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vowel harmony

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Theoretical Consequences of Montañes Vowel Harmony

The tense/lax vowel harmony system of Andalusian Spanish has deservedly attracted considerable attention in the generative phonological literature (Clements (1980), Hooper (1976), Zubizarreta (1979)). There has, however, been no comparable analysis of the far more complex and interesting harmony phenomena of Montañes Spanish. In Montañes we find, in addition to an exceptionless tense/lax harmony, a concomitant fully developed system of harmony along the high/mid parameter. Of even greater significance is the existence of neutral vowels in both systems, of asymmetric, morphologically controlled tense/lax harmony, of feature-changing high/mid harmony, and of interaction between the two harmony processes and more local phonological rules. These phenomena are evidenced extensively in alternations as well as in purely distributional facts.

My examples are all drawn from the *Pasiego* Montañes dialect, in particular the speech of four villages located in the Cantabrian mountains in the south-central portion of the province of Santander in north-central Spain. Pasiego has been described in exhaustive detail in several studies by Ralph J. Penny. Penny (1969a) is a monograph treatment of primarily lexicographic and comparative problems with many valuable synchronic observations as well. It also contains a list, in narrow phonetic transcription, of all of the more than 6000 different tokens collected by Penny. Against this list I have repeatedly tested the basic observations discussed here. Penny (1970) presents the history of the mass/count noun and adjective distinction that is based on the tense/lax harmony system. Most important, Penny (1969b) is a modified taxonomic phonemic description of all the Pasiego vowel harmony phenomena as well as some aspects of their interaction with other features of the vowel system. The analysis presented here is, in some respects, a formal restatement of that treatment.¹

I will assume a theory of phonology that in gross outlines has the familiar autosegmental characteristics (Clements (1977a,b; 1980; 1981), Clements and Sezer (1983), Goldsmith (1976), Halle and Vergnaud (1981), Kaye (1983), Kiparsky (1981; 1983), Ster-

Diana Archangeli, Ellen Broselow, Morris Halle, James Harris, and Paul Kiparsky have provided me with much useful advice in the preparation of this article. I am indebted as well to two *Linguistic Inquiry* reviewers whose silent hand has considerably shaped the final product. Ralph J. Penny has kindly read the manuscript and spared me from a number of errors, though all responsibility for my use of this material falls on me.

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¹ Reviews of Penny (1969a) include Pötters (1972), Hodcroft (1972), Blaylock (1973), Meier (1972-3), as well as a review article by Fleischmann (1973-4).

iade (to appear), Vergnaud (1980)), with matters of detail to be discussed as they become relevant to the analysis. Phonological features can be treated prosodically; that is, they can be represented on separate autosegmental tiers, associated in a systematic way with units on the segmental level. Following Clements (1980; 1981) and Clements and Sezer (1983), I will refer to the autosegmentalized features as *P-segments* and to the segments with which they are associated as *P-bearing elements*. In general, also, P-bearing elements may be underspecified in lexical representation with respect to certain features, this underspecification to be resolved by association with some P-segment or otherwise.²

The orchestration of temporal organization between the synchronous P-segmental and P-bearing levels is accomplished by certain association conventions drawn from Clements (1981) and Clements and Ford (1979). These provide first that free P-segments are associated one-to-one from left to right with free P-bearing elements. Second, a free P-segment will associate with all accessible (without lines crossing) P-bearing elements. Third, associated P-segments will associate preferentially with unassociated P-bearing elements on their right. In the discussion below, I will refer to these association conventions mnemonically as the *Spreading rules*, since their role in these vowel harmony systems is largely confined to that relatively straightforward operation.

Two closely related descriptive problems emerge in the analysis of Pasiego and lead to the theoretical results of this article. The first concerns the distinction between the common automatic and the much rarer feature-changing vowel harmony processes. It will emerge that [tense] harmony in Pasiego is fully automatic and context-free while [high] harmony is context-sensitive and feature-changing, an empirical distinction that must be reflected in quite different formal statements. The second issue in Pasiego vowel harmony is that of the correct representation of neutral vowels. It will be demonstrated that the neutral vowel in the tense/lax system must undergo this harmony rule at an intermediate stage of the derivation to account for interactions with the high/mid system and with certain optional phonological rules. On the other hand, the neutral vowel of the high/mid harmony system is demonstrably excluded from the purview of this harmony process entirely, therefore supporting as well the treatment of neutral vowels by segregating them from the P-bearing class of the harmonizing feature.

The article is organized as follows. Section 1 provides a comprehensive survey of the facts germane to the description of Pasiego vowel harmony. This section is intended as a largely pretheoretical introduction to the analysis. Section 2 takes up the formal description of the two vowel harmony systems, concentrating particularly on the differences between them. Neutral vowels and the formal issues peculiar to them are the focus of section 3. Sections 2 and 3 each conclude with a discussion of precisely what properties of phonological theory the analysis supports. Section 4 collects remaining descriptive issues and includes a summary and an ordered list of rules.

² Particularly detailed discussion of the consequences of underspecification for vowel harmony may be found in Kiparsky (1981) and Steriade (to appear).

1. Characterization of the Phenomena

The systematic phonetic vowel system of Pasiego appears in (1):

	front	central	back
high	i		u
	I		U
mid	e		o
			O
low		A	
		a	

In addition to the obvious distinctions of backness and height, this system of nine vowels contrasts peripheral (*i, u, e, o, a*) and central (*I, U, O, A*) vowels, with *A* not only higher but also considerably fronter than *a*. I will identify this distinction with the values of the feature [tense] distributed as in (2):

(2) a. [+tense]	b. [-tense]
i u	I U
e o	O
a	A

The feature [advanced tongue root] may be more appropriate here than [tense], but the impressionistic phonetic data available are insufficiently precise to allow the exact nature of this contrast to be identified. From a purely phonological standpoint, it is essential only that the feature system recognize a basic difference between the two classes of vowels in (2). The contrast, of course, is not perfect; there is a gap reflected in the absence of a lax mid front vowel *E*. In this respect Pasiego is perhaps atypical of nine-vowel systems, since the tense/lax contrast is more usually neutralized in the low vowel. The vowel system is considerably reduced in unstressed final syllables; the only [-tense] vowel possible in a final unstressed syllable, closed or open, is *U*, whereas any of the three [+tense] vowels *u, e, or a* but not *i or o* may occur under the same conditions.

The first vowel harmony phenomenon controls the distribution of the feature [tense]. All vowels in a word—final or nonfinal, stressed or unstressed—must without exception agree in the value of [tense]. This is exemplified by the various alternations in (3):

(3) [+tense] Words	[-tense] Words
a. abilánus 'hazels'	AbIłÁnU 'hazel'
soldáus 'soldiers'	sOldÁU 'soldier'
kastápus 'chestnut trees'	kAstÁpU 'chestnut tree'
sartínus 'small fry-pans'	sArtÍnU 'small fry-pan'
pułúkus 'young chickens'	pUłÚkU 'young chicken'
kantárus '5 gal. jugs'	kAntÁrU '5 gal. jug'
simpátikus 'congenial (pl.)'	sImpÁtIkU 'congenial (sg.)'

b.	pitrína	'waistband'	pItrínU	'waistband (dim.)'
	pustíya	'the scab'	pUstíyU	'the scab (dim.)'
	trípa	'belly'	trÍpU	'belly (child's)'
	kampaníya	'small cow-bell'	kAmpAníyU	'smaller cow-bell'
	kanástra	'basket (carried on back)'	kAnÁstrU	'id.'
c.	fem. sg.	sg. mass	sg. count	
	mála	málu	mÁIU	'evil'
	límpja	límpju	lÍmpjU	'clean'
	míya	míyu	mÍyU	'my'
	súθja	súθju	sÚθjU	'dirty'
d.	gulundrína	'swallow (fem.)'	gUIUndrínU	'swallow (masc.)'

The masculine suffix $+u/+U$ is a necessary but not sufficient condition for lax vocalism. Lax vowels may not occur in a word without this suffix nor may they occur when this suffix is followed by the plural suffix $+s$. The mass versus count singular adjectives in (3c) are minimal pairs with respect to the distribution of tense and lax vocalism, so the difference in vowel harmony class plays a direct morphological role.

