THE INVENTORY AND THE UNDERLYING DISTRIBUTION OF THEME VOWELS IN THE PORTUGUESE NOUN CLASS

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- ABSTRACT: This paper discusses the underlying distribution and inventory of theme vowels in the Portuguese noun class. Since it deals with the underlying distribution of theme vowels in both word constitution and derivation, the study not only considers the possibility of attaching suffixes to roots or to stems but also adopts the "stem-driven derivation", admitting that the stem is stored in the permanent lexicon. Therefore, the theme vowel is in the basis of the derivation process of the nouns in the language since its subjacency. The observation of Portuguese grammar phenomena has shown that three types of criteria support this position: morphophonological, morphological and semantic ones. Regarding the inventory of nominal theme vowels in Portuguese, the study recognizes the singular behavior, in the nouns of the language, of final unstressed vowel /e/, by comparison with vowels /o, a/. Vowel /e/ plays two roles; it is an epenthetic vowel and, in a restricted way, a theme vowel with no correlation with the gender, whereas vowels /o, a/ are always theme vowels and agree with the gender of the words[1].

- KEYWORDS: Theme vowel. Noun class. Underlying distribution. Derivation and its basis. Portuguese Morphophonology.

Introduction

The focus of this paper is the theme vowel (morpheme of formal class or theme index), in the morphophonology of the Portuguese noun class. As a contribution to the scarce number of studies on the subject, this paper aims to discuss the inventory and the underlying distribution of this morphological unit in the constitution and derivation of words identified as non-verbs in Brazilian Portuguese (BP) and the interface established with the phonology of the language. The starting points of the analysis proposed by

this study are especially Câmara Jr. (1970), Basílio (2001), Alcântara (2003, 2010), Harris (1999) and Bermúdez-Otero (2007, 2013).

Regarding the inventory of nominal theme vowels, the study recognizes the singular behavior of vowel /e/ as legitimizing loans (ex.: *club > clube*) and support to the plural morpheme (ex.: *mar > mares*), functions it assumes by occupying the theme vowel position, together with the cases in which it plays the role of theme vowel (ex.: *vale*); it occurs in a restricted number of words in the language. Only vowels /o, a/ play the role of legitimate theme vowels, which are in correlation with the grammatical gender of words, although sometimes arbitrarily, as in *a tribo*, *o cometa*. However, vowel /o/ predominates in masculine nouns and vowel /a/ prevails in feminine ones.

It should be pointed out that, in this study, regarding the treatment of the inventory of theme vowels, *underlying structure* means *input* of the base word, without inflection. Vowels /o, a/ are always in the *input* of the base word while vowel /e/ is found neither in words ending in liquids nor in acronyms, but it emerges in both pluralization and lexicalized loans; in these cases, it is recognized as epenthesis. Vowel /e/ has these specific functions and there are also cases in which it is a simple theme vowel.

Theme vowel and grammatical derivation

The unpredictability of the theme vowel to fulfill the role of categorization in grammar is in the substrate of the discussion on the grammatical derivation and implies necessary relationship between morphology and phonology, as it will be shown in this paper.

The theme vowel is identified by Câmara Jr. (1970) as classificatory index that assigns a morphological class to the nouns and verbs of the language. By dividing nouns in thematic and athematic ones, he proposes three thematic vowels: /a, o, e/. In the class of BP verbs, vowels /a, e, i/ fulfill this classificatory function.

Basílio (2001) explains the theme vowel by opposing it to the root of a word and by identifying it as an element of flexional definition: added to the word root, the theme vowel forms the stem, which is the morphological basis for the inflection. Therefore, the stem, which contains the theme vowel, is formed by the word without any inflectional marks.

