From Coarticulation to Vowel Harmony in Valencian Catalan

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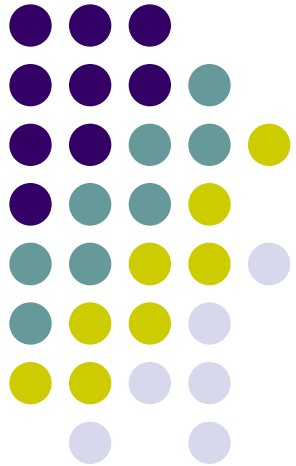


Experimental Phonetics and Sound Change,
Salamanca, March 20, 2012

Background

- Valencian Catalan has a stressed system of 7 vowels ([**i e ɛ a ɔ o u**]). This inventory is generally reduced to 5 elements in unstressed positions ([**i e a o u**]).
- In unstressed syllables, underlying [−ATR] vowels /ɔ́/ and /ɛ́/ raise to [o] and [e], respectively (cf. Wheeler 2005, e.g.):

Stressed			*Unstressed*		
pistola	[pist**ɔ́**la]	‘gun’	pistoler	[pist**o**lér]	‘gunman’
tela	[t**ɛ́**la]	‘cloth’	teler	[t**e**lér]	‘loom’

Background

- Some Valencian varieties exhibit a process of vowel harmony by which word-final low vowels assimilate totally to a preceding [−ATR] vowel (/ɔ́/ or /ɛ́/). Typically, both vowels (/ɔ́/ and /ɛ́/) trigger the process.

Canals variety

/ɔ́/+/a/:	pistola	[pistɔ́lɔ]	‘gun’
/ɛ́/+/a/:	tela	[tɛ́lɛ]	‘cloth’

Background

- However, there are varieties in which only one of the mid-open vowels causes assimilation:

Borriana variety

/ɔ́/+/a/:	pistola	[pistɔ́l**ɔ**]	‘gun’
/ɛ́/+/a/:	tela	[tɛ́l**a**]	‘cloth’

Background

- When conditions for vowel harmony are not met, final /a/ is realized as [a], more or less raised and colored (varieties with final neutralization to [ɛ] or to [ɔ] are also attested):

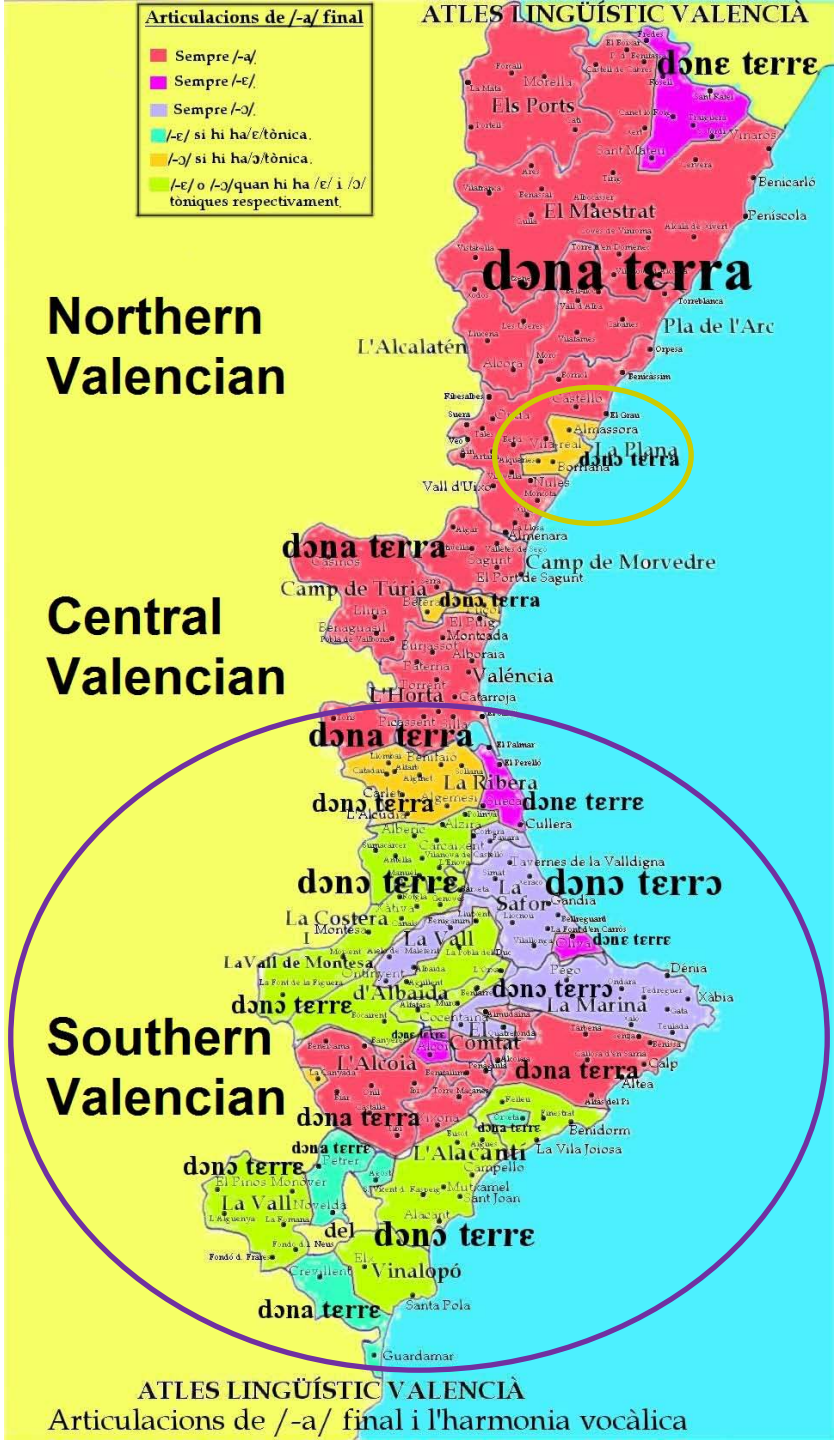
Borriana variety

/á/+/a/:	sala	[sál**a**]	‘room’
/ó/+/a/:	directora	[direktór**a**]	‘director (FEM)’
/é/+/a/:	cera	[sér**a**]	‘wax’

Background

- Vowel harmony is quite common in the southern Valencian dialect.
- The distribution of the three different patterns of vowel harmony (only with /ɔ́/, only with /ɛ́/ or with both [−ATR] vowels) is extremely irregular (cf. Jiménez 2001: 225-227; Saborit 2010: 252).

(*Map source*: J. Saborit's blog, "La /-a/ final i les harmonies vocàliques", http://reocities.com/SoHo/cafe/9308/alvhv.jpg)


ATLES LINGÜÍSTIC VALENCIÀ
Articulacions de /-a/ final
Sempre /-a/.
Sempre /-ɛ/.
Sempre /-ɔ/.
/-ɛ/ si hi ha/ɛ/tònica.
/-ɔ/ si hi ha/ɔ/tònica.
/-ɛ/ o /-ɔ/quan hi ha /ɛ/ i /ɔ/ tòniques respectivament.
dɔnɛ tɛrrɛ
dɔna tɛrra
Northern Valencian
Pla de l'Arc
L'Alcalatén
dɔnɔ tɛrra
dɔna tɛrra
Camp de Morvedre
Camp de Túria
dɔna tɛrra
Central Valencian
Valéncia
L'Horta
dɔna tɛrra
La Ribera
dɔnɔ tɛrra
dɔnɛ tɛrrɛ
dɔnɔ tɛrrɛ
dɔnɔ tɛrrɔ
La Costera
La Vall
dɔnɛ tɛrrɛ
La Vall de Montesa
d'Albaida
dɔnɔ tɛrra
dɔnɔ tɛrra
La Marina
Comtat
Southern Valencian
L'Alcoia
dɔna tɛrra
dɔna tɛrra
dɔna tɛrra
dɔnɔ tɛrra
L'Alacantí
dɔnɔ tɛrra
dɔnɔ tɛrrɛ
Vinalopó
dɔna tɛrra
ATLES LINGÜÍSTIC VALENCIÀ
Articulacions de /-a/ final i l'harmonia vocàlica

Background

- In some towns belonging to the northern dialect (among which Borriana and Les Alqueries) round vowel harmony has been reported as well.

Background

- This study will be devoted to two northern Valencian varieties:
  - The harmonic variety spoken in Borriana and Les Alqueries (from now on, shortened as ‘Borriana variety’).
  - The supposedly non-harmonic variety of the nearby town of Nules.

Goals

a) To investigate how formant frequency values of both the stressed and the final vowels vary in Borriana and Nules varieties as a function of different combinations of a mid-open vowel and a low vowel.

b) To show that there is neither generalized neutralization of /a/ to [ɔ] (*sala* *[sálɔ]), nor significant assimilatory processes triggered by stressed /é/ (*tela* *[télɛ]) in either variety.

Goals

c) To demonstrate that Borriana variety displays round vowel harmony from stressed /ɔ́/ to a post-tonic final /a/ (*pistola* [pistɔ́lɔ]), whereas Nules variety only exhibits high coarticulation levels in the same environment.

d) To show that, in a perceptually asymmetrical context (*toca-la* ‘touch it (FEM)’ [tɔ́kɔla]), /a/ undergoes round vowel harmony in Nules variety as well.

Goals

e) To analyze the extent to which the presence of a morpheme boundary, a clitic boundary or a word boundary affects the degree of assimilation.

f) To discuss whether Nules coarticulation can be considered a phonetic process, prior to the phonologization pattern depicted by Borriana variety.