The vowel e , it will be recalled, is without a lax counterpart in the Pasiego vowel system. With respect to tense/lax vowel harmony, e shows all the properties of a neutral vowel; it neither participates in nor impedes the propagation of the $[-\text{tense}]$ feature value.

(4)	[+tense] Words		$[-\text{tense}]$ Words	
a.	ermánus	'brothers'	b. ermÁnU	'brother'
	pepáskus	'cliffs'	pepÁskU	'cliff'
	bedánus	'wood-chisels'	bedÁnU	'wood-chisel'
	komfesonárjus	'confessionals'	kOmfesOnÁrjU	'confessional'
	kampečánus	'noble (pl.)'	kAmpočÁnU	'noble (sg.)'

Neutral e , then, is ignored in the determination of $[\text{tense}]$ domains.

Pasiego has a second vowel harmony rule, one that affects height. This process partitions the vowel system as shown in (5):

(5)	i	u
[+ high]	I	U
<hr/>		
$[-\text{high}]$	e	o
		O
<hr/>		
	A	
neutral		
	a	

Simply put, all nonlow vowels in a word must agree with the stressed vowel in the value of the feature [high]. That is, all vowels in a word must be drawn exclusively from the top row (the high vowels *i*, *I*, *u*, and *U*) or exclusively from the second row (the mid vowels *e*, *o*, and *O*). The low vowels *a* and *A* are, however, neutral; low vowels, stressed or unstressed, may cooccur freely with vowels from either the high or the mid class, subject only to the independent constraints of tense/lax harmony. There is one major systematic exception to this distribution: vowels in unstressed final syllables, which are drawn from the severely reduced set *e*, *u*, *a*, and *U*, are often in apparent violation of height harmony as a result of low-level reduction processes that will not concern us here.

These observations about height harmony are illustrated by the distributional data in (6); we shall turn to more conspicuous evidence from alternations shortly:

(6)	[+high] Words		[−high] Words	
a.	bindiθír	‘to bless’	xeléča	‘fern’
	kumída	‘lunch’	sospréša	‘surprise’
	čipúdus	‘hunchbacks’	belórta	‘hay-rake’
	lubúkus	‘young wolves’	kolór	‘color’
			destorθér	‘to wring’
b.	pIθÍgU	‘pinch’		
	kUnťÍntU	‘happy (count)’		
	mInÚdU	‘small (count)’		
	IUbÚkU	‘young wolf’		
c.	arína	‘flour’	aθér	‘to do’
	abidúl	‘birch tree’	kalór	‘heat’
	pigáθa	‘magpie’	sertál	‘string (onions)’
	nuθál	‘walnut tree’	ontárga	‘lard’
			legatérna	‘lizard’
			sakrestán	‘sexton’
d.	trAnkÍIU	‘quiet (count)’	bedÁnU	‘wood-chisel’
	gArdÚŋU	‘rake’	bOrrÁčU	‘drunk’
	mIlÁnU	‘buzzard’	AkOIodrÁU	‘long, thin’
	čUbÁskU	‘shower of rain’	AtOIosÁU	‘hunchback’
	IskAIAmbrÚxU	‘dog-rose’		

The forms in (6a) show the typical distribution of [high] in tense-voweled words without neutral *a* (ignoring, here and subsequently, final unstressed syllables). (6b) shows the same for lax-voweled words. In (6c) and (6d) height harmony appears in tense and lax words that include neutral *a/A*. The neutral vowel occurs freely in words of both height harmony classes. The absence of words with [−high, −tense] vocalism (that is, the gap on the right in (6b)) is lawful and will be explained shortly.

Evidence from alternations for the vowel height harmony phenomenon is also forthcoming; consider in particular the verb forms in (7). Other, more extensive alternations determined by height harmony appear in (10), (12), and (13).

(7) [+ high] Verbs		[- high] Verbs	
a.	bibí:s (2pl. pr. ind.)	bebér	'to drink'
	bibiría (1sg. cond.)	bebámus	(1pl. pr. sub.)
	bibía (1sg. imp. ind.)	bebémus	(1pl. pr. ind.)
	bibú (past ppl.)	beberé	(1sg. fut.)
	bIbÍU (past ppl. masc. sg. count)		
b.	sintír 'to feel' (2pl. pr. sub.)	sentémus	(1pl. pr. ind.)
	sintáis (2pl. pr. ind.)		
	sintí:s (1sg. imp. ind.)		
	sintía (past ppl.)		
c.	afluxí:s (2pl. pr. sub.)	afloxár	'to loosen'
		afloxámus	(1pl. pr. ind.)
		afloxémus	(1pl. pr. sub.)
		afloxáis	(2pl. pr. ind.)
d.	kuxí:s (2pl. pr. ind.)	koxér	'to take'
	kuxía (1sg. imp. ind.)	koxáis	(2pl. pr. sub.)
	kuxi (1sg. perf.)	koxámus	(1pl. pr. sub.)
	kuxímus (1pl. perf.)	koxerémus	(1pl. fut.)
	kuxirí:s (2pl. fut.)	koxerán	(3pl. fut.)
	kuxirían (3pl. cond.)		
e.	salír 'to leave' (2pl. pr. ind.)	salémus	(1pl. pr. ind.)
	salí:s (2pl. pr. ind.)	salgámus	(1pl. pr. sub.)
		salgáis	(2pl. pr. sub.)

An informal analysis of these forms is quite enlightening. In alternations like *bibí:s/bebér* or *sintír/sentémus*, the height of the root vowel is determined by the height of the stressed vowel of the desinence. When neutral *a* (or *A*) is stressed, however, the harmony rule cannot determine the height of the root vowel, and in fact an underlying contrast between high and mid root vowels emerges. The underlying verb roots in (7) are /beb/ (cf. *bebámus*), /sint/ (cf. *sintáis*), /aflox/ (cf. *afloxámus*), and /kox/ (cf. *koxámus*). The final case, the neutral-voweled root /sal(g)/, is invariant under harmony and therefore uncontroversial.³

Height harmony is unbounded within the word or clitic group and, possibly, bidirectional. Its unbounded character is shown by (10), (12), and (13), by the distributional evidence in (6), and by alternations in longer verb forms like *mereθér* 'to merit', *miriθí:s* (2pl. pr. ind.) or *aborreθér* 'to bore', *aburriθíu* (past ppl.). The bidirectionality of height

³ There are several diachronic studies of similar verbal alternations in Old Spanish. These include Malkiel (1966), Harris (1975), Penny (1972), Montgomery (1976), and Togeby (1972).

harmony is not entirely self-evident, since most Spanish words are oxytones or paroxytones and thus cannot show the rightward propagation of vowel harmony because of the vowel reduction in final unstressed syllables. There are, however, proparoxytone words that give some distributional support for rightward vowel harmony. These appear in (8), phonologically organized like (6):

(8) *Proparoxytones with Rightward Harmony*

	[+ high] Words		[- high] Words	
a.	andíbula	'jaw'	ómedus	'humid (pl.)'
	antigwísimu	'oldest'	trébede	'trivet'
			θéspede	'lawn'
			bjéspora	'wasp'
b.	dÍθImU	'tenth'		
	sÍtImU	'seventh'		
	rIkÍtIkU	'rickety'		
c.	ágila	'eagle'	kwébana	'basket'
	árguma	'gorse'		
	bitákula	'tavern'		
d.	ÁbrIgU	'south wind'	pÁlpegU	'eyelid'
	ÁgIU	'eaglet'		
	gwÍrfAnU	'orphan'		

The distributional facts in (8), which exactly parallel leftward height harmony in (6), are consistent with saying that height harmony is rightward as well, initiated by the stressed vowel. Unfortunately, the Pasiego verb system and clitic groups like those in (10) provide no examples that might display overt alternations conditioned by rightward propagation of vowel height.

Although height harmony is exceptionless in lax-voweled words, there are words disharmonic in height in the tense-voweled class. According to Penny (1969b), these exceptions break down into two types. The first, illustrated in (9a), includes derived nouns and adjectives with a stressed, mid-voweled suffix: *-éra*, *-éte*; *-ón*, *-ór*, or *-ósus*. The second type, of which the list in (9b) should be exhaustive, includes only utterly un-systematic exceptions. Many of these have regularly harmonic doublets (like *antuxil*, *miliθína*, *legatérna*, *diθír*, *mególu*) and some may be dialect loans from Castilian. (9c) lists a few proparoxytones that are posttonically disharmonic.