In studies of formal classes of Portuguese in the constitution of non-verbs ending in unstressed vowels /o/, /a/, /e/, Alcântara (2003, 2010) identifies their different functions and advocates that the first two vowels are formal class morphemes. Besides, he attributes two roles to final unstressed vowel /e/: formal class morpheme or epenthetic vowel. The author presents the distribution of the three thematic vowels in four classes. The first and more general class, includes nouns ending in /o/ whereas the second class comprises nouns ending in /a/. In the first class, masculine nouns are predominant (*o livro, o gato*), although there are some feminine words (*a tribo, a libido*). In the second class, feminine nouns are prevalent (*a pedra, a gata*), but

masculine nouns can also be found (*o cometa, o idioma*). The third class integrates nouns to which vowel /e/ in the singular form (*esporte, lebre*) is assigned or in the inflected form (*mar-mares, algoz-algozes*); there is the presence of the morpheme expressed by vowel /e/ in words whose phonological structure could dispense with it, since the preceding consonant could occupy the coda of the syllable (*pele, folclore*), as well as in phonological structures which require a theme vowel (*parque, alegre*) – in this case, vowel /e/ licenses the entrance of words into the lexicon. In this class, there is no correlation between the vowel and the gender of the words. The fourth class brings together the athematic nouns, ending in the vowel of the stem (*café, sofá*), in consonant segment (*joveN, pincel*) and diphthongs (*pai, museu*). This characterization of the theme vowel, as capable of forming classes, evidences direct relation with grammatical derivation.

Regarding the insertion process or the presence of the theme vowel in the lexicon, there are two options: in the first, with a purely morphological basis, the root is the starting point of the derivational process (root-driven) (HALLE; MARANTZ, 1993; MORENO, 1997; SCHWINDT, 2013a). In the second, with a morphophonological basis, the stem is the starting point of the derivational process (stem-driven), which implies that, in the lexicon, there is entrance into stems (root + theme vowel) (BERMÚDEZ-OTERO, 2013; ALCÂNTARA, 2003). In the first, the derivational affix is connected directly to the root (root-based), whereas in the second the derivational affix is connected to the stem (stem-based).

By adopting the derivation based on the *stem* in this study, it is understood that the theme vowel integrates the forms stored as lexical entries of the language. The justification of this position is shown below.

Distribution of theme vowel: stem-based derivation

Considering that the combination of suffixes may occur with roots or stems, Bermúdez-Otero (2013) presents empirical evidence from contemporary Spanish in order to defend the superiority of the *stem-based derivation* over the *root-based derivation*. As part of this discussion and its results, the underlying distribution of the theme vowels is also dealt with. Thus, for the author, the stem is stored in the deep lexicon, that is, the theme vowel, since its underlying representation, is found in the basis of the derivation process. In this view, the lexical entry, for example, for the form *menino*, in Portuguese, is ⟦$_N$ menin-o⟧[2]. As a result, the deletion process of the theme vowel must be considered in many cases of derivation[3], such as the deletion of the theme vowel -o in the form *meninada*: *meninada* ⟦⟦⟦menin-o⟧ada⟧ → ⟦meninada⟧.

The deletion of the theme vowel, however, interposes a problem because it masks the underlying morphological structure of the noun stems and allows two interpretations: (a) the theme vowel is an independent unit in the underlying representation ⟦⟦menin⟧o⟧, derivation from the root; (b) the theme vowel is integrated in the lexicon ⟦menin-o⟧, derivation from the stem. Representations in (1) below exemplify the forms of input and output, in a phonological mapping, in the two types of derivation.

(1a) – root-based derivation - phonological mapping

Input   ⟦⟦menin⟧o⟧   ⟦⟦⟦menin⟧ad⟧a⟧
Output   [me.ní.no]   [me.ni.ná.da]

(1b) – stem-based derivation - phonological mapping

Input   ⟦menin-o⟧   ⟦⟦⟦menin-o⟧ad-a⟧
Output   [me.ní.no]   [me.ni.ná.da]

A *stem-based derivation* needs to be justified, as Bermúdez-Otero (2013) highlights, because it does not usually manifest itself in the surface forms of words. In words derived nouns [me.ni.ná.da], it is pertinent to question if the base is ⟦menin⟧ or ⟦menin-o⟧; the latter requires the deletion of the theme vowel in derivational processes, as mentioned before, and is adopted by *stem-based derivation*.

Concerning the relationship between root and stem, it is worth emphasizing the specificity of the terms *stem-based* and *stem-level*: the former refers to morphological subcategorization requirements while the latter concerns phonological properties. The author explains that the grammars are organized to respect these correspondences between grammatical constructions and phonological domains:

> *a. Roots do not define phonological domains.*
> *b. A phonological domain associated with an operation of root-to-stem derivation must be stem-level.*
> *c. Every morphological word defines a word-level domain.*
> *d. The highest phrasal category in the linguistic expression defines a phrase level domain.*
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> (BERMÚDEZ-OTERO, 2007, p.283).

