



Stress in Romance verbs (Spanish and Italian)

GLOW 44

Targeted Collaborative Debates

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Outline

1. Overview of the data: stress in Spanish and Italian verbs
2. Previous main approaches
 - Oltra-Massuet and Arregi (2005)
 - Doner (2017)
3. Perspective A
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Overview of the data: stress in Spanish and Italian verbs

Overview of the data: stress in Spanish and Italian verbs

Empirical problem

- Stress in Romance verbs is sometimes phonologically irregular.

Research questions

- What is the role of morphosyntactic structure in determining the location of stress in verbs?
- If stress is morphosyntactically determined, how should this be modeled? By means of morphosyntax-prosody interface constraints, and if so, of what type? By means of faithfulness to lexical stress? By means of inflectional paradigm uniformity constraints?
- Can stress in verbs be accounted for by the same mechanism that assigns stress in non-verbs?

Overview of the data: stress in Spanish and Italian verbs

- Simple finite tenses of regular verbs
 - (1) Morphological structure of verbs
 - √ + Th + T + Agr
 - √ + Th + Fut-Th + T + Agr
(for future and conditional, *Oltra-Massuet and Arregi 2005*)
- Allomorphy kept at a minimum

Overview of the data: stress in Spanish and Italian verbs

(2) Imperfective indicative in Spanish

1st conjugation *amar* 'to love'

1sg	am á ba ∅
2sg	am á ba s
3sg	am á ba ∅
1pl	am á ba mos
2pl	am á ba js
3pl	am á ba n

2nd conjugation *temer* 'to fear'

1sg	tem í a ∅
2sg	tem í a s
3sg	tem í a ∅
1pl	tem í a mos
2pl	tem í a js
3pl	tem í a n

3rd conjugation *partir* 'to leave'

1sg	part í a ∅
2sg	part í a s
3sg	part í a ∅
1pl	part í a mos
2pl	part í a js
3pl	part í a n

Overview of the data: stress in Spanish and Italian verbs

(3) Imperfective indicative in Italian

1st conjugation *amare* 'to love'

1sg	am á v o
2sg	am á v i
3sg	am á v a
1pl	am a vá mo
2pl	am a vá te
3pl	am á v ano

2nd conjugation *temere* 'to fear'

1sg	tem é v a
2sg	tem é v i
3sg	tem é v a
1pl	tem e vá mo
2pl	tem e vá te
3pl	tem é v ano

3rd conjugation *partire* 'to leave'

1sg	part í v o
2sg	part í v i
3sg	part í v a
1pl	part i vá mo
2pl	part i vá te
3pl	part í v ano

Overview of the data: stress in Spanish and Italian verbs

(4) Imperfective subjunctive in Spanish

1st conjugation *amar* 'to love'

1sg	am á ra ∅
2sg	am á ra s
3sg	am á ra ∅
1pl	am á ra mos
2pl	am á ra js
3pl	am á ra n

2nd conjugation *temer* 'to fear'

1sg	tem jé ra ∅
2sg	tem jé ra s
3sg	tem jé ra ∅
1pl	tem jé ra mos
2pl	tem jé ra js
3pl	tem jé ra n

3rd conjugation *partir* 'to leave'

1sg	part jé ra ∅
2sg	part jé ra s
3sg	part jé ra ∅
1pl	part jé ra mos
2pl	part jé ra js
3pl	part jé ra n

T: *ra* or *se* (free variation)

Overview of the data: stress in Spanish and Italian verbs

(5) Imperfective subjunctive in Italian

1st conjugation *amare* 'to sing'

1sg	am á ssi ∅
2sg	am á ss i
3sg	am á ss e
1pl	am á ssi mo
2pl	am á s te
3pl	am á ss ero

2nd conjugation *temere* 'to fear'

1sg	tem é ssi ∅
2sg	tem é ss i
3sg	tem é ss e
1pl	tem é ssi mo
2pl	tem é s te
3pl	tem é ss ero

3rd conjugation *partire* 'to leave'

1sg	part í ssi ∅
2sg	part í ss i
3sg	part í ss e
1pl	part í ssi mo
2pl	part í s te
3pl	part í ss ero

Overview of the data: stress in Spanish and Italian verbs

(6) Future in Spanish

1st conjugation *amar* 'to love'

1sg	am a r-é ∅ ∅
2sg	am a r-á ∅ s
3sg	am a r-á ∅ ∅
1pl	am a r-é ∅ mos
2pl	am a r-é ∅ js
3pl	am a r-á ∅ n

2nd conjugation *temer* 'to fear'

1sg	tem e r-é ∅ ∅
2sg	tem e r-á ∅ s
3sg	tem e r-á ∅ ∅
1pl	tem e r-é ∅ mos
2pl	tem e r-é ∅ js
3pl	tem e r-á ∅ n

3rd conjugation *partir* 'to leave'

1sg	part i r-é ∅ ∅
2sg	part i r-á ∅ s
3sg	part i r-á ∅ ∅
1pl	part i r-é ∅ mos
2pl	part i r-é ∅ js
3pl	part i r-á ∅ n

Overview of the data: stress in Spanish and Italian verbs

(7) Future in Italian

1st conjugation *amare* 'to love'

1sg	am e r- ó ∅ ∅
2sg	am e r- á ∅ i
3sg	am e r- á ∅ ∅
1pl	am e r- é ∅ mo
2pl	am e r- é ∅ te
3pl	am e r- á ∅ nno

2nd conjugation *temere* 'to fear'

1sg	tem e r- ó ∅ ∅
2sg	tem e r- á ∅ i
3sg	tem e r- á ∅ ∅
1pl	tem e r- é ∅ mo
2pl	tem e r- é ∅ te
3pl	tem e r- á ∅ nno

3rd conjugation *partire* 'to leave'

1sg	part i r- ó ∅ ∅
2sg	part i r- á ∅ i
3sg	part i r- á ∅ ∅
1pl	part i r- é ∅ mo
2pl	part i r- é ∅ te
3pl	part i r- á ∅ nno

Overview of the data: stress in Spanish and Italian verbs

(8) Conditional in Spanish

1st conjugation *amar* 'to love'

1sg	am a r-í a ∅
2sg	am a r-í a s
3sg	am a r-í a ∅
1pl	am a r-í a mos
2pl	am a r-í a js
3pl	am a r-í a n

2nd conjugation *temer* 'to fear'

1sg	tem e r-í a ∅
2sg	tem e r-í a s
3sg	tem e r-í a ∅
1pl	tem e r-í a mos
2pl	tem e r-í a js
3pl	tem e r-í a n

3rd conjugation *partir* 'to leave'

1sg	part i r-í a ∅
2sg	part i r-í a s
3sg	part i r-í a ∅
1pl	part i r-í a mos
2pl	part i r-í a js
3pl	part i r-í a n

Overview of the data: stress in Spanish and Italian verbs

(9) Conditional in Italian

1st conjugation *amare* 'to love'

