Phonetic, phonological, and social forces as filters

Another look at the *Gorgia Toscana*

Christina Villafaña Dalcher

City University London

cvd1*at*city*dot*ac*dot*uk

[una hoha hola]

??

What is *Gorgia Toscana*?

- Occurs in several central Italian dialects
- Results in pronunciation of /p/, /t/, and /k/ as [ɸ], [θ], and [x/h] between sonorants (Vogel 1997)
  but other surface realisations are observed
- Applies to voiced stops (Giannelli & Savoia 1978)

Examples

- poco /poko/ → [poxo] “little”
- vita /vita/ → [viθa] “life”
- topo /topo/ → [toɸo] “mouse”
- prego /prego/ → [preɣo] “beg (1st s.)”
- modo /modo/ → [moðo] “manner”
- la bica /labika/ → [laβixa] “the bale”

Research questions

- How can we account for *Gorgia Toscana's*
  - historical innovation?
  - eventual spread to featurally-similar segments?
  - greater occurrence with velars?
  - gradient output?
  - intersubject variation?

with categorical rules?

Prosodic rule for *Gorgia Toscana*
Nespor and Vogel (1986: 207)

$$\begin{bmatrix} -\text{cont} \\ -\text{voi} \\ -\text{delayed release} \end{bmatrix} \rightarrow [+\text{cont}] \,/\, [_{I} \ldots [\text{-cons}] \_\_ [\text{-cons}] \ldots]_{I}$$

by reference to Laziness?

Weak position, level A (effort cost of p,t,k = 85; effort cost of ɸ, θ, x = 70)
(Kirchner 1998: 274)

	LAZY$_{75}$	*-strid, +cont, +cons	PRES (cont)
p, t, k – p, t, k	* !		
☞ p, t, k - ɸ, θ, x		*	*

with more allophonic categories?

Marotta (2001)

- voiceless stops surface as
  - stops
  - semi-fricatives
  - fricatives
  - deleted segments (/k/)
- voiced stops surface as
  - stops
  - fricatives
  - approximants

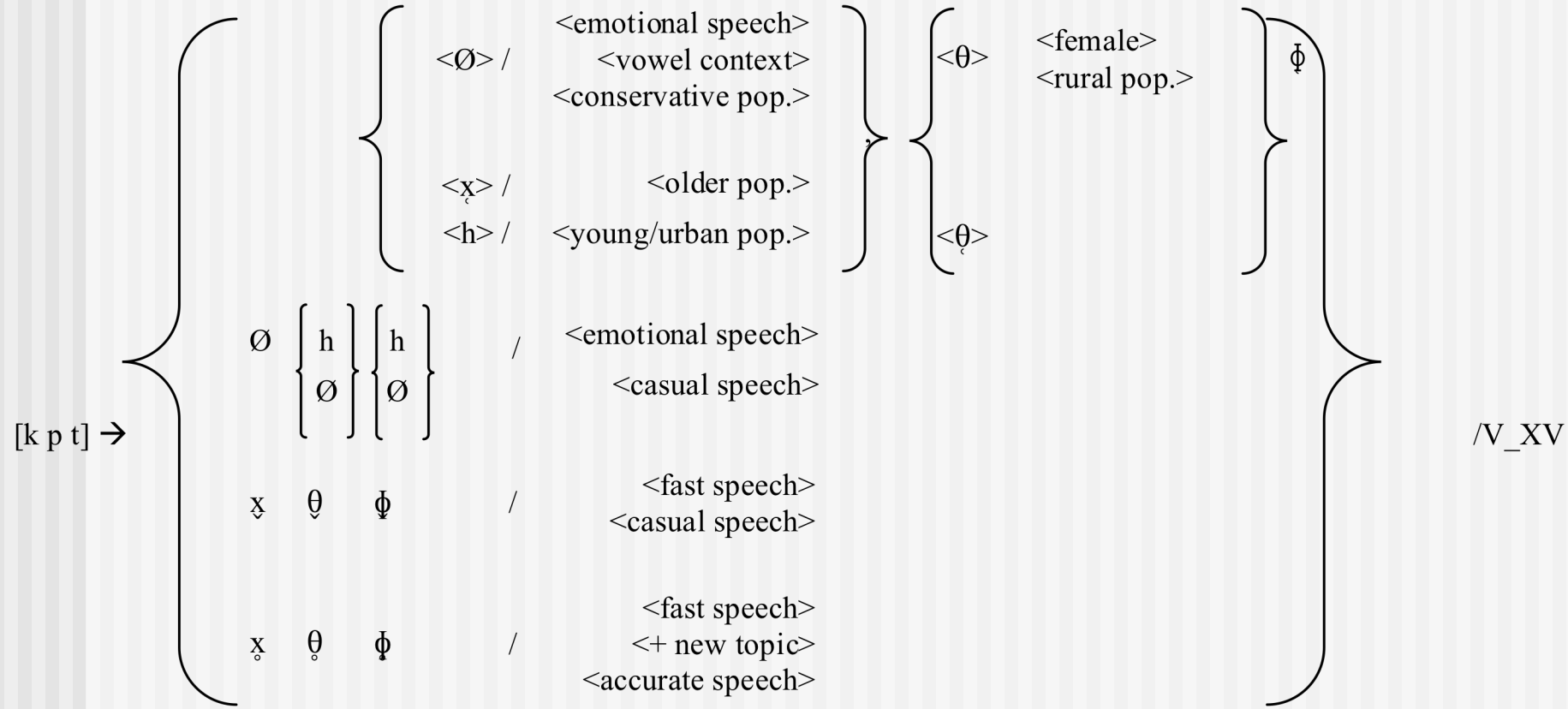
Sorianello (2001)

- voiceless stops
- unreleased voiceless stops
- devoiced voiced stops
- voiced stops
- voiceless fricatives
- voiced fricatives
- approximants
- deleted segments

Giannelli and Savoia (1978)

THIRTY-ONE allophones of underlying /p,t,k/!

with sociolinguistic constraints?