Outline of the presentation

I. Acoustic study: Methodology

II. Leveling of F1 in Nules & Borriana

III. Leveling of F2 in Nules & Borriana

1. The starting point: neutral contexts
2. The preharmonic stage: Nules
3. The harmonic stage: Borriana

IV. Concluding remarks

I. Acoustic study: Methodology

1. Participants

- 8 male subjects from each variety
- Ranging from 43 to 65-years old
- With no studies in Valencian Catalan

  - For Borriana variety, 2 non-harmonic speakers were discarded to prevent interference.

I. Acoustic study: Methodology

2. Task

- The participants were provided with the sentences in Spanish and were asked to translate them into Valencian Catalan.
  - *Spanish*: Tiene una pistola, pero pequeña.
  - *Valencian*: Té una pistola, però xicoteta.
    - *Gloss*: ‘S/he has a gun, but small.’

I. Acoustic study: Methodology

3. Sequences analyzed

- Final unstressed /a/

- In a neutral context (/á/+/a/):

  - *sala* /sál+a/ ‘room’
  - *Sara* /sár+a/ ‘*proper name*’

[In these data, + occurs at the site of attachment for an affix and # for a clitic; a major word-boundary is indicated by ##.]

I. Acoustic study: Methodology

3. Sequences analyzed

- After the stressed vowels [ɔ́] and [ɛ́], appearing:

  - In a prototypically harmonic environment:
    - Contiguous syllables within the word:

Context /ɔ́/+/a/:

- *pistola* /pistɔ́l+a/ ‘gun’
- *cassola* /kasɔ́l+a/ ‘pot’

Context /ɛ́/+/a/:

- *tela* /tɛ́l+a/ ‘cloth’
- *serra* /sɛ́r+a/ ‘saw’

I. Acoustic study: Methodology

3. Sequences analyzed

- In two non-prototypically harmonic contexts:
  - Adjacent syllables, but separated by a minor morphological boundary, a clitic limit (#):

Context /ɔ́/#/a/:

- *dissol-la* /disɔ́l#la/ ‘dissolve it (FEM)’
- *correspon-la* /korespɔ́n#la/ ‘respond to her’

Context /ɛ́/#/a/:

- *perd-la* /pɛ́rd#la/ ‘lose it (FEM)’

I. Acoustic study: Methodology

3. Sequences analyzed

- In two non-prototypically harmonic contexts:
  - Adjacent syllables, but separated by a major morphological boundary, a word-boundary (##):

Context /ɔ́/##/a/

- *dissol la farina* /disɔ́l##la…/
  ‘s/he dissolves the (FEM) flour’
- *li correspon la faena* /korespɔ́n##la…/
  ‘it’s his/her task’

Context /ɛ́/##/a/ (/pɛ́rd##la…/):

- *perd la clau* ‘s/he loses the (FEM) key’
- *perd la jaqueta* ‘s/he loses the (FEM) jacket’

I. Acoustic study: Methodology

3. Sequences analyzed

- For the sake of comparison, the vowels [ɔ́] and [ɛ́], were also registered in a neutral context:

Monosyllabic words with /ɔ́/:

▪ *sol*	/sɔ́l/	‘sun’
▪ *sort*	/sɔ́rt/	‘luck’

Monosyllabic words with /ɛ́/:

▪ *cel*	/sɛ́l/	‘sky’
▪ *cert*	/sɛ́rt/	‘certain’

I. Acoustic study: Methodology

3. Sequences analyzed

- Whenever possible, the vowels were placed in the same consonantal environment: the stressed vowel was preceded by an unvoiced coronal obstruent and followed by a coronal liquid consonant, as in *pistola* or *tela*.
- The syllables preceding the stressed syllable and following the final low vowel were generally unstressed.

I. Acoustic study: Methodology

3. Sequences analyzed

- The sequences were situated at the end of a phonological phrase…
  - …inside the sentence:
    - *Ex*.: Té una **pistola**, però xicoteta.
      - *Gloss*: ‘S/he has a gun, but small’
  - …at the end of the sentence:
    - *Ex*.: Això és una **pistola**.
      - *Gloss*: ‘That’s a gun’

(In general, this parameter proved to be irrelevant to the assimilation. Therefore, we will leave aside the analysis of occurrences located at the end of the sentence.)

I. Acoustic study: Methodology

4. Recordings

- Two different tokens of each context (if possible) were registered.
- The sentences were registered in a quiet room.
  - Digital recorder Zoom H4.
  - AKG C520L Head-worn Cardioid Condenser Microphone.
  - 44,1 kHz sampling and 24 bits resolution.

I. Acoustic study: Methodology

5. Data labeling and analysis

- The mid-point of the vowels was identified using Praat.
- A Praat automatic routine was designed to extract the acoustic features: duration of the vowel, and intensity and formant values at the mid-point of the vowel.

I. Acoustic study: Methodology

5. Data labeling and analysis

- Formant values were normalized using Watt & Fabricius S-centroid procedure (Watt & Fabricius 2002).
- SPSS software package (SPSS 19) was used to perform statistical tests (one-way ANOVA; post-hoc Tukey).

II. Leveling of F1 in Nules & Borriana

1. Introduction

- The analysis of F1, related to height, is especially relevant in Valencian because /ɛ ɔ/ tend to be extra-open (cf. Recasens 1991, Carrera & Fernández 2005, Saborit 2009).

II. Leveling of F1 in Nules & Borriana

1. Introduction

- Hence, Valencian vowel harmony has been attributed to articulatory factors, i.e. to the extreme similarity between the [−ATR] mid vowels and the low vowel.
- (Cf. Recasens 1998; Jiménez 1998, 2001, 2002; Saborit 2009. Alternative views, suggesting perception enhancement as the trigger, are developed in Jiménez 1998; Walker 2005, 2011; Jiménez & Lloret 2011).

II. Leveling of F1 in Nules & Borriana

1. Introduction

- However, [−ATR, −low] vowels /ɛ/ and /ɔ/ in northern Valencian are not usually as extra-open as in the Southern dialect (cf. Recasens 1991, Herrero 2008).
- So, the presence of harmony in northern varieties seems to challenge the purely articulatory hypothesis (cf. Herrero & Jiménez 2011a).

II. Leveling of F1 in Nules & Borriana

2. General pattern

- Generally, the Valencian three [−ATR] vowels, /ɛ a ɔ/, contrast among them in height:

/ɛ/	*/a/*	*/ɔ/*
[−ATR]	[−ATR]	[−ATR]
[–low]	**[+low]**	**[–low]**

II. Leveling of F1 in Nules & Borriana

2. General pattern

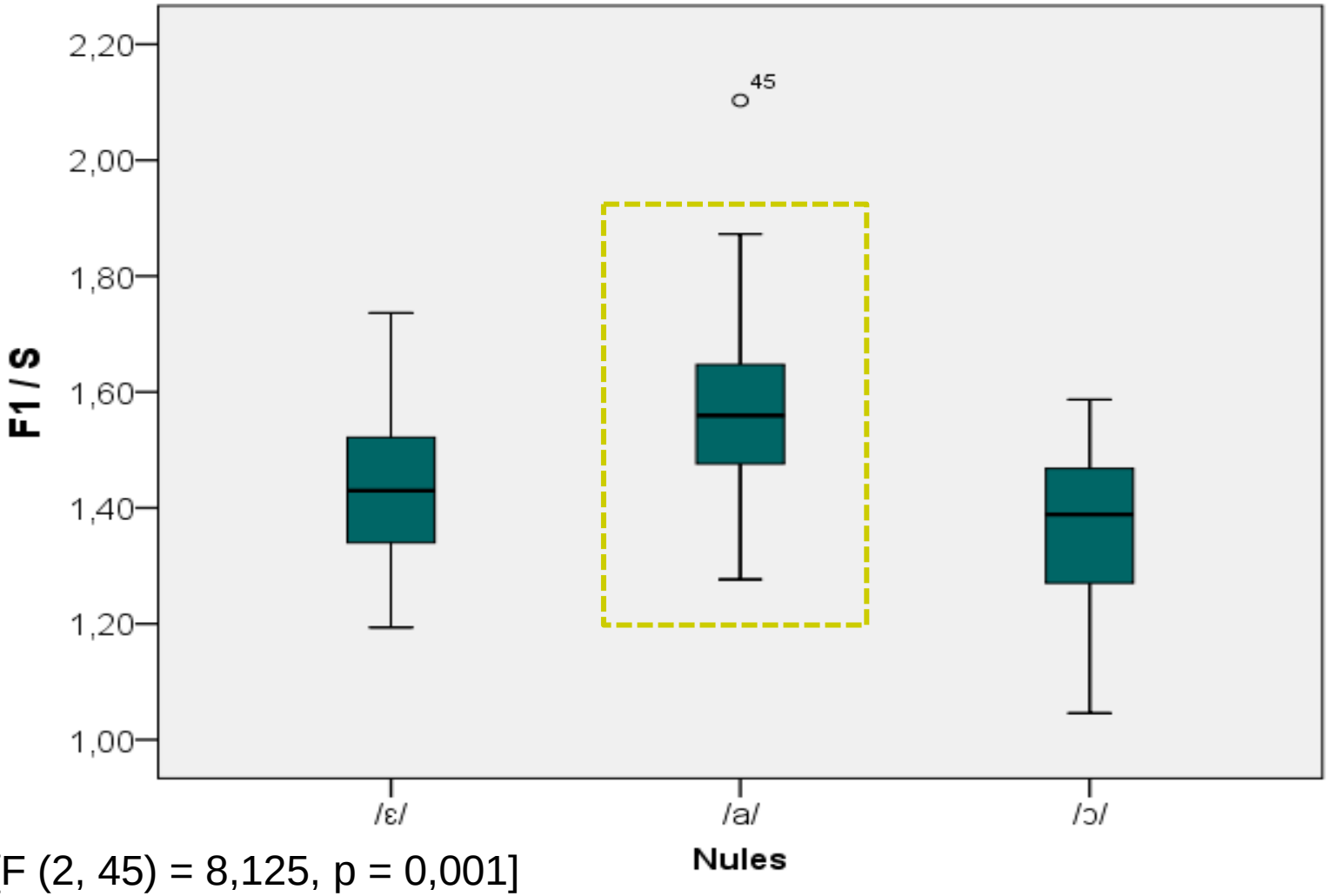
- The realization of /ɛ a ɔ/ in monosyllabic words in Nules and Borriana reflects this contrast: in both varieties, the vowel [á] has the highest degree of aperture; the F1 value of the mid-open vowels [ɔ́] and [ɛ́] is lower and roughly equivalent.
- There is a small difference, though, between [ɛ́] and [ɔ́]: the first vowel tends to be slightly more open (a Valencian peculiarity already pointed out by Carrera & Fernández 2005, Herrero 2010b, among others).

