

THE UNSTRESSED VOCALISM IN THE HISTORY OF PORTUGUESE

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- **ABSTRACT:** *In contemporary European Portuguese, mid vowel raising rule operates in all unstressed contexts: pretonic (p[i]gar [to take], t[u]car [to touch]) or posttonic (núm[i] r[u] [number], ár[v]u[r[i]] [tree], pel[i] [skin], pel[u] [fur]). In the case of the varieties of contemporary Brazilian Portuguese, this rule applies generally only to the vowels in posttonic final open syllables (pel[i] [skin], pel[u] [fur]) or in syllables locked by /S/ (Londr[i]s [London]); in the pretonic context, mid vowel raising is a variable rule in current Brazilian varieties, commonly conditioned by specific phonetic-phonological contexts (p[i]dido [request], c[u]stume [custom], [i]scola [school], [i]mprego [employment], d[i]sconto [discount]). In order to investigate the process of unstressed mid vowel raising throughout the history of Portuguese, this paper presents and compares data from the 13th, 15th and 16th centuries, that suggest the productivity of the raising rule in pretonic and posttonic vowels in these periods. These data, obtained by Fonte (2010a,b, 2014) based on a study of the orthographic practices in *Cantigas de Santa Maria* by Alfonso X, *Cancioneiro Geral* by Garcia de Resende and *Os Lusíadas* by Camões, indicate that, until the 16th century, at least, mid vowel raising was a variable rule, affecting relatively productive pretonic vowels, but still incipient for word-final posttonic vowels.*
- **KEYWORDS:** *Unstressed vowels. Vowel raising. Variation. History of Portuguese.*

Introduction

This paper aims to examine raising rule productivity in unstressed vowels of ancient Portuguese, by analyzing orthographic practices representing pretonic and word-final posttonic vowels in poetical texts from the 13th, 15th and 16th centuries.

According to Mateus and d'Andrade (2000), in contemporary European Portuguese (EP) (Lisbon standard variety), the productivity of unstressed (pretonic and word-final posttonic) vowels is commonly based on a raising and retraction rule which reduces a seven-vowel phonological system (/i, e, ε, a, ɔ, o, u/) in stressed position to a four-

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vowel system in unstressed positions: [i, i, e, u]. In EP, according to the authors, this is a general rule used in all unstressed contexts (e.g.: *p[ɛ]gar* [to pay], *p[i]gar* [to take], *t[u]car* [to touch], *cér[i]bro* [brain], *pér[u]la* [pearl], *leit[i]milk*, *jur[u]* [interest]), with very few lexically marked exceptions (e.g.: *p[a]deiro* [baker], *cr[ɛ]dor* [creditor], *end[e]usar* [to deify], *c[ɔ]rar* [to blush], *s[o]ltar* [to release], *sensív[ɛ]l* [sensitive]).

Contemporary Brazilian Portuguese (BP), for its part, presents different vowel systems in the majority of its varieties according to the unstressed vowel position: if the vowel is before (pretonic) or after (posttonic) the stressed syllable. Câmara Jr. (2007 [1970]) points out that it is a result of a gradual loss of distinctive opening features (neutralization)¹ following the weakening degree of the current BP syllables: tonic > pretonic > posttonic syllables. The author considers that a first neutralization between open-mid vowels (/ɛ, ɔ/) and close-mid vowels (/e, o/) reduces the seven-vowel phonological system (/i, e, ɛ, a, ɔ, o, u/) in the stressed position to a five-vowel system (/i, e, a, o, u/) in the pretonic position. In the final posttonic (the least prominent) context, Câmara Jr. (2007 [1970]) considers the occurrence of a neutralization between mid (/e, o/) and high vowels (/i, u/), and the system is reduced to only three phonemes (/i, a, u/).²

Therefore, in contemporary BP, according to this proposal, upper-mid vowels ([e,o]) occur in pretonic position (e.g.: *pegar* [to take], *morar* [to live]) and, despite the fact that, at the phonetic level, cases of pretonic mid vowel raising³ are common in Brazilian varieties (e.g.: *p[i]dido* [request], *c[u]stume* [custom], *[i]scola* [school], *[i]mprego* [imployment], *d[i]sconto* [discount]), the raising rule of unstressed vowel is general, in Brazil, only in the word-final posttonic position (e.g.: *pel[i]* [skin], *pel[u]* [fur]).⁴

¹ It is worth highlighting that it relates to a neutralization of the opposition, that is, of the distinction among vowels, and not an elimination of vowels in the passage from a (stressed) system to another (unstressed) system. And this explains why unstressed subsystems proposed by Câmara Jr. (2007 [1970]) also comprise current BP variation (including those lower and upper-mid vowels in pretonic position), as we will see below.

² In accordance with Câmara Jr. (2007 [1970]), in non-final posttonic position, the current PB vowels system comprises four phonemes: /i, e, a, u/. Then, when suggesting this system, Câmara Jr. (2007 [1970]) accepts neutralization for /u/, solely in back vowels. In front vowel series, the author states that neutralization does not apply in contemporary BP (standard variety of Rio de Janeiro), and two pronunciations occur: ([e] and [i]). Therefore, even though Câmara Jr. (2007 [1970], p.44) recognizes that it is difficult to find opposite minimal pairs between non-final posttonic [e] and [i] in current BP, the author adds both vowels in BP phonological framework, justifying that a raised posttonic vowel pronunciation for a word as *número* [number], for example, is unusual. Bisol (2003), for her part, based on the pronunciations from the Southern Region of Brazil (statistics by Vieira, 2002) and on the Autosegmental Phonology (especially Feature Geometry Model, by Clements and Hume, 1995), supports that current BP solely presents two subsystems for unstressed vowels (and not three, as Câmara Jr. 2007 [1970]) used to propose): a five-vowel set in pretonic position, and another three-vowel set in final unstressed position. In non-final posttonic context, according to Bisol's understanding (2003), there is a fluctuation between both subsystems (of five and three-vowel). This paper, which focus on the analysis of the unstressed vowels of ancient Portuguese, by considering Bisol's proposals (2003), focus on the positions that represent the two unstressed genuine subsystems of contemporary BP, that is, the pretonic and the word-final posttonic.

³ It is worth noting that, in some varieties of contemporary BP, the lowering of the pretonic mid vowel also occurs (e.g.: *R[ɛ]cife* [Recife], *s[ɔ]taque* [accent]). This paper, however, will not address this process, as it aims to analyze the raising phenomenon in the history of this language.

⁴ Bisol (2003) recognizes the existence of only three phonemes, in the framework of final unstressed vowels of contemporary BP, but reminds that the raised pronunciation ([i] and [u]) is not categorical in all Brazilian varieties. The author shows that Vieira's data (2002), for instance, reveal a resistance to the use of the raising rule, especially in front vowels, in some speeches of the southern region of Brazil (in Curitiba, for example, from 100 cases analyzed,

By noting these differences between European and Brazilian unstressed vocalism in contemporary Portuguese framework, some researchers consider the chance that the generalization of the raising rule in unstressed vowels of contemporary EP is somewhat recent: probably after the 16th century, as this rule was not transferred to Brazil along with the Portuguese vessels that arrived here from the 1500s on.

This hypothesis therefore suggests that contemporary BP (at least concerning the unstressed vocalism) would be closer to ancient Portuguese than to contemporary EP, as the raising rule in Brazil remains variable in some specific unstressed contexts. According to Marquilhas (2003), such raising rule first became generalized in EP in word-final posttonic vowels, exactly as in contemporary BP, and then it was spread to other unstressed positions.

To examine (stressed, pretonic and posttonic) vowel systems of ancient Portuguese, Fonte (2010a,b; 2014) mapped and analyzed rhymes and spelling of remaining poetical texts of Galician-Portuguese (13th century), Middle Portuguese (15th century) and Modern Portuguese (16th century). Particularly in relation to the unstressed vowels, by examining the corpus concerned the spellings involving mid and high vowels in pretonic and posttonic syllables, Fonte (2010a,b; 2014) took results that partly object Marquilhas' (2003) proposal, since they suggest that, at least up to 16th century, the vowel raising rule was more common in Portuguese pretonic vowels than in posttonic vowels, in general.

It is worth noting that, in studies focused on Portuguese unstressed vocalism, Teyssier (1994 [1980]) had already mentioned the lack of evidence on raising of word-final posttonic vowel before the 18th century in the history of the Portuguese language. Therefore, Fonte's data (2010a,b; 2014), while contesting Marquilhas' hypothesis (2003), support Teyssier's statement (1994 [1980]).

Given the information above, this study aims to present the data collected by Fonte (2010a,b; 2014), in order to: *i.* publish the findings of this research, which brings relevant information on the pronunciation of a past period of the Portuguese language that has left no oral registers; and *ii.* analyze the debate brought by the author, giving rise to speculations about the possible reasons that would have made the raising rule more common, in BP, among the word-final posttonic vowels than among the pretonic vowels – exactly the opposite of what probably occurred in the 16th-century Portuguese.