Therefore, an affix will be steam-level if it defines domains that call stem-level constraints, while it will be stem-based if it is added to the stem of a word. As a result, says the author, an affix may be, for example, root-based and stem-level, stem-based and stem-level, stem-based and word-level, but cannot be root-based and word-level, because, as explained before, one of the principles governing the correspondence that may be found between grammatical constructions and phonological domains is that "a phonological domain associated with a root-to-stem operation must be stem-level".

Firstly, it should be noted that understanding that the underlying distribution of theme vowel is linked to the stem of the nouns leads to the fact that this vowel will never manifest itself, in the forms of surface, in the middle of derivational suffixes added to stems, that is, the theme vowel must only report to the right edge of words in the singular or preceding the number mark /-S/ in plural words – and this is a fact that effectively integrates the grammar of Portuguese, as well as the Spanish system, according to Bermúdez-Otero (2013). It should be pointed out that the final vowel of the preserved base within certain derivatives is deprived of the theme vowel function, peculiar to the word final position.

The presentation of arguments in favor of *stem-based derivation* for the derivational phenomenon in Portuguese follows Bermúdez-Otero's proposal (2013) regarding three types of criteria: (a) morphophonological criterion; (b) morphological criterion; and (c) semantic criterion. From these three perspectives, phenomena in Portuguese are able to provide elements for the *stem-based derivation* to explain the derivational process in the language, leaving aside the *root-based derivation*.

(a) Morphophonological criterion for the stem-based derivation

The first criterion has a morphophonological nature, since it considers the operation of a morphologically conditioned phonological process. Data on Portuguese are analyzed in the light of this criterion.

To defend the *stem-based derivation* in the derivation process in Portuguese, there is an argument of morphophonological nature in the nominal metaphony operating in the language. The nominal metaphony is characterized by Miranda (2000) as a phonological process applied to the level of word that causes the alternation of labial mid vowel of the word root when the trigger – a labial theme vowel - is on the edge of the word. The quality of the labial high mid vowel in the stressed syllable of the sequence /o/ ... /o/, according to the author, results from a phonotactic constraint, which serves a morphological condition. Examples are: *p[o]rco* (considering *p[ɔ]rca, p[ɔ]rcos*)*; [o] sso,* (considering *[ɔ]ssos*)*; n[o]vo,* (considering *n[ɔ]va, n[ɔ]vos*).

From the point of view of the phonology of the language, the derived form with the high mid vowel in stressed position proves that it is a word-level phenomenon. As mentioned before, one word-level derivation cannot be based on the root, or may not be root-based. Therefore, the basis of this derivation must be stem-based, that is, must be based on the stem. It is understood, therefore, that the phenomenon of nominal metaphony in Portuguese is stem-based and word-level, a favorable argument for the *stem-based derivation*.

Besides metaphony, root vowel alternation can be included (ex. *b[ɛ]lo - b[e]ldade; l[ɔ]ja - l[o]jista*), since it results from a neutralization process which Portuguese mid vowels present in pretonic position. It is a legitimate case of stem-based derivation, because this vowel alternation depends on the stress and roots do not carry stress;

roots can only have stress on athematic nouns without a theme vowel. There is a stem-based phenomenon when a derivation is operating in nouns whose roots have low mid vowels that become high mid vowels because of the neutralization that results from the shift of the stress position. This is another example of "stem-based derivation" of morphophonological nature.

(b) Morphological criterion for the stem-based derivation

With the support of the morphological criterion, there are phenomena in Portuguese that show evidence of *stem-based derivation*.

One of the arguments, whose basis is morphology, is the behavior of the gender of derived nouns, considering that theme vowels /o/ and /a/ constitute categories that contain mostly nouns of masculine and feminine genders. The relevance of this statement is supported by the Portuguese suffixes which inherit the gender of the base, such as diminutive suffixes *-inho/a*: *o livro, o livrinho*; *a casa, a casinha*; *-ico/a*: *o verão, o veranico*; *a barba, a barbica*; *-ejo: o lugar, o lugarejo* and augmentative suffixes, such as -aço/a: *a água, a aguaça* and *-arra/orra*: *a boca, a bocarra*; *a cabeça, a cabeçorra*. This occurrence requires the derivation to always be stem-based in place of root-based, since it requires the presence of the theme vowel involved with the gender at the basis of the derivation; thus, it reclaims the stems.

