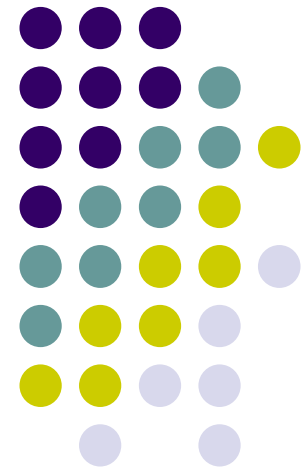# Rara a*f*is, rara a*v*is

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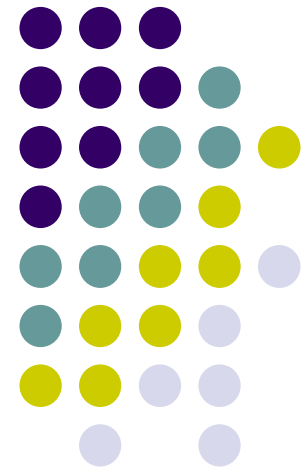
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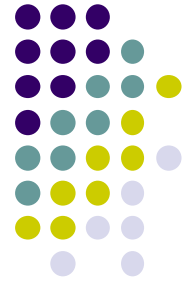
Rara a*f*is, rara a*v*is, or the weird behavior of labiodental fricatives

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Introduction

General facts:

- In **Catalan**, like in other languages, there are **several** phenomena in which the voiceless labiodental fricative (*f*) and, to a lesser extent, its voiced counterpart (*v*) pattern with stops rather than with other fricatives.

- This puzzling behavior, even if familiar, is not well explained in the literature (cf. Wheeler 2005).
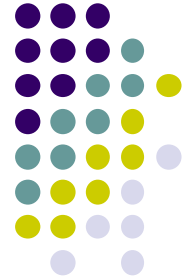
The aim of this paper is twofold:

a) to provide an explanation of the behavior of **f/v** on the basis that labiodental fricatives are ranked between stops and sibilant fricatives in the sonority scale, and

b) to suggest the possibility that the sonority scale may have a non-discrete, gradient nature (in line with work by Boersma & Hayes 2001).
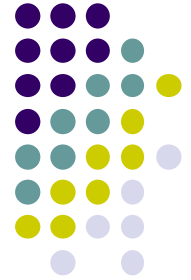
Outline of the presentation

I.   Data: Obstruents in Catalan

- Targets of phenomena
- Triggers of phenomena
- Structures

II.   Analysis

- *f* & *v* in the sonority scale

III.   Further issues: Variation

IV.   Concluding remarks

I. Data: Preliminaries

Catalan obstruent (O) system:

- Stops (T/D):
  - T: /p, t, k/
  - D: /b, d, g/

- Sibilant fricatives (S/Z):
  - S: /s, ʃ, ts, tʃ/
  - Z: /z, ʒ, dz, dʒ/

- Labiodental fricatives (f/v):
  - f: /f/
  - (v: /v/ in some dialects only)

I. Data: Targets

1. Word-final devoicing (and gliding) of O (general)

- T/D: /t/ po[t] 'pot' Cf. po[t]et 'pot (dim)'
  /d/ po[t] 's/he can' Cf. po[d]ia 's/he could'

- S/Z: /s/ na[s] 'nose' Cf. na[s]os 'noses'
  /z/ pi[s] 'flat' Cf. pi[z]os 'flats'

- f/v: /f/ ba[f] 'breath' Cf. ba[f]ada 'puff'
  (/v/ ser[f] 'slave' Cf. ser[v]ir 'to serve'
  to[w] 'soft' Cf. to[v]et 'soft (dim)'
  be[w] 's/he drinks' Cf. be[v]ia 's/he drank'
  lle[w]/[f]* 'I remove' Cf. lle[v]ar 'to remove')

* 1st person PI of class I verbs in insular Catalan may show paradigmatic effects and devoice like other O: [f] in Alghero and varieties of Balearic Catalan. Otherwise, the general alternation is with a **glide**: [v]~[w].

7

2. Voice assimilation (general)

a) Coda voice assimilation (O.C)

O in a coda agree in voicing with the following C:

T/D:	/t/	po[t] tancat	'close pot'	po[d] negre	'black pot'
	/d/	po[t] tenir	's/he can have'	po[d] negar	's/he can deny'

S/Z:	/s/	na[s] petit	'small nose'	na[z] gran	'big nose'
	/z/	pi[s] petit	'small flat'	pi[z] gran	'big flat'

f/v:	/f/	ba[f] pudent	'stinky breath'	ba[v] dolent	'bad breath'
	(/v/	ser[f] petit	'small slave'	ser[v] gran	'big slave')

b) Voicing across words (O ## Vowel)

When followed by a word-initial V: **T/D** & **typically f/v** maintain the voiceless character resulting from word-final devoicing, whereas S/Z assimilate the voicing of the following V:

T/D & f/v:	/t/	po[t] obert	'open pot'
	/d/	po[t] obrir	's/he can open'
	/f/	ba[f] últim	'last breath'
	(/v/	ser[f] informal	'informal slave',
		lle[f] informes	'**I** remove reports')
S/Z:	/s/	na[z] enorme	'big nose'
	/z/	pi[z] immens	'huge flat'

f/v-voicing is **possible**, however, esp. when stress is far:

	/f/	fotògra[f]/[v] alemány	'German photographer'

3. Manner assimilation (Majorca & Minorca, with /v/)

Manner assimilation applies when a C in coda position is followed by a **more sonorant C**. As for O:

- **T/D** systematically undergo manner assimilation:

  /t/   po[f] fred   'cold pot'   po[r] rus   'Russian pot'

       po[n] negre   'black pot'   po[l] lila   'purple pot'

  /d/   po[v] venir   's/he can come'   po[r] roncar 's/he can snore'

       po[n] negar   's/he can deny'   po[ʎ] llegir   's/he can read'

- **S/Z**, although they can undergo manner assimilation when followed by certain C, tolerate a higher degree of intersyllabic sonority rising, *i.e.* S/Z.N (other varieties show Rhotacism):

  /s/   na[s] petit   'small nose'   na[r] rus   'Russian nose'

       na[z] negre   'black nose'   na[l] lila   'purple nose'

  /z/   pi[z] vell   'old flat'   pi[r] rodó   'round flat'

       pi[z] nou   'new flat'   pi[ʎ] lleig   'ugly flat'

- **f/v**, replicating stops again, **tend** to assimilate the manner of articulation of the following more sonorant C, and also when they are followed by a stop (see v-Gliding too).

/f/	ba[n] natural	'natural breath'	ba[r] repel·lent	'disgusting breath'
	aga[p] pomes	'I take apples'	aga[l] làmines	'I take sheets'

/v/	lle[n] nexes	'I remove links'	lle[ʎ] lleganyes	'I remove sleeps'
	lle[p] pomes	'I remove apples'	lle[l] làmines	'I remove sheets'

4. Rhotacism and gliding (Majorca, with /v/)

- **In some varieties, alveolar S/Z** in codas undergo a process of rhotacism when followed by certain non-sibilant C:

/s/, /z/	de[ɹ]gràcia	'misfortune'	fanta[ɹ]ma	'phantom'
/s/	na[ɹ] blanc	'white nose'	na[ɹ] negre	'black nose'
/z/	pi[ɹ] vell	'old flat'	pi[ɹ] modern	'modern flat'

- **Palatal S/Z** in codas undergo a process of gliding when followed by a C:

/ʃ/	pe[j] salat	'salty fish'	Cf.	pe[ʃ]	'fish'
				pe[ʃ]era	'fish bowl'
/dʒ/	ra[j] de vi	'jet of wine'	Cf.	ra[tʃ]	'jet (of liquid)'
				ra[dʒ]ar	'to flow from'

12

- While S/Z in internal codas undergo rhotacism and gliding, both phenomena are unknown for **T/D** & **f**, which undergo other processes of assimilation instead (as seen before):

T/D:

| /t/ | po[b] blanc | 'white pot' | po[n] negre | 'black pot' |
| /d/ | po[v] venir | 's/he can come' | po[n] negar | 's/he can deny' |

f:

| /f/ | ba[d] dolent | 'bad breath' | ba[n] natural | 'natural breath' |
| | aga[p] pomes | 'I take apples' | aga[n] nous | 'I take walnuts' |

- **v** does not undergo rhotacism, but post-V undergoes gliding in coda position:

/v/: **Coda [w]**   **Onset [v]**

lle[w]   'I remove'   lle[v]ar   'to remove'

lle[w] nexes   'I remove links'   lle[v] un poc   'I remove a little'

to[w]   'soft'   to[v]et   'soft (dim)'

to[w] del tot   'completely soft'   to[v] i suau   'soft and smooth'

be[w]   's/he drinks'   be[v]ia   's/he drank'

be[w] bé   's/he drinks well'   be[v] un poc   's/he drinks a little'

- NB: Remember that 1st person PI of class I verbs can behave like T/D (& f) due to paradigmatic effects:

/v/ = T/D (& f):

lle[f]   'I remove'   Cf. lle[v]ar   'to remove'

lle[n] nexes   'I remove links'   lle[f] un poc 'I remove a little'

14

I. Data: Triggers

5. Epenthesis between words (Alghero, with /v/)

- **T/D** & **f/v** in word-final position followed by a word beginning with a C trigger a process of [i]-epenthesis (they appear as voiceless due to **word-final devoicing**):

  /t/:   fe[t] [i] per tu   'done by you'   Cf. fe[t] 'done', fe[t]a 'done (fem)'

  /g/:   be[k] [i] bé   'I drink well'   Cf. be[k] 'I drink', be[g]ut 'drunk'
         be[k] [i] whisky   'I drink whisky'   whisk[i]

