

## STUDIES ON EXTERNAL VOCALIC SANDHI PROCESSES – EMPHASIS ON ELISION – IN OLD PORTUGUESE<sup>1</sup>

Ana Carolina CANGEMI\*

- **ABSTRACT:** The main objectives of this study are the mapping and analysis of external vocalic sandhi processes in Portuguese religious songs (*Cantigas de Santa Maria*) by Alfonso X, the Wise (13<sup>th</sup> century). The sandhi processes that occur through the juxtaposition of words constitute elision, diphthongisation, crasis (MASSINI-CAGLIARI, 2005, for Old Portuguese). Through this work and an unexplored corpus (especially regarding linguistic themes - SNOW, 1987; MASSINI-CAGLIARI, 2005), we intend to contribute to the achievement of deeper knowledge of the history of Portuguese prosody in the period when it was recognised as an “independent” language from Latin.
- **KEYWORDS:** Sandhi Processes; old Portuguese; medieval Galician-Portuguese cantigas; cantigas de Santa Maria.

### Introduction

The main objective of this work is to explore the occurrences of external vocalic sandhi processes taken from a corpus composed of sixty *Cantigas de Santa Maria* (CSM) from Old Portuguese (OP). For Trask (2004, p. 260, our translation), sandhi is a “pronunciation modification in a grammatical boundary”;<sup>2</sup> for Xavier and Mateus (1990, p. 327-328, our translation), it is a “syntactic phonetics phenomenon in which an initial or final segment of a word is affected by the context in which it occurs, and may present different realisations depending on the characteristics of the sound that precedes or follows a word boundary”.<sup>3</sup>

Massini-Cagliari and Cagliari (1998) ponder that metrified poetry is rich in material for the study of the sandhi phenomenon, since poets constructed isosyllabic verses.

---

\* Universidade Estadual Paulista (UNESP). Faculdade Ciências e Letras. Araraquara - SP - Brasil. ana.cangemi@unesp.br. ORCID: 0000-0001-5395-9862.

<sup>1</sup> In this paper, I take up the issues discussed in Cangemi (2014), Cangemi and Massini-Cagliari (2013) and Cangemi and Abreu (2010).

<sup>2</sup> Original: “*modificação de pronúncia numa fronteira gramatical*” (TRASK, 2004, p. 260).

<sup>3</sup> Original: “*fenômeno da fonética sintática em que um segmento inicial ou final de palavra é afectado pelo contexto em que ocorre, podendo apresentar diferentes realizações que dependem das características do som que antecede ou segue uma fronteira de palavra*” (XAVIER; MATEUS, 1990, p. 327-328).

Thus, like the metre, the external vocalic sandhi phenomena reveal the absence of a pause or *cæsura*. In addition, this phenomenon shows whether there was a vowel drop or the occurrence of a diphthong. In OP, it was customary to point out the cases of sandhi with clearly marked elisions (through the addition, in writing, of more than one word and the drop of vowels).

### ***Corpus: Cantigas de Santa Maria***

The *CSM* by the king Alfonso X of Castela, the Wise King, are a collection of 420 songs in praise of the Virgin Mary.

The *Cantigas de Santa Maria* is a collection of more than four hundred poems recounting miracles worked through the intercession of the Virgin Mary or songs of praise in her honor. The text of many is illuminated in full-page miniatures. The poems were written in the language of medieval Galicia and Portugal, the medium of expression preferred by the lyric poets of that day (O'CALLAGHAN, 1998, p. 1).

Most of the *CSM* have musical notation and all are compiled in Old Portuguese<sup>4</sup> by Alfonso X – the Wise King. Musical notation aside, the songs also have illuminations, miniaturised illustrations that represent what is being narrated in the respective song. The Wise King of Castela, Alfonso X, had these songs compiled, and they came down to us through four old manuscripts called codices.<sup>5</sup>

According to Parkinson (1998), *CSMs* are a literary, musical and artistic monument of the highest importance. It should also be noted that most *CSM* scholars, such as Parkinson (1998), believe that not all of them were authored exclusively by the King, since the very unequal artistic value of the songs points to a multiplicity of authors. However, as Parkinson (1998) ponders, it is not impossible that Dom Alfonso X composed some of them, him being a poet himself and “very committed to the structuring and composition of the work”<sup>6</sup> (MASSINI-CAGLIARI, 2005, p. 61, our translation).

---

<sup>4</sup> We chose the label “Old Portuguese” instead of “Galician-Portuguese” because, in the troubadour phase, Galician and Portuguese were recognised by the speakers as being the same language, although there were, most likely, variations between these two parlances.

<sup>5</sup> The *CSM* came down to the present day via four old manuscripts, known as codices: E: El Escorial, Real Monasterio de san Lorenzo, MS B.I.2 (known as o Escorial or musician’s codex) – the most complete of all; T: El Escorial, Real Monasterio de san Lorenzo, MS T.I.1 (rich codex or story codex) – considered the richest in artistic content (especially iconographic); F: Firenze, Biblioteca Nazionale Centrale, Banco Rari, 20 (Firenze codex) – which forms a set with the Escorial codex, once the songs it has complete the T codex; To: Toledo, Madrid, Biblioteca Nacional, MS 10.069 – the smallest and oldest of all, which also contains an index of one hundred songs. Currently, two of these codices are kept at the Biblioteca do Escorial (E e T), one at the Biblioteca Nacional de Madrid (To) and another at the Biblioteca Nacional de Florença (F).

