Autosegmental and metrical spreading in the vowel-harmony systems of northwestern Spain

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Abstract

This paper studies the vowel-harmony processes found in the dialects of Asturias-Cantabria (Spain). These dialects present a variety of harmony systems. Harmonization may be triggered by certain high final vowels (metaphony) or by high stressed vowels. These rules can be in a feeding relation, and up to three different processes may be found in one single dialect. We find three major types of metaphor:

1. metaphor extends throughout the domain of a phonological word;
2. metaphor affects vowels only up to the stressed vowel;
3. only the quality of the stressed vowel is affected by a metaphor-inducing final vowel.

This variation is of great theoretical significance. Whereas the first type can be straightforwardly analyzed as autosegmental spreading, the other two types require a metrical analysis. The feature percolates to all vowels in the foot in type 2 metaphor processes, but only to the head of the foot (the stressed vowel) in type 3 metaphor.

It is thus shown that a seemingly unitary process (vowel harmony) can be implemented in radically different ways in closely related dialects. It is argued that the metrical nature of vowel harmony in certain dialects does not add complexity to the grammar, since metrical structure must be built for stress assignment.

Introduction

A number of dialects spoken in northwestern Spain (regions of Asturias and Cantabria) present vowel-harmony processes triggered by the word-final vowel or by the stressed vowel. Harmonization that has its source in the word-final vowel is known as metaphor in the Romanist tradition.

Although the phenomenon has been relatively well studied from a
dialectological or historical perspective (see Alonso 1962; Blaylock 1965; Catalá 1953; Díaz Castañón 1966; Galmés de Fuentes 1960; Hall 1968; Neira Martínez 1955; Penny 1969a, 1969b, 1970; Rodríguez Castellano 1952; among others), it has only recently been brought to the attention of generative phonologists by McCarthy’s important article on the Pasiegio dialect of Cantabria. McCarthy’s study (1984), which points out the theoretical interest of the vowel-harmony facts of the Pasiegio dialect, triggered the appearance of several other analyses of the same dialect (Goldsmith 1987; Spencer 1986; Steriade 1987; Vago 1988a; Wilson 1988). Other equally interesting dialects of the same area, however, have not yet received an explicit generative treatment. The examination of other dialects of the area, which I undertake in this paper, reveals some parameters of variation of great theoretical significance and also helps to clarify some important points about the harmony processes of Pasiegio that have not been adequately treated.

The dialects spoken in Cantabria are collectively known as Montañés by linguists. The dialects of Asturias, on the other hand, are often referred to as Bable by both linguists and speakers. The trigger of metaphony is always a word-final high vowel. In some dialects, only a high back final vowel triggers metaphony. We find three major types of metaphony processes in Asturias-Cantabria:

1. Metaphony extends throughout the domain of a phonological word:

   \[ CVC\hat{v}CVC \]

2. Metaphony affects vowels only up to the stressed vowel:

   \[ CVC\hat{v}CVC \]

3. Only the quality of the stressed vowel is affected by a metaphony-inducing final vowel. Vowels intervening between the trigger of the process (the final vowel) and the stressed vowel are not affected:

   \[ CVC\hat{v}CVC \]

This variation in the application of metaphony, interdialectal and sometimes intradialectal in dialects with more than one harmony process, is theoretically significant; whereas it is analyzed as autosegmental spreading, metrical analysis. In both types of str a feature is percolated from the final feature percolates to all vowels in the but only to the head of the foot (the)

Another aspect of variation is in the particular dialect. From this p examine, we find two types of meta vowels. Tudanca Montañés has stres Lena Bable possesses a type 3 metapho of the stressed vowel. Pasieg Mc affecting the stressed vowel and a stress-conditioned (type 1).

Many dialects of this area pre unstressed vowels, in addition to vo triggering element a final vowel. Pret the stressed syllable contains a high v ‘I would eat’). We will reserve the where the trigger is a high final vowel vowel raising for harmony induced by raising metaphony can feed unstr quality of the stressed vowel from r [by raising metaphony] \[ kurdin\] ‘tan will show that the two steps in application of two different rules).

Both metaphony and unstressed vowels. An additional condition for is that it must be final; and an adv unstressed vowel raising is that it m what happens with high, final, str processes? The answer is that these raising. With respect to metaphony triggering vowel must be unstressed the facts are not totally conclusive.

The fact is that whereas stressed fi (since this is the ending of the first s second and third conjugations), th polysyllabic oxytone words ending Spanish, the few words of this type ings, for example tabú ‘taboo’, cari preterit forms show that unstressed
triggering stressed vowel is final, as in /komi/kumi 'I ate' (from komér 'to eat'), /meti/miti 'I put in' (from metèr 'to put in') (Penny 1978; similar examples also in Penny 1969a).

As for metaphor, the question of whether stressed final vowels can be triggers obviously only arises in dialects with type I metaphor, where the harmonizing feature can spread to the left beyond the stressed vowel. The only process of this type in the dialects that we will consider is centralizing metaphor in Pasiego. It so happens that, for this particular process, the trigger must be a high back vowel. Front vowels do not trigger the process, regardless of stress properties. As we mentioned above, we lack examples of polysyllabic words ending in /-ò/. Nevertheless, the stressed monosyllabic pronoun tú 'you-sg.' does not present a centralized vowel. This would indicate that centralization is only present in items ending in unstressed /-ò/. The general conditions on the trigger of each of the two processes can be summarized as follows:

(1) Metaphony: + high, + final, (+ back), -stress

UVR: + high, ± final, + stress

In this paper, we will first give analyses of two dialects representing the two types of stress-conditioned metaphor: the dialect of Tudanca in Cantabria, where metaphor affects all vowels in the metrical foot, and the Asturian dialect of Lena, where only the stressed vowel undergoes metaphor. The facts of Pasiego, which have been the object of several other analyses, will then be reconsidered. Pasiego presents, as mentioned above, two metaphor processes: one stress-conditioned (raising) and the other independent of stress (centralization). In addition, unstressed vowel raising, a process also found in Tudanca, is fed by raising metaphor in this dialect.

The conclusion will be that processes of vowel harmony might be of either an autosegmental or a metrical nature. In principle, an autosegmental analysis would seem always simpler and, therefore, preferable from the point of view of the learner. This is not, however, necessarily so in a stress language, where metrical structure needs to be built for the assignment of stress features. In the case of the stress-sensitive harmony processes that we deal with in this paper, the same metrical structure built for stress assignment is then utilized to percolate a different feature, the harmonizing feature. Little complexity is, thus, added to the harmony process by the use of metrical structure, since this is already present for independent purposes.

The evidence presented here, then, argues for the use of metrical devices in the analysis of certain vowel-harmony processes (see Halle and Vergnaud 1981; Poser 1982; Van der Hulst and Smith 1982; Zubizarreta 1979, 1982). In particular, there are stress processes, which must be treated metrically.

1. Vowel harmony in Tudanca Montañés

The dialect spoken in Tudanca, in C harmony processes. One of them is the stressed vowels and causes the centralization of stressed syllable. The other process is tri which cause pretonic nonlow vowels to be all from Penny's (1978) excellent monograph on Tudanca.

1.1 Centralizing metaphor in Tudanca Montañés

Tudanca Montañés has ten vowels in the class of centralization processes that are noncentralized vowels (a) and five central from Penny (1978: 54). Following McCauley's analysis, we consider vowels with a.

Phonetically, centralization does not a.

![Figure 1. The vowels of Tudanca Montañés](image-url)
n /komi/kuni 'I ate' (from komér 'to
tear 'to put in') (Penny 1978; similar
whether stressed final vowels can be
ccted with type 1 metaphony, where the
t is that we will consider is centralizing
that, for this particular process, the
1. Front vowels do not trigger the
es. As we mentioned above, we lack
ng in /-ú/. Nevertheless, the stressed
does not present a centralized vowel.
on is only present in items ending in
ons on the trigger of each of the two
rows:
+ back), – stress

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metaphony: the dialect of Tudanca in
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only the stressed vowel undergoes
which have been the object of several
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be metrical structure built for stress
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his is already present for independent

1. Vowel harmony in Tudanca Montañés

The dialect spoken in Tudanca, in Cantabria, presents two vowel-
harmony processes. One of them is triggered by high word-final un-
stressed vowels and causes the centralization of other vowels up to the
stressed syllable. The other process is triggered by high stressed vowels
which cause pretonic nonlow vowels to harmonize in height. My data are
all from Penny's (1978) excellent monographic study on the Montañés
variety of Tudanca.

1.1 Centralizing metaphony in Tudanca Montañés

Tudanca Montañés has ten vowels in stressed syllables, which phonologi-
cally pattern together in two systems, shown in Figure 1. There are five
noncentralized vowels (a) and five centralized vowels (b) (figures adapted
from Penny 1978: 54). Following McCarthy (1984), I represent central-
vowels with capitals.  

Phonetically, centralization does not affect all five vowels in the same

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![Figure 1. The vowels of Tudanca Montañés](image-url)
manner, as can be seen in (b). Whereas O is a very centralized vowel, centralized E is only slightly centralized and centralized A is raised and fronted; that is [e].

The stressed vowel is centralized if the word ends in an (underlyingly) high vowel. Otherwise, the stressed vowel is noncentralized. In (2), examples are given of words with a final high back vowel (left column) and related forms with a mid or low vowel in the last syllable (right column). The words in the left column present a centralized stressed vowel, which is noncentralized in the related forms of the right column. A final high back vowel is always centralized.