(9) a.	batidéra	'hoe'	lindéra	'hillside'
	libréta	'notebook'	inθiméra	'wall-stones'
	urmigadéra	'itching'	batidóra	'hoe'
	bibidóra	'principal house'	iskarpidór	'comb'
	istirón	'thin person'	pisarósus	'penitent (pl.)'
	marmuxón	'stammerer'	fugón	'hearth'

b.	meleθína	'medicine'	antoxíl	'meadow plant'
	loberíθa	'band of wolves'	okalítal	'eucalyptus grove'
	xostíyus	'bodices'	menútus	'minutes'
	presúra	'rennet'	enkornadúra	'(pair of) horns'
	orúga	'caterpillar'	otúbre	'October'
	dinéru	'money'	díθér	'to say'
	ginéya	'foothill'	idéya	'skill'
	iglésja	'church'	inibél	'a level'
	ligatérna	'lizard'	marisérba	'honeysuckle'
	tiséra	'scissors'	θinθél	'chisel'
	usté	'Usted'	albirikóke	'apricot'
	batikól(a)	'crupper'	limórna	'alms'
	migólu	'crumb'	mirólus	'cross-eyed'
	nusótrus/ muxótrus	'we'	urón	'ferret'
c.	éditus	'[put down in] writing'	pólpitus	'pulpit'
			sétima	'seventh (fem.)'

Given the limited distribution of exceptions of the first type and the tiny number of exceptions of the second type (as against the remaining, regularly harmonic forms in Penny's (1969a) list of more than 6000 different tokens), we should feel no trepidation in concluding that height harmony is a phonologically regular, fully justified process of Pasiego, though we will ultimately want to take formal notice of the relatively systematic exceptions in (9a). The fact that many exceptional forms in (9b) have harmonic doublets or may be dialect borrowings supports this conclusion.⁴

An entirely different source of alternations displaying both tense harmony and height harmony is the behavior of vowels in sandhi. Proclitics show a dependence in vowel height and tenseness on the stressed word of a construction, as the data in (10) demonstrate.⁵ The results of harmony in sandhi are, in a few examples, unexpected, and there are some attested cases where harmony fails to apply in sandhi (probably due to differences in phonological phrasing). Although many aspects of the data in (10) remain unclear because of lacunae in the sources, nevertheless some generalizations emerge. The masculine singular definite article (with its underlying *e* emerging before neutral *a*,

⁴ Penny (1969b) cites two disharmonic verb forms that I have been unable to locate in his monograph (1969a). These are the two 1st singular future forms *sintiré* and *iskupiré* 'spit', as well as the 1st plural present indicative of the latter (though not the former—cf. (7b)), *iskupémus*.

⁵ The demonstratives, which are not proclitics, unexpectedly show height harmony in their final unstressed syllables; contrast *iste ganáu* 'this cattle', *ÍstI tÚntU* 'this madman'; *iste késu* 'this cheese (mass)', *ÍstI pAnÚxU* 'this cornstalk'; *ise késu* 'that cheese (mass)', *ÍstI mUčÁčU* 'that boy'. The agreement in tenseness between demonstrative and noun is a consequence not of phonological harmony but of syntactic concord with respect to the mass/count parameter. What is difficult to account for is the apparent dependence of the height of the final syllable of the demonstrative on the height class of the following word.

(10)

[+ high] [+ tense] <i>Phrases</i>		[- high] [+ tense] <i>Phrases</i>		[+ high] [- tense] <i>Phrases</i>	
		el kwéru	'the leather (mass)'	Il kUrđrU	'the lamb'
		el pélu	'the hair (mass)'	Il mIntIrÚsU	'the liar'
		el mál	'evil'	Il mAdÍrU	'the log'
		el ganáu	'the cattle'	kUn Il mAyÍstrU	'with the teacher'
		kon nó:s	'with us'		
un ubílo	'a ball of yarn'			Un UbÍlU	'a ball of yarn'
		po la kále	'down the street'	pU l kAmÍnU	'along the path'
		po ála	'over there'	pU l ArrÚyU	'along the arroyo'
				pU l prÁU	'through the field'
pa mí	'for me'	pa ké	'for what?'	pA l sUbrÍnU	'for the nephew'
		pa nó:s	'for us'		
		ne yó	'nor I'	nI l ÚnU nI l Útru	'neither the one nor the other'
		ne la casa	'nor the house'		
		en kwénta	'because of'	In Il kAlÍxU	'in the lane'
i mi díxu	'and he said to me'	me lo kompró	'he bought it for me'	Il mI kÚdU	'my elbow'
				Il sU tÍyU	'his uncle'
				Il mI ermÁnU	'my brother'
				Il tU kUmpañÍrU	'your companion'

as in *el mál*) and the first singular pronoun most clearly show the dependency of proclitic vocalism on the harmonic class of the head word with respect to both tenseness and height. More generally, these facts confirm the unbounded and fully productive character of both harmony processes. We will return to some of these sandhi data later.

In addition to these two vowel harmony rules, there are several other relevant observations about the distribution of vowels in Pasiego. The most important of these is the constraint that the mid vowels *e* and *o* do not occur in stressed syllables in lax-voweled domains. The mid vowels occur freely in both stressed and unstressed syllables in tense-voweled words, as in (11a), and they occur as well in unstressed syllables in lax words, as in (11b):

- | | | | |
|---------|-------------------------------------|----|-------------------------------------|
| (11) a. | <i>Stressed e, o in tense words</i> | b. | <i>Unstressed e, O in lax words</i> |
| | xeléča 'fern' | | ermÁnU 'brother' |
| | orél 'laurel' | | bedÁnU 'wood-chisel' |
| | serróte 'handsaw' | | rrOsÁrjU 'backbone' |
| | orkón 'hand-span' | | bOrrÁčU 'drunk' |
| | xedár 'to give birth
(animals)' | | |
| | ormáθa 'currycomb' | | |

Note that all of the examples in (11b) of lax-voweled words containing *e* or *O* have *A* as the stressed vowel. The explanation for this is as follows. Since *e* and *O* cannot be stressed in lax words, and since only *A* is neutral with respect to height harmony (that is, stressed *I* and *U* are incompatible with unstressed mid vowels), it follows that *e* and *O* are possible in lax words only when the stressed vowel is *A*. This explains the gap already noted on the right in (6b) and (8b).

This exclusion of stressed mid vowels in lax words underlies a large number of regular alternations in Pasiego. The stressed mid vowels are regularly raised to high in [–tense] domains:

- | | | | |
|---------|-----------------------------------|----|------------------------|
| (12) a. | [–high, +tense] | b. | [+high, –tense] |
| | el kwéru 'leather (mass)' | | Il kWÍrU 'id. (count)' |
| | el pélu 'hair (mass)' | | Il pÍlU 'id. (count)' |
| | lexéru 'light (mass)' | | IlxÍrU 'id. (count)' |
| | flóxu 'limp (mass)' | | flÚxU 'id. (count)' |
| | rrabjósu 'bitter (mass)' | | rrAbjÚsU 'id. (count)' |
| | rregérus 'good fields' | | rrIgrÍrU 'id. (sg.)' |
| | pełéxus 'pelts' | | pIłÍxU 'id. (sg.)' |
| | konéxus 'rabbits' | | kUnÍxU 'id. (sg.)' |
| | mokérus 'pocket
handkerchiefs' | | mUkÍrU 'id. (sg.)' |
| | golósus 'curious (pl.)' | | gUIÚsU 'id. (sg.)' |
| | θerróxus 'bolts' | | θIrrÚxU 'id. (sg.)' |

The morphologically based alternation between tense and lax vowels, depending on the mass/count distinction, triggers a regular height alternation. All of the forms in (12) must have underlying mid vowels, which then surface unchanged in the tense forms of (12a). But with laxing induced by the singular count morphology in (12b), the stressed mid vowel must raise to high, yielding *Í* or *Ú*. Moreover, this derived high vowel itself triggers [high] harmony, raising any other mid vowels in the domain. Of special interest is the fact that both *e* and *O* raise in lax words even though *e* in lax words is apparently indistinguishable from the same vowel in tense words, where no such height alternation takes place.