As there was no spelling system in ancient Portuguese imposed by the law, it was common to find spelling variations in the representation of a same word in the remaining writings of this period (e.g.: *egreja*, *eigreja*, *igreja* [church]). Based on this resource, Fonte (2010a,b; 2014), in a poetical corpus comprising *Cantigas de Santa Maria* (13th century) by Alfonso X, *Cancioneiro Geral* (15th century and beginning of the 16th century), by Garcia de Resende, and *Os Lusíadas* (16th century), by Camões, searched for all spelling variations between mid and high vowels in unstressed syllables (e.g.:

raising was found in 37 only). For Bisol (2003), Vieira's data (2002) support the thesis that the final unstressed raising, even being a general rule in most Brazilian varieties, shows itself, in some regions of Brazil, as a variable rule in the progress of becoming a general rule.

pedido ~ *pidido* [request], *costumes* ~ *custumes* [customs]; *sangue* ~ *sangui* [blood]). In addition to that, using the same corpus, the author also mapped all spelling (including invariable) representations for mid and high unstressed vowels unlike the contemporary spelling (e.g.: *pipino* [cucumber], *pulicia* [police]).

It is evident that one should not understand writing data as an accurate representation of speaking, as writing should not play the role of phonetic transcription. On the other hand, considering the lack of official spelling rules in the 13th, 15th and 16th centuries, one may say that scribes and composers of that time were free to represent, in writing, some particularities of the speech such as the mid vowel raising in unstressed vowels, for example. Based on these arguments, Fonte (2010a,b; 2014) understood the spelling representations of *Cantigas de Santa Maria*, *Cancioneiro Geral* and *Os Lusíadas* as clues of the speeches from the 13th, 15th and 16th centuries.

In relation to the corpus used by the researcher, one may say that it includes works representing different phases of the history of the Portuguese language (see CASTRO, 2008). *Cantigas de Santa Maria*, by Alfonso X, written in the second half of the 13th century, are a relevant testimony of Galician-Portuguese. In its turn, *Cancioneiro Geral* (1516), by Garcia de Resende, includes poems written throughout the 15th century and beginning of the 16th century by almost 300 poets and represents, within Fonte's corpus (2014), Middle Portuguese, a period in which there would have been a separation between the Galician, specific from the High North of the Iberian Peninsula (Galicia), and Portuguese languages.

At last, the epic work by Camões, *Os Lusíadas* (1572), consisting of 10 songs and 1102 stanzas, can be considered as a legitimate representative of Modern Portuguese not only for being iconic of Renaissance in Portugal, but (and primarily) for playing a decisive role in the history of Portuguese language, highly influencing the characterization of standard Portuguese; most especially in relation to the creation of our spelling (see Souza, 2009).

In the sections below, the findings reported by Fonte (2010a,b; 2014) are presented and discussed by analyzing the orthographic practices of these three poetical works in that they represent the unstressed vowels from the 13th, 15th and 16th centuries.

Pretonic vowels in the 13th, 15th and 16th centuries

We have already observed that, in contemporary EP, the (pretonic and posttonic) unstressed phonological system does not comprise mid vowels due to the actuation of a raising and retraction rule (except for few lexically marked cases).

In contemporary BP, although the phonological system (/i, e, a, o, u/) includes upper-mid vowels in the pretonic context, variationist studies developed in several regions of the country reveal that the realization of pretonic /e/ and /o/ as [i] and [u], respectively, is common in Brazilian varieties.

According to such studies, the vowel harmony process characterized by the influence of the high vowel (/i/ or /u/) of the stressed syllable is one of the primary triggers of the pretonic mid vowel raising in contemporary BP (e.g.: *p[i]dido* [request], *s[i]guro* [safe], *p[u]lícia* [police], *c[u]stume* [custom]). In addition, researches also point out that, by means of a process called vowel reduction, some consonants may condition the raising phenomenon of pretonic mid vowel in Brazilian varieties. In the studies focused on this topic, velar consonants, for example, are often referred to as a trigger of the pretonic vowels raising, both for front (e.g.: *p[i]queno* [small]), and back series (e.g.: *ç[u]lher* [spoon]). Specifically in regard to the back vowel (/o/), researches also assign pretonic vowel raising to the influence of adjacent labial consonants (e.g.: *b[u]neca* [doll], *m[u]leque* [brat]). Concerning the front vowel (/e/), coronal consonants (e.g.: *ç[i]roulas* [briefs]) are pointed out as a recurring trigger of the process. In relation to front vowels, raising also seems to be categorical in word-initial context in Brazilian varieties, especially in syllables closed by a sibilant (e.g.: *[i]scola* [school], *[i]special* [special]) or a nasal (e.g.: *[i]mprego* [employment], *[i]nsino* [teaching]) consonant, in vowel encounters (e.g.: *bob[i]ar* [to make mistake], *g[i]ada* [frost]) and in the initial syllable *des-* (e.g.: *d[i]saparecer* [to disappear], *d[i]sconto* [discount]).

In contemporary BP, pretonic mid vowel raising may be explained, in most of the cases, by the assimilation of adjacent segments, whether they are vowels or consonants. In vowels, for example, raising may be supported from the assimilation of opening features of the high vowel existing in the adjacent syllable. In consonants, the influence of labial and velar (dorsal) consonants in back vowels and the influence of coronals to front vowels series are supported by the fact that back vowels are labial and dorsal, and front vowels are coronal.

On the other hand, it should be highlighted that, in some varieties, the front mid vowel raising, which lacks the [dorsal] and the [labial] features, may occur before dorsal or labial consonant as well. Bisol (2009), for instance, reports data from Porto Alegre, in the Southern region of Brazil, where subsequent labial consonants triggered the raising of /e/, but did not influence the pronunciation of /o/, thus going against the initial hypothesis. In such cases, therefore, the process could not be supported from the sharing of features.

These and other inconsistencies lead Bisol (2009) to propose that vowel harmony is a typical assimilatory process, while vowel reduction, which is still weak in contemporary BP varieties, would present all characteristics of an authentic neutralization case as it changes a five-vowel subsystem into a three-vowel subsystem, such as happened in European Portuguese. According to the author, as vowel harmony is a regular process, conditioned by a specific phonetic-phonological context, it may be included in the neogrammarian assumptions. Vowel reduction, in its turn, would be considered a lexical diffusion process.

According to Bisol's proposal (2009), vowel harmony can be classified as a neogrammarian approach because pretonic vowel raising tends to be categorical in Brazilian varieties before high vowel in (stressed or unstressed) adjacent syllable.

However, according to Bisol (2009), vowel reduction does not depend on a specific phonetic-phonological context and it has been gradually spread in the language to incorporate new lexical items.

It is important to highlight, however, that pretonic vowel raising in both cases (vowel harmony and lexical diffusion) is a variable rule in contemporary BP. For that reason, even vowel harmony may not occur in certain contexts.

In order to obtain clues about the actuation of the raising rule in ancient Portuguese, Fonte (2010a,b; 2014) searched for signs of past pronunciations in the writing of *Cantigas de Santa Maria*, *Cancioneiro Geral* and *Os Lusíadas*.

The methodology adopted by the author, as already mentioned in this paper, was the mapping of all spelling variations between pretonic <e> and <i>, and <o> and <u> in the referred *corpora*. In addition to variation cases, Fonte's studies (2010a,b; 2014) also included data of mid and high pretonic vowels invariable spellings that are different from the contemporary ones.⁵

After collecting data, Fonte (2010a,b; 2014) organized them according to the phonetic-phonological context involved in the supposed raising of the pretonic mid vowel. Considering the contexts that benefit raising in contemporary BP, when arranging the data, the author considered the following criteria:

- the high vowel influence (/i/ or /u/) of the stressed syllable (vowel harmony process);
- the assimilation to the high (/i/ or /u/) unstressed subsequent vowel;
- the influence of the adjacent consonant (vowel reduction process).

Particularly in relation to the vowel reduction, based on articulation points of consonants (C Point) proposed by the Features Geometry Model of Clements and Hume

⁵ One should note that, among the (variable or not) spellings that are different from the contemporary (official) spelling, in the representation of pretonic vowels of ancient Portuguese registered by Fonte (2010a,b; 2014), there were: *i*. cases in which such pretonic vowel, in the contemporary language spelling, is represented by <e> or <o> (e.g.: *pipino* [cucumber], *pulicia* [police]); and *ii*. cases in which such pretonic vowel is represented by <i> or <u> (e.g.: *fegura* [figure], *vezinho* [neighbor], *fogir* [to escape], *somir* [to disappear]). When consulting the etymology of words with different spelling from the contemporary one, Fonte (2010a,b; 2014) attested that, among the cases in which a pretonic vowel in contemporary Portuguese is high, but it represented by a mid vowel in ancient Portuguese, in some data, such mid vowel was an etymological vowel (e.g.: *fegura* < *fīgūrā* [figure], *fogir* < *fīgĕre* [to escape]); and in other cases, it was not (*vezinho* < *vīcīnus* [neighbor], *somir* < *sūmĕre* [to disappear]). Such data, written with a high vowel in contemporary Portuguese, but written with an etymological mid vowel, in the *corpora* analyzed by Fonte (2010a,b; 2014), were understood by the author as changes in the language history, in which the phonetic variant (e.g.: *figura*, *fugir*), with a high vowel resulting from the use of the raising rule, has replaced the variant with etymological mid vowel (e.g.: *fegura*, *fogir*) in Portuguese phonological and spelling system. On the other hand, data written with non-etymological mid vowel, in past poetical spellings, were understood by Fonte (2010a,b; 2014) as hypercorrection: before a recurrent phonetic variation, the one who wrote <e> or <o> (e.g.: *vezinho*, *somir*), instead of an etymological <i> or <u> (e.g.: *vizinho*, *sumir*), would have believed that he registered the etymological variant, not the phonetic one. In order not to exceed the appropriate limits, this paper will only prioritize Fonte's data (2010a,b; 2014) written in the referred *corpora* with pretonic <i> or <u> instead of etymological <e> or <o> and that did not change over the history of the language, that is, the variation cases still remaining in many contemporary BP varieties (e.g.: *pipino* [cucumber], *pulicia* [police]).