<sup>6</sup> Original: “*empenhadissimo na estruturação e na composição da obra*” (MASSINI-CAGLIARI, 2005, p. 61).

[...] one might suppose the king would have followed the structuring and composition of the work closely. In fact, it is stranger to think that, for a long time, a collection of such size had been ascribed only to the Wise King (who would have had more to do). Rather, the logic indicates that the king could not have composed all the 420 songs and, at the same time, being a poet, he can't have written none of them.<sup>7</sup> (PARKINSON, 1998, p. 183, our translation).

Thus, reflecting Parkinson's (1998) position mentioned above, it is possible to consider Alfonso X as the great compiler and organiser of the songs, some of which having been composed by him and others not. Thus, one can think that, given its greatness, the enterprise of the *CSM* implies the intervention of several people, both in the creative aspect of the poetic texts, as well as in the making of the complex manuscripts that contain them (PARKINSON, 1998). According to Leão (2007, p. 3, our translation), "D. Alfonso, who is the main troubadour of that scriptorium, or, to use medieval terminology, is the master of that corporation of poets, plans, writes himself, supervises and reviews the work that will bear his name".<sup>8</sup>

## Methodology

For the verse scansion and, consequently, the mapping of processes between words, we use a methodology based on the mapping of all the solutions for vowel encounters in word junctures, from the notation they received in the handwritten testimonies of the *CSM*. The present methodology seeks to infer, from the verse scansion into *poetic syllables*, the limits between *phonetic syllables*.

The methodology was initiated in Brazil by Massini-Cagliari (1995) and probes the prosodic characteristics of past periods of living languages through poetry's metric and poetic structure. The scansion and counting of the verses' poetic syllables can elucidate doubts regarding the consideration of a vowel sequence belonging to two words in a single syllable or in different syllables. Thus, the writing of the medieval manuscripts, considered here as a source, is particularly revealing of the elision phenomenon, since the vowels dropped in the elision process did not usually appear. An introduction to the application of the methodology described above to the data analysis of medieval

---

<sup>7</sup> Original: "é de suponer que o rei tería acompañado de cerca a estruturación e a composición da obra. Mais en realidade resulta estraño que se teña pensado durante bastante tempo que unha colección de semellante tamaño fose unicamente do Rei Sabio (que tería moitas outras cousas en qué se ocupar). A lóxica indicamos, xa que logo, que non podería o rei ter composto todas as 420 Cantigas e, o mesmo tempo, que sendo el poeta non podería non ter composto ningunha delas". (PARKINSON, 1998, p. 183).

<sup>8</sup> Original: "D. Afonso, que é o principal trovador daquele scriptorium, ou, para usar una terminología medieval, é o mestre daquela corporación de poetas, planeja, escribe ele próprio, supervisa e revê a obra que levará o seu nome" (LEÃO, 2007, p. 3).

religious songs, with the aim of mapping the sandhi processes, is exemplified in (1), in with the first two stanzas of the *CSM* 29.<sup>9</sup>

(1)

- |  |                       |
|--|-----------------------|
| 1. Esta é como Santa Maria fez parecer nas pedras  |                       |
| 2. omagães a ssa semellança.                       |                       |
| 3. Nas/ men/tes/ sen/pre/ tẽ/er                    | <b>A</b> <sup>7</sup> |
| 4. de/ve/mo/-las/ sas/ fei/tu/ras                  | <b>B</b> <sup>7</sup> |
| 5. da/ Vir/gen/, pois/ re/ce/ber                   | <b>A</b> <sup>7</sup> |
| 6. as/ fo/ron/ as/ pe/dras/du/ras.                 | <b>B</b> <sup>7</sup> |
|  |                       |
| 7. Per/ quan/ <b>t' eu</b> / di/zer/ o/ý           | <b>c</b> <sup>7</sup> |
| 8. a/ mui/tos/ que/ fo/ron/ y,                     | <b>c</b> <sup>7</sup> |
| 9. na/ san/ta/ Ge/sse/ma/ni                        | <b>c</b> <sup>7</sup> |
| 10. fo/ron/ a/cha/das/ fi/gu/ras                   | <b>b</b> <sup>7</sup> |
| 11. <b>da</b> / Ma/dre/ de/ Deus/, a/ssi           | <b>c</b> <sup>7</sup> |
| 12. que/ non/ fo/ron/ de/ pin/tu/ras.              | <b>b</b> <sup>7</sup> |
| 13. Nas mentes sempre tẽer...                      |                       |
|  |                       |
| 14. Nen/ ar/ en/ta/lla/das/ non                    | <b>d</b> <sup>7</sup> |
| 15. fo/ron/, se/ Deus/ me/ per/don,                | <b>d</b> <sup>7</sup> |
| 16. <u>e</u> /a/vi/a/ y/ fa/y/çon                  | <b>d</b> <sup>7</sup> |
| 17. <b>da</b> / Se/nnor/ <b>das</b> / a/pos/tu/ras | <b>b</b> <sup>7</sup> |
| 18. con/ sseu/ Fi/ <b>ll'</b> , e/ per/ ra/zon     | <b>d</b> <sup>7</sup> |
| 19. fei/tas/ ben/ per/ sas/ me/su/ras.             | <b>b</b> <sup>7</sup> |
| 20. Nas mentes sempre tẽer                         |                       |

In the example (1), the verses have seven poetic syllables.<sup>10</sup> It is possible to establish what comprises the elisions observed: *da(s)* = de+a(s) (verses 5, 11 and 17); *quant'eu* = quanto + eu (verse 7); *Fill'e* = Fillo + e (verse 18). Furthermore, we must consider as hiatus the sequences E-A (verse 16); A-I (verse 16). In the example (1), the diphthongisation solution was not found.

