment of (57), but not (as far as we can see) without incurring equal or greater liabilities for Alt Y.

rationally) because SC is especially well described and because it differs from AR in interesting ways with respect to the focus of this paper.<sup>76</sup> We continue to rely on Navarro's (1965) classic work for meticulous description of articulatory detail. Hualde (1991) complements Navarro by supplying explicit information regarding systematic contrasts.<sup>77</sup>

#### 4.1 The basics

Consider now a set of key words, most of which appear in previous sections, this time with their typical pronunciations in SC. None of these words is exceptional; all represent coherent classes of examples.<sup>78</sup>

(58)	<i>spelling</i>	<i>phonetic realisations</i>				
		[i]	[j]	[y]	[ɟ]	
a.	vaciá <u>mos</u>	✓	✓			'we empty'
	viciá <u>mos</u>		✓			'we vitiate'
b.	⟨h⟩i <u>é</u> na	✓	✓			'hyena'
	y <u>e</u> ma			✓	✓	'yolk'
	⟨h⟩i <u>e</u> lo			✓	✓	'ice, I freeze'
c.	conv <u>ó</u> y		✓			'convoy'
	conv <u>ó</u> yes			✓		'convoys'
	cre <u>ci</u> ó		✓			's/he grew'
	cre <u>y</u> ó			✓		's/he believed'
d.	clarab <u>ó</u> ya			✓		'skylight'
	paran <u>ó</u> ja			✓		'paranoia'
e.	el y <u>e</u> so				✓	'the plaster'
	iny <u>e</u> ctár				✓	'to inject'
	proy <u>e</u> ctár			✓		'to project'
	c <u>ó</u> nyuge				✓	'spouse'
	suby <u>a</u> cér			✓		'to underlie'
	des⟨h⟩i <u>e</u> lo			✓		'(I) thaw'

As shown in (58a), hiatus is not possible in *vi.c[j]á.mos*, though it is an option in minimally contrastive *va.c[i.]á.mos*, which can also be pronounced *va.c[j]á.mos* thanks to PreD (24). SC is thus one of the dialects mentioned in §2.2 in which the underlying contrast /i./ ≠ /i/ is perceptually salient and phonetically transparent.

<sup>76</sup> Independently of palatal segments, AR and SC sound very different even to untrained observers. SC has a /θ/ ≠ /s/ contrast that AR lacks, the [s] of SC is apical while that of AR is laminal, SC lacks the aspiration phenomena described in §3.5, SC speakers may have a contrastive /ɔ/ (see note 38), intonation patterns are strikingly different in SC and AR, and so on.

<sup>77</sup> We thank Xabier Artiagoitia, Eulàlia Bonet, José Ignacio Hualde, Guillermo Lorenzo, Fernando Martínez-Gil, Carlos Otero, Carlos Piera, Josep Quer, Sebastián Quezada, Luz María Rodríguez, Luis Silva-Villar and Esther Torrego for answering questions about their idiolects of SC.

<sup>78</sup> In the context of this study, the absence of [ʒ] in (58) is conspicuous. Navarro (1965: 131) points out, however, that [ʒ] is heard in some parts of Castilla la Nueva and Andalucía.



(60)	<i>los yesos</i>	<i>los iones</i>	
	[los][iesos]	[los][i.ones]	<i>underlying representation</i>
			<i>word</i>
	los. je.sos	los. i.o.nes	<i>Syllabification (12)</i>
	.jé.sos	.i.ó.nes	<i>Stress assignment</i>
	.yé.sos		<i>SC Consonantalisation</i>
			<hr/>
			<i>phrase</i>
		lo s i.ó.nes	<i>Resyllabification (21)</i>
		lo.s i.ó.nes	<i>Attach Onset (12d)</i>
	loz.yé.sos		<i>Voicing Assimilation (59a)</i>
	lo[z].yé.sos	lo.[s]i.ó.nes	<i>output</i>

The same derivation, up through the end of the word domain, continues as follows if optional PreD applies:

(61)			<i>phrase</i>
		lo s i.ó.nes	<i>Resyllabification (21)</i>
		lo s  j ó.nes	<i>PreD (24)</i>
		jó.	<i>Complex Nucleus (12c)</i>
		sjó.nes	<i>Attach Onset (12d)<sup>81</sup></i>
			<i>Voicing Assimilation (59a)</i>
		lo.[s]jó.nes	<i>output</i>

Despite the fact that /i.on/ may surface with [j], Consonantalisation cannot apply to this morpheme in the word domain, because its initial segment is not [j] but rather [i] at the point in the derivation at which this rule applies. Moreover, regardless of whether this morpheme's initial /i./ undergoes optional PreD or not, it cannot trigger Voicing Assimilation since both [i] and [j] are [–consonantal]. When not syllable-initial, /i./ is optionally realised as [j] but not affected by Consonantalisation.<sup>82</sup>

(58c) illustrates the fact that [y] obligatorily replaces [j] in intervocalic position. That is, the SC version of Consonantalisation (43) is obligatory word-medially as well as word-initially. This obligatoriness is also reflected in the fact that the orthographic distinction illustrated by *clarabóya* vs. *paranóia* in (58d) corresponds to no contrast in SC between [y] and [j] in intervocalic word-internal position, where [j] does not surface in SC (more on this below).

We see in (58e) that [–cont]-spreading (29) applies in SC as expected: [y] and [ɣ] are not contrastive; non-continuant [ɣ] obligatorily replaces continuant [y] after (presumably non-continuant) /l/ and /n/ within and

<sup>81</sup> We see again (cf. last paragraph of §2.2.5) that the result of delinking processes (both Resyllabification and PreD in this example) followed by relinking (here Complex Nucleus and Attach Onset) precisely duplicates that of the initial syllabification operations.

<sup>82</sup> This neutralisation gave rise to part of the structuralists' impasse (see note 43).

over word boundaries, [y] being the default case. Navarro (1965: 129) comments that the same substitution may also occur *en posición inicial acentuada, después de pausa... en pronunciación lenta, fuerte o enfática* ('in an initial stressed syllable, after a pause... in slow, forceful or emphatic pronunciation').<sup>83</sup> This stylistic variation is due to an elaboration of [-cont]-spreading (29) that is peripheral to our concerns.

It is a central concern, however, that [y] (or [j]) rather than [j] appears in stem-initial position after prefixes. This is the case for both stem-level prefixes like *in-* and *con-* and word-level prefixes like *sub-* and *des-*.<sup>84</sup> It is also true independently of whether the initial segment of the stem is underlying /i/ (*des-yemár* 'to remove buds [yemas] from plants') or [j] derived via diphthongisation of /e/ (*des-⟨h⟩iélo*). In (62) derivations are shown of words in which [j] from underlying /i/ appears stem-initially after a stem-level prefix (*cón-/i/uge*) and stem-internally (*bo.n/i/á.to* 'sweet potato'):<sup>85</sup>

(62) <i>boniáto</i>	<i>cónyuge</i>	
[boniato]	[kon[iuxe]]	<i>morphological structure, underlying rep. stem</i>
	.ju.xe	<i>Syllabification (12)</i>
		<i>word</i>
bo.nja.to	kon.ju.xe	<i>Syllabification of inputs</i>
bo.njá.to	kón.ju.xe	<i>Stress assignment</i>
	kón.yu.xe	<i>SC Consonantalisation</i>
		<i>phrase</i>
	kón.ju.xe	<i>[-cont]-spreading</i> <sup>86</sup>

The reason for the syllabification contrast *njV* in *bo.nja.to* vs. *njV* in *kon.ju.xe* is now familiar (see discussion of (46) above): syllabification of the stem constituent [.ju.xe] with [j] in the onset of the first syllable blocks resyllabification of prefixal *n* since the stem-initial onset is filled. Therefore *kon.ju.xe* can be stressed on the antepenultimate syllable but *bo.nja.to* in principle cannot since its first syllable lies outside the stress window

<sup>83</sup> This substitution is an example of the cross-linguistic tendency toward fortition of consonant articulations at the beginning of prosodic groupings, documented experimentally by Fougeron & Keating (1997).