(1995), data were arranged as *coronal*, *dorsal* and *labial* features of adjacent consonants. It must be highlighted that dental, alveolar, palato-alveolar and palatal consonants present [coronal] feature.⁶ [Labial] feature is shared by bilabial and labiodental consonants. Finally, [dorsal] feature is present in velar consonants.

In addition, when arranging her data, Fonte (2010a,b; 2014) also considered variation that included word-initial pretonic vowels. Still on the front vowels ([e] and [i]), the data beginning by unstressed syllable (prefix or not) *des-* were also worth of Fonte's attention.

The results obtained by Fonte (2010a,b; 2014) can be checked in the items below, related to each of the *corpora* analyzed.

Pretonic mid vowel raising in the spelling of *Cantigas de Santa Maria*

In 420 *Cantigas de Santa Maria*, which correspond to the religious side of the troubadour lyric, Fonte (2010a,b; 2014) found cases of spelling variation in mid and high pretonic vowels, which the author attested as signs of phonetic variation containing vowel raising in the 13th century Portuguese.

Phonetic-phonological contexts engaged in the variation found by Fonte (2010a,b; 2014) for Galician-Portuguese are equivalent to contexts responsible for the pretonic mid vowel raising in contemporary BP varieties.

One of the recurring contexts in the variation mapped by Fonte (2010a,b; 2014) in *Cantigas de Santa Maria* was the high vowel in the stressed syllable. The examples below present the productivity of vowel harmony in the raising of front (01) and back (2) pretonic vowels in Galician-Portuguese:⁷

(01)

<i>comedir</i> (CSM 115, 126, 143, 154, 295, 401)	<i>comidir</i> (CSM 423)	[to moderate]
<i>consentir</i> (CSM 14, 64)	<i>consintir</i> (CSM 281)	[to consent]
<i>ferir</i> (CSM 12, 31, 35, 47, 239)	<i>firir</i> (CSM 31 <i>To</i> , 59 <i>To</i> , 63 <i>To</i>)	[to hurt]

⁶ In general, researches include palatal consonants among the segments presenting [coronal] feature (see MATZENAUER, 2005, p.22), although Chomsky and Halle have not attributed such feature to palatal sounds.

⁷ In this section, in each set of examples, data are arranged as follows: first, the verbs in alphabetical order, and then the non-verbs, also in alphabetical order.

<i>pedir</i> (CSM 21, 22, 44, 64, 98)	<i>pidir</i> (CSM 44 <i>To</i> , 98 <i>To</i> , 401)	[to ask]
<i>repentir</i> “arrepender-se” (CSM 10, 94, 204, 390)	<i>repintir</i> (CSM 98 <i>To</i>)	[to repent]
<i>crerezia</i> “clerezia” (CSM 11, 115, 125, 208, 253, 405)	<i>crerizia</i> (CSM 66, 285)	[clergy]
<i>eregia</i> “heresia” (CSM 15 <i>T</i> , 18)	<i>erigia</i> (CSM 15 <i>E</i> , <i>To</i>)	[heresy]
<i>ferida</i> (CSM 15, 22, 28, 35, 38, 84, 141, 159)	<i>firida</i> (CSM 28 <i>To</i> , 63 <i>To</i> , 84 <i>To</i>)	[wound]
<i>menina</i> (CSM 79, 84, 94, 122, 132, 133, 180 <i>T</i> , 195, 378)	<i>minina</i> (CSM 180, 317, 285, 321)	[girl]
<i>menino</i> (CSM 4, 5, 6, 21, 23, 53 <i>T</i> , 138 <i>T</i> , 215, 269, 378)	<i>minino</i> (CSM 53, 115, 149, 323, 393, 403, 406)	[boy]

(02)

<i>descobrir</i> (CSM 93, 97, 115, 131, 149, 151, 159, 299, 316, 404, 405, 410)	<i>descubrir</i> (CSM 316 <i>F</i>)	[to discover]
<i>nozir</i> “prejudicar” (CSM 109, 134, 193)	<i>nuzir</i> (CSM 5, 190)	[to harm]

The variations listed in (01) and (02) may be explained by the assimilation to the opening feature of the adjacent high stressed vowel. In both cases, the high stressed vowel corresponds to a front (/i/), and not back (/u/) vowel. According to Bisol (2013), /i/ is also more productive than /u/ in cases of pretonic mid vowel raising in contemporary BP, once the front high vowel is responsible for the raising of both /e/ and /o/ in Brazilian varieties, while /u/ is more active as a trigger in the raising of /o/. Therefore, one may consider a similarity between the 13th century and the contemporary BP data, as the

previous examples reported /i/ influence to raise both /e/ and /o/ in Galician-Portuguese, but they did not bring any mid vowel raising conditioned by the back high vowel (/u/).

The front high vowel in the adjacent unstressed syllable also raised the pretonic mid vowel:

(03)

<i>arcediⁱago</i> (CSM 202 <i>F</i> , 204)	<i>arcedi^uago</i> (CSM 202)	[archdeacon]
<i>aveziⁱmao</i> “infeliz” (CSM 346)	<i>avizi^umao</i> (CSM 127, 329)	[unhappy]
<i>nemiⁱgalla</i> “nada” (CSM 65, 95, 117, 132, 178)	<i>nimi^ugalla</i> (CSM 65 <i>To</i> , 75 <i>E</i> , <i>To</i> ; 253 <i>E</i>)	[nothing]
<i>pepiⁱon</i> “antiga moeda de Castela” (CSM 85 <i>T</i> , 102, 145, 305)	<i>pipi^uon</i> (CSM 85 <i>E</i>)	[Old currency in Castile]
<i>petiⁱçon</i> “petição, pedido” (CSM 146, 265, 305, 386, 401)	<i>piti^uçon</i> (CSM 146 <i>T</i> , 401 <i>To</i>)	[petition/request]
<i>preguiⁱçoso</i> (CSM 37, 69, 171)	<i>prigui^uçoso</i> (CSM 363)	[lazy]

In these cases, raising may also be supported by the spread of the height node of the high vowel in the subsequent syllable to the target. Based on contemporary BP data, Bisol (1981) states that high vowel tonicity is relevant in vowel harmony process, but it is not a decisive factor. According to the author, in varieties of southern region of Brazil, for instance, there are occurrences of vowel harmony conditioned by the subsequent unstressed high vowel (e.g.: *perdigão* [partridge], *procissão* [procession]). The data presented above indicate that such principle also applies to the cases of vowel harmony of Galician-Portuguese, as the high vowel of the unstressed syllable also triggered the raising of pretonic vowels in the 13th century.

Consonantal segments also seem to have influenced some of the vowel raising cases registered by Fonte (2010a,b; 2014). Examples (04) and (05) below focus respectively on front and back mid vowels and prove such influence by the adjacent consonant on variation of the 13th century:

(04)

pennor “penhor”
(CSM 25, 62, 305, 369)

pinnor
(CSM 62 *T*, *To*)

[pledge]

(05)

jogar
(CSM 6, 42, 136, 154,
156, 163, 254, 401)

jugar
(CSM 174 *E*)

[to play]

çoberto
(CSM 28, 69, 154, 208, 318, 406)

cuberto
(CSM 65, 208 *F*)

[covered]

encoberto
(CSM 401 *To*)

encuberto
(CSM 194, 401)

[covered]

In the variation indicated in (04), palatal consonant ([ɲ]) follows the raised mid vowel. In this case, if we consider that [i] is more coronal than [e] from the phonetic perspective, raising may be supported by the spread of the [coronal] feature (of the palatal consonant) to the (front) pretonic vowel of the subsequent syllable.

In (05), velar (/k, g/) consonants are involved in the reduction process. In these cases, it would not be difficult to justify the pretonic vowel raising by the assimilation to the [dorsal] feature of the adjacent consonant, considering that [u] is phonetically more dorsal than [o].

