

Unnatural patterns and the learnability of incipient language change

Karolina Broś

University of Warsaw

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Processes and syllable structure in Spanish

- o substantial interdialectal variation



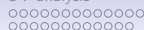
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- resyllabification repairs empty onsets: *las alas – la-sa-las*
- *no complex codas (word-finally)

Spanish from Galdar, Gran Canaria



Word-final consonant deletion

cosas 'things' [kó-sa]

hacer 'to do' [a-sé]

papel 'paper' [pa-pé]

Word-final consonant deletion

cosas 'things' [kó-sa]

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Vowel apocope

cosa 'thing' [kós]

Tenerife [te-ne-ríf] [Play Sound](#)

eso 'this' [és] [Play Sound](#)

perfecto 'perfect' [per.fékt] [Play Sound](#)

Overlap of the two processes

hijos 'children' [íh] [Play Sound](#)

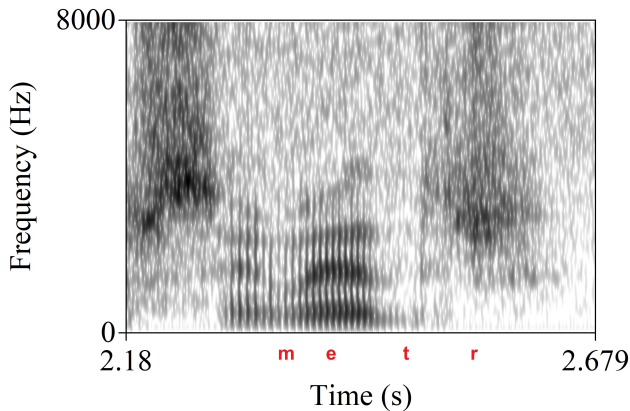
cosas 'things' [cós] [Play Sound](#)

los valientes 'the brave' [lo-ba-ljént] [Play Sound](#)

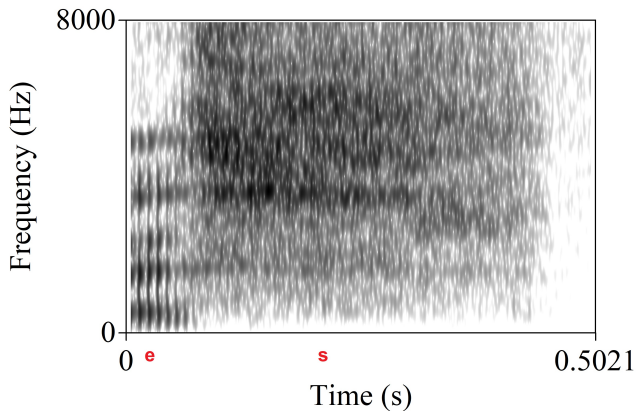
metros 'metres' [métr] [Play Sound](#)

ofertas 'offers' [o-fért] [Play Sound](#)

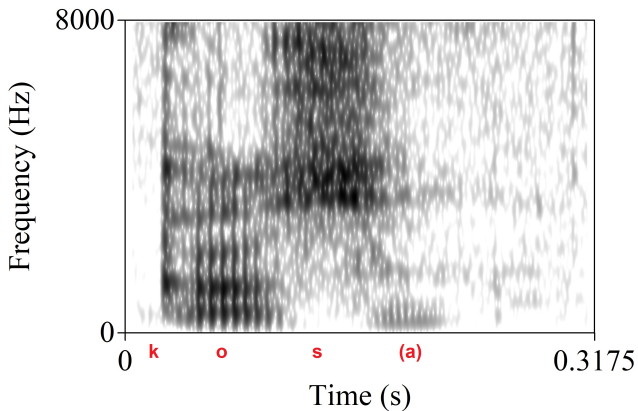
Acoustic signal



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Observations

- lengthening or strengthening of the final consonant after deletions
- no deletion ad infinitum

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- no deletion ad infinitum
- compensatory effect: unstressed post-tonic vowel removed, loss of the syllable compensated by strengthening?
- possible phrase-final effects: domain-final lengthening (Byrd 2000)

