Ordered Separationism: The Morphophonology of *ir*

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1. Two approaches to the relationship between form and function

Several morphological theories have addressed the problem of how to relate the morphosyntax and the morphophonology of words. As the morphology of languages is rarely regular -syncretism, deponency and other phenomena witnessing for this- the strategy is to invoke some sort of separation between the form and the function of morphological constituents, in such a way that different pieces of information belong to different levels. We will consider two of these proposals, which minimally contrast with respect to whether they assume an ordering between these levels or not.

Beard (1991, 1995) argues for the Separation Hypothesis, by virtue of which semantic, categorial and phonological information are in different levels (1). No ordering is assumed between these levels, so it is predicted that an operation can take place in any of the three levels without consequences for the others. From here, the existence of transposition or conversion follow.

(1)   Semantics: [Agent], [Place]...
       Category: [+/- definite], [+/- transitive]...
       Phonology: *-ion*, *-er*...

In contrast with this situation, other separationist theories assume that the different levels are ordered and, therefore, predict that an operation in a previous level will affect the subsequent level(s). This second view is illustrated by models that assume some version of Late Insertion, like Embick's (2000) Feature Disjointness, Starke's Superset Principle (unpublished work; cf. Caha, 2007) or by Ramchand's Exhaustive Lexicalisation Principle (Ramchand, 2007). These models predict that an operation on the morphology[2] of a language constraints the range of possible operations on the phonology.

In this article we are going to argue for the second approach to separationism, that we will call Ordered Separationism (OS). We will show, first, that the Spanish verb *ir* contains morphosyntactically a theme vowel *–a* which does not emerge normally because of independently motivated phonological principles. Secondly, we will show that in a different morphosyntactic environment, the same verb is forced to violate the same phonological principles. This argues in favor of an ordering between morphology and phonology by which a morphological context overrides a phonological operation.

2. Too irregular for an irregular verb

The Spanish verb *ir*, 'to go', is an irregular verb whose peculiarities go a little bit further than one would expect. The first problem that this verb poses to a morphologist is to determine its segmentation. In Spanish, verbs usually consist of a root, a theme vowel and some inflectional affixes (2).

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[2] The differences between what the three mentioned approaches consider "morphology" are sharp. In this paragraph, we use morphology as a cover term to refer to the set of operations that determine the meaning, shape and function of some linguistic objects commonly referred to as "words".

(2) a. root   – theme vowel – inflectional morphemes
    b. cant   – a   – r
       sing   –1ˢᵀ CONJ.   – INFINITIVE
    'to sing'

In principle, there are three options to analyze *ir*. The first one is to propose that the /i/ is the root of the verb and there is no theme vowel (3a); the second one is to analyze /i/ as the theme vowel (3b), and the third one is to propose that there are two /i/, one for the root and another for the theme vowel, that are reduced phonologically to only one element (3c).

(3) Root   Theme vowel   Inflection
    a.   i $\varnothing$ r
    b. $\varnothing$ i   r
    c.   i   i   r

We propose that the right segmentation is (3a), because, otherwise, the verb ir would stand alone on the grammar of Spanish as the only case of an unattested irregularity, namely to take a set of affixes which do not correspond to its paradigm.

2.1. What the imperfective morpheme wants to tell us

Spanish has three conjugations and only two allomorphs of the imperfective past morpheme. The first conjugation, characterised by the theme vowel –a, always takes the allomorph –*ba*. Consider the imperfective past tense of *cantar*, 'to sing' (4)

(4) Imperfective tense from the first conjugation

Root	Theme vowel	Imperfective Tense	Agreement
cant	a	**ba**	s
cant	a	**ba**	mos
cant	a	**ba**	is
cant	a	**ba**	n
cant	a	**ba**	$\varnothing$

In contrast, verbs from the second and third conjugation (characterized by the theme vowels –*e* and –*i*) both use a different allomorph, -*a*. Consider the verb *partir*, 'to leave', from the third conjugation, and the verb *comer*, "to eat", from the second. Notice that in both cases the theme vowel is –*i*.