1sg	am e r-é ∅ i
2sg	am e r-é st i
3sg	am e r-é bb e
1pl	am e r-é m mo
2pl	am e r-é s te
3pl	am e r-é bb ero

2nd conjugation *temere* 'to fear'

1sg	tem e r-é ∅ i
2sg	tem e r-é st i
3sg	tem e r-é bb e
1pl	tem e r-é m mo
2pl	tem e r-é s te
3pl	tem e r-é bb ero

3rd conjugation *partire* 'to leave'

1sg	part i r-é ∅ i
2sg	part i r-é st i
3sg	part i r-é bb e
1pl	part i r-é m mo
2pl	part i r-é s te
3pl	part i r-é bb ero

Overview of the data: stress in Spanish and Italian verbs

(10) Perfective past in Spanish

1st conjugation *amar* 'to love'

1sg	am é ∅ ∅
2sg	am á ste ∅
3sg	am ∅ ó ∅
1pl	am á ∅ mos
2pl	am á ste js
3pl	am á ro n

2nd conjugation *temer* 'to fear'

1sg	tem í ∅ ∅
2sg	tem í ste ∅
3sg	tem j ó ∅
1pl	tem í ∅ mos
2pl	tem í ste js
3pl	tem j é ro n

3rd conjugation *partir* 'to leave'

1sg	part í ∅ ∅
2sg	part í ste ∅
3sg	part j ó ∅
1pl	part í ∅ mos
2pl	part í ste js
3pl	part j é ro n

Overview of the data: stress in Spanish and Italian verbs

(11) Perfective past in Italian

1st conjugation
amare 'to love'

1sg am á Ø i
2sg am á st i
3sg am Ø ó Ø
1pl am á m mo
2pl am á s te
3pl am á ro no

2nd conjugation
temere 'to fear'

1sg tem é Ø i
tem é tt i
2sg tem é st i
3sg tem é (tt e)
1pl tem é m mo
2pl tem é s te
3pl tem é ro no
tem é tt ero

3rd conjugation
partire 'to leave'

1sg part í Ø i
2sg part í st i
3sg part í Ø Ø
1pl part í m mo
2pl part í s te
3pl part í ro no

Overview of the data: stress in Spanish and Italian verbs

(12) Present indicative in Spanish

1st conjugation *amar* 'to love'

1sg **ám** ∅ o ∅
2sg **ám** ∅ a s
3sg **ám** ∅ a ∅
1pl am **á** ∅ mos
2pl am **á** ∅ js
3pl **ám** ∅ a n

2nd conjugation *temer* 'to fear'

1sg **tém** ∅ o ∅
2sg **tém** ∅ e s
3sg **tém** ∅ e ∅
1pl tem **é** ∅ mos
2pl tem **é** ∅ js
3pl **tém** ∅ e n

3rd conjugation *partir* 'to leave'

1sg **párt** ∅ o ∅
2sg **párt** ∅ e s
3sg **párt** ∅ e ∅
1pl part **í** ∅ mos
2pl part **í** ∅ s
3pl **párt** ∅ e n

Overview of the data: stress in Spanish and Italian verbs

(13) Present indicative in Italian

1st conjugation *amare* 'to love'

1sg **ám** ∅ ∅ o
2sg **ám** ∅ ∅ i
3sg **ám** ∅ a ∅
1pl am **já** ∅ mo
2pl am **á** ∅ te
3pl **ám** ∅ ∅ ano

2nd conjugation *temere* 'to fear'

1sg **tém** ∅ ∅ o
2sg **tém** ∅ ∅ i
3sg **tém** ∅ e ∅
1pl tem **já** ∅ mo
2pl tem **é** ∅ te
3pl **tém** ∅ ∅ ono

3rd conjugation *partire* 'to leave'

1sg **párt** ∅ ∅ o
2sg **párt** ∅ ∅ i
3sg **párt** ∅ e ∅
1pl part **já** ∅ mo
2pl part **í** ∅ te
3pl **párt** ∅ ∅ ono

Overview of the data: stress in Spanish and Italian verbs

(14) Present subjunctive in Spanish

1st conjugation *amar* 'to love'

1sg	ám	∅	e	∅
2sg	ám	∅	e	s
3sg	ám	∅	e	∅
1pl	am	é	∅	mos
2pl	am	é	∅	js
3pl	ám	∅	e	n

2nd conjugation *temer* 'to fear'

1sg	tém	∅	a	∅
2sg	tém	∅	a	s
3sg	tém	∅	a	∅
1pl	tem	á	∅	mos
2pl	tem	á	∅	js
3pl	tém	∅	a	n

3rd conjugation *partir* 'to leave'

1sg	párt	∅	a	∅
2sg	párt	∅	a	s
3sg	párt	∅	a	∅
1pl	part	á	∅	mos
2pl	part	á	∅	js
3pl	párt	∅	a	n

Overview of the data: stress in Spanish and Italian verbs

(15) Present subjunctive in Italian

1st conjugation *amare* 'to love'

1sg **ám** ∅ i ∅
2sg **ám** ∅ i ∅
3sg **ám** ∅ i ∅
1pl am **já** ∅ mo
2pl am **já** ∅ te
3pl **ám** ∅ i no

2nd conjugation *temere* 'to fear'

1sg **tém** ∅ a ∅
2sg **tém** ∅ a ∅
3sg **tém** ∅ a ∅
1pl tem **já** ∅ mo
2pl tem **já** ∅ te
3pl **tém** ∅ a no

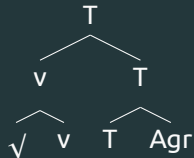
3rd conjugation *partire* 'to leave'

1sg **párt** ∅ a ∅
2sg **párt** ∅ a ∅
3sg **párt** ∅ a ∅
1pl part **já** ∅ mo
2pl part **já** ∅ te
3pl **párt** ∅ a no

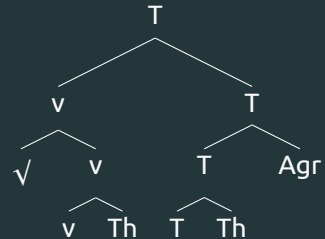
Previous main approaches

(16) Verb

- a. Resulting structure after head-to-head movement of the \checkmark to functional heads c-commanding it (v, T)



- b. Th position required at MS (T = complex head)



- Generalization: stress in all finite verbal forms falls on the vowel preceding the T node

(17) Stress algorithm (single bracketed metrical grid, Idsardi 1992)

- a. Project a line 0 mark for each syllable nucleus
- b. *Insert a right parenthesis to the left of T on line 0*
- c. Project the rightmost mark of each line 0 foot onto line 1
- d. *(Insert a right parenthesis to the right of the rightmost mark on line 1*
- e. Project the rightmost mark of each line 1 foot onto line 2)