Possible options

- constraints on codas and unstressed final vowels

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Frameworks

1. Harmonic Serialism
2. Stratal OT
3. Harmonic Grammar

Problems

1. Harmonic Serialism: constraint reranking necessary to both allow and restrict deletions

HS evaluation

Step 1								
		Contig	Apocope	No Final C	Max(seg)	*Complex	NoCoda	SSG
		Contig	Apocope	No Final C	Max(seg)	*Complex	NoCoda	SSG
pasos	pAsos		*	*!			*	
	pAss	*!		*	*	*	**	*
	pAso		*		*			
ofertas	ofErtas		*	*!			*	
	ofErts	*!			*	**	***	*
	ofErta		*		*			
metros	mEtros		*	*!			*	
	mEtrs	*!		*	*	**	***	**
	mEtro		*		*			
paso	pAso		*!					
	pAs			*	*		*	

HS evaluation

Step 2								
		Contig	Apocope	No Final C	Max(seg)	*Complex	NoCoda	SSG
		Contig	Apocope	No Final C	Max(seg)	*Complex	NoCoda	SSG
paso	pAso		*!			*	**	*
	pAs				*		*	
oferta	ofErta		*!			**	***	*
	ofErt				*	*	**	
metro	mEtro		*!			**	***	**
	mEtr				*	*	**	*
pas	pAs			*!			*	
	pA				*			

HS evaluation

Step 3								
		Contig	Apocope	No Final C	Max(seg)	*Complex	NoCoda	SSG
		Contig	Apocope	No Final C	Max(seg)	*Complex	NoCoda	SSG
pas	pAs			*!			*	
	pA				*			
ofert	ofErt			*		*	**	
	ofEr			*	*!		*	
metr	mEtr			*		*	**	*
	mEt			*	*!		*	

Problems

- 1. Harmonic Serialism:** constraint reranking necessary to both allow and restrict deletions
- 2. Stratal OT:** processes involved are both phrase-final and have to be assigned to the same stratum

Problems

- 1. Harmonic Serialism:** constraint reranking necessary to both allow and restrict deletions
- 2. Stratal OT:** processes involved are both phrase-final and have to be assigned to the same stratum
- 3. Harmonic Grammar:** solved – with CONTIGUITY and CODA-BINARITY

HG evaluation

	<i>Weights</i>	12.0	4.0	1.0	1.0	1.0	
input	winner ~ loser	Apocope	Max(seg)	NoCoda	*Complex	SSG	
pasos	pAs ~ <u>pAsos</u>	+1.0	-2.0				Margin of separation: 4.0
	pAs ~ <u>pAso</u>	+1.0	-1.0	-1.0			Margin of separation: 7.0
	pAs ~ <u>pA</u>		+1.0	-1.0			Margin of separation: 3.0
ofertas	ofErt ~ <u>ofErtas</u>	+1.0	-2.0	-1.0	-1.0		Margin of separation: 2.0
	ofErt ~ <u>ofErta</u>	+1.0	-1.0	-2.0	-1.0		Margin of separation: 5.0
	ofErt ~ <u>ofEr</u>		+1.0	-1.0	-1.0		Margin of separation: 2.0
metros	mEtr ~ <u>mEtros</u>	+1.0	-2.0	-1.0	-1.0	-1.0	Margin of separation: 1.0
	mEtr ~ <u>mEtro</u>	+1.0	-1.0	-2.0	-1.0	-1.0	Margin of separation: 4.0
	mEtr ~ <u>mEt</u>		+1.0	-1.0	-1.0	-1.0	Margin of separation: 1.0
paso	pAs ~ <u>pAso</u>	+1.0	-1.0	-1.0			Margin of separation: 7.0
	pAs ~ <u>pA</u>		+1.0	-1.0			Margin of separation: 3.0