(5) Imperfective tense forms from the second and third conjugation.[3]

Root	Theme vowel	Imperfective Tense	Agreement
com / part	i	**a**	s
com / part	i	**a**	mos
com / part	i	**a**	is
com / part	i	**a**	n
com / part	i	**a**	$\varnothing$

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[3] A few words are in order to justify the morphological segmentation proposed here and in table four. Evidence to analyse –*ía* as two separate morphemes comes from the fact that the affix -*i* identifies the verbal stem in other forms of the paradigm, such as the imperfective subjunctive *com-i-e-ra* / *part-i-e-ra* or the participle *com-i-do* / *part-i-do*, and in these forms the morpheme does not co-occur with -*a*. If we want to avoid postulating unnecessary homophony in the paradigm, the presence in these forms of –*i* independently of –*a* leads to the conclusion that the speaker does not analyse –*ía* as a unit, but as a sequence of the theme vowel plus a tense / aspect morpheme. The same reasoning applies to the first conjugation in favour of analysing –*aba* as two affixes.

Now, the problem is that if we consider the verb *ir* as a member of the third or the second conjugation, it will be the only case of a verb of this class which takes the tense allomorph -ba, characteristic of the first conjugation, in the imperfective.

(6) i-ba-s
     i-ba-mos
     i-ba-is
     i-ba-n
     i-ba-∅

This fact has been noticed by traditional grammarians of Spanish. In the *Esbozo* (2.12.8, p. 306), written in 1973 by Samuel Gili Gaya and Salvador Fernández Ramírez, it is noted that the imperfect *iba* is unique in Spanish due to the combination of affixes. In historical grammars, this anomaly is occasionally remarked; Menéndez Pidal (1968: § 117, d.) notes that the imperfect form of this verb is unexpected, because it exhibits inappropriate tense morphemes. As far as we know, in the history of Spanish, there has never been another imperfective form of the imperfective past tense of this verb.

The combination of affixes has puzzled traditional grammarians because the verb *ir* is assumed to belong to the third conjugation, but it shows the imperfective morpheme which corresponds to the first conjugation.

One possible answer would be to claim that this is only another of the verb's irregularities. This answer would be wrong, in our opinion, because that type of irregularity is unattested. A verb may be irregular because the root changes formally in certain forms. For example, the verb *contar*, 'to count', shows two forms, *cuent-* and *cont-*, depending partially on the position of the stress. With the exception of *contar* and other verbs with the same irregularity, no unstressed /o/ becomes /ue/ in contemporary Spanish.

(7) **cuént-o**
     cuént-as
     cuént-a
     cont-ámos
     cont-áis
     cuént-an

A verb may also be irregular because the stem loses its theme vowel in some forms. For example, the future of verbs such as *poner*, "to put", or *poder*, "can" (8a and 8b) and the imperative of *venir*, "to come", or *salir*, "to go out" (8c and 8d) show this type of irregularity.

(8) a. poner → pond-ré, *not* *pon-e-ré
     b. poder → pod-ré, *not* *pod-e-ré
     c. venir → ven-∅, *not* *ven-e
     d. salir → sal-∅, *not* *sal-e

A verb may be irregular also because it belongs to one conjugation in a form and to another one in the other. For example, the verb *andar*, to walk, belongs to the first conjugation in its present forms, but to the third one in the perfect forms *anduv-*, which take the theme vowel /i/ characteristic of these elements.

Finally, a verb may be irregular because the root or stem uses suppletive forms all along the paradigm. This is the case with the verb *ser*, 'to be', that has three different forms, *s-*, *er-* and *fu-*.

In our analysis, the verb *ir* is irregular in some of these senses. However, no irregular verb is irregular because it exhibits combinations of morphemes which are elsewhere unattested in the paradigms. That is, no isolated irregular verb picks a morpheme for second person to spell out a first person,

and no isolated irregular verb selects a future morpheme from its paradigm when it spells out the past form, and so on. Then, claiming that in the verb *ir*, the allomorph *-ba* is picked instead of *-a* because the verb is irregular would be stipulative and *ad hoc*.