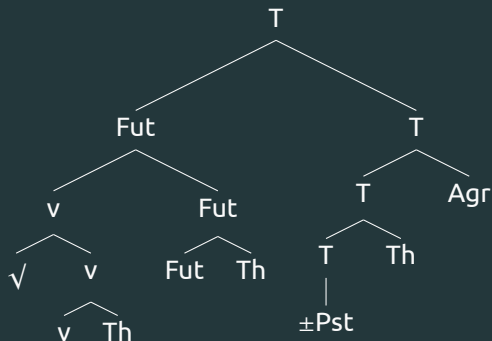
(18) 1pl imperfective indicative

Line 1			x			
Line 0	x		x)		x	x
String	am	∅	á	b	a	mos
Syntax	[√	[v	Th]]	[[T	Th]	Agr]

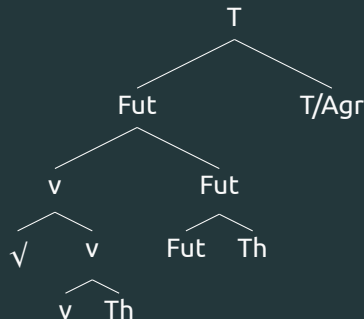
Ultra-Massuet and Arregi (2005)

(19) Future and conditional

a. Resulting structure



b. Fusion



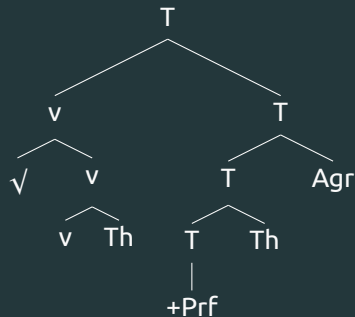
- Future heads a projection different from T (Fut = Fut + Prs; Cond = Fut + Pst)
- T and Agr fuse at MS if T is [-Pst] (only one position available for Vocabulary Insertion)

(20) 1sg future

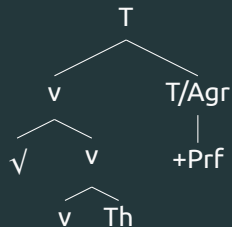
Line 1					x	
Line 0	x		x		x)	x
String	am	∅	a	r	é	∅
Syntax	[√	[v	Th]]	[F	Th]	T/Agr

(21) Perfective past

a. Resulting structure



b. Fusion (although T is [+Pst, +Prf])



(22) Stress

a. 2sg perfective past

Line 1			x	
Line 0	x		x)	x
String	am	∅	á	ste
Syntax	[√	[v	Th]]	T/Agr

b. 3sg perfective past

Line 2				x
Line 1	x			x)
Line 0	x)			x)
String	tem	∅	j	ó
Syntax	[√	[v	Th]]	T/Agr

- The Vocabulary item expressing the T/Agr 3sg perfective past morpheme is lexically specified to project a line 0 right parenthesis to its right.

(24) Stress

a. 1pl present indicative

Line 1			x	
Line 0	x		x)	x
String	am	∅	á	mos
Syntax	[√	[v	Th]]	T/Agr

b. 2sg present indicative

Line 1	x			
Line 0	x)	
String	ám	∅	a	s
Syntax	[√	[v	Th]]	T/Agr

(25) Stress deletion rule (in present tense)

$x \rightarrow . / x _ _) \#$

(A grid mark is deleted if projected by a word-final vowel in present tense.)

Summary

The stress algorithm makes explicit reference to T, a functional head (*Insert a right parenthesis to the left of T on line 0*); phonology has full access to syntactic structure and is sensitive to functional heads like T.

Exceptionality is accounted for by means of two distinct mechanisms:

- lexical marking
- rule of stress deletion

- Extension of Roca's (2005) analysis of non-verb stress in Spanish to stress in verbs (following Idsardi 1992)
- Against Oltra-Massuet and Arregi (2005), who infringe strong modularity
- Lexical parametrization: word or stem as domains for stress

- Present tenses and the perfective past in Spanish: RRR(W) edge parameter (“insert a right bracket to the right of the rightmost element in the word”)

(26) Present indicative: RRR(W)

a. 1sg
x

(x x)

cán to]

b. 1pl
x

x (x x)

can tá] mos

- The imperfective indicative and subjunctive and the conditional: RRR(S) edge parameter

(27) 1pl: RRR(S)

a. Imperfective indicative

x

x (x x) x

can tá ba] mos

b. Conditional

x

x x (x x) x

can ta rí a] mos

- The future: LLR(S) edge parameter

(28) Future: LLR(S)

a. 1sg

 x
(x x (x
can ta ré]

b. 1pl

 x
(x x (x x
can ta ré] mos

- Perfective past: different edge parameters associated to different entries of T, which display suppletion: RRR(S) or LLR(S) edge parameters

(29) Perfective past:

a. 1sg: LLR(S)

x

x (x

can té]

b. 2sg: RRR(S)

x

x (x x)

can tá ste]

Summary

Following Roca's (2005) account for non-verb stress in Spanish, Doner's (2017) account of stress in Spanish verbs makes use of three different edge parameters, which are selected by different T morphemes: RRR(W), RRR(S) and LLR(S).

Perspective A

Perspective A

Claim: stress is stem-final (stem = $\sqrt{\text{ + Th V}}$); feet are syllabic trochees

(30) Stress in non-verbs (Baković 2016)

	Regular		Exceptional	
			Class 1	Class X
V-final words	penultimate	final	antepenultimate	
	sabán]a	Panamá]	sában]a	
	'savannah'	'Panama'	'sheet'	
C-final words		final	penultimate	antepenultimate
		animál]	caníbal]	régimen]
		'animal'	'cannibal'	'diet'

Constraint ranking

NONFINALITY₁ » FINALSTRESS » NONFINALITY

(31) Modularity at the morphology-phonology interface (Bermúdez-Otero 2012)

a. *Indirect Reference Hypothesis:*

Only alignment constraints can refer to morphosyntactic structure in the input

b. *Modular serial interface:*

i. Each of the two modules *X* and *Y* possesses its own representational vocabulary.

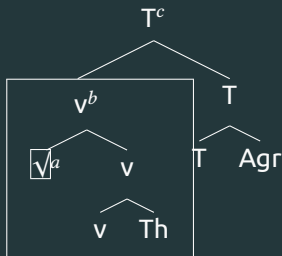
ii. The computations performed in *Y* have no effect upon those carried out in *X*, and vice versa.

iii. *X* affects *Y* in the following manner. The output of *X* is displayed at the interface with *Y*. **A specific subset of the elements present in the output of *X* is put in correlation with elements in the input to *Y*** by means of lexical look-up, realization statements, or mapping rules. **The computations performed in *Y* can refer to the correlations so established.** However, *Y* does not have access to the internal operations of *X*, or to elements in the output of *X* that do not enter into correlation with elements in the input of *Y*.

