



THEME VOWELS AND A ROOT-BASED APPROACH TO MORPHOLOGY: EVIDENCE FROM BRAZILIAN PORTUGUESE

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ABSTRACT

This research makes use of data from thematic vowels interacting with diminutives and metaphony in Brazilian Portuguese to argue for a grammatical configuration in which morphemes can merge directly at the root. This article, therefore, offers evidence in favor of an approach to morphological theory based on the root as the primitive unit, as proposed by Distributed Morphology. In short, this paper argues that, by starting from the root, we have simple answers to complex phonological problems. Therefore, this work diverges from theories that argue that the stem is the primitive, and which assume that minimal category-neutral units are unmotivated and unnecessary.

Keywords: root; word; diminutives; metaphony; Brazilian Portuguese.

RESUMO

Este trabalho faz uso de dados de vogais temáticas em interação com diminutivos e metafonía no português brasileiro para argumentar por uma configuração gramatical em que os morfemas possam se ligar diretamente à raiz. Este artigo, portanto, oferece evidências a favor de uma abordagem da teoria morfológica baseada na raiz como a unidade primitiva, como proposto pela Morfologia Distribuída. Em suma, este texto argumenta que, partindo das raízes, temos respostas simples para problemas fonológicos complexos. Este trabalho diverge, portanto, de teorias que defendem que o radical é o primitivo e que assumem que unidades mínimas de categorias neutras são desmotivadas e desnecessárias.

Palavras-chave: raiz; palavra; diminutivos; metafonía; português brasileiro.

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1 INTRODUCTION

Bermúdez-Otero (2013, p. 05) states that Morphological Theory has two ways to deal with primitives in grammatical derivations, if one assumes the levels of constituency root, stem, and word from Lexical Phonology and Morphology and related approaches:

- ROOT-DRIVEN approach will take the root as the starting point of grammatical derivations, resorting to diacritics such as inflectional class features where necessary to deal with idiosyncrasies in root-to-stem derivation. This is the line taken by most proponents of DM, who assume that lexical storage is restricted to exponents of $\sqrt{\text{nodes}}$ and of single functional heads (e.g. Halle and Marantz 1993, Embick 2010).
- STEM-DRIVEN approach, in contrast, will assume that the permanent lexicon contains entries for stems and stem-deriving suffixes, complete, in the case of Spanish, with theme vowels. Generalizations over these lexical entries, if cognitively real, will be expressed by means of lexical redundancy rules in the sense of Jackendoff (1975).

On the basis of the behavior of theme vowels in Spanish, Bermúdez-Otero (2013) argues for a stem-driven approach. The present paper, on the basis of Portuguese theme vowels and their interaction with diminutives, vowel metaphony, and clitic placement argues instead for a root-driven approach.

2 THE [-E] CLASS THEME VOWELS AND PLURALS OF DIMINUTIVES IN PORTUGUESE

This section examines the behavior of theme [-e] in diminutive plural forms. We will see that the phenomenon supports a root-driven approach to morphology in spite of the existing idiosyncrasy of theme vowel placement.

In Portuguese, like in Spanish, nominal and adjectival stems typically belong to one of three inflectional classes, distinguished by their respective theme vowels: [-o], [-a], or [-e] (see Camara Jr. (1956)). There is massive lexical idiosyncrasy and the theme vowel that a particular stem will select cannot be predicted from the phonological shape of its root or from its syntactic features. Moreover, there are many words that lack a theme vowel (e.g. *café* 'coffee'). Therefore, since the occurrence of theme vowels is unpredictable, it is perhaps natural to propose that theme vowels and roots are stored together at the stem. Table 1 shows examples of theme vowels in Portuguese.

TABLE 1 — PORTUGUESE THEME VOWELS

[-o]	
masc	lobo 'wolf', figo 'fig', peito 'chest', rato 'rat', livro 'book', libido 'libido', tribo 'tribe'
fem	
[-a]	
masc	cometa 'comet', fantasma 'ghost', drama 'play', mapa 'map'
fem	girafa 'giraffe', dama 'lady', fada 'fairy', ilha 'island', lâmpada 'lamp'
[-e]	
masc	abacate 'avocado', clube 'club', padre 'priest' tigre 'tiger', verde 'green'
fem	arte 'art', ave 'bird', chave 'key', cidade 'city', sorte 'luck', pele 'skin'
∅	
masc	chá 'tea', café 'coffee', jovem 'young', rei 'king', pá 'shovel', boi 'bull'
fem	bagagem 'baggage', coragem 'courage', lei 'law'

Source: elaborated by the author.

