

Obscure vocalic changes and Positional Markedness*

Jesús Jiménez & Maria-Rosa Lloret

Universitat de València & Universitat de Barcelona

1. Introduction

Some structural **positions** are **stronger** than others due to the prosodic or morphological prominence derived from certain physical or functional properties.

The distinction between strong and weak positions has been used to explain some asymmetries attested in the world languages regarding the different behavior of elements which are alike except for the structural position in which they appear.

Table 1. General pattern in prominence relations:

<i>+ Prominent (strong)</i>	<i>– Prominent (weak)</i>
Syllable peak	Syllable margin
Syllable onset	Syllable coda
Main metrical foot	Secondary metrical foot
Metrical foot peak (head)	Metrical foot margin (non-head)
Within the metrical foot	Outside the metrical foot
Stressed syllable	Unstressed syllable
Pretonic syllable	Posttonic syllable
Word-initial position	Word-final position
Stem	Affix

Two kinds of basic behaviors with regard to prominence:

- a) Segments that appear in strong positions, due to the prominence of these structural sites, are usually better protected and more reluctant to change. Contrariwise, segments attached to weak positions are more vulnerable and more prone to change.

Prominence → protection / preservation

- b) More prominent elements, due to their intrinsic physical characteristics, tend to link to structurally strong positions, whereas weaker elements tend to attach to less salient positions.

Prominence → attraction of prominent features

Formalized in Optimality Theory in terms of:

- a) Prominence → protection / preservation: *positional faithfulness* (cfr. Beckman 1998)
- b) Prominence → attraction of prominent features: *positional or contextual markedness* (cfr. Prince & Smolensky 2004)

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In **traditional grammars**, type a) effects have been usually pointed out, but type b) effects are normally disregarded.

Goals of the paper: To present the effects of positional faithfulness and, especially, of positional markedness as instances derived from the prominence of the initial position of the word. We will show effects that involve the choice of vowels with more salient features in word-initial position because they better suit structurally strong positions; examples to be discussed are from Catalan and other Romance languages.

Outline of the paper:

- Word-initial position prominence (§ 2)
- Segmental prominence (§ 3)
- Initial position and positional faithfulness (§ 4)
- Initial position and positional markedness (§ 5)
- Case study: pronominal clitic variation in Pedreguer (Valencian Catalan) (§ 6)

2. Word-initial position prominence

The relevance of this site has already been pointed out in **traditional studies**:

“...the initial position is the most stable, the position which makes vowels more resistant, the most similar to the stressed position...” [...][*la posición inicial es la más firme, la que da más resistencia a las vocales, la que más las asemeja a la acentuada...*] (Menéndez Pidal 1985: 67).

Also in **more recent works**:

- The initial position of the word has been considered especially prominent mostly for psycholinguistic and perceptual reasons (cfr. Nootboom 1981, Hawkins & Cutler 1988, Barnes 2002, Chitoran *et alii* 2002).
 - Different psycholinguistic experiments on word recognition (more efficient at the beginning of the word) and effects derived from word distortion (which are considered worse if the deviant part is at the beginning of the word) have determined that the left part of the word is more important than the end of the word. This has been related to the importance of temporal structure in languages or to the lexical access to words, from left to right.
- From a phonetic point of view, Barnes (2002) has proved that several effects attributed to the initial syllable of the word are, in fact, strictly induced by the vowel which appears at the absolute left edge of the word, since this vowel, among other things, is clearly longer than other vowels.
 - Other scholars have argued that word-initial consonants may have a special status as well, which has to do with prominent effects stemming from the position in which they are located (see, among others, Chitoran *et alii* 2002).

Conclusion: Positional prominence hierarchies:

General prominence scheme: Peak (strong position) > Margin (weak position)

Particular case: Initial (strong position) > Non initial (weak position)

3. Segmental prominence

As for segments, which are the bases for **prominence**?

- Traditionally, segmental prominence has been coupled with sonority. From an articulatory point of view, segments are considered more sonorous if their articulation is more open, if they present a low degree of constriction (Sievers 1881, Jespersen 1913, Saussure 1916), or a minimal jaw elevation (Lindblom 1983) or less segmental force (Vennemann 1988).
- From a perceptual point of view, sonority is measured in terms of audibility: segments which are more audible, i.e. those which present more energy, are more sonorous (Bloch & Trager 1942).