II. Leveling of F1 in Nules & Borriana

2. General pattern

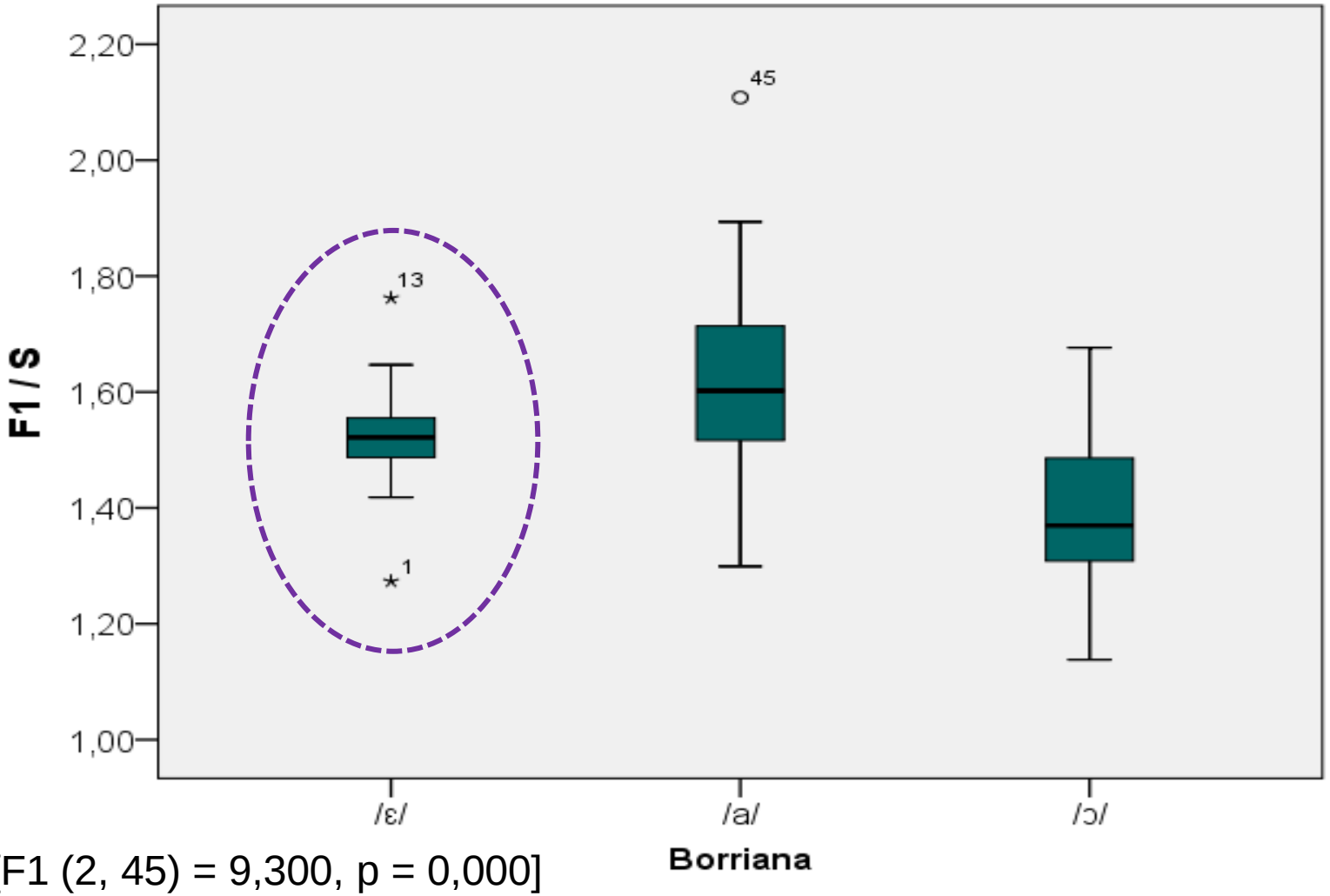
- Additionally, although /ɛ ɔ/ are usually more closed than in other Valencian varieties, the realization of /a/ is also less open.
- So, the similarity in the degree of aperture of all three [−ATR] vowels, which should favor vowel harmony, is still maintained in the varieties under focus.

II. Leveling of F1 in Nules & Borriana



[F (2, 45) = 8,125, p = 0,001]

II. Leveling of F1 in Nules & Borriana



[F1 (2, 45) = 9,300, p = 0,000]

II. Leveling of F1 in Nules & Borriana

3. Contextual leveling

- The basic contrast in height between mid-open vowels and the low vowel in monosyllabic words tends to disappear somehow when these segments are followed by an unstressed [a] (*sala*, *tela*, *pistola*).

II. Leveling of F1 in Nules & Borriana

3. Contextual leveling

- In Nules, all the vowels in the contexts under study are equivalent in height, except the stressed [ɔ́] (the average difference, though, is very small: 43Hz from the [ɔ́] in *pistola* to the /ɛ́/ in *tela*, for instance*).*

  - Context /ɔ́/+/a/ (*pistola*)
  - Context /ɛ́/+/a/ (*tela*)
  - Context /á/+/a/ (*sala*)

[F (5, 90) = 2,580, p = 0,031]

II. Leveling of F1 in Nules & Borriana

3. Contextual leveling

- In Nules, all the vowels in the contexts under study are equivalent in height, except the stressed [ɔ́] (the average difference, though, is very small: 43Hz from the [ɔ́] in *pistola* to the */ɛ́/* in *tela*, for instance*).*

Scheffé's test

- Context /ɔ́/+/a/ (*pistola*)
- Context /ɛ́/+/a/ (*tela*)
- Context /á/+/a/ (*sala*)

[F (5, 90) = 2,580, p = 0,031]

II. Leveling of F1 in Nules & Borriana

3. Contextual leveling

- In Borriana, the differences in F1 disappear when we compare the two vowels in every potentially harmonic context:

  - Context /ɔ́/+/a/ (*pistola*)
  - Context /ɔ́/#/a/ (*dissol-la*)
  - Context /ɔ́/##/a/ (*dissol la…*)

(likewise, in the contexts /ɛ́/+/a/ (*tela*) & /á/+/a/ (*sala*))

[F (5, 90) = 9,891, p = 0,000]

II. Leveling of F1 in Nules & Borriana

4. General remarks

- In Nules and Borriana, the matching in height between the stressed and the unstressed vowel is even found in the absence of partial color assimilation (context *tela*, for example) or total color assimilation (context *dissol la farina*, for instance).

II. Leveling of F1 in Nules & Borriana

4. General remarks

- Hence, we can assume that the leveling of F1 in every potentially harmonic context in Borriana (and in some contexts in Nules) is independent from vowel harmony and probably prior to it.
- That is, the leveling of height would not be a parasitic effect of color harmony (against Jiménez 1998).

II. Leveling of F1 in Nules & Borriana

4. General remarks

- Typological relevance:
  - The Valencian case was special among Iberian harmony processes since it appeared to affect primarily color and to alter height only as a by-product.
  - But this set of data provides evidence that, even in Valencian, changes in height are prior to changes in color, and probably also indicate that, in this dialect, contrasts in height among vowels are more unstable than contrasts in color.

II. Leveling of F1 in Nules & Borriana

4. General remarks

- According to the traditional hypothesis, the scenario presented so far, with a radical reduction of height contrasts in harmonic contexts, should favor assimilation of color, although…

… similarity in height among segments should especially promote coarticulation & harmony between /a/ and the mid-open front vowel /ɛ́/ (cf. Herrero 2008, Herrero & Jiménez 2011a).