(Giannelli & Savoia 1978 - "Rule 18")

in a more integrated way?

Consider multiple forces working to encourage or inhibit sound change:

- maintenance of perceptual contrast
- articulatory difficulty
- simplicity of cognitive representations
- social marking and group association

1. Historical innovation and spread

Izzo (1972)

<1525	*c. 1780*	*present day*
only velars lenite	non-velars begin leniting	all stops lenite, with preference for /k/

2. Synchronic patterns

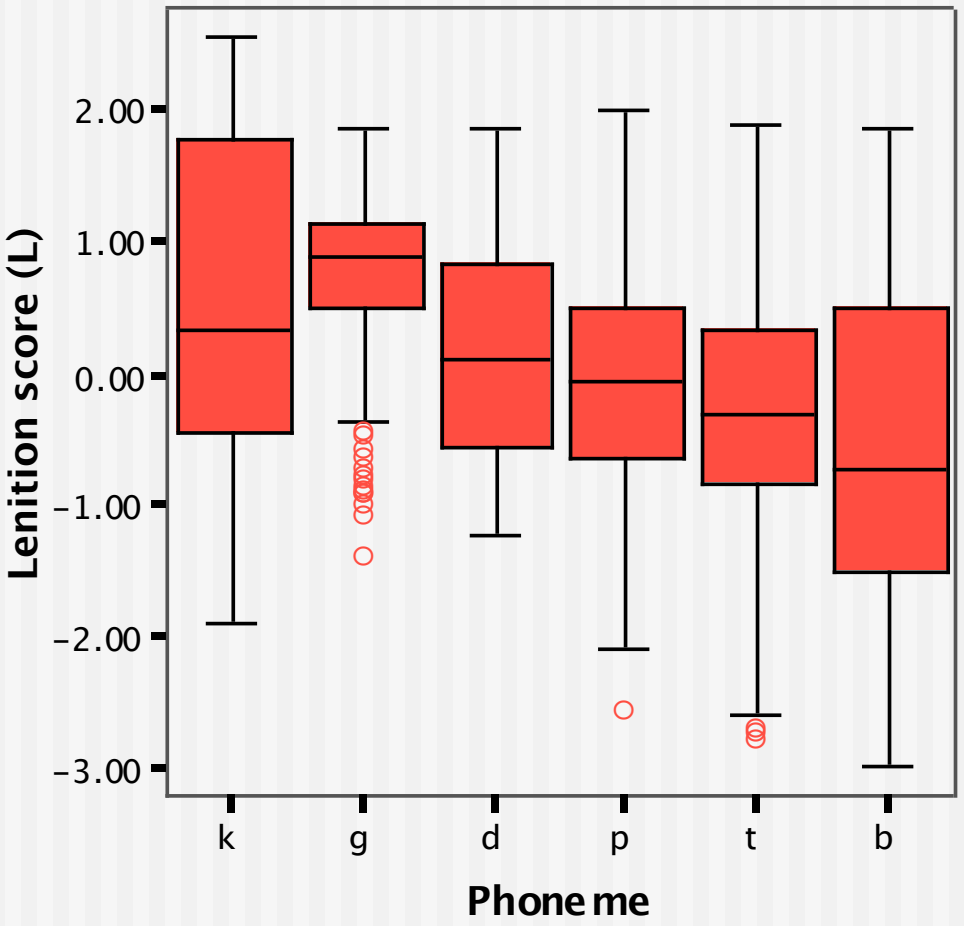
Villafaña Dalcher (2006)

- Six native speakers of Florentine Italian
- 1020 tokens (/p,t,k,b,d,g/) in VCV contexts
- Elicited via sentence reading
- Acoustic measurements:
  - constriction and VOT durations; periodicity and intensity during constriction; release burst absence
- Latent variable extraction results in an L score for each token

(Lavoie 2001; Lewis 2001)