Our proposal is that the verb *ir* is no exception to the class of morphemes selected by each conjugation. It belongs to the first conjugation, that which is identified by the theme vowel *-a*, and it takes, regularly, the past tense morpheme *-ba*. The question, them, is how to prevent the phonological materialization of the theme vowel *–a* in Spanish only in this context.

3. How to stop a theme vowel

The vowel /a/ is phonologically very stable in Spanish. The rare cases of loss or change of /a/ which can be found in the historical morphology of Spanish can be related with an independent morphological process or with some case of non systematic phonological change –popular etymology mainly, but not exclusively, as in *rana-cuajo > renacuajo*, 'tadpole'–. We will propose that, also in the case of *ir*, the reason for the non insertion of /a/ is more morphological than phonological, even though there are phonological reasons to explain it.

We claim that the theme vowel is not inserted in order to avoid that the root changes. The requisite that precludes the theme vowel from being inserted is morphological, not phonological, and is an instance of the cross-linguistically robust generalization that the preservation of the shape of roots outranks the preservation of the shape of affixes. This principle, named ROOT-FAITHFULNESS, has been widely discussed in the phonological literature and has been shown to play a significant role in consonant inventories, accent placing or reduplication (McCarthy & Prince, 1995, Urbanczyk, 1996, Alderete, 2001). The proposal is that ROOT-FAITHFULNESS is ranked higher than AFFIX-FAITHFULNESS, in such a way that when the phonological requisites of the affix clash with those of the root, it is the affix, and not the root, that undergoes a process of repair. The prevalence of roots is grounded on their privileged role on lexical retrieval and recognition, as well as other psycholinguistic processes (Beckman, 1997).

(9)   ROOT-FAITHFULNESS >> AFFIX-FAITHFULNESS

Let us see how this ranking explains the shape of the verb *ir*. The radical /i/ is obviously phonologically weak, with the consequence that its shape may be altered by phonological rules, therefore making it less transparent.

It is a fact of the Spanish phonology that when a [+high] vowel is in the same syllable as another vowel, it becomes a glide and forms a diphthong with it. We assume that in this phonological context, the rule which forms diphthongs is unescapable – unless the two adjacent vowels are lexically specified as belonging to different syllables. At the same time, in Spanish phonology it is clear that a glide in onset position becomes a consonant. The derivations in (10) illustrate this process.

(10)   /iéɾo/ → [yéɾo], *hierro*, 'steel'
     /iélo/ → [yélo], *hielo*, 'ice'
     /uéɾto/ → [gwéɾto], *huerto*, 'orchard'

The insertion of the theme vowel *-a* after the radical /i/ would create the same phonological context as in (10), that is, a high vowel followed by a vowel in word-initial position. This contexts leads fatally to the transformation of the root /i/ into /y/, as in (11).

(11)   /iába/ → [yáβa]

In Optimality Theory, the way in which this case can be analyzed is very interesting. There would be three constraints at play. First of all, a constraint of ROOT-FAITHFULNESS which favors maximal preservation of the phonological shape of the root. This constraint would be ranked very high in the hierarchy. Secondly, one markedness constraint is able to give account of the transformation of the high

vowel into a consonant: ONSET. Finally, there would be a third constraint that favors the preservation of the theme vowel; this last constraint belongs to the family of AFFIX-FAITHFULNESS constraints; we state it as DEPENDENCY (THEME VOWEL). This constraint is dominated both by the root faithfulness family of constraints and by the markedness constraint ONSET. (12) illustrates how the ranking ROOT-FAITHFULNESS >> ONSET >> DEP (THEME VOWEL) accounts for the attested form *iba* as opposed to **yaba* (and other possible candidates).