HG evaluation

	<i>Weights</i>	100.0	100.0	100.0	100.0	100.0	
input	winner ~ loser	NoCoda	*Complex	Apocope	Max(seg)	SSG	
pasos	pAs ~ pAsos			+1.0	-2.0		Margin of separation: -100.0
	pAs ~ pAss	+1.0	+1.0		-1.0	+1.0	Margin of separation: 200.0
	pAs ~ pAso	-1.0		+1.0	-1.0		Margin of separation: -100.0
	pAs ~ pA	-1.0			+1.0		Margin of separation: 0.0
ofertas	ofErt ~ ofErtas	-1.0	-1.0	+1.0	-2.0		Margin of separation: -300.0
	ofErt ~ ofErts	+1.0	+1.0		-1.0	+1.0	Margin of separation: 200.0
	ofErt ~ ofErta	-2.0	-1.0	+1.0	-1.0		Margin of separation: -300.0
	ofErt ~ ofEr	-1.0	-1.0		+1.0		Margin of separation: -100.0
metros	mEtr ~ mEtros	-1.0	-1.0	+1.0	-2.0	-1.0	Margin of separation: -400.0
	mEtr ~ mEtrs	+1.0	+1.0		-1.0		Margin of separation: 100.0
	mEtr ~ mEtro	-2.0	-1.0	+1.0	-1.0	-1.0	Margin of separation: -400.0
	mEtr ~ mEt	-1.0	-1.0		+1.0	-1.0	Margin of separation: -200.0
paso	pAs ~ pAso	-1.0		+1.0	-1.0		Margin of separation: -100.0
	pAs ~ pA	-1.0			+1.0		Margin of separation: 0.0

HG evaluation

	<i>Weights</i>	9.0	4.0	2.0	1.0	1.0	1.0	1.0	1.0	
input	winner ~ loser	Apocope	Max(c)	contig	NoCoda	*Complex	Max(v)	binarycodas	SSG	
pasos	pAs ~ pAsos	+1.0	-1.0				-1.0			Margin of separation: 4.0
	pAs ~ pAsoh	+1.0	-1.0				-1.0	+1.0		Margin of separation: 5.0
	pAs ~ pAss		-1.0	+1.0	+1.0	+1.0			+1.0	Margin of separation: 1.0
	pAs ~ pAso	+1.0			-1.0		-1.0			Margin of separation: 7.0
	pAs ~ pA		+1.0		-1.0					Margin of separation: 3.0
ofertas	ofErt ~ ofErtas	+1.0	-1.0		-1.0	-1.0	-1.0			Margin of separation: 2.0
	ofErt ~ ofErtah	+1.0	-1.0		-1.0	-1.0	-1.0	+1.0		Margin of separation: 3.0
	ofErt ~ ofErts		-1.0	+1.0	+1.0			+1.0	+1.0	Margin of separation: 1.0
	ofErt ~ ofErta	+1.0			-2.0	-1.0	-1.0			Margin of separation: 5.0
	ofErt ~ ofEr		+1.0		-1.0	-1.0				Margin of separation: 2.0
metros	mEtr ~ mEtros	+1.0	-1.0		-1.0	-1.0	-1.0		-1.0	Margin of separation: 1.0
	mEtr ~ mEtroh	+1.0	-1.0		-1.0	-1.0	-1.0	+1.0	-1.0	Margin of separation: 2.0
	mEtr ~ mEtrs		-1.0	+1.0	+1.0			+1.0	+1.0	Margin of separation: 1.0
	mEtr ~ mEtro	+1.0			-2.0	-1.0	-1.0		-1.0	Margin of separation: 4.0
	mEtr ~ mEt		+1.0		-1.0	-1.0			-1.0	Margin of separation: 1.0
paso	pAs ~ pAso	+1.0			-1.0		-1.0			Margin of separation: 7.0
	pAs ~ pA		+1.0		-1.0					Margin of separation: 3.0