  /v/:   vi[f] [i] molt...   'I live very...'   Cf. vi[f] 'I live', vi[v]ir 'to live'

- **S/Z** do not (they undergo **coda voice assimilation**):

  /s/:   é[z] whisky   'it's whisky'   Cf. é[s] 'it is', é[s]er   'to be'

  /z/:   pi[s] petit   'small flat'   pi[s] 'flat', pi[z]os 'flats'

6. Rhotacism (varieties of Majorca, with /v/)

● Rhotacism applies when the following C is a **voiced non-sibilant C** (D, N, v) and **less systematically f**:

+ D,N,v:	de[ɹ]**g**ràcia	'misfortune'	fanta[ɹ]**m**a	'phantom'
	na[ɹ] **b**lanc	'white nose'	na[ɹ] **n**egre	'black nose'
	pi[ɹ] **v**ell	'old flat'	pi[ɹ] **m**odern	'modern flat'
+ f:	e[ɹ]**f**era	'sphere'	pi[ɹ] **f**red	'cold flat'
Cf. + T:	na[s] **p**etit	'small nose'	na[s] **t**rencat	'broken nose'

I. Data: Structures

7. Complex onsets (general)

- **T/D** & **f/v** can combine with l/ɾ in complex onsets:

T/D:	[tr]es	'three'	[pl]ou	'it rains'
	[d]rac	'dragon'	[bl]au	'blue
f/v:	[fr]esc	'fresh'	[fl]or	'flower'
	([vr]itat	'true' < veritat	[vl]adimir	'Vladimir')

- **S/Z** cannot (all sC- loans are adapted with e-initial epenthesis):

  S/Z: e-Snoopy, e-sport, e-slam

17

I. Data: Sum up

- Overall:

    F/V = T/D

- But:

    F = T/D   (X Gliding, target)
    V = S/Z   (√ Gliding, target)

- and variation F/V:

    F/V [f]~[v]   (Voicing O##V, target)
    F/V [N]~[v]   (Manner ass. O.N, target)
    [ɹ]~[s].**F**   (Rhotacism, trigger)

II. Analysis (without variation)
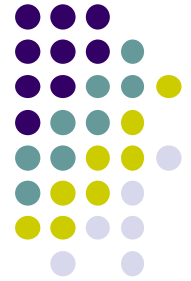
	T	f	D	v	S	Z
Word-final devoicing (WFD)						
Voice assimilation O.C						
Manner assimilation O.N						
Rhotacism (target)						
Complex onset						
Voicing O##V			**WFD**	**WFD**		
Epenthesis O##C			**WFD**	**WFD**		
Gliding						
Rhotacism (trigger)						

- **Sonority scale:**

T < **f** < **D** < **v** < **S** < **Z** < N < r < ɾ, l < G, ɹ < V
0   1   2   3   4   5   6   7   8   9 10

II. Analysis: Voice assimilation

- **Trigger of sibilant voicing across words:**

  Agree[±voice]$_{WIn}$: An obstruent and a word-initial segment must agree in voicing.

  (Cf. Lloret&Jiménez 2009. On the prominence of word-initial position, cf., e.g., Nooteboom 1981, Byrd 1986, Hawkins&Cutler 1988, Barnes 2002, Chitoran *et al.* 2002, van Oostendorp 2003)

- **Trigger of word-final voiceless stop and *f* maintenance across words:**

  Gradual **No-VC-Link(voice),** prevents stops from voicing (as a result of $\text{Agr}[\pm\text{vc}]_{\text{WIn}}$) due to the degree of dissimilarity between segments.

  (Cf. Jiménez 1999, Lloret&Jiménez 2009; *apud* Itô *et al.* 1995. Also in Bermúdez-Otero 2001, 2006 to prevent voice from spreading between V & C within words)

- **No-VC-Link(voice) family of constraints,** ranked according to the degree of dissimilarity between segments:

VC link * | VC link √

T < f < D < v < S < Z < N < r < ɾ, l < G, ɹ < V

0   1   2   3   4   5   6   7   8   9   10
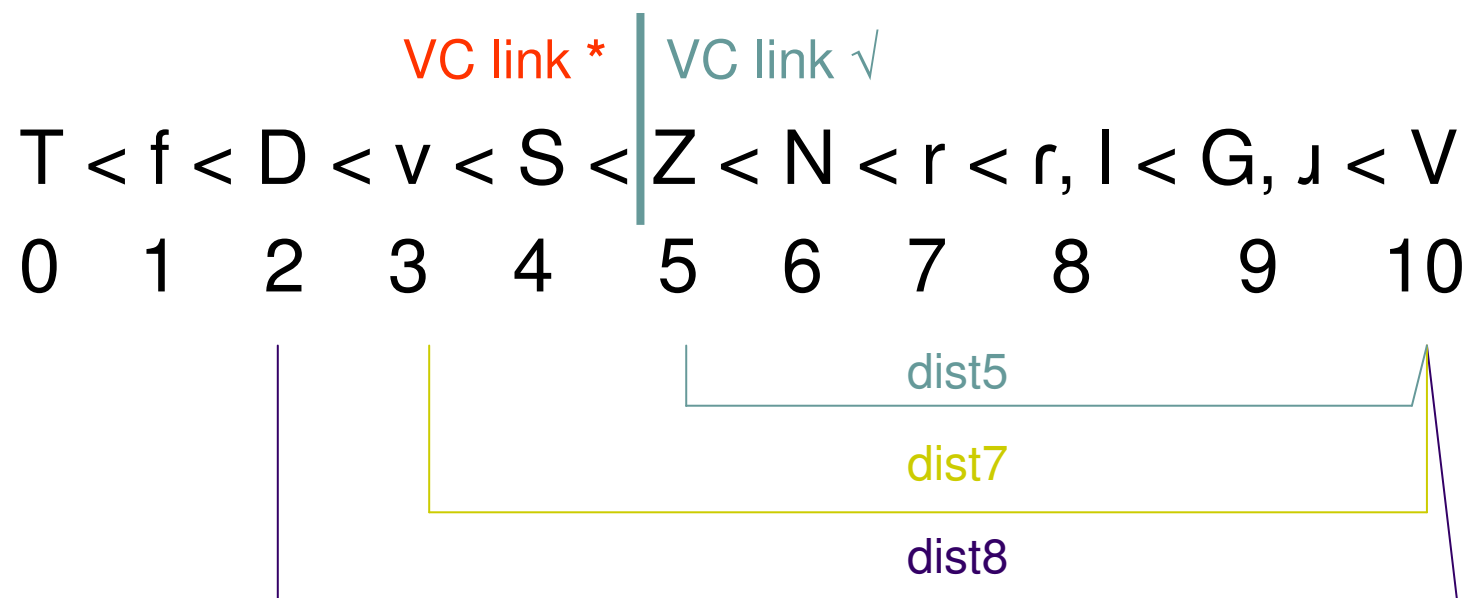
dist5

dist7

dist8

- **No-VC-Link(voice) ranking:**

    The more distance, the worse link.

    … No-VC-Link(dist8) >> No-VC-Link(dist7) >> No-VC-Link(dist6) >> No-VC-Link(dist5) …

- **Relevant ranking for Catalan (general):**

    … No-VC-Link(dist8) >> No-VC-Link(dist7) >> Agree[±voice]$_{WIn}$, No-VC-Link(dist6) >> No-VC-Link(dist5) …

[t V]: dist 10
[d V]: dist 8

po/t/ obert 'open pot'	No-VC-Link(dist10)	No-VC-Link(dist8)	Agree[±vc]$_{WIn}$	No-VC-Link(dist6)	No-VC-Link(dist5)
☺ a. po[t] obert			*		
b. po[d] obert		*!			

po/d/ obrir 's/he can open'	No-VC-Link(dist10)	No-VC-Link(dist8)	Agree[±vc]$_{WIn}$	No-VC-Link(dist6)	No-VC-Link(dist5)
☺ a. po[t] obrir			*		
b. po[d] obrir		*!			

[f V]: dist 9
[v V]: dist 7

ba/f/ últim 'last breath'	No-VC-Link(dist9)	No-VC-Link(dist7)	Agree[±vc]$_{WIn}$	No-VC-Link(dist6)	No-VC-Link(dist5)
☺ a. ba[f] últim			*		
b. ba[v] últim		*!			

ser/v/ informal 'informal slave'	No-VC-Link(dist9)	No-VC-Link(dist7)	Agree[±vc]$_{WIn}$	No-VC-Link(dist6)	No-VC-Link(dist5)
☺ a. ser[f] informal			*		
b. ser[v] informal		*!			

[s V]: dist 6
[z V]: dist 5

na/s/ enorme 'big nose'	No-VC-Link(dist8)	No-VC-Link(dist7)	Agree[±vc]$_{WIn}$	No-VC-Link(dist6)	No-VC-Link(dist5)
a. na[s] enorme			*!		
☺ b. na[z] enorme					*

pi/z/ immens 'huge flat'	No-VC-Link(dist8)	No-VC-Link(dist7)	Agree[±vc]$_{WIn}$	No-VC-Link(dist6)	No-VC-Link(dist5)
a. pi[s] immens			*!		
☺ b. pi[z] immens					*

II. Analysis: Epenthesis

● **Trigger of epenthesis across words**:

No-Internal-Coda family of constraints, ranked according to the relative sonority of the segment in the coda:

The less sonorous, the worse coda.

No-Int-Coda(T) >> No-Int-Coda(f) >> No-Int-Coda(D) >> No-Int-Coda(v) >> No-Int-Coda(S) >> No-Int-Coda(Z) >> No-Int-Coda(N) ...