Of particular interest here is the [-e] class. Bermúdez-Otero, following Camara Jr. (1970), notes that the [-e] class is divided in two subclasses: the [-e]-only and the ordinary [-e]-class. The same is true for Portuguese. In both Spanish and Portuguese, there are words that end in [-e] in the singular and plural forms (*pele, peles* 'skin, skins'), the so-called e-only class. There are, however, other words in which [-e] appears in the plural forms exclusively, the so-called ordinary [-e] class, such as *flor* 'flower' (cf. *flor-flores* 'flower, flowers').

TABLE 2 — [-E] CLASS

Ordinary [-e] class ([-e] ~ ∅ in singular forms)	[-e] only class
algoz – algozes 'executioner'	ave – aves 'bird'
feliz – felizes 'happy'	crase – crases 'crisis'
ar – ares 'air'	clube – clubes 'club'
dever-deveres 'duty'	craque – craques 'expert'
flor – flores 'flower'	detalhe – detalhes 'detail'
mártir – mártires 'martyr'	deboche – deboches 'jeer'
capaz – capazes 'able'	pirâmide – pirâmides 'pyramid'
raiz – raízes 'root'	time – times 'team'
crúz – cruzeiros 'cross'	sorvete – sorvetes 'ice cream'
	folclore – folclores 'folklore'
	alarme – alarmes 'alarm'
	alegre – alegres 'happy'
	baile – bailes 'ball'
	bosque – bosques 'grove'
	carne – carnes 'meat'
	charme – charmes 'charm'
	cliente – clientes 'client'
	filme – filmes 'film'
	árvore – árvores 'tree'

Source: elaborated by the author.

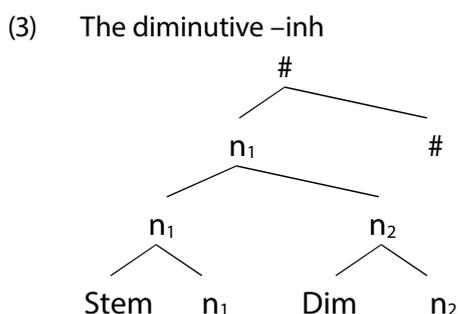
Camara Jr. (1970) proposes that [-e] is a theme vowel that has a zero allomorph in the singular form. Bermúdez-Otero shares Mattoso Camara's view. Bermúdez-Otero's argument is based on the fact noted by Bonet (2006) that an epenthetic vowel [e] is not always final, whereas the theme [-e] is always stem-final. Bonet compares the Spanish word *padre*, with a stem-final theme [-e], *Al Sader*, adapted from the pronunciation of the Arabic proper name Al Sadr where the placement of epenthetic [e] is governed by the phonology, which inserts the vowel inside the root. According to this argument, Spanish crucially never uses word-final [e] epenthesis to repair ill-formed syllables. In this analysis, theme vowels and their allomorphs are unpredictable, and this, in turn, is taken as evidence by Bermúdez-Otero that they can be stored together at the stem.

Bachrach and Wagner (2007) first analyzed Portuguese diminutive morphemes from the point of view of syntactic structure. They claim that they are morphological adjuncts, and the two different forms of the diminutive in Portuguese (-*inho* and -*zinho*) reflect a difference in the syntactic scope of the adjunction. They behave as adjuncts rather than heads, since diminutives differ from other derivational affixes in Portuguese in their phonology. They display cases of counter-bleeding opacity (cf. Menuzzi (1993); Lee (1999); Ferreira (2005); Bachrach and Wagner (2007); Bisol (2010); Armelin (2015)), as can be observed in the processes of regressive nasalization (1) and neutralization of [ATR] contrasts (2). Derivational affixes attract the stress, and the unstressed stem vowel fails to undergo nasalization in Portuguese, as in (1a). In diminutives, however, the stem vowel nasalizes despite the fact that stress has shifted away from the root (1b-c). Bachrach and Wagner also note that Portuguese has [ATR] contrast in a stress position, but the [+/- ATR] contrast is lost when stress is shifted away from the root due to suffixation (2a). With diminutives, however, the contrast is maintained (2b-c). Stress in Portuguese is mainly penultimate (BISOL, 2007).