Another aspect of Pasiëgo harmony is the behavior of the high glides *j* and *w*. In a word or sandhi domain, a *j* or *w* in the stressed syllable, with few exceptions, induces [+high] vocalism to its left despite a following (stressed) [–high] vowel. That is, the high glides in a stressed syllable stand at the boundary between two height harmony domains. This observation is supported by a wide variety of alternations, including many under verbal derivation or inflection (13a) or in proclitics (13b). The data in (13c) show that unstressed, posttonic *j* and *w* do not induce [+high] harmony in vowels to their left.

(13)	[–high]		[+high] <i>j/w</i> [–high]
a.	amfestár	‘to infect’	amfiθjón ‘infection’
	kornéxa	‘crow’	kurnixjár ‘to caw’
	boθeθár	‘to yawn’	buθiθjár ‘id.’
	sejór	‘sir’	siñurjár ‘to address as Usted’
	belórta	‘hay-rake’	bilurtjár ‘carry by hay- rake’
	bérde	‘green’	birdigjár ‘to turn green’
	molér	‘to grind’	muljénda ‘grinding’
	bebér	‘to drink’	bibjénda ‘drinking’
	komér	‘to eat’	kumjénda ‘eating’
	arrebolbér	‘to redden’	arribulbjénda ‘reddening’
	koxár	‘to take’	kuxjéra (3sg. imp. sub.)
	ménus	‘less’	mingwár ‘to lessen’
b.	me lo kompró	‘he bought it for me’	mi lu djó ‘he gave it to me’
	se kasó	‘he got married’	si kumjó ‘it’s been eaten’
	lo málu	‘the bad thing’	lu pjór ‘the worst thing’
	el ganáu	‘the cattle’	il mjéu ‘fear’
c.	rrOsÁrjU	‘backbone’	
	rrosárjus	‘id. (pl.)’	
	rrekÁpjU	‘bee-swarm’	
	rrekápjus	‘id. (pl.)’	
	iglésja	‘church’	
	médjas	‘middle (fem. pl.)’	

It is apparent from (13) that the high glides *j* and *w* are unaffected by a following stressed mid vowel and so are immune to vowel harmony. It is also clear that the high glides, when they occur in the stressed syllable, induce [+high] vocalism for an unbounded distance to the left but not at all to the right. Examples like *amfiθjón* show that the low vowel *a* is unaffected by this process, just as it is in vowel-induced height harmony. It appears, then, that the high glides in a stressed syllable are vowel height

harmony triggers without themselves participating in the process.⁶ Penny ((1969b), though not (1969a)) notes as well that the palatal consonants *č*, *č*, and *n* also have this effect, though in view of the numerous unexplained exceptions in his data (like *senór*) and the lack of alternations supporting the distributional evidence, I will assume that this ranks only as a minor tendency, probably of diachronic import only.

Three last, seemingly low-level phonological processes interact with the two types of harmony. We have already seen the first of these, the reduction evidenced in (7) that renders height harmony opaque in final unstressed syllables. Second, the unround [+tense] vowels are in free variation in initial unstressed syllables before *n* and *s*, regardless of the height-harmonic class of the word, as shown in (14a). Third, there is similar free variation in initial unstressed syllables between unstressed *e* and *i* or *I* when adjacent to *r* and *rr*, exemplified in (14b).

- | | | |
|---------|---|---------------|
| (14) a. | <i>askína</i> ~ <i>eskína</i> ~ <i>iskína</i> | 'corner' |
| | <i>astónθas</i> ~ <i>estónθas</i> ~ <i>istónθas</i> | 'then' |
| | <i>andrína</i> ~ <i>endrína</i> ~ <i>indrína</i> | 'sloe' |
| | <i>enrrIdÚsu</i> ~ <i>InrrIdÚsU</i> | 'naughty' |
| b. | <i>rrebUltÚsU</i> ~ <i>rrIbUltÚsU</i> | 'disobedient' |
| | <i>rrendír</i> ~ <i>rrindír</i> | 'to give in' |

In both kinds of free variation illustrated in (14), although the *e* variant is neutral with respect to tense/lax harmony, the high and low vowel variants harmonize in tenseness with the rest of the form.

Except for a few small points that will emerge later, this completes the summary of the Pasiego vowel harmony system and the phenomena that interact with it. Let us now turn to a formal characterization of these complex facts.

2. Fundamentals of Pasiego Harmony: Analysis and Discussion

In this section we will take up the formal analysis of the data and generalizations presented above, though confining ourselves to the vowel harmony processes as they apply in words without transparent elements. The important issues of neutral vowels and their place in the two rules of harmony are the subject of a later section.

⁶ An *LI* reviewer has pointed out that the raising of vowels before *j* is known in Spanish from a very early period as a strictly local rule, not a propagating one. (See, for example, the rule called "Phonetic Metaphony" in Harris (1975).) It would appear that this rule was conflated with vowel height harmony in Pasiego, thus granting it unbounded application.

There are two gaps in the available data that could influence the analysis of vowel raising before high glides. First, I have found no unimpeachable examples of vowel raising across an intervening neutral *a*, so this expected connection with vowel-triggered harmony is not fulfilled. Second, since no words with the diphthongs *jÓ* or *wÓ* are attested in Pasiego, it cannot be determined whether this phenomenon extends to [-tense] words as well.

2.1. [tense] Harmony

The harmonic class [–tense] has a highly skewed distribution; a necessary but not sufficient condition for [–tense] harmony in a word is the masculine suffix +*u*/+*U* in absolute word-final position. All other words, including all finite verb forms, belong to the [+tense] class. The harmonic class [–tense] has a direct status in the morphology; it marks the category of masculine singular count nouns and adjectives. In its morphological aspect, [–tense] is partly independent of the masculine suffix +*u*/+*U*, since the latter may occur without the former.

Formally, all vowels in all words or morphemes of Pasiego are lexically unspecified for the feature [tense], and vowels are the P-bearing elements for this feature. In particular, the vowels of proclitic forms, which also participate in tense/lax harmony, are likewise lexically unspecified for [tense]. The special morphological status of lax vocalism is expressed by saying that the feature value [–tense], by itself, constitutes the masculine singular count noun morpheme of Pasiego. This notion of autosegmental vowel harmony melodies—essentially morphemes made up of the harmonizing feature and nothing else—was first introduced by Clements (1980) in connection with a somewhat different phenomenon in Andalusian Spanish. The notion of feature-sized morphemes is developed in much greater detail with far more complex examples from sound symbolic and mutation systems in McCarthy (1983a,b) and Lieber (to appear).

This morpheme [–tense] is expressed phonologically by virtue of its autosegmental association with some other elements of the phonological representation. That is, this morpheme is made pronounceable only by linking up with material that yields a full segment. The autosegmental association rule that links [–tense] must take note of the limited distribution of this feature-sized morpheme; it is confined to words ending in the +*u*/+*U* suffix. Hereafter, I will adopt the conventions of indicating archisegments unspecified for [tense] by boldface and of abbreviating [±high] and [±tense] as [±H] and [±T].

(15) *Masculine Singular Count Morphology*

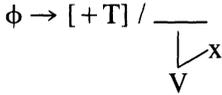
$$\begin{array}{c} [-T] \\ \vdots \\ +\mathbf{u}\# \end{array}$$

The output of (15) is subject to the autosegmental Spreading rules, linking the value [–tense] with all vocalic archisegments that are accessible—that is, that occur in the same word or sandhi domain.

A vowel that is not associated with [–tense] by virtue of this spreading—in effect, any vowel not in a sandhi domain with a masculine singular count noun or adjective—is then spelled out by a default rule as [+tense]. Kiparsky (1981; 1983) makes wide use of such default rules; I will follow him in assuming that they assign an autosegmental feature value to vowels that are not already associated with a value of the same feature.

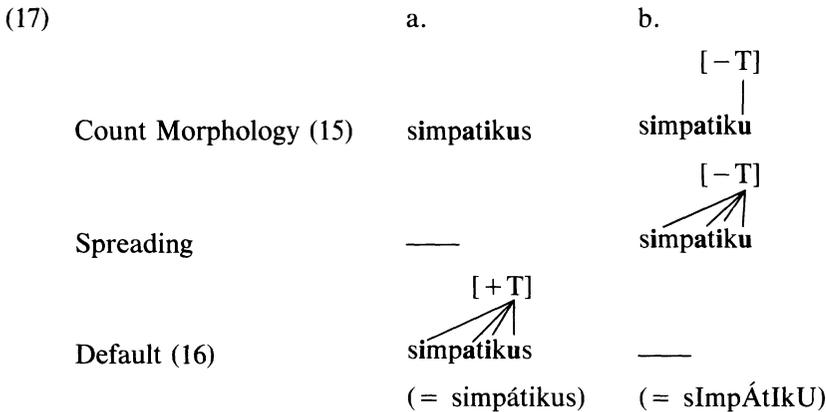
The rule in (16) is a quite explicit statement of the conditions under which this happens, though it is likely that aspects of (16) are redundant in a universal theory of such rules.