- **Epenthesis constrained by:**

  Dep: Every element of the output has a correspondent in the input.

- **Relevant ranking for Alghero Catalan:**

  No-Int-Coda(T) >> No-Int-Coda(f) >> No-Int-Coda(D) >> No-Int-Coda(v) >> **Dep** >> No-Int-Coda(S) >> No-Int-Coda(Z) >> No-Int-Coda(N)...

fe/t/ per tu 'done by you'	No-Internal-Coda(T)	No-Internal-Coda(f)	**Dep**	No-Internal-Coda(S)
a. fe[t] per tu	*!			
☺b. fe[t i] per tu			*	

vi/v/ per tu 'I live for you'	No-Internal-Coda(T)	No-Internal-Coda(f)	**Dep**	No-Internal-Coda(S)
a. vi[f] per tu		*!		
☺b. vi[f i] per tu			*	

é/s/ petit 'it's small'	No-Internal-Coda(T)	No-Internal-Coda(f)	**Dep**	No-Internal-Coda(S)
☺ a. é[s] petit				*
b. é[s i] petit			*!	

diu/n/ tres 'they say three'	**Dep**	No-Internal-Coda(S)	No-Internal-Coda(N)
☺ a. diu[n] tres			*
b. diu[n i] tres	*!		

II. Analysis: Manner Assim.

- **Trigger of Manner assimilation (Majorca & Minorca Catalan)**:

Intersyllabic Distance (InterDist): A constraint which penalizes rising sonority profiles in syllable borders. (Gouskova 2004; Pons 2005, press)

The more rising is a profile,
the worse is the intersyllabic contact.

... InterDist(+2) >> InterDist(+1) >> InterDist(0) >> InterDist(−1) >> InterDist(−2) ...

(NB: Geminates are invulnerable to InterDist constraints. Hence, InterDist(0) only relevant for heterorganic clusters.)

- **Examples (with S/Z in the coda):**

Contact		Tolerated profiles	
[s] ## [p]	na[s_4 p_0]etit	−4	(0–4)
[s] ## [f]	pi[s_4 f_1]red	−3	(1–4)
[s] ## [v]	pi[z_5 v_3]ell	−2	(3–5)
[s] ## [r]	na[r_7 r_7]us	GEM	
[s] ## [n]	na[z_5 n_6]egre	+1	(6–5)

		Discarded profiles	
[s] ## [r]	na[z_5 r_7]us	+2	(7–5)

33

- **Examples (with T/D and f/v in the coda):**

Contact			**Tolerated profiles**	
[f] ## [p]	aga$[\mathbf{p}_0 \ p_0]$omes		GEM	
[p] ## [f]	ca$[\mathbf{f}_1 \ f_1]$lor		GEM	
[f] ## [n]	lle$[\mathbf{n}_6 \ n_6]$exes		GEM	
[t] ## [n]	po$[\mathbf{n}_6 \ n_6]$egre		GEM	

			Discarded profiles	
[f] ## [p]	aga$[f_1 \ p_0]$omes		−1	(0–1)
[p] ## [f]	ca$[p_0 \ f_1]$lor		+1	(1–0)
[f] ## [n]	lle$[v_3 \ n_6]$exes		+3	(6–3)
[t] ## [n]	po$[d_2 \ n_6]$egre		+4	(6–2)

34

- **Manner assimilation constrained by:**

  - **Ident(sibilant) (IdentSib):** Assign one violation mark for every sibilant input segment whose output correspondent is not sibilant. (Cf. Pater 1999)

  - Other **IdentManner** (IdentCont,IdentO…) constraints.

- **Relevant ranking for Majorca & Minorca Catalan:**

  ... InterDist(+2) >> **IdentSib** >> InterDist(+1) >> InterDist(0) >> InterDist(–1) >> InterDist(–2), **IdentManner** ...

na/s/ petit 'small nose'	Inter Dist(+2)	**Ident Sib**	Inter Dist(+1)	Inter Dist(-3)	Inter Dist(−4)
☺ a. na[s] petit					*
b. na[p] petit		*!			

pi/z/ fred 'cold flat'	Inter Dist(+2)	**Ident Sib**	Inter Dist(+1)	Inter Dist(-3)	Inter Dist(−4)
☺ a. pi[s] fred				*	
b. pi[f] fred		*!			

na/s/ negre 'black nose'	InterDist(+2)	**IdentSib**	InterDist(+1)
☺ a. na[z] negre			*
b. na[n] negre		*!	

