

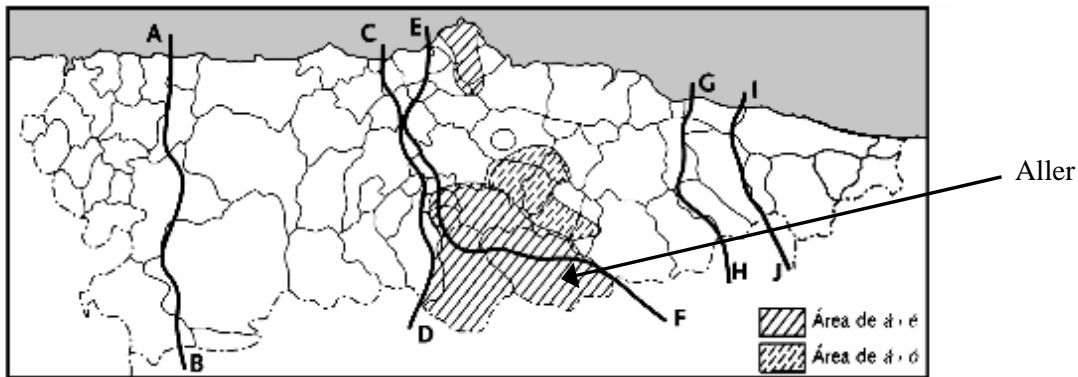
An Analysis of Metaphony in Felechosa Asturian*

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1. Introduction

- This paper presents an analysis of metaphony in Felechosa Asturian (henceforth FA; Arias Cabal 1992)
- Felechosa is in the Aller municipality located in the Caudal Valley in Asturias (northern Spain)

- (1) Map of Asturias (reproduced from Cano Gonzalez 1992: 29; regions exhibiting metaphony are shaded)



- Data were gathered from three native speakers of FA; main consultant is a man about 50 years old from Felechosa
- All data are from the first author's field notes except where noted

2. Vowel processes in FA

-Five-vowel system: /i, e, a, o, u/

- (2) Vowel features

	i	e	a	o	u
[high]	+	-	-	-	+
[low]	-	-	+	-	-
[back]	-	-	-	+	+

-Metaphony: stressed vowel in a word undergoes (partial) raising harmony triggered by a high suffix vowel

- (3) Metaphony: /a/ to [e]

pélu	'stick'	pálos	'stick-PL'
θapétu	'shoe'	θapátos	'shoe-PL'
βléŋku	'white-M.SG'	βláŋkos	'white-M.PL'

- (4) 'Transparent' vowels in proparoxytones (also present in Nalón Valley (Walker 2006))

péjaru	'bird'	pájaros	'bird-PL'
séβanu	'sheet'	sáβanos	'sheet-PL'

- (5) Metaphony (plus final vowel lowering): /e, o/ to [i, u]

a. níγro	'black-M.SG'	néγros	'black-M.PL'
uíjo	'eye'	uéjos	'eye-PL'
βuíno	'good-M.SG'	βuéno	'good-N.SG'
b. súrðo	'deaf-M.SG'	sórðos	'deaf-M.PL'
útro	'other-M.SG'	ótros	'other-M.PL'
gúrðo	'fat-M.SG'	górðo	'fat-N.SG'