<sup>84</sup> As in *in-yectár*, *cón-yuge*, etc., on the one hand, and *sub-yacér*, *des-⟨h⟩iélo*, etc., on the other. There are no independent words like *\*yectár*, *\*yúge*, and the stems in question have no consistent meaning in the words in which they appear. On the other hand, *yacér*, *⟨h⟩iélo* are free-standing words, and the meanings of prefixed words containing them are compositional.

<sup>85</sup> According to Hualde (personal communication) no hiatus pronunciation *\*bo.n[i.á].to* is possible for this word, in contrast with *p[i.á].no* 'piano', *d[i.á].blo* 'devil', etc.

<sup>86</sup> This rule applies in the phrase domain in SC as in AR since it affects sequences of words (e.g. *el [j]éso*, *con [j]éso* 'with plaster') as well as within a single word (e.g. *cón[j]uge*), as shown in (58).

(which contains the rightmost three s-counters, here the rhyme elements *j-a-o*). Finally, only the [j] of *kón.ju.xe* can undergo Consonantalisation since it is syllable-initial while the [j] of *bo.njá.to* is not.

The derivation of words like *des-yemár* and *des-⟨h⟩iélo* with a word-level prefix is similar, except that nothing of additional interest happens in the stem constituent. Stress and diphthongisation operate in the word constituent, as illustrated in (63):

(63) [des[[elo]<sub>stem</sub>]<sub>word</sub>]<sub>word</sub>

	<i>stem</i>
.e.lo	<i>Syllabification</i> (12)
	<i>inner word</i>
.é.lo	<i>Stress assignment</i>
.jé.lo	<i>Diphthongisation</i>
.yé.lo	<i>SC Consonantalisation</i>
	<i>outer word</i>
des.yé.lo	<i>Syllabification</i> (12)
	<i>phrase</i>
de[z].yé.lo	<i>Voicing Assimilation</i> (59)

The derivation of prefixed *⟨h⟩iélo* here is the same as that of the independent word *⟨h⟩iélo*. In particular, SC Consonantalisation applies after word-domain diphthongisation. On the other hand, as illustrated in (61), phrase-domain (and optional) PreD (24) applies too late for Consonantalisation to affect its output. Thus, though *⟨h⟩iéna* and *⟨h⟩iélo* look deceptively similar, the distinct sources of their diphthongs – [jé] from /i.e/ via PreD in *⟨h⟩iéna* vs. [jé] from /e/ via diphthongisation in *⟨h⟩iélo* – allow SC to keep them distinct in surface representations. The orders Diphthongisation ≧ Consonantalisation – e.g. *élo* → [jé]lo → [yé]lo, a feeding relationship – and Consonantalisation ≧ PreD – e.g. /i./ena (→ \*[y]éna) → [j]éna, counterfeeding – account for the curious contrast in well-formedness observed in *⟨h⟩[y]élo* vs. \*⟨h⟩[y]éna and analogous words of each type.

What is the form of Consonantalisation in SC? For clarity, the generalisation that emerges from (58) is displayed in (64) with additional examples, all in standard orthography:

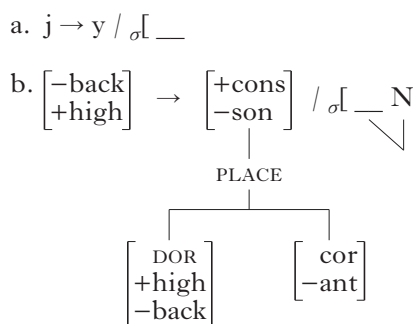
(64) *syllable-initial* [y]                      *non-syllable-initial* [j]

in.yec.tár	‘to inject’	si.niés.tro	‘sinister’
des.⟨h⟩ié.lo	‘thaw’	de.sjér.to	‘desert’
⟨h⟩iér.ba	‘grass’	piér.na	‘leg’
yén.do	‘going’	cre.cién.do	‘growing’
cre.yó	‘believed’	cre.ció	‘grew’
yé.so	‘plaster’	riés.go	‘risk’



The complementarity of [y] and [j] is perfect: [y] always appears in syllable-initial position; [j] does not.<sup>87</sup> This distribution is independent of whether [j] is derived by diphthongisation of /e/ or is the reflex of /i/. For example, the underlined strings in <h>iérba and piérna derive from /e/ (cf. <h>[e]rbicída ‘herbicide’, p[e]rmituérto ‘crooked-legged’) while those in yésa and riésgo do not (there is no form of either stem with the simple vowel [e]). Also, the [y ~ j] of the verbal desinences in cre.[y]ó, cre.c[j]ó, [y]én.do and cre.c[j]én.do – see (58c) – is generated directly as /i/ under morphological rather than phonological control, as explained in connection with (32)–(34) in §3.3. In sum, [y] replaces [j] in syllable-initial position regardless of its derivational source; all that matters is that [j] be syllable-initial at the appropriate derivational stage. We conclude then that the SC version of Consonantalisation has the form shown in (65), which is nearly identical to the AR version (43):

## (65) SC Consonantalisation



The only difference between AR (43) and SC (65) is that the latter applies to syllable-initial [j] regardless of its position in the word.

## 4.2 Postvocalic denuclearisation

The following issue remains unresolved. SC speakers who have strong judgements about syllabicity distinctions in initial position (e.g. <h>[i.á].to vs. [yá].te) and medial postconsonantal position (e.g. va.c[i.á].mos vs. vi.c[já].mos) make no such distinction in medial postvocalic position. For example, both *paranóia* and *clarabóya* have [y]; [j] is excluded in the indicated position. On our terms, this means that while stressed [í] occurs intervocalically – as in *ba*<[h]>[í]a ‘bay’, *bo*<[h]>[í]o ‘shack’, *cre*[í]amos ‘we believed’ – unstressed [i] appears not to. If it did, the absence of words like \**clarabó[j]a* and \**paranó[j]a* would be unexplained: PreD (24) – which applies in the phrase domain, i.e. across the board (cf. (61)) – would

<sup>87</sup> Additional instances of [j] from /i/ are created by PreD (24) in the phrasal domain, but these cannot be affected by the word-domain rule of Consonantalisation and are thus irrelevant to its statement.

straightforwardly produce such forms from *Xó.i.a* and analogous sequences.

The question thus arises as to whether the absence of unstressed intervocalic [i] is an accidental gap or a systematic one. If it were accidental, then *ipso facto* the absence of words like \**clarabó[j]a* and \**paranó[j]a* would need no explanation. This, however, is not the case: to say that SC speakers have no overt contrast between [y] and [j] in word-medial intervocalic position is not to say that both segments are acceptable. All Spanish phoneticians (e.g. Navarro 1965: 49–50, 130–131) and our consultants' reactions converge on the conclusion that [j] is systematically excluded in favour of [y] in the context in question in SC. This is clearly a generalisation that a grammar of SC must embody for observational and descriptive adequacy.

Consonantalisation (65) itself does not capture this generalisation: (65) accounts for the replacement of [j] by [y] in syllable-initial position; it says nothing about the absence of word-medial unstressed intervocalic [i], which, if present, would escape (65) and thus be available subsequently for optional Denuclearisation to [j] in the phrase domain. But this does not happen; therefore some additional process makes medial unstressed [i] subject to Consonantalisation in the word domain. The following data shed light on this issue:

- |         |                |                  |               |                   |
|---------|----------------|------------------|---------------|-------------------|
| (66) a. | b[i.ó]m.bo     | 'screen'         | p[i.a].nís.ta | 'pianist'         |
| b.      | m[o.<h>i].na   | 'annoyed'        | p[a.í]s       | 'country'         |
|         | *m[ó.<h>i].na  |                  | *p[á.i]s      |                   |
| c.      | a.m[o<h>j].nár | 'to annoy'       | p[aj].sá.no   | 'country-<br>man' |
| d.      | b[ój].na       | 'beret'          | b[áj].le      | 'dance'           |
|         | [oj].gá.mos    | 'we hear (SUBJ)' | b[aj].lá.mos  | 'we dance'        |

These examples illustrate a curious asymmetry in the sequences of permissible high (H) and non-high vowels (V) in hiatus in surface representations in SC. We see in (66a) that H.V is allowed with both stressed and unstressed V. We see in (66b), however, that mirror-image V.H is allowed with stressed H but disallowed with unstressed H. Comparison of (66b) with (66c) reveals that V.H with stressed H alternates systematically with VG when H is not stressed. Finally, (66d) shows that both stressed and unstressed diphthongs of the form VG are permissible.<sup>88</sup> In sum, in SC an unstressed high vocoid directly following a vowel must surface as a glide – despite the fact that the mirror image of this restriction does not hold. In other words, both [i.V] and [jV] are grammatical, but \*[V.i] is not grammatical though [Vj] is.