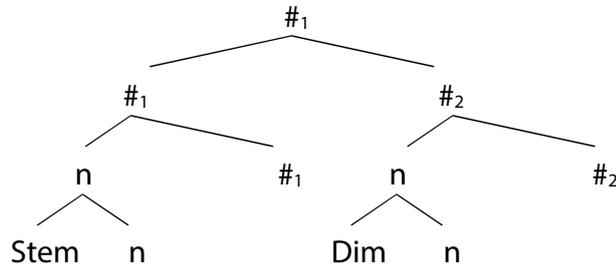
- (1) Regressive nasalization (BACHRACH; WAGNER, 2007)
 - a. fãm-a, fam-os-o 'fame, famous'
 - b. cãm-a, cãm-inh-a 'bed, small bed'
 - c. cãm-a, cãm-a-zinh-a 'bed, small bed'

- (2) Cyclic Stress Effects: [+/- ATR] contrast (BACHRACH; WAGNER, 2007)
 - a. a. bɛl-a, bel-ez-a 'beautiful, 'beauty'
 - b. b. bɛl-inh-a 'little beautiful one'
 - c. c. bɛl-a-zinh-a 'little beautiful one'

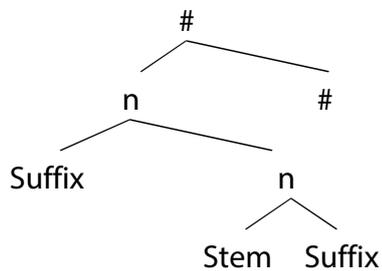
Bachrach and Wagner take the facts above to propose the following syntactic structure for derivational suffixes of Portuguese, where # stands for number:



(4) The diminutive -zinh



(5) Other derivational suffixes of Portuguese



Of crucial importance to us here is the plural of diminutives. But before we discuss the facts, it is important to point out that the regular plural morpheme in Portuguese is -s suffixed to a word:

(6) louco-loucos 'crazy one, crazy ones'

However, sometimes, adding -s to a base triggers phonological changes (see Ferreira (2005); Becker, Clemens and Nevins (2017); and Becker et al. (2018), among other studies, for a broader discussion of glide alternation):

- (7) a. *jornaw* - *jornai-s*
'newspaper- newspapers'
- b. *hotew* - *hotei-s*
'hotel - hotels'
- c. *porco* - *porco-s*
'pig - pigs'
- d. *corpo* - *corpo-s*
'body - bodies'

- (8) a. *coração* - *coraçõe-s*
'heart - hearts'
- b. *capitão* - *capitãe-s*
'captain - captains'

The plural goes inside and outside of *-zinh*, as predicted by the syntactic structure in (9):

- (9) a. *jornawzinho - jornaizinho-s*
'little newspaper- little newspapers'
b. *hotewzinho - hoteizinho-s*
'little hotel - little hotels'
- (10) a. *porkinho - pørkinho-s*
'little pig - little pigs'
- (11) a. *corpinho - cørpinho-s*
'little body - little bodies'

The continued overapplication of these processes supports the structure in (4), whereby *-zinho* is an adjunct, outside the scope of changes directly affecting the stem. Nonetheless, there is an empirical problem for Bachrach and Wagner's proposal with the diminutives in *-zinh* when attached to the ordinary e-class roots ending in *r*. For roots ending in *r*, the analysis leads to predictions that are not borne out, as in (12). The pluralized forms of the ordinary e-class obligatorily have [-e]. But in the diminutive plural the [-e] is optional, and in fact, the forms without [-e] are preferred (cf. Ferreira (2005)).