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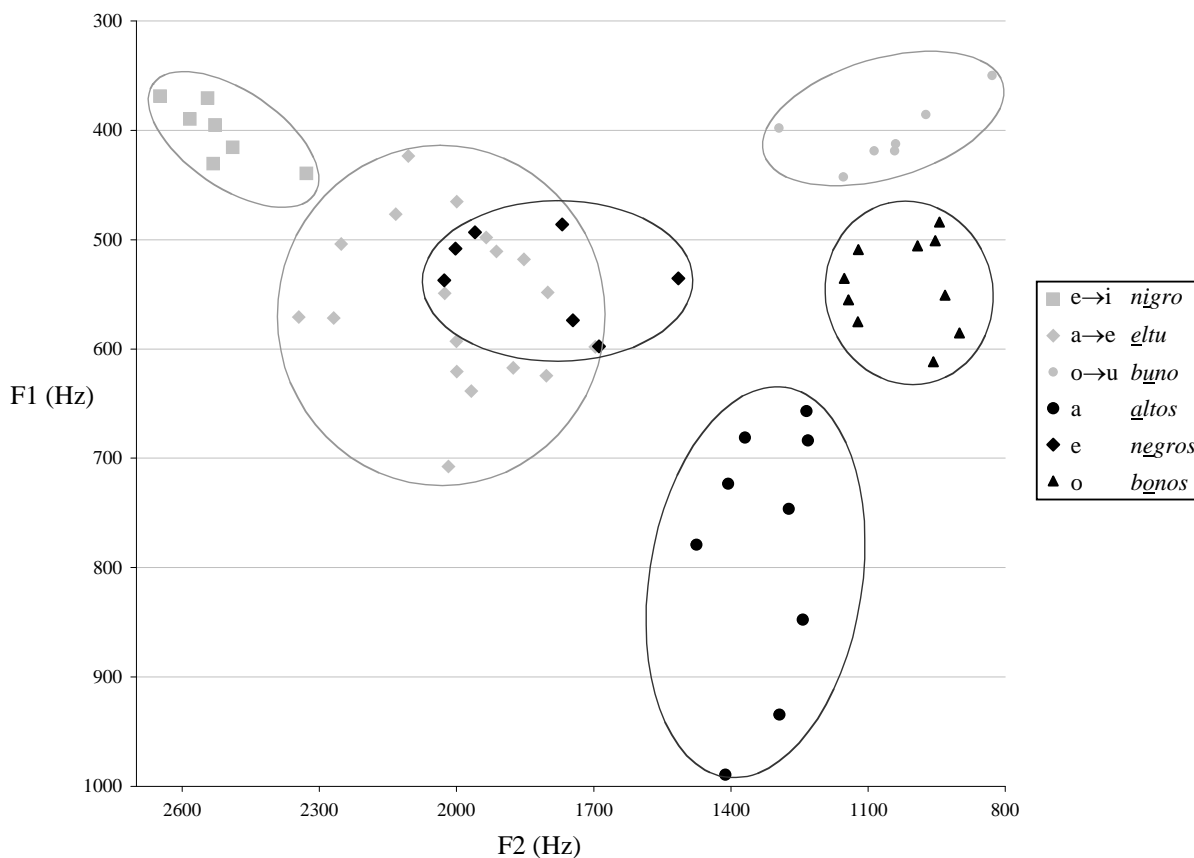
- (6) No change to underlyingly high root vowels
 río ‘river’ ríos ‘river-PL’
 muntʃo ‘much-M.SG’ muntʃos ‘much-M.PL’

- Lowering occurs in words with an underlying mid stress vowel that raises to high
- This is noted by Arias Cabal (1992) but described as non-neutralizing
- Does lowering occur in any word with a high stressed vowel or only when raising applies?
 - This determines whether lowering is triggered by the stressed high vowel or is parasitic on metaphony
 - Arias Cabal (1992: 2) claims that final [u] is found only in words with underlyingly low stressed vowels
 - Our efforts to test this were unsuccessful; see Nuchi (2009) for discussion

3. Phonetic study

- Does raising result in neutralization?

- (7) F1 and F2 of stressed vowels in FA



(Note: insufficient tokens of /i, e/ to compare with derived [i, e]; see Nuchi 2009 for discussion)