<sup>9</sup> The capital letters A and B represent the rhyme pattern of the chorus; lowercase b, c, d, e, f represent the stanza pattern. At the end of the verse, the letters are followed by a number, which represents the number of poetic syllables in the verse. The syllables in bold correspond to the elision process of the first word's last vowel with the second word's first vowel, while the underlined ones correspond to the formation of hiatus of the first word's last vowel with the second word's first vowel.

<sup>10</sup> The troubadour poet counts the poetic syllables and places the stresses in each verse. Stress and rhythmic patterns of the language in which the poems were composed can be observed. There are two ways of counting syllables of the verses in Portuguese: the first way considers that the poetic syllables can be counted until the verse's last stressed syllable, disregarding the final unstressed ones, and in the second way, the counting always considers one unstressed syllable after the stressed one, even if it does not exist. The product of the first type of counting is the high-pitched verse, characteristic of Portuguese and French, and the product of the second type, the low-pitched verse, which is characteristic of Italian and Spanish (MASSINI-CAGLIARI, 1999).

## External vocalic sandhi

The term sandhi, from the ancient Sanskrit grammar, designates the morphological and phonological changes caused by the contact between forms of the language (TRASK, 2004). According to Crystal (2000, p. 196), sandhi is

A term used in SYNTAX and MORPHOLOGY to refer to the PHONOLOGICAL MODIFICATION of GRAMMATICAL FORMS which have been juxtaposed. The term comes from a Sanskrit word meaning ‘joining’. Sandhi forms are forms which have undergone specific modifications in specific circumstances (i.e. various sandhi rules have been applied). [...] In languages where sandhi forms are complex, a distinction is sometimes made between external sandhi (sandhi RULES which operate across word boundaries) and internal sandhi (rules which operate within words).<sup>11</sup> (CRYSTAL, 2000, p. 196, author’s emphasis, our translation).

Bechara (1964) observes that while reading poetic verses there are junctures and pauses in the act of speaking. This occurrence can happen within the same word or by the combination of two words: external vocalic sandhi. Sandhi can therefore be characterised as internal and external. An example of internal vocalic sandhi occurs when we pronounce the word *cooperar* ‘cooperate’, as *coperar*, or when we pronounce the vowel /i/ of the proper name Tiago as a semivowel (Tia.go). For external sandhi, in Brazilian Portuguese and Old Portuguese literature, i) elision, ii) diphthongisation, iii) degemination and iv) crasis are usually considered:<sup>12</sup>

- i) meni[no a]legre → meni[na]legre ‘happy boy’
- ii) ca[rro a]zul → ca[rrwa]zul ‘blue car’
- iii) ca[sa a]marela → ca[sa]marela ‘yellow house’
- iv) ami[ga a]ssi → ami[ga]ssi<sup>13</sup> ‘friend like this’

---

<sup>11</sup> Original: “*Termo usado na SINTAXE e na MORFOLOGIA para indicar uma MODIFICAÇÃO FONOLÓGICA de FORMAS GRAMATICAS que ficaram justapostas. O termo deriva de uma palavra do sânscrito que significa “junção”. As formas de sândi passaram por modificações específicas em circunstâncias específicas (isto é, várias regras de sândi foram aplicadas) [...]. Nas línguas em que as formas sândi são complexas, existe às vezes a distinção entre “sândi externa” (REGRAS de sândi que operam no limite da palavra) e “sândi interna” (regras que operam dentro das palavras)*”. (CRYSTAL, 2000, p. 196).

<sup>12</sup> The literature – Bisol (1989, 1992a, 1996, 2000, 2002, 2003); Abaurre (1996); Abaurre, Galves and Scarpa (1999); Tenani (2002, 2003, 2004); Brescancini e Barbosa (2005); Collischoon (2005, 2011, 2012) – on sandhi regards, unanimously and without controversies, three phonological processes that operate across word boundaries junctures in Brazilian Portuguese: elision, degemination and diphthongisation. For OP, Massini-Cagliari (1995) and Cangemi (2014) indicate, as processes, elision, crasis and diphthongisation.

<sup>13</sup> Massini-Cagliari (2005) preferred to refer to the process of sandhi occurring between two ‘a’ as crasis - and not as degemination - since it is, by its nature, slightly different from the process described by Bisol (1992a) for BP. Degemination does not presuppose the simplification of the syllable, considering that the two mora, corresponding to

In order to observe and analyse these processes, we start from the scansion and counting of the poetic syllables of the verses in order to elucidate doubts about the consideration of a sequence of vowels belonging to two words in a single syllable – in which case there is elision - or in different syllables - thus constituting a hiatus. It is worth reaffirming that the scansion of poems in poetic syllables is an ally in the study of elision, since the phonetic non-realisation of the unwritten vowel can be confirmed by counting the verse's poetic syllables.

