ANDALUSIAN VOWEL HARMONY AND MORPHOLOGY-PHONOLOGY INTERFACE

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1. Introduction[1]

Vowel systems can differ from one language to another in several ways. Their inventories, for instance, can vary with regard to their number and contrastive features. Eastern Andalusian Vowel Harmony (henceforth, EAVH) illustrates the way in which morphology and phonology interaction can result in a complex vocalic system. EAVH shows [RTR] alternation, which is very significant if we consider that this feature has no phonemic status in Spanish. The process was studied as early as 1939 by Navarro Tomás, who, among other scholars (Alonso et al. 1950, Salvador 1957, 1977), proposed a complete doubled vowel system (*desdoblamiento*).[2] That is to say, that a simple five-vowel set would turn into a ten-vowel one in Eastern Andalusian. The weakening process affecting word-final /s/, which is the plural marker and also corresponds to several verbal inflections, was stated to be the trigger for the alternation.

Be that as it may, and in the light of the data from Granada collected by Sanders (1994), the process is completely predictable (although some variation within the region of Andalusia is found), so it would indicate that only five vowels are phonemic, and that the openness alternation should be explained through (at least) phonological processes. Following Sanders (1994), Jiménez & Lloret (2007) argue that EAVH is *favored* but *not determined* by the fact that vowel quality is often the only exponent of grammatical contrasts. These authors propose a phonetic account of vowel opening which is triggered by a following (dropped) fricative. They claim that the feature

[1] I am grateful to Eulàlia Bonet, Joan Mascaró, Pilar Prieto, Clàudia Pons and Teresa Cabré for their useful comments and suggestions. I also want to thank all the participants from Úbeda as well as my contact person there.

[2] The defenders of this ten-vowel system based their proposal on the fact that native speakers of Eastern Andalusian can distinguish between minimal pairs like singular *perro* 'dog' ['pero] and plural *perros* 'dogs' ['pɛrɔ] thanks to the different vowel quality. This semantic contrast was therefore understood as a sign of the phonemic status of [RTR] vowels. However, as more recent works point out (Sanders 1994, 1998), Jiménez and Lloret 2007), the opening of the rightmost vowel within the word can be easily explained as an articulatory consequence (cue preservation) of the deletion of the final consonant.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 295-307.

[RTR] comes from the laryngeal[3] specifications for fricatives. In such a case, vowels would open as cue preservation, even though the complete loss of /s/ is not guaranteed. In other varieties, however, other consonants undergoing deletion and causing the opening of the preceding vowel are not fricatives, and they are not supposed to have any feature referring to glottis articulation.

The present work focuses on the description and analysis of a concrete variety of Eastern Andalusian. New data from the area of Jaén (the town of Úbeda, to be precise) was collected and analyzed for that purpose. Section 2 is devoted to this description. Section 3 discusses the results and tries to shed light on the morphological incidence that the data seems to show. An alternative interpretation of the process as well as its appropriate analysis within the OT framework is also proposed. I present the conclusions in section 4.

2. EAVH in the Úbeda (Jaén) variety

2.1. Experimental design

The main goal of the present study is to describe in detail the pattern of vowel quality alternations not only in singular and plural forms but also in other forms that may be relevant. The results obtained are expected to show the extent to which morphology is implied in the Jaén variety.

A questionnaire containing 148 items was prepared in the shape of 4 sets of slide presentations. The first set consisted of 61 slides and the target words were mainly nouns, both singular and plural. A second set corresponded to 49 slides in which there were sentences that the informants had to complete with a word, being it a noun, an adverb, and even a construction formed by a verb and a clitic. The third set was made of 12 slides in which the participants were asked to conjugate the present tense indicative of several verbs. Finally, 26 mixed slides constituted the fourth set. They contained a picture that was probably less obvious, and for this reason an additional written sentence served as a hint to help the informants in recognizing the object.

The questionnaire was presented to 10 female native speakers, all of them aged between 25 and 50, and residents in Úbeda, Jaén. Two of the informants had to be discarded[4] for the present study, the final results of the fieldwork, thus, being based on the other 8 speakers. The test took around 30 minutes and an average of 100 words per informant was digitally recorded with a Marantz Professional PMD 660 Portable Solid State Recorder. The analysis was done with Praat.