This asymmetry was noted in structuralist studies of the 1950s and it is discussed in more recent works (e.g. Harris 1969: 22–36, 1971: 170, 178,

<sup>88</sup> In the stems illustrated in (66a–c), the instances of [i] are obviously reflexes of syllabically marked /i/. The [j] in the stems of [oj]gámos, b[áj]le and b[aj]lámos (66d), on the other hand, is the realisation of unmarked /i/, there being no evidence for /i./ in any manifestation of these stems.

Hualde 1991: 478, 1994: 630–640, Roca 1997b: 260–263), but no analysis we know of takes into consideration the range of data we account for here and/or fully explicates the interactions of relevant rules or constraints and their place in the grammar. We now propose a novel generalisation, namely, that the absence of words like \*clarabó[j]a and \*paranó[j]a in SC and the asymmetry illustrated in (66) are one and the same linguistic fact. This generalisation is implemented by Postvocalic Denuclearisation (PosD) (26), which is obligatory in SC. As noted in §2.5, PosD is not simply the mirror image of PreD (24); the two processes apply under different conditions: PreD (24) applies optionally according to register and tempo, without regard to morphological constituency (that is, in the domain of the phrase). In contrast, PosD applies obligatorily within stems but not over the boundary between prefix and stem – for example *r[e.-i]nсталár* ‘to reinstall’ (cf. \**r[e.i]nár* ‘to rein’), *pr[o-.(h)i]bír* ‘to prohibit’ (cf. \**b[ó.i]na* ‘beret’ (66c)). In sum, PosD (26) is an obligatory word-domain rule while PreD (24) is an optional phrase-domain rule in SC.<sup>89</sup>

The role of PosD is illustrated in (67). In particular, the derivation of *paranóia* shows how PosD guarantees that representations like \**paranó[j]a* do not surface in SC. We naturally assume the unmarked underlying representation /paranoia/, but, as shown in (67), even if it were /paranoi.a/ with marked intervocalic /i./, the result would be the same: with either representation the high vocoid surfaces as [y] rather than [j].

(67) <i>paranóia</i>	<i>amo&lt;h&gt;inár</i>	<i>bo&lt;h&gt;io</i>	
paranoi.a	amoi.nar	boi.o	<i>underlying representation</i>
pa.ra.no.i.a	a.mo.i.nar	bo.i.o	<i>Syllabification (12)</i>
pa.ra.nó.i.a	a.mo.i.nár	bo.í.o	<i>Stress assignment</i>
pa.ra.nó j]a	a.mo j]nár		<i>PosD (26)</i>
pa.ra.nó.ja			<i>Attach Onset (12d)</i>
	a.moj.nár		<i>Attach Rhyme (12e)</i>
pa.ra.nó.ya			<i>SC Consonantalisation</i>

PosD is sensitive to stress and thus must be ordered after stress assignment. Where applicable – not to the stressed [i] of *bo.<h>í.o* – PosD obligatorily mutilates the representation of syllabic structure, as shown in (26). The component processes of the syllabification algorithm then reincorporate the stranded high vocoid into syllabic structure in the normal way: into the onset in *para.nó[.ja]* and as a coda in *a.[mój].nár*. SC

<sup>89</sup> Examples like *r[e.i]nсталár* and *pr[o.(h)i]bír*, however, can optionally be realised as *r[ej]ns.talár* and *pr[o<h>j].bír* under the same conditions of register and tempo under which prevocalic unstressed [i] loses its syllabicity. Phrase-domain PreD in SC should thus be formulated as a mirror-image rule. We will forego this refinement, however, since it is not essential to our core proposals. The inapplicability of PosD over a prefix–stem boundary can be attributed to the ‘closure’ condition on application of prosodic rules (Halle & Kenstowicz 1991, Harris 1993).

Consonantalisation then applies as expected, replacing syllable-initial [j] with [y] in words like *pa.ra.nó.[y]a*.

In sum, our proposals explain – in the strong sense – why words like *\*m[ó.<h>i].na* and *\*p[á.i]s* (66b) cannot surface, integrating this fact with the obligatory neutralisation of medial postvocalic [j] and [y] to [y] in SC.

### 4.3 Summary of rules and interactions

As we did for AR in (55), we list in (68) the phonological rules of SC that are mentioned above, following the format of (55). Additional comments regarding domains and crucial precedence relations follow, without belabouring obvious carry-overs from (55).

(68)			<i>must precede</i>
a.	<i>stem domain</i>		
	Syllabification	Syl	Resyl, Stress
b.	<i>word domain</i>		
	Syllabification	Syl	Resyl, Stress
	Stress assignment	Stress	Diph, PosD, PreD
	Diphthongisation	Diph	SCCon
	PostV Denuclearisation (26)	PosD	
	SC Consonantalisation (65)	SCCon	PreD, [+voi], Sprd
c.	<i>phrase domain</i>		
	Syllabification	Syl	Resyl
	Resyllabification (21)	Resyl	<i>r-str</i>
	PreV Denuclearisation (24)	PreD	
	Voicing assimilation (59)	[+voi]	
	[–cont]-spreading (29)	Sprd	
	<i>r-strengthening in coda</i>	<i>r-str</i>	

*Remarks on domains and precedence relations* (A ≧ B = A precedes B)

- (i) Syllabification
  - ≧ Resyllabification and Stress assignment, cf. (55).
- (ii) Stress assignment
  - ≧ Diphthongisation, cf. (55).
  - ≧ PostV and PreV Denuclearisation: stressed vowels do not denuclearise, cf. (55).
- (iii) Diphthongisation
  - ≧ SC Consonantalisation: Diphthongisation feeds SC Consonantalisation, cf. (63).
- (iv) SC Consonantalisation
  - ≧ PreV Denuclearisation: SC Consonantalisation is counterfed by PreV Denuclearisation ( $\langle h \rangle i.éna \rightarrow \langle h \rangle [j] éna \rightarrow * \langle h \rangle [y] éna$ ). The order SCCon ≧ PreD is enforced by domain assignment, word for SCCon, phrase for PreD.<sup>90</sup>

<sup>90</sup> A few of our SC consultants who do not themselves consonantalise the products of PreD report the impression of a growing tendency among younger speakers,

- » Voicing assimilation: SC Consonantalisation feeds Voicing assimilation (*lo[s j]esos* → *lo[s y]esos* → *lo[z y]esos*), cf. (60), (61).
- » [–cont]-spreading (§3.6).

### 5 AR and SC together

Information originally presented mainly in (28) and (58) is now compiled in (69) to highlight similarities and differences in pronunciation between AR and SC:

(69)	[ʒ]	[y]	[j]	[i]	<i>source</i>
yés <u>o</u>	AR	SC			underlying #iV
<h>i <u>é</u> na		AR	SC	SC	underlying #i.V
<h>i <u>é</u> lo		AR/SC			diphthongisation of /e!/ diphthongisation of /e!/ underlying ViV
Gó <u>y</u> a	AR	SC	AR/SC		underlying Vi.V in AR; ViV in SC
secu <u>ó</u> ia		AR/SC	AR		

We have argued in §§3 and 4 that despite the surface disparities seen in (69), there is no difference in the underlying set of segments of AR and SC, nor in the distribution of those segments in particular classes of words except for the class represented by *secuóia* in (69). AR does not have an underlying /ʒ/, but it does have a syllabicity contrast between marked /i./ and unmarked /i/, as does SC. Thus, the divergences summarised in (69) can be attributed to differences in the existence, form, optionality or position of rules in the grammars of AR and SC.

We illustrate these differences graphically by conflating (55) and (68) in (70). Rules and domains shared by PO, RN and SC bear no special marking. Rules that appear in only one or two of the three dialects are flagged by the initials of the dialect(s) in which they are found.