The preservation of the gender of the basis, however, is not true of all suffixes forming nouns in Portuguese, since there are those who impose their own gender, for example, the augmentative suffix-*ão*: *a mulher, o mulherão[4]*, and others such as *-ada*: *o pêssego, a pessegada*; *-aria: o livro, a livraria*. Whether the genre in the broad meaning is given by the word or by the suffix, in such cases, the basis of derivation is the stem.

Portuguese has examples in which the final vowel of the base is maintained, without theme vowel function within certain derivatives. The following cases are examples:
a) derivation with the suffix *-oso*. In base with theme vowel *-o*, this vowel is preserved, manifested as [u] ~ [w]; examples: *afeto> afet[u]oso~afet[w]oso; defeito> defeit[u] oso~defet[w]oso; ímpeto> impet[u]oso~impet[w]oso; luto> lut[u]oso~lut[w]oso; preconceito> preconceit[u]oso~*preconceit[w]oso; luxo> *lux[u]oso~lux[w]oso; monstro> monstr[u]oso~monstr[w]oso;*
b) derivation with the sequence *-ão*. In base with theme vowel *-o*, this vowel is preserved, manifested as [o] ~ [w]; examples: *feijão> feij[o]ada~feij[w]ada; ferrão> ferr[o] ada~ferr[w]ada; trovão> trov[o]ada~trov[w]ada; ladrão> ladr[o]agem~*ladr[w]agem *> ladr[o]eira~ladr[w]eira > ladr[o]aço~ ladr[w]aço;*
c) derivation of nouns from verbs (deverbal nouns). In this derivation, the theme vowel of the verb remains. The preservation of the theme vowel in this case is justified because

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[4]   The suffix *–ão has* recently started copying the gender of the base (*mulherona*) or of the referent (*sapatona*), especially
       when there is a lexicalized concurrent form (*caixão - caixona*) (we thank a referee for making this observation).

the suffixes deriving nouns from verbs begin with a consonant, such as *-mento* (ex.: *alinh-a-mento, abaix-a-mento, chave-a-mento, esquec-i-mento, acolh-i-mento, afer-i-mento*)[5]. This fact makes the following view to be considered economic: the theme vowel, present in the nouns derived from verbs, is also in the basis of the derivation when nouns are considered the basis for derivation.

(c) Semantic criterion for the stem-based derivation

The semantic criterion for stem-based derivation is anchored in an implicational relationship: considering that the meaning of a derivative is compositional, then it is more likely that its base is a stem, rather than a root. In Portuguese, there are examples in diminutives, such as *animalzinho, cafezinho*, and endings, such as *-mente*, in *calmamente* or *logicamente*, which maintain a vowel remaining of the theme vowel of the base words, without their peculiar function.

Words ending in *-mente* and *-zinho*, such as *calmamente* and *cafezinho*, have received different interpretations. For Câmara Jr. (1970), they are words derived by juxtaposition. For Menuzzi (1993) and Schwindt (2013b), prosodic words are formed by composition. Bisol (2010), regarding the diminutive, emphasizes the role of /z/ as epenthesis, a case of surface structure, constituting the formation of the diminutive, *-inho* or *-zinho*, a derivational process from *-inho*. The details of this discussion will not be described in this paper because they would take up much space, but seeing them as derivation would be a stem-based case.

A fact that has been observed in Portuguese reinforces the arguments in favor of *stem-based derivation*, linked to the semantic criterion: it is the existence of lexical items which have, as their only formal specificity, theme vowels, but which have different meanings, although, in broader terms, are related, such as *pingo/pinga*, *saco/saca* and *fruto/fruta*[6].

The specificities of meaning can be observed in: *pingo* (theme vowel -o) – common use[7]: "small portion of liquid; when it spills, it takes the form of a globule; drop"; *pinga* (theme vowel -a) – common use: "beverage portion swallowed at once; sip, gulp; alcohol, white rum". As for the morphological behavior, it is observed that both bases can be adjoined by the suffix -ado, but there is the specificity that, only to the base with terminal vowel -o, the following suffixes can be added: *-ar, -ada, -oso*

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[5]   In this type of derivation, the representation of theme vowel -e, from the class of verbs, shows alternation with vowel [i] ([e] ~ [i]) (example: *esquecer > esquecimento*), as well as the representation, so, theme vowel -i, from the class of verbs, shows alternation with vowel [e] ([i] ~ [e]) (ex.: *adimplir > adimplemento*).