- (12) a. *flor – flores* *florzinha - florezinhas ~ florzinhas*
'flower(s)' 'little flower(s)'
b. *mar – mares* *marzinho - marzinhos ~ marezinhos*
'sea(s)' 'little sea(s)'

One cannot propose that the adjunction can be inside or outside number, because forms like *hotewzinhos*, with a singular stem, are ungrammatical in Standard Brazilian Portuguese. Although possible in some dialects, this is not Standard Brazilian Portuguese: there is *hoteizinhos*, but *florzinhas ~ florezinhas*. Words from the ordinary e-class ending in *r* are thus the only forms allowed to not carry a plural stem in the diminutive plural (FERREIRA, 2005).

Crucially, however, the same is not true for the e-only class. The plural (13) *arvorezinha* 'little tree' cannot vary with **arvorzinha*.

- (13) a. *árvore - árvores* *arvorezinha - arvorezinhas *~ arvorzinhas*
'tree(s)' 'little tree(s)'

Recall that Bermúdez-Otero (as well as Mattoso Camara) proposes that [-e] is a theme vowel. Bermúdez-Otero (2013, p. 7) states that "stems never enter the derivation without their theme vowels, and so it is perfectly feasible to store full stems in the lexicon". If stems are stored, one cannot distinguish between *florezinhas* and *arvorezinhas*. Both have the theme [-e] in the plural stem when *-zinh* is added, since [-e] is the theme allomorph for the plural in both cases.

- (14) a. $[[\text{árvores}]_{\text{num}}][\text{inhas}]_{\text{num}}]_{\text{num}}$
b. $[[\text{flores}]_{\text{num}}][\text{inha}]_{\text{num}}]_{\text{num}}$

How does one know that [-e] cannot be deleted in (14a), but can in (14b)? The stems are identical in that both carry [-e].

Ferreira (2005) proposes that the [-e] that appears on the plural forms exclusively is an epenthetic vowel, rather than a theme vowel. That is, in "the cases of words ending in *r*, such as *flor* 'flower', [...] the plural forms contain an epenthetic vowel preceding the plural marker -s, which is a strategy to avoid complex codas in BP" (FERREIRA, 2005, p. 117). The analysis of [e] in this context as epenthesis is also in Lee (1993) and Santana (2019).

In this analysis, in the case of *-zinh* derivations, the epenthetic theme vowel is not obligatory, because the word has been resyllabified (*flor+s+zinh+a*), and [-s] is deleted in this context (*florzi-nha*). In *flores*, the epenthesis is obligatory, since a cluster of *r* and *s* is ungrammatical in a word boundary in Portuguese. Note that the sequence *rs* in coda is allowed: *perspectiva* 'perspective'. But the sequence *rs* never occurs in a word boundary in words native to this language.¹

These facts support an analysis that roots must be stored independently of [-e], otherwise one would be not able to separate plural forms like *florezinhas* and *arvorezinhas*.

One could try to save a stem-based approach by claiming that the stem for words like *flor* is *flor+∅*. The [-e] vowel could be part of the plural allomorph, *-s ~ -es*. In this analysis, however, the *-es* alternation should occur at the same time as the *-is* alternation (*papel-papéis*) or any other alternation that affects plurality. The *-is* allomorph (as well as any of the other irregular plural allomorphs), however, never fails in Standard Brazilian Portuguese.

To sum up, the root must be stored for the knowledge that roots ending in *r* of the ordinary e-class accept [-e] deletion (as in 12), but not roots ending in *r* of the e-only class (as in 13). That is, the behavior of diminutives in Portuguese indicates that roots must be stored independently from theme vowels, since one must distinguish roots in the ordinary e-class from the e-only class in order to derive the correct output of different pluralized diminutive forms in this language.

Therefore, in a root-based approach, it can be stated that *arvor-* is an athematic root that subcategorizes for the theme vowel [-e], found in both the singular and plural. The root *flor* is also athematic. In the diminutive singular and plural, *árvore* retains its theme vowel obligatorily. By contrast, *flor* displays epenthesis to avoid *rs* in word-final position, and it can display overapplication of epenthesis in the plural, leading to the possibility of either *florzinhas* or *florezinhas*.^{2,3}

1 Note that *rs* is accepted, however, in the plural forms of loan words: *designers*, *ubers*, *gamers*, which suggests a different grammar for loan words. One anonymous reviewer has suggested considering [e] as part of the root in an analysis in terms of root allomorphy (*mar ~ mare* and *flor ~ flore*, for instance). But the presence of an [e] vowel would face the same problems as a stem-driven approach in this case.