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[3] Vaux (1998) and Gerfen (2002) point out that fricatives /s, h/ in codas are [spread glottis]. See also Gordon (2001), who claims that [spread glottis] refers to an articulatory gesture like the opening of the glottis.

[4] One of the discarded speakers was a well-educated person; she probably studied abroad and had contact with other more standard varieties of Spanish. Although her speech was more likely related to Eastern Andalusian, the formant values for her vowels completely disagreed with those of the rest of the group. The second discarded participant was some years older than the rest of the group. When analyzing the data, and perhaps due to a loss of flexibility of the vocal cords (presbyphonia or aging voice), the spectrograms were not as clear as they should be to carry out a precise analysis.

2.2. Description and results of the Jaén variety

2.2.1. Coda weakening

Both medial and final codas are highly penalized in Eastern Andalusian. Apart from some few cases (*cactus*, *futbolín*), medial codas are restricted to liquids, nasals and fricatives, all of them coronal. These internal consonant codas can undergo either aspiration or deletion. Alveolar fricatives and velar stops undergo aspiration and cause the gemination of the following consonant (1a). Alveolar fricatives can be deleted, however, when followed by a nasal which, in turn, geminates as well (1b). Other stops undergo deletion (1c).

(1)	a.	cactus	['ka^{h}ttʊ]	'cactus'
		césped	['θe^{h}ppɛ]	'lawn'
	b.	esmalte	[em'malte]	'polish'
	c.	futbolín	[fu'βoliŋ]	'table football'

Unlike what is found in other varieties, in the Jaén variety (henceforth, JVH) final codas only undergo deletion while aspiration is not found among the data. Final consonants are also restricted in Spanish: only liquids, nasals and fricatives (always coronal) are permitted, other kind of consonants being extremely rare. Every obstruent, whatever its place of articulation is, undergoes deletion without exception (2).

(2)	tarot	[ta'ɾɔ]	'tarot'
	anorak	[ano'ræ]	'anorak'
	nariz	[na'ɾɪ]	'nose'
	reloj	[re'lɔ]	'watch'

Nasals are preserved, showing a clear tendency to velarization (3). Concerning liquids, there exists some variation, depending on the speaker: some informants show deletion of laterals and preservation of rhotics, and others show the opposite pattern. Others delete or preserve both of them (4).

(3)	melocotón	[meloko'toŋ]	'peach'
	cantan	[caɲ'taŋ]	'(they) sing'
(4)	girasol	[xiɾa'sol] ~ [xiɾa'sɔ]	'sunflower'
	tambor	[tam'boɾ] ~ [tam'bɔ]	'drum'

In any case, what is significant is the consistency that speakers show in this respect, since only the deletion of any liquid (whatever its manner is) causes the opening of the preceding vowel.

An interesting point to bear in mind is that a rhotic in coda position can entail morphological information when it corresponds to the infinitive marker in verbs. According to the results of the present work, the infinitive suffix /r/ triggers the harmony the same way that morphological /s/ does (§ 2.2.2). This fact will shed some more light on the motivation of the process studied here.

2.2.2. [RTR] alternation and morphological codas

In the whole set of possible consonant codas in Spanish, there are some that can correspond to suffixes containing morphological information (this is what I call *morphological coda*). The more studied morphological coda is that of the plural marker /-s/: *perro* 'dog' vs. *perro**s*** 'dogs'. Furthermore, the alveolar fricative is also present in some conjugated verbal forms, as it is the case of the second person singular and part of the first and second person plural: *come**s*** '(you SG) eat', *comemo**s*** '(we) eat' and *coméi**s*** '(you PL) eat'. The alveolar nasal occurs as well in verbal inflection, corresponding to the third person plural suffix: *come**n*** '(they) eat'.

The loss of a morphological coda can lead to a misinterpretation of the utterance: The plural marker, for instance, is most of the times the only existing difference between a singular form and its plural counterpart (5.a). Within the verbal inflection, also the second and the third person singular would become homophonous unless some process applied: *come* '(s/he) eats' vs. *come**s*** '(you SG) eat' (5.b).