[6]   The language contains different examples of the same nature. Some are the following: *barco/barca; horto/horta; poço/poça; manto/manta; banco/banca; lombo/lomba; sapato/sapata; plano/plana, cinto/cinta, ramo/rama.*

[7]   The meanings were taken from the Houaiss Dictionary Electronic (FUNDAÇÃO DORINA NOWILL PARA CEGOS, 2009) – among all the listed meanings, the most commonly used ones are mentioned (hence, the use of the expression "common use").

(*pingo* ➔ *pingar , pingada, pingoso*). The suffixes *-uço, -eiro* are added to the base *pinga* (theme vowel -a) (*pinga* ➔ *pinguço , pingueiro*) – the meaning of each base licenses different morphological behavior.

A similar phenomenon occurs in the case of *saco/saca* and *fruto/fruta*. It can be observed that, in the first case, there are differences in meaning: *saco* (theme vowel-o) – common use: "paper, cloth, leather, or plastic container, oblong, open at the top and closed at the bottom and sides"; *saca* (theme vowel -a) – common use: "large tote, large and long container, small suitcase; suitcase". There is also a difference in morphological behavior when considering both bases since the suffixes *-aria, -inho/a* can be attached both to the base with -o, and to that with -a, but the suffixes *-ola, -ete* can only be added to the base with -o (the *sacola* and *saquete* forms only derive from *saco*).

In the case of *fruto/fruta*, the most common meanings of *fruto* (theme vowel -o) are: "consequence, the end result of anything (previously planned or unplanned); advantageous product; advantage; child, offspring"; for *fruta* (theme vowel -a), the most common use is "edible fruit or inflorescence". The specialization of meaning, considering the difference of the theme vowel also has morphological implications: the form with theme vowel -o licenses the suffixes *-ar, -ear, -escer, -ário, -oso* (the forms *frutar, frutear, frutescer, frutário, frutuoso* derive from *fruto*)*,* while the form with theme vowel -a licenses the suffixes *-aria, -eira, -eiro, -ose* (the forms *frutaria, fruteira, fruteiro, frutose* derive only from *fruta*), in a true complementary distribution. Thus, in this case, it means that the theme vowels attributes, to the lexical items, formal and semantic specificity, which reflects in the derivational process – the theme vowel in such cases must be based on derivation and the phenomenon is stem-based and word-level.

With the subsidies of the three criteria of morphophonological, morphological and semantic nature discussed before, it seems that the stem, that is, the way the theme vowel is defined, is the basis of derivation in Portuguese, assuming therefore that the theme vowel is inserted into the lexicon.

It should also be emphasizing that understanding that the derivational affix is stem-based equalizes the derivation process in the language, since, when considering bases with theme vowel and athematic ones, the affix will always be adjoined to a unit of the language of the same nature.

Inventory of nominal theme vowels

The inventory of theme vowels in the class of Portuguese nouns, according to the authors cited in the introduction of this paper, comprises the set of three final unstressed segments: /o/, /a/, /e/, which carry out a classificatory function in the language morphology.

However, in the literature (HARRIS, 1999; VILLALVA, 1994; ALCÂNTARA, 2003, 2010; BERMÚDEZ-OTERO, 2013), a differentiated behavior of the vowel /e/ is recognized in the set of segments that draw up this inventory. Villalva (1994) considers

that only vowels /o/, /a/ are thematic indexes; vowel /e/ is discarded, considering its absence at the end of unstressed phonetic forms in European Portuguese (EP).

Alcântara (2003, 2010) only assigns, to vowels /o/, /a/, the unique categorization of formal class morphemes, since the unstressed final vowel /e/ may fulfill the roles of both formal class morpheme and epenthetic vowel. According to the author, vowel /e/ is configured as a formal class morpheme when the root ends in a consonant licensed to the coda position by the phonology of Portuguese (ex.: *mole, vale, pele*); it is epenthetic when it is required by phonology to save malformed structures, with segments on coda not licensed by the grammar (ex.: *dente, neve, parede*).