2 In a stem approach, assuming that [-e] is always theme, the two words would rely on the thematic vowel (*árvore+s+zinhas* and *flore+s+zinhas*), generating *florezinhas* e *arvorezinhas*. Assuming the possibility of an epenthesis of [e], we would have *árvore+s+zinhas* and *flor+s+zinhas*, if the first is thematic and the second epenthetic, generating *florzinhas* and *arvorezinhas* (see Ferreira (2005) for this analysis). It would certainly be possible to generate the variation in a weighted optimality theory with the hypothesis that there is a thematic vowel [-e] and an epenthetic vowel [e]. However, Bermúdez-Otero's hypothesis that both are epenthetic and stored as words cannot generate the difference between *florzinhas*~*florezinhas* and only *arvorezinhas*. Therefore, if a root-based analysis is able to straightforwardly account for the facts, it should not be rejected.

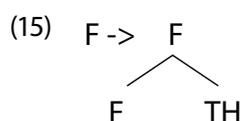
3 A reviewer observed the existence of words such as *arvorinhas* and *florinhas*. They are indeed possible, but



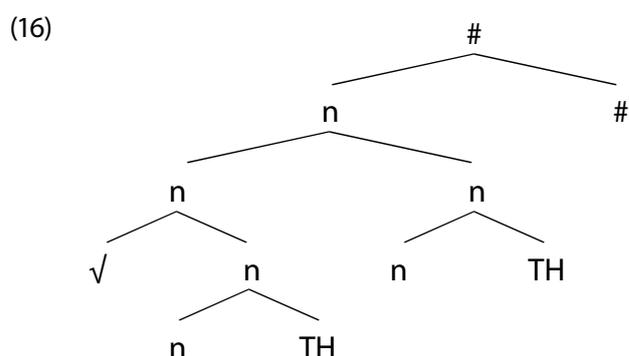
3 INNER STEMS AND VOWEL METAPHONY

There are two possible views of morphology under evaluation: ROOT-BASED (or $\sqrt{\text{NODE-BASED}}$) and STEM-BASED (or LEXEME-BASED). In the former, a derivational affix can attach to a root; in the latter, it always attaches to a stem. A stem contains a theme vowel. There are, however, words that do not have a theme vowel before a derivational morpheme (e.g. *contista* /kont-ist-a/ 'story teller'). Note that the absence of a theme vowel in this position is not across the board. There are words that have a theme vowel before a derivational morpheme; see, for instance, *afinação* /afin-a-sãw/ 'tuning'. Bermúdez-Otero defends a stem-based approach and he must therefore explain the absence of a theme vowel before certain derivational morphemes. In a root-based approach, this is not necessary, since one would say that in the first case the derivational affix attaches to a root, whereas it attaches to a stem in the second case (root vs. stem morphemes). If all affixes attach to a stem, the absence of a theme vowel in the first case must be accounted for and a vowel deletion rule must be proposed.

Oltra-Massuet and Arregi (2005, p. 46) propose that, in Spanish, a TH position is morphologically adjoined to all functional heads in verbs:



Oltra-Massuet and Arregi's proposal for verbs is extended to nouns by Bermúdez-Otero, and thus, a noun has the syntactic structure in (16); that is, a noun has an inner and an outer stem and, therefore, two theme vowels. The inner one, however, can be empty or deleted by rule, and thus, he accounts for absence of the theme vowel in certain cases.



they do not favor one analysis over the other, as both can equally account for the data. In an analysis in which [e-] is a theme vowel stored with the root, a vowel deletion rule ($V \rightarrow \emptyset / __ V$), as proposed by Bermúdez-Otero, would be applied to derive the data. And a hypothesis based on the root would derive the data by adding the suffix *-inha* directly to the root, also generating the data.

Unfortunately, there is no criterion guaranteed to reliably distinguish between root-based and stem-based derivations in all relevant cases in Spanish.