Hence, the more open is a segment the more prominent it is. Because of that, vowels (elements with minimal articulatory constriction and, at the same time, more audible) are the segments that better suit syllable peaks (strong position).

Segmental prominence scale:

a > ε,ɔ > e,o > i,u > ə > ... > p,t,k

4. Word-initial position and positional faithfulness

The correlation between positional prominence and faithfulness and, more specifically, the claim that the **initial position** of words is a **privileged site** to preserve features has already been acknowledged in traditional works, where this position is described as a singular locus.

Regarding vowels, there are many pieces of evidence for this prominent status:

- General maintenance of syllable-initial vowels in the evolution from Latin to Romance languages:

(1) APRILE ‘April’ > abril (Cat., Port., Sp.), avril (Fr.), aprile (It.), aprilie (Rom.)

HIBERNU ‘winter’ > hivern (Cat.), hiver (Fr.), inverno (It., Port.), iarna
(Rom.), invierno (Sp.)

IURARE ‘swear’ > jurar (Cat., Port., Sp.), jurer (Fr.), giurare (It.), jura (Rom.)

- Protection of segmental features which are otherwise neutralized or changed in other unstressed positions:

- Maintenance of hiatuses to block the formation of rising diphthongs in initial syllables —and changes in the initial high segments—, in Catalan and in Spanish (Cabré & Prieto 2006):

(2) Catalan:

biòleg [i.ó] ‘biologist’ vs. radiòleg [j.ó] ‘radiologist’

(3) Spanish:

biólogo [i.ó] ‘biologist’ vs. radiólogo [j.ó] ‘radiologist’

- Preservation of mid-open vowels in pretonic position, whether initial or internal, in Galician (Freixero 2006):

(4) b[ɛ]lleza 'beauty' gob[ɛ]rnación 'government'
 [ɔ]sudo 'bony' v[ɔ]tar 'to vote'

- Preservation of open mid-vowels in absolute word-initial position (lack of vowel reduction) in some Valencian Catalan varieties (Sancho Cremades 1995):

(5) Valencian (Canals):
 [ɔ]brim 'we open', [ɔ]mplim 'we fill'
 vs.
 p[ɔ]rtem, *p[ɔ]rtem 'we bring'

Case study: Valencian lack of vowel reduction at the left edge.

Relevant constraints:

- As a general rule, the more sonorous is a vocalic peak, the better it is (6); but in unstressed position (a weak position) the less sonorous is a vowel, the better it is (7):

(6) *PEAK/e, o (*P/e, o) >> *PEAK/ɛ, ɔ (*P/ɛ, ɔ)
 (7) *UNSTRESSED/ɛ, ɔ (*UNSTR/ɛ, ɔ) >> *UNSTRESSED/e, o (*UNSTR/e, o)

- Faithfulness constraints at play:

(8) IDENT[±open]-V_{Initial} (ID[±open]-V_{In}): The value for [±open] in the I is the same as that of its correspondent in the O, if the vowel appears at the beginning of the word.
 (9) IDENT[±open]-V (ID[±open]-V): The value for [±open] in the I is the same as that of its correspondent in the O.

(10) **Ranking:** ID[±open]-V_{In} >> *UNSTR/ɛ, ɔ >> *UNSTR/e, o, ID[±open]-V

Analysis:

(11) Input: /ɔ'brim/ 'we open'

Candidates	ID[±open]-V _{In}	*UNSTR/ɛ, ɔ	*UNSTR/e, o	ID[±open]-V
☞ a. ɔ'brim		*		
b. o'brim	*!		*	*

(12) Input: /pɔr'tem/ 'we bring'

Candidates	ID[±open]-V _{In}	*UNSTR/ɛ, ɔ	*UNSTR/e, o	ID[±open]-V
a. pɔr'tem		*!		
☞ b. por'tem			*	*

5. Word-initial position and positional markedness

The **initial position** of words, as other prominent positions, tends to **attract prominent features** (*Rich-get-richer principle*, cfr. Donegan 1978: 143). Hence, a vowel is sometimes replaced with a more sonorous segment in that site. Some of the changes related to the initial position have been attributed to **underlying tendencies** not properly understood:

“As the initial *e*, *O* can change to *a*, with the help of obscure assimilations and dissimilations as well as **a certain preference for the vowel *a* in initial position as the clearest vowel:...**” [*Lo mismo que la e inicial, O se puede cambiar en a, ayudando oscuras asimilaciones o disimilaciones a cierta preferencia otorgada a la a inicial como vocal más clara: ...*] (Menéndez Pidal 1985: § 20₃): NOVACULA > *navaja* ‘pocketknife’, *COLOSTRU > *calostro* ‘colostrum’.