na/s/ rus 'Russian nose'	InterDist(+2)	**IdentSib**	InterDist(+1)
a. na[z] rus	*!		
☺ b. na[r] rus		*	

ca/p/ flor 'any flower'	Inter Dist(+3)	Inter Dist(+2)	Ident Sib	Inter Dist(+1)	Inter Dist(−1)	Ident Manner
a. ca[p] flor				*!		
☺ b. ca[f] flor						*

aga/f/ pomes 'I take apples'	Inter Dist(+3)	Inter Dist(+2)	Ident Sib	Inter Dist(+1)	Inter Dist(−1)	Ident Manner
a. aga[f] pomes					*!	
☺ b. aga[p] pomes						*

lle/v/ nexes 'I remove links'	Inter Dist(+3)	Inter Dist(+2)	Ident Sib	Inter Dist(+1)	Inter Dist(−1)	Ident Manner
a. lle[v] nexes	*!					
☺ b. lle[n] nexes						*
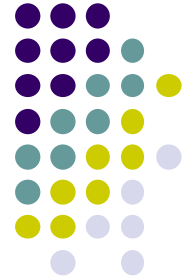
II. Analysis: Rhotacism

- **Trigger of rhotacism in varieties of Majorca Catalan**:

Intersyllabic Distance (InterDist):

The more rising is a profile,
the worse is the intersyllabic contact.

- **Examples:**

Contact		Tolerated profiles	
[s] ## [p]	*na[$ʁ_9$ p_0]etit	–9	(0–9)
[s] ## [f]	pi[$ʁ_9$ f_1]red	–8	(1–9)
[s] ## [b]	na[$ʁ_9$ b_2]lanc	–7	(2–9)
[s] ## [v]	pi[$ʁ_9$ v_3]ell	–6	(3–9)
[s] ## [p]	na[s_4 p_0]etit	–4	(0–4)
[s] ## [n]	na[$ʁ_9$ n_6]egre	–3	(6–9)

*[ʁ p] could be a good profile, but [s p] too (see tableaux below)

		Discarded profiles	
[s] ## [f]	pi[s_4 f_1]red	–3	(1–4)
[s] ## [b]	na[z_5 b_2]lanc	–3	(2–5)
[s] ## [v]	pi[z_5 v_3]ell	–2	(3–5)
[s] ## [n]	na[z_5 n_6]egre	+1	(6–5)

- **Rhotacism constrained by:**

IdentSib & **IdentCont**

Crucially, **IdentSib** demoted in the ranking.

- **Ranking in Majorca & Minorca Catalan without rhotacism (but manner assim.):**

  ... InterDist(+2) >> **IdentSib** >> InterDist(+1) >> InterDist(0) >> InterDist(−1) >> InterDist(−2), **IdentManner** ...

- **Ranking in Majorca Catalan with rhotacism:**

  ... InterDist(+2) >> InterDist(+1) >> InterDist(0) >> InterDist(−1) >> InterDist(−2), **IdentCont** >> InterDist(−3) >> **IdentSib** >> InterDist(−4) ...

na/s/ **p**etit 'small nose'	**Ident Cont**	Inter Dist(−3)	**Ident Sib**	Inter Dist(-4)	Inter Dist(−9)
☺ a. na[s] petit				*	
b. na[ɹ] petit			*!		*
c. na[p] petit	*!		*		

pi/z/ **f**red 'cold flat'	**Ident Cont**	Inter Dist(−3)	**Ident Sib**	Inter Dist(−4)	Inter Dist(−8)
a. pi[s] fred		*!			
☺ b. pi[ɹ] fred			*		*
c. pi[f] fred	*!		*		

pi/z/ vell 'old flat'	Inter Dist(−2)	Ident Cont	Inter Dist(−3)	Ident Sib	Inter Dist(−4)	Inter Dist(−6)
a. pi[z] vell	*!					
☺ b. pi[ɹ] vell				*		*
c. pi[v] vell		*!		*		

na/s/ negre 'black nose'	Inter Dist(+1)	Ident Cont	Inter Dist(−3)	Ident Sib	Inter Dist(−4)
a. na[z] negre	*!				
☺ b. na[ɹ] negre			*	*	
c. na[n] negre		*!		*	

III. Further issues: Variation

	T	f	D	v	S	Z
Word-final devoicing (WFD)						
Voice assimilation O.C						
Manner assimilation O.N						
Rhotacism (target)						
Complex onset						
Voicing O##V			WFD	WFD		
Epenthesis O##C			WFD	WFD		
Gliding						
Rhotacism (trigger)						

45

Manner assimilation O.N

T/D: po**[n]** negre

f/v: ba**[n]** natural

ba**[v]** natural

S/Z: na**[z]** negre

+

−

Voicing O ## V

to

− **T**/**D**   po[t] obert

f/v: ba[f] últim

        fotògra[f]/[v] alemány

+ **S/Z:**   na[z] enorme

to

to

to

to

to

to

to

to

to

Rhotacism (triggers)