- (8) Mean F1 and F2 values for stressed vowels in FA

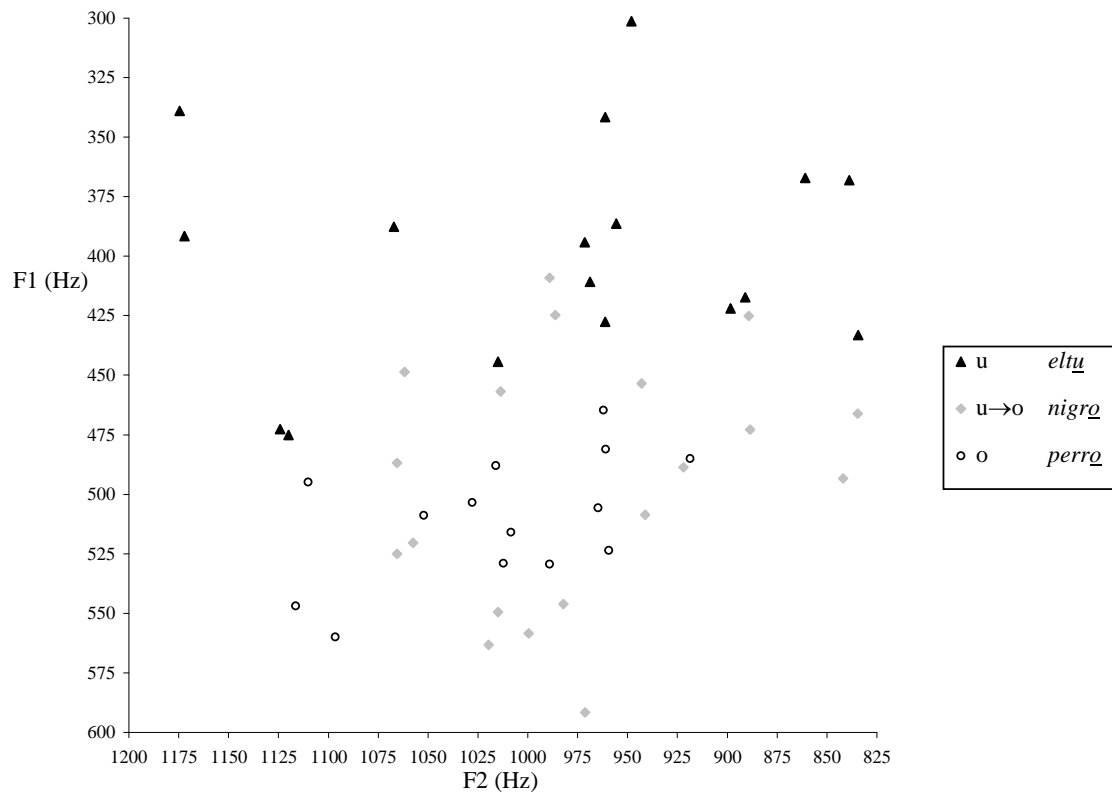
vowel	F1 (Hz)	F2 (Hz)
e→i	402	2522
a→e	557	1999
o→u	413	1026
a	782	1326
e	533	1815
o	541	1021

- Mean differences in F1 and F2 for /e/ vs. /a/→[e] are 24Hz and 184Hz, respectively
- Just-noticeable differences are 10-30 Hz for F1, 20-100 Hz for F2 (Stevens 2000: 228)
- Difference in F1 in this study does not reach significance (p=0.303)
- Difference in F2 may be significant (p=0.048)

-Does lowered final /-u/ merge with /o/?

- Arias Cabal (1992: 9) analyzes the change as categorical but finds varying realizations of the lowered /u/
- In our data, /u/ → [o] is not distinguishable from /o/

(9) F1 and F2 of /o/, /u/, and /u/→[o] in FA



(10) Mean F1 and F2 values for final vowels in FA

vowel	F1 (Hz)	F2 (Hz)
u	399	986
u→o	494	973
o	510	1014

- F2 difference not significantly different for any pair (p=0.383 for o vs. u; 0.089 for o vs. u→o; 0.683 for u vs. u→o)
- F1 differences suggest merger of lowered /u/ with /o/:
 - For /o/ vs. /u/→[o], mean F1 difference (16 Hz) is not significant (p=0.273)
 - For /o/ vs. /u/, mean F1 difference (111 Hz) is significant (p<0.001)
 - For /u/ vs. /u/→[o], mean F1 difference (95 Hz) is significant (p<0.001)