Perspective A

(32) Levels of representation in a modular serial interface (based on Bermúdez-Otero 2012)

a. Syntactic output



b. Phonological input (UR): $[[[a_1 m_2]^a a_3]^b b_4 a_5 m_6 o_7 s_8]^c$

c. Phonological output (SR): $[a_1 . m_2 \acute{a} . 3 \beta_4 a . 5 m_6 o_7 s_8]_\omega$

(33) Constraints

a. FINALSTRESS

Let *input vowels* = $i_1, i_2, i_3 \dots i_n$, and *output vowels* = $o_1, o_2, o_3 \dots o_m$.

Assign one violation mark for every pair i_x, o_y , where i_x is in correspondence with o_y , i_x is stem-final and o_x is not stressed.

(If i_x = vowel at the right edge of the stem, and o_x = stressed vowel, then i_x must be in correspondence with o_x .)

b. NONFINALITY

Let *input vowels* = $i_1, i_2, i_3 \dots i_n$, and *output vowels* = $o_1, o_2, o_3 \dots o_m$.

Assign one/two violation mark(s) for every pair i_x, o_y , where i_x is in correspondence with o_y , i_x is stem-final/word final and o_x is stressed.

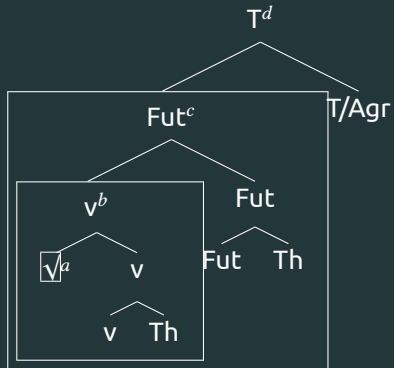
(34) Spanish *amar* 'to love', 1pl imperfective indicative

[[[am] ^a a] ^b bamos] ^c	FINALSTRESS	NONFINALITY
☞ a. a((má]ba)mos)		*
b. ((á.ma])ba)mos	* _W	L
c. a.ma](bá.mos)	* _W	L
d. a.ma]ba(mós)	* _W	** _W

- We assume layered feet (Martínez-Paricio 2013) in proparoxytones (Krämer 2018).

Perspective A

(35) Future and conditional



(36) Spanish *amar* 'to love', 1pl future indicative

[[[[am] ^a a] ^b re] ^c mos] ^d	FINALSTRESS	NONFINALITY
☞ a. a.ma(ré)mos		*
b. a((má.re)mos)	* _W	L
c. a.ma.re](mós)	* _W	** _W

(37) Underlying metrical structure

Ft
|
 σ
|
 μ
|
/va/

/o/

(38) Italian *amare* 'to love', 3sg perfective past

[[[am] ^{a,b} ó] ^c	FAITH(Stress)	FINALSTRESS	NONFINALITY
☞ a. (a.m]ó)		*	**
b. ((á:]m]o)	* _W	L	* _L

Perspective A

(39) 1pl and 2pl present forms

a. Italian

2pl	am-á-∅-te	tem-é-∅-te	part-í-∅-te	
3pl	ám-a-∅-no	*tém-e-∅-no	*párt-i-∅-no	expected
3pl	ám-∅-∅-ano	tém-∅-∅-ono	párt-∅-∅-ono	attested

b. Spanish

2pl	am-á-∅-js	tem-é-∅-js	part-í-∅-s	
3pl	ám-a-∅-n	tém-e-∅-n	*párt-i-∅-n	expected
3pl	ám-∅-a-n	tém-∅-e-n	párt-∅-e-n	attested

Perspective A

(40) Spanish *amar* 'to love', 2sg present indicative

[[[am] ^{a,b}]as ^c	FINALSTRESS	NONFINALITY
☞ a. (á.m]as)		*
b. (a.m]ás)	* _W	** _W

(41) Spanish *amar* 'to love', 1pl present indicative

[[[am] ^a a] ^b mos] ^c	FINALSTRESS	NONFINALITY
☞ a. a(má]mos)		*
b. ((á.ma])mos)	* _W	L
c. a.ma](mós)	* _W	** _W

Perspective A

(42) Italian *indicare* 'to indicate', 3pl present indicative

[[[indic ₁] ^{a,b}]ano] ^c	NONFIN _{√1}	FINALSTRESS	NONFIN	NONFIN _ω
☞ a. ((ín.di)c)a no		*		
b. in.di((c)á:)no		*		* _W
c. in((dí.c)a)no	* _W	L	* _W	* _W

(43) Italian *indicare* 'to indicate', 1pl present indicative

[[[indich ₁] ^a ja] ^b mo] ^c	NONFIN _{√1}	FINALSTRESS	NONFIN	NONFIN _ω
☞ a. indi((chiá:)]mo)			*	*
b. ((ín.di)chia)]mo		* _W	L	L
c. in((dí.chia)]mo)	* _W	* _W	L	*

Conclusions

Summary

We have proposed a simple and unified OT analysis of stress that abides by the Indirect Reference Hypothesis and the Modular serial interface as presented by Bermúdez-Otero (2012).

We claim that stress is stem-final, which includes the root and the theme vowel.

Irregular stress is derived with underlying metrical structure on one morph in Spanish (3sg perfective past) and two morphs in Italian (3sg perfective past, 1st conjugation, and 1pl and 2pl imperfective past).

Stress on the penultimate vowel of the root in certain Italian verbs is triggered by a lexically indexed version of $\text{NONFINALITY}_{\sqrt{1}}$. This constraint is inactive in Spanish.

Thank you!

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Appendix: Spanish stress is non-verbs

- An analysis based on Baković (2016) incorporating class X exceptions (all candidates satisfy TROCHEE and layered feet are assumed in proparoxytones, whose right alignment explains the three-syllable window in Spanish)

(44) *saban-a* 'savannah'

<i>saban-a</i>	FINSTRESS	*LFT	FTBIN	NONFIN
☞ a. <i>sa(bán-a)</i>				*
b. <i>saba(n-á)</i>	* _W		* _W	** _W
c. <i>((sába)n-a)</i>	* _W	* _W		<i>L</i>

Appendix: Spanish stress in non-verbs

(45) animal 'animal'

animal	FINSTRESS	*LFT	FTBIN	NONFIN
☞ a. ani(mál)			*	**
b. a(nímal)	* _W		L	L
c. ((áni)mal)	* _W	* _W	L	L

Appendix: Spanish stress in non-verbs

(46) Panamá 'Panama'

panama	FINSTRESS	*LFT	FTBIN	NONFIN
☞ a. pana(má)			*	**
b. pa(náma)	* _W		L	L
c. ((pána)ma)	* _W	* _W	L	L

Appendix: Spanish stress in non-verbs

(47) *saban*₁-a 'sheet'

<i>saban</i> ₁ -a	NONFIN ₁	FINSTRESS	*LFT	FTBIN	NONFIN
☞ a. ((<i>sá</i> ba)n-a)		*	*		
b. sa(<i>bán</i> -a)	* _W	<i>L</i>	<i>L</i>		* _W
c. saba(n- <i>á</i>)	* _W *	*	<i>L</i>	* _W	* _W *