III. Leveling of F2 in Nules & Borriana

Structure:

1. The starting point: neutral contexts
    1. Basic contrast
    2. Lack of general assimilation or neutralization
2. The preharmonic stage: Nules
3. The harmonic stage: Borriana

III.1. The starting point: neutral contexts

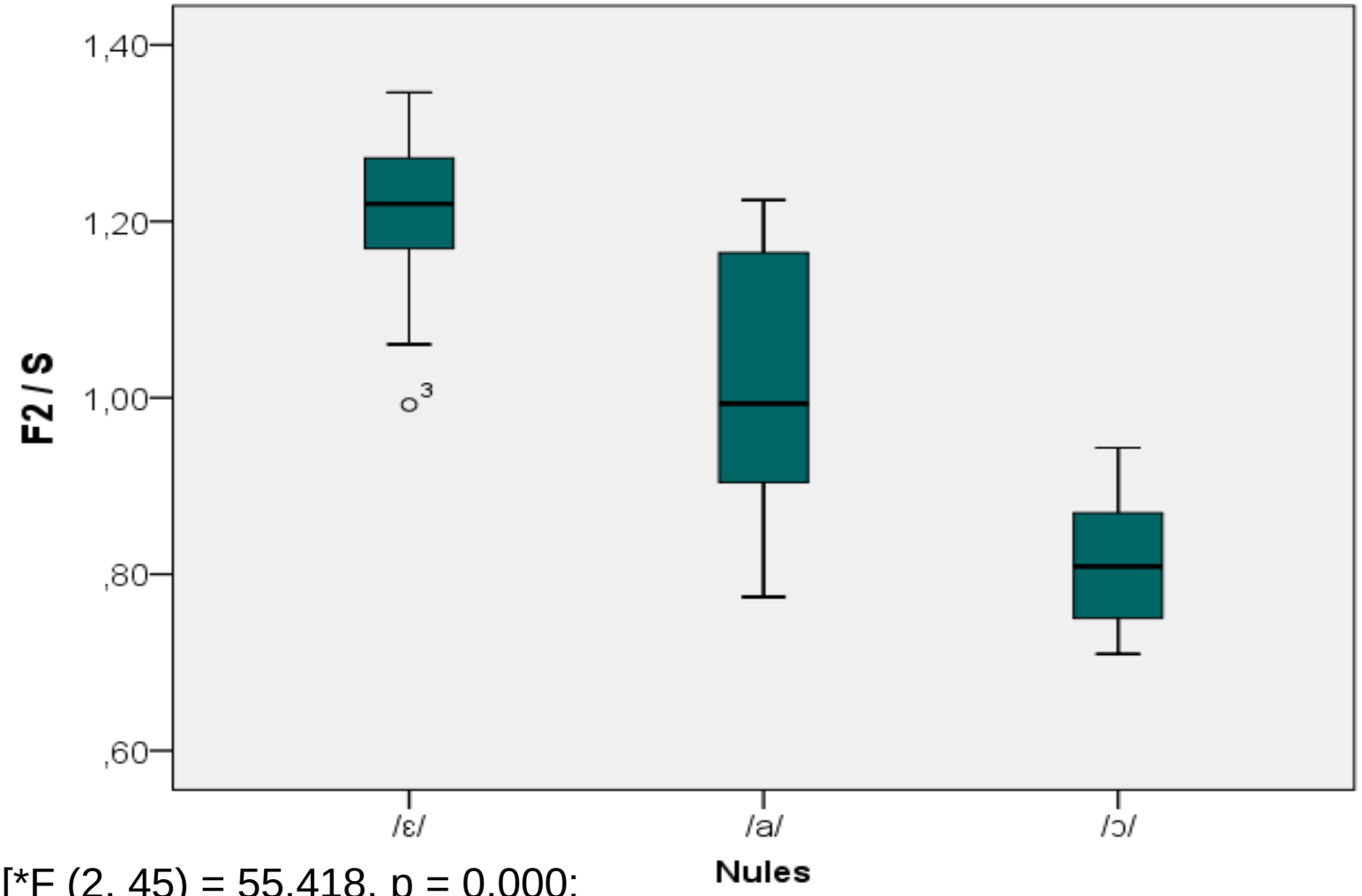
1. Basic contrast

- [−ATR] vowels also present a contrast depending on color (i.e. place of articulation).

/ɛ/	/a/	/ɔ/
[−back]	[+back]	[+back]
[−round]	[−round]	[+round]
[−ATR]	[−ATR]	[−ATR]
[−low]	[+low]	[−low]

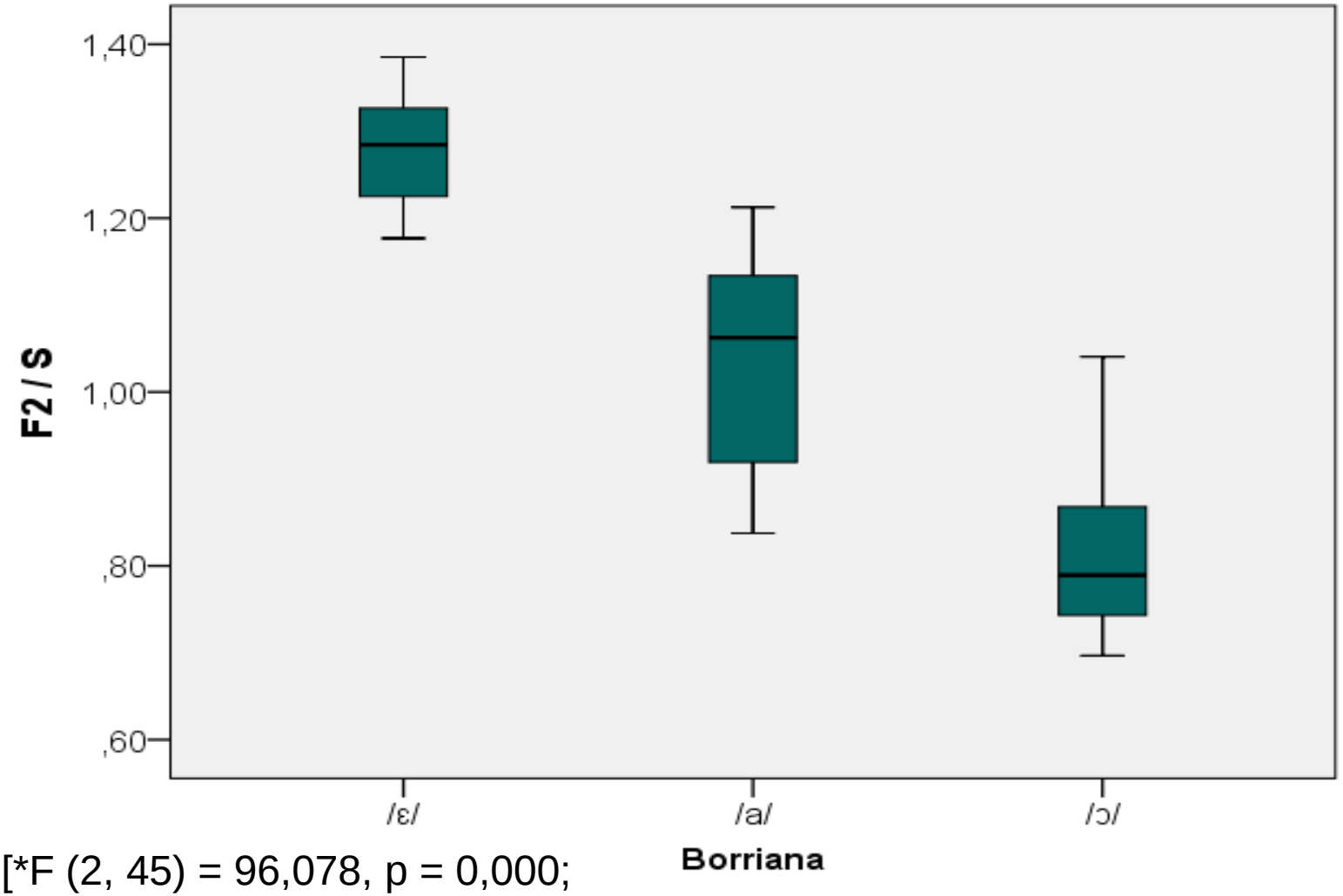
- In neutral contexts, without assimilation (*cel*, *sal* and *sol*), the distinction is undoubtedly robust enough in both varieties:

III.1. The starting point: neutral contexts



[*F (2, 45) = 55,418, p = 0,000;
H (2) = 32,370, p = 0,000]

III.1. The starting point: neutral contexts



[*F (2, 45) = 96,078, p = 0,000;
H (2) = 37,850, p = 0,000]

III.1. The starting point: neutral contexts

2. Lack of general assimilation or neutralization

- In Nules and Borriana the F2 values of unstressed /a/ in post-tonic position are not different from stressed /á/,…

  - …neither in the context /á/+/a/:
    - sala [sál**a**] *[sálɔ], *[sálɛ]

