

How the Spanish Verb Works*

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1. Introduction

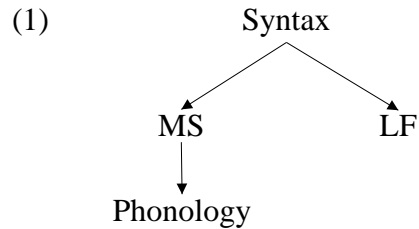
In this talk I provide an analysis of the morphology of Spanish finite verbal forms within the framework of Distributed Morphology (DM, Halle and Marantz 1993, 1994). The main goals of the talk are as follows:

1. Following one of the central tenets of DM, to show that there is a direct relationship between the syntax/semantics of verbs and their morphophonological realization.
2. Following Oltra-Massuet's (1999) work on Catalan verbs, to provide a unified account of allomorphy in the verbal theme vowels and in the Tense/Mood (T/M) markers.
3. To develop an analysis of stress in the verbal system which is dependent on the syntactic structure of verbs. This is part of a more general project developed in Arregi and Oltra-Massuet (in prep), which crucially relies on (i) the DM assumption that words have a syntactic structure, and (ii) the framework for stress developed in Idsardi (1992) and Halle and Idsardi (1995).

2. Theoretical Background: Distributed Morphology

The framework I will assume is Distributed Morphology. DM assumes a Morphological Structure level (MS) between Spell Out and Phonology:

*I would like to thank David Embick, Morris Halle, Jim Harris, Alec Marantz and Isabel Oltra-Massuet for their very helpful comments and discussion on different parts of the work presented here. Needless to say, all errors are mines.



DM is characterized by two central hypotheses (Halle and Marantz 1994):

1. *Late Insertion*. Syntax manipulates bundles of abstract syntactico-semantic features (terminal nodes, or morphemes). At MS, morphemes are provided with phonological features via *Vocabulary Insertion*, which is governed by the *Subset Principle*: the Vocabulary Item (VI) specified for the largest subset of the features contained in a terminal node is inserted in that terminal node.
2. *Syntactic Hierarchical Structure All the Way Down*. Morphemes are organized into hierarchical structures determined by the principles and operations of syntax.

The two hypotheses are crucial in the present study. Taken together, they basically state that there is a direct relationship between syntax and morphophonology.

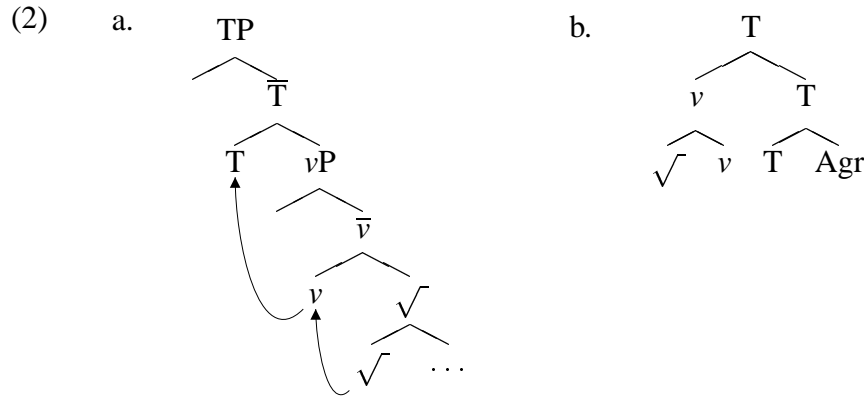
In the next section I spell out the main ideas behind the analysis of Spanish verbs, and in §4 I illustrate the analysis.

3. The Syntax of Spanish Verbs

Following Marantz (1997), I assume that roots have no category,¹ and that in the syntax they are merged with category-giving functional heads. In the verbal domain, this head is *v*. This head is responsible for the verbal properties of the verbal complex, like (in)transitivity, agentivity, (accusative) case, and so on.

A verb is formed in the syntax by successive head-to-head movement of the verbal root to functional heads c-commanding it (*v*, T, etc.). Furthermore, I assume that subject Agr is adjoined to T at MS (Halle and Marantz 1993):

¹A similar view has been defended for Spanish since Harris (1977).



There are two conspicuous morphophonological properties of Spanish verbs which will help us determine their structure and ultimately justify the analysis offered here:

- (3) a. Verb forms with more marked syntactico-semantic features are longer than verb forms with less marked syntactico-semantic features:

	Root	Th	T/M
<i>Present</i>	tém	e	∅
<i>Past</i>	tem	í	a
<i>Conditional</i>	tem	e	r - í - a

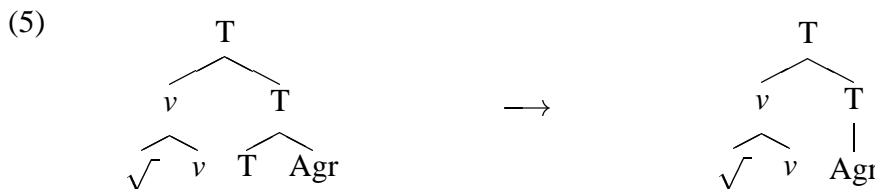
- b. T/M markers always contain the vowels *a*, *e* or *i*, which also happen to be the verbal theme vowels: *-b-a* or *-a* ImpInd, *r-e* or *-r-a* in Fut, *-r-i-a* in Cond, *-r-a* in PstSbj.

I will argue that neither property of Spanish verbs is an accident:

1. Based on the observation in (3a), I will assume (4) (Cf. Embick and Halle 2000):

- (4) A terminal node containing only features with unmarked values is deleted at MS.