Harris (1999), in his studies of Spanish, describes the presence of final unstressed /e/ in a complementary distribution with its absence: in opposition to the context in which it occurs ∅, wherein the sequences at the end of the root are phonological admissible in words of the language (ex.: *mil, común, red*), vowel /e/ is introduced into other contexts (ex.: *nube, arte, triple*). Similarly, Portuguese has correlate forms in examples such as *mar, mal, paz* and *clube, parque, ave*, respectively.

As opposed to theme vowels /o, a/, therefore, vowel /e/ shows a peculiarity in the theme vowel condition (class marker or thematic index), both in Portuguese and in Spanish. Concerning words in Portuguese ending in final unstressed /e/, a search in the lexicon shows a result that can be revealing: there is a significantly small number of words whose roots end in sequences licensed by the language that present final unstressed vowel /e/, such as items *mole, vale, pele*[8].

Considering the singular behavior of final unstressed vowel /e/, it opens up the possibility of questioning its function as a legitimate thematic vowel, present in the underlay of the language nouns. As part of this discussion, some aspects found in nouns ending in unstressed /e / must be observed. Besides, facts related to this vowel must be examined. Four points are presented:

1st) final unstressed vowel /e/ is attributed, in the epenthetic element condition, to the loans accepted by BP in cases in which a final sequence of the radical is not licensed by the language (ex.: *basquete, bife, boxe, clube, chefe, iode*), as well as in contexts in which this final sequence is licensed (ex.: *console, quermesse, escore, xale, folclore*).

2nd) final unstressed vowel /e/ shows alternations:

a) with ∅, in roots whose consonants would be licensed as a coda by language phonology (ex.: *caractere ~ caráter; belvedere ~ belveder ~ belver; prócere ~ prócer*)[9], including PB variants with less prestige (ex.: *mole ~ mol; pele ~ pel; gole ~ gol*);

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[8]   This is the group that, in Alcântara's proposal (2003), is Formal Class IV, and that counts the total of only 61 words (ALCÂNTARA, 2003, attachments), according to a search in the Houaiss Dictionary of the Portuguese Language (HOUAISS; VILLAR; FRANCO, 2001). Only in those few cases, vowel /e/ is in the *input* and is recognized as a theme vowel.

[9]   Unusual words also show the movement of the language towards the deletion of final /e/.

b) with theme vowels /o, a/ (ex.: *gole ~ golo; triple ~ triplo;* chilre ~ chilro; *aderece ~ adereço; biopse ~ biópsia; avalanche ~ avalancha; asteque ~ asteca; enfarte ~ enfarto; cale ~ calha; manicure ~ manicura; cabine ~ cabina; clone ~ clono; dengue ~ dengo*) ;

c) with forms resulting from metathesis (ex.: *ambre ~ âmbar ; acétre ~ acéter ; açucre ~ açúcar*) ;

d) with athematic forms (ex.: *arse ~ arsis; cânabe ~ cânabis; aurífice ~ ourives ; isóscele ~ isósceles*).

The alternations experimented by vowel /e/ show its unstable behavior, subject to deletion, to metathesis and to substitution by legitimate theme vowels /o, a/.

3rd) final unstressed vowel /e/ shows alternations with theme vowels /o, a/ in the process of language acquisition by Brazilian children (ex.: *controle ~ controlo*); in children's data, vowels /o, a/ can even be assigned to athematic nouns (example: *capuz ~ capuzo*)[10], while a final coronal unstressed vowel is only attributed to surface shapes in the developmental stage in which the CVC syllable structure is not yet licensed for children's outputs (ex.: *nariz* ➔ [na'lizi]; *flor* ➔ ['foli]). In the acquisition process, there is evidence that /o, a/ are considered the real theme vowels in the language.

4th) final unstressed vowel /e/ does not behave as a trigger of nominal metaphony, as occurs in language nouns with final unstressed /o/ and /a/ (ex.: *br/ɛ/ve *br/e/ve; l/ɛ/ bre *l/e/bre; l/ɛ/ve *l/e/ve; t/ɛ/se *t/e/se*).