(70)			<i>must precede</i>
a. <i>stem domain</i>			
	Syllabification	Syl	Resyl, Stress
b. <i>word domain</i>			
	Syllabification	Syl	Resyl, Stress
RN	Resyllabification (21)	Resyl	Asp, <i>r</i> -str
	Stress assignment	Stress	Diph, PreD, PosD
PO/RN	Coronalisation (35)	Cor	Diph, PreD, PosD, Cons, Sprd, Resyl (in phrase domain)
	Diphthongisation	Diph	Cons

---

especially teenagers, to do so. This suggests reapplication of Consonantalisation after PreD in the phrasal domain, among other possibilities.

PO/RN	PreV Denuclearisation (24)	PreD	Cons
	PostV Denuclearisation (26)	PosD	Cons
PO/RN	Consonantalisation (43)	Cons	Asp, Sprd, Resyl (in phrase domain)
SC	Consonantalisation (64)	Cons	PreD, [+voi], Sprd
RN	Aspiration (51)	Asp	Resyl (in phrase domain)
<i>c. phrase domain</i>			
	Syllabification	Syl	Resyl
	Resyllabification (21)	Resyl	Asp, <i>r</i> -str
	PreV Denuclearisation (24)	PreD	
PO	Aspiration (49)-PO	Asp	
SC	Voicing assimilation (59)	[+voi]	
	[–cont]-spreading (29)	Sprd	
	<i>r</i> -strengthening in coda	<i>r</i> -str	

The differences among dialects are, mainly:

(i) AR has an early rule of Coronalisation that takes syllable-initial [j] *hors de combat* so that it is never neutralised with the product of diphthongisation of /e!/ or with a denuclearised /i./.

(ii) In AR PreD applies in the word domain. The phenomenon of denuclearisation in SC includes obligatory PosD in the word domain. Additionally, PreD applies optionally in the phrase domain in both AR and SC. As noted below (68), word-domain Consonantalisation is countered by phrase-domain PreD in SC.

(iii) Early (word-domain) application of PreD in AR allows underlying marked /i./ to fall together with initial [j] produced by diphthongisation of /e!/: both are subject to Consonantalisation – e.g. /i./ón → [j]ón → [y]ón like [e!]lo → [j]élo → [y]élo.<sup>91</sup> On the other hand, the exclusively phrasal position of PreD in SC prevents this neutralisation: only the [j] from diphthongisation arises early enough to be consonantalised to [y]; this [j] is thus neutralised with [j] from underlying /i/ in SC – e.g. /i./ón (↔ \*[y]ón) → [j]ón vs. [é!]lo → [j]élo → [y]élo and /i./áte → [j]áte → [y]áte.

(iv) SC and AR treat coda /s/ differently: SC voices it before a voiced consonant, AR aspirates it. As shown in (61), the late (phrasal) position of PreD in SC makes *s*-voicing impossible before an exponent of underlying /i./. On the other hand, the distribution of aspirated /s/ in RN shows that PreD is positioned within the word-domain phonology of that dialect, because PreD precedes word-domain Consonantalisation (/i./ón → [j]ón → [y]ón), which in turn precedes word-level Aspiration in RN (*des*[j]érba → *des*[y]érba → *de*[hy]érba; cf. (54)).

The cumulative effect of these differences is to make AR a more ‘consonantalising’ dialect than SC. In AR /i/ can emerge as a strident fricative or affricate, and even /i./ is desyllabified in many environments and subsequently turned into an obstruent in most instances. SC, on the

<sup>91</sup> Recall that Consonantalisation is obligatory word-initially in AR, but some speakers usually do not apply it medially.

other hand, forbears to consonantalise any underlying /i./, and its most extreme fortition is to turn some /i/'s into non-strident palatal fricatives or affricates. Even so, SC is more 'consonantalising' than other languages with which one could compare it. In Slovak, for instance, underlying high vocoids that are onsets by every test are nonetheless strictly forbidden to develop any consonantal articulation (Rubach, personal communication). Rubach suggests that Slavic languages in general may avoid consonantalisation of onset glides. Our impression of French and of English is that they too fail to consonantalise glides in onset position – indeed Spanish speakers correct the second author for using [j] in Spanish where [y] is required. These informal observations are hindered, however, by a lack in the literature of explicit discussion of the position of syllable-initial glides. Even studies specifically concerned with locating glides in onset *vs.* nuclear position, such as Davis & Hammond (1995) on English, fail to consider the position of such glides. These authors marshal several arguments for the onset position of the [w] in *twin vs.* the nuclear position of the [j] in *pure*, but say nothing about the position of initial [j] in *year*, *yet* and *yip*. Though we cannot pursue the point here, we suspect that English syllable-initial [j] is in onset position, as opposed to the nuclear position that Davis & Hammond motivate for postconsonantal [j]. As one argument, they note the well-known fact that [j] occurs only before [u], as in *pure*, *few*, *music*, *cute* (\*p[j]ear, \*f[j]ow, \*m[j]esic, etc.). We would add, however, that [j] occurs freely before any vowel if no tautosyllabic consonant precedes it: *year*, *your*, *yet*, *Yale*, *yore*, *yowl*. Thus English may be like Spanish in filling onsets with glides if no better candidate is available.

## 6 AR and Optimality Theory

If the descriptive proposals regarding AR offered above are correct in relevant respects, they present well-defined problems for Optimality Theory (OT). No OT analysis of this material is available, so far as we know. Therefore, we cannot proceed in the logically most direct way, by comparing the success of the analyses. Since construction of strawmen rarely settles anything, the only productive avenue open to us is to lay the issues on the table as clearly as possible. We hope that our presentation will help interested investigators to arrive at more far-reaching conclusions in the future than we can at this time. To focus our discussion, we will not concentrate on the stratal organisation of the grammar that our analysis points to, nor on the counterfeeding opacities involved in the fates of underlying /i/ and /i./. These constitute well-recognised difficulties in a non-derivational framework that have been addressed elsewhere. Rather, we point out those cases that evidently must be handled by the novel mechanism of sympathy theory. We contend that even with that addition, finding an OT analysis for this interconnected set of facts may not be a simple task.

Our understanding of OT is based primarily on McCarthy (to appear a). We choose this very public but – as the present article goes to press – still unpublished document as our basic reference because it is the most recent and most comprehensive evaluation of OT with respect to opacity, elaborated by one of the theory’s most highly regarded advocates.

The problem we consider first involves the interaction of Resyllabification (21) with Coronalisation (35) and Consonantalisation (43), discussed at the end of §3.4.3. For ease of reference, correct and incorrect derivations of a typical example are given in (71):<sup>92</sup>

(71) a.	<i>incorrect</i> (feeding)	b.	<i>correct</i> (counterfeeding)
	ré[j] .ál.to <i>input</i>		ré[j] .ál.to <i>input</i> ‘tall king’
	ré.[j] ál.to (21)		– (35)
	*ré.[ž] ál.to (35)		ré.[j] ál.to (21)

In the incorrect derivation (71a), Resyllabification and Coronalisation are in a feeding relationship since application of the former creates the environment (syllable-initial position) in which Coronalisation applies to /j/, giving the wrong output \*ré.[ž] ál.to. The correct derivation (71b), in which the same rules are sequenced in the opposite order, involves a counterfeeding relationship. On Kiparsky’s (1971, 1973) definition of opacity, Coronalisation (35) is opaque in (71b) because the output ré.[j] ál.to contains an instance of the rule’s input ([j]) in the rule’s environment (syllable-initial position). McCarthy refers to this type of opacity in a counterfeeding relationship – in which the environment rather than the input of the counterfed rule is created by the counterfeeding rule – as ‘Counterfeeding on environment’ (McCarthy’s ‘type (33a)’).<sup>93</sup>

We follow McCarthy closely in explaining the problem that examples like (71) pose for OT. First, translating the rules in question into OT terms, we have the constraint rankings shown in (72), the analogue of McCarthy’s (36):

(72)	<i>Type (33a) counterfeeding opacity : rankings</i>	
	*j ≫ F(j ↦ ž)	(translation of Coronalisation)
	*C.V ≫ F(C.V ↦ .CV)	(translation of Resyllabification) <sup>94</sup>

<sup>92</sup> The same point can be made with either Coronalisation or Consonantalisation; we arbitrarily pick the former.

