Sound change as a function of experimental setting: methodological and theoretical issues

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Introduction: modalities and generalisations

Data 1: read and repeated speech. Data 2: spontaneous speech (6 speakers).

Modality 1
/s/ -> [h/H] /_V
/s/ -> [h] /_k
/s/ -> [∅] /_d
/b d g/ -> [b d g] /V(C)_
/b d g/ -> [B D G] /V_
/p t k/ -> [b d g] /V_

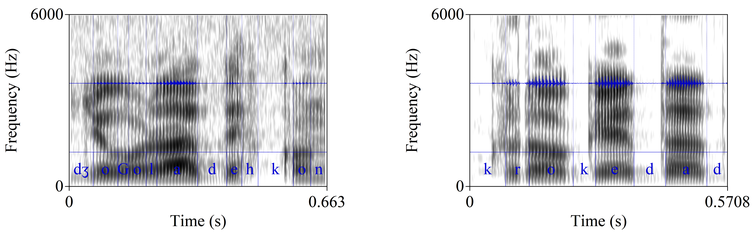
Modality 1
prensa[h]idráulicas 'hydraulic presses'
chocolate[h]con 'chocolates with'
pane[∅]de 'breads from'
pane(s)[d]e 'breads from'
cinco[D]ulces 'five sweets'
cinco[b]anes 'five breads'

[B D G] are voiced approximants. [H] is a voiced glottal fricative.

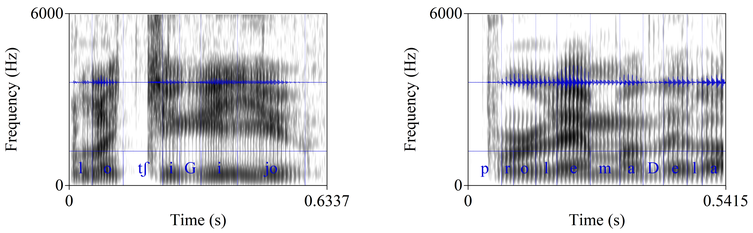
Modality 2
/s/ -> [h/H]/_V
/s/ -> [∅] /_C
/b d g/ -> [B D G] /V(C)_
/b d g/ -> [B D G] /V_
/p t k/ -> [b d g] /V_
/p t k/ -> [p t k] /V(C)_

Modality 2
prensa[H]idráulicas 'hydraulic press'
chocolate[∅]con 'chocolates with'
pane(s)[D]e 'breads from'
cinco[D]ulces 'five sweets'
cinco[b]anes 'five breads'
chocolate(s)[k]on 'chocolates with'

Processes and domains of application:
1. Coda weakening (debuccalisation, voicing, elision). In spontaneous speech it also includes other consonants: /d/, /r/, /l/ (variation: optional).
2. Voiced stop weakening (spirantisation). Also applies (variably) after a non-deleted sonorant, and always after a non-deleted /s/ in spontaneous speech. Intervocalically very strong, incl. deletion. => Domain extension
3. Voiceless stop weakening (voicing), which applies both inside words and across word boundaries, but strictly after a vowel. It can be accompanied by approximantisation and occasionally occurs after deletion.



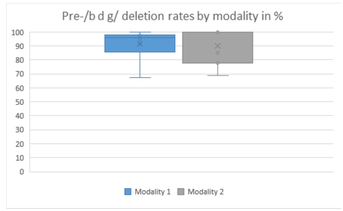
Controlled speech. Left: chocolates con 'chocolate with' presents no /s/ deletion before a voiceless stop and no voicing. Right: croquetas de 'croquettes with' presents deletion before a voiced segment but no spirantisation.

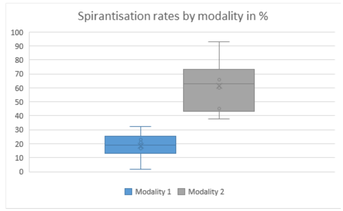


Spontaneous speech. Left: los chiquillos 'the guys' presents deletion before a voiceless sound and no voicing. Right: problemas de la 'problems with/about' presents deletion before a voiced sound and spirantisation.