<table>
<thead>
<tr>
<th>Left Column</th>
<th>Right Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>plímtU</td>
<td>pintA</td>
</tr>
<tr>
<td>stíku</td>
<td>čka</td>
</tr>
<tr>
<td>sěktU</td>
<td>sěkA</td>
</tr>
<tr>
<td>kětA</td>
<td>kěsos</td>
</tr>
<tr>
<td>shambráAU</td>
<td>shambráA</td>
</tr>
<tr>
<td>sekAIAU</td>
<td>sekAlo</td>
</tr>
<tr>
<td>OšU</td>
<td>óhos</td>
</tr>
<tr>
<td>sšIU</td>
<td>sóla</td>
</tr>
<tr>
<td>bjúdU</td>
<td>bjúda</td>
</tr>
<tr>
<td>ÒůrdU</td>
<td>Òůrdos</td>
</tr>
</tbody>
</table>

Centralization of the stressed vowel also takes place when the vowel of the last syllable is underlyingly a high front vowel. A complication is introduced in this case by the fact that the distinction between final /i/ and /e/ is always neutralized, both with allophones ranging in height from mid to high and including [a] and [i]. The underlying quality of the final vowel can, however, be detected from its effects on the stressed vowel. /i/ causes centralization and /e/ does not. Thus compare the imperfective forms in the left column of (3), with final /-i/, with the /-e/ final third-person singular present indicative forms of the same verbs, in the right column:

<table>
<thead>
<tr>
<th>Left Column</th>
<th>Right Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>/abri/[Abra]</td>
<td>/abrI/[abrI]</td>
</tr>
<tr>
<td>/meti/[mÉti]</td>
<td>/mete/[mÉte]</td>
</tr>
<tr>
<td>/komi/[kOma]</td>
<td>/kome/[kOma]</td>
</tr>
</tbody>
</table>

In Tudanca Montañés, as in the standard dialects of Spanish, word stress may fall in any of the three last syllables of the word. In the examples given in (2)–(3), stress falls uniformly on the penult. If stress falls on the antepenultimate syllable, the unstressed penultimate also surfaces as centralized. As the examples in (4) show, centralization affects all vowels up to the stressed vowel starting from the right end of the word but does not go beyond the stressed syllable:

<table>
<thead>
<tr>
<th>Left Column</th>
<th>Right Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>antígwisimU</td>
<td>'very old'</td>
</tr>
<tr>
<td>kárAbU</td>
<td>'tawny owl'</td>
</tr>
<tr>
<td>hágAdU</td>
<td>'liver'</td>
</tr>
<tr>
<td>óregAnU</td>
<td>'oregano'</td>
</tr>
<tr>
<td>pórítiku</td>
<td>'hall'</td>
</tr>
<tr>
<td>púlpuítU</td>
<td>'pulpit'</td>
</tr>
<tr>
<td>0ångAnU</td>
<td>'drone'</td>
</tr>
<tr>
<td>rěklIkU</td>
<td>'rachitic'</td>
</tr>
</tbody>
</table>

Final, unstressed, high vowels are assigned the centralizing feature [-ATR], by a rule like (5):

(5) V\#[
[-hi] [-ATR]

Rule (5) is actually a schematic phonological feature is organi different nodes (see Clements 198 and Pulleyblank (I.p.) and Archang formulation which consists of the number of parameters that is tak imposed on the trigger or target parameters that need to be deter the type of operation that the processes: spreading, insertion, d of the rule; that is, the ele inserted, deleted, or delinked.

The rule represented schematics feature [-ATR] on the appropri unstressed high vowel. This rule

(6) Centralization of final high operation: insert argument: [-ATR]
target conditions: V, [+high stress foot])

The feature [-ATR] must then how to stop the spreading of the underlying vowels are possible [-ATR] (P-bearing units), autose all possible feature-bearing acquire the spreading feature.
s. O is a very centralized vowel, and centralized A is raised and
word ends in an (underlyingly) vowel is noncentralized. In (2), al high back vowel (left column) vowel in the last syllable (right
present a centralized stressed forms of the right column. A
zed:

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ta</td>
<td>'female calf'</td>
</tr>
<tr>
<td>a</td>
<td>'girl'</td>
</tr>
<tr>
<td>a</td>
<td>'dry' (fem)</td>
</tr>
<tr>
<td>os</td>
<td>'cheeses'</td>
</tr>
<tr>
<td>ambra</td>
<td>'hungry' (fem)</td>
</tr>
<tr>
<td>alo</td>
<td>'to dry it' (mass)</td>
</tr>
<tr>
<td>os</td>
<td>'eyes'</td>
</tr>
<tr>
<td>a</td>
<td>'alone' (fem)</td>
</tr>
<tr>
<td>oda</td>
<td>'widow'</td>
</tr>
<tr>
<td>dos</td>
<td>'left-handed' (pl masc)</td>
</tr>
</tbody>
</table>

'takes place when the vowel of the front vowel. A complication is
the distinction between final /i/ and phones ranging in height from mid
derlying quality of the final vowel is on the stressed vowel. /i/ causes
smear the imperative forms in the
the /e/ final third-person singular
verbs, in the right column:

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>y/[abo]</td>
<td>'opens'</td>
</tr>
<tr>
<td>e/[mèi]</td>
<td>'puts in'</td>
</tr>
<tr>
<td>ve/[kòma]</td>
<td>'cats'</td>
</tr>
</tbody>
</table>

andard dialects of Spanish, word
ast syllables of the word. In the
uniformly on the penult. If stress
the unstressed penultimate also
in (4) show, centralization affects
from the right end of the word
yllable. 

(4) antigwisImU 'very old'
hígAdU 'liver'
orÈgAnU 'oregano'
pòrukU 'hall'
púltitU 'pulpit'
0AngAnU 'drone'
 ArkîtIkU 'rachitic'

Final, unstressed, high vowels are noncontrastively centralized. They
are assigned the centralizing feature, which I will take to be the feature
[−ATR], by a rule like (5): 

(5) 

Rule (5) is actually a schematic vision of the process. I assume that
phonological features are organized in a hierarchical manner under
different nodes (see Clements 1985; Sagey 1986). Following Archangeli
and Pulleyblank (1987) and Archangeli (1987), I will adopt a system of rule
formulation which consists of the specification of the value of a short
number of parameters that is taken, as well as any specific conditions
imposed on the trigger or target of the process. The two fundamental
parameters that need to be determined in any phonological process are the
type of operation that the rule involves (there being four basic
processes: spreading, insertion, deletion, and delinking), and the
argument of the rule; that is, the element (feature or node) that is spread,
inserted, deleted, or delinked.

The rule represented schematically in (5) consists of the insertion of the
feature [−ATR] on the appropriate place of the structure of a word-final
unstressed high vowel. This rule will be formulated as in (6):

(6) Centralization of final high vowels in Tudanca Montañés
operation: insert
argument: [−ATR]
target conditions: V, [+high], ___#, [−stress] (that is, nonhead in
stress foot)

The feature [−ATR] must then spread leftward by rule. The problem is
how to stop the spreading of the feature at the stressed syllable. If all five
underlying vowels are possible feature-bearing units for the feature
[−ATR] (P-bearing units), autosegmental spreading of the feature would
cause all possible feature-bearing units in the word or phrasal domain to
acquire the spreading feature. Consider the effects of autosegmental
spreading of centralization in a word such as /antigwisimU/ 'very old'. I
start with the output of centralization of final high vowels /antigwisimU/;

(7) P-bearing units
Autosegmental spreading

antigwisimU
a i i U
\ / \ \ \ \ [-ATR]
*[AntigwisimU]

What we want is for the centralizing feature to spread leftward only up
to the stressed syllable, to obtain the attested form [antigwisimU] 'very
old'. The solution is to make this vowel-assimilation rule which depends
on stress features operate in a domain defined by the assignment of stress:
the metrical foot (see van der Hulst and Smith 1982 for a study of
harmony processes restricted to metrical domains).

I take stress assignment to be a structure-building process and will
assume that the structure created in this process can be utilized for the
spreading of other features. The spreading of a feature may thus take
place in one of two ways: in an autosegmental manner, utilizing the
hierarchical structure of segments (see Archemegi and Pulleyblank i.p.),
or in a metrical manner, through prosodic structure. I assume that stress
is not a feature which is part of the segmental feature hierarchy but,
rather, is assigned by building metrical structure. If the spreading of a
feature is constrained by the position of a stressed element, this indicates
that the feature in question is percolated through the metrical structure
built for stress assignment. I take the autosegmental or metrical character
of the rule to constitute a parameter of variation in spreading rules.

[[-ATR] spreading is a stress-conditioned, metrical process in Tudanea
Montañés, but a non-stress-conditioned, autosegmental operation in the
neighboring Pastigo dialect (see section 3).]

We can thus percolate the feature [[-ATR], assigned to begin with to a
high word-final vowel, to all vowels in a metrical foot defined by stress,
causing the harmonization in the feature [[-ATR] of the stressed vowel
and a possible other vowel within the metrical foot.

6The assignment of stress in the Tudanea dialect takes place in a similar
way as in Standard Castilian Spanish (see Harris 1983, Roca 1988 for two
different analyses of stress assignment in Standard Spanish). Here I will
assume that the basic rule responsible for stress assignment in Montañés
or Castilian is one that builds a left-headed foot from the right end of the
stress domain, giving the unmarked oxytone pattern, as in (8a). This is
unless the last syllable is marked as a head, as in (8b), or is marked in the
lexicon as extrametrical, as in (8c).
I such as /antigwisimu/ "very old". I of final high vowels /antigwisimu/:

\[ \text{antigwisimu} \]
\[ \text{i i i U} \]
\[ \text{i i i U} \]
\[ \text{[- ATR]} \]
\[ \text{tlgwisimu} \]

A feature to spread leftward only up attested form [antigwisimu] "very 1 well-assimilation rule which depends 2 defined by the assignment of stress: 3 and Smith 1982 for a study of ical domains).

structure-building process and will this process can be utilized for the reading of a feature may thus take utolesment manner, utilizing the De Archangeli and Pulleyblank i.p.), isodic structure. I assume that stress 1 epochs feature hierarchy bottom, cal structure. If the spreading of a of a stressed element, this indicates ated through the metrical structure autosegmental or metrical character or of variation in spreading rules. ioned, metrical process in Tuda 2 ned, autosegmental operation in the on 3). 6

[- ATR], assigned to begin with to a in a metrical foot defined by stress, uture [- ATR] of the stressed vowel e metrical foot. 7

lanca dialect takes place in a similar (see Harris 1983; Roca 1988 for two it in Standard Spanish). Here I will for stress assignment in Montañés eaded foot from the right end of the oxytone pattern, as in (8a). This is head, as in (8b), or is marked in the

(8) a. \( \sigma \sigma \sigma \)

b. \( \sigma \sigma \sigma \)

c. \( \sigma \sigma \sigma \)

I will further assume that, in the case of words with antepenultimate stress, (8c), the extrametrical syllable is adjoined to the metrical foot:

(9) \( \sigma \sigma \sigma \)

Through these metrical structures, the feature [- ATR], assigned by rule (6) to a final unstressed high vowel, is percolated. If stress is penultimate, the two vowels in the foot (the final vowel and the stressed vowel) will be centralized. If stress is antepenultimate the vowels in the three last syllables of the word will surface as centralized (that is, [- ATR]). The rule of centralizing metaphony in Tudanea is stated in (10) as a process that spreads the feature [- ATR] to all P-bearing units in the stress foot:

(10) Centralizing metaphony in Tudanea Montañés:

operation: spread
mode: metrical
domain: stress-foot
argument: [- ATR]
target (P-bearing units): V

Some derivations are given in (11):

(11) a. Underlying representations:

/kukiyegu/ /antigwisimU/ /komi/

b. Stress assignment:

\[ \text{kukiyego} \]
\[ \text{antigwisimu} \]
\[ \text{komi} \]

c. Centralization of final high vowels:

\[ \text{kukiyego} \]
\[ \text{antigwisimu} \]
\[ \text{komi} \]

\[ \text{[- ATR]} \]
\[ \text{[- ATR]} \]
\[ \text{[- ATR]} \]

d. Centralizing metaphony:

\[ \text{kukiyego} \]
\[ \text{antigwisimu} \]
\[ \text{komi} \]

\[ \text{[- ATR]} \]
\[ \text{[- ATR]} \]
\[ \text{[- ATR]} \]

'kukiyego' 'very old' 'cat!'