However, Portuguese offers evidence against Bermúdez-Otero's no bare root proposal. Portuguese is well known for its vowel metaphony, a phenomenon common in Iberian languages, but with no equivalence in Spanish (PENNY, 2009). Portuguese metaphony is a process in which a vowel harmonizes with a theme vowel. An example from Harris is below. Note that the harmonization process occurs when the theme vowel is deleted:⁴

- (17) /serv-i-o/ > [sirvo] 'I serve' (HARRIS, 1974)
to serve-TH-1sg.present

Harris (1974) discussed metaphony in verbs, but it also occurs in nouns. It operates within the seven-vowel system of Portuguese (/a/, /e/, /e/, /i/, /o/, /ɔ/, /u/) and is most clearly evident in nouns with the raising of tonic low /ɔ/ to mid-high position (with the consequent neutralization of the /ɔ/ ~ /o/ contrast in these circumstances). This process occurs before the theme vowel /-o/ in the singular form exclusively:

- (18) a. /pɔrku/ > [porku] *porco* 'pig'
/pɔrkos/ > [pɔrkus] *porcos* 'pigs'
/pɔrka(s)/ > [pɔrka(s)] *porca(s)* 'sow(s)'
b. /gordo/ > [gordu] *gordo* 'fat'
/gordo/ > [gordos] *gordos* 'fat pl.'
/gorda(s)/ > [gorda(s)] *gorda(s)* 'fat fem(s).'

The word in (19) contains the suffix -os 'ous':

- (19) /formɔso/ > [formɔzu] *formoso* 'beautiful (masc. sing.)'
/formɔsos/ > [formɔzus] *formosos* 'beautiful (masc. pl.)'
/formɔsa(s)/ > [formɔza(s)] *formosa(s)* 'beautiful (fem. sing./pl.)'

As in the other cases, /ɔ/ harmonizes before the theme vowel /-o/ in the singular form.

Now consider when superlative morphemes are added. Portuguese has two superlative morphemes -íssim and -érrim. Compare /formɔso/ and /formɔsa/ when the superlative suffixes are added, generating *formosíssimo/formosíssima* and *formosérrimo/formosérrima*:

- (20) [formɔzerimo] vs. [formɔzerima] 'very formous masc vs fem'
[formɔzísimo] vs. [formɔzísima] 'very formous masc vs fem'

Note that metaphony occurs when -íssim is added, but not when -érrim is added. The vowels are always neutralized to /o/ in the case of -érrim attachment. A very interesting contrast peculiar to Portuguese.

⁴ Portuguese verbs have the following theme vowels: [-a], [-e], [-i], and [-o] (CAMARA Jr., 1970).

The harmony phenomenon in *-íssim* attachment can be captured if this morpheme is added to a word. If *-íssim* is added to a word that contains a theme vowel, metaphony is accounted for. Harmony applies and the theme vowel is deleted. A phenomenon like verb metaphony is discussed by Harris (1974) (cf. /serv-i-o/ > [sirvo] 'I serve'). As in the case of verbs, the theme vowel is deleted before a suffix that begins with a vowel.

- (21) /formɔs-o/ > /formɔso+ísim+o/ > [formoz**í**simo] 'very formous'
[form**o**zisimo] vs. [forməzisima] 'very formous masc vs. fem'

That is, one can assume the presence of an inner theme vowel that is deleted, but that triggers metaphony when *-íssim* is added. This phenomenon, parallel to verb metaphony, is discussed in detail by Harris (1974).⁵

When *-érrim* is added, the vowels are neutralized and there is no metaphony. In a root-based approach, this is straightforward: a root morpheme is attached to a bare root. So, metaphony cannot apply, since there is no inner theme vowel to agree with.⁶

- (22) /formɔs+érrim+o/

When metaphony does not apply, a rule of unstressed vowel neutralization applies, which is very productive in Portuguese (cf. Harris (1974), Camara Jr. (1970)).