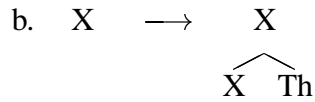
With respect to T, past is the marked case and present the unmarked one. Thus, while a past form has the structure in (2b), a present form has the structure in (5) at MS:



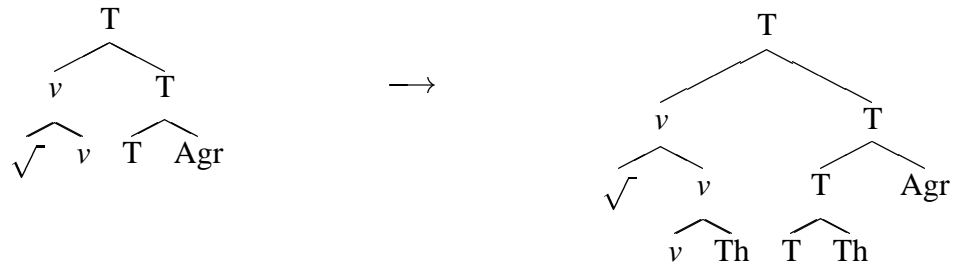
2. Based on the observation in (3b), I will adopt Ultra-Massuet's (1999) analysis of Catalan, which includes the following morphological well-formedness condition:²

²A similar analysis was proposed for Latin in Williams (1981) but the implementation of this observation and the framework used are radically different from what is proposed in Ultra-Massuet (1999).

(6) a. At MS, all syntactic functional heads require a theme position.



(7)



That the verbal stem (here, v) requires a theme position is uncontroversial. Oltra-Massuet's insight consists in positing a theme position for every functional head. This will explain why T/M markers have the vowels they have.

As is well known, the realization of this node is dependant on idiosyncratic properties of the root. Following Oltra-Massuet (1999), I implement this by assigning class features to roots:

(8) *Class Features*

	I	II	III
α	-	+	+
β		+	-

The Vocabulary entries for roots contain unpredictable information, and redundancy rules fill in predictable values of features:

(9) *Vocabulary Entries for Roots*

I	II	III
kant	tem ₊ β	part ₊ α

(10) *Redundancy Rules*

- $\emptyset \longrightarrow -\alpha$
- $+\beta \longrightarrow +\alpha$
- $-\beta \longrightarrow +\alpha$
- $+\alpha \longrightarrow -\beta$

(11) *Vocabulary Entries for Theme (1st version)*

- $/e/ \longleftrightarrow \text{Th} / [+ \beta] \text{ __}$
- $/i/ \longleftrightarrow \text{Th} / [- \beta] \text{ __}$

c. /a/ \longleftrightarrow Th

As I will show below, the assumption that the realization of Th depends on morphological features will allow us to account for neutralizations in this position. Furthermore, the assumption that all syntactic functional heads contain a theme position will also allow us to account for the pattern of allomorphy mentioned in (3b).

4. The Past and the Future

In this section I illustrate the analysis with the Imperfective Past, the Future and the Conditional. The appendices deal with the rest of the paradigm.

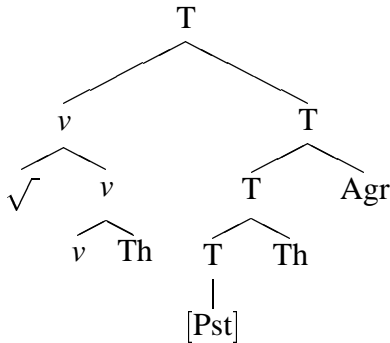
4.1. The Imperfective past

(12) *The Imperfective Past*

	<i>1st Conjugation</i>	<i>2nd Conjugation</i>	<i>3rd Conjugation</i>
<i>1Sg</i>	cant á b a Ø	tem í Ø a Ø	part í Ø a Ø
<i>2Sg</i>	cant á b a s	tem í Ø a s	part í Ø a s
<i>3Sg</i>	cant á b a Ø	tem í Ø a Ø	part í Ø a Ø
<i>1Pl</i>	cant á b a mos	tem í Ø a mos	part í Ø a mos
<i>2Pl</i>	cant á b a is	tem í Ø a is	part í Ø a is
<i>3Pl</i>	cant á b a n	tem í Ø a n	part í Ø a n

The structure I assume for the Imperfective Past is:

(13) *The Imperfective Past*



Given (13), the realization of the 1st conjugation is transparent:

(14) $\sqrt{+v}$ Th $[_T \text{ Pst}]$ Th Agr
 cant a b a mos

As expected, the verbal theme is *a*, since first conjugation verbs have no class feature. (10a) and (11c) ensure that Th is realized as the default *a* in this case. Ultra-Massuet's (1999) insight is that the following vowel *a*

is also a theme vowel, the tense theme in this case. As expected in this theory, this theme is realized as the default *a*, since there is no class membership information available in the local context of Th. Consider the imperfective form for the second and third conjugations:

- (15) $\sqrt{+v}$ Th $[_T \text{ Pst}]$ Th Agr
 tem i \emptyset a mos

As in the 1st conjugation, the tense theme is the default *a*. The main difference between 1st and 2nd/3rd is the realization of T itself:

- (16) /b/ \longleftrightarrow [Pst] / a ___

In the 2nd and 3rd conjugations, T is \emptyset , i.e. no vocabulary item is inserted.

Finally, the difference between 2nd and 3rd conjugations is neutralized in the verbal theme position. It is realized as /i./ (i.e. syllabic /i/)³:

- (17) *Vocabulary Entries for Theme* (2nd version)

- a. /i./ \longleftrightarrow Th / [+ α] ___ [Pst]
- b. /e/ \longleftrightarrow Th / [+ β] ___
- c. /i/ \longleftrightarrow Th / [- β] ___
- d. /a/ \longleftrightarrow Th

This neutralization can be accounted for in an elegant manner by positing class features and underspecifying the relevant vocabulary entries for the theme position.