HG evaluation

	<i>Weights</i>	7.0	3.0	2.0	1.0	1.0	1.0	
input	winner ~ loser	Apocope	Max(c)	contig	NoCoda	Max(v)	SSG	
pasos	pAs ~ <u>pAsos</u>	+1.0	-1.0			-1.0		Margin of separation: 3.0
	pAs ~ <u>pAss</u>		-1.0	+1.0	+1.0		+1.0	Margin of separation: 1.0
	pAs ~ <u>pAso</u>	+1.0			-1.0	-1.0		Margin of separation: 5.0
	pAs ~ <u>pA</u>		+1.0		-1.0			Margin of separation: 2.0
ofertas	ofErt ~ <u>ofErtas</u>	+1.0	-1.0		-1.0	-1.0		Margin of separation: 2.0
	ofErt ~ <u>ofErts</u>		-1.0	+1.0	+1.0		+1.0	Margin of separation: 1.0
	ofErt ~ <u>ofErta</u>	+1.0			-2.0	-1.0		Margin of separation: 4.0
	ofErt ~ <u>ofEr</u>		+1.0		-1.0			Margin of separation: 2.0
metros	mEtr ~ <u>mEtros</u>	+1.0	-1.0		-1.0	-1.0	-1.0	Margin of separation: 1.0
	mEtr ~ <u>mEtrs</u>		-1.0	+1.0	+1.0		+1.0	Margin of separation: 1.0
	mEtr ~ <u>mEtro</u>	+1.0			-2.0	-1.0	-1.0	Margin of separation: 3.0
	mEtr ~ <u>mEt</u>		+1.0		-1.0		-1.0	Margin of separation: 1.0
paso	pAs ~ <u>pAso</u>	+1.0			-1.0	-1.0		Margin of separation: 5.0
	pAs ~ <u>pA</u>		+1.0		-1.0			Margin of separation: 2.0

Further problems

Learning a pattern of final marked syllable creation –
unnatural and counterintuitive

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unnatural and counterintuitive

When submitted to the GLA (Boersma & Hayes 2001) and to the
MaxEnt calculator (Hayes 2009), the data are unlearnable

Both algorithms fail to learn the correct output distributions with
optional deletions

Pair Distributions

pairs [1]: string1 = "/pasos/" string2 = "[pasos]" weight = 0

pairs [2]: string1 = "/pasos/" string2 = "[pass]" weight = 0

pairs [3]: string1 = "/pasos/" string2 = "[paso]" weight = 50

pairs [4]: string1 = "/pasos/" string2 = "[pas]" weight = 50

pairs [5]: string1 = "/pasos/" string2 = "[pa]" weight = 0

pairs [6]: string1 = "/metros/" string2 = "[metros]" weight = 0

pairs [7]: string1 = "/metros/" string2 = "[metrs]" weight = 0

pairs [8]: string1 = "/metros/" string2 = "[metro]" weight = 50

pairs [9]: string1 = "/metros/" string2 = "[metr]" weight = 50

pairs [10]: string1 = "/metros/" string2 = "[met]" weight = 0

GLA evaluation

	<i>ranking value</i>	<i>disharmony</i>	<i>plasticity</i>
Apocope	100.915	103.484	1.000000
Contig	100.000	99.634	1.000000
Max-v	99.085	97.435	1.000000
Max-c	-0.390	0.696	1.000000
NoCoda	-3574.187	-3571.096	1.000000
SSG	-26062.741	-26058.516	1.000000

/pasos/	Apocope	Contig	Max-v	Max-c	NoCoda	SSG	
[pasos]	*				*		-104.484
[pass]		*	*		**	*	-200.069
[paso]	*			*			-104.484
☞ [pas]			*	*	*		-99.435
☞ [pa]			*	**			-99.435

/metros/	Apocope	Contig	Max-v	Max-c	NoCoda	SSG	
[metros]	*				*		-104.484
[metrs]		*	*		***	*	-201.069
[metro]	*			*			-104.484
[metr]			*	*	**	*	-101.435
☞ [met]			*	**	*		-100.435

GLA evaluation

/pasos/	→ [pasos]	27939
/pasos/	→ [pass]	0
/pasos/	→ [paso]	14595
/pasos/	→ [pas]	34287
/pasos/	→ [pa]	23179
/metros/	→ [metros]	38067
/metros/	→ [metrs]	0
/metros/	→ [metro]	19726
/metros/	→ [metr]	1668
/metros/	→ [met]	40539