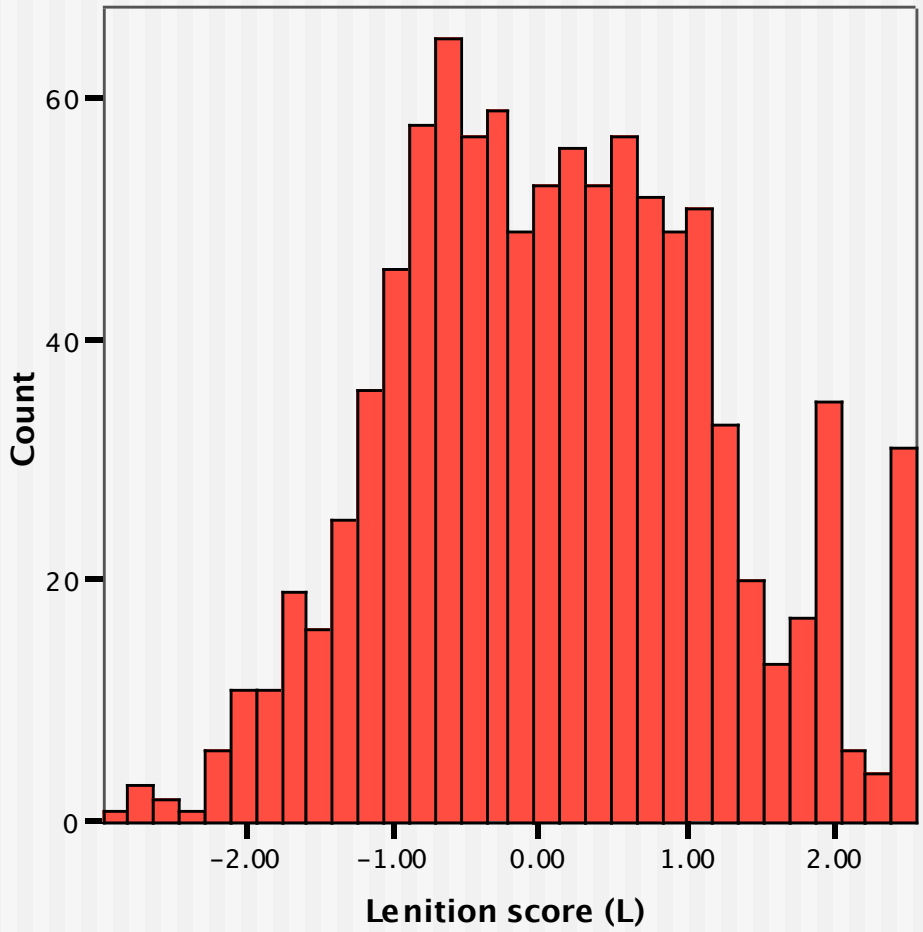
2a. Affected sounds

All stops lenite, but velars are most prone to weakening



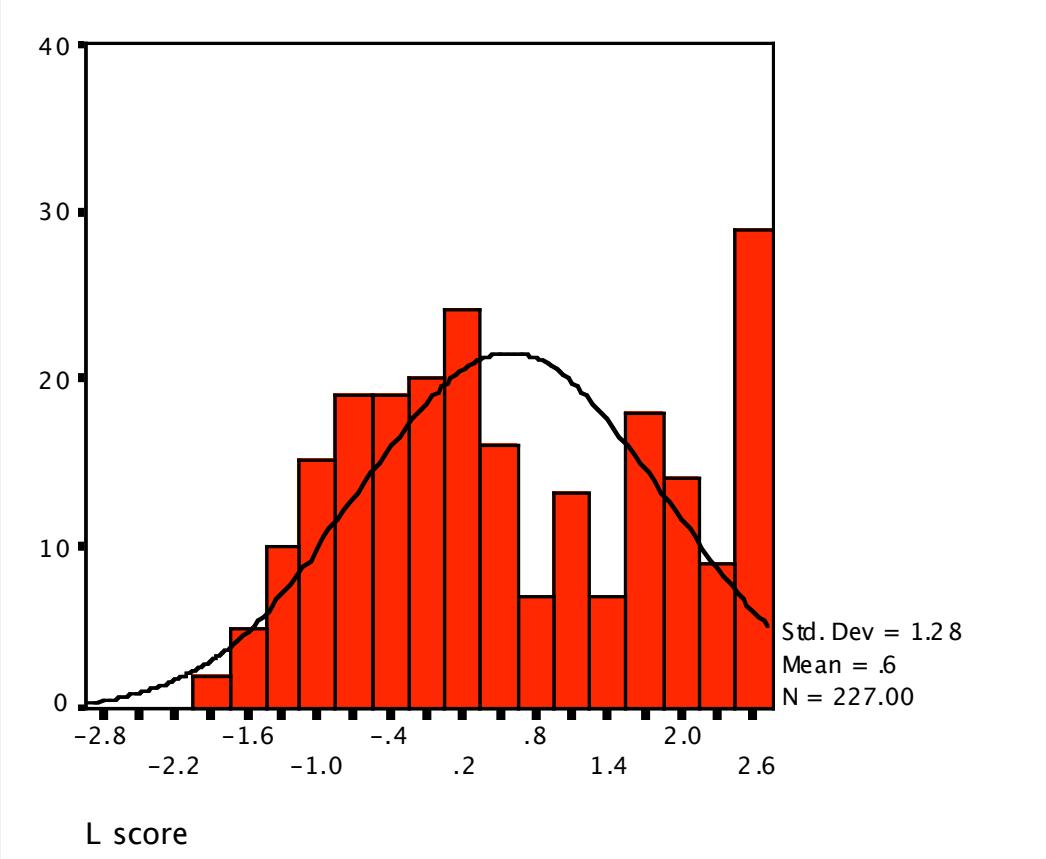
2b. Gradience

L scores fall at *all points* along a continuum



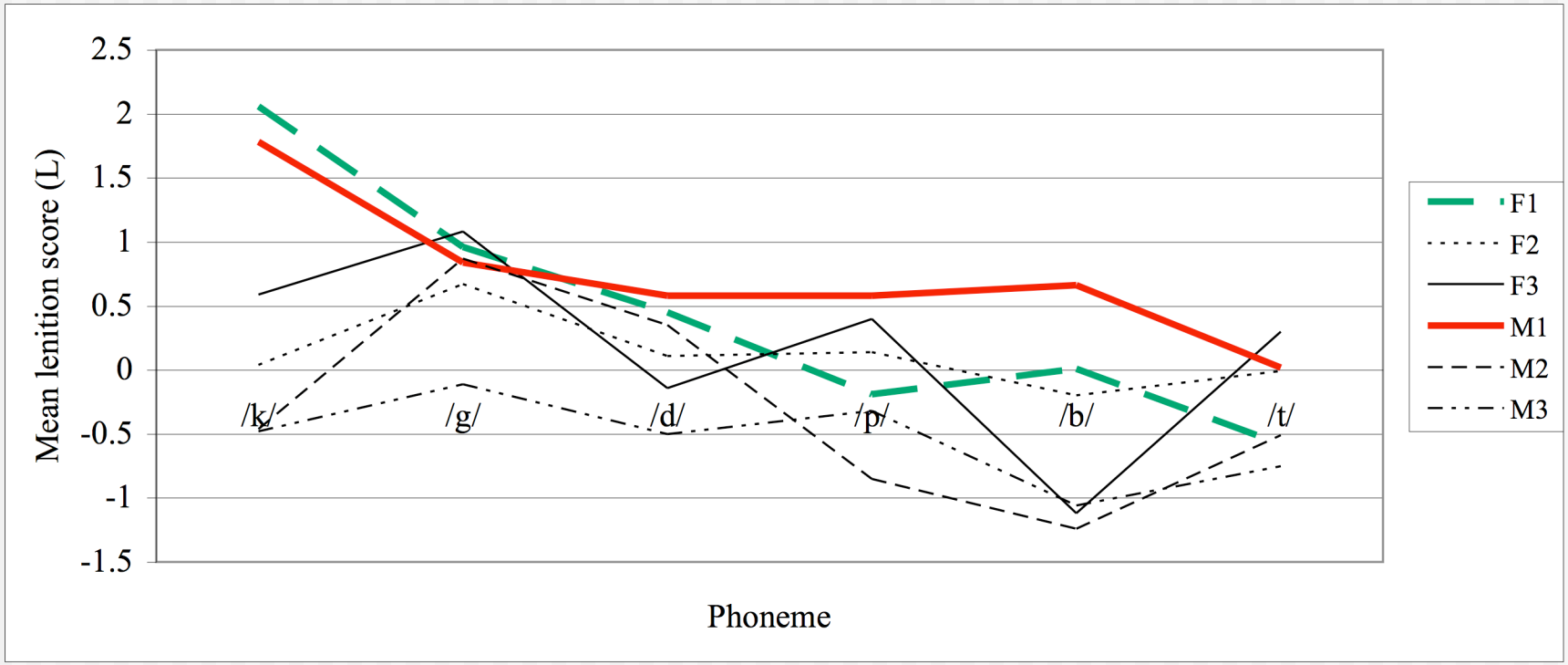
2c. Categoricity

but /k/ seems
to approach
categorical deletion



2d. Variation

individuals lenite different consonants to varying extents