4.2. The Future and the Conditional

- (18) a. *The Future*

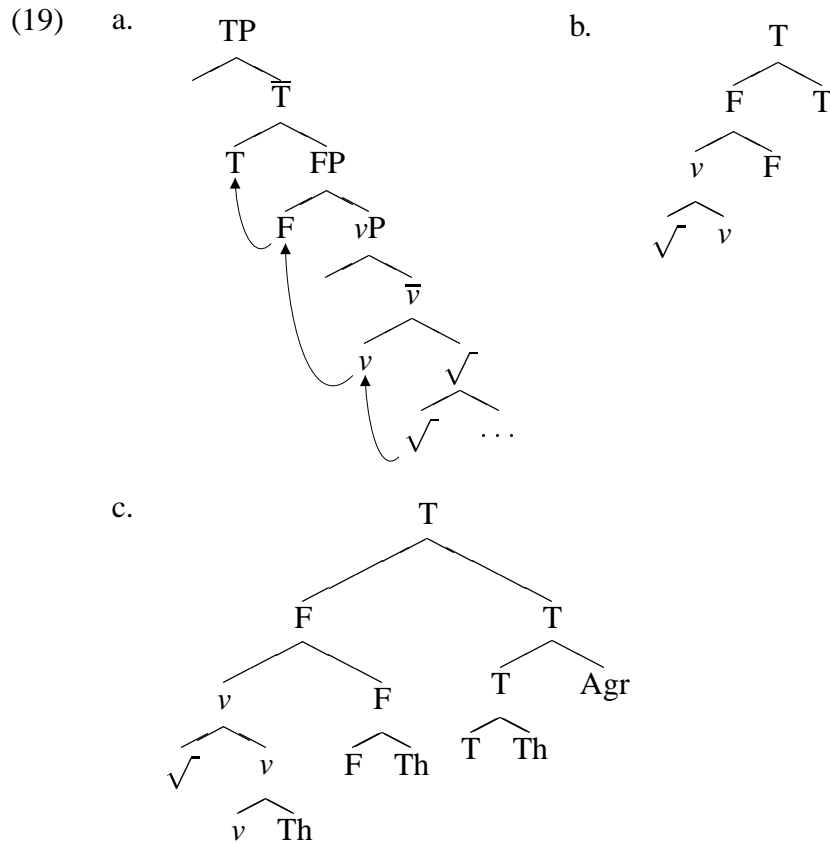
(I)	cant	a	}	r	é	\emptyset	(1Sg)
(II)	tem	e		r	á	s	(2Sg)
(III)	part	i		r	á	\emptyset	(3Sg)
				r	é	mos	(1Pl)
				r	é	is	(2Pl)
				r	á	n	(3Pl)

³As shown in Harris and Kaisse (to appear), among others, some high vowels must be exceptionally marked as being syllable nuclei in Spanish. This allows us to account for near minimal pairs like *llano* [iá.no] vs. *hiato* [i.á.to]. Theme *i* must be exceptionally marked as syllabic in the imperfective, since it is in a position where we would expect it to form a complex nucleus with the following vowel (i.e. *temía* is [te.mi.a], not *[te.mia]). As shown in the references cited above, this syllabification cannot be a result of stress placement.

b. *The Conditional*

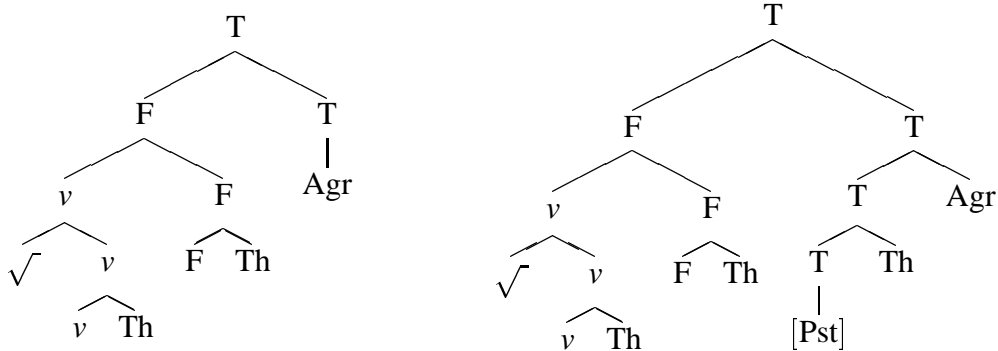
(I)	cant	a	}	r	í	a	∅	(1Sg)
(II)	tem	e		r	í	a	s	(2Sg)
(III)	part	i		r	í	a	∅	(3Sg)
				r	í	a	mos	(1Pl)
				r	í	a	is	(2Pl)
				r	í	a	n	(3Pl)

I assume that the feature [Fut] heads a projection separate from T:



T is present in the future and past in the conditional:

- (20) a. *The Future* (after deletion of T) b. *The Conditional* (no T deletion)



Besides allowing an elegant analysis of the Spanish data, the structure assumed here is syntactically and semantically motivated

- In one of its uses, it is a future with a reference point in time prior to the utterance time:

- (21) Juan dijo que Pedro cantaría una canción.
 Juan said that Pedro sing-Cond a song
Juan said that Pedro would sing a song.

- In other languages, a tense which is transparently formed with the past and the future is used in the same sequence-of-tense contexts. In English, the conditional is future *will*+Past. This is especially clear in Basque:

- (22) a. Juan-ek esan dau Pedro-k kanta bat kanta-ko dab-ela.
 Juan-Erg said has Pedro-Erg song a sing-Fut Aux(Pr)-Comp
Juan has said that Pedro will sing a song.
- b. Juan-ek esa ban Pedro-k kanta bat kanta-ko ban-ela.
 Juan-Erg said had Pedro-Erg song a sing-Fut Aux(Pst)-Comp
Juan said that Pedro would sing a song.

In Basque, it is clear that the future is separate from T, and that the future is Future+Present, and the conditional Future+Past.

- Furthermore, the conditional has the same uses as the corresponding tense in Basque and English, i.e. future with respect to the past and the consequent of counterfactual conditional sentences (among others).⁴ Finally, Iatridou (to appear) also argues that the use of the past in counterfactuals is not accidental; it makes a decisive contribution to the meaning of this kind of sentence.

⁴The conditional is also used in the antecedent of counterfactual conditional sentences in Basque. In fact, this is also true in some dialects of both Spanish and English.

Thus, there are both semantic and morphological arguments that the conditional is Future+Past in these three languages. The verb forms in the three languages can be derived from the tree in (19a) and head movement. In Basque, v moves to F and an auxiliary is inserted in T. In English, v stays, and F moves to T, forming *will* in the future (i.e. present T) and *would* in the conditional (i.e. past T). Finally, in Spanish, v moves to F and F moves to T.

Given the structures in (20) at MS, the realization of these two tenses is now quite transparent. As can be seen in (18), the conditional is on the surface more complex than the future. This is due to the fact that in the latter, T is deleted, and in the former, it is not.