Appendix: Spanish stress in non-verbs

(48) canibal₁ 'cannibal'

canibal ₁	NONFIN ₁	FINSTRESS	*LFT	FTBIN	NONFIN
☞ a. ca(níbal)		*			
b. ((cáni)bal)		*	* _W		
c. cani(bál)	* _W *	L	L	* _W	* _W *

Appendix: Spanish stress in non-verbs

(49) régimen₁ 'diet'

régimen ₁	NONFIN ₁	FAITHSTRESS	FINSTRESS	*LFT	FTBIN	NONFIN
☞ a. ((régi)men)			*	*		
b. re(gímen)		* _W	*	L		
c. regi(mén)	* _W *	* _W	L	L	* _W	* _W *

Appendix: Spanish stress in non-verbs

(50) régimen₁-es 'diets'

régimen ₁ -es	AL-R	NONFIN ₁	FAITHSTRESS	FINSTRESS	*LFT	NONFIN
☞ a. re((gíme)n-es)			*	*	*	
b. regi(mén-es)		* _W	*	L	L	* _W
c. ((régi)me)n-es	* _W		L	*	*	

Appendix: Spanish stress in non-verbs

(51) ómicron 'omicron'

ómicron	FAITHSTRESS	FINSTRESS	*LFT	FTBIN	NONFIN
☞ a. ((ómi)cron)		*	*		
b. o(mícron)	* _W	*	L		
c. omi(crón)	* _W	L	L	* _W	* _W *

Appendix: Spanish stress in non-verbs

(52) ómicron-es 'omicrons'

ómicron-es	AL-R	FAITHSTRESS	FINSTRESS	*LFT	NONFIN
☞ a. omi(crón-es)		*			*
b. o((mícro)n-es)		*	* _W	* _W	L
c. ((ómi)cro)n-es	* _W	L	* _W	* _W	L

Appendix: Spanish stress in non-verbs

(53) $\text{caracter}_{1,2}$ 'character'

$\text{caracter}_{1,2}$	*LFT ₂	NONFIN ₁	FINSTRESS	*LFT	FT-BIN	NONFIN
☞ a. ca(rácter)			*			
b. carac(tér)		* _W	L		* _W	* _W *
c. ((cárac)ter)	* _W		*	* _W		

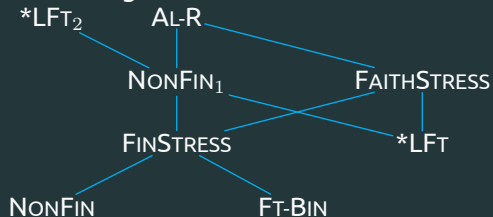
Appendix: Spanish stress in non-verbs

(54) $\text{caracter}_{1,2}\text{-es}$ 'characters'

$\text{caracter}_{1,2}\text{-es}$	$*\text{LFT}_2$	NONFIN_1	FINSTRESS	$*\text{LFT}$	NONFIN
☞ a. $\text{carac}(\text{tér-es})$		*			*
b. $\text{ca}((\text{rácte})\text{r-es})$	$*_W$	L	$*_W$	$*_W$	L

Appendix: Spanish stress in non-verbs

(55) Hasse diagram for stress in verbs and non-verbs in Spanish



- Optimal Paradigms (McCarthy 2005) (see also Ohannesian 2004 for stress in Spanish verbs using OP): every element of an inflectional paradigm stands in correspondence with every other element
- Verbs may contain more than one theme vowel (following Oltra-Massuet and Arregi 2005)

(56) Relevant constraints

- a. ALIGN(Theme vowel, L; Head of Foot, L): The left edge of every theme vowel is aligned with the left edge of the head of a foot. (For each segment that intervenes between the left edge of a theme vowel and the left edge of the nearest head of foot, the candidate form receives one violation mark.)
- b. OPTIMAL-PARADIGM LEFT-ANCHOR- FOOT: In the stems of every member of the paradigm, left edges of feet stand in correspondence.

(57) 1pl and 2pl present forms

a. Italian

2pl	am-á-∅-te	tem-é-∅-te	part-í-∅-te	
3pl	ám-a-∅-no	*tém-e-∅-no	*párt-i-∅-no	expected
3pl	ám-∅-∅-ano	tém-∅-∅-ono	párt-∅-∅-ono	attested

b. Spanish

2pl	am-á-∅-js	tem-é-∅-js	part-í-∅-s	
3pl	ám-a-∅-n	tém-e-∅-n	*párt-i-∅-n	expected
3pl	ám-∅-a-n	tém-∅-e-n	párt-∅-e-n	attested

- Italian: *-eno* never occurs; *-ino* occurs only in 3pl present subjunctive of 1st conjugation; the *-o-* in *-ono* cannot likely be a theme vowel because it occurs in more than one conjugation, but only in one cell (3pl)

(58) Italian *indicare* 'to indicate', present indicative

	ALIGN(TV, H/F)	OP-L-ANCHOR-F
a. 'indico, 'indichi, 'indica, indi'chiamo, indi'cate, 'indicano	2	16
b. 'indico, 'indichi, 'indica, 'indichiamo, 'indicate, 'indicano	10 _W	L
c. 'indico, 'indichi, 'indica, indi'chiamo, indi'cate, in, 'dicano	2	22 _W
d. 'indico, 'indichi, 'indica, indi'chiamo, indi'cate, indi'cano	2	18 _W

(59) Italian *cantare* 'to sing', imperfective indicative

/cant-/ + {1sg, 2sg, ... }	ALIGN(TV, H/F)	OP-L-ANCHOR-F
a. can'tavo, can'tavi, can'tava, canta'vamo, canta'vate, can'tavano	8	16
b. can'tavo, can'tavi, can'tava, can'tavamo, can'tavate, can'tavano	12 _W	L
c. can'tavo, can'tavi, can'tava, canta'vamo, canta'vate, canta'vano	8	18 _W

(60) Violations of ALIGN(TV, H/F)

a. cant|a₁('v|a₂mo

a₁ = 1 violation due to <a₁> itself; a₂ = 1 violation due to <v>

b. *can'(t|a₁v|a₂mo

a₁ = 1 violation due to <t>; a₂ = 3 violations due to <tav>

Meinschaefer (2011)

- According to Meinschaefer (2005), theme vowels have no special status in Spanish. Furthermore, she restricts paradigm uniformity to play a role only in non-present tenses in Spanish.