Pair Distributions 2

pairs [1]: string1 = "/pasos/" string2 = "[paso]" weight = 50

pairs [2]: string1 = "/pasos/" string2 = "[pas]" weight = 50

pairs [3]: string1 = "/metros/" string2 = "[metro]" weight = 50

pairs [4]: string1 = "/metros/" string2 = "[metr]" weight = 50

GLA evaluation

	<i>ranking value</i>	<i>disharmony</i>	<i>plasticity</i>
Apocope	140.762	139.760	1.000000
Contig	100.000	100.054	1.000000
Max-c	79.805	80.775	1.000000
NoFinalC	79.433	78.671	1.000000
Max-v	59.238	61.443	1.000000
SSG	-9400.140	-9398.803	1.000000
NoCoda	-9420.707	-9421.990	1.000000

/pasos/	Apocope	Contig	Max-c	NoFinalC	Max-v	SSG	NoCoda	
☞ [pasos]	*			*			*	-219.430
[pass]		*		*	*	*	**	-243.167
[paso]	*		*					-220.535
[pas]			*	*	*		*	-221.889
[pa]			**		*			-222.993

/metros/	Apocope	Contig	Max-c	NoFinalC	Max-v	SSG	NoCoda	
☞ [metros]	*			*			*	-219.430
[metrs]		*		*	*	*	***	-244.167
[metro]	*		*					-220.535
[metr]			*	*	*	*	**	-223.889
[met]			**	*	*		*	-302.664

GLA evaluation

```

/pasos/ → [pasos] 18378
/pasos/ → [pass] 0
/pasos/ → [paso] 12394
/pasos/ → [pas] 22498
/pasos/ → [pa] 46730
/metros/ → [metros] 28091
/metros/ → [metrs] 0
/metros/ → [metro] 42131
/metros/ → [metr] 29778
/metros/ → [met] 0

```

MaxEnt evaluation

 weights after optimization:	
NoCoda ($\mu=0.0$, $\sigma^2=100000.0$)	0.34957745859965395
*Complex ($\mu=0.0$, $\sigma^2=100000.0$)	0.0
Apocope ($\mu=0.0$, $\sigma^2=100000.0$)	0.0
Max(seg) ($\mu=0.0$, $\sigma^2=100000.0$)	0.062089052582986186
SSG ($\mu=0.0$, $\sigma^2=100000.0$)	0.0
($\mu=0.0$, $\sigma^2=100000.0$)	0.0
($\mu=0.0$, $\sigma^2=100000.0$)	0.0

MaxEnt evaluation

Input:	Candidate:	Observed:	Predicted:
pasos	pAsos	0.0	0.19777523315526252
pasos	pAss	0.0	0.1310350295519301
pasos	pAso	1.0	0.26364924591948163
pasos	pAs	1.0	0.17467953989609092
pasos	pA	0.0	0.23286095147723482
ofertas	ofErtas	0.0	0.2351352543324118
ofertas	ofErts	0.0	0.10982815633734477
ofertas	ofErta	1.0	0.31345296124696465
ofertas	ofErt	1.0	0.14640918449245885
ofertas	ofEr	0.0	0.1951744435908199
metros	mEtros	0.0	0.2351352543324118
metros	mEtrs	0.0	0.10982815633734477
metros	mEtro	1.0	0.31345296124696465
metros	mEtr	1.0	0.14640918449245885
metros	mEt	0.0	0.1951744435908199
paso	pAso	1.0	0.3928088158542035
paso	pAs	1.0	0.2602535917796472
paso	pA	0.0	0.34693759236614924

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- the observed changes show incipient advanced lenition, which is in line with the direction of weakening in the dialect
- the processes are domain and prosody dependent (possible domain narrowing?)
- variation reflects lack of completeness and gradient phonetic effects
- the changes create unnatural outputs (syllable structure) - major shift, difficult to model
- though modelled with additional assumptions/constraints, the changes seem not to be learnable
- cophonologies in the making, possibly unstable productions, the direction still unknown: **DO NOT HAVE TO BE LEARNED**

Thank You!