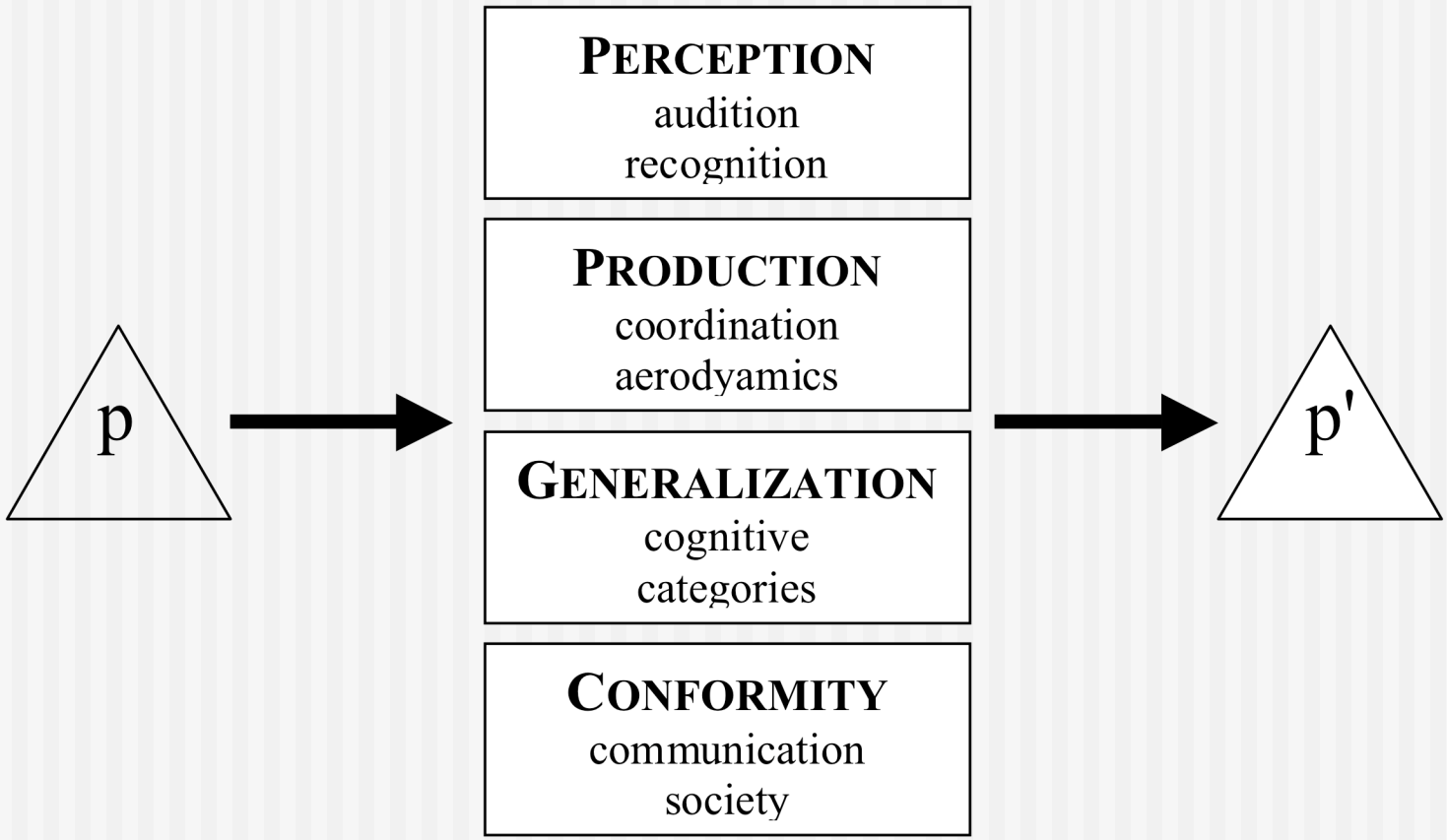
Research questions (redux)

- How can we account for *Gorgia Toscana's*
  - historical innovation?
  - eventual spread to featurally-similar segments?
  - greater occurrence with velars?
  - gradient output?
  - intersubject variation?

Is *Gorgia Toscana*…

- Physiologically motivated?
- Perceptually motivated?
- Phonologically motivated?
- Socially motivated?
- All of the above?