'kukiyego' 'very old' 'cat!'

'kukiyego' 'very old' 'cat!'
As mentioned above, the front vowels /e/ and /i/ are neutralized in word-final position. In particular, in the realization of our example /komi/ we may obtain a vowel [i] that is not centralized. Since the stressed vowel will, however, be centralized, we need to assume that there are intermediate stages /kómi/ and /kÔmi/, as in the derivation in (12), and that the decentralization of final /−I/ or its lowering to a schwa-like vowel is effected by a low-level phonetic rule that applies after the spreading of the centralizing feature [−ATR].

The process of high final-vowel-induced centralization, illustrated in (2)–(4), affects the stressed vowel and vowels to its right, as just mentioned, but not pretonic vowels.

Centralized vowels can, however, also be found to the left of the stressed vowel, but in this case, centralization is caused by a totally independent process. A vowel to the left of the stressed vowel will be centralized if it is in contact with a labial consonant, either to its left or to its right, and fulfills one of two additional conditions: it either is mid, or is in a word that ends with a high vowel (that is, if the stressed vowel is centralized). The examples in (12a) show labial-induced centralization of /e/ and /o/ in non-high-final words. The examples in (12b) show that high and low vowels are not centralized in analogous circumstances:

(12) a. mEHôka ‘pinky’
    gwEHôra ‘egg-basket’
    bônôka ‘weasel’
    môrôiya ‘blood-sausage’
    b. piôhêkos ‘pinches’
    pîntâ ‘painted’ (fem)
    bîhános ‘worms’
    punîta ‘stitch’
    pásar ‘to pass’
    maîhôs ‘pigs’

If the final vowel is high, on the other hand, all five phonological vowels are centralized to the left of the stressed vowel if in contact with a labial consonant:

(13) a. pêrûk ‘little dog’
    bêhûk ‘old person’
    bêrûk ‘boar’
    fêmêk ‘patch’
    sôbêk ‘armpit’
    môtûk ‘snout’
    pôtrûk ‘colt’

b. plôhûk ‘pinch’
    chpInôku ‘spinal c’
    mûfôku ‘stone’
    bûhûnû ‘worm’
    môtâmû ‘pig’
    támû ‘short a’

This labial-induced centralization adjacency to a labial consonant or glide is not a vowel-harmony process a here (see Penny 1978: 32–35 for more of centralization). We will be concerned

1.2 Unstressed vowel raising in Tudanca

Tudanca Montañés possesses a set of nonfinal mid vowels which contains a high vowel or a prevocalic glide be observed by comparing related forms and prevocalic glides in the stressed

(14) òêra ‘wax’
    sêka ‘dryness’
    merendâr ‘to have a snack’
    mêdjû ‘middle’
    kôfêr ‘to boil, cook’
    molêr ‘to grind’
    hômû ‘oven’

This raising process, unlike centralization, is a phonological exception. Systematically, there is no correspondence to the raising of pretonic vowels an (15) show:

kôfêr ‘to cook’ kufiîr (compare)
metêr ‘to put in’ metîrîa (compare)
komêr ‘to eat’ komîrîa (compare)

This process can be understood as a [+high] leftward from the stressed v
s /e/ and /i/ are neutralized in realization of our example /kom/.

Since the stressed vowel assume that there are intermediate-derivation in (12), and that the vening to a schwa-like vowel is applied after the spreading of the ed centralization, illustrated in l vowels to its right, as just

be found to the left of the lization is caused by a totally t of the stressed vowel will be consonant, either to its left or to conditions: it either is mid, or is that is, if the stressed vowel is labial-induced centralization of examples in (12b) show that high analogous circumstances:

This labial-induced centralization process operates only under strict adjacency to a labial consonant or glide. Although it does not lack interest, this is not a vowel-harmony process and thus will not be further examined here (see Penny 1978: 32–35 for more details and some less systematic cases of centralization). We will be concerned only with vowel-harmony rules.}

1.2 Unstressed vowel raising in Tudanca Montañés

Tudanca Montañés possesses a second process of vowel harmony. Unstressed nonfinal mid vowels are raised to high if the stressed syllable contains a high vowel or a prevocalic glide. The operation of this rule can be observed by comparing related forms with nonhigh and high vowels and prevocalic glides in the stressed syllable:

\[
\begin{array}{ll}
\text{θēra} & \text{'wax'} \\
\text{sēka} & \text{‘dryness’} \\
\text{merendēr} & \text{‘to have a snack’} \\
\text{mēdējēr} & \text{‘middle’} \\
\text{kōṭēr} & \text{‘to boil, cook’} \\
\text{molēr} & \text{‘to grind’} \\
\text{hōrnēr} & \text{‘oven’} \\
\end{array}
\]

\[
\begin{array}{ll}
\text{θriya} & \text{‘match’} \\
\text{sikūra} & \text{‘thirst’} \\
\text{mirjēnda} & \text{‘snack’} \\
\text{mēdējēnēr} & \text{‘medium’} \\
\text{kūnēnā} & \text{‘kitchen’} \\
\text{mujiēnēdā} & \text{‘grinding’} \\
\text{hurniēn} & \text{‘stove’} \\
\end{array}
\]

This raising process, unlike centralization, has a number of lexical exceptions. Systematically, there is no raising in the initial syllables /re-/ and /es-/ (which often correspond to prefixes).

The raising of pretonic vowel is an unbound process, as the examples in (15) show:

\[
\begin{array}{ll}
\text{kōṭēr} & \text{‘to cook’} \\
\text{metēr} & \text{‘to put in’} \\
\text{komēr} & \text{‘to eat’} \\
\end{array}
\]

\[
\begin{array}{ll}
\text{kūnīura} & \text{‘cooking (noun)’} \\
\text{mitīria} & \text{‘would put in’} \\
\text{kumīria} & \text{‘would eat’} \\
\end{array}
\]

This process can be understood as autosegmental spreading of the feature [+ high] leftward from the stressed vowel:
(16) komeria → kumiria

[+ high] [+ high]

McCarthy (1984) describes this spreading process, which, as we will see, is also found in Pasiego, as being fundamentally bidirectional. To do that we would have to exclude the final vowel from the domain of spreading, which, when it is /-o/ (as in the plural masculine or in the singular masculine of uncountable mass nouns and adjectives and some exceptional nonmass masculine nouns), is not affected by raising; for example, thúrdo ‘left-handed’ (masc. pl.), not *thúrdus. McCarthy does in fact exclude final vowels from consideration, since these are affected by other processes in Pasiego. As we will see below, word-final /-o/ in Pasiego is realized as a vowel that ranges in height from open [ı] to closed [ʊ]. It is, however, phonetically different from a true high vowel.

In the case of proparoxytones, we could in theory find a test ground for the bidirectionality of the process, even excluding the final vowel from consideration. But proparoxytones with a mid vowel in the posttonic syllable are extremely rare in Spanish, and the few that are found mostly belong to the learned lexicon (návodo, cátodo). If we add the requirement that the stressed vowel be high we have probably only one possible example: hámedo ‘humid’. If the process of [+ high] spreading were bidirectional we would expect úmidos/úmidos for the plural in Tudanca and Pasiego respectively. The fact is, however, that this is not a valid example in Pasiego, since the attested form is ómidos, with a mid stressed vowel, and the word is not listed by Penny (1978) in his study of Tudanca Montañés. We are thus left without examples to show the bidirectionality of the process if we exclude the final syllable from consideration. However, given the fact that there is no compelling reason to exclude the final syllable from the domain, I conclude that this is an unbounded, bidirectional, leftward process of autosegmental spreading. The process is formulated as in (17):11

(17) Unstressed vowel raising in Tudanca Montañés:
operation: spread
mode: autosegmental
direction: leftward
argument: [+ high]
trigger condition: [+ stress]
target condition: V

We have characterized the target of the rule simply as a vowel. The fact is, however, that the low vowel is not affected by the rule. This follows directly if we assume that the impo-

+ high] which the spreading of the fe-
tcreate, is universally resolved in the
This is not necessarily the case, how-
the Lena dialect: but it can be safely,
universal grammar.

Whether a low vowel blocks fur-

ther spreading even though it doe-
s certain for the Tudanca dialect, gi-
are not rare and that the process, w
does not affect criticizing elements a

2. Vowel harmony in Lena Bable

In the Asturian dialect of Lena, ma-
present in their stressed syllable a high-
corresponding masculine plural er-
singular [-a], plural [-as][-es]).12 As-
raising of the stressed vowel in one d-
stressed low vowel [a] in words with-
vowel [e] in [-u]-final masculine sin-
vowels [e] and [e] correspond to the-
There is no change if the stressed va-
other than the masculine singular:

(18) masc. sg. masc. pl.
 a. gétu gétos
 sëntu santos
 bentënu bentános
 tsemarëgus tsemarágos
 pëlu pales
 šënu šanos
 b. kabëtha kabëtos
 nínuf nénos
 korðiru korðeros
 káldiru káléros
 tšùbu tšobos
 këku kökos
 këstu kösos
 c. këbu këbos
 fióu fiós
 kabritu kabritos
Vowel-harmony systems of Spain 785

directly if we assume that the impossible feature combination [+low, +high] which the spreading of the feature [+high] to low vowels would create, is universally resolved in the blocking of the rule in such cases. This is not necessarily the case, however, as we will see when we examine the Lena dialect; but it can be safely taken as the unmarked option in universal grammar.