(16) *Default Rule*



The context of (16) requires that the affected vowel not already bear an autosegmental specification on the [tense] autosegmental tier.

The derivations in (17) show a plural adjective and its masculine singular count allomorph; the underlying representation is completely unspecified for [tense], as the boldface vocalic archisegments indicate:

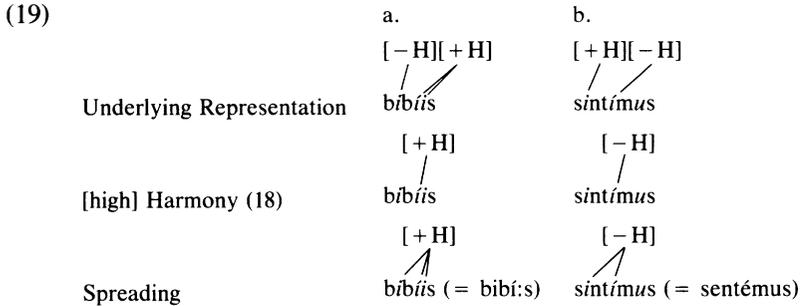


The autosegmental spreading here is entirely automatic and conventional. Since there is at most one autosegment per word, it must associate with all P-bearing elements (that is, vowels) in its domain. There is, then, no harmony rule for the feature [tense], but only a morphological rule (15) introducing [-tense] and the Default rule (16) spelling out [+tense].

2.2. [high] Harmony

In contrast to [tense] harmony, [high] harmony is both context-sensitive and feature-changing, and it requires rather different theoretical assumptions with much different descriptive consequences. Height harmony is context-sensitive because the value of [high] for all vowels in each word or clitic group is determined by the stressed vowel. It is feature-changing because underlying vowel height contrasts remain in environments where the neutral vowel *a/A* is stressed, although they are neutralized in other contexts. This is demonstrated clearly by the alternations in (7).

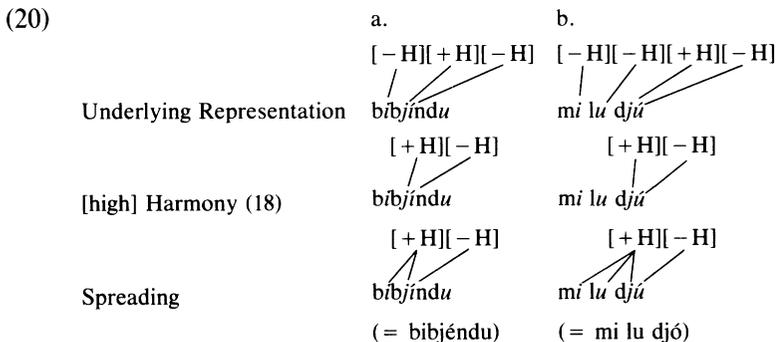
This type of harmony cannot be described solely in terms of the feature-spreading



We can now turn to the harmonic behavior of the high glides exemplified in (13). *w* and *j* in a stressed syllable block the expected leftward propagation of [-high] (and vacuously [+high]) from the stressed vowel. Furthermore, they induce the spread of [+high] to their left, while they do not themselves harmonize.

The behavior of the high glides *w* and *j* under height harmony is a straightforward consequence of rule (18), providing that glides as well as vowels (therefore, [-cons] segments) are permitted to be P-bearing with respect to [high]. Recall that a glide-vowel sequence in a stressed syllable may be disharmonic with respect to [high], with the [+high] feature of the glide spreading leftward to all pretonic vowels. The fact that the language tolerates disharmonic stressed glide-vowel sequences follows from the formulation of (18), since the value of [high] is erased only from unstressed syllables. The value of [high] associated with the glide will prevail to the left because of the universal prohibition against crossing autosegmental association lines. Since the values of [high] for both the vowel and the glide in a stressed syllable remain linked to their respective segments, their respective association lines must bound the two high domains. It should be noted that this analysis is entirely compatible as well with a view that surface glides and vowels have identical underlying sources; all that is required is that stress inhere in syllables rather than segments so that more than one nonconsonantal segment in a syllable may bear stress.

Some representative derivations of words incorporating stressed high glides appear in (20). In this case, the underlying representations are (informally) /beb + jéndu/ and /me lo djó/:



In sum, the fundamental mechanism of Pasiego height harmony is feature erasure by rule (18).

2.3. Discussion

Pasiego has two strikingly different sorts of vowel harmony, which have led to quite different formal accounts. Let us now backtrack along the route of the decisions that were made in the course of the analysis and reflect on their theoretical and descriptive implications.

First consider tense/lax harmony. There is no underlying (nonmorphological) contrast between tense and lax vowels; therefore, vowels are lexically unspecified for the feature [tense]. Surface tense vowels are spelled out as such by a default statement like (16) because of the evident morphological asymmetry between [+tense] and [–tense]. Lax vowels occur only in a well-defined set of morphological circumstances, marked by the masculine singular count morpheme [–tense]. Tense vowels constitute the elsewhere case, appearing not only in masculine singular count nouns and adjectives that contrast morphologically with the mass class but also in all verb forms or other categories for which the mass/count distinction is simply irrelevant.

Since, for these morphological reasons, the value [+tense] is introduced only by a default rule, the analysis developed here treats [–tense] as a dominant harmonic value in the sense of Clements (1977a; 1980). Although [–tense] is assigned by a context-sensitive rule, the actual harmony process is itself context-free, induced solely by autosegmental spreading. This becomes clear if we consider the hypothetical case of a language just like Pasiego but lacking vowel harmony—that is, a language where lax vocalism functions morphologically in the final vowel but all other vowels are tense; in such a language rule (15) would not differ significantly in its formulation.

In contrast, height harmony is both feature-changing and context-sensitive, two attributes that are expressed simultaneously by the feature erasure rule (18). It is an implicit claim of Clements's (1977a; 1980; 1981) account of vowel harmony as well as Kiparsky's (1981; 1983) that context-sensitivity is excluded from systems like [tense] harmony, where the autosegmental Spreading rules alone are involved, whereas the deletion process responsible for feature-changing harmony (or its equivalent in Kiparsky's theory) can freely stipulate quite elaborate contextual restrictions. We find, then, that the facts of Pasiego with its automatic rule of [tense] harmony contrasting with a complex rule of [high] harmony support the formal typology of vowel harmony characteristic of these autosegmental theories.

3. Neutral Vowels

As we have seen, [tense] harmony and [high] harmony are expressed by quite different formal mechanisms. These two harmony systems exploit very different treatments of neutral vowels as well.

3.1. Neutral *e* in [tense] Harmony

The vowel *e* does not appear to undergo and does not impede the spreading of [tense] harmony; there is no lax *E*, although *e* functions like one in lax-voweled words. Two basically different proposals have appeared in the autosegmental literature for dealing with a phenomenon of this sort. On the one hand, Clements (1977a; 1980; 1981) has claimed that neutral vowels are excluded from the set of elements that are P-bearing with respect to the harmonizing feature. For Pasiego, this would mean that *e* is not P-bearing with respect to [tense] and is therefore fully specified at the segmental level as [+tense]. This renders it invisible to the spreading of the harmonic feature. On the other hand, Kiparsky (1981; 1983) represents neutral vowels by archisegments that are prohibited by a universal convention from being autosegmentally linked with the harmonizing feature during the lexical portion of the derivation. Neutral vowels are ultimately spelled out for a value of the harmonizing feature by a postlexical default rule.