<sup>93</sup> McCarthy suggests that cases of counterfeeding on focus should not be treated by sympathy, and he offers instead Kirchner’s (1996) proposal that such chain-shift cases be treated via locally conjoined constraints. However, it does not seem to us that the case for incorporation of constraint conjunction into the armamentarium of OT is closed. Nor do we understand why counterfeeding on focus should be excluded in principle from the uniform treatment of opacity via sympathy that is one of McCarthy’s goals. If counterfeeding on focus is reintroduced, sympathy may be needed to describe the chain shifts in AR whereby /i/ travels further along the strengthening scale than /i./ does.

<sup>94</sup> For brevity we have simply translated Resyllabification into a faithfulness constraint. Of course, the notion of resyllabification is a derivational one: in non-stratal



Expressions like ‘\*j’ are well-formedness constraints; expressions like ‘F(j ↗ ž)’ are faithfulness constraints. Thus the ranking ‘\*j ≫ F(j ↗ ž)’ means that the constraint prohibiting syllable-initial [j] dominates the constraint requiring faithfulness of the output reflex of input [j], here [ž], to input [j]. This ranking thus models the effect of Coronalisation.

Finally, following McCarthy, we rank \*C.V above \*j, so that both processes are not blocked altogether. Now this ranking and those in (72) are collected in tableau (73), the analogue of McCarthy’s (37):

(73) Type (33a) counterfeeding opacity: tableau

	/j.V/	*C.V	F(C.V↗.CV)	*j	F(j↗ž)
<i>opaque</i>	☞ a. .jV		*	*	
<i>transparent</i>	☞ b. .žV		*		*
<i>faithful</i>	c. j.V	*!			

As McCarthy observes, the incorrect transparent output (73b) cannot be evaluated as worse than the correct opaque output (73a) within classic OT because (73b) involves less serious violations than (73a), no matter how the currently unranked constraints are ranked.

McCarthy thus reaches the conclusion that sympathy has to be added to OT for cases of counterfeeding on the environment (33a). Still following McCarthy, a tableau involving the sympathy relation for the data under discussion is shown in (74), the analogue of McCarthy’s (38):

(74) Applying sympathy to type (33a) counterfeeding opacity

	/j.V/	*C.V	☞F(j↗ž)	★F(C.V↗.CV)	*j	F(j↗ž)
<i>opaque</i>	☞ a. .jV			*	*	
<i>transparent</i>	☞ b. .žV		*!	*		*
<i>sympathetic and faithful</i>	☞ c. j.V	*!		✓		

McCarthy explains: ‘The form exercising sympathetic influence on the outcome is [(74c) ☞j.V]. It is... the most harmonic member of the set of

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versions of OT there is no ‘intermediate stage’ that refers to the first pass of syllabification. Nor can the hierarchical effects of Resyllabification be translated exactly into McCarthy’s linear schematism for the formulation of rules and constraints. While (72) is close enough for illustration, an internally consistent sympathy treatment would replace our translation of Resyllabification. One family of faithfulness constraints that can be used to replicate the results of intermediate syllabification is Anchor (McCarthy, to appear a,b). F(Anchor<sub>IO</sub>(Word, σ, Final)), when applied to corresponding input and output consonants, favours outputs in which a consonant that is word-final in the input emerges as syllable-final in the output. The sympathetic candidate j.[V is better anchored than the attested output .j][V.

candidates that obey the selector constraint [F(C.V  $\rightarrow$  .CV)]. The sympathetic, cross-candidate faithfulness constraint [ $\clubsuit$ F(j  $\rightarrow$  ž)] evaluates resemblance to [ $\clubsuit$ C.V]. And according to this constraint, the opaque output [.jV] resembles [ $\clubsuit$ C.V] more than transparent [.žV] does' (McCarthy, to appear a; our bracketed substitutions for McCarthy's schematic formulae).<sup>95</sup>

The case of counterfeeding just examined illustrates one type of opacity that motivates sympathy in McCarthy. We turn now to another, a case of counterbleeding, and a rather complicated one at that. It is the phenomenon of word-domain Aspiration (51) –  $s \rightarrow h$  in codas – and phrase-domain Resyllabification (as above, see note 94) in the RN dialect of AR (§ 3.5, (52)). A typical example is *és. el* 'it's he'  $\rightarrow$  *é[h. el*. Aspiration applies first, giving *é[h. el*, which Resyllabification restructures to *é[h. el*. The two rules are in a counterbleeding relation in this derivation: if Resyllabification applied first, yielding *é[s. el*, Aspiration could not apply since its environment (syllable-final position for [s]) has been eliminated (bled) by Resyllabification. In the correct derivation, the output is opaque by Kiparsky's definitions (1971, 1973), because the environment for Aspiration is not visible in the output.

According to McCarthy (to appear a), 'counterbleeding interaction leads to non-surface-apparentness, which is invariably problematic for OT's output orientation'. In McCarthy's tableau (26) it is again demonstrated that there is no ranking of the constraints that will make the output of a counterbleeding interaction the optimal candidate. We will not repeat the demonstration here; suffice it to say that the marks against a transparent (but incorrect) candidate are a proper subset of the marks against an opaque (but correct) one. Thus Aspiration and Resyllabification in RN can be added to the cases McCarthy cites as untreatable in classic OT.

McCarthy continues (to appear a): 'adding the sympathy relation to OT solves this problem, since it provides a constraint that favours [the opaque candidate] over [the transparent candidate]'. The  $\clubsuit$ -candidate is  $\clubsuit h.V$ , McCarthy's  $\clubsuit ADC\#$ , which does not violate the faithfulness constraint relevant to Resyllabification, namely F(C.V  $\rightarrow$  .CV). The opaque candidate *.hV* (as in *é[h. el*) more strongly resembles  $\clubsuit h.V$  than does the transparent candidate *.sV* (as in *é[s. el*).<sup>96</sup> The opaque candidate is therefore optimal thanks to the sympathy relation, and through this relation 'counterbleeding opacity emerges from the basic ranking/violation texture of OT'.

<sup>95</sup> An anonymous *Phonology* reviewer observes that this case could be handled without sympathy, by an output–output constraint enforcing resemblance between the [j] in the output *re[j]V* and the base form *re[j.]* in isolation. However, as we understand it, McCarthy's goal is to eliminate all the mechanisms for accounting for counterfeeding on environment that do not generalise to every case. There happens to be a base form to appeal to in this case, but as McCarthy shows, such appeal is not always possible.

<sup>96</sup> Sympathy has approximately the function of the intermediate derivational stage in the rule-based analysis' (McCarthy, to appear a).

There is more to the RN case, however, and it involves the difference between words and phrases. As discussed in §3.5 and illustrated in (52), Resyllabification applies in this dialect not only in the phrase domain (as described just above) but also in the word domain. A typical example, involving the prefix *des-*, is *de[s.a]rme* ‘disarmament’ → *de[.sa]rme*. Application of Resyllabification here prevents (bleeds) subsequent application of Aspiration (*\*de[h.a]rme*), whose environment no longer exists. The output *de[.sa]rme* is transparent: the reason for the failure of Aspiration is surface-apparent. There is thus no opacity problem for OT in this example.

The question arises, however, of the compatibility in OT of this example with the previous one, in which Aspiration and phrase-domain Resyllabification stand in an opaque relation for which sympathy is the proposed remedy. In other words, Aspiration and Resyllabification stand in a transparent and in an opaque relationship in the same dialect, the same grammar. On our analysis this situation is modelled by assigning Resyllabification to both the word- and the phrase-domain. Within sympathy theory this case is in danger of running afoul of a central and appealing prediction concerning opacity (McCarthy, to appear a: §3.2): if two ‘notionally distinct processes ... violate exactly the same faithfulness constraints, then they must always act together in rendering a third opaque’. Our two notionally distinct processes are word-internal and phrasal resyllabification. If they violate exactly the same faithfulness conditions, sympathy predicts that both should opacify a third process, Aspiration, or neither should. The question is how to translate the two passes of Resyllabification into a theory without strata. Both word-internal and phrasal resyllabification violate Anchor (Root,  $\sigma$ , Initial): both processes result in a root syllable whose first segment is not the first segment of that root. But the word-internal process does not opacify Aspiration (e.g. *de.[s]árme*) while the phrasal process does (e.g. *é[h] él*). Thus if this Anchoring condition is the crucial faithfulness constraint, RN does not bear out the attractive prediction at issue. However, one can imagine other Anchoring conditions that might make different predictions.<sup>97</sup> The ultimate outcome of this case thus depends on the contents of the universal set of Anchoring constraints and the best way to deploy them.