Additional evidence for the claim that *-érrim* is a root morpheme comes from words like *paupérrimo* and *pobríssimo*. Both words mean the same thing, 'very poor'. But *-érrim* attaches to a root, *pauper-*, and *-íssim* to a word, *pobre* 'poor'. There is no word *pauper* in Portuguese. *Pauper* must be a root. Below are other examples comparing *-érrim* and *-íssim*. Note that *-érrim* attaches to a smaller domain than *-íssim*:

- | | | | |
|------|---------|---------------|----------------|
| (23) | acre | - acérrimo | ~ acríssimo |
| | áspero | - aspérrimo | ~ asperíssimo |
| | célebre | - celebérrimo | ~ celebríssimo |
| | íntegro | - integérrimo | ~ integríssimo |
| | livre | - libérrimo | ~ livríssimo |
| | magro | - macérrimo | ~ magríssimo |
| | mísero | - misérrimo | ~ miseríssimo |
| | negro | - nigérrimo | ~ negríssimo |

⁵ Portuguese has a post-syntactic phonological rule of vowel harmony and another of vowel neutralization in unstressed positions (see Kenstowicz and Sandalo (2016), for example, for both rules). But, interestingly, in careful speech, in the Standard dialect, where the rules of harmony and neutralization do not apply, there is a clear contrast to be explained: the presence of an open vowel can only occur in the case of the suffix *-íssim*. This puzzle cannot be explained in a stem-based approach, since the intermediate theme vowel would always be there and the phonological contrast would remain a mystery.

⁶ An anonymous reviewer asked if *formɔs-* is indeed a root. In this paper, the root is assumed to be *formɔs-*, since there is no space to discuss the status of derivational affixes as roots. It could be the result of a merge of two roots. However, the relevant point is the evidence for the absence of the internal theme vowel. That is, the issue addressed here is the phonological phenomenon of metaphony, which cannot be explained if the theme vowel is always present.

To sum up, Portuguese metaphony is evidence of when a theme vowel is in the underlying form, but is deleted. This is because metaphony applies when the theme vowel is deleted in Portuguese (HARRIS, 1974). If metaphony fails to apply, this means that a theme vowel was never there. Therefore, there are root morphemes, that is, morphemes that attach to bare roots, and a root-based view of morphology is necessary.

4 CLITIC PLACEMENT: MESOCLISIS

Although the main data is from Brazilian Portuguese, there is evidence from European Portuguese for roots as primitives. Portuguese exhibits a complementary distribution between pronominal enclisis and proclisis that cannot be attributed to finiteness distinctions, as in other Romance languages. In Portuguese, clitic placement is sensitive to the presence of certain triggers, such as negation and complementizers. If there is a trigger, pronominal clitics are proclitics; otherwise, they are enclitics:⁷

- (24) a. Ele viu-**me**.
he saw-CL1sg.
'He has seen me.'
- b. Ele não **me** viu.
he NEG CL1sg. saw
'He has not seen me.'

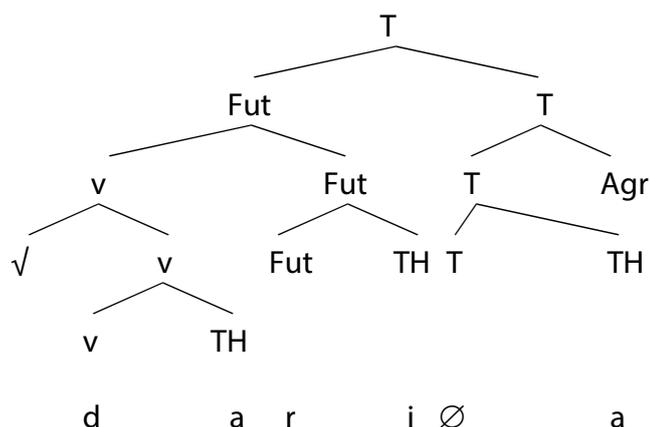
Future tense and conditionals offer an interesting case to the discussion: the clitic must be infixal if there is no trigger of proclisis. A pronominal clitic appears before the future/conditional morpheme:

- (25) a. Dar-**me**-ia (cf. Não me daria 'One would not give it to me')
give-CL1sg.-CONDITIONAL
'One would give it to me'
- b. Dar-**me**-á (cf. Não me dará 'One will not give it to me')
give-CL1sg.-FUTURE
'One will give it to me'

⁷ Note that Portuguese is not an isolated case of a language that displays proclisis/enclisis alternation in tensed clauses (cf. Shlonsky (2004); Ouhalla (2005), among others).