Neutral *e* in Pasiego demands an account that incorporates some aspects of these proposals while also allowing neutral vowels to participate in the harmony process directly. Specifically, I will argue that *e* is P-bearing with respect to [tense] and undergoes harmony for this feature like all other vowels. A subsequent rule then dissociates archisegmental *e* from the [–tense] value, inducing the application of the Default rule to supply [+tense]. In other words, *e* is associated by autosegmental spreading with the masculine singular count morpheme [–tense] just as any other vowel is, but the association with *e* is later severed by the following rule:

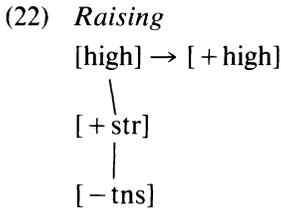
- (21) *e-Fission*
- $$\begin{array}{c}
 [-\text{tns}] \\
 | \\
 [-\text{back}] \\
 | \\
 [-\text{high}]
 \end{array}$$

The vowel freed from [–tense] by rule (21) is then subject to being spelled out as [+tense] by the Default rule (16). In this respect I follow Kiparsky's treatment of neutral vowels, while differing from him in considering (21) to be a rule like any other ordered in the phonological derivation rather than a well-formedness condition on lexical representations.

Although the mere fact that *e* is neutral is insufficient to select among the alternative analyses, additional observations do determine the choice. It is a fact, evidenced by both distributional data and alternations, that the mid vowels are neutralized to high under stress in lax-voweled words only (cf. (11), (12)). The result of this neutralization is transparent with respect to [high] Harmony; unstressed vowels harmonize with derived [+high] vowels just as they do with underlying ones (cf. (12)). The treatment of *O* is straightforward on the surface; it raises to *U* when stressed, though stressed *o* and

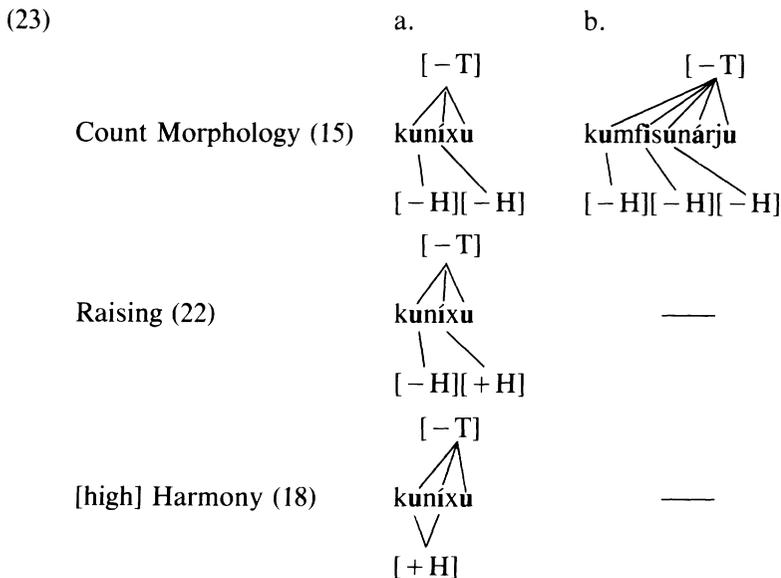
unstressed *O* remain unchanged. The stressed vowel *e* raises to *I* in lax words, but it does not raise in tense words or when unstressed.

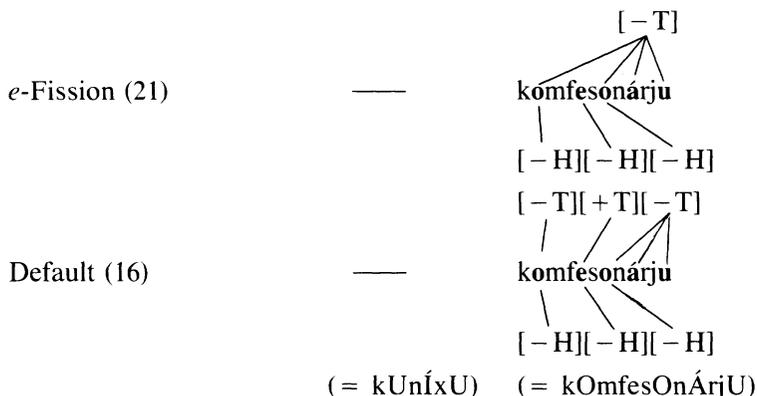
If neutral *e* goes through an intermediate stage as *E* in lax-voweled words, then a homogeneous treatment of raising in both the front and back mid vowels is possible. This rule appears in (22):



E, then, undergoes Raising like stressed *O*, but unstressed *E* (which remains) is subsequently tensed to *e* by rule (21) *e*-Fission. Raising bleeds away all instances of stressed *E* from the purview of *e*-Fission. The abstract intermediate representation for the neutral vowel is therefore crucial to the formulation of Raising in (22). Raising will be ordered before [high] Harmony, since words with raised vowels invariably harmonize with the derived value of [high] (whence the height alternations concomitant with tensing differences in (12)).

Some representative derivations appear in (23); here, the boldface symbols for high vowels represent archisegments unspecified for both [high] and [tense]. The informal underlying representations are /konéxu/ and /kɔmfesonárju/:





It is possible to construct an alternative analysis without the rule of *e*-Fission, but only at a considerable loss of explanatory force. Lacking the intermediate stage where tense and lax *e* are distinct entities, we would be forced to formulate the raising rule with a context stipulating that the affected vowel is followed somewhere in the word or sandhi domain by a vowel that is associated with the feature value $[-\text{tense}]$, a quite puzzling condition to find on an otherwise straightforward neutralization process. Although this environmental condition is entirely superfluous in the case of *O*, it would be needed to distinguish *e* in lax words from the same vowel in tense words. This environment, then, would be purely an artifact of our failure to recognize the intermediate lax stage through which *e* passes.

This account of the neutral vowel has some interesting consequences for certain optional rules of vowel height neutralization. There is free variation among the unstressed unround vowels $a \sim e \sim i$ or $A \sim e \sim I$ in initial syllables before *n* or *s*, regularly in tense words and occasionally in lax ones (cf. (14a)). The unstressed front vowels $e \sim i$ or $e \sim I$ are also in free variation adjacent to *r* and *rr*, regularly in both tense and lax words (cf. (14b)). A standard problem in treating neutralizations of this sort (like the analogous *pin/pen* homophony in central Texas) is establishing underlying representations and determining the direction—raising or lowering—of the rule. In fact, there are no data that force particular underlying representations. But we can establish something about the direction of the rules; they must be able to both raise and lower vowels.

We can determine that both raising and lowering are involved from the interaction with [high] harmony. We find that the variation in vowel height introduces surface violations of [high] harmony. These surface violations go in both directions, involving high vowels in $[-\text{high}]$ harmony domains (like *istónθas*) and mid vowels in $[\text{+high}]$ harmony domains (like *endrína*). From this observation it follows that the rules responsible for this variation in vowel height apply after [high] Harmony and do not have a determinate output; that is, they yield vowels with freely varying values of the height features. I suggest that these rules be formulated as in (24) (the rules are expressed segmentally for perspicuity):

(24) *Allophony Rules*

$$\begin{array}{l}
 \text{a. } \left[\begin{array}{c} + \text{syll} \\ - \text{rnd} \\ - \text{str} \end{array} \right] \rightarrow \left[\begin{array}{c} \alpha \text{ high} \\ \beta \text{ low} \\ \beta \text{ back} \end{array} \right] / \# C_0 \text{ --- } \left[\begin{array}{c} + \text{cor} \\ - \text{lat} \\ \left\{ \begin{array}{c} + \text{nas} \\ + \text{cont} \end{array} \right\} \end{array} \right] \\
 \\
 \text{b. } \left[\begin{array}{c} + \text{syll} \\ - \text{back} \\ - \text{str} \end{array} \right] \rightarrow [\alpha \text{ high}] \% \text{ --- } \left[\begin{array}{c} + \text{cor} \\ - \text{lat} \\ + \text{cont} \\ + \text{son} \end{array} \right] \\
 \\
 \alpha, \beta = + \text{ or } -, \text{ in free variation}
 \end{array}$$