Whether a low vowel blocks further spreading to its left or allows further spreading even though it does not undergo the rule is difficult to ascertain for the Tudanca dialect, given the facts that lexical exceptions are not rare and that the process, unlike that in Pasiego (see section 3), does not affect elicitizing elements such as articles and prepositions.

2. Vowel harmony in Lena Bable

In the Asturian dialect of Lena, masculine singular nouns ending in [-u] present in their stressed syllable a higher vowel than that which is found in corresponding masculine plural (ending in [-os]) and feminine forms (singular [-a], plural [-as]/[-es]). As the examples in (18) show, there is raising of the stressed vowel in one degree in the masculine singular. To a stressed low vowel [a] in words with other endings corresponds the mid vowel [e] in [-u]-final masculine singular forms; and to the stressed mid vowels [e] and [é] correspond the high vowels [i] and [u], respectively. There is no change if the stressed vowel is already a high vowel in forms other than the masculine singular:

<table>
<thead>
<tr>
<th>a.</th>
<th>masc. sg.</th>
<th>masc. pl.</th>
<th>fem. sg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>getu</td>
<td>gatós</td>
<td>gàta</td>
</tr>
<tr>
<td>b.</td>
<td>kabiðu</td>
<td>kabêšos</td>
<td>kabêθa</td>
</tr>
<tr>
<td>c.</td>
<td>kőbu</td>
<td>kőbos</td>
<td>fío</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b.</th>
<th>sêntu</th>
<th>sántos</th>
<th>sánta</th>
</tr>
</thead>
<tbody>
<tr>
<td>b.</td>
<td>bentênu</td>
<td>bentános</td>
<td>beniána</td>
</tr>
<tr>
<td>b.</td>
<td>tsamérgu</td>
<td>tsamárgos</td>
<td>tsamárga</td>
</tr>
<tr>
<td>b.</td>
<td>pêlu</td>
<td>pálos</td>
<td>šána</td>
</tr>
<tr>
<td>b.</td>
<td>šênu</td>
<td>šanos</td>
<td>šana</td>
</tr>
<tr>
<td>b.</td>
<td>kabêθu</td>
<td>kabêšos</td>
<td>kabêθa</td>
</tr>
<tr>
<td>b.</td>
<td>kordiru</td>
<td>kordéros</td>
<td>kordéra</td>
</tr>
<tr>
<td>b.</td>
<td>kaldiru</td>
<td>kaléros</td>
<td>kaléra</td>
</tr>
<tr>
<td>b.</td>
<td>tsûbu</td>
<td>tsôbos</td>
<td>tsôba</td>
</tr>
<tr>
<td>b.</td>
<td>kûku</td>
<td>kôkos</td>
<td>kôša</td>
</tr>
<tr>
<td>b.</td>
<td>kûsu</td>
<td>kôšos</td>
<td>kôša</td>
</tr>
<tr>
<td>b.</td>
<td>kôbu</td>
<td>kûbos</td>
<td>fío</td>
</tr>
<tr>
<td>b.</td>
<td>fiu</td>
<td>fios</td>
<td>fía</td>
</tr>
<tr>
<td>b.</td>
<td>kabritu</td>
<td>kabritos</td>
<td>kabrita</td>
</tr>
</tbody>
</table>

The process is

the rule simply as a vowel. The fact affected by the rule. This follows
The same vocalic alternations in the stressed vowels are found in adjectives and participles. Interestingly, adjectives with masculine singular in [-u] and participles oppose a form in [-o], used in agreement with uncountable or 'mass' nouns, to the masculine singular. Some examples of masculine singular, feminine singular, and mass forms of adjectives are given in (19):  

(19) masc. sg. | fem. sg. | mass  
--- | --- | ---  
blēnk | blānka | blānko 'white'  
étn | ālt | āļo 'tall'  
gwēp | gwāp | gwāpo 'handsome'  
moyē | moyā | moyāo 'wet'  
fērt | fārt | fāto 'stuffed'  
andē | andā | andāo 'walked'  
būn | bōn | bōno 'good'  
bwēn | bwēn | bwēno 'good'  
fōndu | fōnoda | fōndo 'deep'  
rēūndu | rēōnda | rēndo 'round'  
tūntu | tōntu | tōnto 'stupid'  
flūs | flōsa | flōso 'lazy, loose'  
fi | fē | fēo 'ugly'  
fondēru | fondēr | fondēro 'lower'  
sīku | sēka | sēko 'dry'  

Masculine nouns that can refer either to a mass or to countable objects present an ending [-i] in the singular countable form and an ending [-o] in the mass form. The presence of one or the other ending has consequences for the height of the stressed vowel:  

(20) countable sg. | mass  
plū | plē 'hair'  
fyīr | fyēro 'iron'  

The few items that present final [-i] (such as the demonstratives) show that raising of the stressed vowel also takes place in this case:  

(21) masc sg. | fem sg.  
isti | ėsta 'this'  
is | ėsa 'that'  

As in Castilian or Tudanca Montañés, in the Asturian dialect of Lena, word stress may fall in any of the three last syllables. It is, thus, possible to have an intervening syllable between the raising-triggering high final vowel and the target of raising, the stressed vowel. In these cases, raising operates as in the cases examined so far where trigger and target are adjacent. The vowel intervening unaffected, unlike what we saw a

(22) masc sg. | masc pl.  
būrbwēbanu | burwēbanos  
pēšaru | pāsaro  
kēkabu | kākabos  
kândanu | kándanos  
sēbanu | sābanos  
silīkūtiku | silīkotikos  
trwībanu | trwēbanos  

The most striking fact of raising the fact that this is an assimilation locality requirement generally as same underlying quality as that occur between trigger and target examples in (22) show.  
Let us assume that the raising spreading of the feature [+ high] I shall return shortly. An example of problem. The low vowel can be for the spreading feature [+ high] [+ high]. The mid stressed vowel feature [+ high] that is closest to only P-bearing units (segments in the condition which requires adjacent respected in an example like /trv/ 'boy':  

(23)  
P-bearing units:  
Autosegmental spreading:  

Examples like /kāndanu/ 'dry' indeed a possible target of the raising spreading by raising metachrony.  
Given standard assumptions a that can change a mid vowel to l
stressed vowels are found in adjectives with masculine singular in [-o], used in agreement with feminine singular. Some examples of these mass forms of adjectives are

white’  all’
handsome’  vet’
stuffed’  walked’
good’  good’
leap’  sound’
tupid’  lazy, loose’ nursery’
form or a mass or to countable objects

such as the demonstratives) show
kines place in this case:

in the Asturian dialect of Lena,
tsyllables. It is, thus, possible to
be raising-triggering high final
ed vowel. In these cases, raising
where trigger and target are

adjacent. The vowel intervening between trigger and target remains unaffected, unlike what we saw was the situation in Tudanca:\(^{16}\)

(22)  masc sg.  masc pl.  fem sg.
burwibanu  burwébanos  ‘wild strawberry’
péśaru  pásaros  pása  ‘bird’
kékabu  kákabos  ‘wreck’
kéndanu  kándanos  ‘dry branch’
sébanu  sábanos  sában  ‘sheet’
silikítiku  silikótkos  silikóti  ‘suffering from silicosis’
trwibanu  trwébanos  ‘beehive’

The most striking fact of raising metaphor in Lena Bable is precisely the fact that this is an assimilation process that seems to violate the locality requirement generally assumed in spreading rules. A vowel of the same underlying quality as that which undergoes the rule can patently occur between trigger and target without being affected, as some of the examples in (22) show.

Let us assume that the raising of the stressed vowel is caused by spreading of the feature [+ high] of the word-final vowel, a point to which I shall return shortly. An example like /trwébanu/ /trwibanu/ presents no problem. The low vowel can be taken not to be a possible P-bearing unit for the spreading feature [+ high], since a vowel cannot be [+ low] and [+ high]. The mid stressed vowel would then be the possible bearer of the feature [+ high] that is closest to the trigger of the process. Assuming that only P-bearing units (segments that can bear a particular feature; see Clements 1980, 1981) count in the computation of locality, the locality condition which requires adjacency between relevant segments would be respected in an example like /trwébanu/ ‘beehive’, just as it is in /nénu/ ‘boy’:

(23)  P-bearing units:

<table>
<thead>
<tr>
<th>trwébanu</th>
<th>nénu</th>
</tr>
</thead>
<tbody>
<tr>
<td>e u</td>
<td>e u</td>
</tr>
</tbody>
</table>

Autosegmental spreading:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[trwibanu]</td>
<td>[nínú]</td>
</tr>
<tr>
<td>[+ high]</td>
<td>[+ high]</td>
</tr>
</tbody>
</table>

Examples like /kándanu/ ‘dry branch’ show us, however, that /a/ is indeed a possible target of the rule. Low stressed vowels are changed to mid by raising metaphor.

Given standard assumptions about vowel features, there is no feature that can change a mid vowel to high and a low vowel to mid. Since these
two changes are undoubtedly produced by the same process, I will claim that indeed the feature that spreads to the stressed vowel is always the same feature, [+ high]. The spreading of this feature will raise stressed /e/ to [i] and stressed /o/ to [u] under the usual assumptions. It is then the raising from /a/ to [e] that requires some comment. My claim is that the impossible feature combination [+ low, + high] that would result from the metaphony process is changed to [− high, − low], that is, a mid vowel (see Calabrese 1987 for a more detailed and unrestricted treatment of feature incompatibility in vowel harmony). Whether this mid vowel is realized as [e] or as [o] will depend on the specification of /a/ as [− back] or [+ back]. In Lena /a/ becomes [e] by metaphony. The low vowel is thus specified as [− back] in this dialect. In the neighboring variety of the Nalon Valley, where metaphony seems to take place otherwise than in Lena (Blaylock 1965; Penny 1970), /a/ is raised to [o] and not to [e]; thus /gatu/ ‘cat’ in Lena is pronounced [gētu], in the Nalon Valley is pronounced [götə]. The difference is that in the Nalon Valley variety /a/ is [+ back].