(5)	a.	ídolo	['iðolo]	*'idol'*	ídolos	['ɪðɔlɔ]	*'idols'*
		abeto	[a'βeto]	*'fir'*	abetos	[æ'βɛtɔ]	*'firs'*
	b.	como	['komo]	*'(I) eat'*	comemos	[kɔ'mɛmɔ]	*'(we) eat'*
		comes	['kɔmɛ]	*'(you SG) eat'*	coméis	[kɔ'mɛj]	*'(youPL) eat'*
		come	['kome]	*'(s/he) eats*	comen	['komeŋ]	*'(they) eat'*

In the light of these examples, it seems that the deletion of morphological codas do not only trigger the preceding vowel opening but also the spreading of this new feature [RTR] to the rest of the vowels within the word. The fact that both the plural and the second person singular markers correspond to the same underlying phonemic form, may lead us to think of the properties of the alveolar fricative as being responsible for the process. If this was the case, any other non-morphological alveolar fricative codas would trigger the harmony as well. Among the data collected in Jaén, some target words were chosen to cover this point. What is found is that non-morphological final /s/ does not trigger the spreading process (6).

(6)	revés	[re'βɛ]	'back'
	estrés	[eʰt'tɾɛ]	'stress'
	Burgos	['buɾɣɔ]	'Burgos'

Besides the alveolar fricative, the alveolar rhotic, which can correspond to the infinitive marker in verbs, has to be considered as a morphological coda as well. During the recording, one of the speakers spontaneously pronounced the infinitive form when conjugating verbs, showing that this suffix also triggers the spreading process. Examples (7-8) below illustrate how the differences between morphological and non-morphological final /ɾ/, respectively:

(7)	comer	[kɔ'mɛ]	'to eat'
	destrozar	[dɛʰttɾɔ'θæ]	'to sing'
(8)	yogur	[ʒo'ɣʊ]	'yogurt'
	extintor	[eʰttiɰ'tɔ]	'fire extinguisher'

2.2.3. Spanish and Andalusian vowels. Acoustic evidence

Table 1 shows the average values of Jaén mid vowels, taken from the whole conjugation (present, indicative) of the verb comer *'to eat'* of the 8 speakers. These vowel values are compared to those of Spanish and Catalan, a language in which mid vowels differ in height underlyingly (this fact might explain the difference with respect to the degree of openness between the two languages). There are also differences in the values for close vowels between Castilian Spanish[5] and Eastern Andalusian.

Table 1

Formant values average and comparison

Jaén Spanish	**[e]**	**[ɛ]**	**[o]**	**[ɔ]**
F1	500	630	550	630
F2	2235	2086	1153	1257
Catalan [Recasens, 1986]	**[e]**	**[ɛ]**	**[o]**	**[ɔ]**
F1	362	543	422	634
F2	2161	2045	717	863
Spanish [Quilis et al., 1983]	**[e]**	**[ɛ]**	**[o]**	**[ɔ]**
F1	492	—	511	—
F2	2253	—	981	—

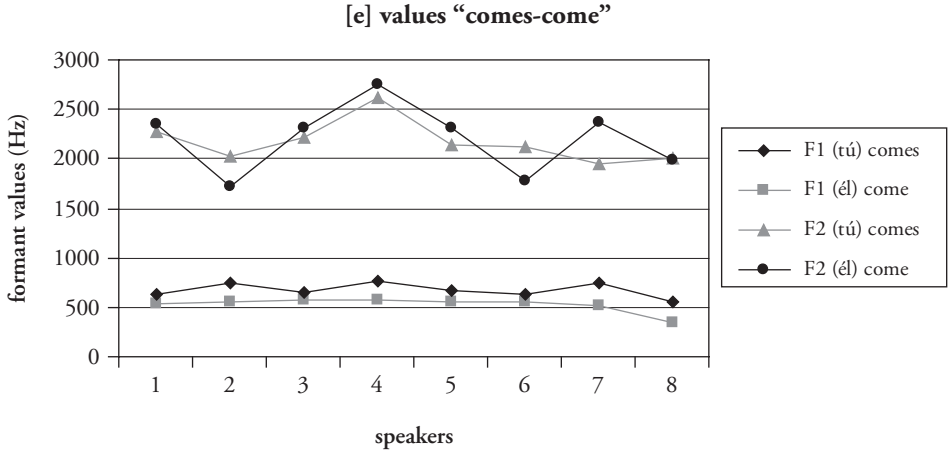

Figure 1

Formant values of the rightmost vowel

[5] The origin of the female speakers of these Spanish values was both South America and Spain, being unspecified the very concrete linguistic area.