4. Analysis

- Metaphony and lowering are not merely phonetic – see above
- Also, there is no phonetic motivation for lowering; a coarticulatory lowering effect would apply when the stressed vowel is non-high

-Metaphony is not suppletive allomorphy; masc. sg. forms with exceptional /-o/ do not show raising

(11) Forms with exceptional /-o/

péro	‘dog’	péros	‘dog-PL’
fórno	‘oven’	fórnos	‘oven-PL’
óso	‘bear’	ósos	‘bear-PL’

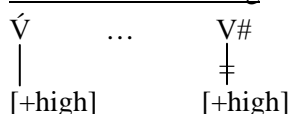
4.1 A rule-based account

-Requires two metaphony rules and a lowering rule

(12) Metaphony



(13) Final vowel lowering



-Ordering: metaphony > final vowel lowering (lowering counterbleeds metaphony)

-Problems with the rule-based account:

-If metaphony = spreading

-Gapped representations/line crossing violations in forms with prepenultimate stress

-Not clear how to get from gapped representation in (12)a to separate instances of [+high] that trigger lowering in (13)

-If metaphony = rewriting [-high] as [+high] when the final vowel is [+high]

-Redundancy and lack of representational motivation for metaphony

4.2 An OT account à la Walker

-Metaphony is driven by the poor perceptibility of height features in a word-final unstressed high vowel

-Height feature perceptibility is enhanced via realization in a strong position

-Impressionistically, vowel height is hard to distinguish (and F1 hard to measure) word-finally in FA

(14) Constraints needed for metaphony

∃LICENSE(height)/ó: For any instance of [high] or [low] in a high vowel in a word, some member of that feature’s chain belongs to a stressed syllable (adapted from Walker 2004).

IDENT[high]

IDENT[low]

(15) *pelu* ‘stick’

/pal-u/	∃LICENSE(height)/ó	IDENT[high]	IDENT[low]
a. pálu	**!		
b. pélu	*		*

(16) Constraint needed to ensure stepwise raising

IDENT[high]&IDENT[low]

(17) *pelu* ‘stick’

/pal-u/	IDENT[high]&IDENT[low]	∃LICENSE(height)/ó	IDENT[high]	IDENT[low]
a. pálu		**!		
☞ b. pélu		*		*
c. pílu	*!		*	*

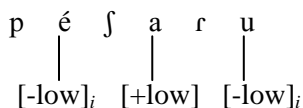
(18) Mechanism needed to account for transparent vowels: ‘Identity licensing’ (Walker 2004: 105)



(19) *pefaru* ‘bird’

/paʃar-u/	∃LICENSE(height)/ó	IDENT[high]	IDENT[low]
a. páʃaru	**!		
b. péʃeru	*		**!
☞ c. péʃaru	*		*

(20) Identity licensing in (19)c



(21) Constraints needed for vowel height transfer and final lowering

MAX[high]

CRISP(σ, [high]): A single [high] feature may not be linked to multiple syllables (Walker 2001)

(22) *uijo* ‘eye’

/uej-u/	MAX[high]	CRISP(σ,[high])	∃LICENSE(height)/ó	IDENT[high]	IDENT[low]
a. uéju			*!		
b. uéjo	*!	*		*	
c. uíju		*!		*	
☞ d. uíjo				**	

(23) Ranking

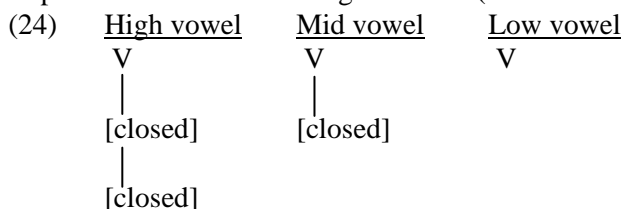
MAX[high], CRISP(σ,[high]), IDENT[high]&IDENT[low] >> ∃LICENSE(height)/ó >> IDENT[high], IDENT[low]