In general, the analysis of the spelling variation cases presented in this subsection allow us to infer that the pretonic mid vowel raising occurred in the 13th century demonstrates that the rule was primarily conditioned by the assimilation to the opening feature of the (stressed or unstressed) high vowel of the adjacent syllable.

Pretonic mid vowel raising in the spelling of *Cancioneiro Geral*

After a century and a half of troubadour lyric, poetry disappeared from the Portuguese writings up to the 16th century, when Garcia de Resende decided to collect poetic texts produced throughout the 15th century and beginning of 16th century in his *Cancioneiro Geral*, published in 1516. This initiative is responsible for attesting the poetic production of Portugal in the 15th century. It is important to highlight that there is no document that attest Portuguese poetic production in the 14th century.

Fonte (2014) presented a phonological framework of Portuguese vowels by observing successive periods of the language, beginning from the first one (troubador

verse). After analyzing the use of vowels in medieval religious cantigas, the author adopted, as a corpus, the next poetic work in the chronological axis of Portuguese poetry, i.e., the *Cancioneiro Geral*, by Resende.

In data from the 15th and early 16th centuries, Fonte (2014) found traces of pretonic mid vowel raising. However, according to the author, and unlike what occurs in the contemporary century, there were more cases of spelling variation or invariable spelling in the representation of pretonic mid and high vowels, in the *Cancioneiro Geral* than in Alfonso X's cantigas. On the other hand, although the number of cases has increased, in relation to the corpus of the previous period, the raising rule continues to be supported in the majority of the data by the influence of the adjacent segment.

In Middle Portuguese, the high stressed vowel remains a recurring context in raising of pretonic mid vowels, as Fonte's data (2014) point out. In the examples below, front (06) and back (07) high vowels are found in the stressed syllable following the raised (front) pretonic vowel:⁸

(06)

<i>espedio</i> "despediu" (p.48, III)	<i>espidio</i> (p.90, III)	[she/he dismissed]
<i>pedir</i> (p.149, I; p.371, 458, II; p.77, 288, 314, III; p.28, 71, 85, 86, 112, 159, 203, 221, 236, 245, 256, 286, 311, 313, 327, 336, IV)	<i>pidir</i> (p.235, 299, 301, 305, II; 178, IV)	[to ask]
<i>queria</i> (p.141, 143, 144, I; p.458, II; p.87, 213, 231, 313, 348, III; p.105, 115, 137, 138, 158, 176, 192, 229, 235, 243, 249, 290, 303, 318, IV)	<i>quiria</i> (p.214, 245, II)	[he/it wanted]
<i>seguir</i> (p.74, 76, 92, 94, 154, I; p.311, 390, 398, II; p.161, 212, III; p.18, 30, 54, 70, 124, 136, 151, 218, 287, IV)	<i>siguir</i> (p.487, I; 243, II; 88, 91, 100, III)	[to follow]

⁸ In Middle and Modern Portuguese data, in addition to the variable spellings, there are many invariable spellings, unlike the occurrences in the contemporary century. For this reason, the examples of this and the subsequent section were also arranged based on this variation criterion: after separating the different parts of speech (verb and non-verb), the variant data, which come first, were separated, in each part of speech, from the invariant data, which come at last. This arrangement applies to all examples showed in this in the next section, except for cases of vowel reduction, whose division, as we will see below, will consider the type of consonant involved (coronal, labial or dorsal) and its position in relation to the vowel (before or after), in addition to the criteria already referred.

<p style="text-align: center;"><i>sentir</i></p> <p>(p.75, 77, 80, 84, 105, 132, 141, 143, 145, 150, I; p.63, 68, 170, 174, 234, 248, 350, 357, 373, 412, 417, 448, 463, 468, II; p.7, 13, 42, 58, 63, 114, 117, 123, 124, 131, 144, 149, 164, 183, 193, 211, 290, 301, 352, III; p.3, 12, 15, 16, 36, 42, 58, 82, 87, 92, 95, 105, 113, 117, 122, 130, 143, 147, 233, 236, 245, 253, 290, 297, 302, 319, 321, IV)</p>	<p style="text-align: center;"><i>sintir</i></p> <p>(p.180, I; p.65, 68, 131, 170, 211, 223, 228, 235, 244, 245, 256, 346, II)</p>	<p>[to feel]</p>
<p style="text-align: center;"><i>servir</i></p> <p>(p.14, 80, 81, 85, 92, 93, 121, 141, 143, I; p.417, II; p.163, 176, 191, 213, 277, 287, 290, 304, III; p.26, 34, 81, 84, 86, 117, 119, 124, 130, 156, 159, 192, 230, 234, 236, 245, 248, 256, 264, 279, 285, 287, 292, 294, 299, 301, 321, 327, IV)</p>	<p style="text-align: center;"><i>sirvir</i></p> <p>(p.488, I)</p>	<p>[to serve]</p>
<p style="text-align: center;"><i>escrivir</i> (p.305, II)</p>		<p>[I wrote]</p>
<p style="text-align: center;"><i>escrivira</i> (p.416, II)</p>		<p>[I wrote]</p>
<p style="text-align: center;"><i>impedir</i> (p.416, II)</p>		<p>[to prevent]</p>
<p style="text-align: center;"><i>repetir</i> (p.50, II)</p>		<p>[to repeat]</p>
<p style="text-align: center;"><i>enliços</i> (p.214, I)</p>	<p style="text-align: center;"><i>inliço</i> (p.214, I)</p>	<p>[tangle]</p>
<p style="text-align: center;"><i>esprito</i> (p.63, 268, 272, 405, II; p.108, 111, 151, 172, 336, IV)</p>	<p style="text-align: center;"><i>Isprito</i> (p.211, IV)</p>	<p>[spirit]</p>
<p style="text-align: center;"><i>fantesia</i> (p.19, 303, 383, 401, 436, I; p.56, 144, 174, 177, 221, 235, 238, 318, 325, 333, 344, 367, 410, 418, 443, 451, 454, 472, II; p.14, 118, 122, 147, 160, 169, 231, 232, 241, 255, III; p.6, 21, 57, 91, 129, 213, 243, 294, 336, IV)</p>	<p style="text-align: center;"><i>fantisia</i> (p.156, IV)</p>	<p>[fantasy]</p>
<p style="text-align: center;"><i>mediada</i> (p.18, 27, 46, 300, 325, 339, IV)</p>	<p style="text-align: center;"><i>midida</i> (p.211, II)</p>	<p>[measure]</p>
<p style="text-align: center;"><i>menina</i> (p.78, 302, IV)</p>	<p style="text-align: center;"><i>mininas</i> (p.128, III)</p>	<p>[girls]</p>

mentira (p.67, 205, 298, 435, I; 17, 52, 452, 454, II; p.3, 24, III; p.136, 335, IV) *mintiras* (p.203, III; p.104, IV) [lies]

metido (p.62, 88, I; p.413, II; p.4, 355, 381, III; p.179, IV) *mitido* (p.270, II) [involved]

mezquinho (p.215, III; p.163, 276, IV) *mizquinho* (p.272, I) [stingy]
mezquinhos (p.204, I)

pedido (p.95, I; p.347, III) *pidido* (p.272, II) [request]

pedidos (p.161, I; p.51, IV) *pididos* (p.222, IV) [requests]

sentidos (p.154, I; p.245, 246, II; p.63, 99, III; p.46, 246, 253, 255, IV) *sintidos* (p.210, II) [senses]

biliz “beliz” (p.222, IV) [wily]

bixigas (p.179, I) [bladders]

mindigo (p.214, IV) [beggar]

pipino (p.309, II) [cucumber]

repitida (p.219, II) [repeated]

siguinte (p.301, II) [following]

(07)

mesura (p.184, I; p.233, 260, IV) *misura* (p.320, I) [curtsy]

progenitura (p.355, II) *proginitura* (p.378, II) [progeny]

vestiduras (p.101, III) *vistidura* (p.365, III) [vesture]

Concerning the pretonic back vowel, in the *Cancioneiro* by Resende, raising cases including front (08) and back (09) high vowel of the stressed syllable were also reported:

(08)

<i>encobr̃ir</i> (p.81, 152, 429, I; p.50, 412, 436, 438, II; p.11, 21, 131, 158, 163, 167, III; p.12, 28, 52, 249, 295, IV)	<i>encubr̃ir</i> (p.183, III; p.96, IV)	[to cover]
	<i>chuvia</i> (p.424, II)	[it was raining]
	<i>pussuir</i> (p.324, I)	[to possess]
<i>cor̃isco</i> (p.209, II)	<i>cur̃iscos</i> (p.220, 317, I)	[spark]
<i>foc̃inho</i> (p.212, 258, I)	<i>fuc̃inhos</i> (p.220, III)	[snout]
	<i>dur̃ido</i> (p.250, II)	[sore]
	<i>lijuñjaria</i> “lisonjaria” (p.237, II)	[flattery]
	<i>pul̃icia</i> (p.209, I)	[police]
	<i>assuṽios</i> (p.106, I)	[whistles]

(09)

<i>cobert̃ura</i> (p.183, 259, I)	<i>cubert̃ura</i> (p.239, III)	[covering]
<i>cost̃umes</i> (p.79, III)	<i>cust̃umes</i> (p.283, 391, II; p.120, IV)	[customs]
<i>doç̃uras</i> (p.318, 357, II)	<i>duç̃ura</i> (p.310, 315, 359, I; p.16, II; p.270, III; p.191, IV) <i>duç̃uras</i> (p.85, I; p.26, 120, III)	[sweetness]

<i>fortuna</i> (p.169, 322, 323, 324, 350, 422, I; p.215, 227, 253, 266, 391, 430, 437, II; p.4, 6, 12, 68, 89, 186, III; p.54, 106, 252, 302, IV)	<i>furtuna</i> (p.76, II; p.182, 252, IV)	[fortune]
<i>monturo</i> (p.208, I)	<i>munuro</i> (p.309, II)	[dump]
<i>budum</i> (p.309, II)		[stink]
<i>apustura</i> “compostura” (p.251, II)		[composure]
<i>cumpustura</i> (p.133, I)		[composure]
<i>rebuludo</i> (p.337, IV)		[plump]

As we may note, in cases of vowel harmony of Middle Portuguese, unlike what was found for Galician-Portuguese, both front (/i/) and back high vowel (/u/) acted like a trigger to the process.