## **Elision and degemination processes: an outlook of BP**

In order to make the presentation of the approach to elision more pedagogical, we present the studies referring to Brazilian Portuguese (BP).<sup>14</sup> The external sandhi processes in BP concern two main ideas addressed by Bisol (1992a). The first idea defines the external sandhi as a resyllabification process involving two words under the domain of the same utterance. The second idea, a consequence of the first one, is that when these two words meet and a VV sequence arises, the prosodic pattern of the following word is incorporated by the syllable that is formed. Therefore, the basic structure for all vowel sandhi processes is similar to that of the diphthong - two vowels under the same syllable and their phenomena are governed by the resyllabification that occurs automatically when words that form the VV sequences meet. The words are spoken without pause, as part of a larger prosodic unit.

In BP, the sandhi processes - elision, diphthongisation and degemination - are frequent when two words are combined to form sentences. For Bisol (1992b), these processes are favoured by two vowels in sequence. In resyllabification, these are under the domain of the same syllable. In addition, Bisol (1992b) observes that unstressed vowels are favourable to the application of the sandhi process and the phonological phrase is the preferred domain for the sandhi process.

When resyllabification occurs, according to Collischonn (2005), the sandhi processes have in common the fact that they occur between two syllabic nuclei that came into contact. In the case of elision, the author ponders:

Portuguese rejects this configuration and, as a consequence, one of them disappears, the one that is prosodically weaker. Usually, this is the case for the first vowel because, being unstressed and final, it is weaker than

---

each of the vowels /a/ that merge, remain. Check example (7), in this article, in relation to the formal mechanisms of process differentiation.

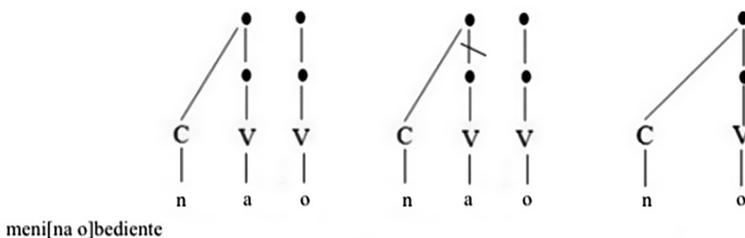
<sup>14</sup> It should be noted that external vowel sandhi is a phenomenon of the spoken language, that is, oral. Therefore, studies related to this topic, in BP, have the oral language as their corpus. In OP, in the 13th century, there is no recording of the speaker's production. Thus, with the appropriate methodologies and considerations, we study segmental and suprasegmental aspects of past periods of languages, in which there is no recording of the speaker's production, through written texts.

the pretonic unstressed of the next word<sup>15</sup> (COLLISCHONN, 2005, p. 128, our translation).

The elision only applies, in BP, across word boundaries, but not within words - domain restriction. In addition to this aspect, to the occurrence of elision in BP, we can draw attention to another restriction: the elision occurs only when there is a low vowel /a/ followed by another vowel. The occurrences appear in greater numbers followed by a back vowel and in smaller numbers followed by a front vowel.

The elision has as the biggest domain the utterance and as the lowest the phonological word. In the elision, one of the vowels is dropped: “The deleted vowel is always unstressed and is on the left” (BISOL, 1992a, p. 96, our translation).<sup>16</sup>

**Image 1 – Syllabication**



**Source:** Bisol (1992a, p.96).

According to Bisol (1992a), a restriction to elision is found when a morpheme<sup>17</sup> (the smallest meaningful constituent) comes to its encounter. When the morpheme is by itself or in contracted forms – (3) –, it is preserved.

(3)

moro na esquina - \*moro [nisquina] ‘(I) live on the corner’

cuida da entrada - \*cuida [dentrada] ‘watches the entrance’

mora na Holanda - \*mora [nolanda] ‘Lives in Holland’

(BISOL, 2000, p. 326).

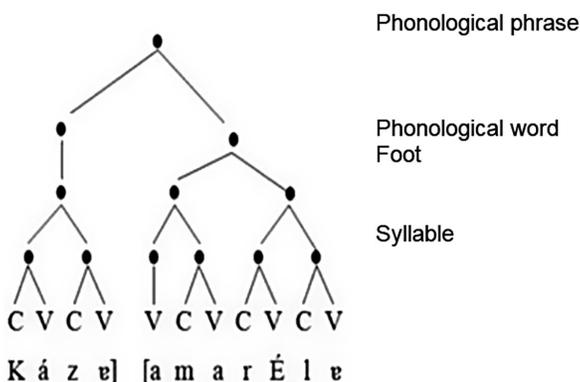
<sup>15</sup> Original: “O português rejeita esta configuração e, em consequência, ocorre o desaparecimento de um deles, daquele que é prosodicamente mais fraco. Normalmente, este é o caso da primeira vogal, pois sendo átona final, é mais fraca do que a átona pretônica da palavra seguinte”. (COLLISCHONN, 2005, p. 128).

<sup>16</sup> Original: “A vogal elidida é sempre átona e fica à esquerda”. (BISOL, 1992a, p. 96).

<sup>17</sup> Morpheme preservation is important, as it is a meaning-carrying entity. If it is erased, semantic values are lost.