The following figures correspond to the formant values of the mid vowels contained in both forms *come* '(s/he) eats' and *comes* '(you SG) eat', which differ in the surface only thanks to the [RTR] alternation. Figure 1 shows the values for the rightmost vowel /e/, which, in the case of the second person singular, *comes* ["kɔmɛ] '(you SG) eat', becomes open as a consequence of the deletion. There is a slight but consistent difference in the first formant, which is the responsible for the height, although F2 values are less uniform.

The results corresponding to the harmonizing vowel are even more convincing (Figure 2). F1 values are clearly of an open vowel in the second person singular, which is the form undergoing harmony. F2, which indicates vowel fronting, seems not to be that regular again, but apart from speakers 1, 2 and 5, there is a regular difference as well.

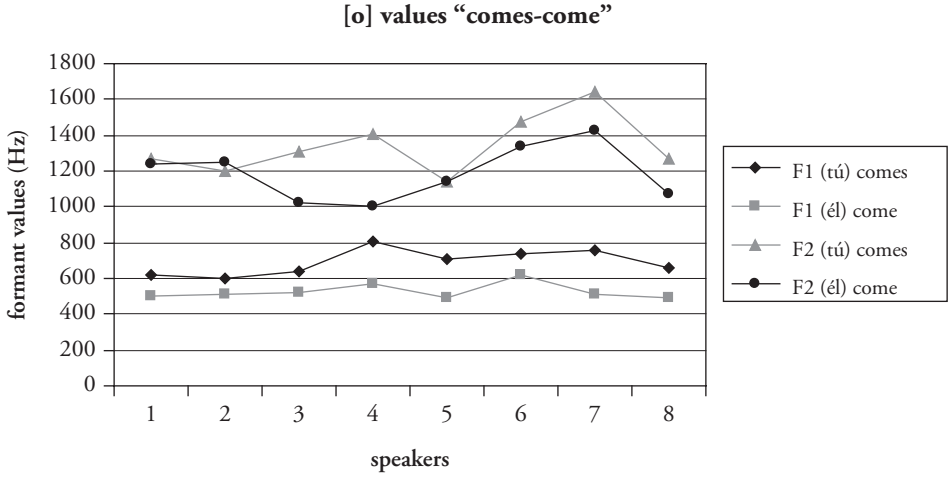

Figure 2

Formant values of the harmonizing vowel

2.2.4. Scope of the harmony

Regarding the behavior of the different vowels in the spreading process, the results show that there are neither blocking nor transparent vowels in this system. The high vowels /i, u/ undergo harmony, showing [RTR] counterparts. The low vowel /a/ undergoes fronting and laxing, becoming slightly velar (/æ/). Mid vowels are easier to identify even in direct speech. Actually, the close realizations of /e, o/ appear to be even closer than in standard Spanish varieties, as was already said. The open counterparts, even less close than in languages with a phonemic distinction for [RTR] vowels, are clearly open allophones, and they are even more perceptible when the harmony occurs in domains containing only mid vowels.

As regards the scope of the harmony, the results show differences in prosodic boundaries. On the one hand, any plural clitic pronoun attached to a verb trig-

gers the harmony to the rest of the vowels of the word, no matter where the stress is placed (9). This is not surprising if we consider a verb and a clitic to form a single prosodic word. On the other hand, compound nouns pattern in a different way: Only the vowels of the second part of the compound undergo opening. This is so because each of the parts constitutes a separate prosodic word (10). Finally, in the light of the examples in (11), we can discard stress effects as playing a role in the process, since it does not block the harmony at all.