(61) Spanish *cantar* 'to sing', imperfective indicative

/cant-/ + {1sg, 2sg, ... }	OP-L-ANCHOR-F	ALL-FT-RIGHT
a. can'taba, can'tabas, can'taba, can'tabamos, can'tabajs, can'taban		1
b. can'taba, can'tabas, can'taba, canta'bamos, canta'bajs, can'taban	16 _W	L

(62) Italian *cantare* 'to sing', perfective past

/cant-/ + {1sg, 2sg, ... }	ALIGN(TV, H/F)	OP-L-ANCHOR-F
a. can'tai, can'tasti, can'to, can'tammo, can'taste, can'tarono	5	
b. can'tai, can'tasti, 'canto, can'tammo, can'taste, can'tarono	5	10 _W

- The same effect of OP-L-ANCHOR-F is observed in Spanish perfective past, in which both 1sg and 3sg (*canté, cantó*) have final stress despite violating FT-BIN.

- For future and conditional, Meinschaefer (2011) assumes a stem extension, corresponding to the phonological exponent of Fut in Ultra-Massuet and Arregi (2005), and the following constraint:

(63) ALIGN(Stem extension, L; Head of Foot, L): The left edge of every stem extension is aligned with the left edge of the head of a foot.

Summary

In Spanish, present indicative and irregular perfect forms (*dije, dijiste, dijo, dijimos, dijisteis, dijeron* 'to say') are not affected by paradigm uniformity. Paradigm uniformity in Spanish is only active in non-present tenses.

In Italian, stem-forming elements (e.g. theme vowels and stem extensions) condition stress assignment.

Meinschaefer (2011) uses a combination of different mechanisms to account for stress in verbs:

- 2 morphosyntax-prosody interface constraints: one referring to theme vowels, one referring to stem extensions;
- a paradigm uniformity constraint, relativized in Spanish to apply only in non-present tenses, and used in Italian to derive stress on the root in 3pl present indicative (*indicano*) and final stress in 3sg perfective past (*cantò*).

Vowel clusters

There are two types of verbs of the 1st conjugation whose root ends in a high vowel or whose last syllable nucleus contains the sequences /ai, au, ei, eu/. They can be classified depending on stress location:

1. Stress on the high vowel (and therefore hiatus; stress falls on the last vowel of the root):

ENVI-AR (to send): enví-o *éenvj-o, envi.á-ba *envjá-ba

ACTU-AR (to act): actú-o *áctw-o, actu.á-ba *actwá-ba

AISL-AR (to isolate): aís-l-o *ájs-lo, a.islá-ba *ajslá-ba

DESCAFEIN-AR (to decaffeinate): descafeín-o *descaféjn-o, ?descafejná-ba

AUN-AR (to combine): aún-o *áwn-o, a.unáb-a *awná-ba

REHUSAR (to refuse): rehús-o *réws-o, re.husá-ba *rewsá-ba

FINALSTRESS » NONFINALITY

Vowel clusters

2. Diphthong (stress falls on the penultimate vowel of the root):

ANUNCI-AR (to announce): anúncj-o *anunci-o, anuncjáb-a *anunci.áb-a

AVERIGU-AR (to find out): averígw-o *averigú-o, averigwáb-a *averigu.áb-a

BAIL-AR (to dance): bájl-o *ba.íl-o, bajláb-a *ba.ilá-ba

CAUS-AR (to cause): cáws-o *ca.ús-o, cawsá-ba *ca.usá-ba

PEIN-AR (to comb): péjn-o *pe.ín-o, pejná-ba *pe.iná.ba

ADEUD-AR (to owe): adéwd-o *ade.úd-o, adewdá-ba *ade.udá-ba

NONFINALITY₁ >> FINALSTRESS >> NONFINALITY + ONSET (TETU effect)

(See Cabré and Ohannesian 2009)

Irregular perfective past

Verbs like:

PONER ('to put'): pús-e, pus-í-ste, pús-o, pus-í-mos, pus-í-ste-is, pus-ié-ro-n

DECIR ('to say'): dij-e, dij-í-ste, díj-o, dij-í-mos, dij-í-ste-is, dij-é-ro-n.

First, in these cases, -e and -o are T/Agr morphs that are not underlyingly stressed (as opposed to /-ó/ in a regular verb like *part-i-ó*).

Second, in these cases the perfective past selects a different root allomorph.

Third, these irregular allomorphic roots subcategorize for those specific T/Agr morphs without underlying metrical structure.

In the presence of a theme vowel, FINALSTRESS is enough to account for regular stress: dij-í-ste, dij-í-mos, dij-í-ste-is, dij-é-ro-n.

Stress in Romance verbs (Spanish and Italian)

GLOW 44 - Targeted Collaborative Debates

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Outline

1. Intro: stress in Spanish and Italian verbs
2. Stress in CVCV
3. Perspective B
4. To feed into the debate

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Intro: stress in Spanish and Italian verbs

Empirical problem

- The stress patterns displayed by each variety of Romance (except French) cannot be captured by one generalization valid at a single level of analysis (phonological, morphological, or syntactic)

To contribute to the debate:

- Is the distinction in stress assignment made in the lexical entries, in the application of rules/constraints/principles, or at the surface level? Or do we need to refer to a combination of these?
- As Xico has just shown, an analysis enforcing both morphology-prosody alignment and lexical specification looks promising.

Intro: stress in Spanish and Italian verbs

- Long-standing debate in morphophonology: procedures vs. representations
- (Formal) approaches differ procedurally, representationally, or at both levels.

Intro: stress in Spanish and Italian verbs

As for the procedures

- **Assumption 1:** syntactic structure (an entire literature: see Embick 2000, Oltra-Massuet and Arregi 2005 a.o.)
- **Oltra-Massuet & Arregi's (2005) generalization:** stress in all finite verbal forms falls on the vowel preceding the T node.
- This enforces analyzing Future as heading a projection distinct from T, for instance.
- Does this predict stress placement in Italian verbs, too?

Intro: stress in Spanish and Italian verbs

As for the representations

- Strict CV and Direct Interface (Scheer 2011): alignment between morphosyntactic structure and the phonology is represented by CV units.
- The lexical property ‘accentedness’ can be encoded through the presence of CV (cf. Yates 2016, 2020 a.o.).
- **Assumption 2:** a CV unit realizes stress (Larsen 1998; Enguehard 2016; Scheer 2000 and others)

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Larsen (1998)

CVCV phonology: Lowenstamm (1996), Scheer (2004).

- In CVCV, there is no hierarchy between the syllabic slots.
- How can stress be represented in such a framework?

Stress-related phenomena

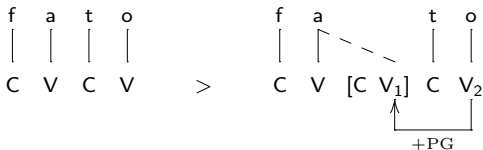
Stress correlates with various phonological phenomena: lengthening, aspiration, reduction, glottalization, etc. (van der Hulst, 2010)

- As for Italian, in the beginning there was Chierchia (1986): stress adds metrical space.
- Indeed, it is a well-known fact of Italian that stressed syllables must be heavy (although with restrictions, we'll discuss this later).