(12)

	ROOT-FAITHFULNESS	ONSET	DEP(THV)
ya.ba	*!		
ja.ba	*!	*	
i.a.ba		**!	
☞i.ba		*	*

In this account, the Theme Vowel is inserted and then the Phonology chooses not to spell it out; in other words, the morphological position for the insertion of the Theme Vowel is present in the morphology (and arguably also in the syntax, Fábregas & Pazó (2006), but no phonological information would emerge there. This situation is compatible, we believe, with a strictly interpretive view of phonology, where it is a non generative level, that interprets the information that comes from other levels, in this case, morphology. The decision that phonology takes in this case is strongly conditioned by morphological units, because at this point phonology must be sensitive to the different morphological constituents, such as theme vowel, root and so forth.

The question now is under which circumstances the phonology can allow the non insertion of phonological material in a morphosyntactic terminal. Learnability issues suggest that this situation cannot be always allowed, and indeed we know that ellipsis is strongly conditioned by the recoverability of the non spelled out material. In general, what we have learnt from ellipsis studies is that a phonologically non licensed morphosyntactic terminal has to be identified by an adjacent constituent which has phonological material. What counts as adjacency may differ from one level of the grammar to the other (Embick & Noyer, 2001), but it is reasonable to suppose that in the phonological level the relevant notion is linear adjacency.

The other question that becomes relevant is what exactly counts as identification. This is a matter on its own which has to be answered on empirical grounds for the general case. However, it is relatively clear what means identifying in the case of a theme vowel: affixes belonging to the verbal paradigm can license the ellipsis of the theme vowel, because they play the same role of category identification that otherwise the theme vowel does in Spanish.

Taking into account these two components, we can state the principle that licenses Theme Vowel ellipsis in the following way:

(13)   Erase from the phonological representation a Theme Vowel if it is linearly adjacent to a phonologically explicit affix that identifies the grammatical category of the word.

Notice that this principle states under which circumstances it is possible to erase a theme vowel when there is a clash between the morphology and the phonology of the word. When there is no clash between these two components (e.g., in *evalu-a-ba*, evaluate.IMPF), there is no need to erase a theme vowel. Due to economy conditions, if there is no need to erase a constituent from the representation, the constituent cannot be erased, because a representation that applies a rule of erasure is less economic than one which doesn't (cf. also Nunes, 2004 about deletion of features in non trivial chains).

In the second section, we will see how this principle forces the phonology to violate Root-Faithfulness in the context of the gerund.[4]

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[4] As one of the reviewers notices, one relevant question here is why the form *v-* (*v-oy, v-amos…*) is not used in the context of the imperfective form to construct the phonologically and morphologically unproblematic form *v-a-ba*. The distribution of the three suppletive roots of the verb *ir* (*i-*, *v-* and *fu-*) widely exceeds the limits of this article,

3.1. Morphosyntax outranks morphophonology: the gerund

The form *yendo* is an unexpected form in our previous analysis. In this form the root /i/ is clearly changed into an /y/, which is precisely the result that Root-Faithfulness avoided. We will show that the gerund has a more complex morphosyntactic structure and, due to the principle in (13), the phonology is forced to violate Root-Faithfulness.

Oltra (1999) proposes that in a language such as Catalan and Spanish theme vowels are associated to any functional head. Thus, according to this author, in a conditional form, where structurally there are three functional heads, little v, Mood and Tense, there are three theme vowels, in bold in (14).

(14) $[[[\text{cant-}\mathbf{a}]_v\text{-r-}\mathbf{í}]_{\text{Mood}}\text{-}\varnothing\text{-}\mathbf{a}]_{\text{Tense}}$
        'would.sing.3SG'

However, Fábregas & Pazó (2006) show that the status of what has traditionally been considered the theme vowel in verbs is different from the additional morphemes that are placed under the rest of functional projections in the verbal domain. The morphological tradition has singled out the verbal theme vowel from the other increments that the affixes may take in the paradigm for good reasons, as their syntactic and phonological behavior differ greatly from the one of what Oltra calls theme vowels of higher functional heads. In other words, I agree with Oltra that functional heads such as Mood or Tense can have an additional morpheme, but the theme vowel that marks verbs as belonging to a specific conjugation class is a morpheme on its own, which is in the syntactic structure. To avoid confusion, I will call the additional affixes added to higher functional heads "increments" while I will reserve the term theme vowel to what has traditionally been called so.