Setting this last issue aside, the exploitation of sympathy in the two AR cases above is apparently successful. However, it is clear that the addition to OT of the novel and complex mechanisms of sympathy is an *a priori* undesirable weakening of the theory. Whether or not this weakening is warranted to handle a set of recalcitrant cases is an open question at present. Moreover, Idsardi (1997b) argues at a more general level that

<sup>97</sup> For example, *de.[s]árme* might be claimed to violate Anchor (Morpheme,  $\sigma$ , Final) while *é[h] él* violates both that and Anchor (Word,  $\sigma$ , Final). Such a superset relation removes the prediction that the more general constraint, Anchor (Morpheme) must opacify a process that a more specific one – Anchor (Word) – does (McCarthy, to appear a: §3.2). However, the further consequences of granting such latitude to the set of Anchoring constraints are unclear.

sympathy is no more adequate in handling opacity than the devices it is intended to replace or supplement, and that, in the end, OT does not have an adequate way of handling opaque interactions.<sup>98</sup>

In sum, OT, supplemented or not by the subtheory of sympathy, remains controversial. As we said at the outset of this study, a deepened understanding of general phonological theory must rest on detailed investigations of individual grammars. Little can be learned from simple cases that do not challenge the basic resources of competing theories. We hope that our analysis of the complex web of data from Argentinian and Standard Castilian Spanish has contributed in some measure to the ongoing debate.

### Appendix: Lexical syllabicity distinctions in other analyses

As pointed out in §2.2, most if not all Spanish speakers make lexically contrastive distinctions in syllabicity of the type illustrated in (75):

(75) [i u]	vs. [j w]		
r[i]ó	‘s/he laughed’	d[j]ó	‘s/he gave’
<h>[u]í	‘I fled’	f[w]í	‘I went’

Such contrasts have been documented by phoneticians for at least 80 years and have figured prominently in theoretical works for over four decades (see note 16). However, Dunlap (1991: 185) asserts that ‘there is no contrast of the sort shown in [(75), JH/EK], where the syllabicity of a high vocoid varies independently of stress’. Rosenthal (1994: 176, *et passim*) seconds Dunlap.

Though Dunlap and Rosenthal are evidently unaware of the facts and analyses just alluded to, they are aware of the data illustrated in (76), which involve the placement of stress in present-tense verb forms:<sup>99</sup>

(76) a.	tra.bá.ja	*trá.ba.ja	‘s/he works’
	me.né.a	*mé.ne.a	‘s/he shakes, stirs’
	de.po.sí.ta	*de.pó.si.ta	‘s/he deposits’
	co.ló.ca	*có.lo.ca	‘s/he places’
	com.pú.ta	*cóm.pu.ta	‘s/he computes’
b.	a.ca.rí.c[j]a	*a.cá.ri.c[j]a	‘s/he caresses’
	a.fé[j].ta	*á.fe[j].ta	‘s/he shaves’
	ví.c[j]a		‘s/he vitiates’
	ó.d[j]a		‘s/he hates’
	ré[j].na		‘s/he rules’
	pé[j].na		‘s/he combs’
	bá[j].la		‘s/he dances’
	ca.lúm.n[j]a		‘s/he slanders’
	di.vór.c[j]a		‘s/he divorces’
	en.ví.d[j]a		‘s/he envies’
	e.ló.g[j]a		‘s/he praises’
	rá.b[j]a		‘s/he rants’

<sup>98</sup> See also Halle & Idsardi (1997), Idsardi (1997a, 1998).

<sup>99</sup> Harris (1995) contains extensive discussion and bibliography.

c. des.ca.rrí.a	*des.cá.rrí.a	‘s/he misguides’
re.<h>í.la	*ré.<h>i.la	‘it buzzes’
va.cí.a		‘s/he empties’
ro.cí.a		‘s/he sprinkles’

The examples in (76a) illustrate the fact that (polysyllabic) present-tense verb forms in Spanish are exceptionlessly stressed on the penultimate syllable (*sic*; not ‘penultimate vocoid’ or ‘penultimate mora’) independently of the quality of the peak vowel of that syllable and independently of the structure of that syllable or of surrounding syllables.

The examples in (76b) illustrate that stress is possible on the *third* vocoid from the right only when the *second* vocoid from the right is high and adjacent to another vocoid – either left-adjacent to the last vowel (e.g. *a.ca.rí.c[ja]*) or right-adjacent to the stressed vowel (e.g. *a.f[éj].ta*).

The examples in (76c) illustrate that stress is also possible on the penultimate high vocoid even though it is left-adjacent to the last vowel (e.g. *des.ca.rr[i.a]*) or right-adjacent to the preceding vowel (e.g. *r[e.<h>í].la*).

The contrast in stress placement between (76b) and (76c) and analogous examples is a clear diagnostic of an underlying syllabicity contrast, which we represent as syllabically unmarked /i/ in (76b) *vs.* obligatorily syllabic /i./ (i.e. /i/ lexically identified as a syllable nucleus – cf. §2.4) in (76c). The relative size of the two sets of examples in (76) reflects the real world: verbs like those in (76b) vastly outnumber verbs like those in (76c). This is as expected on our account, whereby /i/ and /i./, respectively, are the unmarked and marked cases of syllabicity in high vocoids in general (see discussion of (5) and (6) above).

Dunlap denies that the data sampled in (76) have anything to do with a syllabicity contrast. Rather, Dunlap proposes to equate the difference in stress placement between (76b) and (76c) in verbs with the stress contrast in nouns and adjectives like ‘type A’ *corréa* ‘strap’ *vs.* ‘type B’ *córnea* ‘cornea’.<sup>100</sup> This proposal, however, provides no account of the systematic impossibility of verb forms like *córnea*, which have stress on the third vocoid from the end, just as do verbs like those in (76b). But it is clear why *córnea* cannot be a verb while all those in (76b) and hundreds more can be and are: only in the latter is the penultimate vocoid a *glide*; that is, syllabically unmarked underlying /i/. Thus the syllabification *cor.ne.a vs. a.ca.ri.c[j]a, a.fe[j].ta*, and so on. Moreover, given that ‘type A’ cases vastly outnumber ‘type B’ cases in nouns and adjectives, Dunlap’s proposals lead us to expect the same relationship in verb forms; that is, that verb forms like *ro.cí.a* should outnumber forms like *ó.d[j]a*. Exactly the opposite is true.

Consider now how stress patterns in verb and non-verb forms with the same stem can and cannot be paired. The following data (in standard orthography) are valid for all major dialects, including AR and standard Castilian:

<sup>100</sup> The ‘type A/type B’ terminology follows Harris (1983, 1988). Type A includes consonant-final oxytones like *contról* ‘control’, as well as vowel-final paroxytones like *corréa*; these are by far the predominant stress patterns in Spanish. Minority type B includes consonant-final paroxytones like *apóstol* ‘apostle’ in addition to vowel-final proparoxytones like *córnea*.

(77) Noun/Adjective	Verb
a. stem ends in C/i/-	
colúmpio ‘swing’	colúmpio ‘I swing’
cópia ‘copy’	cópia ‘s/he copies’
b. stem ends in C/i./-	
ánsia ‘yearning’	ansía ‘s/he yearns’
vário ‘various’	varío ‘I vary’
c. stem ends in C/i./-	
vacío ‘empty’	vacío ‘I empty’
lejía ‘lye’	enlejía ‘s/he applies lye’ (<j> = /x/)
d. stem ends in ?	
*{vacío	vácio}
*{lejía	enlójia}
*{ánsia	ánсия}
*{vário	vário}

Noun/verb pairs like *cópia/cópia* (77a) show that nouns and adjectives stressed on the antepenultimate vocoid can match verbs stressed on the antepenultimate vocoid. Pairs like *ánsia/ansía* (77b) show that nouns and adjectives stressed on the antepenultimate vocoid can match verbs stressed on the penultimate vocoid. Pairs like *vacío/vacío* (77c) show that nouns and adjectives stressed on the penultimate vocoid can match verbs stressed on the penultimate vocoid. The remaining logically possible case illustrated in (77d) – nouns and adjectives stressed on the penultimate vocoid paired with verbs stressed on the antepenultimate vocoid – does not exist, despite the fact that each individual word in (77d) is well-formed segmentally and prosodically.