Universal grammar thus provides a parameter with two options to solve the case when two incompatible features are combined. The unmarked option seems to be not to allow the linking of the feature that would create an incompatible feature combination. The Lena facts show that there is a second option: to change the value of both features to create a possible combination.17

There are processes of other languages that also suggest that the option of changing the incompatible specifications [+ high, + low] into [− high, − low] is taken. These are rules where, as in Lena, a high vowel causes the raising of a vowel from low to mid. A process of this type is found in Basque. In many Basque dialects /a/ is raised to [e] when the preceding vowel is high (see Hualde 1988). This is shown with the article /a/ in the examples in (24):

(24) gisōn-a ‘the man’  tšakúr-e ‘the dog’
    baiσo-a ‘the forest’  buro-e ‘the head’
    ets-e-a ‘the house’  mend-e ‘the mountain’
    akēf-a ‘the billygoat’  lapin-e ‘the rabbit’

An almost identical process is found in the Galician-Leonese dialect of Ancares (see Fernández González 1981). These processes could be interpreted as the spreading of the feature [+ high] of /i/, /u/ to /a/, thus producing a [+ high, + low] combination that, as in Lena, is then changed to [− high, − low].

Having established that /a/ is a possible target of raising metaphony, let us consider again the effects of the autosegmental spreading of the [+ high] feature of the final v [trwibanu] and /kándénu/ [kend]

(25) P-bearing units:
    Autosegmental spreading:

    An analysis of this process as a problem that pretonic vowels sh
giving *kuridru from /kordru/
     Lena, as we saw happened with cr at the stressed vowel. The correc

(26) P-bearing units:
    Autosegmental spreading:

    All these facts suggest that spr
place in an autosegmental main
metaphony in Tudanca, in a met
metaphony processes of the tv
feature percolation to all units in
head of the foot (that is, the
metaphony in Lena Bable is for

(27) Raising metaphony in Len
operation: spreading
mode: metrical
argument: [+ high]
domain: stress foot
target: head
trigger: ___

Derivations are given in (28). (that is, the stressed vowel):

(28) /silikōl[k] silikōlik/
by the same process, I will claim the stressed vowel is always the [+high] feature of the final vowel in examples such as /trwēbanu/ [trwēbanu] and /kândanu/ [kândanu]:

(25) P-bearing units:

<table>
<thead>
<tr>
<th></th>
<th>trwēbanu</th>
<th>kândanu</th>
</tr>
</thead>
<tbody>
<tr>
<td>eau</td>
<td>a au</td>
<td></td>
</tr>
</tbody>
</table>

Autosegmental spreading:

\[
\begin{array}{c}
[+ \text{high}] \\
[+ \text{high}] \\
[+ \text{high}]
\end{array}
\]

\* [trwēbanu] * [kândanu]

An analysis of this process as autosegmental spreading also presents the problem that pretonic vowels should also be affected by spreading, thus giving * [kurdīru] from /kordēru/ 'lamb'. However, raising metaphony in Lena, as we saw happened with centralizing metaphony in Tudanca, stops at the stressed vowel. The correct form is [kordīru]:

(26) P-bearing units:

<table>
<thead>
<tr>
<th></th>
<th>kordēru</th>
</tr>
</thead>
<tbody>
<tr>
<td>oe u</td>
<td></td>
</tr>
</tbody>
</table>

Autosegmental spreading:

\[
\begin{array}{c}
[+ \text{high}] \\
[+ \text{high}]
\end{array}
\]

\* [kurdīru]

All these facts suggest that spreading of [+ high] in Lena does not take place in an autosegmental manner, but, as in the case of centralizing metaphony in Tudanca, in a metrical fashion. The difference between the metaphony processes of these two dialects is that in Tudanca we have feature percolation to all units in the stress foot and in Lena only to the head of the foot (that is, the stressed vowel). The rule of raising metaphony in Lena Babbage is formalized as in (27): 19

(27) Raising metaphony in Lena Babbage

operation: spreading
mode: metrical
argument: [+ high]
domain: stress foot
target: head
trigger: ++#

Derivations are given in (28). I italicize the head of the metrical foot (that is, the stressed vowel):

(28) Stress assignm

<table>
<thead>
<tr>
<th></th>
<th>/silīkōti(ku)/</th>
<th>/pāša(ru)/</th>
<th>/gātu/</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>silīkōti(ku)</td>
<td>pāša(ru)</td>
<td>gātu</td>
</tr>
</tbody>
</table>

```
```
To sum up, metaphony in Lena Bable is a stressed-vowel raising rule that consists in the metrical spreading of the feature [+ high] of the final vowel to the head of the prosodic foot.29

I have assumed that the quality of the stressed vowel in the underlying representation of the morphemes is that which surfaces in forms other than the masculine singular and that the high-vowel-final masculine singular forms show the operation of a rule of vowel raising. It is clearly preferable to take as underlying vowels those which appear in forms other than the masculine singular and having a rule of vowel raising to obtain the forms in the leftmost column in (18)–(22), rather than taking the masculine singular forms as basic, with a rule of vowel lowering in the other forms. Not only are the masculine singular forms divergent in their vocalism from all forms bearing any other nominal inflectional markers; the evidence from derivational morphology also shows that the underlying quality of the stressed vowel is that which appears in the feminine, masculine plural, or mass forms, and not that of the masculine singular when this is different:

(29) masc sg./fem sg. derived form
fundo/fonda ‘deep’ fonduru ‘lower’
pēšaru/pāšara ‘bird’ pašarin ‘little bird’
tušu/tušóba ‘wolf’ tsobá ‘wolf pack’
gētu/gātə ‘cat’ gatiár ‘to crawl’

Another clear reason for taking non-masculine-singular forms as more basic is that from, say, the feminine singular or the masculine plural, we can always derive the masculine singular, but not vice versa. Consider, for instance, the minimal opposition, neutralized in the masculine singular, between futu/fiu ‘son/daughter’ and fiu/féa ‘ugly’ m/f. If we take the form of the stem that appears in the feminine as basic, we can regularly derive fiu ‘ugly’ from /fi-u/ by raising, whereas the underlying form of fiu ‘son’ is already /fi-u/. If, on the other hand, we were to take the masculine form as basic, we would have a stem /fi-/ in both cases and we would not be able to obtain the two different forms for ‘daughter’ and ‘ugly’ without lexical marking.

3. Vowel-harmony processes in 
P

The Pasiego dialect possesses three centralization of vowels under the Tudanca Montañés, but with inten-
phonic); (b) raising of the stressed v
Lenia Asturian (raising metaphor:
when the stressed syllable c
high vowel, also as in the Tudanc
now examine each of these three 

3.1. Centralizing metaphony in 
P

Unstressed final high back vowels and trigger the centralization of the 
dialect of Tudanca presents a sin 
these two Montañés dialects on centralization affects only vowels in 
the domain of centralization is the 
prepositions, and other clitics. 
(30a) with the Tudanca examples

(30) a. Pasiego
   Atri Stonau ‘sad’
   Isk Aiofru ‘shivering’
   rfrjAuli ‘sensitive’
   kUn II mAyIstru ‘with’

b. Tudanca
   ahambru ‘hungry’
   esanimu ‘discourage
   antimulim ‘very old
   aká el médiku ‘to the

Another difference with Tudan surface with /-e/, and realized as a
centralization, although it causes final /-e/, as we will see below.

centralization in Pasiego.

In Pasiego, thus, centralization difference between the two dialects on 
centralizing feature takes place 
without making use of metrics
3. Vowel-harmony processes in Pasiego Montañés

The Pasiego dialect possesses three processes of vowel assimilation: (a) centralization of vowels under the influence of a final high vowel, as in Tudanca Montañés, but with interesting differences (centralizing metaphony); (b) raising of the stressed vowel when the final vowel is high, as in Lena Asturian (raising metaphony); and, (c) raising of a mid pretonic vowel when the stressed syllable contains a prevocalic (high) glide or a high vowel, also as in the Tudanca dialect (unstressed vowel raising). I will now examine each of these three processes separately.

3.1. Centralizing metaphony in Pasiego Montañés

Unstressed final high back vowels in Pasiego are necessarily centralized and trigger the centralization of other vowels to their left. We saw that the dialect of Tudanca presents a similar process. An important difference between these two dialects is that, whereas in Tudanca centralization affects only vowels up to the stressed syllable, in Pasiego the domain of centralization is the phonological word, including articles, prepositions, and other clitics. Thus, compare the Pasiego examples in (30a) with the Tudanca examples in (30b):

(30) a. **Pasiego**
   - AtrlstOnÁU ‘sad’
   - IskA1OfjÁU ‘shivering’
   - rlfjrÁtkU ‘sensitive to cold’
   - kUn Il mAyÍstrU ‘with the teacher’

b. **Tudanca**
   - ahambrÁU ‘hungry’
   - esaníAmÁU ‘discouraged’
   - antígwÍslmU ‘very old’
   - aká el mEdIkU ‘to the doctor’s’

Another difference with Tudanca is that final /i/ (neutralized in the surface with /ε/, and realized as a schwa-type vowel) does not trigger centralization, although it causes the raising of the stressed vowel (unlike final /e/), as we will see below. Only final /u/ is thus the trigger of centralization in Pasiego.

In Pasiego, thus, centralization is not a stress-conditioned process. The difference between the two dialects is that in Pasiego the spreading of the centralizing feature takes place in a purely autosegmental manner, without making use of metrical prosodic structure. The centralizing
feature, which is assigned to a final unstressed high back vowel by a rule identical to (6), given for Tudanca above, is then assigned to all vowels in the phonological word by autosegmental spreading:

(31) atristonA\u201d -> \u201dAtristOn\u201d

\[ [-ATR] \quad [-ATR] \]

The rule can be formulated as in (32):

(32) Centralizing metaphor in Pasiego Montañés
operation: spread
argument: [-ATR]
mode: autosegmental
target condition: V

This rule is fed by the redundant assignment of the feature [-ATR] to final, unstressed, high back vowels.