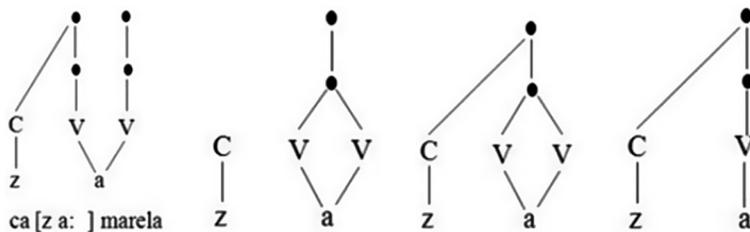
As for degemination, what happens is not the dropping<sup>18</sup> of one of the vowels as in elision, but their fusion<sup>19</sup> (BISOL, 1992a). According to Bisol (1992a), in BP, identical vowels degeminate (4). Degemination acts on a sequence of identical vowels and as a product of the vowel fusion there is the disappearance of a syllable, when considering the relationship between initial and non-initial syllabification, by a syllabification process - (5).

**Image 2 – Prosodic hierarchy**



Source: Bisol (1992a, p.96).

**Image 3 – Degemination**



Source: Bisol (1992a, p. 92).

<sup>18</sup> When there is a combination of any timbre of unstressed vowels belonging to the same category in their underlying form, whether [e, a], [i, i] or others, the result is a vowel of stronger timbre. These cases are interpreted as the weakest vowel being erased (BISOL, 1992a, p. 88).

<sup>19</sup> When resyllabification occurs, in the case of same-category vowels, phonetic differences arising from the different positions they occupied in the word, the syllables to which they were attached disappear. Once the boundary between the two words is lost, the “position-conditioned” variants are lost (BISOL, 1992a, p. 88). To these facts, Bisol (1992a) allows the interpretation of a process in which the merging of the vowels occurs.

Thus, there is a simplification (shortening) of two syllables that become a single one: “Degemination occurs when the two vowels that meet are similar (segmental restriction) [...] as long as the second vowel does not carry a primary stress (rhythmic restriction)”<sup>20</sup> (COLLINCHONN, 2005, p. 127, our translation).

Degemination can occur at any point in a sentence: in the combination of two words within clauses, between clauses or sentences. According to Nespor (1987), for degemination to occur the two sentences must be pronounced by the same speaker and must be addressed to the same interlocutor - pragmatic conditions for structuring the utterance. As phonological conditions for the restructuring of utterances, Bisol (1992a) ponders that the two sentences must be relatively short and must not have pauses between them.

Degemination also happens when: both vowels of the words are stressed, if the vowel of the second word is stressed, if both vowels are unstressed or if only the vowel of the first word is stressed. However, there are rhythmic restrictions to the occurrence of degemination. Bisol (1992a, p. 87, our translation) observes that, in BP, there is no degemination when i) the first vowel of the second word carries the primary stress, unless this stress “is weakened for prosodic or rhythmic reasons”,<sup>21</sup> and when ii) there is duration or lengthening of the vowel equivalent to the temporal presence of two vowels. In degemination, the entire syllable changes place, submitting itself to the domain of the primary stress of the second word.

In short, degemination comprises two rules: resyllabification and shortening. However, in elision there is the dropping; in degemination, fusion. Resyllabification is a consequence of the Obligatory Contour Principle (OCP)<sup>22</sup> and the shortening is a process of temporal simplification, that is, two times in the prosodic line are replaced by one, because in Portuguese long vowels do not exist.

Finally, elision, as well as degemination, in BP, for Bisol (1992a, p. 100, our translation), are “due to mechanisms related to resyllabification”<sup>23</sup> and have prosodic consequences. The elision is only applied to an unstressed syllable, whereas degemination restricts the second stressed vowel.

## The elision process in OP

All the solutions for vowel encounter in word junctures were mapped in the sixty CSM. The results found were 4308 occurrences of vowel encounters in juncture context.

---

<sup>20</sup> Original: “*A degeminação ocorre quando as duas vogais que se encontram são semelhantes (restrição segmental) [...], desde que a segunda vogal não tenha acento primário (restrição rítmica)*” (COLLINCHONN, 2005, p. 127).

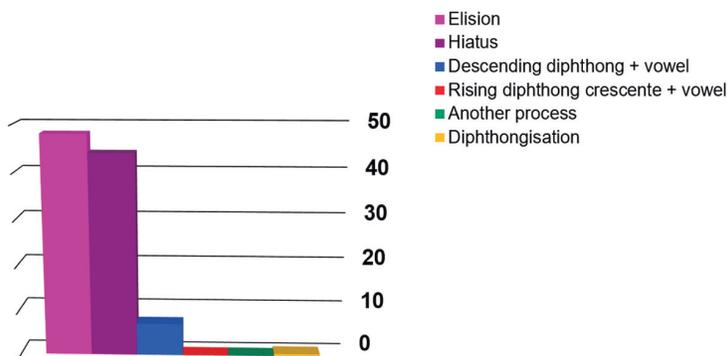
<sup>21</sup> Original: “*venha a ser enfraquecido por razões prosódicas ou rítmicas*” (BISOL, 1992a, p. 87).