The examples show words in which the vowel in Latin was ĕ (short e), from which the low mid vowels have been derived in Portuguese; if metaphony motivated by the final unstressed vowel /e/ were applied, the resulting form should present high mid vowel, but it does not happen. Thus, this vowel does not seem to behave as a theme vowel, because, if it did, the behavior should be expected to be a trigger of metaphony, in agreement with the behavior of theme vowels /o/, /a/.

These arguments add to another which shows the difference in behavior of final unstressed /e/ by comparison with vowels /o, a/: underlying theme vowels /o, a/ are involved with basic phenomena of morphophonology in Portuguese, such as neutralization (bElo>beleza) and nominal metaphony, as mentioned in this paper, whereas vowel /e/ is involved with surface phenomena, such as metathesis or filling the void of a vowel theme, a discussion that has also been presented in this study. Moreover, it must be acknowledged that the number of words of the language in which final unstressed /e/ is attributed to roots ending in sequences licensed by the language is very limited, a fact that was also previously mentioned.

On this basis, it is assumed that vowel /e/ is called to occupy, in the surface structure, the space that the morphology of Portuguese earmarks to theme vowel.

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[10] This assignment of theme vowel to athematic nouns is found in a stage of the acquisition process in which the phonology of children already integrates syllabic structure with coda, a fact that shows that this vowel epenthesis cannot be interpreted as a result of the complex structure of the syllable.

Therefore, the status of legitimate theme vowels, integrating the underlying structure of the language, should be assigned only to both vowels /o, a/. Although three vowels manifest themselves in theme vowel position, /o, a, e/, vowels /o, a/ are naturally in the *input* of most of the words in Portuguese. The occurrence of /e/ is only noticed in limited cases, such as *mole, vale, pele*. They appear in all other cases in theme vowel position as epenthesis and as licensors of structures which are not allowed by the language, an explicit fact in syllabification.

Final remarks

Focusing on theme vowel of the class of nouns of Portuguese, this paper discussed two points: the underlying distribution and the inventory of nominal theme vowels. When dealing with the underlying distribution of theme vowel in the constitution and in the derivation of words, in the derivation process, the possibility of suffixes joining roots or themes was considered. It was assumed that there is evidence to adopt a *stem-based derivation*, supported by three different phenomena in Portuguese, organized according to three types of criteria: (a) morphophonological criterion; (b) morphological criterion; and (c) semantic criterion. It is understood that the stem is stored in the deep lexicon, and that the theme vowel, since the underlay, is found in the basis of the derivation process of the nouns of the language.

As part of the central object of the study, the paper also considered the issue of the inventory of nominal theme vowels in Portuguese, assuming that, for the nouns of the language, there are two genuine theme vowels: /o, a/. With evidence from the singular behavior, in Portuguese nouns, of the final unstressed vowel /e/ by comparison with the vowels /o, a/, it is assumed that vowel /e/ plays the role of theme vowel in a restricted number of words; this vowel is mostly called just to occupy, in the surface structure, the space that the morphology of Portuguese reserved for the theme vowel. Therefore, the status of legitimate theme vowels is attributed to vowels /o, a/, naturally integrating the *input* of most words in the language, besides carrying the grammatical gender of the word, unlike what happens with vowel /e/.

▪ *RESUMO: O artigo discute a distribuição subjacente e o inventário das vogais temáticas da classe dos nomes do português. Ao tratar da distribuição subjacente da vogal temática na constituição e na derivação das palavras, o estudo considera a possibilidade de a combinação de sufixos ocorrer com raízes ou com temas e adota a "derivação com base no tema", admitindo que o tema está armazenado no léxico profundo; assim sendo, a vogal temática está na base do processo de derivação dos nomes da língua desde a subjacência. Na*

observação de fenômenos da gramática do português, três tipos de critérios dão suporte a essa posição: critério morfofonológico, critério morfológico e critério semântico. Com relação ao inventário das vogais temáticas nominais no português, o estudo reconhece o comportamento singular, nos nomes da língua, que mostra a vogal /e/ ao ser comparada com as vogais /o, a/. Enquanto a vogal /e/ mescla dois papéis: vogal epentética e, de forma restrita, vogal temática, sem correlação com o gênero, as vogais /o, a/ legitimam-se sempre como vogais temáticas e compactuam com o gênero das palavras.

■ *PALAVRAS-CHAVE: Vogal temática. Classe dos nomes. Distribuição subjacente. Derivação e sua base. Morfofonologia do português*

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