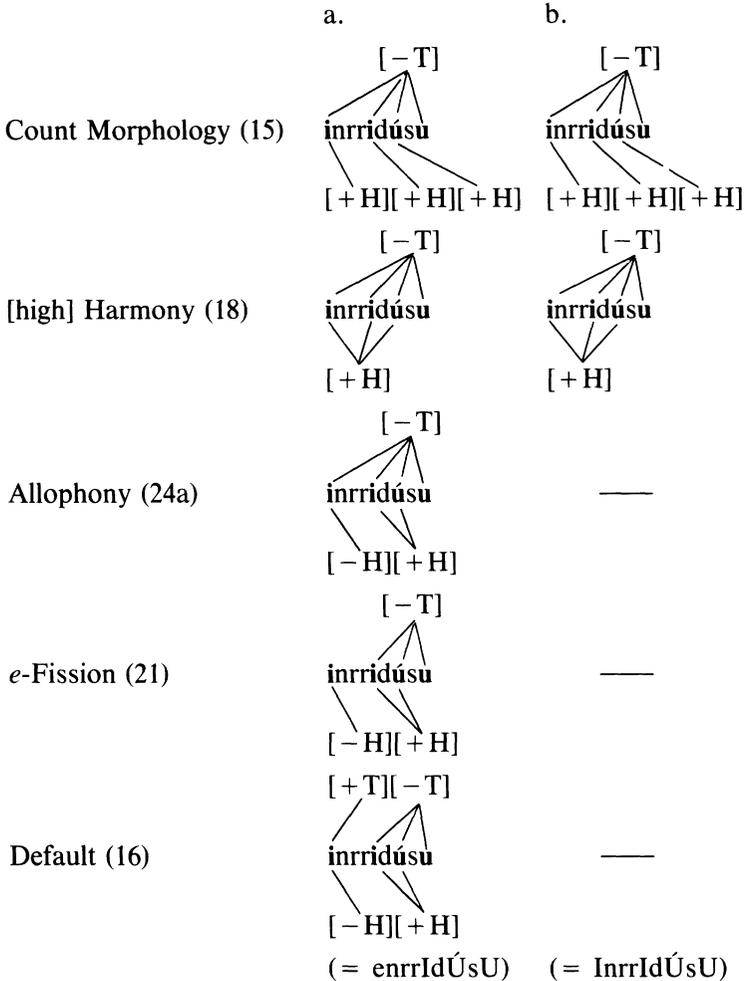
There is interesting evidence that this vowel height variation is not merely a low-level phonetic phenomenon, evidence that strongly supports the account of neutral *e* given above. We can establish that the optional Allophony rules in (24) are ordered at a particular relatively abstract stage of the derivation, and that they interact in a crucial way with the *e*-Fission rule (21). Two observations are relevant. First, we have already established that the Allophony rules (24) are ordered after [high] Harmony, since they yield representations opaque with respect to [high] Harmony (cf. also (25) below). Second, the free variants observe the [tense] harmony regularities, so the Allophony rules are transparent with respect to [tense] harmony. Thus, the *e* variant occurs in both tense and lax words and the *a/A* and *i/I* variants are distributed appropriately between words of the two classes.

The second observation—the transparency of the interaction between the Allophony rules and [tense] harmony—seems to admit of two possible explanations. The first and most obvious solution would be to order the Allophony rules before Count Morphology (15), so they would precede the harmonic spreading of [–tense]. But we have just seen that the Allophony rules follow [high] Harmony (because of the opaque interaction) and [high] Harmony demonstrably follows Raising (cf. (23) and (26)), which itself crucially refers to the [–tense] feature value introduced by the Count Morphology rule. Therefore, by virtue of transitivity of ordering this solution is untenable.

This transparency of the Allophony rules with respect to [tense] harmony versus opacity with respect to [high] harmony is explicable, however, if we order the Allophony rules after [high] Harmony but before *e*-Fission, which restores neutral *e* from the abstract intermediate stage *E*. Therefore, whether the Allophony rules yield *e* or *E*, the result will be neutralized to *e*. But if the Allophony rules produce *a/A* or *i/I*, then nothing further happens in the derivation. In other words, the *e*-Fission rule, and the corresponding abstract analysis of the neutral vowel, predict the correct interaction of [tense] harmony with the Allophony rules in (24).

The following two derivations contrast in the value of [high] assigned by the Allophony rule, yielding two of the occurring free variants of this word.

(25)



In sum, I have claimed that Pasiego *e* is P-bearing with respect to the feature [tense]. The surface exclusion of its lax counterpart *E* is accomplished by the rule of *e*-Fission (21), whose output is then spelled out as [+tense] by the Default rule (16). Two aspects of the analysis crucially depend on including *e*-Fission as a phonological rule, ordered in the derivation, that eliminates an abstract intermediate stage. First, *e*-Fission must be ordered after Raising (22) if the analysis is to express the exactly parallel behavior of *e* and *O* in lax-voweled words. Second, the transparency of the interaction between [tense] harmony and Allophony (24) shows that the vowels derived by Allophony must be subject to subsequent *e*-Fission and the Default rule. In essence, *e*-Fission is crucially ordered at a relatively late stage of the derivation, followed only by the Default rule, which renders its output [+tense].

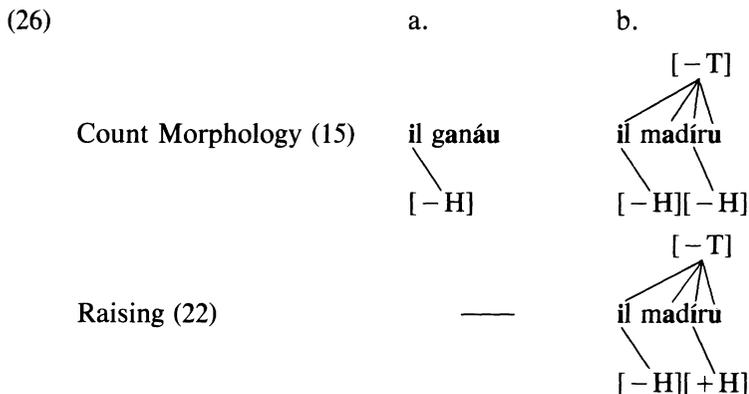
3.2. Neutral *a* in [high] Harmony

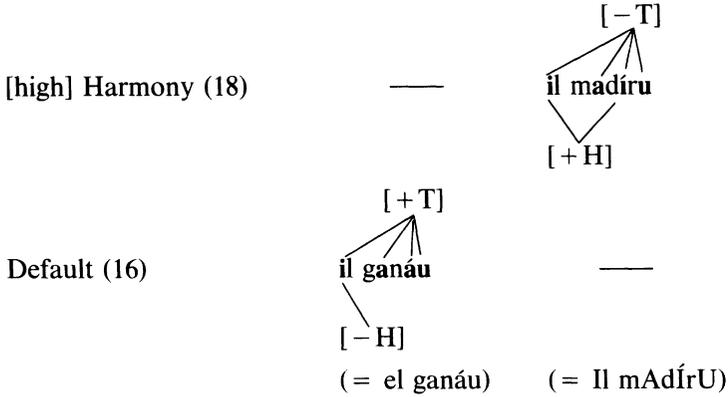
The low vowel *a/A* is unaffected by and does not impede the harmonic spreading of the feature [high], whether from vowels or from glides. Further, when *a/A* is the only stressed nonconsonantal segment in a word, [high] Harmony is not initiated and the contrasting underlying values of [high] emerge on unstressed syllables.

This is clearly a rather different case from the neutral vowel in [tense] harmony. When *a/A* is in the position where it would be expected to initiate [high] harmony—that is, in the stressed syllable, without an accompanying high glide—in precisely that case the other vowels appear in their underlying, contrasting heights (cf. (7)). Moreover, there is no evidence of the sort found with *e* that low vowels in unstressed syllables undergo height harmony at any earlier stage of the derivation. Thus, *a/A* in no way participates in [high] harmony.

In this case, it is entirely appropriate to adopt Clements's (1977a; 1980; 1981) proposal that *a/A* is excluded from the P-bearing class of the autosegmental feature [high]. By this adjustment in the formulation of the rule, low vowels may not appear in the target position for the height harmony process; rather, they are simply ignored. This is, of course, a familiar property of neutral vowels. But in one important respect the analysis goes beyond the usual expectations. If the stressed vowel is [+low] and if there is no high glide in the stressed syllable, then no value of [high] is associated with the stressed syllable to trigger deletion of [high] from unstressed syllables, and therefore the underlying height contrasts emerge. These conditions in which harmonic neutralization fails are not explicitly noted in the grammar, but rather they emerge out of the interaction of two independently necessary properties: the neutral status of low vowels and the fact that height harmony is triggered only by stressed vowels, indicated formally by the context-sensitive [high] Harmony rule (18).