<sup>22</sup> The Obligatory Contour Principle (OCP) was formulated by Leben (1973) and is one of the fundamental principles for the phonological analysis of geminate segments. Identical sequences of autosegments are forbidden by the OCP. Example: a segment sequence (aa) containing two units is reduced to one unit (a) through a derivational process. This segment (a) is worth two (aa) and is called geminate. Sequences of identical units are forbidden in phonological representations.

<sup>23</sup> Original: “*Decorrentes de mecanismos relacionados à ressilabificação*” (BISOL, 1992a, p. 100).

Of these, 2073 (48.1%) refer to elision processes,<sup>24</sup> 1894 (44.0%) to hiatus processes,<sup>25</sup> 310 (7.2%) to descending diphthong encounters with a vowel,<sup>26</sup> 5 (0.1%) of ascending diphthong encounters with a vowel,<sup>27</sup> 5 (0.1%) to processes not yet named by the specialised literature and 21 (0.5%) to diphthongisation processes<sup>28</sup>. It is noted that there are 179 more cases of elision compared to the hiatus process, which corresponds to a difference of 4.1%.

**Graph 1** – Intervoculary processes in the sixty CSM



**Source:** Author's elaboration.

We observe that, while almost all vocalic sequences can constitute a hiatus, there are restrictions regarding the occurrence of other sandhi processes. In OP, for elision to occur, it is necessary that the first word's final vowel be /a/, /e/ or /o/.

<sup>24</sup> As seen, the elision occurs, in BP, when the final unstressed vowel of the first word is deleted, and a new syllable is formed, from the junction of the first word's unstressed final syllable's onset with the initial vowel of the second word.

<sup>25</sup> The occurrence of hiatus follows the opposite path to the occurrence of elision, that is, for the hiatus to occur, there must first be the encounter of the first word's final vowel and the second word's initial vowel, without the former – the final vowel of the first word – being dropped.

<sup>26</sup> Descending diphthongs are considered a CVV sequence, in which the second V is a semivowel, i.e., a glide. Then, for the occurrence of an encounter of a decreasing diphthong with a vowel, the context must be the following: the syllable of the first word should be CVV, the second V being a glide, and would meet the initial V of the second word.

<sup>27</sup> Ascending diphthongs are considered a CVV sequence, where the first V is a semivowel, i.e., a glide. Then, for the occurrence of encounters of ascending diphthongs with a vowel, the context should be the following: the syllable of the first word should be CVV, the first V being a glide, and it would come into contact with the initial V of the second word. It is worth noting that both the meeting of ascending diphthongs with vowel and descending diphthongs with vowel lead to the hiatus.

<sup>28</sup> For the occurrence of diphthongisation as an external vocalic sandhi, there is the following context: the first word, CV meets the beginning of the second word, carrying a V. The first word's V turns into a glide when in contact with the initial V of the second word. Similarly to the elision, the diphthongisation is the result of a resyllabification mechanism.

**Chart 1 – Elision**

Final vowel of the first word	Initial vowel of the second word	Elision	
a +	a (a, ã/an)	47	2,27%
	e (e, ê) / en)	28	1,35%
	é (/É/)	3	0,14%
	i	1	0,05%
	o		
	ó (/o/)		
	u (u, û / un)	2	0,10%
<b>Subtotal:</b>	<b>a + V</b>	<b>81 (3,91%)</b>	
e +	a (a, ã/an)	526	25,37%
	e (e, ê) / en)	301	14,52%
	é (/É/)	44	2,12%
	i	41	1,98%
	o	363	17,51%
	ó (/o/)	6	0,29%
	u (u, û / un)	65	3,14%
<b>Subtotal:</b>	<b>e + V</b>	<b>1346 (64,93%)</b>	
é (/É/) +	a (a, ã/an)		
	e (e, ê) / en)		
	é (/É/)		
	i		
	o		
	ó (/o/)		
	u (u, û / un)		
<b>Subtotal:</b>	<b>é (/É/) + V</b>		
i +	a (a, ã/an)		
	e (e, ê) / en)		
	é (/É/)		
	i		
	o		
	ó (/o/)		
	u (u, û / un)		
<b>Subtotal:</b>	<b>i + V</b>		

Final vowel of the first word	Initial vowel of the second word	Elision	
o +	a (a, ã/an)	228	11,0%
	e (e, ê) / en)	254	12,25%
	é (/ɛ/)	43	2,07%
	i	19	0,92%
	o	85	4,10%
	ó (/ɔ/)	3	0,14%
	u (u, û / un)	14	0,68%
Subtotal:	o + V	646 (31,16%)	
u +	a (a, ã/an)		
	e (e, ê) / en)		
	é (/ɛ/)		
	i		
	o		
	ó (/ɔ/)		
	u (u, û / un)		
Subtotal:	u + V		
<b>TOTAL</b>		<b>2073 (100%)</b>	

Source: Author's elaboration.