(9)	recógelos	/rekoxe#lo+s/	[rɛ'kɔxɛlɔ]	'pick them MASC up'
	consíguelas	/konsige#la+s/	[kɔn'sɪɣɛlæ]	'obtain them FEM'
	súbelos	/sube#lo+s/	['sʊβɛlɔ]	'put them MASC up'
(10)	rompeolas	/rompe##ola+s/	[ˌrompe'ɔlæ]	'breakwater'
	cuentaquilómetros	/kwenta##kilometro+s/	[ˌkwe̪ntakɪ'lɔmɛtɾɔ]	'speedometer'
(11)	ídolos	['ɪðɔlɔ]	'idols'	
	monederos	[mɔnɛ'dɛɾɔ]	'purses'	
	cotillones	[kɔtɪ'ʒɔnɛ]	'party-favours'	
	encubrís	[ɛŋkʊ'βɾɪ]	'(you PL) conceal'	

3. Formalization within OT

3.1. Morphological and Licensing constraints in OT

Jiménez & Lloret (2007) suggest an OT analysis of EAVH. Their proposal is based on the fact that morphology favors but does not motivate the harmony. Following Walker's (2006) *Generalized Licensing*, they appeal to perceptual markedness constraints to account for the spreading process. Licensing and faithfulness constraints, on the other hand, serve as the motivation for the opening of the rightmost vowel in the word; that is, cue preservation.[6] To avoid disharmonic roots in which [RTR] only targets the leftmost vowel, they appeal to an anchoring constraint. No constraint referring to morphology plays a role in their analysis.

One of the problems in formalizing the process within OT is to account for the source of the [RTR] feature. [spread glottis] and the constraints MAX(Lar) and MAX(Sib) cannot predict the opening of a vowel when the deleted consonant is not a sibilant or a fricative. MAX(Place), also proposed by Jiménez & Lloret to account for vowel fronting in those cases of deletion of coronals, is not enough if we consider that in JVH also non-coronal consonants (*anorak*, *nariz*) cause vowel aperture as well.

Turning to Walker's (2005) *Weak Triggers,*[7] her account cannot predict JVH since stress does not determine the domain of the spreading. For example, in forms

[6] Under Jiménez & Lloret's view, all [RTR] vowels spread their acquired feature when it originates in an underlying sibilant or [spread glottis] element in the Granada variety. They also account for the variation that exists regarding the scope: while in some realizations the initial unstressed vowel undergoes harmony, in others it does not.

[7] This work is based on the idea that a feature that originates in a suffix migrates to the most prominent position to become more perceptible.

such as that of *miércoles* (['mjeɾkoɬ]) 'Wednesday', the harmonic feature would be expected to target the first syllable, which is the stressed one. Therefore, this proposal would fail in accounting for those cases of singular forms, in which the spreading process does not take place in the Jaén variety. The main problem, thus, is that this theory can account for harmonies in which all vowels will trigger the spreading but it cannot predict those cases in which harmony takes place only under very specific morphological conditions. Therefore, some constraint referring exclusively to the morphosyntactic information contained in the suffixes triggering JVH is needed.

One possibility is to consider inflectional affixes to be weak triggers. Since the morphosyntactic information is lost in coda deletion, the strategy would be to take the appeared feature and spread it as a floating morpheme. By accepting this, licensing constraints should be reformulated as LICENSE(affix/PrWd), where affixes are licensed to be realized in the domain of the prosodic word.

Kurisu's (2001) REALIZEMORPHEME, even though directly related to morphology, seems not to be as precise as it should: there are cases in which the deleted consonant is not a morpheme but only part of an inflectional affix. It can be interpreted, then, that the morphological information is maintained in the preserved part of the suffix, as it happens in certain verbal forms. If applying this constraint to these forms, the harmony would indicate that a morpheme is realized twice in the surface.

General Alignment constraints (McCarthy & Prince 1993) are not enough to explain the process unless competing at the same time with some morphological constraint. A reformulation of the Alignment family is found in Akinlabi's (1995) work *Featural Affixation*. He considers that phonological features may function as grammatical morphemes. Featural affixes can get realized as part of the stem, and they have to be licensed to become phonetically realized. These features must be associated with a licensor in the stem or elsewhere. Under this view, JVH can be understood as a case of featural misalignment: the morpheme ends up being realized in an unexpected position. Featural Alignment adapts Generalized Alignment constraints to the scheme in (12).

(12) ALIGN(PFeat, Gcat)
A prosodic feature is aligned with some grammatical category.