− **T:**   na[s] **p**etit

f: na[s] **f**als

na[ɹ] **f**als

+ **D, v, N:**   na[ɹ] **b**lanc   na[ɹ] **v**ell   na[ɹ] **n**egre
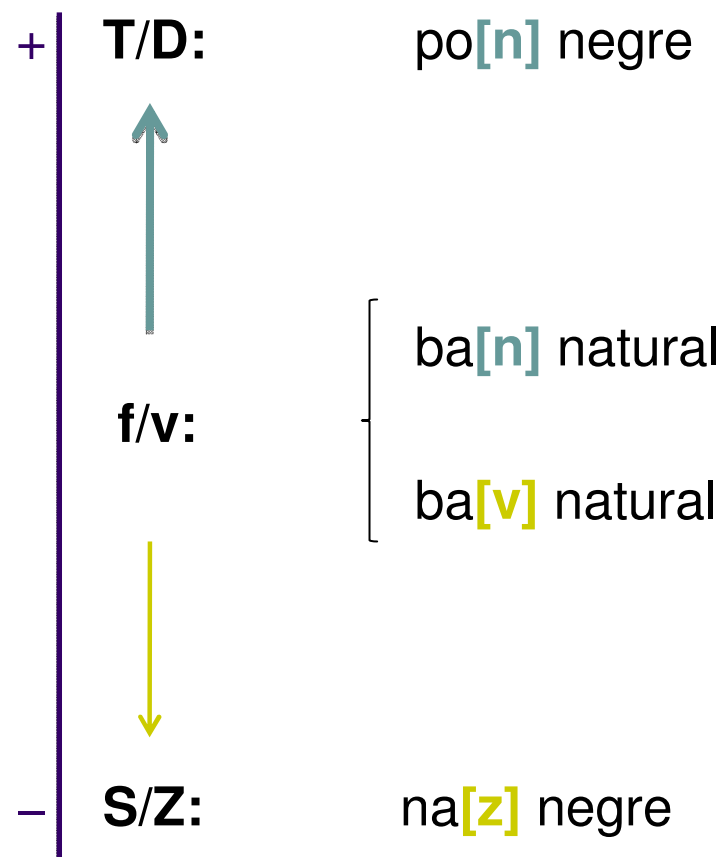
- **Behavior of O in the sonority scale:**

T < f < D < v < S < Z < N < r < ɾ, l < G, ɹ < V

0   1   2   3   4   5   6   7   8   9   10
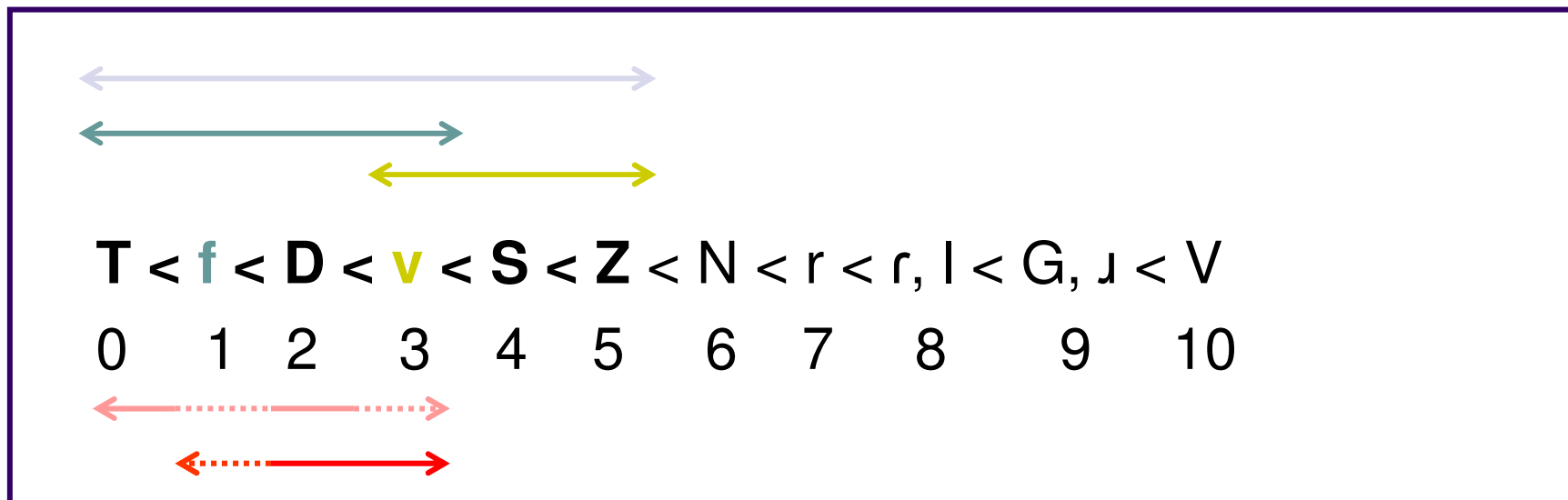
——— Word-final devoicing, Voice assim O.C

——— Epenthesis, Complex onsets

——— Gliding

——— Remain voiceless in O##V, Manner ass. O.N   ········· Variation

——— Rhotacism (trigger)   ········· Variation

49

IV. Concluding remarks
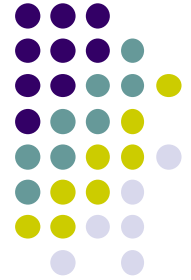
- The behavior of **f** & **v** is mostly ambiguous: They usually pattern with stops, but they can also pattern with sibilants.