In the unstressed syllable, in the data of *Cancioneiro Geral*, according to Fonte (2014), the front high vowel favors the raising of front mid vowels (10), and the back high vowel influences the raising of back mid vowels (11):

(10)

<i>competidor</i> (p.155, III)	<i>compitidor</i> (p.24, II)	[competitor]
<i>mentirosos</i> (p.76, III)	<i>minitiroso</i> (p.410, II)	[liar]
<i>nemigalha</i> “nada” (p.306, 435, 473, I; p.34, 38, II; p.32, 214, 288, III; p.90, 170, IV)	<i>nimigalha</i> (p.193, IV)	[nothing]
<i>sentimento</i> (p.93, 101, I; p.36, III)	<i>sintimento</i> (p.234, II) <i>sintimentos</i> (p.246, II;)	[feeling]
<i>cirimonía</i> (p.218, II)		[ceremony]

<i>cermonias</i> (p.429, II)	[ceremonies]
<i>dilicada</i> (p.191, IV)	[delicate]
<i>dirivados</i> (p.212, I)	[derivative]
<i>livianas</i> (p.446, II)	[frivolous]
<i>livindade</i> (p.63, III)	[levity]
<i>mixilhão</i> (p.473, I)	[mussel]
<i>mixilhoa</i> “mexerico” (p.201, III)	[gossip]
<i>persiguidores</i> (p.240, II)	[persecutors]
<i>anticiparam</i> (p.70, III)	[they anticipated]
<i>entristicer</i> (p.107, IV)	[to sadden]
<i>vivirá</i> (p.271, I)	[she will live]
<i>vivirei</i> (p.79, 339, II; p.93, 119, IV)	[I will live]
<i>vivireis</i> (p.85, III)	[you will live]

(11)

<i>procurar</i> (p.68, I)	<i>prucurar</i> (p.40, I)	[to search]
<i>acustumar</i> (p.101, III)		[to accustom]
<i>custumar</i> (p.402, III; p.266, IV)		[to custom]
<i>cogumelos</i> (p.337, IV)	<i>cugumelo</i> (p.273, IV)	[mushroom]
<i>costumado</i> (p.389, III)	<i>acustumado</i> (p.128, II)	[accustomed]
<i>portugueses</i> (p.198, II)	<i>prtugues</i> (p.235, III)	[Portuguese]
<i>acustumada</i> (p.191, IV)		[accustomed]
<i>cumunal</i> (p.124, III)		[communal]
<i>custureiro</i> (p.45, II)		[couturier]
<i>custureiros</i> (p.222, III)		[couturiers]
<i>custumada</i> (p.236, II)		[accustomed]
<i>desacustumada</i> (p.128, II)		[unaccustomed]

With regard to the data presented in (10) and (11), it is worth noting that, in many of these examples, the raising of the pretonic mid vowel may be a result of other (verbal or nominal) paradigms, as in *m[i]ntiroso* [liar], *comp[i]tidor* [competitor], *s[i]ntimento* [feeling] and *pers[i]guidores* [persecutors], among the front vowels, in which the raising may be associated to the pronunciation of these vowels (which are also raised) in verbal tenses *m[i]ntir* [to liar], *comp[i]tir* [to compete], *s[i]ntir* [to feel] and *pers[i]guir* [to persecute] (all of them with high vowel in the stressed syllable), or among back vowels, in *pr[u]curar* [to search], *ac[u]stumar* [to accustom] and derivatives, in which high pretonic vowel may be a sign of raising in nominal forms such as *pr[u]cura* [search] and *c[u]stume* [custom] (also with a stressed high vowel).

In word-initial position, the front mid vowel was raised in the spelling of *Cancioneiro Geral* in syllables closed by nasal (12) or sibilant (13) consonants:

(12)

<i>envidar</i> (p.315, III; p.284, IV)	<i>invidar</i> (p.336, III)	[to make]
<i>insinar</i> (p.364, I)		[to teach]

(13)

<i>istenso</i> “extenso” (p.267, II)	[extensive]
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Fonte (2014) also registered a case of spelling variation in *Cancioneiro Geral* including the pretonic front vowel of the prefix *des-*:

(14)

<i>desfavores</i> (p.106, 122, 124, 153, I; p.82, 122, 161, IV)	<i>disfavores</i> (p.99, 106, I)	[disfavor]
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At last, adjacent consonants demonstrated an expressive context in data of Middle Portuguese: the number of cases of mid vowel raising associated to the vowel reduction process in data of the 15th and the early 16th centuries is considerably higher than the one registered in the cantigas of the 13th century. In the examples listed in (15) and (16), consonantal segments are involved in raising cases of front and back pretonic vowels, respectively:⁹

⁹ As previously mentioned in this paper, the arrangement of the examples related to the vowel reduction process considered, overall, the place of articulation of the consonant (coronal, labial or dorsal) and its position regarding the raised vowel. At first, examples were classified by the consonant type and listed according to the following order: coronal, labial and dorsal. Then, within each group, data were divided according to the consonant position in relation

(15)

<i>ensandecer</i> (p.20, I; 174, III; p.59, 297, IV)	<i>ensandicer</i> (p.31, I)	[to go mad]
<i>bocijar</i> (p.71, I)		[to yawn]
<i>divera</i> “deveria” (p.13, 185, II; 104, III)		[I should]
<i>sequer</i> (p.24, 308, 400, I; 19, 88, II)	<i>siquer</i> (p.202, III)	[not even]
<i>caçireiro</i> “carcereiro” (p.99, IV)		[prison officer]
<i>liam</i> (p.318, II; p.398, III; p.169, IV)		[lion]
<i>lião</i> (p.376, 380, 382, 387, 388, 389, 467, II)		[lion]
<i>lioa</i> (p.282, III; p.331, IV)		[lioness]
<i>liões</i> (p.302, 378, 379, 381, I)		[lions]
<i>liões</i> (p.334, IV)		[lions]
<i>liões</i> (p.327, I)		[lions]
<i>liões</i> (p.150, IV)		[lions]
<i>lionado</i> (p.84, IV)		[tawny]
<i>melhor</i> (p.161, 324, 470, I; p.140, 195, 196, 228, 354, 419, 421, 422, 429, II; p.24, 29, 189, 237, 272, III; p.7, 8, 13, 286, 289, 296, 309, 327, 331, IV)	<i>milhor</i> (p.21, 34, 63, 105, 124, 125, 141, 169, 174, 181, 182, 190, 205, 221, 280, 282, 285, 367, 380, 382, 391, 417, 418, 424, 426, 472, 473, 488, 489, I; p.12, 39, 53, 79, 149, 170, 186, 187, 190, 192, 218, 244, 247, 267, 312, 329, 346, 350, 356, 459, 472, II; p.26, 51, 90, 103, 108, 118, 129, 137, 143, 151, 164, 169, 174, 177, 178, 206, 217, 236, 251, 281, 294, 314, 318, 326, 351, 359, 368, 384, 392, III; p.11, 31, 91, 94, 101, 102, 103, 123, 136, 167, 169, 225, 242, 243, 280, 296, IV)	[better/best]
<i>melhores</i> (p.150, 461, 469, I)	<i>milhores</i> (p.174, I; p.314, II; p.356, III)	[better/best]

to each raised pretonic vowel: first the examples with consonant before the vowel; then the examples in which the consonant is in the adjacent syllable. After this division, the arrangement follows the same criterion adopted for the other examples demonstrated in this section: verbs and non-verbs, variable and invariable words and, finally, alphabetical order.