Anticipatory metathesis can also be viewed as an instance of attraction of salient properties (in this case, complex onsets) towards the initial position of the word:

“A consonant in a complex onset (usually, the liquid *r* or *l*) of a non-initial syllable shifts to form a new complex onset with the consonant that appears in the initial syllable of the word.” [*Une consonne combinée (le plus souvent la liquide r ou l) dans une syllabe non initiale va se combiner avec la consonne qui ouvre la première syllabe.*] (Grammont 1933: 340): *cabro* > *crabo* ‘buck’, *Gabriel* > *Grabjéw* (Bagnères-de-Luchon); *cabra* > *craba* ‘goat’, *febrer* > *freber* ‘February’ (Alghero Cat.). (For Alghero Catalan, see also Cabrera, Pons & Torres 2010.)

In Optimality Theory, the accumulation of salient features belonging to different grammatical components is viewed as a way to improve the outcome: the **isomorphism between levels** increases the structural iconicity of the whole, since properties which are prominent are highlighted and properties which are less relevant are faded.

Results of the tendency to gather different prominent (or non-prominent) properties in the same site:

a) ...in stressed vowels:

Being the stressed position a salient site, we observe several changes in which a vowel is substituted by a more open segment:

- Opening of [o] as [ɔ] in stressed initial syllables in Catalan, except in the most northern area (cfr. Moll 2004: 62; Coromines 1971: 189-195; Gulsoy 1993: 90-94):

(13) fl[ɔ]r ‘flower’ n[ɔ]m ‘name’ h[ɔ]ra ‘hour’

- The same reason has been adduced to explain the tendency to realize as open the stressed mid-vowels that appear in loanwords and learned words, regardless of the quality of the original vowel (cfr. Jiménez & Lloret 2010, Kenstowicz 2011). This tendency has been reported to be active in Portuguese and in Italian, where unsettled vowels (e.g. those from loanwords and learned words) are realized as open (see, for instance, the formula *vocale incerta, vocale aperta* ‘uncertain vowel

(pronunciation), open vowel', Migliorini 1945, 1990; Franceschi 1968), and also in Catalan and Galician, which are the sources for the examples in (14):

- (14) est[ɔ̃]p 'stop', [é]tica 'ethics' (Cat.; cfr. Pi-Mallarach 1997, Wheeler 2005, Mascaró 2008)
st[ɔ̃]p 'stop', [é]tica 'ethics' (Gal.; cfr. Freixeiro 2006)

Concurrent facts in this pattern: positional prominence (of the stressed syllable), segmental prominence (open vowels are more salient than closed vowels).

Case study: Selection of open vowels in loanwords and learned words.

Constraints at play:

- (15) *PEAK/e, o (*P/e, o) >> *PEAK/ε, ɔ (*P/ε, ɔ)
(16) IDENT[±open]-V_{Stressed} (ID[±open]-V_{Str}): The value for [±open] in the I is the same as that of its correspondent in the O, if the vowel is stressed.

Relevant ranking: ID[±open]-V_{Str} >> *P/e, o >> *P/ε, ɔ

Analysis:

- (17) Input: /'sɛg/ 'blind'

Candidates	ID[±open]-V _{Str}	*P/e, o	*P/ε, ɔ
☞ a. 'sɛk		*	
b. 'sɛk	*!		*

- (18) Input: /'tʃɛk/ 'check'; E = mid-vowel without [±open] specification

Candidates	ID[±open]-V _{Str}	*P/e, o	*P/ε, ɔ
a. 'tʃɛk		*!	
☞ b. 'tʃɛk			*

b) ...in unstressed vowels:

- Contrariwise, in vowel reduction the output vowels are in general less prominent (more closed) than the underlying vowels they replace (Alghero Catalan vowel reduction, /e/, /ɛ/ > [a]: exceptional, driven by perceptual constraints; cfr. Crosswhite 1999, 2004; Wheeler 2005; Lloret & Jiménez 2008):

- (19) General scheme of vowel reduction in Central Catalan:

[ə] < /a/, /ɛ/, /e/
[u] < /ɔ/, /o/

- (20) General scheme of vowel reduction in Eastern Catalan:

[e] < /ɛ/
[o] < /ɔ/
↑ ↑
Output vowels: *Input vowels:*
less sonorous *more sonorous*

Concurrent facts in this pattern: lack of positional prominence (of unstressed syllables, in initial position and elsewhere), segmental prominence reduction.

c) There are **important differences in prominence among unstressed syllables** as well:

- Shift from *e* to *a* at the very beginning of initial closed syllables in Western Catalan, both if the vowel is epenthetic (*espina* > *aspina* ‘thorn, spine’) and if it is underlying (*embut* > *ambut* ‘funnel’). The change affects in a less systematic way some vowels that appear in the first syllable but are not in absolute initial position, especially if they appear in closed syllables (*bescoll* > *bascoll* ‘neck’ vs. *t(r)esor* > **t(r)asor* ‘treasure’) (cfr. Lloret & Jiménez 2008).
- Cfr., similarly, sporadic changes from E, O (in Classical Latin) to *a* (in Vulgar Latin or Early Romance): BILANCEA ‘scales’ > *balança* (Cat.), *balanza* (Sp.), SILVATICU ‘wild’ > *salvatge* (cat.), *salvaje* (cast.); NOVACULA ‘pocketknife’ > *navalla* (Cat.), *navaja* (Sp.), *COLOSTRU ‘colostrum’ > *calostre* (Cat.), *calostro* (Sp.).

Western Catalan varieties differ as far as the **domain** to which the distinction between ‘Initial > Non-initial’ applies:

- **Word-initial position:** All Western dialects consider especially salient the initial position of words; hence, the most sonorous vowel, [a], is selected as epenthetic vowel in this site:

(21) [a]spina ‘thorn, spine’

- **Clitic group:** Elements added in a broader domain such as the clitic group (where the clitics form a prosodic unit with the host to which they attach) may be considered less salient: among other typical characteristics of weak elements, pronominal clitics do not carry primary stress, are functional elements and only add grammatical information.

a. Taking that into account, some varieties select [e] as epenthetic vowel in domains beyond the prosodic word:

(22) [e]m porta ‘s/he brings me’
 m[e] la porta ‘s/he brings her to me’
 donant-m[e] ‘giving me’

b. However, if the relevance of the initial position extends to the clitic group domain, we find:

(23) [a]m porta ‘s/he brings me’
 m[e] la porta ‘s/he brings her to me’
 donant-m[e] ‘giving me’

c. A variant of the pattern in b), which will be formalized in § 6, is found in the city of Pedreguer (Valencian Cat.), where a distinction is made between the proclitic position (at the beginning of the clitic group and hence more prominent) and the enclitic position (at the end of the clitic group and hence less prominent):

(24) i. Clitics in proclitic position: epenthetic vowel [a], sometimes alternating with [e]: [a]m porta, m[a] la porta.
 ii. Clitics in enclitic position: epenthetic vowel [e], without alternation: donant-m[e], donant-m[e]-la

Concurrent facts in this pattern: positional prominence (of the initial syllable), segmental prominence ([a] is more salient than [e], [o]).

6. Positional markedness: formalization

Study case: variation in Pedreguer pronominal clitic system (cfr. Beltran 2005, Garcia & Beltran 1994)

- (25) **A single clitic:** In proclitic ([a] as epenthetic vowel) and enclitic position ([e] as epenthetic vowel). (In the feminine [la], [les] clitics, the vowel is morphological.)

	PROCLITICS (BEFORE CONS.)	ENCLITICS (AFTER CONS.)	
ME / TE / SE	[am] / [at] / [as]	[me] / [te] / [se]	‘me / you / himself’
MOS / VOS	[mos] / [vos]	[mos] / [vos]	‘us / you’
EL / LA	[al] / [la]	[lo] / [la]	‘him / her’
ELS / LES	[a(l)s] / [les]	[los] / [les]	‘them’
LI / ELS	[li] / [als]	[li] / [los]	‘to him / to them’

- (26) **Two clitics in proclitic position:** [a] is usually the epenthetic vowel, sometimes in variation with [e]:

	EL	LA	ELS	LES
ME	[mal] [mel]	[mala]	[mals]	[males]
TE	[tal]	[tala]	[ta(l)s] [te(l)s]	[tales]
LI	[lil]	[lila]	[lils] [lis]	[liles]
ELS	[alzal]	[alzala]	[alza(l)s]	[alzales]
SE	[sal]	[sala]	[sals]	[sales]
MOS	[mol] [mozal]	[mola]	[mols] [mozals]	[moles]
VOS	[vol] [vozal]	[vola]	[vols] [vozals]	[voles]