In Pasiego there is stronger phonetic motivation than in Tudanca to assume that the feature that spreads in these cases is the feature [-ATR]. Penny (1969a) describes the vowels that occur in these contexts as being both centralized and engoladas, a term which seems to refer to the retraction of the root of the tongue. As in Tudanca, centralized A is close in point of articulation to an open [e]. E, which in Tudanca is much closer to its noncentralized counterpart than any of the other centralized vowels, is in Pasiego phonoetically indistinguishable from noncentralized e.²¹

McCarty (1984) and Vago (1988a) take the centralization feature to be the mark of the masculine singular count morphology. This point of view cannot be correct since there is no count morphology. The agreement behavior of items with count and mass forms clearly shows that it is mass morphology and not count morphology which is marked by means of extra morphological features (see Hualde 1989; Neira 1982: 163–166).

Nouns with a mass interpretation trigger mass agreement only with items to their right in the NP or outside of the NP. Targets of agreement to the left of mass nouns in the NP agree with the noun in gender (masculine or feminine) and not in the mass feature. The following examples are in the Lena dialect (adapted from Neira 1982):

(33) a. ésta maera estabá sêko
    [fem] -> [fem] [mass]
    [mass] —
    ‘This wood (mass) was dry.’

b. isti mañÔ estâba espígâo
    [masc] -> [masc] [mass]
    [mass] —
    ‘This corn field was ripe.’

On the other hand, count (masculine or feminine) with all

(34) a. ésta maera estabâ
    [fem] -> [fem] —
    ‘This piece of wood was d

b. isti mañÔ estâba es
    [masc] -> [masc] -> [mas]
    ‘This corn (individual

This shows that mass nouns cause a feature and a mass feature. Cou gender morphology. There is morphology (for more details Hualde 1989).

An additional argument against centralization is that not all mass centralization. Masculine singular other than /u/ or in a consonant present centralization, as the P

(35) pikañôn ‘itching’
    oraxon ‘with long ears’
    onbrîl ‘shoulder’
    aprindô ‘apprentice’

We can thus take the central metaphor processes that we have motivated. In Pasiego, centralize back vowel (which redundantly the case that all items with this

There is, however, a fact that the process in Pasiego. /o/ in one phonetic realizations that range includes the plural masculine, w

as masculine nouns taken to few exceptional masculine sin dialects in the area. In these metaphor, I represent final /-

(36) a. singular (/u/)
    AbI\u201dAnÂU
    Abi
    soI\u201dA\u201d
    solk
    kAStA\u201dAnU
    kas
    simpA\u201dIkU
    sim
On the other hand, count nouns trigger only gender agreement (masculine or feminine) with all targets of agreement:

(34) a. ęsta maéra estaba séka
    [fem][fem]→[fem]
    'This piece of wood was dry.'

b. isti maído estaba espigéu
    [masc][masc]→[masc]
    'This corn (individual plant) was ripe.'

This shows that mass nouns carry two morphological features, a gender feature and a mass feature. Count nouns, on the other hand, carry only gender morphology. There is thus mass morphology, but not count morphology (for more details and also examples from Pasiego, see Hualde 1989).

An additional argument against the morphological treatment of centralization is that not all masculine singular countable nouns present centralization. Masculine singular countable nouns may end in vowels other than /u/ or in a consonant or glide, in which case they will not present centralization, as the Pasiego examples in (35) show:

(35) pikaθón 'itching'
    orexón 'with long ears'
    onbrái 'shoulder'
    aprindío 'apprentice'

We can thus take the centralization process in Pasiego and the other metaphorical processes that we have considered to be purely phonologically motivated. In Pasiego, centralization is triggered by a final unstressed high back vowel (which redundantly carries the feature [− ATR]). It is simply the case that all items with this ending are masculine singular countable.

There is, however, a fact that obscures the phonological character of the process in Pasiego. /o/ in a final unstressed syllable in Pasiego has phonetic realizations that range from an open [u] to a closed [o]. This includes the plural masculine, which ends in [−os] in other dialects, as well as masculine nouns taken to express uncountable or mass entities and a few exceptional masculine singular countable nouns, as in the other dialects in the area. In these words with underlying /−o/ there is no metaphor. I represent final /−o/ as o:

(36) a. singular (/−u/) plural (/−os/)
    AbIsÁnU abiánus 'hazelnut tree'
    sOldÁU soldáos 'soldier'
    kAstÁnU kastánus 'chestnut tree'
    sImpÁtKU simpátikos 'nice'
b. Exceptional masculine singular /-o/
   berano 'summer'
marto 'March'
santjago 'July'
sano 'plain'
dweto 'sorrow'
sweto 'sleep'
tjempo 'time'
iljerno 'winter'
apuro 'fear'
du 'finger'
kareto 'horse with white hair on its forehead'
toro 'bull'

Whereas /u/ in a final unstressed syllable is realized as U, /o/ in the same context is realized as u (that is, open [u] or closed [ø]).

The five phonological vowels of Pasiego give a four-way phonetic contrast in unstressed word-final position, since the distinction between /-e/ and /-i/ is neutralized. The situation is summarized in (37) (see Penny 1969a: 51 for a precise phonetic characterization of each of the four surface vowels in word-final position):

(37) Vowels in unstressed word-final position
   [-i/-e] → a/-o/ø
   [-i/-e] → a/-o/ø

To sum up, the metaphor process of centralization in Pasiego involves the autosegmental spreading of the feature [-ATR], which is assigned by rule to final /-u/ to all vowels within the domain of the phonological word.

3.2 Unstressed vowel raising in Pasiego Montañes

As in the Tudanca dialect, in Pasiego mid vowels to the left of a stressed syllable containing a high vowel or prevocalic glide are raised to high, although lexical exceptions are found. The operation of this process can be observed in verbal paradigms. In the forms in the left column the stressed vowel is mid or low. In the related forms listed on the right, the stressed syllable has a high vowel or a prevocalic glide and the pretonic (underlyingly mid) vowels are also high.

(38) koxere 'I will take'
koxeras 'you will take'
koxamos 'we take (su

This process has a form [+high] feature of the stressed vowels in the domain:

(39) koxeria→kuxeria
    [+high] [+high]

A difference with Tudanca articles and prepositions and Pasiego, although they are no

(40) pU kAmInU
    compare po la kase
    mi le djio
    compare me lo kompro

As we can see in the exam but allow the further spreadin vowels are not raised is not a
for a low vowel not to take situation is that found in Len
give [-high, -low].
I will assume that the featur the left of the stressed high vowel feature combination would be

(41) pOI kAmInU→pU kA
    [+high] [+]

3.2. Raising metaphor in P

As in Lena Asturian, in Pasiego when the word-final vowel in singular countable forms in the
/-o/-final mass forms, (a), or column:
Vowel-harmony systems of Spain

(38) koxéré 'I will take' kuxiria 'I would take'
koxerás 'you will take' kuxiriamos 'we would take'
koxámos 'we take (subj)' kuxirá 'I took (subjunctive)'

This process has a formulation identical to that in Tudanca: the [+ high] feature of the stressed vowel is spread autosegmentally to other vowels in the domain:

(39) koxería→kuxiría

[+ high] [+ high]

A difference with Tudanca, nevertheless, is that noun clitics such as articles and prepositions and verbal pronouns are affected by raising in Pasiego, although they are not in Tudanca:

(40) pUl kAmÍnU 'by the road'

compare po la káxe 'by the street'

mi lu dó 'he gave it to me'

compare me lo kompró 'he bought it for me'

As we can see in the example pUl kAmÍnU, low vowels are not raised but allow the further spreading of the feature [+ high]. The fact that low vowels are not raised is not surprising. It is probably the unmarked case for a low vowel not to take the feature [+ high]. The more surprising situation is that found in Lena, where [+ high] combines with [+ low] to give [- high, - low].

I will assume that the feature [+ high] spreads initially to all vowels to the left of the stressed high vowel and is then delinked when an impossible feature combination would be created.24

(41) pOl kAmÍnU→pUl kAmÍnU→pUl kAmÍnU

[+ high] [+ high] [+ high]

3.2. Raising metaphor in Pasiego Montañés

As in Lena Asturian, in Pasiego stressed mid vowels are raised to high when the word-final vowel is high. Compare the /u/-final masculine singular countable forms in the left column of (42) with the corresponding /o/-final mass forms, (a), or plural /os/-final forms, (b), in the right column:
manner. He orders this procedure that stressed lax (that is, ce changed to high by the rule in

(45) Raising: 

[+ stress] [+ high]

[- tense]

For example, /kêsU/ first be stipulation, in (45) that disallow 

[kêsU]. This treatment misses and does not offer an explan reason is patently that the fin assimilation in height. As su feature [+ high] from the final be only whether this spreading character.

Further, there are data wih analysis. There is nothing so prevents them from surfacing are also raised under the sat underlyingly high. This is the mentioned, does not cause raising of a stressed vowel. For as schwa-like vowels; but, wh vowel, /-e/ does not. As in the final words that causes raising other areas, where final [-i] is are the masculine singular de the second conjugation:

(46) /es/ is 'this' (mas. s compare fem. sg. ést /es/ is 'that' (mas. sg compare fem. sg. ésa /bebi/ biba 'drink'; cor /komi/ kúmu 'eat'; con

Raising is thus independent.

It is not possible to decide the postonic vowel in proper extremely rare in this position
manner. He orders this process after centralization. Then he postulates that stressed lax (that is, centralized) mid vowels are forbidden and changed to high by the rule in (45):

\[(45) \text{Raising: } \text{[high]} \rightarrow [\text{+ high}]\]

\[\downarrow \quad \text{[+ stress]}\]

\[\downarrow \quad \text{[− tense]}\]

For example, /kıs\u00fAk/ first becomes /k\u00fAk\u00f3/. Then the rule, or rather the stipulation, in (45) that disallows stressed lax mid vowels changes this into [k\u00f3\u00f3]. This treatment misses the point that this is an assimilatory process and does not offer an explanation for the raising of these vowels. The reason is patently that the final high vowel triggers the raising. This is an assimilation in height. As such it must be treated as spreading of the feature [+ high] from the final vowel to the stressed vowel. The issue will be only whether this spreading process is autosegmental or metrical in character.