<i>rendeiro</i> (p.370, II; p.377, III)	<i>rindeiros</i> (p.233, III)	[who receives income]
<i>bisouro</i> (p.338, IV)		[beetle]
<i>Marichal</i> (p.29, 259, III)		[marshal]
<i>ninhū</i> (p.376, III)		[none]
<i>pineira</i> “peneira” (p.435, I)		[sieve]
<i>pirnalta</i> (p.366, III)		[leggy]

(16)

<i>joelhos</i> (p.493, I)	<i>juelhos</i> (p.35, II)	[knees]
<i>fogueira</i> (p.382-383, III)	<i>fogueiras</i> (p.330, I)	[bonfire]
<i>muela</i> (p.110, 198, III)		[gizzard]
<i>pumar</i> (p.294, I)		[orchard]
<i>coitado</i> (p.104, 146, I)	<i>cuitado</i> (p.200, II)	[suffering]
<i>cuberta</i> (p.174, 192, 271, I; p.224, III)		[covered]
<i>cubertas</i> (p.345, I; p.32, 247, 397, II)		[covered]
<i>cuberto</i> (p.167, 347, I; p.42, 249, 406, II)		[covered]
<i>cubeertos</i> (p.275, IV)		[covered]
<i>cubertos</i> (p.332, II; p. 97, III)		[covered]
<i>descuberta</i> (p.371, 385, I; 326, 438, II; p.45, IV)		[uncovered]
<i>descubertas</i> (p.345, 405, I; p.217, II; p.74, III)		[uncovered]
<i>descuberto</i> (p.81, 213, 400, I; p.136, 436, 461, II; p.361, III; p.12, 52, 153, IV)		[uncovered]
<i>descubertos</i> (p.332, II)		[uncovered]
<i>encuberta</i> (p.350, 371, I; p.150, II; p.59, IV)		[covered]
<i>encubertas</i> (p.153, I; p.136, 146, II)		[covered]
<i>encuberto</i> (p.143, 286, 296, I; p.189, II)		[covered]
<i>encubertos</i> (p.326, II; p.18, III; p.114, IV)		[covered]

<i>regurosos</i> “rigoroso” (p.419, I)	[rigorous]
<i>jugar</i> “jogar” (p.149, 150, 169, 170, 297, 303, I; 452, II; p.18, 78, 329, III; p.3, 172, IV)	[to play]
<i>jugatar</i> (p.301, I)	[to joke]
<i>juguetar</i> (p.382, III)	[to joke]
<i>jugador</i> (p.18, III)	[player]
<i>jugadores</i> (p.311, I)	[players]
<i>juguetador</i> (p.298, I)	[joker]
<i>juguetas</i> (p.83, IV)	[joker]

The examples listed in (15) present occurrences of front mid vowel raising in the pretonic syllable. In these data, the raised pretonic vowel is preceded or followed by a coronal consonant that may have conditioned the raising rule.

The examples pointed out in (16) highlight the recurrence of labial and dorsal consonants in several raising cases of back pretonic mid vowels. These cases can be motivated by the assimilation of [labial] and [dorsal] features of such consonants, considering, for example, that [u] is phonetically more labial and dorsal than [o]. Among these data, only the variation *joelhos* ~ *juehos* cannot be explained by the assimilation to the feature of the (palatal) adjacent consonant, as back vowels do not present [coronal] feature. On the other hand, we could associate pretonic mid vowel raising to the fact that palatal (as well as velar) consonants are produced in a higher point in the mouth cavity. However, the problem is that this assimilation could not be represented by the Feature Geometry Model, as it does not comprise the opening feature of consonantal segments. The vowel encounter context could also be brought into question to support pretonic mid vowel raising, since such context is also productive in raising cases of contemporary BP. Even so, we could not say that it is an assimilation case. Therefore, these are cases supporting Bisol’s proposal (2009) that the vowel reduction process would be more associated to neutralization rather than assimilation, which has been already mentioned in this paper.

Vowel raising in Middle Portuguese was conditioned by both processes: harmony and reduction. When we match the results of the two periods considered, we find an increase of the passage from Galician-Portuguese to Middle Portuguese in cases including productivity of consonantal contexts, which were as expressive as those regarding high vowel of the (stressed or unstressed) adjacent syllable, among the data of the 15th and the early 16th centuries. Although most of these cases may be justified by the assimilation to the features of the involved consonants, we understand, as Bisol (2009), that the vowel reduction process, unlike harmony, is closer to a neutralization rule – reducing the system from five to three vowels –, than to a rule of feature assimilation. The comparison between data of the two periods analyzed so far suggests

a development of this reduction work of the pretonic vowel system in the history of the language as there has been a relevant increase in the passage from a period to another in vowel raising of pretonic mid vowels followed by a consonant.

Pretonic mid vowel raising in the spelling of *Os Lusíadas*

To provide data on Modern Portuguese, Fonte (2014) selected Camões' masterwork, a classic of Portuguese Literature and an icon of Renaissance in Portugal: *Os Lusíadas* [*The Lusíads*].

This third moment, in the chronological axis of the history of Portuguese language, also brings evidence of raising rule productivity in pretonic mid vowels of that time. The phonetic-phonological contexts involved in the cases documented by Fonte (2014) in Camões' epic work are similar to those registered for the previous periods.

The high stressed vowel was identified as a recurring context among raising cases of front and back pretonic mid vowel. In (17), there is a front high stressed vowel in the subsequent syllable of the (raised) pretonic vowel, which is also a front vowel:

(17)

<p><i>sentir</i> (I-15; II-15, 66; III-65, 66, 141; IV-14, 29, 36; V-58, VI-31, 36; VIII-35, 58; IX-48; X-12, 33, 36, 48)</p>	<p><i>sintir</i> (V-52)</p>	<p>[to feel]</p>
	<p><i>diffrir</i> (I-30; VIII-80)</p>	<p>[to differ]</p>
<p><i>devida</i> (I-56)</p>	<p><i>divido</i> (III-1; VI-55)</p>	<p>[due]</p>
<p><i>embebidos</i> (X-24)</p>	<p><i>embibidos</i> (V-90)</p>	<p>[soaked]</p>
<p><i>perigo</i> (I-43; II-14, 27, 28, 30, 44; III-21; IV-8, 29, 80, 101; V-43; VII-2, 39; VIII-48, 85)</p>	<p><i>pirigos</i> (VIII-89)</p>	<p>[danger]</p>
<p><i>Sevilha</i> (III-75; VIII-24)</p>	<p><i>Sivilha</i> (IV-46)</p>	<p>[Seville]</p>

<i>gingivas</i> (V-81)	[gums]
<i>minina</i> (III-134; IV-3)	[girl]
<i>minino</i> (II-36, 43; III-125; IV-92; IX-30, 35)	[boy]
<i>niquicia</i> “nequícia” (VIII-65)	[malice]
<i>Apinino</i> “Apenino” (III-15)	[Apennines]
<i>Cyfsia</i> “cefisio” (IX-60)	[Cephissian]
<i>Cizimbra</i> “Sesimbra” (III-65)	[Sesimbra]
<i>Hircinia</i> “Hercínia” (III-11)	[Hercynian]

Among the cases of back mid vowel raising registered by Fonte (2014) on the spelling of *Os Lusíadas*, front (18) and back (19) high stressed vowels are also relevant contexts:

(18)

<i>descobrir</i> (I-43, 103; IV-6; V-4, 44; VIII-70, 71, 72; IX-40, 69, 86; X-52, 140)	<i>descubrîr</i> (V-25; VI-26)	[to discover]
<i>sorrîr</i> (V-35)	<i>surrîr</i> (IX-70)	[to smile]
<i>cubrîr</i> (II-15; VII-37)		[to cover]
<i>engulîr</i> (VI-97)		[to swallow]
<i>cobiça</i> (VII-2, 11; VIII-59, 77; IX-93)	<i>cubiça</i> (III-32; IV-95; X-55, 58, 145)	[covetousness]
<i>homicida</i> (X-115)	<i>humicidas</i> (III-136)	[homicidal]
<i>insuffridas</i> (V-43)		[not suffered]
<i>insufribil</i> (I-65)		[insufferable]

(19)

<i>costume</i> (I-45; II-81, 94, 110; III-13, 96; IV-65; V-2, 98; VII-15, 41, 44, 58, 66; X-91)	<i>custume</i> (V-1; VIII-42; X-68, 139)	[custom]
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The examples pointed out in (17), (18) and (19) present the productivity of the vowel harmony process to the pretonic mid vowel raising of Modern Portuguese. In these examples, the front high stressed vowel (/i/) conditioned the raising of both front (e.g.: *sintir* [to feel]) and back (e.g.: *surrir* [to smile]) pretonic vowels. On the other hand, the back stressed vowel (/u/) triggered vowel raising solely of the back pretonic vowel (e.g.: *custume* [custom]).

We previously noted in this paper that, based on data of contemporary BP, Bisol (2013) demonstrates that /i/ tends to be more productive than /u/ as a trigger to pretonic mid vowel raising. According to the author, it happens for primary articulatory reasons, since, according to the cardinal vowels scheme claimed by Jones (1957), /i/ is the highest vowel of the vowel system. This is why, for Bisol (2013, p.54, our translation)¹⁰,

[a back high vowel has little attractive force over /e/ because changing /e/ into /i/ means creating a higher articulation than the /u/ vowel itself, the conditioner. It explains why *veludo* [velvet] and *bermuda* [shorts], for example, tend to preserve the basis vowel, while *pepino~pipino* [cucumber] and *bonito~bunito* [beautiful] tend to change it].