- (23) a. $\sqrt{+v}$ Th F Th T/Agr
 tem e r a s
- b. $\sqrt{+v}$ Th F Th T Th Agr
 tem e r i Ø a s

The realization of the verbal theme is straightforward: *a* in the first conjugation, *e* in the second, and *i* in the third. F is realized as *r*, so we need an additional vocabulary entry:

- (24) /r/ \longleftrightarrow [Fut]

The future theme is realized as *a* or *e* in the future and *i* in the conditional. Since there is no class membership available in the local context, we expect it to be always *a*:

- (25) [Fut]+Th $\xrightarrow{Red.(10a)}$ [Fut, $-\alpha$]+Th $\xrightarrow{VI(17d)}$ [Fut, $-\alpha$] + [_{Th} *a*]

We still need to account for the cases in which it is not. In the conditional, it is *i*, i.e. what is ‘1st conjugation’ becomes ‘third conjugation’:

- (26) $\emptyset \longrightarrow +\alpha$ / [Fut, $___$] + [Pst]

- (27) [Fut]+Th+[Pst] $\xrightarrow{(26)}$
 [Fut, $+\alpha$]+Th+[Pst] $\xrightarrow{Red.(10c)}$
 [Fut, $+\alpha, -\beta$]+Th+[Pst] $\xrightarrow{VI(17a)}$
 [Fut, $+\alpha, -\beta$] + [_{Th} *i.*] + [Pst]

In the cases in which it is *e* (1stSg, 1stPl and 2ndPl), I assume that it is due to a phonological rule which changes theme *a* to *e* in certain morphological contexts.

Finally, the realization of T and its theme is straightforward. In the future, they are not realized because the T node is deleted. In the conditional, their realization is as expected: T (Pst) is \emptyset and Th is *a*, just as in the imperfective in the second and third conjugations.

Summary: What is important to note is that our independently motivated assumptions about the structure of verbal forms allows us to predict a great deal about the realization of the so-called ‘tense-markers’ in the future and the conditional. First, both start with *r*, which is the realization of Fut. Second, they contain certain vowels which elsewhere are theme vowels.

In the next section I show that stress placement in these tenses can be derived in an elegant way once we assume the syntactic and morphological analysis defended here.

4.3. Stress

The analysis of the syntax of verbs developed in the previous section allows a rather simple analysis of stress in the verbal paradigm.

As is well-known, the correct generalization about stress in these tenses cannot be stated in terms of distance from the edge of the word:

- (28) a. Final Stress: Fut *cantaré*
 b. Penultimate Stress: Fut *cantarémos*
 ImpInd *cantábas*
 Cond *cantarías*
 c. Antepenultimate Stress: ImpInd *cantábamos*
 Cond *cantaríamos*

Rather, as proposed in Oltra-Massuet (1999) for Catalan, stress is determined by the structure: **stress is on the vowel preceding T.**

(29) *Stress Patterns*

a. *The Imperfective Past*

b. *The Future*

$\sqrt{+v}$ Th **T** Th Agr
 ... **á/í** b/Ø a s/mos/ ...

$\sqrt{+v}$ Th F Th **T/Agr**
 ... a/e/i r **á/é** s/mos/ ...

c. *The Conditional*

$\sqrt{+v}$ Th F Th **T** Th Agr
 ... a/e/i r **í** Ø a s/mos/ ...

I will develop an analysis of these stress facts within the framework of Idsardi (1992) and Halle and Idsardi (1995). The main characteristics of this theory are:

- (30)
- a. A standard assumption in current theories of stress is that stress is not a phonetic feature. Rather, it is the phonetic means for marking certain groupings of linguistic elements.
 - b. Furthermore, not all phonemes in the string are capable of bearing stress. This fact is implemented by assuming that the elements capable of bearing stress project an abstract mark on a separate plane, the *metrical plane*. The sequence of abstract marks projected by stressable elements constitutes line 0 of the metrical plane. What a stressable element is depends on the language.
 - c. We need, in addition, a way to group these elements into what are called *feet*. This grouping is done by projecting brackets on the metrical plane. Idsardi's (1992) innovation is that only one bracket is necessary to group elements: a left bracket groups all the elements to its right, and a right bracket groups all the elements to its left.
 - d. Brackets are projected either at the edges of the stress domain (*Edge-Marking* rules) or at the edges of certain syllables (i.e. heavy syllables, a specific syllable in an accented vocabulary item, etc.).
 - e. Within each foot, an element (the rightmost or the leftmost one) is designated as the head and is projected onto the next line in the grid.

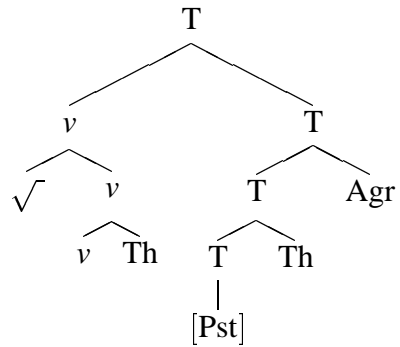
In Arregi and Oltra-Massuet (in prep), we develop an analysis of stress in Spanish in which stress is determined by the syntactic structure of words in both the verbal and nominal domains. The present analysis should be seen as part of that more general project. Our proposal is that in Spanish, **brackets are also projected from the syntactic structure:**

- (31)
- a. Project a line 0 element for each syllable head.
 - b. **Project a right boundary to the left of T on line 0.**
 - c. Project the right-most element of each constituent onto the next line on the grid.

The basic rule that derives stress placement in these tenses is (31b).