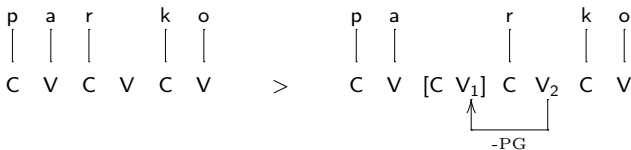
Larsen (1998)

(1) The representation of stress according to Larsen (1998)

a. [fá:to] 'destiny'



b. [párko] 'park'



In (1-a), V₂ governs and thus licences V₁: accordingly, the CV introduced by stress is maintained and can be identified by the propagation of vowel *a*. In (2), in turn, V₁ is not governed by V₂ (because V₂ is empty, thus already governed by the final V position), hence V₁ remains unactivated and no propagation occurs.

Stress and CVCV

The typology of stress-related lengthening (Enguehard, 2016)

- The position of CV introduced by stress is binary: either CV precedes the stressed V, or it follows it.
- The propagation of the autosegment on this CV: either Cs or Vs.

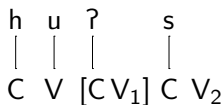
The facts to retain are the following:

- In Italian, stress-CV **follows** the stressed V.
- Only vowels spread onto the stress-CV.
- Crucially, stress-CV entails stress in the surface, but the reverse is not true: stressed closed syllables in Italian [fatto], *[fa:ttɔ]

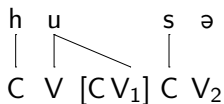
Larsen (1994)

In Danish *stød*, stress correlates with glottalization. Larsen (1994) proposes to represent this phenomenon as the realization of the stress-CV. Note that long vowels may occur in stressed positions, so the stress CV may also be the site of lengthening.

(2) Danish *stød*: ['huʔs] 'house'



(2) Danish long vowels: ['hu:sə] 'houses'



Scheer (2000)

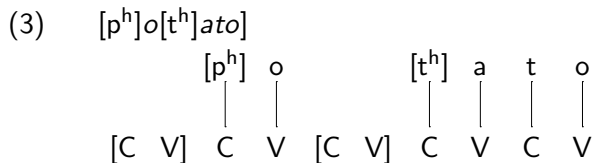
Stress correlates with aspiration, as in English [p^h]o[t^h]ato. The aspirated plosives appear:

- word-initially
- before stress

According to Scheer (2000), in both cases, an empty CV is responsible for the presence of the aspiration.

Scheer (2000)

The representation of *potato*. The initial empty CV has been proposed by Lowenstamm (1999).



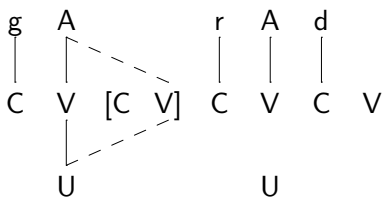
The crucial observation is the following:

In CVCV phonology, there is no mean to distinguish a morphologically-conditioned empty CV (the initial site, for instance), from a prosodically-conditioned empty CV (the stress CV).

Enguehard (2016)

In Russian, stress correlates with blocking of vowel reduction. Enguehard (2016) shows that a stressed vowel cannot reduce because it is underlyingly long.

(4) Russian *gorət* 'town'



Faust & Ulfsbjorninn (2018)

Faust and Ulfsbjorninn (2018) develop a grid-based notion initially proposed by Ulfsbjorninn (2014) and integrate this within a strict CVCV representational system. The paper also introduces some sort of procedural mechanism into CVCV phonology: “Metrically-significant nuclei project to Line 1” (see also Ulfsbjorninn 2021.)

(5) Palestinian Arabic [kátbat] ‘she wrote’

L3 *_α

L2 * *

L1 * *)_α *

k	a	t		b	a	t	
C	V	C	V	C	V	C	V

CVCV and stress

Overall, a number of studies have been devoted to stress within CVCV phonology.

Main observations

- Stress is represented through the effects resulting from its presence vs. absence
- There is no formal way to encode prominence, except in the model proposed by Faust and Ulfsbjorninn (2018)
- Faust & Ulfsbjorninn's model introduces procedures into the CVCV model (namely the stress algorithm proposed for Palestinian Arabic)
- Alignment between the morpho(syntactic) structure and stress can be enforced by postulating a stress CV (lexically) associated with an affix.

Outline

1. Intro: stress in Spanish and Italian verbs
2. Stress in CVCV
3. Perspective B
4. To feed into the debate

Proposal

- Roots do not bear a fixed accented V-slot (I follow the standard notation * to mark the stressed V)
- Roots are projecting items, i.e they project prosodic positions, labelled 1, 2, ...
- By default, stress goes on ...

Proposal

- Roots do not bear a fixed accented V-slot (I follow the standard notation * to mark the stressed V)
- Roots are projecting items, i.e they project prosodic positions, labelled 1, 2, ...
- By default, stress goes on ...

Italian

Stress goes on the second V-slot counting from right to left. Stress inserts a CV between position 1 and position 2.

Spanish

Stress goes on the second V-slot counting from right to left.

Prosodic templates

(6) Verbal template in Italian:

	*		.		*
	2	1		2	1
...	C	V	C	V	→ ... C V [C V] C V

(7) Verbal template in Spanish:

	*
	2 1
...	C V C V

The typology of affixes with respect to stress

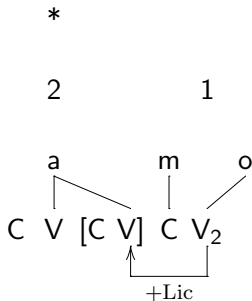
Affixes with respect to stress

- 1 Unaccented affixes (either segmental, or templatic) (=extrametrical) (IT, SP PresInd 1sg and 3pl)
- 2 Unaccented but projecting affixes (Imperfective Indicative)
- 3 Lexically-accented affixes (=they bear a stressed position over a V-slot) (Future, Conditional, SP 1pl PresInd)

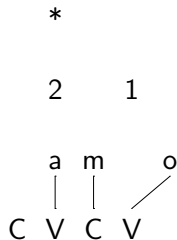
Present indicative

1sg suffix -o has no template, no stress in either Italian and Spanish

(8) IT 1sg PresInd [á:mo]:



(9) SP 1sg PresInd [ámo]:



Present indicative

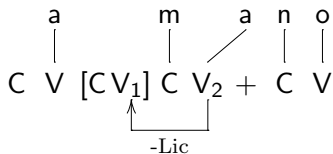
3pl suffixes -ano (IT) -an (SP) have no stress, but do bear a CV-unit. Stress surfaces on the root, according to the prosodic template.

(10) IT 3pl PresInd [ámano]:

*

2

1

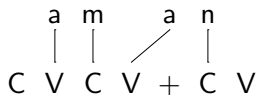


(11) SP 3pl PresInd [áman]:

*

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I follow Ulf sbjorninn (2021): only the final V can license the V-slot of the stress-CV.