A filtering model's ingredients



(Hume & Johnson 2001)

How do the filters work on *p*?

- Perception

  discourages alterations if they reduce contrast

- Production

  encourages alterations that are articulatorily simpler

- Generalization

  simplifies cognitive representations

- Conformity

  brings p into line with linguistic community's norms

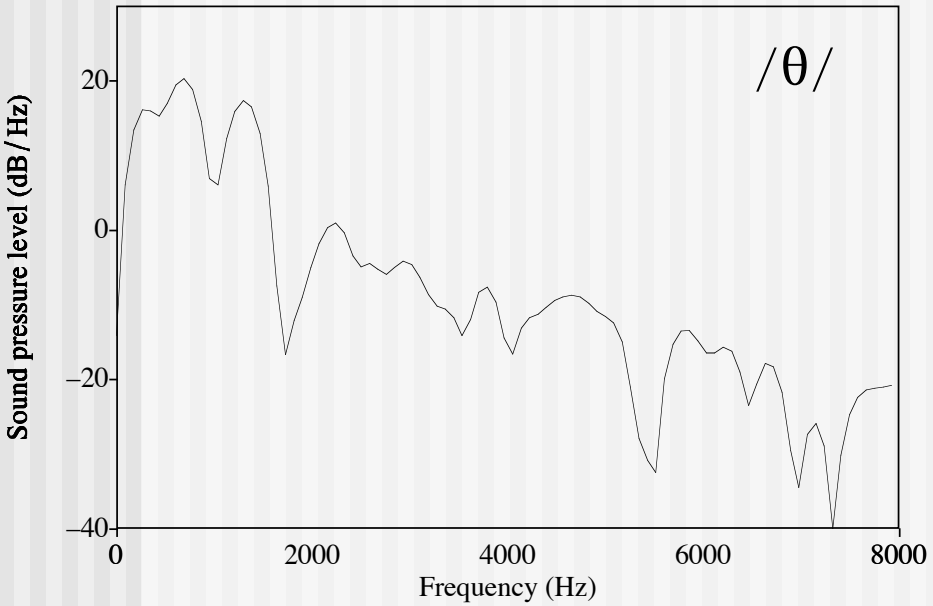
Perception (1)

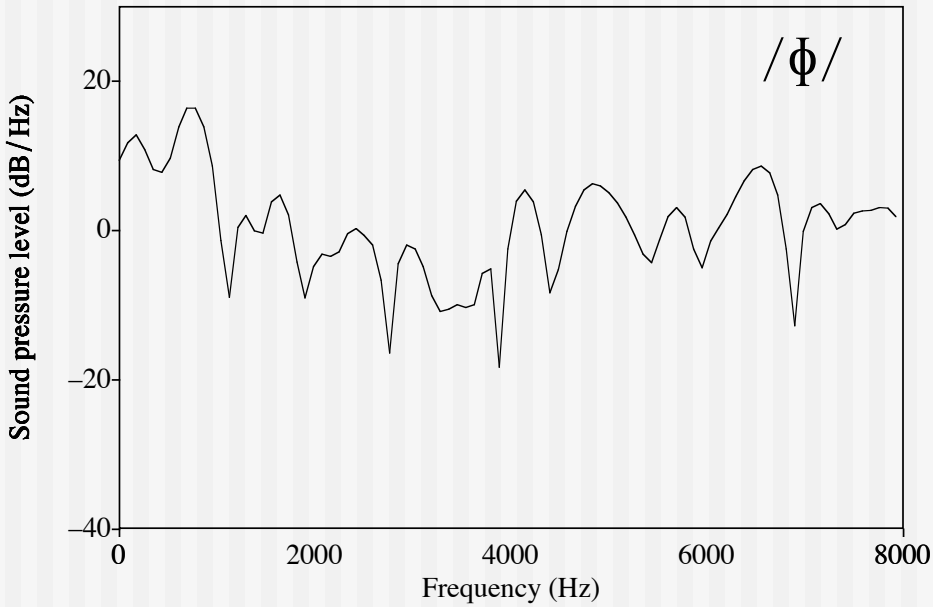
- Phoneme inventory
  - Presence of labiodental fricatives
  - Lack of velar fricatives

Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Palatal	Velar	Labio-Velar
	f v	s z		ʃ (ʒ)			

Perception (2)

- Maintenance of contrast in non-velars
  - distribution of energy differs in lenited /p/ and /t/