3.2. Attempting a solution within OT

Apart from the morphological conditioning, the source of the [RTR] is also difficult to capture within OT. According to the results, the opening of the rightmost vowel cannot be explained as a compensatory lengthening, since the differences in length are not significant enough in final open vowels. For that reason, a constraint such as MAX-μ, has to be ruled out. In the light of the data, the deletion of any consonant with the exception of nasals, regardless of its place of articulation, causes the opening of the preceding vowel. Returning to cue preservation, it seems that there is some gestural constraint involved in this openness. Here, it is understood that the realization of the consonant is intended even though it is not finally produced, and the special constriction that this pseudo-articulation provokes in the oral cavity makes

these differences in height appear in vowels. Further research on this possible articulatory explanation should be carried out in depth.

For the sake of the argument, the present proposal uses a generic constraint, here called MAX(GESTURE), which serves as the one which marks the deletion of any final consonant leaving a trace in the shape of the [RTR] feature on the preceding vowel. By doing so, the proposal can better focus on what causes the spreading of this new appeared feature.

To capture the morphological conditioning in JVH, Featural Affixation may be suitable for that purpose: morphological misalignment takes place under pressure from other (phonological) constraints. A latent morphosyntactic feature is licensed by phonological constraints to be realized —in this case— in a spreading environment. PARSESUFFIX[8] avoids the loss of the morphosyntactic information that is contained in the deleted coda and ALIGNSUFFIX indicates the domain in which this feature applies. These two constraints will license the realization of the morpheme in the shape of the spreading of the [RTR] feature, which appears as a result of cue preservation by means of the MAX(GESTURE) constraint.

With respect to the locality of the assimilation, a constraint indicating the adjacency of the feature that spreads is needed. NOGAP[9] prevents features skipping over potential targets. Faithfulness constraints regarding the deletion of the final consonant as well as the harmonic feature in vowels are needed: MAX penalizes deletion; IDENTITY prevents the surface realization to have a feature (here, [RTR]) that does not exist underlyingly.

The analysis of JVH is illustrated in tableaux (14-16).[10] On the one hand, the CODACONDITION constraint has to outrank MAX to force coda deletion. IO-CONTIGUITY, penalizes the deletion of medial codas while permitting that of the final. MAX(GESTURE) and PARSESUFFIX, on the other hand, are the constraints responsible for the appearance and the spreading of the feature, respectively. ALIGNSUFFIX/PrWd and NOGAP are directly related to the domain of the harmony. The first allows the feature to spread until the left edge of the prosodic word, and the second militates against skipping any potential target vowel. Finally, IDENTITY-IO(RTR) penalizes any instance of the feature [RTR] in the output. The full hierarchy, given in (13), involves a ranking in which some constraints are undominated (IO-CONT, CODACOND, MAX(GEST) and PARSESUFX). These constraints are responsible for the main motivation of the process and they outrank others more related with the spreading process of the appeared feature. At the bottom of the hierarchy, we find MAX and IDENTITY-IO(RTR), penalizing the deletion and the presence of the harmonic feature.

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[8] These constraints can be defined in more detail by specifying the kind of morphosyntactic information that is contained in the suffix; that is, SUFFIX can be replaced by PLURAL, by 2ND.SG, or by INFINITIVE. In this work, Featural Affixation constraints are unified in order to simplify the formalization. Therefore, the following tableaux show these constraints as PARSESUFFIX and ALIGNSUFFIX/PrWd.

[9] Archangeli & Pulleyblank (1994), Kirchner (1993), Beckman (1995).

[10] Processes that are not explained in this study (stress assignment and spirantization) are not taken into account in the present formalization, and only candidates that satisfy the stress and spirantization patterns of Spanish are considered.

(13)

IO-Cont, CodaCond, Max(Gest), ParseSfx >> AlignSfx/PrWd >> NoGap, Max, Ident-IO(RTR)

Tableau (14) illustrates how this hierarchy correctly predicts the realization of a plural form. Faithful candidate (14a) fatally violates CodaCond. Next, candidate (14b) represents a form in which the morpheme has no exponence. It violates both Max(Gest) and ParseSuffix. But also (14c) fails to become the optimal: cue preservation is not enough as far as this change does not spread to the rest of the vowels within the word. Candidate (14e) violates the alignment constraint since the harmonic feature spreads only up to the stressed syllable. In (14f) the feature skips one of the vowels within the prosodic word, violating NoGap. Therefore candidate (14d) is optimal even though it has one violation of Max and four of Identity-IO(RTR).