- (27) **Two clitics in enclitic position:** [e] is always the epenthetic vowel:

	EL	LA	ELS	LES
ME	[mel]	[mela]	[mels]	[meles]
TE	[tel]	[tela]	[tels]	[teles]
LI	[lil]	[lila]	[lils]	[liles]
ELS	[lzlo]	[lzla]		
SE	[sel]	[sela]	[sels]	[seles]
MOS	[mol]	[mola]	[mols]	[moles]
VOS	[vol]	[vola]	[vols]	[voles]

Possible reasons for the alternation between proclitic [a] and enclitic [e]:

a. Neutralization of *e* only in proclitic sites? Probably not sufficient because:

- Lack of neutralization in the feminine clitic *les* (where the vowel stands for the feminine morph). This clitic appears as [les] in both positions. Maintenance of [les] in proclitic position cannot be explained as an analogical effect from enclitic forms, since in that case the analogy would affect other clitics as well. Thus, maintenance of [les] has to be interpreted as a faithfulness effect (/lez/).
- Neutralization would be restricted to proclitic forms. Hence, we would nevertheless need a reason for this limitation.

b. Alternative: Selection of vowels according to **positional markedness**:

- As previously stated, the more sonorous is a vocalic peak, the better it is:

$$(28) \quad *P/e \gg *P/a$$

- Instead, for epenthetic vocalic peaks (which normally appear in a prosodically weak position) the contrary is true again: the less sonorous they are, the better:

$$(29) \quad *P_{EP}/a \gg *P_{EP}/e.$$

Additionally, (29) can split depending on the site of the epenthesis, i.e. in proclisis or in enclisis:

$$(30) \quad *P_{PROCLEP}/a \gg *P_{PROCLEP}/e \quad (\text{preverbal position})$$

$$(31) \quad *P_{ENCLEP}/a \gg *P_{ENCLEP}/e \quad (\text{postverbal position})$$

Since enclitics are placed at the end of the clitic group, inserting a vowel (regardless of its quality) as a syllable peak in that position (i.e. final, relatively weak position) would be more costly than inserting the same vowel in proclitic position (i.e. initial, relatively strong position):

(32) Universal ranking:

$$*P_{ENCLEP}/\alpha \text{ (postverbal position)} \gg *P_{PROCLEP}/\alpha \text{ (preverbal position)}$$

- Faithfulness constraint at play:

(33) IDENT[±low]-V (ID[±low]-V): The value for [±low] in the I is the same as that of its correspondent in the O.

Ranking for Pedreguer:

$$(34) \quad \text{ID}[\pm\text{low}]\text{-V}, \quad *P_{ENCLEP}/a \gg *P_{ENCLEP}/e, \quad *P/e \gg *P/a, \quad *P_{PROCLEP}/a \gg *P_{PROCLEP}/e$$

Analysis:**Enclitic position, [e]-epenthesis** (and faithfulness to the input vowel in fem. /les/):

(35) Input: porta-/m+lz/ 'bring them (masc.) to me'

Candidates	ID[±low]-V	*P _{ENCLIP/a}	*P _{ENCLIP/e}	*P/e	*P/a
☞ a. <u>m</u> els			*	*	
b. ma <u>l</u> s		*!			*

(36) Input: porta-/lez/ 'bring them (fem.)'

Candidates	ID[±low]-V	*P _{ENCLIP/a}	*P _{ENCLIP/e}	*P/e	*P/a
☞ a. les				*	
b. las	*!				*

Proclitic position, [a]-epenthesis (and faithfulness to the input vowel in fem. /les/):

(37) Input: /m+lz/ porta 's/he brings them (masc.) to me'

Candidates	ID[±low]-V	*P/e	*P/a	*P _{PROCLIP/a}	*P _{PROCLIP/e}
a. <u>m</u> els		*!			*
☞ b. ma <u>l</u> s			*	*	

(38) Input: /lez/ porta 's/he brings them (fem.)'