**Chart 2 – Hiatus**

Final vowel of the first word	Initial vowel of the second word	Hiatus	
a +	a (a, ã/an)	152	8,03%
	e (e, ê) / en)	214	11,30%
	é (/ɛ/)	30	1,58%
	i	22	1,16%
	o	115	6,07%
	ó (/ɔ/)	8	0,42%
	u (u, û / un)	57	3,01%
Subtotal:	a + V	598 (31,57%)	

e +	a (a, ã/an)	297	15,68%
	e (e, ê) / en)	141	7,44%
	é (/É/)	67	3,54%
	i	19	1,0%
	o	203	10,72%
	ó (/o/)	11	0,58%
	u (u, ù / un)	33	1,74%
<b>Subtotal:</b>	<b>e + V</b>	<b>771 (40,71%)</b>	
é (/É/)	a (a, ã/an)	6	0,32%
	e (e, ê) / en)	3	0,16%
	é (/É/)		
	i	1	0,05%
	o	3	0,16%
	ó (/o/)		
	u (u, ù / un)		
<b>Subtotal:</b>	<b>é (/É/)</b> + V	<b>13 (0,69%)</b>	
i +	a (a, ã/an)	31	1,64%
	e (e, ê) / en)	16	0,84%
	é (/É/)	1	0,05%
	i	2	0,11%
	o	13	0,69%
	ó (/o/)		
	u (u, ù / un)	11	0,58%
<b>Subtotal:</b>	<b>i + V</b>	<b>74 (3,91%)</b>	
o +	a (a, ã/an)	148	7,81%
	e (e, ê) / en)	131	6,92%
	é (/É/)	6	0,32%
	i	17	0,90%
	o	70	3,70%
	ó (/o/)	3	0,16%
	u (u, ù / un)	18	0,95%
<b>Subtotal:</b>	<b>o + V</b>	<b>393 (20,75%)</b>	

u +	a (a, ã/an)	18	0,95%
	e (e, ê) / en)	7	0,37%
	é (/ɛ/)	6	0,32%
	i	4	0,21%
	o	10	0,53%
	ó (/ɔ/)		
	u (u, ù / un)		
Subtotal:	u + V	45 (2,38%)	
<b>TOTAL</b>		<b>1894 (100%)</b>	

Source: Author's elaboration.

Observing the Chart 1, which shows the quantification of elision processes present in the *CSM*, we can confirm that there is a quantitative difference in behaviour, if we compare the cases of elision when the first word's final unstressed vowel is /a/ and when the elided vowel is /e/ or /o/. In terms of percentage, there is 3.91% (81 out of 2073 cases) for the dropping of the /a/ vowel, while those of /e/ are equivalent to 64.93% (1346 out of 2073 cases) and those of /o/ to 31.16% (646 out of 2073 cases). Therefore, the occurrence of elision with words whose unstressed vowel is /a/ is more restricted than with /e/ or /o/. Still regarding the elision of /a/, it is possible to notice that while the elision process of /e/ or /o/ can happen before all the vowels, the elision of /a/ happens more often in front of the same /a/.

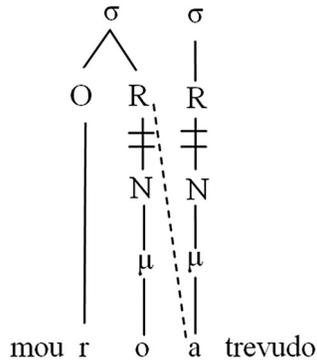
The most typical elision cases happen when the first word's unstressed vowel is /e/ - 1346 cases (64.93%) – or /o/ - 646 cases (31.16%) – (6):

(6) E os judeus, que sem[pr' a]costuma[d' an] (*CSM* 27; verse 70)  
sempr' acostumad' an = sempre + acostumado + an

From the quantitative results reached in the mapping of the first sixty *CSM*, it was found that there is the suppression of the unstressed vowels a, e,<sup>29</sup> and o before an initial vowel of another word; after this movement, the onset of the syllables on vocabulary junction is resyllabified. The onset of the first word's final syllable is linked to the nucleus of the next word's first syllable – (7).

<sup>29</sup> As Massini-Cagliari (2005) did, according to Maia's studies (1997), during the research, we adopted the abbreviations "e +" as a reference to the usual spelling of the absent phoneme /e/, although its phonetic realisation as [e] or [i] cannot be specified with certainty. Likewise, we use the abbreviation "o +" referring to the most common spelling at the time of the absent vowel, which, in this case, refers to the phoneme /o/, and which would possibly have the phonetic realisations [o] and [u].

**Image 4 – Onset<sup>30</sup>**



**Source:** Author's elaboration.

When reflecting on the elision data of her corpus, Massini-Cagliari (2005), elaborated from data collected in the *cantigas de amigo* of the Cancioneiro da Biblioteca Nacional de Lisboa and from the corpus of one hundred *cantigas de amigo* and *cantigas de amor*, pointed to the differentiation of external vocalic sandhi processes that occur in the OLD according to the quality of the first word's unstressed vowel. According to the author, there is a difference - the drop of the unstressed vowel – depending on whether it is /a/ or not - and she concluded that she is facing two different processes of external vocalic sandhi: those whose final unstressed vowel of the first word is /a/ and the others where the unstressed vowel of the word is /e/ and /o/.

In the first case, where the unstressed /a/ vowel at the end of the first word is dropped, Massini-Cagliari (2005) noted that it is more often dropped when the initial vowel of the second word is also /a/, there is no occurrence of its suppression before /ε/, /i/ and /u/ and few occurrences involving the vowels /o/ and /ɔ/. For the researcher, the suppression of same-quality vowels, in OP, should be understood as crasis. In the second case, where unstressed /e/ and /o/ vowels are dropped before vowels of any quality, there is the elision.