Further, there are data which cannot be accounted for in McCarthy's analysis. There is nothing special about stressed centralized vowels that prevents them from surfacing as mid. Noncentralized stressed mid vowels are also raised under the same circumstances, when the final vowel is underlyingly high. This is the case when the word ends in /-i/, which, as we mentioned, does not cause centralization but, as in Lena, causes the raising of a stressed vowel. Final /-e/ and /-i/ are neutralized and realized as schwa-like vowels; but, whereas /-i/ causes the raising of the stressed vowel, /-e/ does not. As Penny (1969a: 65) points out, the group of [e]-final words that causes raising is the same group that have final [-i] in other areas, where final [-i] is distinguished from final [-e]. Among them are the masculine singular demonstratives and the imperative of verbs of the second conjugation.

\[(46) \text{/est\u00ed/ esto 'this' (masc. sg.):}\]

\[\text{compare fem. sg. est\u00e1, masc. pl. est\u00f3s}\]

\[\text{/es\u00ed/ esa 'that' (masc. sg.):}\]

\[\text{compare fem. sg. \u00e9sa, masc. pl. \u00e9sos}\]

\[\text{/beb\u00ed/ biba 'drink!'; compare beb\u00e9r 'to drink'}\]

\[\text{/kom\u00ed/ k\u00e9ma 'eat!'; compare k\u00e9mor 'to eat'}\]

Raising is thus independent from centralization.

It is not possible to decide whether stressed vowel raising also affects the posttonic vowel in proparoxytones, given the fact that /e/ and /o/ are extremely rare in this position. In Lena, we had clear evidence that only
the stressed vowel was affected in examples such as pešaró (pl. pešaróv), since low vowels are possible targets of raising metaphony in that dialect. In any case it is possible to understand the process as being essentially metrical spreading of the high feature of the final vowels to the head of the metrical foot.

Stressed vowel raising is ordered before and triggers the rule of high harmony. This is apparent in the example /korderú/ kUrdrIrU 'lamb' given in (44). Compare this with the Lena form kordirú, which shows stressed vowel raising but not high harmony. Other examples are given in (47):

(47) /kontentú/ kUniÍntU ‘happy’ (compare pl. konténtus)
     /fédondu/ fídUndU ‘round’ (compare pl. fédondus)
     /golosu/ gUlIsU ‘sweet-toothed’ (compare pl. golóso)

Notice that it is not possible to collapse unstressed vowel raising and high harmony into a single rule, something like ‘spread [+ high] to the left’, without any reference to the stressed/unstressed distinction. The reason is that unstressed nonfinal high vowels and glides do not trigger the raising of other vowels. This is shown by examples such as okálitú ‘eucalyptus’ (not *ukálítu), okalítal (not *ukalítal), kÓmfísOnÁrjU ‘confessional’ (not *kUmfsIsUnÁrjU).

To wind up, consider the derivation of il kUrdrIrU ‘the lamb’, which involves the three processes of centralization, stressed vowel raising, and high harmony:

(48) Underlying: /el korderú/ el Korderú
    Stress assignment: [stress]
    Linking of [− ATR]: [− ATR]
    Centralizing metaphony: [− ATR]
    (autosegmental spreading) El kOrdIrU
    Raising metaphony: (metrical spreading to head of foot) El kOrdIrU
    Unstressed-vowel raising: (autosegmental spreading) [+ high]
     II kUrdrIrU
     [+ high]

Of these processes, stress assigns metaphony, and raising metaphony. The linking and spreading follow the assignment of stress (as assigned this feature) but need no rules (contra McCarthy 1984).

I should like to remark, before abstract and complex properties turn out not to be essential at all (laxing, in his terminology), must be a factor before the raising processes. The high, never surfacing stressed lax in his raising rule (reproduced in [45], this treatment is particularly at an intermediate derivational k which will never surface as su position. If stressed, it will be released through this rule delinking its [− tense].

In this paper, I have shown raising need not be ordered in crucial need for intermediate ab ing nor found in the surface, a targets for other rules. I have centralizing metaphony affects of phonetic implementation will quality as noncentralized e in P. (see note 21). Thus since specific rules of phonetic other centralized vowels (and f as position; see [37] above). The vowel undergoes the linking of the analysis. We could have a vowel transparent for the reason allowing the propagation of crucially ordered after centrali tive vowel E is not required simplicity can lead us to prefer

To conclude, Pasiego has g ı been raised by final vowels; a case autosegmental spreading of the
Of these processes, stress assignment must necessarily precede raising metaphor, and raising metaphor applies before unstressed vowel raising. The linking and spreading of the feature [−ATR] must also follow the assignment of stress (assuming that only unstressed final /-u/ is assigned this feature) but need not be ordered with respect to the raising rules (contra McCarthy 1984).

I should like to remark, before concluding, that some of the most abstract and complex properties required in McCarthy's (1984) analysis turn out not to be essential at all. McCarthy claims that centralization (laxing, in his terminology), must be a phonological rule crucially ordered before the raising processes. The reason for this is to obtain abstract (that is, never surfacing) stressed lax mid vowels Ε, Ο, which are the targets of his raising rule (reproduced in [45] above). In the case of the front mid lax vowel, this treatment is particularly abstract, since it requires the presence at an intermediate derivational level of a phonologically distinct vowel Ε, which will never surface as such, either in stressed or in unstressed position. If stressed, it will be raised to Ι. If unstressed, it will undergo a later rule delinking its [−tense] feature and will be reanalyzed to ε.

In this paper, I have shown that the processes of centralization and raising need not be ordered in phonological derivations. There is no crucial need for intermediate abstract vowels, which are neither underlying nor found in the surface, and which are created simply to serve as targets for other rules. I have assumed, without much discussion, that centralizing metaphor affects all five underlying vowels and that a rule of phonetic implementation will indicate that centralized Ε has the same quality as noncentralized ε in Pasiiego (and that it is only slightly different from ε in Tudanca; see note 21). This seems to be the simplest assumption, since specific rules of phonetic implementation are also needed for the other centralized vowels (and for noncentralized vowels in unstressed final position; see [37] above). These rules will specify that Ο has a phonetic quality close to [o], that Α has a point of articulation close to that of [e], etc. (see Penny 1969a: 50–51, 1969b). But assuming that the front mid vowel undergoes the linking of the centralizing feature is not crucial for the analysis. We could have proposed that, in the Pasiiego dialect, this vowel is transparent for the centralization process, not being affected but allowing the propagation of the centralizing feature. Since no rule is crucially ordered after centralizing metaphor, the presence of a distinctive vowel Ε is not required. Only reasons of pattern congruity and simplicity can lead us to prefer one of these two analyses over the other.

To conclude, Pasiiego has two metaphor processes (processes triggered by final vowels): a centralization process which consists in the autosegmental spreading of the feature [−ATR], assigned to begin with
to final unstressed /-u/; and a raising process, which affects the head of the stress foot and makes use of the metrical structures created for stress assignment. In addition it has another process of autosegmental leftward spreading of the feature [+ high], which originates on the stressed vowel. We thus find in this dialect instances of both metrical and autosegmental vowel-harmony processes.

4. Conclusion

I have identified two parameters along which vowel harmony systems may differ in stress languages. The harmony process may be autosegmental or metrical in nature. In this second case, it may affect all vowels in the stress-defined unit or only the stressed vowel (the head of the foot). The three types of vowel harmony that these two binary parameters define are attested in a small area of northwestern Spain; in fact, one dialect, Pasiego, has both a metrical and an autosegmental vowel-assimilation process. It is likely that at least two of these types are also found in another area of Spain with vowel harmony, Eastern Andalusia. The interesting fact is that a seemingly unitary phenomenon such as vowel harmony may be instantiated by two quite distinct mechanisms of universal grammar: autosegmental spreading and metrical percolation, depending on the particular characteristics of the process. This should not be too surprising, given the independent justification for the existence of each of these two components of universal phonology. A similar variation could be expected in the assignment of prosodic features in the so-called pitch-accent languages, which present characteristics somewhat in between those of pure tonal languages and those of stress-accent languages and are often historically related to languages with purely tonal or stress-accentual prosodic types. There is general agreement that tonal assignment is instantiated by autosegmental means, whereas stress is assigned metrical. There is much less agreement as to the proper analysis of some pitch-accent languages. A detailed analysis might very well reveal that neighboring pitch-accent varieties differ precisely on whether autosegmental or metrical means are used in the assignment of prosodic features (see Hualde 1988: ch. 6 for some discussion of this issue as it relates to pitch accent and stress accent in Basque dialects).

Received 23 November 1988
Revised version received 8 May 1989

Notes

• Parts of this paper were presented at the December 1988 Meeting of the LI the audience at these presentations. Larry Hyman. I am also grateful to Debbie Schindewein, and three i errors are mine. Correspondence: University of Illinois

1. The speakers of Montañés dialect ‘village style’ (see Holmeski and Santiander before the administrative notes section) reserve the use of capitals to represent these forms.

2. Penny (1978) uses a different note to shade the use of capitals to represent these forms.

3. Compare also the finite i imperative to throw him/hér (mas.) versus centralization spreads up to the corresponding forms bear centralization (Penny 1978: 81).

4. I assume that only final unstressed the stressed pronoun de ‘you’ as you are above in the main text). This a section 5.

5. Given the lack of phonetic parentheses may, it is difficult to I to characterize a centralized vowel would indicate that perhaps the articulation point is cut by Penn to show that perhaps [−ATR] does not affect the analysis in a central way.

6. My distinction between metrical and terminological usage in van der Hem ‘autosegmental’ in connection with the process is meant to be metrical but not affect the analysis in a central way.

7. A similar treatment is proposed for Andalusian dialects.

8. The analysis that I present below (1988), although there are some

9. Penny proposes [ku:k] as a that appears in other words sue the deletion of the suffix-initial considering.

10. A somewhat similar influence on dialects, to the west of the area. The phonetic motivation for e front vowels tend to acquire l vowels tend to acquire a more
which affects the head of the structures created for stress of autosegmental leftward originates in the stressed vowel. The metrical and autosegmental Which vowel harmony systems may process may be autosegmental, it may affect all vowels in the way (the head of the foot). The two binary parameters define are Spain: in fact, one dialect, autosegmental vowel-assimilation these types are also found in Atony, Eastern Andalusia. They 1. A unitary phenomenon such as a quite distinct mechanisms of dinging and metrical percolation of the process. This should not for the existence of the phonology. A similar variation prosodic features in the so-called characteristics somewhat in those of stress-accent languages ages with purely tonal or stress-agreement that tonal assigns, whereas stress is assigned to the proper analysis of some this might very well reveal that precisely on whether autosegment-assignment of prosodic features of this issue as it relates to dialects.