Some representative derivations appear in (26); (26a) shows the behavior of a stressed low vowel (in underlying /el ganáu/) and (26b) shows a low vowel in an unstressed syllable (in /el madéru/):





3.3. Discussion

I have proposed two quite different accounts of the two classes of neutral vowels in Pasiego. It remains to consider what the theoretical consequences of these analyses are, particularly as they relate to the distinction between feature-changing and non-feature-changing vowel harmony.

Consider first the analysis of neutral *e* in [tense] harmony. There is no intrinsic property of the autosegmental theory of vowel harmony in Clements (1977a; 1980; 1981) that excludes this sort of treatment of neutral vowels. The existence of the notion “not a P-bearing element” as an account of some neutral vowels does not preclude the alternative, albeit more complex, analysis that incorporates a rule like *e*-Fission. Moreover, the existence of alternatives within the theory is not a serious embarrassment, since the choice between them may be safely left to the evaluation metric. In other words, the evaluation metric will select the less complex stipulation of a restricted P-bearing class unless evidence supporting a rule like *e*-Fission is forthcoming, as it is in Pasiego [tense] harmony.

This conclusion—that the theory must countenance two mechanisms underlying the neutral vowel phenomenon—is, of course, supported by the two types of harmony in Pasiego. While the [tense] harmony rule demonstrably implements neutral vowels by *e*-Fission, [high] Harmony must exclude the low vowels from the P-bearing class. Low vowels cannot be associated autosegmentally with [–high] at all because low vowels in stressed syllables do not induce [–high] harmony. The only way to express the total neutrality of low vowels with respect to [high] Harmony is to exclude them from the purview of that rule entirely. It is, in fact, difficult to imagine how such a feature-changing harmony rule could implement neutral vowels except by restrictions on the P-bearing class or some equivalent device, since nonparticipation by neutral vowels is crucial to determining that the Pasiego harmony rule is feature-changing in the first place.

We see, then, that this bifurcated analysis of Pasiego neutral vowels is not only descriptively necessary but also compatible with at least one version of autosegmental

theory. This latter statement is not obviously true if we turn to Kiparsky's (1981; 1983) lexical phonological analysis of vowel harmony. In Kiparsky's account, a vowel is neutral if it is not lexically distinctive for the harmonizing feature. In Finnish vowel harmony, for example, the neutral status of *i* and *e* is attributed to the absence of a lexical contrast between these vowels and their [+back] counterparts. The lexical rule of vowel harmony in Finnish is subject to a quite general constraint on structure preservation: it cannot create configurations that are not lexically distinctive, and therefore it must skip over *i* and *e*.

Clearly the feature [tense] is lexically nondistinctive for *e* in Pasiego, so the analysis of neutral *e* in Pasiego that I have presented is incompatible with this requirement of structure preservation—but only if [tense] harmony is lexical. Under the assumptions of lexical phonological theory, though, the harmonic spreading of the feature [tense] cannot be a lexical process. The feature [tense] is lexically distinctive for no vowels of Pasiego but is rather itself an independent property of the morphology. Even if we granted that there is a lexical contrast between mass and count masculine singular suffixes *u* and *U*, eschewing rule (15), it would still follow that [tense] is nondistinctive lexically for the vowels *i*, *a*, and *o*, as well as *e*.⁸ Since [tense] obviously spreads autosegmentally to all of these vowels, the spreading that is characteristic of [tense] harmony cannot be a lexical process under the assumptions of the theory. The spreading of the feature value [–tense] must, then, happen at the postlexical level, where the requirement of structure preservation does not apply. From the fact that [tense] harmony is postlexical, it further follows that the account of neutral *e* offered here is entirely compatible with the assumptions of the lexical phonological theory.

In contrast, neutral *a* in [high] harmony can be readily accounted for under structure preservation since, not only in Pasiego but universally, the feature [high] is nondistinctive lexically for [+low] vowels. It follows that a value of [high] cannot be associated autosegmentally with a low vowel, and therefore that low vowels must be neutral if [high] harmony is lexical. It is by no means clear in view of the ordering relations described in section 3.1 that we can maintain postlexical [tense] harmony and lexical [high] harmony. But the fact that these two rules, taken from different modules of the grammar, have the same upward-bounding domain—the clitic phrase—is not surprising. Clitic

⁸ This apparently peculiar state of affairs—where the harmonizing feature is lexically distinctive for at most one vowel in one morpheme—is a consequence of the fact that Pasiego harmony is morphologically controlled and not root controlled. Root controlled harmony in Finnish or Turkish, for example, allows a fairly rich set of lexical contrasts; the quite limited source of [–tense] in Pasiego means that the lexicon scarcely contrasts that feature at all.

It is with regard to this difference between Pasiego and the more common root controlled systems that we should distinguish the proposal for neutral *e* made here from the view, dating back at least to Bach (1968), that neutral vowels are lexically distinctive for the harmonizing feature, only to undergo a later rule of absolute neutralization. Bach, his successors in the same opinion, and his critics, in particular Kiparsky (1973), were referring to a theory in which the harmonic value of a root is marked lexically on its first vowel, even if that vowel is neutral. This situation clearly does not obtain in Pasiego, and, at least from the standpoint of lexical distinctions, there is no sense in which *e*-Fission can be described as a neutralization rule.

phrases and similar constituents stand at the interface between the lexicon and the post-lexical level, incorporating properties of both.

4. Remaining Phenomena and Summary

4.1. Disharmonic Forms

There are no words in Pasiego disharmonic with respect to the feature [tense] (ignoring the formally distinct neutral vowel cases). This follows from the fully automatic, conventional character of [tense] harmony; there is no rule of [tense] harmony that such forms could be exceptions to. Since vowels are lexically unspecified for [tense], the spreading of [–tense] is accomplished by an automatic convention, and the Default rule must spell out remaining vowels as [+tense] simply to render them pronounceable, there is no room in the analysis for words disharmonic with respect to [tense].

There are, however, two classes of exceptions to [high] harmony (cf. (9)). In the larger, relatively more productive class (9a) there is a disharmony in the feature [high] at the boundary of one of the initially stressed, mid-voweled suffixes *-éra*, *-éte*, *-ón*, *-ór*, and *-ósus*. Since the domain of [high] harmony is, in any case, bounded by the juncture associated with words and clitic groups, we might reasonably presume that these suffixes bear a pseudojuncture of that category as well. That is, the separate harmonic domains in words with such suffixes are determined by essentially grammatical rather than phonological considerations.

The other class of disharmonic forms is simply a short, closed list of unpredictable words (9b). These may simply be lexical exceptions to the [high] Harmony rule. In many cases, such exceptionality is apparently variable, since many of the disharmonic forms of this type have regularly harmonic doublets.

4.2. Summary

The list in (27) summarizes the ordering relations claimed to obtain among the various rules in this analysis:

- (27) Count Morphology (15)
 - Raising (22)
 - [high] Harmony (18)
 - Allophony (24)
 - e*-Fission (21)
 - Default (16)

In brief, these ordering relations are justified as follows. Count Morphology must precede Raising, since it is the [–tense] feature value introduced by the former that triggers the latter. Raising precedes [high] Harmony because words displaying both phenomena belong to the [+high] harmonic class derived by Raising. [high] Harmony must precede Allophony because their interaction is opaque—the result of Allophony may be dishar-

monic with respect to [high]. *e*-Fission must follow both [high] Harmony and Allophony to eliminate all associations between *e* and [–tense], and subsequently the Default rule spells out as [+tense] all *e*'s and vowels in words not subject to Count Morphology.

In this article I have constructed an analysis of Pasiego vowel harmony with an eye toward two important theoretical issues: the feature-changing parameter in vowel harmony rules and the representation of neutral vowels. The evidence presented supports a major formal difference between feature-changing and non-feature-changing harmony. The former is implemented by an elaborate context-sensitive rule of feature deletion followed by feature spreading, while the latter occurs by feature spreading unaided by other mechanisms. As for neutral vowels, I have argued that phonological theory must recognize two formal approaches, full participation by the neutral vowel followed by a rule severing its association with the harmonizing feature and exclusion of the neutral vowel from the class of harmonizing elements. Finally, I have tentatively suggested that there is a partial correlation between these two properties of Montañes vowel harmony: fully participating neutral vowels will only be found in non-feature-changing harmony systems, although they are not a necessary concomitant of such systems.

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