Present indicative

In Italian, some roots instantiate inflected forms in which stress falls on the third vowel from the right as in PresInd 1sg [káriko] ‘I charge’. These roots create forms that violate the three-V-slot window: PresInd 3pl [kárikano] ‘they charge’. Stressed vowels do not lengthen in either case (but see Ulfbsjorninn 2021). These roots are lexically stressed on the V-slot labelled “3”.

(12) IT 1sg PresInd [káriko]:

*

3 2 1

k	a	r	i	k	o
					/
C	V	C	V	C	V

(13) IT 3pl PresInd [kárikano]:

*

3 2 1

k	a	r	i	k	a	n	o	
					/			
C	V	C	V	C	V	+	C	V

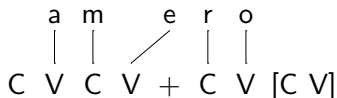
Future indicative

Future indicative suffixes are templatic, accented items: the prosodic template is overruled, stress goes where suffix says so. The principle is: “The rightmost wins”, as shown in Italian 1sg FutInd:

(14) IT 1sg FutInd [ameró], *[ámeró]:

*

2 1



Future indicative

The same situation occurs in Spanish:

(15) SP 1sg FutInd [amaré]:

*

2 1

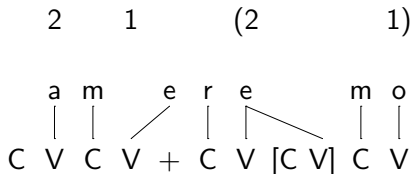
	a	m		a	r	e
			/			
C	V	C	V	+	C	V

Future indicative

Future 1pl in Italian.

(16) IT 1pl FutInd [ameré:mo]:

*



Future indicative

Future 1pl in Spanish:

(17) SP 1pl FutInd [amarémos]:

*

2 1 (2 1)

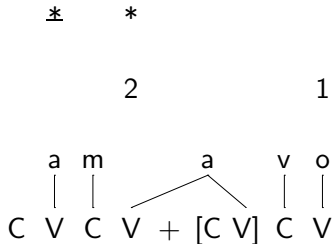
a	m		a	r	e	m	o	s		
			/	/	/					
C	V	C	V	C	V	+	[C	V]	C	V

In both Italian and Spanish 1pl forms, the suffix creates a prosodic minimal word, made of two projecting V-slots. Final V in Spanish -/mos/ does not project, cf. Faust and Ulfsbjorninn (2018).

Imperfective indicative

Imperfective indicative suffixes do not bear a fixed accented V-slot but they do project prosodic positions (as roots), i.e. they are visible to stress assignment. Therefore, stress is assigned to the second V-slot from right-to-left starting from #1. The stress-CV is inserted accordingly.

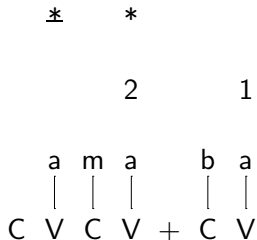
(18) IT 1sg ImpInd [amá:vo], *[ámavo]:



Imperfective indicative

Stress is assigned following the two-V-slot window in Spanish:

(19) SP 1sg Implnd [amába], *[ámaba]:



Imperfective indicative

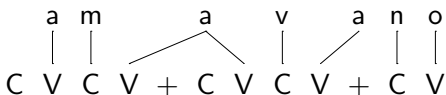
Adding an unaccented suffix leaves the stressed V-slot unaffected:

(20) IT 3pl Implnd [amá:vano], *[amavá:no]:

‡ *

2

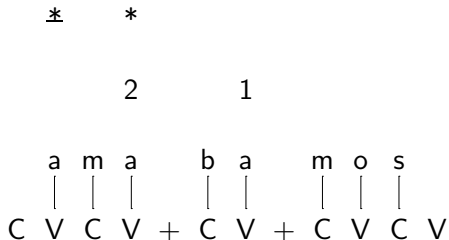
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Imperfective indicative

The same situation holds in Spanish, where 1pl is unaccented:

(21) SP 1pl PresInd [amábamos], *[amabámos]:



A detour into Spanish diphthongization

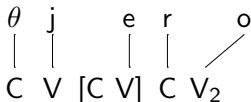
Some verbs display alternations *we/o* (*recuerdo/recordamos* 'remember' and *je/e* (*cierro/cerramos* 'close/shut up'). Thus, Spanish stress may also be realized through lengthening (=the insertion of the stress-CV).

(22) SP PresInd 1sg *cierro*:

*

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A detour into Spanish diphthongization

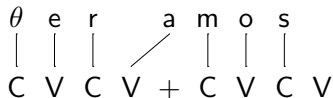
Stress correlates with a CV only in certain roots (=a restricted group) and only when it falls within the root.

(23) SP PresInd 1pl cerramos:

*

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A detour into Catalan

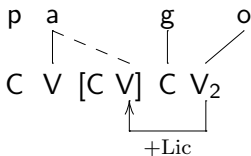
Catalan displays vowel reduction in unstressed positions. This can be observed in the verbal system, as shown by the comparison between 1sg PresInd and 1pl PresInd (verb: *pagar* 'to pay'). In other words, stressed vowels are long (Lowenstamm 1991; Bucci 2013)

(24) CAT PresInd 1sg p[á]go 'I pay':

*

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A detour into Catalan

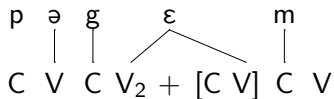
When stress is realized on the suffix, the root vowel surfaces as [ə]. This occurs because -em is unaccented but projecting: it does not bear its own stress, but enforces computation of stress according to the three-V-slot algorithm (Catalan works like Italian).

(25) CAT PresInd 1pl p[ə]gu[ɛ]m 'we pay':

*

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CAT 1pl -em differs from SP 1pl -mos in that the final V-slots projects in the former but does not in the latter.

A detour into Catalan

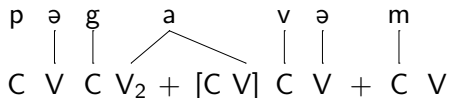
When an accented suffix is added, 1pl surfaces with a reduced vowel. This occurs in the Imperfective Indicative. Here, though, 1pl -em seems not to project...

(26) CAT Implnd 1pl p[ə]g[a]v[ə]m 'we were paying':

*

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A detour into Catalan

In the future indicative, stress falls on the last vowel: the future suffix is lexically accented (as in Italian and Spanish).

(27) CAT FutInd 1pl p[ə]g[ə]r[ε]m 'we will pay':
 *



Outline

1. Intro: stress in Spanish and Italian verbs
2. Stress in CVCV
3. Perspective B
4. To feed into the debate

To feed into the debate:

Some possible things to debate afterwards

- Do representation-based approaches suffice to account for the stress patterns in Romance verbs?
- How do we encode lexical stress into the representations? And how do we compute it procedurally?
- Can predictable stress patterns, in turn, be derived exclusively in the phonology?

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