This asymmetry is absolutely systematic and inviolable, but it is beyond the descriptive reach of Dunlap’s proposals. The examples in (77a–c) show that there is no correlation in stress placement between non-verbs and verbs. But Dunlap proposes that the same type A/type B distinction operates in verbs and non-verbs alike. Dunlap is thus unable to explain (a) why segmentally identical verb/non-verb pairs with the same stem are not stressed identically, and (b) why the pattern in (77d) is ungrammatical while the patterns in (77a–c) are grammatical.

Exactly the possibilities in (77) are predicted on the analysis we advance here and others that recognise an underlying syllabicity contrast among high vocoids in Spanish (Harris 1969, 1983, 1989, 1995, among others). Since present-tense verb stress is always on the penultimate syllable, the class of stems illustrated in (77a) have syllabically unmarked underlying /i/ while the classes in (77b) and (77c) have marked underlying /i./ . The difference between the latter two sets is that in their non-verb instantiations the stems in (77b) have type B stress but those in (77c) have type A, a distinction not available to verb forms, whose stress is fully determined by their inflectional properties (e.g. on the penultimate syllable in present indicative and subjunctive and other forms).<sup>101</sup> The pairings in (77d) are impossible because their stress contours demand contradictory

<sup>101</sup> The remaining logically possible combination of syllabically unmarked /i/ and type B stress in non-verb forms might be expected to result in words like \**có.lum.pio*, with stress on the fourth vocoid from the right edge of the word. This contour, however, is ruled out by general prosodic restrictions in Spanish (§3.4.2 above; Harris 1995).

underlying representations for a given stem, namely, unmarked /i/ in verb forms but marked /i./ in noun or adjective forms.

In sum, though Dunlap and Rosenthal claim that it does not exist, the syllabicity contrast at issue is indispensable for a range of data in Spanish; no viable alternative to it is known. We have singled out Dunlap for scrutiny here because it is sufficiently clear and detailed so as to permit critical evaluation. Moreover, the empirical support of Dunlap's potential contribution to moraic theory depends on the validity of its claims regarding syllabicity, as does Rosenthal's contribution to Optimality Theory.

Hualde (1997) includes an essentially taxonomic analysis of Spanish vowel phonemes that converges, not surprisingly, with §2.2 above on the conclusion that the inventory of contrastive [–consonantal] segments is /a e i o u/. In particular, Hualde states that 'it is preferable to reduce the phonemic inventory from /i/-/j/ to a single phoneme /i/, at the cost of introducing a certain amount of lexical marking' (1997: 66). With respect to the syllabicity contrasts illustrated in (5), (6), (75), etc., Hualde proposes that the cases we write as /i u/ correspond to regular syllabification while the /i. u./ cases amount to 'lexical marking' and 'exceptional syllabification'. But Hualde makes no explicit proposal regarding the formal correlates of 'lexical marking' or the mechanisms responsible for assigning syllable structure, regular or exceptional. It is thus not clear, in Hualde's terms, whether or in what way a 'phonemic distinction' between, say, /i/ and /j/ differs empirically and substantively from a 'lexical marking' associated with regular or exceptional syllabification. For example, if, as we propose, /i/ and /i./ (in our shorthand) have the same segmental features [–consonantal, +high, –back, ...] and the only difference between them is the lexical association of the syllabic node N in the case of hiatus, does that count for Hualde as an addition to the 'phonemic inventory' of Spanish? As far as we can see, the answer to such questions, or indeed whether they are even meaningful, cannot be determined without additional articulation of Hualde's theoretical apparatus.

Roca (1997b) provides an analysis of certain aspects of underlying syllabicity distinctions in Spanish. He represents this distinction as vocoids lexically designated as syllable nuclei *vs.* vocoids not so designated – thus contrasting exactly the segments we write as /i. u./ *vs.* /i u/, a notation explicated in §2.4 above. Roca objects, however, to referring to this distinction as one of 'vowels' *vs.* 'glides', as has been traditional in the past. Roca claims that recognition of a lexical contrast between so-called vowels and glides 'under its most obvious interpretation ... implies a return to the SPE binary feature [ $\pm$ syllabic]' (1997b: 234 *et passim*). It strikes us that Roca's objection is merely terminological rather than substantive. Furthermore, his claim regarding [ $\pm$ syllabic] is baffling, given his own use of lexical specification of nuclearity to mark the contrast at issue. Setting terminology aside, the substantive issue is whether or not lexical marking of nuclearity is the empirically correct formal representation of the Spanish syllabicity contrast under discussion. On this issue, our view does not differ from Roca's.

#### REFERENCES

- Alarcos Llorach, Emilio (1961). *Fonología española*. Madrid: Gredos.  
 Blevins, Juliette (1995). The syllable in phonological theory. In Goldsmith (1995). 206–244.

- Bowen, J. Donald & Robert P. Stockwell (1955). The phonemic interpretation of semivowels in Spanish. *Lg* **31**. 236–240.
- Bowen, J. Donald & Robert P. Stockwell (1956). A further note on Spanish semivowels. *Lg* **32**. 290–292.
- Calabrese, Andrea (1995). A constraint-based theory of phonological markedness and simplification procedures. *LI* **26**. 373–463.
- Campos, Héctor & Fernando Martínez-Gil (eds.) (1991). *Current studies in Spanish linguistics*. Washington: Georgetown University Press.
- Carreira, María (1988). The structure of palatal consonants in Spanish. *CLS* **24:1**. 73–87.
- Carreira, María (1991). The alternating diphthongs in Spanish: a paradox revisited. In Campos & Martínez-Gil (1991). 407–445.
- Clements, George N. (1987). Phonological feature representation and the description of intrusive stops. *CLS* **23:2**. 29–50.
- Cole, Jennifer (1995). The cycle in phonology. In Goldsmith (1995). 70–113.
- Craddock, Jerry R. (1973). Review of Harris (1969). *Linguistics* **109**. 83–109.
- Cressey, William W. (1978). *Spanish phonology and morphology: a generative view*. Washington: Georgetown University Press.
- Davis, Stuart & Michael Hammond (1995). On the status of onglides in American English. *Phonology* **12**. 159–182.
- Dunlap, Elaine (1991). *Issues in the moraic structure of Spanish*. PhD dissertation, University of Massachusetts, Amherst.
- Fougeron, Cécile & Patricia A. Keating (1997). Articulatory strengthening at edges of prosodic domains. *JASA* **101**. 3728–3740.
- García-Bellido, Paloma (1997). The interface between inherent and structural prominence in Spanish. In Martínez-Gil & Morales-Front (1997). 469–513.
- Goldsmith, John (1981). Subsegmentals in Spanish phonology. In W. W. Cressey & D. J. Napoli (eds.) *Linguistic symposium on Romance linguistics: 9*. Washington: Georgetown University Press. 1–16.
- Goldsmith, John (ed.) (1995). *The handbook of phonological theory*. Cambridge, Mass. & Oxford: Blackwell.
- Guerssel, Mohamed (1986). Glides in Berber and syllabicity. *LI* **17**. 1–12.
- Halle, Morris (1995). Feature geometry and feature spreading. *LI* **26**. 1–46.
- Halle, Morris & William Idsardi (1997). *r*, hypercorrection, and the Elsewhere Condition. In Roca (1997c). 331–348.
- Halle, Morris & Michael Kenstowicz (1991). The Free Element Condition and cyclic versus noncyclic stress. *LI* **22**. 457–501.
- Halle, Morris, Bert Vaux & Andrew Wolfe (1998). *On feature spreading and the representation of place of articulation*. Ms, MIT & Harvard University.
- Harris, James W. (1969). *Spanish phonology*. Cambridge, Mass.: MIT Press.
- Harris, James W. (1971). Aspectos del consonantismo español. In H. Contreras (ed.) *Los fundamentos de la gramática transformacional*. Mexico City: Siglo XXI. 164–185.
- Harris, James W. (1983). *Syllable structure and stress in Spanish: a nonlinear analysis*. Cambridge, Mass.: MIT Press.
- Harris, James W. (1984). Theories of phonological representation and nasal consonants in Spanish. In P. Baldi (ed.) *Papers from the 12th Linguistic Symposium on Romance Languages*. Amsterdam: Benjamins. 153–168.
- Harris, James W. (1985). Spanish diphthongisation and stress: a paradox resolved. *Phonology Yearbook* **2**. 31–45.
- Harris, James W. (1988). Spanish stress: the extrametricality issue. Ms, MIT. Distributed 1992, Indiana University Linguistics Club.
- Harris, James W. (1989). Our present understanding of Spanish syllable structure: theoretical and applied perspectives. In P. C. Bjarkman & R. M. Hammond (eds.) *American Spanish pronunciation*. Washington: Georgetown University Press. 151–169.