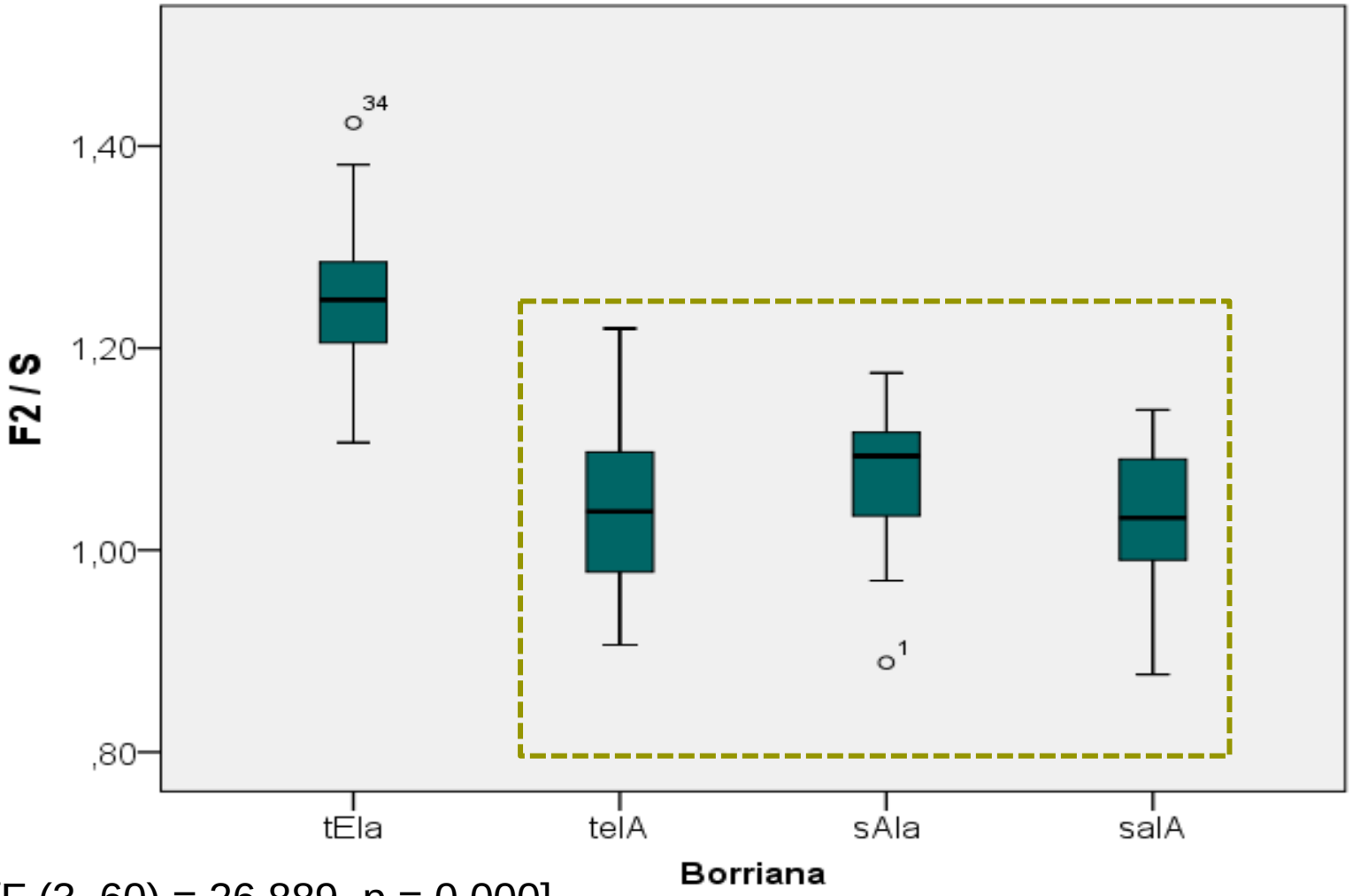
  - …nor in the context /é/+/a/:
    - tela [tél**a**] *[télɛ], *[télɔ]

III.1. The starting point: neutral contexts

2. Lack of general assimilation or neutralization

- Hence, there is neither general neutralization of final */a/* as [ɔ] (or [ɛ]), nor assimilation triggered by the stressed front vowel [ɛ́].
- Obviously, in both varieties the F2 value of the stressed [ɛ́] differs from the three low vowels of *sala* and *tela*:

III.1. The starting point: neutral contexts



[F (3, 60) = 26,889, p = 0,000]

III.2. The preharmonic stage: Nules

1. General pattern

- In the environment /ɔ́/+/a/ (*pistola*) the F2 of the unstressed /a/ has an intermediate value between that of the stressed /ɔ́/ (*pistola*) and that of the unstressed /a/ in the context /á/+/a/ (*sala*), and is significantly different from the values of the last two vowels.

III.2. The preharmonic stage: Nules

1. General pattern

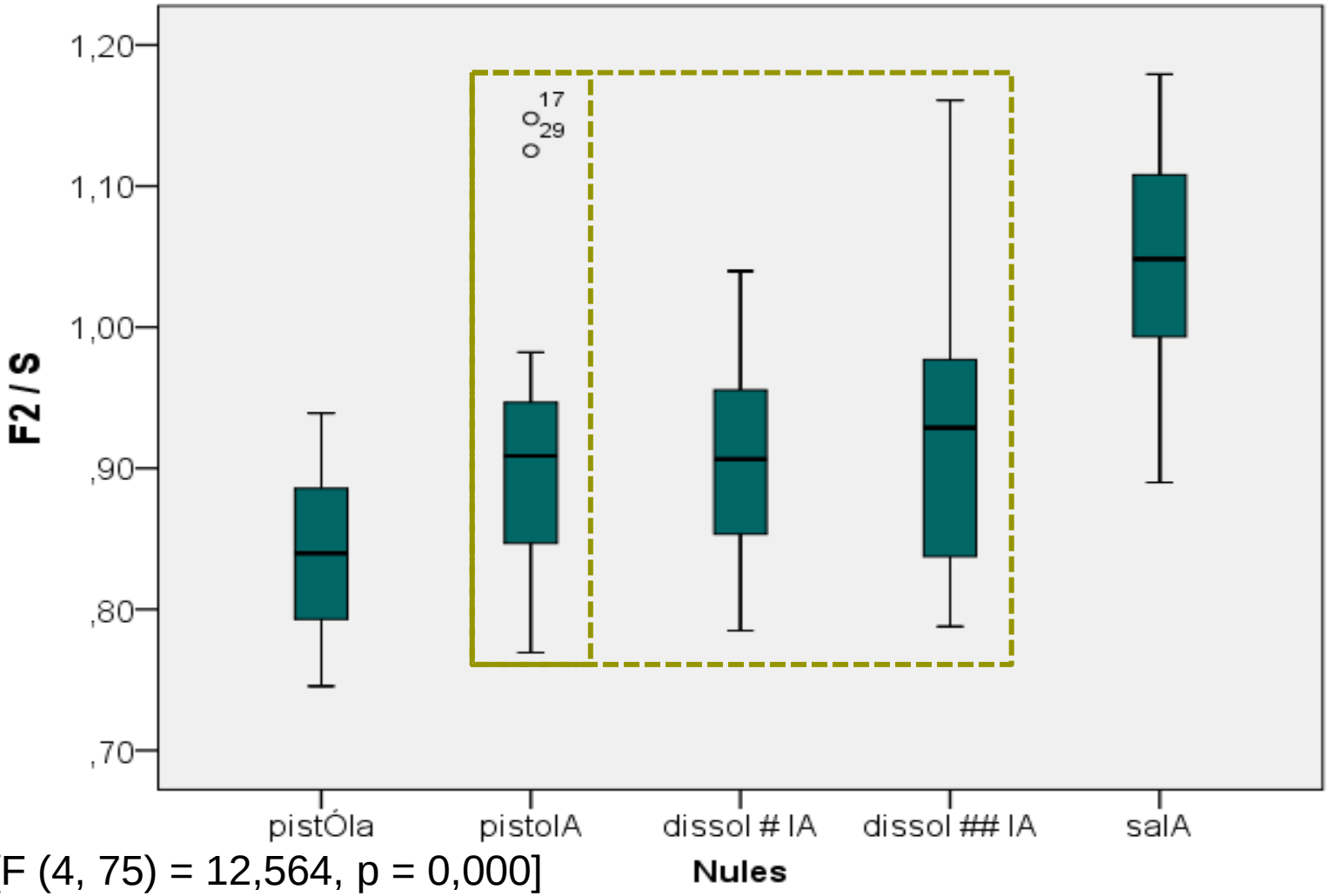
- The backing/rounding of /a/ in the context /ɔ́/+/a/ (*pistola*) is supposed to be caused by coarticulation stemming from the stressed vowel. (cf. Herrero 2010a)
- As a typical phonetic process, it should operate across morphological boundaries as well.

III.2. The preharmonic stage: Nules

1. General pattern

- Indeed, the levels of coarticulation across a clitic boundary (context *dissol-la*) & across a word boundary (context *dissol la farina*) are statistically equivalent to those found in the prototypically harmonic context (*pistola*).
- And in both cases the partially assimilated vowels appear to be different from the unstressed final low vowel in *sala* and the stressed round vowel in *pistola*.

III.2. The preharmonic stage: Nules



[F (4, 75) = 12,564, p = 0,000]

III.2. The preharmonic stage: Nules

2. Perceptually asymmetrical contexts

- Word-final /a/ is protected from total assimilation by its relative prominence (on the status of final vowels, see Barnes 2006, Walker 2011).
- By comparison, post-tonic internal syllables are regarded as prosodically weaker. What happens in that position, i.e. in a less prominent site?

III.2. The preharmonic stage: Nules

2. Perceptually asymmetrical contexts

- Difficulties in describing the behavior of /a/ in this environment:
  - Proparoxytones are not frequent in Romance languages.
  - Post-tonic internal /a/ in traditional Catalan words were raised to [e]: ORPHĂNU > *orfe* (FEM: *òrfena*), ORGĂNU > *orgue*.
  - Additionally, proparoxytones with internal /a/ tend to be learned words (*apòstata* ‘apostate’, *pròstata* ‘prostate’), usually taken directly from Spanish sources, without [−ATR] mid vowels.