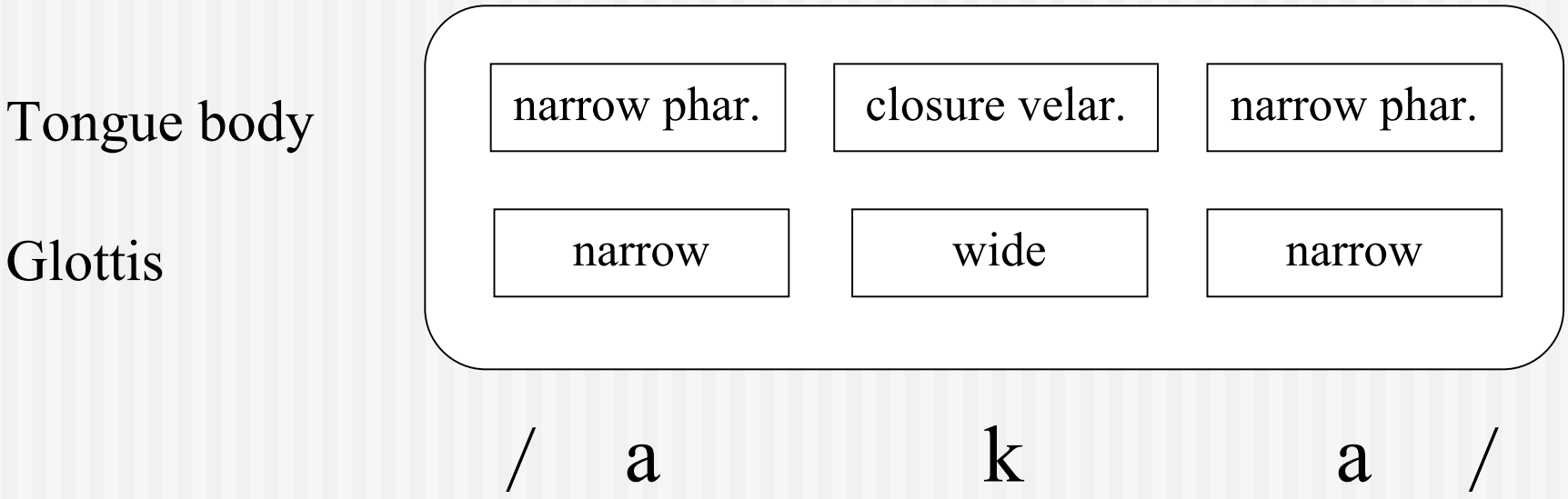


The perception filter and GT

- Dispreference for non-velar lenition
- But lenition of all stops still permitted

Production (1)

- gradual, not categorical, reduction in constriction degree/duration when articulators are identical (Browman & Goldstein 1990)
- reduction of articulatory effort (Kirchner 1998)



Production (2)

Janda and Joseph (2003: 206)

- "sound change originates in a very 'small,' highly localized context over a relatively short temporal span"
- "purely phonetic conditions govern an innovation at this necessarily somewhat brief and limited point of origin"

Izzo (1972)

<1525 *c. 1780*

multiple references to velar lenition only

first reference to lenition of /p/ and /t/

The production filter and GT

- Velars more susceptible (synchronically)

  they share common articulators with surrounding vowels

- *Gorgia Toscana* assumes infinite forms

  minor fluctuations in acoustic dimensions

  are the result of minor fluctuations in articulator motions

- Velars lenited first (historically)

Generalisation (1)

Gorgia Toscana affects all oral stops

- Exaggeration (Janda 2000)
- Phonologisation (Hyman 1977)
- Symmetry (Hayes 1997)

Phonetically-motivated sound changes spread throughout a natural class.

Generalization (2)

Hayes (1999: 253-54)

- ...constraints are typically natural, in that the set of cases they ban is phonetically harder than the complement set.
- Phonological constraints tend to ban phonetic difficulty in simple, formally symmetrical ways.

The generalisation filter and GT

- Delayed spread from velars to non-velars
- Synchronic weakening of all stops in inventory
- Possible phonologisation of /k/ weakening

Conformity (1)

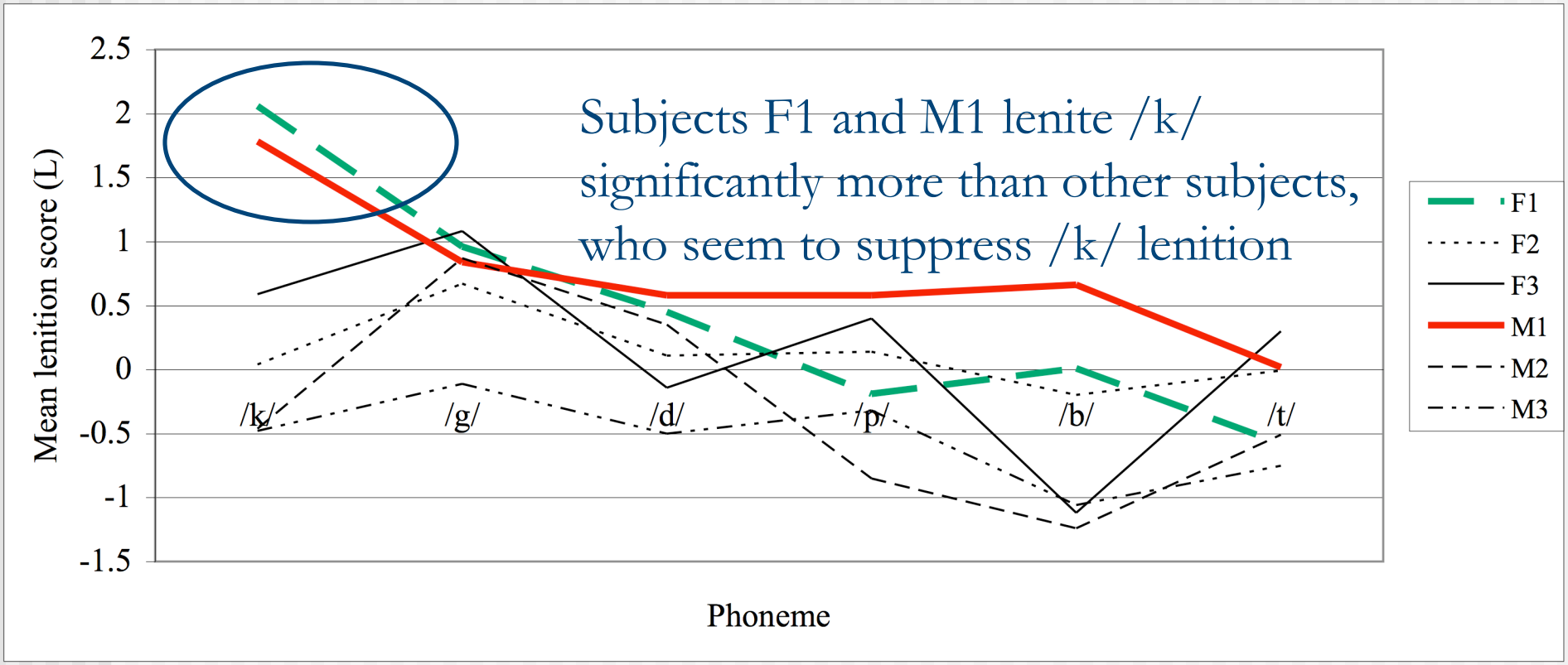
Cravens (2000:13-15)