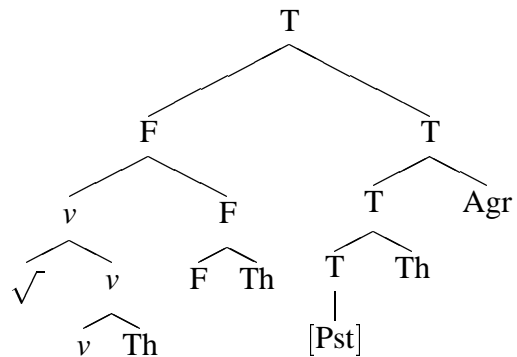
(32) *Stress in the imperfective past (cantábamos)*

Line 1 x
 Line 0 x x) x x
 String c a n t a b a m o s
 Syntax √+v Th T Th Agr



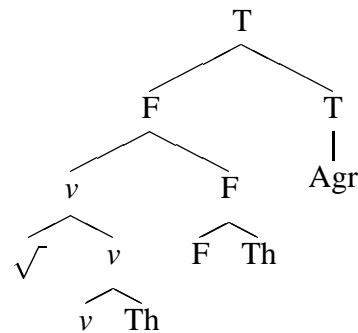
(33) *Stress in the conditional (cantaríamos)*

Line 1 x
 Line 0 x x x) x x
 String c a n t a r i Ø a m o s
 Syntax √+v Th F Th T Th Agr



(34) *Stress in the future (cantaríamos)*

Line 1 x
 Line 0 x x x) x
 String c a n t a r e m o s
 Syntax √+v Th F Th T/Agr



What is important about this analysis of stress is that *the stress of all the relevant forms are derived from independently motivated assumptions about their syntactic structure.*

5. Conclusion

In this study I have shown that the syntax of Spanish verbs can tell us a lot about their morphophonology:

1. There is a transparent relation between syntactic (featural) markedness and morphophonological markedness. This is implemented by deleting terminal nodes with unmarked features at MS.
2. Oltra-Massuet's (1999) hypothesis that theme vowels are adjoined to every syntactic functional head allows us to account for the allomorphy in the tense/mood markers and to relate it to allomorphy in the verbal theme vowel. Each vowel that appears in the former is also a verbal theme vowel in other forms.
3. Taking into account the syntactic structure of verbs, we can predict in a simple manner stress placement in all tenses.

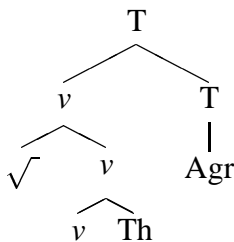
Thus, the present study should be seen as providing evidence in favor of morphological frameworks in which the internal structure of words is constructed and constrained by syntactic principles. Furthermore, the fact that the mapping between syntax and stress placement incorporates central aspects of Idsardi's (1992) theory of stress also provides evidence for this framework.

Appendix 1: The Present

(35) *The Present Indicative*

	<i>1st Conjugation</i>	<i>2nd Conjugation</i>	<i>3rd Conjugation</i>
<i>1Sg</i>	cánt Ø o	tém Ø o	párt Ø o
<i>2Sg</i>	cánt a s	tém e s	párt e s
<i>3Sg</i>	cánt a Ø	tém e Ø	párt e Ø
<i>1Pl</i>	cant á mos	tem é mos	part í mos
<i>2Pl</i>	cant á is	tem é is	part í s
<i>3Pl</i>	cánt a n	tém e n	párt e n

(36) *The Present Indicative*



1Pl and 2Pl are straightforward:

(37) a. *Present Indicative, 1Pl (cantámos)*

√+v Th T/Agr
cant á mos

b. *Present Indicative, 2Pl (teméis)*

√+v Th T/Agr
tem é is

c. *Stress in the Present Indicative, 1Pl and 2Pl*

Line 1 x
Line 0 x x) x
String c a n t a m o s
Syntax √+v Th T/Agr

Stress in 2Sg, 3Sg and 3Pl is not on the theme vowel, as expected, but on the stem.

In order to account for this pattern, we must first look at stress in Spanish in general. In §4.3, I proposed a number of rules for stress in the Spanish verb based on Oltra-Massuet's (1999) analysis

for Catalan. The basic idea behind the analysis is that stress placement in Spanish (and other Romance languages) is determined by the syntactic structure of words. In fact, Oltra-Massuet extends this analysis to non-verbal environments. Specifically, she proposes that in non-verbal contexts, foot boundaries are also projected from functional heads. In Arregi and Oltra-Massuet (in prep), we develop this proposal, concentrating on Spanish. In that paper, it is proposed that stress placement in Spanish is the consequence of the rules in (38).

- (38)
- a. Project a line 0 element for each syllable head.
 - b. Project a right boundary to the right of *n/a/v* (i.e. category-giving functional heads) on line 0.
 - c. Project a right boundary to the left of T on line 0.
 - d. Edge-Marking on line 1: RRR (place a right bracket to the right of the right-most element in the string).
 - e. Project the right-most element of each constituent onto the next line on the grid.

The only additions to the stress rules assumed so far in this paper are (38b, d). (38b) projects a foot boundary from the category giving functional heads adjoined to roots. While (38b) is only active in verbal environments, (38c) is active in all words. (38d) will ensure that the rightmost element on line 1 will be stressed in cases in which both (38b) and (38c) apply. The basic advantage of this analysis with respect to previous ones in non-verbal contexts is that it can capture in a unified manner several well-known generalizations about stress placement in Spanish. I will not go into the details of this analysis here, and refer the reader to Arregi and Oltra-Massuet (in prep).

In verbal contexts, the prediction is that (38b) will be irrelevant, since (38d, e) will ensure that only the vowel preceding T will be stressed. This is illustrated in (39) with the 1PI imperfective form *cant-á-b-a-mos*.

(39) *Stress in the imperfective past (cantábamos)*

<i>Line 2</i>		x				
<i>Line 1</i>	x	x)				
<i>Line 0</i>	x)	x)	x	x		
<i>String</i>	c	a	n	t	a	b
<i>Syntax</i>	v	Th	T	Th	Agr	

This is true also in all the other forms we have seen so far, including the ones in the present (cf. 37c). This revised analysis makes the same predictions as the previous one regarding verbal contexts.