- Harris, James W. (1991). The form classes of Spanish substantives. *Yearbook of Morphology 1991*. 65–88.
- Harris, James W. (1993). Integrity of prosodic constituents and the domain of syllabification rules in Spanish and Catalan. In K. Hale & S. J. Keyser (eds.) *The view from building 20 : essays in linguistics in honor of Sylvain Bromberger*. Cambridge, Mass.: MIT Press. 177–193.
- Harris, James W. (1995). Projection and Edge Marking in the computation of stress in Spanish. In Goldsmith (1995). 867–887.
- Harris, James W. (1997). Why *n'ho* is pronounced [li] in barceloní Catalan: morphological impoverishment, merger, fusion, and fission. *Recherches Linguistiques de Vincennes* 26. 61–86. Revised version in *MIT Working Papers in Linguistics* 30. 451–479.
- Harris, James W. (1999). Spanish negative *in-*: morphology, phonology, semantics. In M. Kenstowicz (ed.) *Ken Hale : a life in language. Papers in linguistics in honor of Ken Hale*. Cambridge, Mass.: MIT Press.
- Hualde, José I. (1989). Silabeo y estructura morfé mica en español. *Hispania* 72. 821–831.
- Hualde, José I. (1991). On Spanish syllabification. In Campos & Martínez-Gil (1991). 475–493.
- Hualde, José I. (1994). La contracción silábica en español. In V. Demonte (ed.) *Gramática del español*. Mexico City: Colegio de México. 629–647.
- Hualde, José I. (1997). Spanish /i/ and related sounds: an exercise in phonemic analysis. *Studies in the Linguistics Sciences* 27. 61–79.
- Idsardi, William (1997a). Phonological derivations and historical changes in Hebrew spirantization. In Roca (1997c). 367–392.
- Idsardi, William (1997b). Sympathy creates chaos. Ms, University of Delaware.
- Idsardi, William (1998). Tiberian Hebrew spirantization and phonological derivations. *LI* 29. 37–73.
- Kaisse, Ellen M. (1992). Can [consonantal] spread? *Lg* 68. 313–332.
- Kaisse, Ellen M. (1996). The prosodic environment of *s*-weakening in Argentinian Spanish. In K. Zagana (ed.) *Grammatical theory and Romance languages*. Amsterdam: John Benjamins. 123–134.
- Kaisse, Ellen M. (1998). Laterals are [–continuant]. Ms, University of Washington.
- Kaisse, Ellen M. (1999). Resyllabification precedes all segmental rules: evidence from Argentinian Spanish. In J.-M. Authier, B. Bullock & L. Reed (eds.) *Formal perspectives on Romance linguistics*. Amsterdam: Benjamins. 197–210.
- Kenstowicz, Michael J. (1994). *Phonology in generative grammar*. Cambridge, Mass. & Oxford: Blackwell.
- King, Harold V. (1952). Outline of Mexican Spanish phonology. *Studies in Linguistics* 10. 51–62.
- Kiparsky, Paul (1971). Historical linguistics. In W. Dingwall (ed.) *A survey of linguistic science*. College Park: University of Maryland Press. 576–642.
- Kiparsky, Paul (1973). Abstractness, opacity, and global rules. In O. Fujimura (ed.) *Three dimensions of linguistic theory*. Tokyo: Taikusha. 57–86.
- Kiparsky, Paul (1993). Blocking in nonderived environments. In S. Hargus & E. M. Kaisse (eds.) *Studies in Lexical Phonology*. San Diego: Academic Press. 277–313.
- Kirchner, Robert (1996). Synchronic chain shifts in Optimality Theory. *LI* 27. 341–350.
- Ladefoged, Peter & Ian Maddieson (1996). *The sounds of the world's languages*. Cambridge, Mass. & Oxford: Blackwell.
- Lahiri, Aditi & Vincent Evers (1991). Palatalization and coronality. In C. Paradis & J.-F. Prunet (eds.) *The special status of coronals : internal and external evidence*. San Diego: Academic Press. 79–100.

- Levin, Juliette (1985). *A metrical theory of syllabicity*. PhD dissertation, MIT.
- Lipski, John (1997). Spanish word stress: the interaction of moras and minimality. In Martínez-Gil & Morales-Front (1997). 559–593.
- Lozano, María del Carmen (1979). *Stop and spirant alternations: fortition and spirantization processes in Spanish phonology*. PhD dissertation, Ohio State University.
- McCarthy, John (to appear a). Sympathy and phonological opacity. *Phonology* 16.
- McCarthy, John (to appear b). Faithfulness and prosodic circumscription. In J. Dekkers, F. van der Leeuw & J. van de Weijer (eds.) *Optimality Theory: phonology, syntax, and acquisition*. Oxford: Clarendon.
- Martínez Celdrán, Eugenio (1994). *Fonética*. Barcelona: Teide.
- Martínez-Gil, Fernando & Alfonso Morales-Front (eds.) (1997). *Issues in the phonology and morphology of the major Iberian languages*. Washington: Georgetown University Press.
- Monroy, R. (1980). *Aspectos fonéticos de las vocales españolas*. Madrid: Sociedad General Española de Librería.
- Navarro Tomás, Tomás (1965). *Manual de pronunciación española*. Madrid: Consejo Superior de Investigaciones Científicas.
- Poser, William (1982). Phonological representations and action-at-a-distance. In H. van der Hulst & N. Smith (eds.) *The structure of phonological representations*. Part 2. Dordrecht: Foris. 121–158.
- Pulleyblank, Douglas (1994). Underlying mora structure. *LI* 25. 344–353.
- Quilis, Antonio (1993). *Tratado de fonología y fonética españolas*. Madrid: Gredos.
- Quilis, Antonio & Joseph A. Fernández (1985). *Curso de fonética y fonología españolas*. Madrid: Consejo Superior de Investigaciones Científicas.
- Real Academia Española (1973). *Esbozo de una nueva gramática de la lengua española*. Madrid: Espasa-Calpe.
- Roca, Iggy (1988). Theoretical implications of Spanish word stress. *LI* 19. 393–423.
- Roca, Iggy (1991). Stress and syllables in Spanish. In Campos & Martínez-Gil (1991). 599–635.
- Roca, Iggy (1997a). On the role of accent in stress systems: Spanish evidence. In Martínez-Gil & Morales-Front (1997). 619–664.
- Roca, Iggy (1997b). There are no ‘glides’, at least in Spanish: an optimality account. *Probus* 9. 233–265.
- Roca, Iggy (ed.) (1997c). *Derivations and constraints in phonology*. Oxford: Oxford University Press.
- Rosenthal, Samuel (1994). *Vowel glide alternations in a theory of constraint interaction*. PhD dissertation, University of Massachusetts, Amherst. Published 1997, New York: Garland.
- Rubach, Jerzy (1993). *The lexical phonology of Slovak*. Cambridge, Mass. & Oxford: Clarendon Press.
- Rubach, Jerzy (1998). A Slovak argument for the onset–rhyme distinction. *LI* 29. 168–179.
- Sagey, Elizabeth (1986). *The representation of features and relations in nonlinear phonology*. PhD dissertation, MIT.
- Saporta, Sol (1956). A note on Spanish semivowels. *Lg* 32. 287–290.
- Scullen, Mary Ellen (1993). *The prosodic morphology of French*. PhD dissertation, Indiana University.
- Stockwell, Robert P., J. Donald Bowen & Ismael Silva-Fuenzalida (1956). Spanish juncture and intonation. *Lg* 32. 641–665.
- Tranel, Bernard (1987). *The sounds of French*. Cambridge: Cambridge University Press.
- Trigo, L. Rosario (1988). *On the phonological derivation and behavior of nasal glides*. PhD dissertation, MIT.