- "In...Florence, the spirants also carry high status... there is no negative judgment conferred on their use"
- /k/ lenition a "stereotypical marker of regional association"
- Non-Florentine Italians more aware of /k/ lenition than of /p/ and /t/ lenition
- Unlenited /k/ a possible marker of "Italianness"

Conformity (2)

Villafaña Dalcher (2006)

- Stereotypical /k/ lenition not present for all subjects



Conformity (3)

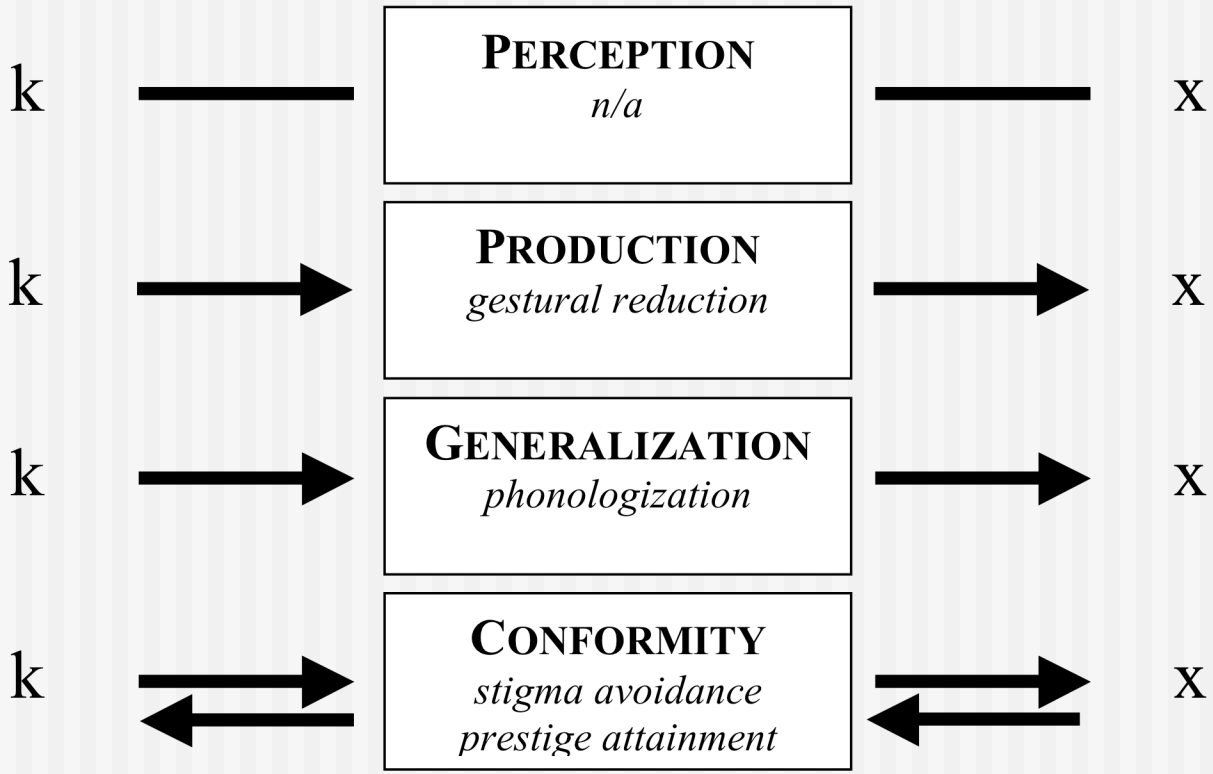
Interesting, when we look at certain social characteristics of the subjects...

subject	higher education	white-collar employment	second language(s)	international travel	domestic travel
F1	✘	✘	✘	✘	✘
F2	✓	✓	✓	✓	✓
F3	✓	✓	✓	✓	✓
M1	✘	✘	✘	✘	✘
M2	✓	✓	✓	✓	✓
M3	✓	✓	✓	✓	✓