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Notes

- Parts of this paper were presented at a seminar at the University of Illinois, at the December 1988 Meeting of the LSA, and at BLS 15. I want to thank the members of the audience at these presentations, especially Chuck Kisseberth, Dana Archangeli and Larry Hyman. I am also grateful to Jim Harris, Dieter Wanner, Doug Pulleyblank, Debbie Schmidewin, and three reviewers for Linguistics for helpful comments. All errors are mine. Correspondence address: Department of Spanish, Italian, and Portuguese, University of Illinois, 707 S. Mathews Avenue, Urbana, IL 61801, USA.

1. The speakers of Mentenhe dialects simply refer to their variety as estiu public, that is, ‘village style’ (see Holmquist 1982). Cantabria was known as the Province of Santander before the administrative restructuring of Spain into autonomous regions.

2. Penny (1978) uses a different notation, with diacritics above and under the vowels. He reserves the use of capitals to represent the neutralization of oppositions in phonological representations.

3. Compare also infinitive/imperative pairs bearing the masculine clitic 1U such as it 1A1U ‘to throw him/11’ (masc.) versus it 1A1U ‘throw it’ (masc.). These examples show that centralization spreads up to the stressed vowel in each case. Both examples contrast with corresponding forms bearing the mass clitic le, which does not cause any centralization (Penny 1978: 81).

4. I assume that only final unstressed vowels undergo this process of centralization, since the stressed pronoun it ‘you’ (sg.) does not have a centralized vowel (see discussion above in the main text). This also applies to the Passiego dialect, to be discussed in section 3.

5. Given the lack of phonetic parallelism between different pairs of centralized/noncentralized vowels, it is difficult to know what the most appropriate phonological feature to characterize centralized vowels would be. The phonetics of the low centralized vowel would indicate that perhaps the appropriate feature is [−tense]; but other details of articulation pointed out by Penny (1969a) in the description of the Passiego dialect seem to show that perhaps [−ATR] is more adequate (see section 3.1). The choice of feature does not affect the analysis in any manner, however.

6. My distinction between metrical and autosegmental spreading differs from the terminological usage in van der Hulst and Smith (1982). These authors employ the term ‘autosegmental’ in connection with their analysis of nasalization in Guarani, for instance, even though they claim that the domain of application of this spreading process must be defined in metrical terms. In the terminology used in this paper, that would be a metrical process.

7. A similar treatment is proposed by Zubizarreta (1979) for stress-conditioned lax harmony in Andalsian dialects of Spanish.

8. The analysis that I present resembles more that of Harris (1983) than that of Roca (1988), although there are some differences in the assumptions.

9. Penny proposes /kukyjega/ as underlying form for this word, with the same suffix /-eg/- that appears in other words such as hembrica ‘cow that gives birth to females’. I ignore the deletion of the suffix-initial /k/, since it is irrelevant for the process that we are considering.

10. A somewhat similar influence of labials on neighboring vowels is also found in Galician dialects, to the west of the area with which we are concerned (see Porto Da pena 1988).
of the labial consonant. Doug Pulleyblank (personal communication) reports that the Nigerian language Ekparkon also has a process of centralization of vowels under the influence of neighboring labial consonants.

11. A reviewer remarks that a reason for excluding the final vowel from the domain of the rule could be that it constitutes an inflectional marker. To postulate a domain for the application of this rule that excludes inflectional endings, however, would be paradigms in a dialect such as Pasiegio where articles and other proclitics are in fact affected by raising (see [38]). The domain of the rule must then clearly be at least the phonological word, which may be larger than the morphological word, and not some subword domain.

12. The feminine plural ending is [-as] in the Upper Lena Valley, but [-es] in Lower Lena. The alternation, feminine singular [-al], feminine plural [-es] is characteristic of the Barel of the central region of Asturias.

13. In the case of inanimates with both masculine and feminine forms, the masculine frequently indicates a smaller object than the feminine, for example, a bentana is a smaller window than a bentana.

14. It is not the case that all masculine singular adjectives or nouns end in [-u], although this is the most common ending; see section 3.1.

15. For details on the use of ‘mass’ adjectives see Hualde (1989).

16. I have been unable to find any examples of words with stress on the antepenultimate syllable and a mild vowel in the penut. As mentioned above in 1.2, words with these characteristics are rare in Spanish, especially outside of the learned or scientific vocabulary, which is generally not included in dialectological studies.

17. A third possibility would be the blocking of the spreading operation (see, for instance, Vago 1988b). How a language chooses among these options is an open question. An approach that has been taken to determining the option chosen in particular cases involves the use of radically underspecified phonological representations (see Archangeli and Pulleyblank i.p.; Shuyers 1988; Vago 1988a, 1988b; among others). My main objection to such treatments is that the proposed underspecified representations often either are incompatible with other facts of the language which are independent of the harmony process in question or require radically different underlying representations for the sound systems of closely related dialects. As a case in point, Vago (1988a, 1988b) postulates that in Pasiego /a/ is the maximally underspecified vowel, to account for the fact that this vowel behaves as transparent for the spreading of the feature [+ high]. This is hard to reconcile with the independent fact that in Spanish the vowel that systematically behaves as a neutral vowel is /e/ and not /a/ (for example, in a number of processes of vowel epenthesis; see Harris 1980, 1983, 1985), and Pasiego does not seem to differ from Standard Spanish in this respect.

18. Another example of a process where high vowels trigger the raising to mid of the low vowel is given in Poser (1982) from Wolofe. In this language /a/ is raised to [e] between two high vowels.

19. Zabazaretu (1982) establishes a distinction between nonpolatized feet, in which the same feature value percolates to all positions, and polarized feet, where weak and strong positions receive different specifications. Such a distinction seems to characterize appropriately the different effects of the metaphor rules in Tudanca and Lena.

20. A question that arises is why only final vowels trigger metaphor. Why does the prefinal high vowel in the plural form silikiketek trigger the raising of the stressed vowel? Adapting the solution that Siwyers (1988) proposes to explain comparable facts in a Southern Italian dialect, we could claim that metaphor obeys the strict cycle condition (Mascaró 1976; Kiparsky 1982, 1985; see also Hualde i.p.). Metaphony, being thus restricted to derived underlying domain of the stem.

Another possibility would be to change the element in the penultimate syllable assumed. In that case, the high metaphony if it did not lose its application. On the theoretical issue and Kagen (1986) and Roca (1987) in any event, it seems that, if the high metaphony was able to affect the stressed vowel /agga/ 'eagle,' we find aga in Pasiegio.

21. The centralizing metaphor p domain will belong to the men centralization subset, in phonetic terms, will be the work of rules of place, some centralized vowels are higher than some others. Degrees of centralization E to be a phoneme, noncentralized e, even though Tudanca) or identical to Pasiego transparent vowel in Pasiego; spreading of the centralizing fe will be the case in McCarthy's i.

22. Final /a/ is phonetically different I ignore this phonetic difference.

23. McCarthy (1984) claims that t stressed vowel is mid; but, as V lowering process.

24. Based on the example, Pasiego prj'ot unstressed vowels can take place be the only example. Stressed k for example, por agra (Penny 1 'meadow' is actually monosyllabic, maja) what seems to be the raising in the preceding this raising.

25. /X/ is the consonant that is in Tudanca.

References

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being thus restricted to derived environments, would be blocked from applying in the underived domain of the stem [silikotik].

Another possibility would be to postulate that, in proparoxytones, the extrametrical element is the penultimate syllable (see Harris 1983) and not the last syllable, as we have assumed. In that case, a high vowel in the penultimate syllable would not trigger metaphor if it did not lose its extrametricality until after the rule of metaphor had applied. On the theoretical issues that such a view on extrametricality raises, see Den Os and Kager (1986) and Reza (1988).

In any event, it seems that, historically, a penultimate high vowel in a proparoxytone was able to affect the stressed vowel, at least sporadically. Thus, for Castilian Spanish /āgila/ ‘eagle’, we find /āgil/ in Lena.

21. The centralizing metaphor process gives the result that all vowels in the relevant domain will belong to the centralized subset of vowels. What it means to belong to the centralized subset, in phonetic terms, is then separately determined for each vowel. This will be the work of rules of phonetic implementation. As we saw also for Tudanca, once centralizations are higher than their noncentralized counterparts, whereas some others are lower. Degrees of centralization also vary on a vowel-specific basis. I take centralized E to be a phonological entity which is phonologically different from noncentralized e, even though both vowels may be phonetically very similar (in Tudanca) or identical (in Pasiego). It would also be possible, however, to consider /e/ a transparent vowel in Pasiego, which is not affected by centralization but allows the spreading of the centralizing feature through it. Nothing crucial would hinge upon this, unlike the case in McCarthy’s (1984) analysis, as we will discuss.

22. Final /-u/ is phonetically different from /-a/ in other positions but in my transcriptions I ignore this phonetic difference, which is phonologically irrelevant.

23. McCarthy (1984) claims that there is also lowering of stressless high vowels when the stressed vowel is mid; but, as Vago (1988a) points out, there is no clear evidence for a lowering process.

24. Based on the example prAU ‘by the meadow’, Vago (1988a) claims that raising of unstressed vowels can take place in cases where the stressed vowel is low. This seems to be the only example. Stressed low vowels do not trigger raising in any other examples; for example, por ágwua (Penny 1969: 145) ‘for water’, not *por ágwua. The word prAU ‘meadow’ is actually monosyllabic: pr/AW (adapting Penny’s transcription to our symbols). What seems to be happening here is that the glide in the stressed syllable is causing raising in the preceding elide, and not that the low vowel is somehow triggering this raising.

25. /x/ is the consonant that is realized as [ʃ] in Lena, as [x] in Pasiego, and as [h] in Tudanca.

References


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