As previously mentioned, Ultra-Massuet and Arregi claim that a theme vowel attaches to each head, so they propose the following structure for future tense and conditional in Iberian languages:

(26) Future and Conditional verbs, according to Ultra-Massuet and Arregi (2005)



Ultra-Massuet and Arregi (2005) have argued that the future and conditional have two tense heads: one marked by *-r*, which is a future tense, and a second adjoined tense node.

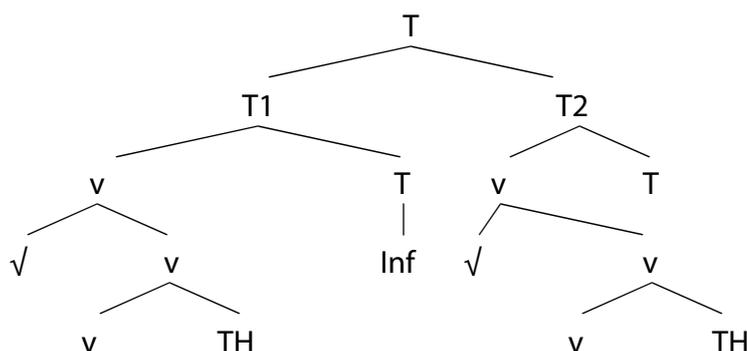
An enclitic clitic in Portuguese goes after the first tense marker (the *-r* morpheme), as seen in (25) above.

That is, if we assume their analysis, the Portuguese clitic breaks into the middle of a constituent, since the clitic would be placed between Fut and TH, which is impossible.

One could say that it goes at the end of the constituent and then undergoes metathesis to its surface position and this is why it surfaces before the supposed theme vowel. But this is absolute neutralization, since this possibility never surfaces if the proposed theme vowel is empty. We would propose a metathesis rule with a questionable empty category.

I maintain with Harris (1969) that the element analyzed as an intermediate theme vowel by Ultra-Massuet and Arregi is actually an auxiliary verb, a second root node. Below, I propose a syntactic structure that builds on Harris' (1969) insight.

(27)



As evidence for his analysis of a second root node, Harris notes the phonological similarity between the auxiliary *ir* 'go' and *haver* 'to have' and the conditional and future tenses for some verbs in Spanish. In Portuguese, the similarity is very productive:

- (28) a. Eu **ia** sair em dois dias. 'I would leave in two days.'
 b. Eu sair**ia** em dois dias. 'I would leave in two days.'
- (29) a. Eu **hei** de sair em dois dias. 'I will leave in two days.'
 b. Eu sair**ei** em dois dias. 'I will leave in two days.'

Harris suggests that the analysis of such tenses as a verb in the infinitive and an auxiliary verb in a raising structure is still active in the language. The facts about mesoclitic clitics in Portuguese support Harris' analysis, and strongly questions the existence of an inner stem and the existence of theme vowels attached to all F heads, as proposed by Oltra-Massuet and Arregi. Therefore, it goes against intermediate theme vowels as default.

Galves and Sandalo (2012) propose that a clitic in Portuguese must be c-commanded by a functional head. If a clitic is not c-commanded by such a head, it undergoes Lowering, a right dislocation operation of Merger (EMBICK; NOYER, 2001), in which a head lowers post-syntactically to adjoin to the next available head. Constraints that prohibit certain configurations (or filters) are common after syntax, in phonological form, and this constraint is an instance of such a filter (see Arregi and Nevins (2012) for post-syntactic constraints). Evidence for this analysis comes from the fact that Lowering processes create units more closely attached to each other than those resulting from prosodic attachments, since this is a Merger operation, that is, an incorporation process. Now, if a clitic undergoes Lowering, it follows that it turns out to be an affix-like element. This is exactly what the phonological and syntactic evidence shows about pronominal enclitics in Portuguese (cf. Vigário (1999, 2003); Bermúdez-Otero and Luís (2009); Duarte and Matos (2000); among others).

As predicted by Lowering, the clitic lowers to the first available head. Mesoclisism in Portuguese is predicted by this analysis and no constituent is split by the clitic.

To sum up, Portuguese offers evidence from diminutives, vowel metaphony, and clitic placement for the need for morphemes in the grammar that attach to a bare root, and therefore, for a root-based analysis of morphology.

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