III.2. The preharmonic stage: Nules

2. Perceptually asymmetrical contexts

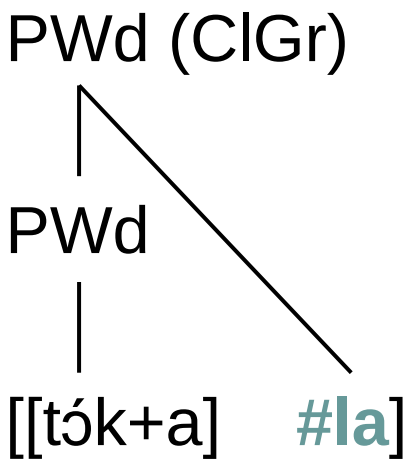
- As a result, speaker's intuitions for these words are uncertain.
- Alternative: Verbal forms ending in /a/ with penultimate stress followed by a syllabic clitic (for instance, the feminine clitic *la*):

▪ toca-la	/tɔ́k**a**#la/	'touch it (FEM)'
▪ assola-la	/asɔ́l**a**#la/	'devastate it (FEM)'

III.2. The preharmonic stage: Nules

2. Perceptually asymmetrical contexts

- In these cases, the clitic forms a prosodic unit with the host (either a recursive phonological word or a clitic group):

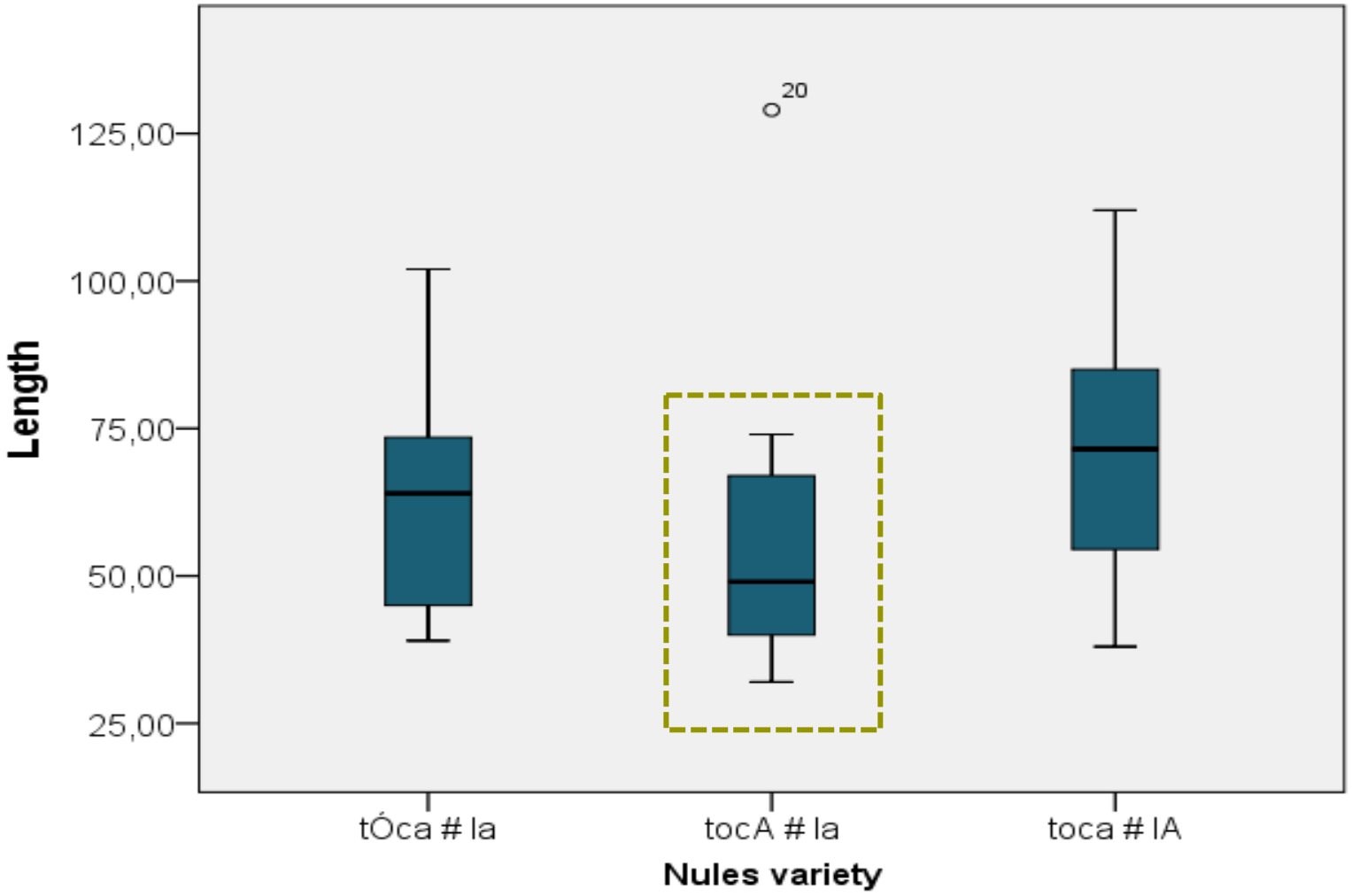


III.2. The preharmonic stage: Nules

2. Perceptually asymmetrical contexts

- In the context /tɔ́ka#la/, the intensity of the stressed vowel and the two post-tonic ones is not significantly different.
- But their length is distinctly different, with the length of the post-tonic internal vowel at the bottom; i.e. the internal vowel can be considered weaker.
  - The shortening is especially pronounced in the sequence *toca-la*, the most common one.

III.2. The preharmonic stage: Nules

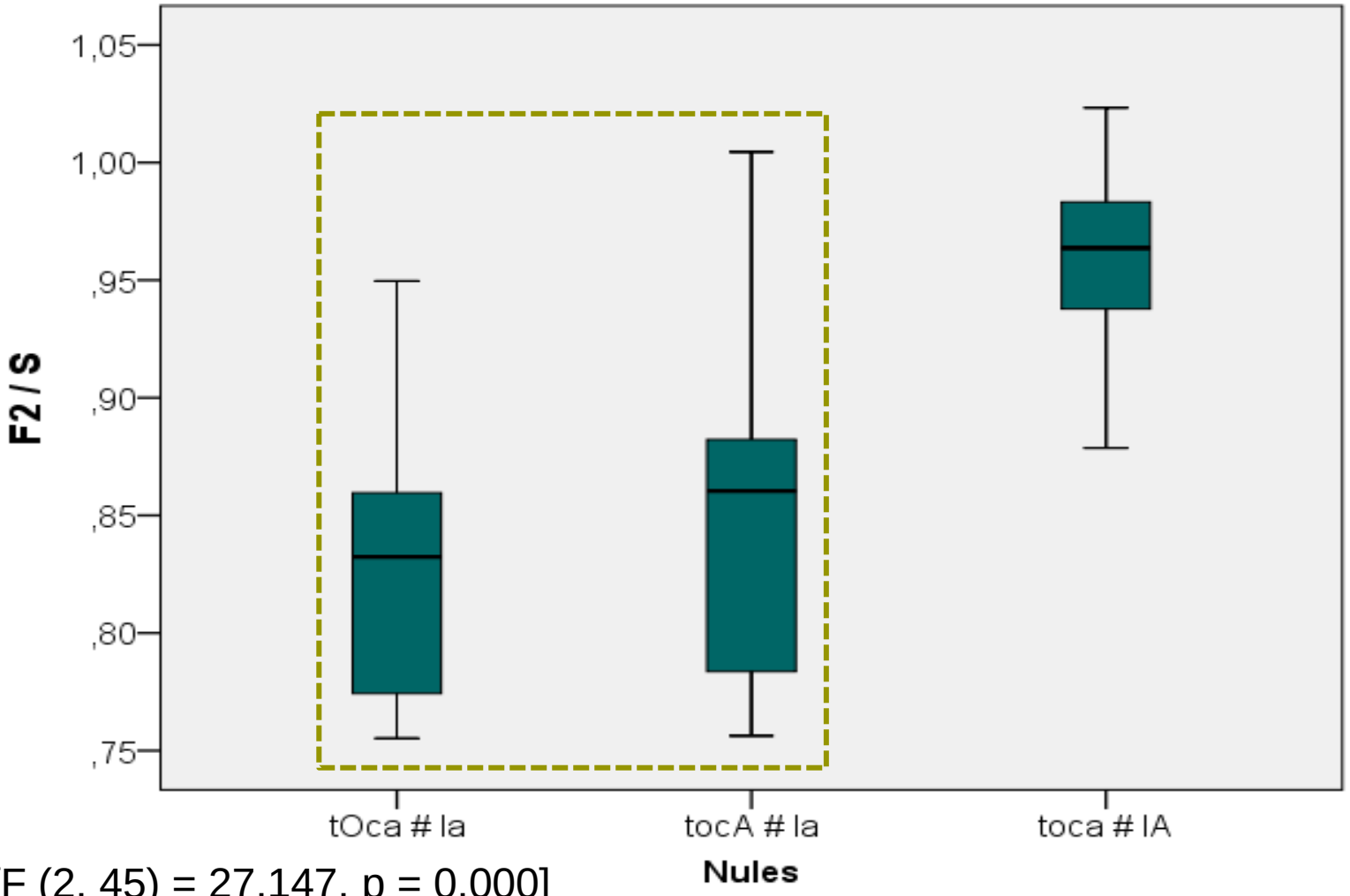


III.2. The preharmonic stage: Nules

2. Perceptually asymmetrical contexts

- Outcome: Post-tonic internal /a/ undergoes total assimilation with the stressed vowel /ɔ́/ in the verbal form.
- Vowel harmony does not continue to the following pronoun. The clitic vowel shows intermediate F2 values between the coarticulated /a/ in the context *pistola* and neutral [a] in the context *sala*. Hence, there is coarticulation with the preceding unstressed vowel, but less intense.