(14)

/monedero+s/	IO-Cont	CodaCond	Max(Gest)	ParseSfx	AlignSfx/ PrWd	NoGap	Max	Ident-Io(RTR)
a. [mone'ðeɾos]		*!						
b. [mone'ðeɾo]			*!	*			*	
c. [mone'ðeɾɔ]				*!	*		*	*
☞ d. [mɔnɛ'ðɛɾɔ]							*	****
e. [mone'ðɛɾɔ]					*!		*	**
f. [mɔne'ðɛɾɔ]						*!	*	***

Tableau (15) shows how the same hierarchy works out for those forms undergoing final coda deletion and having no harmonic process. Since the final coda consonant does not entail morphological information, ParseSuffix is not violated. Max(Gest), however, discards candidate (15b), which has no phonetic mark for the deleted consonant. Candidate (15d) is ruled out because it has one violation more of Identity-Io(RTR) than (15c), that becomes the optimal one.

(15)

/trebol/	IO-Cont	CodaCond	Max(Gest)	ParseSfx	AlignSfx/ PrWd	NoGap	Max	Ident-Io(RTR)
a. ['treβol]		*!						
b. ['treβo]			*!				*	
☞ c. ['treβɔ]							*	*
d. ['trɛβɔ]							*	**!

Finally, tableau (16) shows the role of the alignment constraint: compound nouns have strong morphological boundaries, and as a consequence, they are built up from two prosodic words. AlignSuffix/PrWd militates against surface forms such as those of (16c) and (16e), in which the domain for the harmony is not the prosodic word. All vowels in candidate (16f) undergo harmony (that is, both prosodic words). Although it does not violate AlignSuffix/PrWd, it is ruled out because of Identity-Io(RTR). Candidate (16d), therefore, is the optimal one since it shows both cue preservation and spreading of the harmonic feature and moreover, this feature spreads within the right domain.

(16)

/rompe##ola+s/	IO-Cont	CodaCond	Max(Gest)	ParseSfx	AlignSfx/ PrWd	NoGap	Max	Ident-Io(RTR)
a. [ˌrompe]['olas]		*!						
b. [ˌrompe]['ola]			*!	*			*	
c. [ˌrompe]['olæ]				*!	*		*	*
☞ d. [ˌrompe]['ɔlæ]							*	**
e. [ˌrompɛ]['ɔlæ]					*!		*	***
f. [ˌrɔmpɛ]['ɔlæ]							*	****!

4. Conclusions

JHV sheds some light on the distinction between phonological harmonies and morphological harmonies. The former are not able to make grammatical contrasts and are the source of allomorphy. The second are the ones creating those grammatical contrasts, and exist independently of whether there is harmony throughout the language or not (Finley 2005).

More specifically, the morphological conditioning in JVH is the result of an unexpected situation in which a phonological process (coda deletion) removes the phonetic material corresponding to a morpheme or part of a morpheme. The same phonological constraint that removes this morphosyntactic information is also responsible for the appearance of a new feature, [RTR], which is not distinctive in the language, as a result of cue preservation. Morphology takes this new feature and spreads it to the rest of the vowels within the word in order to license the exponence of the otherwise-lost morphosyntactic information. Harmony becomes, this way, the alternative realization of the morpheme that is indispensable in the language.

Akinlabi's *Featural Affixation* serves here to appeal for an explanation of the process based on featural morphemes. Many languages show non-concatenative morphology, and although this is not the case in Romance languages, Jaén Spanish seems to resort to this alternative as well. By doing so, featural affixes in general, and those of JVH in particular, are of a great complexity: they are morphemes in the shape of a

feature that target other segmental material contained in a root that, in turn, has its own functional value already.

This and other cases of featural morphemes are certainly worthy of an in-depth study. JVH can be easily related, in this sense, to languages like Basque or Mapundungun, in which the infixation of a feature, [palatal], creates grammatical contrasts, indicating [+affective].

Finally, I would like to leave open the question of how and to what extent cue preservation is the source for the opening of the rightmost vowel in JHV. This is an empirical issue that definitely needs to be answered.

References

Akinlabi, Akinbiyi, 1996, «Featural Affixation», *Journal of Linguistics* 32, 239-289.