Candidates	ID[±low]-V	*P/e	*P/a	*P _{PROCLIP/a}	*P _{PROCLIP/e}
☞ a. les		*			
b. las	*!		*		

Ranking for Pedreguer, when there is **variation** between *ma'ls porta* and *me'ls porta* in proclitic position:(39) ID[±low]-V, *P_{ENCLIP/a} >> *P_{ENCLIP/e}, *P/e, *P_{PROCLIP/a} >> *P/a, *P_{PROCLIP/e}

(40) Enclisis: Input: porta-/m+lz/

Candidates	ID[±low]-V	*P _{ENCLIP/a}	*P _{ENCLIP/e}	*P/e
☞ a. <u>m</u> els			*	*
b. ma <u>l</u> s		*!		

(41) Proclisis: Input: /m+lz/ porta

Candidates	ID[±low]-V	*P/e	*P _{PROCLIP/a}	*P/a	*P _{PROCLIP/e}
☞ a. <u>m</u> els		*			*
☞ b. ma <u>l</u> s			*	*	

7. Conclusions

Positional prominence exerts a **twofold influence** on segmental features:

- On the one hand, **faithfulness requirements** are stronger when a site is more relevant. As a result of this tendency, we have described cases of exceptional preservation of features whose origin lies on the position in which the bearing segments appear. Usually, the exceptions are limited to the stressed vowel, but they have also been attested in word-initial position and in the pretonic syllables of stems (being the stem a stronger position than affixes: cfr. preservation of pretonic open mid-vowels in Galician).
- On the other hand, the most prominent features tend to be linked to the most relevant positions and, inversely, the least prominent features tend to associate with the least salient positions. Thus, there is a tendency towards the **accumulation of prominent and non-prominent properties** in strong and weak sites, respectively. As an important novelty of this work, we have discussed several cases in which positional prominence —either that of word-initial position or that of stressed syllables— couples with a higher degree of segmental openness.

All in all, prominent positions gather features that are also relevant, and vice versa.

Variety	Factors determining prominence: strong position	Prominent effects
Galician	Being part of the stem	Preservation of open mid-vowels
Catalan, Galician, Italian, Portuguese	Stressed syllable	Opening of vowels in loanwords and learned words
Catalan (general)	Initial syllable	Opening of <i>o</i>
Catalan, Spanish...	Stressed initial syllable	Preference for the vowel [a]
Catalan, Spanish...	Initial syllable	Maintenance of hiatuses
Valencian (Canals)	Word-initial position	Preservation of open mid-vowels
Valencian (Pedreguer)	Proclitic position	Epenthetic vowel: [a]

Variety	Factors determining prominence: weak position	Non-prominent effects
Catalan (general)	Unstressed syllable	Vowel reduction
Catalan, Spanish...	Non-initial syllables	Diphthongization
Valencian (Pedreguer)	Enclitic position	Epenthetic vowel: [e]

References

- Barnes, Jonathan (2002): *The phonetics and phonology of positional neutralization*. PhD Dissertation, University of California, Berkeley. Published as 2006: *Strength and weakness at the interface: Positional neutralization in phonetics and phonology*. Berlin: Mouton de Gruyter.
- Beckman, Jill N. (1998): *Positional faithfulness*. PhD Dissertation, University of Massachusetts, Amherst. Published as 2001: *Positional faithfulness: an optimality theoretic treatment of phonological asymmetries*. New York: Garland. [<http://roa.rutgers.edu>], no. 234]