What I would like to propose is that in the problematic cases (i.e. 2Sg, 3Sg, 3Pl in the present), it is the bracket projected by *v*, not *T*, that determines stress placement. I propose this clash deletion rule to account for these cases:

(40) *Clash Deletion in Verbal Environments*

) → Ø /)x__#

Since it only applies in word-final clashes, it does not delete the clash in 1Pl and 2Pl (cf. 37c). It does not apply in ImpInd for the same reason (cf. 32). Finally, it does not apply in Cond or Fut (cf. 33, 34), since there is no clash. However, it does apply in 2Sg, 3Sg and 3Pl PrInd, since they do have a clash in final position:

(41) *Stress in the Present Indicative, 2Sg, 3Sg, 3Pl*

i. Line 0 Stress Rules:

Line 0 x) x)
 c a n t a s/Ø/n

ii. Clash Deletion:

Line 0 x) x
 c a n t a s/Ø/n

iii. Other Stress Rules:

Line 2 x
Line 1 x)
Line 0 x) x
 c a n t a s/Ø/n

In 2Sg, 3Sg and 3Pl of the 3rd conjugation, the theme vowel is lowered to *e*. What these forms have in common is that their theme vowel is post-tonic (cf. 41):

(42) *Theme Vowel Lowering*

i → e / VC₀__ (*i* is a theme vowel)
 |
 * Line 2

- (43) UR partis
 Stress (41) pártis
 Lowering (42) pártēs

In 1Sg, the theme vowel is deleted. I propose that this is due to a rule that deletes a theme vowel before another vowel:

- (44) *Theme Vowel Deletion*

$$\begin{array}{ccc} V_1 & \longrightarrow \emptyset / _ & V_2 \\ | & & | \\ [-\text{high}] & & [-\text{high}] \end{array} \quad (V_1 \text{ is a theme vowel})$$

Note that (44) only applies to non-high vowels, since there are cases of high theme vowels before a vowel (cf. ImpInd *temías*), and of theme vowels before a high vowel (cf. PrInd *cantáis*).

(44) also accounts for the fact that the stress is on the stem. Our stress rules predict that the stressed vowel is the theme vowel. After it is deleted, stress is shifted to the left, given that feet are right-headed:

- (45) *1sg Present Indicative*

UR cantao
 Stress (cantá)o
 Deletion (44) (cán)to

In the 3rd conjugation, (42) lowers the theme vowel to *e*, and then (44) deletes it. This shows that Lowering applies before Deletion:⁵

- (46) *1Sg Present Indicative, 3rd Conjugation*

UR partio
 Stress (pár)tio
 Lowering (42) (pár)teo
 Deletion (44) (pár)to

⁵In this case, stress is not on the theme vowel, since, being high, it is syllabified with the following vowel and thus does not project onto line 0. As a consequence, the bracket projected by T does not group any line 0 marks and stress falls on the stem.

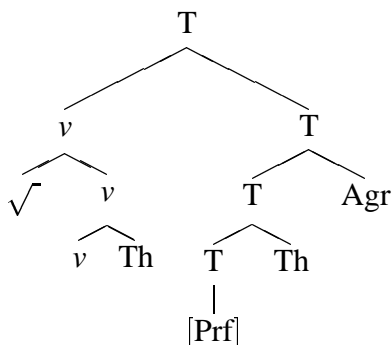
Appendix 2: The Perfective Past

(47) *The Perfective Past*

	<i>1st Conjugation</i>	<i>2nd Conjugation</i>	<i>3rd Conjugation</i>
<i>1Sg</i>	cant é Ø	tem í Ø	part í Ø
<i>2Sg</i>	cant á ste	tem í ste	part í ste
<i>3Sg</i>	cant Ø ó	tem i ó	part i ó
<i>1Pl</i>	cant á mos	tem í mos	part í mos
<i>2Pl</i>	cant á steis	tem í steis	part í steis
<i>3Pl</i>	cant á ron	tem ié ron	part ié ron

Given the assumptions in §3, we expect this structure for the perfective:

(48) *The Perfective Past*



However, the realization of this tense (47) suggests that the structure is simpler. Specifically, it seems that both T and its theme are not realized overtly. I propose that this is related to the fact that the realization of Agr in this tense is quite different from other tenses:

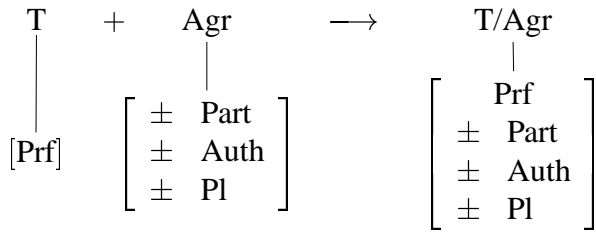
(49) *Agreement in perfective and non-perfective forms*

	Non-Perfective	Perfective
<i>1Sg</i>	-o/Ø	-Ø
<i>2Sg</i>	-s	-ste
<i>3Sg</i>	-Ø	-ó
<i>1Pl</i>	-mos	-mos
<i>2Pl</i>	-is	-steis
<i>3Pl</i>	-n	-ron

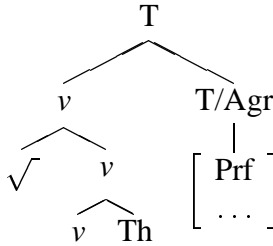
These two facts can be related if we assume that T and Agr fuse in the perfective:⁶

⁶*Auth(or)* and *Part(icipant)* are person features (cf. Halle 1997).

(50) *Fusion in the Perfective Past*



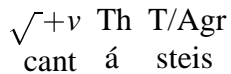
(51) *The Perfective Past*



Given that T and Agr fuse, we explain why there is only one slot for both morphemes and why Agr looks so different from other contexts.

The realization of each node in the 1st conjugations is now straightforward:

(52) *The Perfective Past* (cantásteis)

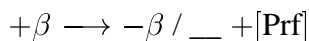


In the 1st conjugation, the theme vowel is *a*. There are two exceptions: 1Sg *cant-é-Ø* and 3Sg *cant-Ø-ó*. The latter is the result of rule (44), which also deletes the theme vowel in the 1Sg present forms. Note that the fact that this rule applies in such heterogeneous morphological contexts (1Sg PrInd and 3Sg Prf) provides evidence for the phonological status of this deletion rule. The only thing that sets these two forms apart from the rest is their phonology.

In the 1Sg, the theme vowel is *e*, rather than the expected *a*. This is similar to the Future (see §4.2). I will assume that the same phonological rule that changes theme vowel *a* to *e* is responsible for the same change in the 1Sg perfective.