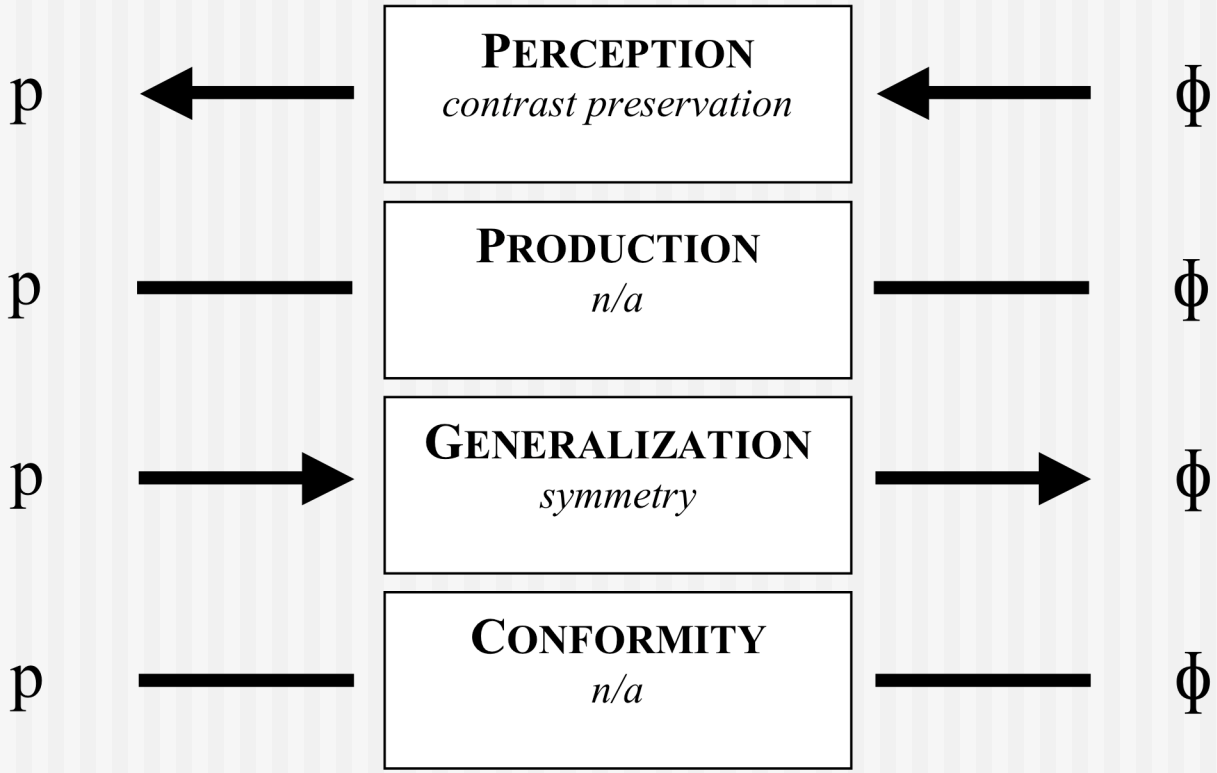
The conformity filter and GT

- Prestige of velar lenition in limited geographical area
- Encouragement of velar lenition for subjects with "Florentine" identity
- Suppression of velar lenition for subjects with "Italian" identity

Example - /k/


k
PERCEPTION
n/a
x
k
PRODUCTION
gestural reduction
x
k
GENERALIZATION
phonologization
x
k
CONFORMITY
stigma avoidance
prestige attainment
x

Example - /p/


p
PERCEPTION
contrast preservation
ϕ
p
PRODUCTION
n/a
ϕ
p
GENERALIZATION
symmetry
ϕ
p
CONFORMITY
n/a
ϕ

Conclusions

- Accounts for observations
  - Historical innovation of velar lenition
  - Eventual spread to natural class
  - Greater susceptibility of velars
  - Gradient nature of lenition
  - Intersubject variation in /k/ lenition
- Accounts for general variation in the output
  - within a narrowly-defined time scale
  - constant interactions among filters
- Language specificity
  - Filters influenced by Italian sound system

[finiho] << /finito/ ‘finished’

Thank you.

References

Browman, C.P. & L. Goldstein. 1990. "Tiers in articulatory phonology, with some implications for casual speech". In J. Kingston and M. Beckman (Eds.), *Papers in Laboratory Phonology I: Between the Grammar and Physics of Speech* (pp. 341-376). Cambridge: Cambridge University Press.

Browman, C.P. & L. Goldstein. 1992. Articulatory Phonology: An overview. *Phonetica, 49*, 155-180.

Cravens, T. 2000. "Sociolinguistic subversion of a phonological hierarchy." *Word* 51:1, pp. 1-19.

Giannelli, L. 1997. "Tuscany." In M. Maiden and M. Parry (Eds.), *The Dialects of Italy*. New York: Routledge.

Giannelli, L. & T. Cravens. 1997. "Consonantal weakening". In M. Maiden & M. Parry (Eds.), *The Dialects of Italy*. New York: Routledge.

Giannelli L. e L. M. Savoia. 1978. " L'indebolimento consonantico in Toscana" I, *Rivista Italiana di Dialettologia* 2, pp. 25-58.

Hayes, B. 1999. "Phonetically-driven phonology: the role of optimality theory and inductive grounding". In M. Darnell, E. Moravscik, M. Noonan, F. Newmeyer, and K. Wheatly (Eds.), *Functionalism and Formalism in Linguistics*, Volume I: General papers. (pp. 243-285). Amsterdam: John Benjamins.

Hyman, L. 1977. "Phonologicization." In A. Juilland (Ed.) *Linguistic Studies presented to Joseph H. Greenberg.* Saratoga: Anma Libri. pp. 407-418.

References

Izzo, H.J. 1972. *Tuscan and Etruscan.* (University of Toronto Romance Series, 20). Toronto: University of Toronto Press.

Janda, R.D. 2003. "'Phonologization' as the start of dephoneticization – Or, on sound change and its aftermath: Of extension, generalization, lexicalization, and morphologization." In B. Joseph and R. Janda (Eds.) *The Handbook of Historical Linguistics.* Malden, MA: Blackwell.

Janda, R.D. & B.D. Joseph. 2003. "Reconsidering the cannons of sound change: towards a 'Big Bang' theory." In B. Blake & K. Burridge (Eds.) *Selected Papers from the 15th Int'l Conference on Historical Linguistics.* Amsterdam: John Benjamins. 205-219.

Kirchner, R. 1998. "Geminate Inalterability and Lenition". ROA 249-398.

Kirchner, R. 1998. *An Effort-based Approach to Consonant Lenition.* University of California at Los Angeles Ph.D. Dissertation.

Kirchner, R. 2001. "Phonological contrast and articulatory effort." In L. Lombardi (Ed.), *Segmental Phonology and Optimality Theory.* Cambridge: Cambridge University Press.

Kirchner, R. 2004. "Consonant lenition." In Hayes, Kirchner, and Steriade (Eds.), *Phonetically Based Phonology.* Cambridge: CUP.

Lavoie, L. 2001. *Consonant Strength: Phonological patterns and phonetic manifestations.* Cornell University Ph.D. dissertation.

Lewis, A. 2001. *Weakening of intervocalic /p, t, k/ in two Spanish dialects: Toward the quantification of lenition processes.* University of Illinois at Urbana-Champaign Ph.D. Dissertation.

Villafaña Dalcher, C. 2006. *Consonant weakening in Florentine Italian: an acoustic study of gradient and variable sound change.* Georgetown University Ph.D. Dissertation.