- **f** & **v** do not form a homogeneous group either, since sometimes they are targets of different requirements.

- We suggest that the variability of labiodental fricatives as far as voicing assimilation, manner assimilation and rhotacism are concerned is not derived from the constraint hierarchy, but from the **erratic position** that labiodental fricatives have **within the sonority scale** (as other ambiguous segments do, e.g. liquids).

- This supports the idea that the phonetic organization of segments along the sonority scale should have **a non-discrete, gradient nature**, in line with the work by Boersma & Hayes (2001).

- Boersma & Hayes' proposal could be adapted to the organization of segments in the sonority scale in such a way that each specific sound would cover a range of values in that scale, which would correspond to their **phonetic properties**. And this range, or part of it, might overlap the range allocated to another sound.

- **Gradient sonority scale:**

[p]   [f]   [s]

[p] phonetic values

[f] phonetic values

[s] phonetic values
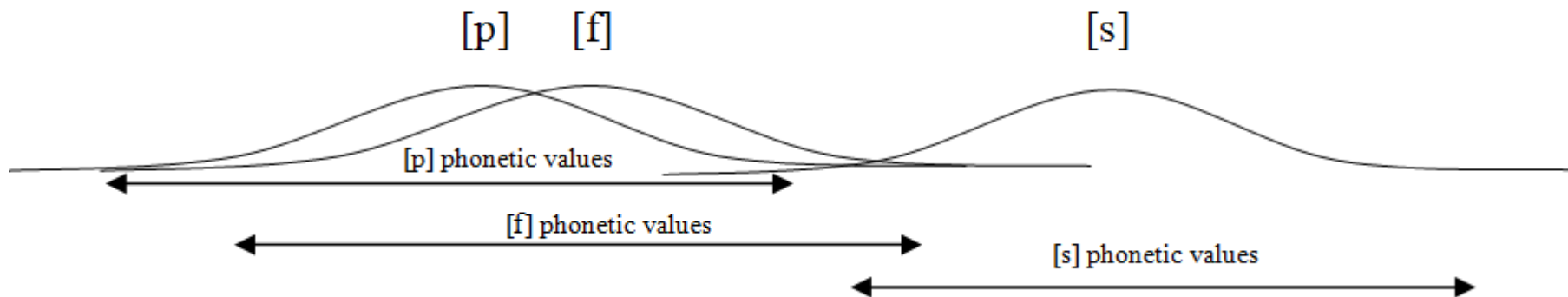
- In the cases where the range of values for different sounds overlap, a **different phonological interpretation** of the relative sonority of the sounds across languages, linguistic varieties and across the speech of a single speaker could be allowed and would indeed be expected. Hence, **different phonological sonority hierarchies** could be possible.

[p]   [f]   [s]

[p] phonetic values

[f] phonetic values

[s] phonetic values
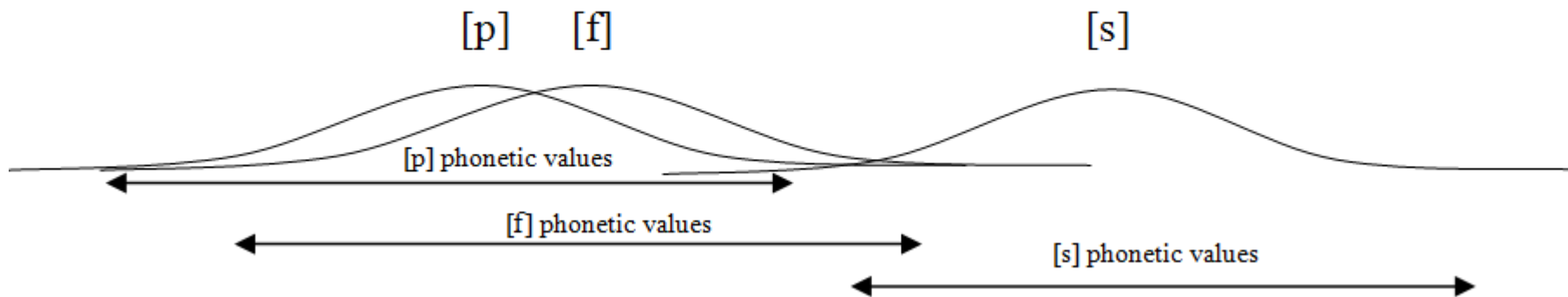
- The consequence of such an approach to the sonority scale would be that **the position in the hierarchy of some sounds should be less fixed than that of others**.

  According to our prediction, this would be the case of segments that are **cross-linguistically ambiguous as far as sonority is concerned**, like labiodental fricatives (as well as liquids).

Thank you for your attention

(ppt soon available at: http://www.uv.es/foncat)

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