In the 2nd and 3rd conjugations, the theme vowel is *i*. However, the expected one in the 2nd is *e*. The following impoverishment rule is a formalization of this conjugation class change:

(53) *Impoverishment in the Perfective*



Given (53) and the redundancy rules in §3, the theme vowel is realized as *i* in the second conjugation:

$$(54) \quad \begin{array}{l} [v + \beta] + \text{Th} + [\text{T/Agr Prf}] \xrightarrow{(53)} \\ [v - \beta] + \text{Th} + [\text{T/Agr Prf}] \xrightarrow{VI(17c)} \\ [v - \beta] + [\text{Th } i] + [\text{T/Agr Prf}] \end{array}$$

In both 2nd and 3rd conjugations, the theme vowel in the 3Pl forms is *ie*, rather than the expected *i*. In order to account for these forms, one more vocabulary entry for the theme position is needed:

(55) *Vocabulary Entries for Theme* (3rd version)

- a. /ie/ \longleftrightarrow Th / [- β] $_$ $\left[\begin{array}{c} \text{Prf} \\ \text{3Pl} \end{array} \right]$
- b. /i./ \longleftrightarrow Th / [+ α] $_$ [Pst]
- c. /e/ \longleftrightarrow Th / [+ β] $_$
- d. /i/ \longleftrightarrow Th / [- β] $_$
- e. /a/ \longleftrightarrow Th

Stress is also accounted for in this analysis:

(56) *Stress in the Perfective Past*

Line 2 x
 Line 1 x x)
 Line 0 x) x) x
 String c a n t a s t e
 Syntax $\sqrt{+v}$ Th T/Agr

However, the 1Sg and 3Sg forms are more interesting. In the 1Sg forms, stress is final. Line 0 stress rules result in the following:

(57) *Stress in the Perfective Past, 1Sg*

Line 0 x) x)
 String c a n t e
 Syntax $\sqrt{+v}$ Th T/Agr

In this context, we expect Clash Deletion (40) to apply. The result would be penultimate stress, as in the present. Thus, we must mark perfective forms as exceptions to Clash Deletion. The other stress rules result in the correct stress patterns:

(58) *Stress in the Perfective Past, 1Sg*

Line 2 x
 Line 1 x x)
 Line 0 x) x)
 String c a n t e
 Syntax $\sqrt{+v}$ Th T/Agr

In the 3Sg forms, stress is on the vowel realizing T/Agr. This fact can be easily captured by assuming that this vocabulary item is specified to project a line 0 right bracket to its right:

(59) *Stress in the Perfective Past, 3Sg*

Line 2 x
 Line 1 x x)
 Line 0 x)) x)
 String t e m i o
 Syntax $\sqrt{+v}$ Th T/Agr

Irregular Perfective Forms

Certain verbs do not conform to the regular pattern in the perfective:

(60) *The Irregular Perfective Past*

1Sg pús e Ø
 2Sg pus í ste
 3Sg pús Ø o
 1Pl pus í mos
 2Pl pus í steis
 3Pl pus ié ron

The verbs that have these irregular forms are:

- (61) *andár/andúve* ‘walk’, *cabér/cúpe* ‘fit’, *decír/díje* ‘say’, verbs derived from the bound root *-ducír/dúje*, *estár/estúve* ‘be’, *habér/húbe* (auxiliary) ‘have’, *hacér/híce* ‘do’, *podér/púde* ‘can’, *ponér/púse* ‘put’, *querér/quíse* ‘want’, *traér/tráje* ‘bring’, *tenér/túve* ‘have’, *vení/víno* ‘come’, and all verbs derived from these by prefixation.

The first thing to note is that the endings in (60) for the irregular forms are more similar to the regular 2nd/3rd conjugation forms than to the regular 1st conjugation. This is true even for the 1st conjugation verbs *andar* and *estar*.⁷ Thus, I will assume that all these verbs belong to the 3rd conjugation in the perfective. In any case, there are still some differences between regular 3rd conjugation forms and the irregular ones. These are listed in (62).

- (62) a. All irregular forms involve some kind of stem allomorphy.
 b. 1Sg *pús-e* and 3Sg *pús-o* have stress on the stem, while their regular counterparts have final stress (*tem-í*, *tem-i-ó*).
 c. The theme vowel in the 1Sg is *e*, while in the regular forms it is *i*.
 d. The theme vowel in the 3Sg is \emptyset , while in the regular forms it is *i*.

I propose that (62b-c) are the result of the following:

- (63) The verbs in (61) are *not* exceptions to Clash Deletion (40) in the Perfective Past.

In the 1Sg form, stress is placed on the stem due to Clash Deletion. The theme vowel lowers to *e* due to (42) which lowers *i* to *e* in postonic position:

- (64) *1Sg Perfective Past, Irregular Verbs*

i. Line 0 Stress Rules:

Line 0 x) x)
 p u s i

ii. Clash Deletion:

Line 0 x) x
 p u s i

iii. Other Stress Rules:

Line 2 x
 Line 1 x)
 Line 0 x) x
 p u s i

iv. Lowering:

Line 2 x
 Line 1 x)
 Line 0 x) x
 p u s e

⁷Note that in these two cases the stem is also augmented with *-uv-*, which is probably responsible for this change in class.

In the 3Sg form, stress is on the stem also due to Clash Deletion. Furthermore, as in the 1Sg PrInd forms in the 3rd conjugation (*párto*, cf. 46), the theme vowel is deleted due to Lowering (42) and Deletion (44).

(65) *3Sg Perfective Past, Irregular Verbs*

i. Line 0 Stress Rules:

Line 0 x)) x)
p u s i o

ii. Clash Deletion:

Line 0 x)) x
p u s i o

iii. Other Stress Rules:

Line 2 x
Line 1 x)
Line 0 x) x
p u s i o

iv. Lowering:

Line 2 x
Line 1 x)
Line 0 x) x
p u s e o

v. Deletion:

Line 2 x
Line 1 x)
Line 0 x) x
p u s o

It is important to note that the fact that the phonological rules proposed here are independently motivated by other forms. The fact that they allow us to reduce the irregularities in these perfective forms provides strong support for the rules and for the analysis presented here.