III.2. The preharmonic stage: Nules



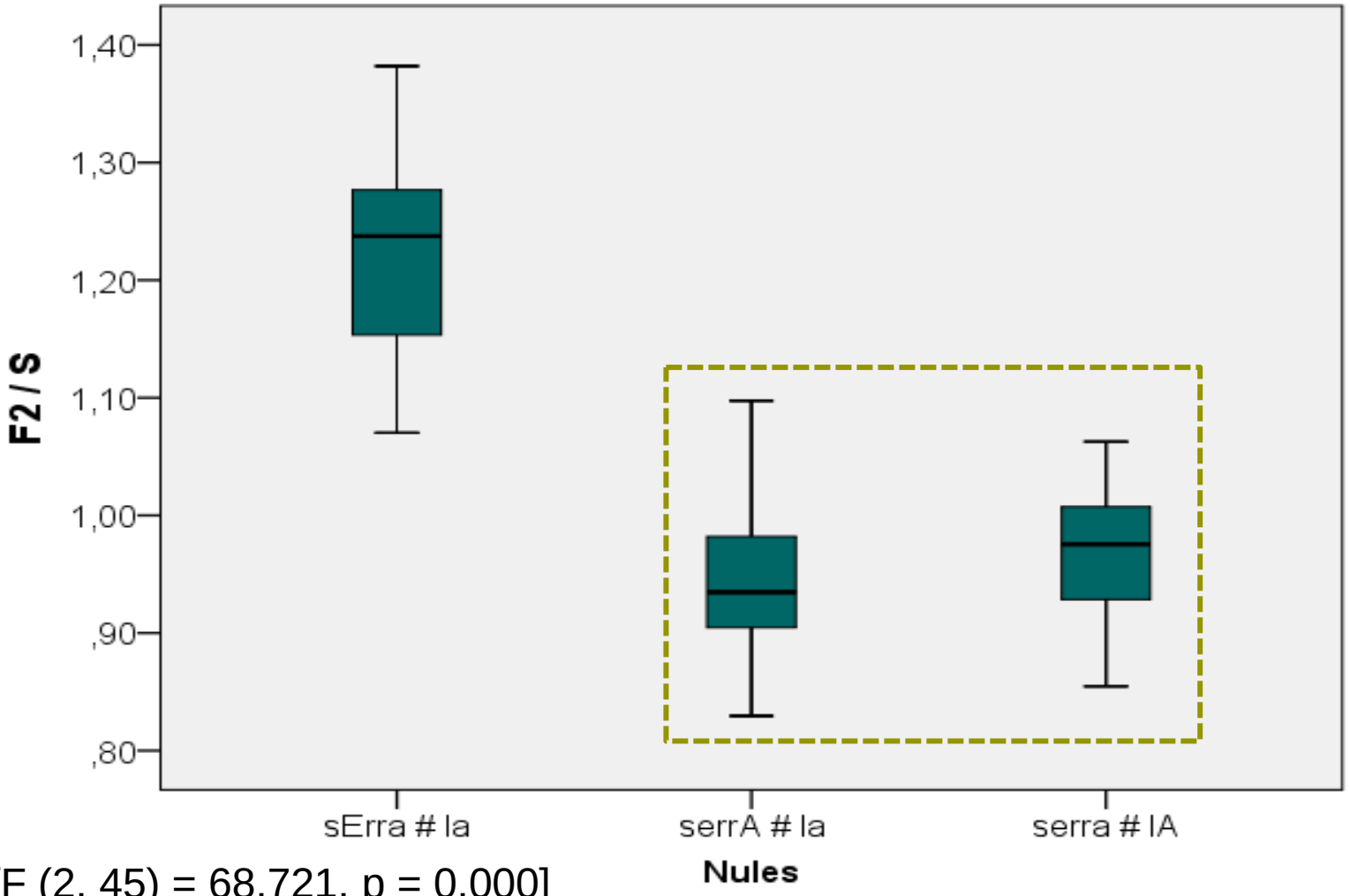
[F (2, 45) = 27,147, p = 0,000]

III.2. The preharmonic stage: Nules

2. Perceptually asymmetrical contexts

- By contrast, although the same variation in vowel length exists, there are no similar assimilatory effects related to the front vowel /*ɛ́*/ in the parallel context /*ɛ́*/#/a/##/la/: *serra-la* ‘saw it (FEM)’.

III.2. The preharmonic stage: Nules



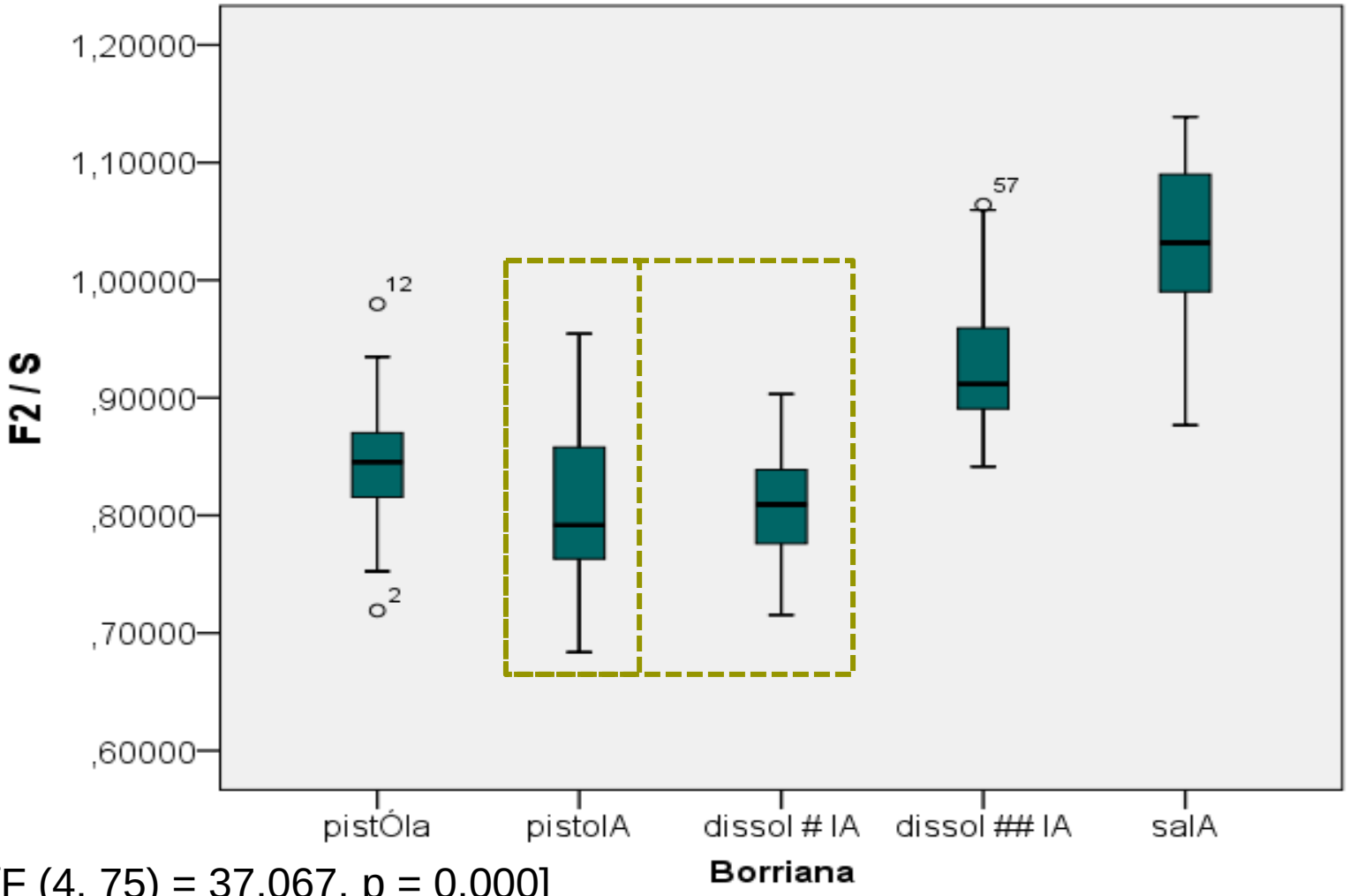
[F (2, 45) = 68,721, p = 0,000]

III.3. The harmonic stage: Borriana

1. General pattern

- As expected, in this variety /a/ in the context /ɔ́/+/a/ (*pistola*) displays total assimilation to the stressed vowel: [pistólɔ].
- The process likewise affects the final vowel in the context /ɔ́/#/a/, with a clitic boundary (*dissol-la*).
  - In a previous set of data, with subjects above 65 years-old, this context showed some variation between total and partial assimilation (Herrero & Jiménez 2011a,b).

III.3. The harmonic stage: Borriana



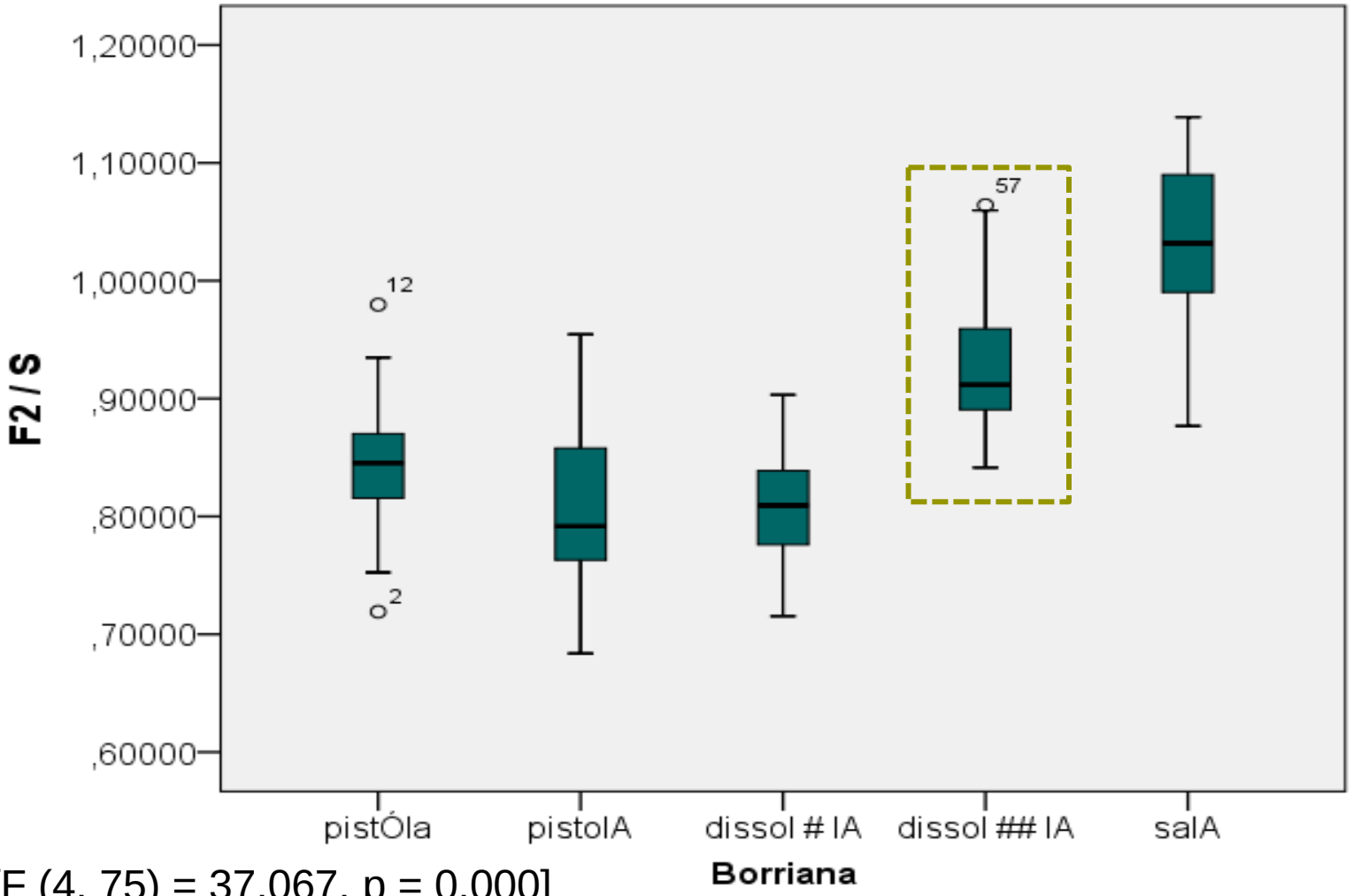
[F (4, 75) = 37,067, p = 0,000]