It also explains the higher productivity of the front high vowel, in relation to the back high vowel, to the vowel raising phenomenon of the 16th century.

In the unstressed syllable, according to Fonte (2014), the front high vowel also influenced the raising of the front (20) and back (21) pretonic mid vowel in the data of Modern Portuguese:

(20)

<i>derivar</i> (X-99)	<i>dirivar</i> (III-21; IV-8; IX-54; X-67)	[to derive]
<i>viverão</i> (II-103; VI-78)	<i>vivirão</i> (II-105)	[they will live]
<i>mentirosas</i> (I-11)	<i>mintirosa</i> (IX-44)	[liar]
	<i>declinada</i> (II-98)	[declined]
	<i>misilhões</i> “mexilhões” (VI-17)	[mussels]

¹⁰ “[...] uma vogal alta posterior exerce pouca força atrativa sobre /e/, pois mudar /e/ para /i/ significa criar uma articulação mais alta do que a própria vogal /u/, o condicionador. Isso explica por que *veludo* e *bermuda*, por exemplo, tendem a preservar a vogal da base, enquanto *pepino~pipino* e *bonito~bunito* tendem a alterá-la.” (BISOL, 2013, p.54)

(21)

<i>cobiçoso</i> (III-76; IV-44, 81; VIII-96; IX-72)	<i>cubiçosos</i> (IX-66)	[covetous]
<i>descobridor</i> (VIII-37, 57)	<i>descubridores</i> (IX-1)	[discoverer]
<i>cubiçadas</i> (II-80)		[coveted]
<i>ruciada</i> “rociada” (IX-62)		[sprayed]

The back high unstressed vowel, according to Fonte (2014), conditioned the raising of the pretonic mid back vowel, as pointed out by the data below from Camões’ verses:

(22)

<i>costumar</i> (I-18, 58; II-20; III-4)	<i>custumar</i> (X-122)	[to custom]
<i>costumado</i> (II-57; III-93; IV-45)	<i>custumado</i> (IV-93)	[accustomed]
<i>costumada</i> (II-18; III-81; IV-56)		

The examples presented in (20), (21) and (22) also confirm the higher influence of the front high vowel (/i/) when compared to the back high vowel (/u/), in pretonic mid vowel raising conditioned by the assimilation to the feature of the adjacent high vowel. In all these examples, as already noted, the high vowel that triggers the process is in the unstressed syllable next to the target pretonic vowel. However, in some of these data, raising may be a result from other paradigms of these verbal and nominal forms, where high vowel is in the stressed syllable (e.g.: *mentir* [to lie] > *mentiroso* [liar]; *cubiça* [covetousness] > *cubiçoso* [covetous], *cubiçado* [coveted]; *descubrir* [to discover] > *descubridor* [discoverer]; *rucio* [spray] > *ruciado* [sprayed]; *custume* [custom] > *costumar* [to custom], *custumado* [accustomed]).

The word-initial pretonic front vowel is raised when followed by a nasal consonant in the same syllable, in the spelling registered in *Os Lusíadas*:

(23)

<i>enfiar</i> (VI-98)	<i>infiar</i> (VI-87)	[to thread]
<i>ensinar</i> (I-71, 97; II-78; III-1)	<i>insinar</i> (I-53; II-70; III-120, 140; VI-33; VII-37; VIII-79; IX-27; X-83, 84, 109, 112, 118)	[to teach]
	<i>incurtar</i> (IX-20)	[to shorten]
<i>engenho</i> (I-2, 4; III-13, 14; IV-102; V-17, 98; VII-82; VIII-2, 71, 89; X-9, 19, 80, 82, 110, 145, 154)	<i>ingenho</i> (V-98)	[ingenuity]
	<i>infiado</i> (I-37; II-49)	[threaded]

Finally, vowel reduction process also showed itself relevant in raising front (24) and back (25) pretonic mid vowels registered by Fonte (2014) in Camões' verses:

(24)

	<i>bocijar</i> (VI-39)	[to yawn]
<i>leoneses</i> (VIII-9)	<i>liones</i> (III-70, 89; IV-8)	[Leones]
	<i>cigueira</i> (V-54)	[blindness]
<i>lião</i> (I-68; III-129; IV-34, 80; X-43, 69, 147)		[lion]
	<i>Lião</i> (III-19, 70; VI-56)	[Leon]
	<i>liao</i> (IV-36; V-12)	[lioness]
<i>melhormente</i> (IX-12)	<i>milhor</i> (I-77; II-46; III-18; IV-103; V-34, 35; VI-40; VII-16; VIII-52, 85; IX-8, 10, 12, 58, 93; X-95, 97, 114, 121)	[better/best]
<i>pelouros</i> (X-35, 38)	<i>pilouro</i> (I-67; VI-98; X-31, 43, 147)	[an old bullet type]

(25)

<i>cuberto</i> (I-19, 105; VI-18, 39; X-63)	[covered]
<i>descuberta</i> (IV-63; IX-65)	[uncovered]
<i>descuberto</i> (I-105; II-30; V-14, 32, 65; VI-9, 50, 86; VIII-56, 86)	[uncovered]
<i>encuberta</i> (VIII-55; X-69)	[covered]
<i>reguroso</i> (III-137)	[rigorous]
<i>rigurosos</i> (III-125)	[rigorous]
<i>rigurosas</i> (X-149)	[rigorous]

Similar to the data from Middle Portuguese, the process of vowel reduction in raising pretonic mid vowels of Modern Portuguese also involves the presence of coronal consonants, with regard to front pretonic vowels, and the presence of (velar) dorsal consonants, in relation to back pretonic vowels. Therefore, vowel raising could be supported by the assimilation to the features of adjacent consonants, as front vowels present [coronal] feature and back vowels present [dorsal] feature. However, as already mentioned in this paper, we understand, with Bisol (2009), that vowel reduction process, even allowing an interpretation based on the assimilation of contiguous features, seems to work much more as a neutralization rule than as a merely assimilation process. Modern Portuguese data, such as Middle Portuguese data (considering the due proportions, since Camões' work is smaller than the *Cancioneiro*, in terms of extension), support the hypothesis that vowel reduction process has been gradually spread in lexicon and, as a legitimate neutralization rule aiming to reduce the system, was increasingly including contexts that were sensitive to the raising rule until it became general in EP, remaining as a variable rule in the several varieties of contemporary BP.

Fonte (2010a,b; 2014), when analyzing the spelling used in *Cantigas de Santa Maria*, *Cancioneiro Geral* and *Os Lusíadas*, obtained relevant clues regarding pretonic vowels of Galician-Portuguese, Middle Portuguese and Modern Portuguese.

In the three works analyzed, the author found enough data to classify pretonic mid vowel raising in the 13th, 15th and 16th centuries as a variable rule. With regard to the 13th century, the results found by Fonte (2010a,b; 2014) highlight the productivity of a variable rule, which was conditioned primarily by the assimilation to the feature of the high vowel of the (stressed or unstressed) adjacent syllable. For the 15th and 16th centuries, however, the author's data suggest that such raising rule, although still variable, already included new phonetic-phonological contexts.

When comparing data from the three works analyzed by Fonte (2010a,b; 2014), there is an increase of pretonic mid vowel raising associated to vowel reduction in the passage from Galician to Middle Portuguese. In other words, the comparison of data

seems to suggest the gradual diffusion, in the lexicon, of a rule that, later on, would become general in Portugal (but not in Brazil).¹¹

Following Bisol's proposal (2009), one may understand the vowel harmony occurrences presented throughout this section as a legitimate assimilation process, whereas the vowel reduction cases can be classified as an authentic neutralization rule gradually spread throughout the centuries to new lexical items.

Posttonic vowels from the 13th, 15th and 16th centuries

As previously noted in this work, in contemporary (European and Brazilian) Portuguese, the seven-vowel phonological system in stressed position significantly reduces in the final unstressed position,¹² due to a neutralization between mid and high vowels. It is worth noting that such neutralization favored the pronunciation with raised vowel both in Brazil ([i], [u]) and Portugal ([i], [i], [u]), even though the language orthographic representation benefits mid vowels (e.g.: *pele* [skin], *pelo* [fur]). It means that the raising process among final posttonic vowels of Portuguese, unlike what was observed in this paper for pretonic vowels, is a general rule, conditioned by the accent position, not only in EP, but also in contemporary BP (at least in the majority of the varieties).

In order to analyze the raising process among posttonic vowels of ancient Portuguese, Fonte (2010a,b; 2014) adopted the same methodology that was used for the study of the pretonic vowels, that is, mapping all spelling representations involving posttonic mid and high vowels in *Cantigas de Santa Maria*, *Cancioneiro Geral* and *Os Lusíadas*. Then, in the mapped data, the author looked for cases where a high vowel (<i> or <u>) represented, in the spelling (variable or not) of the referred *corpora*, a vowel represented by the grapheme <e> or <o> (e.g.: *quasi* [almost]) in contemporary Portuguese.