With this caveat in mind, accepting the rest of Oltra's analysis, note that if there is an additional functional projection in the gerund, we expect that there is an additional theme vowel. There is independent evidence that the gerund contains an additional functional head – arguably of prepositional nature –, and we will revise it in the following paragraphs.

3.1.1. Gerunds are more complex

Among the pieces of evidence for an additional head in the gerund, notice that gerunds may have an illocutive interpretation in discourse initial position, that is, even when they cannot be interpreted as part of a bigger sequence (15).

(15)   ¡Anda-ndo!
        walk-GERUND
        'Let's go'

If we take syntax-semantics isomorphism seriously, there must be a head that conveys the propositional reading of the gerund, something impossible with other members of the paradigm. Consider for example the infinitive; in Spanish, it can only take an illocutive reading equivalent to (15) in combination with a preposition.

(16)   *(A) calla-r
        at shut.up-INFINITIVE
   "Shut up"

---

as they raise many questions, among other things, with respect to the relationship between verbs belonging to different paradigms (the root *fu-* is shared by the verb *ir* and the verb *ser*, "to be"). However, the distribution of *v-* is relatively clear, as it can only be used in the present (both in indicative and subjunctive): *voy* / *vaya*. I propose that this suppletive root is tagged as [present finite] in the lexicon, so it can only be inserted in finite contexts specified for present tense.

Secondly, gerunds have an adpositional function. Some gerunds are interpreted as locative expressions, equivalent to *allí*, 'there' (17), and also to PP's introduced by *en*. Note that the copulative verb in (17) is always the same, *estar*, which is generally used also with gerund durative periphrasis. Other tests, like equative sentences, show that gerunds can express locations.

(17) a. La Real Academia está tomando la segunda calle a la izquierda.
　　　 the Real Academia is taking the second street to the left.
　　　 'The Real Academia is located in a place to which one arrives turning left on the second street'

　　　b. Tomando la segunda calle a la derecha es donde está la Real Academia.
　　　 taking the second street to the right is where is the Real Academia.
　　　 'In a place to which one arrives turning right on the second street is where the Real Academia is'

Other gerunds have a temporal meaning, but most of them have a modal meaning equivalent to several PP's. Our proposal is that in the internal structure of the gerund there is a prepositional complementiser (Kayne 1994), that, being a functional head, defines a vocalic increment -*e*. (18) represents this structure.

(18)

```
                    P
              _____|_____
             Pº           vP
                      _____|_____
                     vº          √
```
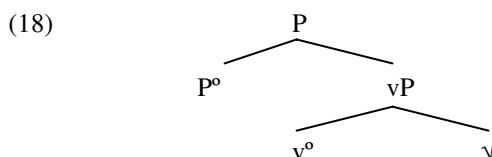
3.1.2. Consequences

Each of the functional heads introduces a position to insert a vowel. In the case of the gerund of the verb *ir*, the gerund would contain two vowels, /a/ for little v, and /e/ for the Pº. The phonological materialisation of the verb *ir* would be the one in (19).

(19)	i	a	∅-e	ndo
	ROOT. go	THEME VOWEL	PREPOSITIONAL COMPLEMENTISER	GERUND

Notice in the configuration that -*a* is the theme vowel of the verb, a morpheme on its own right, while the form –*e* is an increment of a non-spelled out prepositional complementizer, added to the morphological representation in the way proposed by Oltra (1999).

To preserve ROOT-FAITHFULNESS, avoiding the sequence in which *i*- is followed by a non high vowel, it would be necessary to erase both the verb's theme vowel and the increment of the prepositional complementizer. The resulting form would be *indo*.