III.3. The harmonic stage: Borriana

1. General pattern

- The assimilation, though, is sensitive to major morphological boundaries: across words (as in *dissol la farina*) the vowel of the article is not totally assimilated. Its realization is at an intermediate point between the harmonized /a/ in *pistola* and the neutral /a/ in the context *sala*.
- Therefore, there is coarticulation, as in Nules, but not vowel harmony.

III.3. The harmonic stage: Borriana



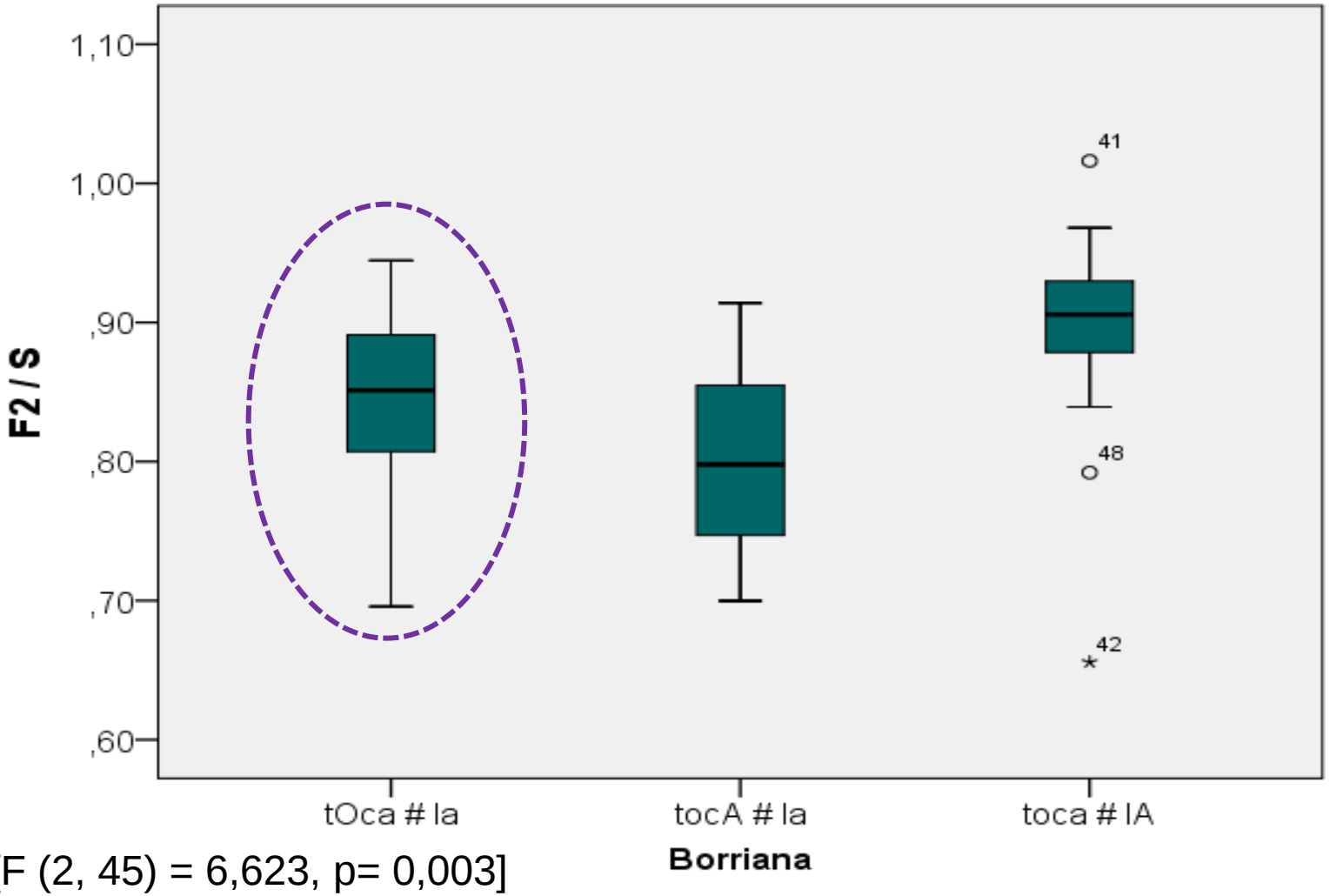
[F (4, 75) = 37,067, p = 0,000]

III.3. The harmonic stage: Borriana

2. Perceptually asymmetrical contexts

- As in Nules *toca-la,* round vowel harmony affects post-tonic internal vowels.
- The assimilation is again not recursive: the /a/ in the pronoun is only realized with slight changes in F2, like the /a/ belonging to a different word (context /ɔ́/##/a/, *dissol la farina*).

III.3. The harmonic stage: Borriana



[F (2, 45) = 6,623, p= 0,003]

III.3. The harmonic stage: Borriana

2. Perceptually asymmetrical contexts

- Replicating again the Nules pattern, mid-open front vowels do not trigger assimilation in the parallel context /ɛ́/#/a/##/la/: *serra-la*.

IV. Concluding remarks

1. Summary

Changes in F2 value	Nules	Borriana
1. /sál+a/ ‘room’	X	X
2. /tɛ́l+a/ ‘cloth’	No	No
3. [tɔ́kɔ] # /la/ ‘touch it (FEM)’	Coarticulation	Coarticulation
4. /disɔ́l ## la…/ ‘s/he dissolves the (F)…’	Coarticulation	Coarticulation
5. /disɔ́l # la/ ‘dissolve it (FEM)’	Coarticulation	VH
6. /pistɔ́l+a/ ‘gun’	Coarticulation	VH
7. /tɔ́ka # la/ ‘touch it (FEM)’	VH	VH

IV. Concluding remarks

2. Final remarks

- Generally speaking, differences in height among [−ATR] vowels do not seem to restrict their capability to trigger or experiment assimilation.
- In neutral contexts (rows 1 & 2), there is not general neutralization of final /a/ to [ɔ] in either variety.
- In the potentially harmonic context /ɛ́/+/a/ (row 2, *tela*) the [−back] feature is wholly realized in the stressed syllable, without coarticulation or vowel harmony to the final low vowel.

IV. Concluding remarks

2. Final remarks

- In both varieties, total assimilation from stressed [ɔ] is witnessed.
- In Nules variety, only the weakest of the post-tonic vowels, i.e. the post-tonic internal vowel, undergoes vowel harmony (row 7). This variety, thus, exhibits evidence of word-final faithfulness.
- In Borriana, low vowels adjacent to a round vowel and located in more prominent sites (word-final position and clitic-final position; rows 5 & 6) are realized with total assimilation as well.

IV. Concluding remarks

2. Final remarks

- Whereas Borriana vowel harmony is sensitive to major morphological boundaries (context /disɔ́l ## l**a**…/; row 4), coarticulation operates in both varieties across major and minor morphological boundaries (Nules rows 3-6; Borriana, rows 3 & 4).
- The last vowel in the context /tɔ́ka/#/l**a**/ (row 3), which could be a target for recursive vowel harmony, only undergoes coarticulation, i.e. partial assimilation.

IV. Concluding remarks

2. Final remarks

- Nules and Borriana partial assimilation acts as a typically phonetic process, whereas Borriana total assimilation displays the properties expected in phonological phenomena.

IV. Concluding remarks

2. Final remarks

- The whole picture is thus consistent with an interpretation in which Nules variety presents a first stage in the process of assimilation and Borriana variety displays a generalization of the extension to every strictly post-tonic vowel which is placed inside the clitic group (or the recursive phonological word).

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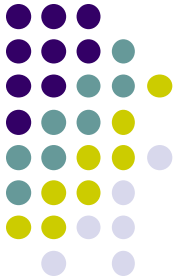

Thank you for your attention

Presentation soon available at:
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