As already noted in the introduction of this paper, the signs of word-final posttonic vowel raising in the 13th, 15th and 16th centuries were lower than those registered by Fonte (2010a,b; 2014) for pretonic vowels of the same period. In the three analyzed *corpora*, the author found rare traces of a final unstressed vowel raising – which solely involved the front mid vowel (<e>).

¹¹ Bisol (2015), studying the productivity of vowel harmony rule throughout the history of Portuguese in the raising process of the pretonic mid vowel, also finds, by analyzing (written and oral) data from different times (since the first periods of the language up to the 21th century), a gradual increase, primarily from the 16th century, of raising cases involving the phonetic-phonological contexts in addition to the high vowel of the contiguous syllable. Therefore, Fonte's data (2010a,b; 2014), from exclusively poetic (written) texts and unlike (except for *Os Lusíadas*) those addressed by Bisol (2015), support, in general, the conclusions of the researcher's work (see BISOL, 2015).

¹² As already mentioned in this paper, in non-final posttonic context, as well as in pretonic position, the mid vowel raising is a variable rule in current BP. As in current BP, the non-final posttonic subsystem is a fluctuation between pretonic and final unstressed subsystems – and also because Brazilian and European unstressed vocalism solely matches with final posttonic context – for posttonic vowels, this paper will solely comprise Fonte's data (2010a,b; 2014) regarding final unstressed position (and without syllabic coda).

In *Cantigas de Santa Maria*, Fonte (2010a,b; 2014) registered some cases of spelling variation between word-final posttonic mid and high vowels of verbal forms of the 13th century:

(26)

<i>dixe</i> “disse” (CSM 55, 125, 144, 233, 238)	<i>dixi</i> (CSM 196)	[he/she said]
<i>diste</i> “deste” (CSM 105)	<i>disti</i> (CSM 40)	[you gave]
<i>feziste</i> “fizeste” (CSM 6, 14, 32, 75, 84)	<i>fezisti</i> (CSM 40)	[you made]
<i>ouve</i> “houve” (CSM 1, 2, 4, 5, 7)	<i>ouvi</i> (CSM 25, 38)	[there was]
<i>ouviste</i> “houveste” (CSM 241, 350, 420, 422)	<i>ouvisti</i> (CSM 40)	[you had]

Among the nominal forms written in Alfonso X’s cantigas, Fonte (2010a,b; 2014) found solely one case of spelling variation involving the vowel of the final posttonic syllable:

(27)

sangue (CSM 38 *T To*, 73, 104, 133, 149) *sangui* (CSM 38 *E*, 101, 104, 154, 222) [blood]

In *Cancioneiro* by Resende, traces of final unstressed vowel raising were less frequent than those found in the verses of Alfonso X:

(28)

	<i>dizi</i> (p.97, III)	[you say]
<i>Quase</i> (p.203, IV)	<i>quasi</i> (p.227, 230, 234, 284, 334, 427, I; p.7, 217, 248, 397, 400, 401, 405, 471, II; p.1, 65, 80, 96, 216, 255, 316, 379, III)	[almost]

Finally, in *Os Lusíadas*, Fonte (2014) also found few occurrences of final unstressed mid vowel raising:

(29)

<i>Tigre</i> (IV-64)	<i>Tigris</i> (X-102)	[Tiger]
<i>quasi</i> (I-10, 77, 79; II-63; III-20)		[almost]

Therefore, the data presented in this section reveal that, in the three works analyzed by Fonte (2010a,b; 2014), there is a predominance of graphemes <e> and <o> in the word-final unstressed position to represent front and back vowels, respectively. Before this evidence, we are prone to believe that the raising of the final posttonic vowel, although it could occur in Galician and Middle Portuguese and in the beginning of Modern Portuguese, as observed, it was not preponderant in the language up to the second half of the 16th century, at least.

The results obtained by Fonte (2010a,b; 2014) confirm the testimony of Teyssier (1994 [1980]) that there is no evidence, before the 18th century, of a generalization of the raising rule among posttonic vowels of Portuguese. On the other hand, it is possible to consider the hypothesis that the spelling of ancient Portuguese was more conservative in the representation of posttonic vowels than in the representation of pretonic vowels of that time. Moreover, this predominance of mid vowel spellings, in the *corpora* considered, may indicate that a writing pattern was more easily fixed among the posttonic vowels than among the pretonic ones, and that there was, therefore, a general convention in representing all word-final unstressed vowels by <e> and <o>.

Concerning the back vowels, there is still the assertion based on morphological matters to support the lack of the grapheme <u> in the data pointed out by Fonte (2010a,b; 2014), as the final unstressed <o> also represents the morpheme gender marker in Portuguese. Nevertheless, by being aware that the rules of writing at that time were not official and that speakers had more freedom to represent speaking features in writing, it seems controversial the fact that there are so few data indicating a supposed predominant pronunciation of final unstressed [i] and [u] in the past.

Conclusions

The data presented over this paper, which Fonte (2010a,b; 2014) obtained from the analysis of the orthographic practices in *Cantigas de Santa Maria*, *Cancioneiro Geral* and *Os Lusíadas*, provide clues on the pronunciation of the unstressed vowels of ancient Portuguese and, consequently, propose an interesting reflection about the spread of the raising rule in pretonic and posttonic vowels of Portuguese throughout the history.

We observed that, in contemporary EP, mid vowel raising is a general rule both in pretonic and posttonic syllables. On the other hand, in contemporary BP, vowel raising is a general rule in final posttonic vowels and (still) a variable rule in pretonic vowels. By observing solely the contemporary language framework, we could assume that, in historical terms, the raising rule first spread to posttonic vowels of Portuguese and then to pretonic vowels – and this is the hypothesis of Marquilha (2003) already mentioned in the introduction of this paper. Fonte's (2010a,b; 2014) data, however, suggest that up to the 16th century, at least, the raising rule was much more usual in pretonic than in posttonic mid vowels in Portuguese.

Such data, which are against the expectation created by the contemporary Phonology of the language, do not only point that supremacy of the raising rule is new among posttonic vowels in relation to pretonic vowels, as well as it allow us to verify that this supposed transposition of the raising rule would have been caused, apparently, by prosodic aspects.

In other words, this progress of the raising rule among the posttonic vowels, in BP, may be explained by rhythm: the final unstressed syllable vowel is shorter than the pretonic syllable vowel in contemporary BP, and that would have favored the generalization of the rule initially among the final posttonic vowels.

In contemporary EP, as there is an equivalence in the rhythm of the unstressed vowels in general, the duration of the pretonic vowel is very approximate to the duration of the posttonic vowel – which explains the use of the same rule (raising and retraction) for all unstressed vowels.

Finally, Fonte's data (2010a,b; 2014) allow us to conclude that, at least up to the second half of the 16th century, the raising of the unstressed mid vowel was still a variable rule in Portuguese and more productive in pretonic vowels than in final posttonic vowels.

Therefore, this general framework does not correspond to what is found nowadays in terms of unstressed vowels, both in BP and EP, as in these two varieties the raising rule is not variable for final posttonic vowels and, in EP, it is not variable for pretonic vowels either. In this sense, the hypothesis from the previous studies that the current Brazilian pronunciation would be closer to ancient Portuguese pronunciation only applies to pretonic vowels (and not to the whole vowel system).

FONTE, J. O vocalismo átono na história da língua portuguesa. *Alfa*, São Paulo, v.61, n.1, p.165-196, 2017.

- RESUMO: No português europeu atual, a regra de alçamento (elevação) de vogal média atua em todos os contextos átonos, sejam eles pretônicos (*p[i]gar, t[u]car*) ou postônicos (*núm[i]r[u], árv[u]r[i], pel[i], pel[u]*). Já entre as variedades do português brasileiro atual, essa regra costuma ser geral apenas para as vogais postônicas finais, em sílaba aberta (*pel[i], pel[u]*) ou travada por /S/ (*Londr[i]s*); no contexto pretônico, a elevação da vogal média, nos falares brasileiros em curso, é uma regra variável, geralmente condicionada por contextos fonético-fonológicos específicos (*p[i]dido, c[u]stume, [i]scola, [i]mprego, d[i]sconto*). Com o intuito de investigar o processo de elevação de vogal média átona ao longo da história da língua portuguesa, este trabalho expõe e compara dados dos séculos XIII, XV e XVI que apontam a atuação da regra de alçamento entre as vogais pretônicas e postônicas de então. Esses dados, obtidos por Fonte (2010a,b, 2014) a partir da observação da grafia empregada nas *Cantigas de Santa Maria* de Afonso X, no *Cancioneiro Geral* de Garcia de Resende, e em *Os Lusíadas* de Camões, sugerem que, até o século XVI, pelo menos, o alçamento de vogal média era uma regra variável, bastante comum entre as vogais pretônicas, mas ainda incipiente entre as vogais postônicas finais.

- PALAVRAS-CHAVE: Vogais átonas. Alçamento vocálico. Variação. História da língua portuguesa.

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