Appendix 3: The Subjunctive

(66) a. *The Present Subjunctive*

	<i>1st Conjugation</i>	<i>2nd Conjugation</i>	<i>3rd Conjugation</i>
<i>1Sg</i>	cánt e Ø	tém a Ø	párt a Ø
<i>2Sg</i>	cánt e s	tém a s	párt a s
<i>3Sg</i>	cánt e Ø	tém a Ø	párt a Ø
<i>1Pl</i>	cant é mos	tem á mos	part á mos
<i>2Pl</i>	cant é is	tem á is	part á is
<i>3Pl</i>	cánt e n	tém a n	párt a n

b. *The Past Subjunctive*

	<i>1st Conjugation</i>	<i>2nd Conjugation</i>	<i>3rd Conjugation</i>
<i>1Sg</i>	cant á r a Ø	tem ié r a Ø	part ié r a Ø
<i>2Sg</i>	cant á r a s	tem ié r a s	part ié r a s
<i>3Sg</i>	cant á r a Ø	tem ié r a Ø	part ié r a Ø
<i>1Pl</i>	cant á r a mos	tem ié r a mos	part ié r a mos
<i>2Pl</i>	cant á r a is	tem ié r a is	part ié r a is
<i>3Pl</i>	cant á r a n	tem ié r a n	part ié r a n

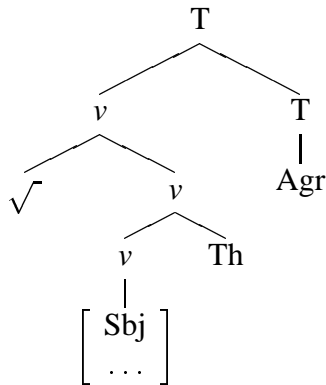
In principle, these forms are featurally more marked than their indicative counterparts. However, this does not seem to be reflected in their realization. Specifically, the PrSbj is not more complex than the PrInd, and the PstSbj is not more complex than the ImpInd.

In order to account for this discrepancy, I will assume that the feature Sbj is not syntactically active. Rather, it is added in the morphological component:

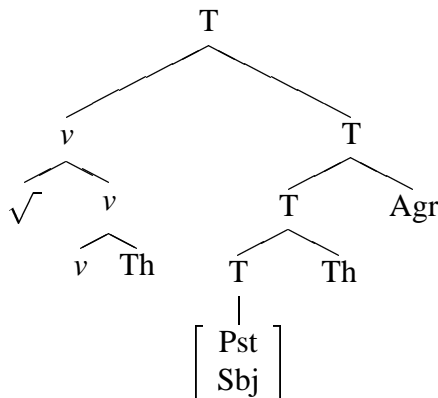
- (67) At MS, insert the feature Sbj into the highest syntactic functional head in the structure in certain syntactic environments.

Furhtermore, I assume that (67) applies after T deletion in the present. The resulting structures are:

(68) a. *The Present Subjunctive*



b. *The Past Subjunctive*



(67) implies that the subjunctive feature itself is not interpreted at LF. Rather, it is the morphological reflex of certain syntactic structures which are associated with certain interpretations. There is in fact independent evidence that this is the case. In Iatridou (to appear) it is shown that in the antecedent of counterfactual conditionals, what is interpreted is the past tense morphology, not the subjunctive. This allows her to explain certain robust cross-linguistic patterns in the morphology of verbs in counterfactual sentences. Her conclusion is similar to mine: the subjunctive is not a morpheme that is interpreted; rather, it is the result of a well-formedness condition.

Another problem posited by the PrSbj is the verbal theme vowel. In the 1st conjugation, it is *e*, rather than the expected *a*. In the 2nd and 3rd conjugations, it is *a*, rather than the expected *e/i*. For the 1st conjugation, I assume that it is due to a rule changing *a* to *e*, similar to the ones responsible for the same change in the future (see §4.2) and in the 1Sg perfective (cf. Appendix 2). As for the 2nd and 3rd conjugations, I propose that it is due to the following impoverishment rule:

(69) *Impoverishment in the Present Subjunctive*

$$+\alpha \longrightarrow \emptyset / [v \text{ ___}, \text{Sbj}]$$

Stress placement in the PrSbj is identical to the PrInd. Given that their structure is the same in the relevant aspects, the stress rules proposed here derive stress placement in both tenses in the same manner.

In the subjunctive past, T is realized as *r*:

$$(70) \quad /r/ \longleftrightarrow \left[\begin{array}{c} \text{Pst} \\ \text{Sbj} \end{array} \right]$$

Furthermore, the tense theme is *a*. This is expected in the present analysis, since, there being no class feature in the local context, the theme position is realized with the unmarked item *a*.

The realization of the verbal theme in the past is straightforward in the 1st conjugation; it is the expected *a*. In the 2nd and 3rd conjugation, it is *ie*. This is also the realization of the verbal theme in the 3Pl perfective form (see Appendix 2). Thus, we need to modify the corresponding vocabulary item accordingly:

(71) *Vocabulary Entries for Theme* (Final version)

$$\text{a. } /ie/ \longleftrightarrow \text{Th} / [+ \alpha] \text{ ___} \left\{ \begin{array}{l} \left[\begin{array}{c} \text{Pst} \\ \text{Sbj} \end{array} \right] \\ \left[\begin{array}{c} \text{Prf} \\ \text{3Pl} \end{array} \right] \end{array} \right.$$

- b. /i./ \longleftrightarrow Th / [+ α] ___ [Pst]
- c. /e/ \longleftrightarrow Th / [+ β] ___
- d. /i/ \longleftrightarrow Th / [+ α] ___
- e. /a/ \longleftrightarrow Th

Finally, stress in the PstSbj is also as expected; the stressed vowel is the one to the left of T:

(72) *Stress in the past subjunctive* (cantáramos)

<i>Line 2</i>	x				
<i>Line 1</i>	x	x)			
<i>Line 0</i>	x)	x)	x	x	
<i>String</i>	c	a	r	a	m
<i>Syntax</i>	$\sqrt{+v}$	Th	T	Th	Agr

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