MaxEnt evaluation

Input: pasos		NoCoda	Apocope	Max(c)	Max(v)	SSG	contig
pAsos	0.0	1.0	1.0	0.0	0.0	0.0	0.0
pAss	0.0	2.0	0.0	0.0	1.0	1.0	1.0
pAso	1.0	0.0	1.0	1.0	0.0	0.0	0.0
pAs	1.0	1.0	0.0	1.0	1.0	0.0	0.0
pA	0.0	0.0	0.0	2.0	1.0	0.0	0.0
Input: ofertas		NoCoda	Apocope	Max(c)	Max(v)	SSG	contig
ofErtas	0.0	1.0	1.0	0.0	0.0	0.0	0.0
ofErts	0.0	3.0	0.0	0.0	1.0	1.0	1.0
ofErta	1.0	0.0	1.0	1.0	0.0	0.0	0.0
ofErt	1.0	2.0	0.0	1.0	1.0	0.0	0.0
ofEr	0.0	1.0	0.0	2.0	1.0	0.0	0.0
Input: metros		NoCoda	Apocope	Max(c)	Max(v)	SSG	contig
mEtros	0.0	1.0	1.0	0.0	0.0	0.0	0.0
mEtrs	0.0	3.0	0.0	0.0	1.0	2.0	1.0
mEtro	1.0	0.0	1.0	1.0	0.0	0.0	0.0
mEtr	1.0	2.0	0.0	1.0	1.0	1.0	0.0
mEt	0.0	1.0	0.0	2.0	1.0	0.0	0.0
Input: paso		NoCoda	Apocope	Max(c)	Max(v)	SSG	contig
pAso	1.0	0.0	1.0	0.0	0.0	0.0	0.0
pAs	1.0	1.0	0.0	0.0	1.0	0.0	0.0
pA	0.0	0.0	0.0	1.0	1.0	0.0	0.0

MaxEnt evaluation

 weights after optimization:	
NoCoda ($\mu=0.0$, $\sigma^2=100000.0$)	0.0
Apocope ($\mu=0.0$, $\sigma^2=100000.0$)	0.019618819806995747
Max(c) ($\mu=0.0$, $\sigma^2=100000.0$)	0.19482172582283658
Max(v) ($\mu=0.0$, $\sigma^2=100000.0$)	0.019781594694479897
SSG ($\mu=0.0$, $\sigma^2=100000.0$)	0.0
contig ($\mu=0.0$, $\sigma^2=100000.0$)	9.202692324349519

MaxEnt evaluation

Input:	Candidate:	Observed:	Predicted:
pasos	pAsos	0.0	0.3009222417795193
pasos	pAss	0.0	3.0318317813862294E-5
pasos	pAso	1.0	0.24765339618634122
pasos	pAs	1.0	0.24761308771333448
pasos	pA	0.0	0.20378095600299112
ofertas	ofErtas	0.0	0.3009222417795193
ofertas	ofErts	0.0	3.0318317813862294E-5
ofertas	ofErta	1.0	0.24765339618634122
ofertas	ofErt	1.0	0.24761308771333448
ofertas	ofEr	0.0	0.20378095600299112
metros	mEtros	0.0	0.3009222417795193
metros	mEtrs	0.0	3.0318317813862294E-5
metros	mEtro	1.0	0.24765339618634122
metros	mEtr	1.0	0.24761308771333448
metros	mEt	0.0	0.20378095600299112
paso	pAso	1.0	0.3542726602658379
paso	pAs	1.0	0.3542149982665145
paso	pA	0.0	0.2915123414676477

OT Help operations

1. NoCoda, *Complex, Max(C), SSG, *C]Pph, *s]Coda // Apocope, Ident(place) // Max(V) (OT, HG fail)
 2. NoCoda, *Complex, Max(Seg), SSG // Apocope (OT, HG fail)
 3. NoCoda, *Complex, Max(Seg), SSG // Apocope (OT, HG fail)
 4. Apocope, Coda-Bin, Contig // Max(C), Max(V) // NoCoda, *Complex, SSG (solved)
 5. Apocope, Contig // Max(C), Max(V) // NoCoda, SSG (solved)
- Minor problem: SSG must be ranked above NoCoda to account for Spanish syllabification