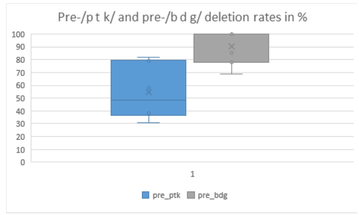
Data interpretation & theoretical assumptions

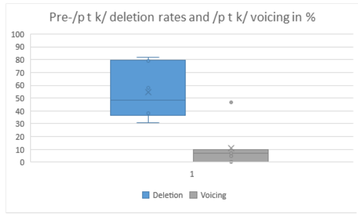
Frequency of occurrence – distribution graphs





- Deletion rates before voiced segments the same across modalities.
- Occasional spirantisation in controlled speech, with gender differences.
- Twofold rise in spirantisation across speakers.





- Rates of deletion before voiceless sounds include all consonants.
- The deletion rate in Modality 2 is 0%.

Analytical framework:

1. Stratal OT: opaque /s/ aspiration across a word boundary, deletion dependent on phrase context.

a) *s]CODA, MAX(C) » IDENT(Place) at the word level

/panes/	*s]CODA	MAX(C)	IDENT(Place)
a. panes	*!		
☞ b. paneh			*
c. pane		*	

b) ONSET, *s]CODA » IDENT(Place), MAX(C) at the phrase level

/paneh+en/	ONSET	*s]CODA	IDENT(Place)	MAX(C)
☞ a. pane.hen				
b. pane.en	*!			*
c. pane.sen			*!	

2. Positional and general markedness constraints responsible for different stages of weakening: *ptk, *V_ptk, *bdg *V_bdg

3. Turbidity: deleted segments leave a trace/block processes. Positional faithfulness constraints are not violated as the segment is not erased from the phonological representation.

Stratal OT analysis and implications

- **The data require a variationist approach:** competition between two co-phonologies. Variation is a reflection of a change in progress: transition from one system to another.
- **The lifecycle of phonological processes:** the domains of application of the different processes are gradually extended. Spirantisation inside words is now phonologised. Across a word boundary, the transition is not complete.
- **New rules alongside old rules.** The same trajectory for voicing.

Constraint hierarchy:

Grammar 1: AGREECC(voice), *s]CODA, *h » *V_bdg, *V_ptk » MAX(C), IDENT(voice), IDENT(cont), IDENT(Place) » *bdg, *ptk

/paneh+de/	AGREECC	*h	*V_bdg	MAX(C)	IDENT(cont)	*bdg
a. paneh.de	*!	*				*
b. paneh.De	*!	*			*	
☞ c. pane(h).de				*		*
d. pane(h).De				*	*!	

/paneh+kon/	AGREECC	*h	*V_ptk	MAX(C)	IDENT(v)	*bdg	*ptk
a. paneh.kon		*!					*
b. paneh.gon	*!	*			*	*	
☞ c. pane(h).kon				*			*
d. pane(h).gon				*	*!	*	

Grammar 2: AGREECC(voice), *s]CODA, *h » *V_ptk, *bdg, *V_bdg » MAX(C), IDENT(voice), IDENT(cont), IDENT(Place) » *ptk

/paneh+de/	AGREECC	*h	*bdg	*V_bdg	MAX(C)	IDENT(cont)
a. paneh.de	*!	*	*			
b. paneh.De	*!	*			*	
c. pane(h).de			*!			
☞ d. pane(h).De					*!	

/paneh+kon/	AGREECC	*h	*V_ptk	*bdg	MAX(C)	IDENT(v)	*ptk
a. paneh.kon		*!					*
b. paneh.gon	*!	*		*		*	
☞ c. pane(h).kon					*		*
d. pane(h).gon				*!	*	*	

Conclusions

Rule generalisation and language change via synchronic observation.
Speech modality as a factor in inter- and intra-speaker variation.
Linguists should be cautious about data-gathering methodology.