(20)　i　　　　　∅　　　　　∅-∅　　　　　ndo

But erasing both vowels at the same time goes against the principle that determines the licensing of elliptic constituents. In the configuration in (20), the ellipsis of the theme vowel –*a* is not licensed by any phonologically spelled out adjacent affix. This principle makes the form *indo* ungrammatical, in the sense that it is not a possible input for the phonology to evaluate.

Thus, the only option is to allow one of the two theme vowels to surface. At this point, a principle of faithfulness between different members of the paradigm (McCarthy, 2005) makes it a better option to

erase, as in the rest of the forms, the theme vowel –*a* than the prepositional complementizer increment –*e*, resulting in the attested form *yendo*, whose structure is shown in (21).[5]

(21) i   Ø   Ø-e   ndo

4. A short comparative note between Portuguese and Spanish

The historical origin of the puzzling properties of the verb *ir* come from the way in which Spanish analised the Latin imperfect past from *ire*, which was already *ibam, ibas, ibat, ibamus, ibatis* and *ibant*, following the general pattern in Latin, where first, second, third and fourth conjugations took systematically –*ba* for the imperfect tense: *amabam* from *amare*, *tenebam*, from *tenere*, *faciebam*, from *facere*, and *venibam*, from *venire*.

Two neighboring Romance languages have reanalyzed this irregularity in different ways, trying to assimilate it into the general pattern of the language. From one side, Spanish, as we have seen, analyses the segment /i/ as the root, turning the verb into a first conjugation member, as we have argued.

The second possibility to solve the irregularity is to reanalyze the verb as a verb from the third conjugation, interpreting the /i/ as theme vowel, and provide it with an imperfective morpheme which is standard in this conjugation. This is the solution taken by Portuguese:

(22) ía
      ías
      ía
      íamos
      íeis
      íam

This is the regular form of the imperfective past tense for the third conjugation in Portuguese. Let us consider the verb *partir*, 'to leave'.

(23) partia
      partias
      partia
      partiamos
      partieis
      partiam

From here it follows that there is no reason to propose that the verb *ir* in Portuguese does not belong to the third conjugation. In fact, the /i/ seems to be the theme vowel in this language.

(24)

Root	Theme vowel	Past tense	Agreement
Ø	i	**a**	s
Ø	i	**a**	mos
Ø	i	**e**	is
Ø	i	**a**	m
Ø	i	**a**	Ø

---

[5] Our proposal makes it possible to explain other independent properties of the verb *ir*. The second person plural imperative of any verb in Spanish loses the affix –*d* when an enclitic pronoun attaches to it: *calla-d* (shut up-2PL.IMP) vs. *calla-Ø-os* (shut up.IMP-you). This rule only knows one exception, the imperative of the verb *ir*, *i-d*, where the affix –*d* can never disappear without leaving any trace: **i-Ø-os* (go.IMP-you). Under our analysis, the explanation of this phenomenon is that the presence of –*d* is compulsory because it is licensing the ellipsis of the theme vowel –*a* in a configuration [[[i-] -Ø]TV –d]. If –*d* disappears, the configuration is ungrammatical.

5. Conclusions: a theory of morphophonology

In this article we have argued that Morphology determines the set of forms that Phonology can take into account. Phonology chooses from a pre-determined set, which is constrained by forms which are morphologically and syntactically grammatical. In other words, the morphological shape of a word, determined by its morphosyntactic features, conditions in relevant senses the phonological materialization of the same word.

Going back to the question which motivated this discussion, the case of the verb *ir*, its lack of theme vowel in some forms and the fact that in a morphologically more complex form like the gerund it is forced to violate Root-Faithfulness, provides evidence that, even though different information may appear in different levels, there is strict ordering relationship between these levels. A separationist theory should be able to giving account of cases where the syntax of a word forces the violation of a morphological principle, or the morphology forces that of a phonological principle. We believe that Late Insertion hypotheses are this type of theory.

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