OT evaluation

		Apocope	No Final C	Max(seg)	NoCoda	*Complex	SSG
		Apocope	No Final C	Max(seg)	NoCoda	*Complex	SSG
pasos	pAsos	*!	*		*		
	pAss		*!	*	**	*	*
	pAso	*!		*			
	pAs		*!	**	*		
	pA			***			
ofertas	ofErtas	*!	*		*		
	ofErts		*	*	***	**	*
	ofErta	*!		*			
	ofErt		*	**	**	*	
	ofEr		*	***!	*		
metros	mEtros	*!	*		*		
	mEtrs		*!	*	***	**	**
	mEtro	*!		*			
	mEtr		*	**	**	*	*
	mEt		*	***!	*		
paso	pAso	*!					
	pAs		*!	*	*		
	pA			**			

OT evaluation

		Apocope	Max(seg)	NoCoda	*Complex	SSG
		Apocope	Max(seg)	NoCoda	*Complex	SSG
pasos	pAsos	*!		*		
	pAss		*	**	*	*
	pAso	*!	*			
	pAs		**!	*		
	pA		***!			
ofertas	ofErtas	*!		*		
	ofErts		*	***	**	*
	ofErta	*!	*			
	ofErt		**!	**	*	
	ofEr		***!	*		
metros	mEtros	*!		*		
	mEtrs		*	***	**	**
	mEtro	*!	*			
	mEtr		**!	**	*	*
	mEt		***!	*		
paso	pAso	*!				
	pAs		*	*		
	pA		**!			

OT evaluation

		Apocope	Coda-Bin	Max(seg)	NoCoda	*Complex	SSG
		Apocope	Coda-Bin	Max(seg)	NoCoda	*Complex	SSG
pasos	pAsos	*!			*		
	pAss			*	**	*	*
	pAso	*!		*			
	pAs			**!	*		
	pA			***!			
ofertas	ofErtas	*!			*		
	ofErts		*!	*	***	**	*
	ofErta	*!		*			
	ofErt			**	**	*	
	ofEr			***!	*		
metros	mEtros	*!			*		
	mEtrs		*!	*	***	**	**
	mEtro	*!		*			
	mEtr			**	**	*	*
	mEt			***!	*		
paso	pAso	*!					
	pAs			*	*		
	pA			**!			

OT evaluation

		Apocope	Coda-Bin	Max(c)	SSG	Max(v)	NoCoda	*Complex
		Apocope	Coda-Bin	Max(c)	SSG	Max(v)	NoCoda	*Complex
pasos	pAsos	*!					*	
	pAss				*	*	**	*
	pAso	*!		*				
	pAs			*!		*	*	
	pA			**!		*		
ofertas	ofErtas	*!					*	
	ofErts		*!		*		***	**
	ofErta	*!		*				
	ofErt			*		*	**	*
	ofEr			**!		*	*	
metros	mEtros	*!					*	
	mEtrs		*!		**	*	***	**
	mEtro	*!		*				
	mEtr			*	*	*	**	*
	mEt			**!		*	*	
paso	pAso	*!						
	pAs					*	*	
	pA			*!		*		

OT evaluation

		Apocope	Coda-Bin	SSG	Max(c)	Max(v)	NoCoda	*Complex
		Apocope	Coda-Bin	SSG	Max(c)	Max(v)	NoCoda	*Complex
pasos	pAsos	*!					*	
	pAss			*!		*	**	*
	pAso	*!			*			
	pAs				*	*	*	
	pA				**!	*		
ofertas	ofErtas	*!					*	
	ofErts		*!	*			***	**
	ofErta	*!			*			
	ofErt				*	*	**	*
	ofEr				**!	*	*	
metros	mEtros	*!					*	
	mEtrs		*!	**		*	***	**
	mEtro	*!			*			
	mEtr			*!	*	*	**	*
	mEt				**	*	*	
paso	pAso	*!						
	pAs					*	*	
	pA				*!	*		