Alarcos Llorach, Emilio, 1958, «Fonología y fonética: a propósito de las vocales andaluzas», *Archivium* 8, 191-203.

Archangely, Diana & Douglas Pulleyblank, 1994, *Grounded Phonology,* Cambridge, Massachussets, The MIT Press.

Bakovicæ, Eric, 2000, *Harmony, Dominance and Control*. Doctoral dissertation, Rutgers University.

Beckman, Jill, 1995, «Shona height harmony: Markedness and positional identity». In: Jill Beckman, Laura Walsh Dickey & Suzanne Urbanczyk (eds.), *University of Massachusetts Occasional Papers in Linguistics* 18: Papers in Optimality Theory.

Finley, Sara, 2005, «Morphological Influences on Vowel Harmony». Presented at the *Workshop on harmony in the languages of the Mediterranean*, *the Old World Conference in Phonology 2.*

Gerfen, Chip, 2002, «Andalusian Codas», *Probus* 14, 247-277.

Gordon, Matthew, 2001, «Laryngeal Timing and Correspondence in Hupa». In: Albright, A. and T. Cho (eds.), *UCLA Working Papers in Linguistics 7. Papers in Phonology* 5, 1-70.

Halle, Morris & Kenneth N. Stevens, 1971, «A note on laryngeal features», *MIT Quaterly Progress Report* 11, 198-213.

Jiménez, Jesús & Maria-Rosa Lloret, 2007, «Andalusian vowel harmony: Weak triggers and perceptibility». Presented at the *Workshop on harmony in the languages of the Mediterranean*, *the Old Word Conference in Phonology 4.* [Available at www.uv.es/foncat].

Kirchner, Robert, 1993, «Turkish Vowel Harmony and disharmony: an optimality theoretic account». Paper presented at *Rutgers Optimality Workshop I* (ROW-I), October 22, 1993.

Kurisu, Kazukata, 2001, *The Phonology of Morpheme Realization*. Doctoral dissertation, University of California, San Diego.

Mascaró, Joan, 1976, *Catalan Phonology and the phonological cycle*. Doctoral dissertation, MIT.

—, 2007, «Local and long-distance analyses of harmony in metaphonic systems». Presented at the *Manchester Phonology Meeting.*

McCarthy, John & Alan Prince, 1993, «Generalized Alignment». In G. Booij and J. van Marle (eds.), *Yearbook of Morphology:* 79-153. Dordrecht, Kluwer.

Navarro Tomás, Tomás, 1939, «Desdoblamiento de fonemas vocálicos», *Revista de Filología Hispánica* 1, 165-167.

Recasens, Daniel, 1986, *Estudis de Fonètica Experimental del Català Oriental Central*, «Biblioteca Milà i Fontanals» 6.

Salvador, Gregorio, 1957, «El habla de Cúllar-Baza», *Revista de Filología Española* 41, 161-252.

—, 1977, «Unidades fonológicas vocálicas en el andaluz oriental», *Revista Española de Lingüística* 7, 1-23.

Sanders, Benjamin P., 1994, *Andalusian vocalism and related* processes. Doctoral dissertation, University of Illinois at Urbana-Champaign.

—, 1998, «The Eastern Andalusian vowel system: Form and structure», *Rivista di linguística* 10.1, 109-135.

Soriano, Bàrbara, 2007, *Jaén Vowel Harmony and morphology-phonology interface.* MA dissertation. Universitat Autònoma de Barcelona.

Quilis, Antonio & Manuel Esgueva, 1983, «Realización de los fonemas vocálicos españoles en posición fonética normal». In M. Esgueva and M. Cantero (eds.), *Estudios de Fonética* I, 159-252.

Vaux, Bert, 1998, «The Laryngeal Specification of Fricatives», *Linguistic Inquiry* 29, 497-511.

Walker, Rachel, 2005, «Weak triggers in vowel harmony», *Natural Language and Linguistic Theory* 23, 917-989.

—, 2006, «Long-distance Metaphony: A Generalized Licensing Proposal». Handout of the *PhonologyFest Workshop, Indiana University,* Bloomington, June 23, 2006. [Available at www.rcf.usc.edu/~rwalker/pubs.html].