- Beltran i Calvo, Vicent (2005): *El parlar de la Marina Alta*. 2 vol. Alacant: Departament de Filologia Catalana, Universitat d'Alacant.
- Bloch, Bernard / Trager, George L. (1942): *Outlines of linguistic analysis*. Baltimore: LSA Special Publications.
- Cabré Monné, Teresa / Prieto, Pilar (2006): *Exceptional hiatuses in Spanish*. In: Martínez-Gil, Fernando / Colina, Sonia (ed.): *Optimality-Theoretic Studies in Spanish Phonology*. Amsterdam / Philadelphia: John Benjamins, 205-238.
- Cabrera, Maria / Pons Moll, Clàudia / Torres Tamarit, Francesc (2010): *Left is more. Rhotic metathesis in Alguerese Catalan*. In: *XX Colloquium on Generative Grammar*. Barcelona, Universitat Pompeu Fabra.
- Chitoran, Ioana / Goldstein, Louis / Byrd, Dani (2002): *Gestural overlap and recoverability: Articulatory evidence from Georgian*. In: Gussenhoven, Carlos / Warner, Natasha (ed.): *Papers in Laboratory Phonology 7*. Cambridge: Cambridge University Press, 419-447.
- Coromines, Joan (1971): *Lleures i converses d'un filòleg*. Barcelona: Club Editor.
- Crosswhite, Katherine (1999): *Vowel reduction in Optimality Theory*. PhD Dissertation, UCLA. Published as 2001: London / New York: Routledge.
- (2004): *Vowel reduction*. In: Hayes, Bruce / Kirchner, Robert / Steriade, Donca (ed.): *Phonetically based phonology*. Cambridge: Cambridge University Press, 191-231.
- Donegan, Patricia J. (1978): *On the Natural Phonology of vowels*. PhD Dissertation, Ohio State University, Columbus. Published as: *The Ohio State Working Papers in Linguistics 23*.
- Franceschi, Temistocle (1968): *Vocale incerta, vocale aperta; consonante incerta, consonante sonora*. In: Quilis, Antonio (ed.): *XI Congreso Internacional de Lingüística y Filología Románica: actas*. Vol. III. Madrid: Revista de Filología Española, 1105-1113.
- Freixeiro, Xosé Ramón (2006): *Gramática da lingua galega. I. Fonética e fonoloxía*. Vigo: A Nosa Terra. 2nd ed.
- Garcia, Josepa / Beltran, Vicent (1994): *El parlar de Pedreguer*. Pedreguer: Ajuntament de Pedreguer, Institut d'Estudis Comarcals de la Marina Alta.
- Grammont, Maurice (1933): *Traité de phonétique*. Paris: Librairie Delagrave.
- Gulsoy, Joseph (1993): *Estudis de gramàtica històrica*. València / Barcelona: Institut Interuniversitari de Filologia Valenciana / Publicacions de l'Abadia de Montserrat.
- Hawkins, John A. / Cutler, Anne (1988): *Psycholinguistic factors in morphological asymmetry*. In: Hawkins, John A. (ed.): *Explaining Language Universals*. Oxford: Blackwell, 280-317.
- Jespersen, Otto (1913): *Lehrbuch der Phonetik*. Leipzig: B. G. Teubner.
- Kenstowicz, Michael (2011): *Vocale incerta, vocale aperta*. In: *Omaggio a P.-M. Bertinetto*.
- Lindblom, Björn (1983): *Economy of speech gestures*. In: MacNeilage, Peter F. (ed.): *The production of speech*. New York: Springer-Verlag, 217-245.
- Lloret, Maria-Rosa / Jiménez, Jesús (2008): *Marcatge posicional i prominència en el vocalisme àton*. In: *Caplletra 45*, 55-91. [<http://www.uv.es/foncat>], no. 21]
- Mascaró, Joan (1986): *La distribució de les vocals mitjanes tòniques en català central*. In: *Caplletra 44*, 75-102. [<http://www.uv.es/foncat>], no. 24]
- Menéndez Pidal, Ramón (1985): *Manual de gramática histórica española*. Madrid: Espasa Calpe. 18th ed.
- Migliorini, Bruno (1945): *Pronunzia fiorentina o pronunzia romana?* Firenze: Sansoni.
- (1990): *La lingua italiana nel Novecento*. Firenze: Le Lettere.
- Moll, Francesc de Borja (2006): *Gramàtica històrica catalana*. València: Universitat de València.
- Nooteboom, Sieb G. (1981): *Lexical retrieval from fragments of spoken words: beginnings vs. endings*. In: *JoPh 9*, 407-424.
- Pi-Mallarach, Josep (1997): *L'obertura de les vocals mitjanes en una mostra de neologismes del català*. PhD Dissertation, Universitat Autònoma de Barcelona, Bellaterra.
- Prince, Alan / Smolensky, Paul (2004): *Optimality Theory*. Malden / Oxford / Carlton: Blackwell. [<http://rutgers.roa.edu>], no. 537]
- Sancho Cremades, Pelegrí (1995): *El valencià col·loquial de la vila de Canals*. Canals: Ajuntament de Canals.
- Saussure, Ferdinand de (1916): *Cours de linguistique générale*. Paris: Payot.
- Sievers, Eduard (1881): *Grundzüge der Phonetik*. Leipzig: Breitkopf & Hartel.
- Vennemann, Theo (1988): *Preference laws for syllable structure*. Berlin: Mouton de Gruyter.
- Wheeler, Max W. (2005): *The phonology of Catalan*. Oxford: Oxford University Press.

Jesús Jiménez (jesus.jimenez@uv.es)
 Maria-Rosa Lloret (mrosa.lloret@ub.edu)