5. An issue in vowel height representation

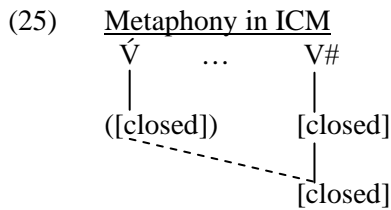
-The MAX[high] OT account requires representing vowel height with separate features [+high] and [+low]

-Parkinson (1996) argued that metaphony is better analyzed in his Incremental Constriction Model (ICM)

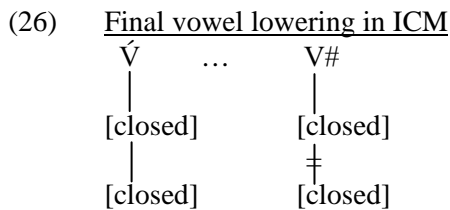
Representation of vowel height in ICM (Parkinson 1996):



- In ICM, metaphony spreads a single instance of [closed], yielding a single process of one-step raising
- Other models require two separate processes (spreading [-low] to low vowels, and [+high] to mid vowels)



- But as we have shown, FA treats low vs. mid vowel raising differently
- In the OT analysis, MAX and CRISP crucially refer to [high] but not [low]
- Impossible to characterize final lowering as vowel height transfer (or dissimilation) with a single height feature



- Hence, the details of metaphony in FA seem to provide an argument for [±high] and [±low] and against the ICM
- See also Kaze 1991 for a critique of earlier incremental models

6. Types of metaphony in Romance

Harmonizing feature

Height: FA, Lena Asturian (Hualde 1989, 1998, Walker 2004), Veneto Italian (Walker 2005), Nalón Valley (Hualde 1998)

- One-step raising: FA, Lena Asturian
- /a/ raises to [e]: FA, Lena Asturian
- /a/ raises to [ɔ]: Nalón Valley

-Complete raising (e.g., /a/ to [i]): Teramo Italian (Walker 2005)

[-ATR]: Cantabrian Tudanca Montañés (Hualde 1989)

[+ATR]: Southern Umbro Italian (Walker 2005)

Behavior of intervening vowels

Intervening vowels are transparent: FA, Lena Asturian, Nalón Valley

Intervening vowels harmonize: Cantabrian Tudanca Montañés

Intervening vowels block metaphony: Central Veneto

Extent of spreading

Feature spread stops at tonic: FA, Lena Asturian, many others

Feature spreads past tonic: Central Veneto (variably), FA? (*pikíno* ‘small-M.SG’ vs. *pekéno* ‘small-N.SG’)

Interaction with other processes

‘Underapplication’ opacity (derived high vowels do not trigger raising): Francavilla Fontana Italian (Walker 2005)

‘Overapplication’ opacity (high vowel triggers lowered to mid in surface form): FA

7. Conclusion

-Summary:

- Metaphony in FA is more complicated than some examples in the literature due to final lowering, which obscures the trigger of metaphony

- However, FA metaphony and lowering yield to a hybrid analysis involving both metaphony and height transfer
- FA metaphony thus fills in a gap in Walker's (2001, 2004, 2005, 2006) typology; if metaphony results from difficulty in perceiving height features in unstressed word-final high vowels, it is natural to predict that in some language the height features could shift to the strong position and be lost from the final vowel.
- Issues for future research:
 - Find proparoxytones with mid → high stressed vowels to see whether final lowering applies
 - Look for proparoxytones with non-low penultimate vowels to see whether they are transparent
 - Find some examples with unambiguous underlyingly high root vowels to see whether final lowering applies and to check whether mid vowels that raise to high merge completely with underlyingly high vowels
 - Can we predict when spreading will continue past the tonic?
 - How do clitics fit into the analysis? (masc. sg. =*lu* triggers metaphony but its vowel does not lower)
 - Is there a way to get step-wise raising without constraint conjunction?
 - Will the examples discussed by Maiden (1991) where triggering unstressed high vowels neutralize to [ə] yield to the same analysis?

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