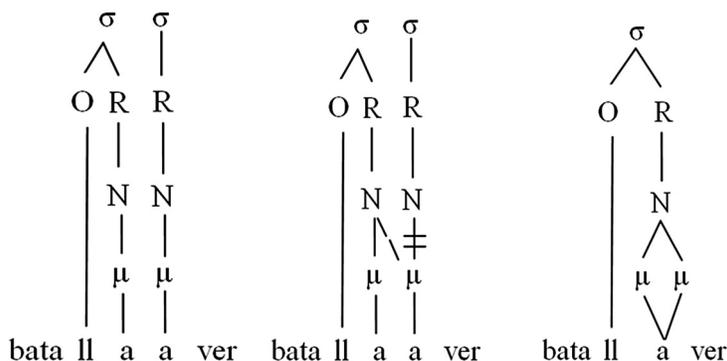
In fact, the consideration that only crasis (and not elision) would occur when the final unstressed vowel of the first word is /a/ would explain the fact that the hiatus is the preferred solution for vowel encounters formed by the vowel /a/ followed by other vowels<sup>31</sup> (MASSINI-CAGLIARI, 2006, p. 81, our translation).

<sup>30</sup> Word sequence taken from the CSM 28, verse 39.

<sup>31</sup> Original: “De fato, a consideração de que ocorreria somente a crase (e não a elisão) quando a vogal átona final da primeira palavra é /a/ explicaria o fato de o hiato ser a solução preferida para encontros vocálicos formados pela vogal /a/ seguida de outras vogais”. (MASSINI-CAGLIARI, 2006, p. 81).

According to Massini-Cagliari (2005), the two moras, corresponding to each of the merging /a/ vowels, remain the same - (7). The author considers that, unlike what happens with the words ending in final unstressed /e/ and /o/, the final unstressed vowel /a/ cannot be dropped; otherwise the process of elision could be applied.

**Image 5 – Elision**



**Source:** Author's elaboration.

For the purpose of better visualisation, Massini-Cagliari (1999, 2000) describes the process of crasis in OP as the disconnection of the nucleus of the second word's initial syllable, followed by its reassociation to the preceding syllable's nucleus, representing a resyllabification of the initial structure - (8). Due to restrictions imposed by the OCP, the two vowels end up merging, although the moras to which they were initially associated remain (MASSINI-CAGLIARI, 2005).

Massini-Cagliari (2005) says that, in a non-linear derivational perspective, the differentiation of the elision and crasis processes

[...] is in the levels of first vowel disassociation and of association of the next word's initial vowel, which occur just below the rhyme, so that the mora corresponding to the first word's final vowel is dropped (in the crasis, this mora was kept) and only the mora of the second word's initial vowel remains.<sup>32</sup> (MASSINI-CAGLIARI, 2005, p. 233, our translation).

By mapping this study's corpus and the results obtained quantitatively, we confirm the difference in behaviour of the elision when there is suppression of the first word's final unstressed vowel /a/ followed by the second word's initial vowel /a/.

<sup>32</sup> Original: "está nos níveis de desassociação da primeira vogal e de associação da vogal inicial da palavra seguinte, que ocorrem logo abaixo da rima, para que a mora correspondente à vogal final da primeira palavra seja eliminada (na crase, esta mora se mantinha) e apenas a mora da vogal inicial da segunda palavra se mantenha". (MASSINI-CAGLIARI, 2005, p. 233).

It is also important to note that there is a process that differs from the dropping of the first vowel (elision) or junction (crasis) of the vowels in OP. It is the deletion or not realisation of the second word's initial vowel:

(9)

- a. aos tres Reis en Ultramar / ouv' **a**strela mostrada, (CSM 1-38,39)
- b. que a terra toda **a**'sclareceu, (CSM 15-91)
- c. do demo, **que** sterreces. (CSM 20-39)
- d. nen d' aguillon **a**'scodudas. (CSM 31-68)
- e. del, a Reynna **nobre** spirtual. (CSM 58-53)

The process, not yet named, occurs in 5 (0.1%) of the sandhi cases. Therefore, it is a marginal process in troubadour lyric. However, one must observe the context in which this process occurs, that is, the dropped vowel is /e/ followed by the unvoiced alveolar fricative -/s/. Massini Cagliari (2005) had mapped data like this in her corpus. According to the author, the dropped vowel /e/ is OP's epenthetic vowel by nature and this vowel is, as stated above, in the second word's initial context. Massini-Cagliari (2005, p. 235, our translation) ponders that

[...] this is precisely one of the contexts in which, necessarily, there is the epenthesis of a vowel to "correct" the syllabic structure, at the lexical level. [...] there is the possibility that the vowel of the previous word fills the nucleus of this irregular syllable, if there is no epenthesis.<sup>33</sup>

In the corpus of sixty CSM, we also observe this process of dropping the second word's initial vowel, not yet named by specialised literature.

## Conclusion

Through the conduction of this study, it was possible to make, in relation to the elements of sandhi in the investigated corpus, an initial contribution to the study of the segmental and suprasegmental aspects of OP, through the observation of the troubadours' written notation from seven hundred years ago.

By mapping the sixty CSM, regarding the elision process - 1726 cases (47.9%) -, in the OP, it is possible to say that this constituted the most recurrent sandhi process in the language of the time in poetic discourse. However, the difference in recurrence of this process when compared to the hiatus process - 1579 cases (43.8%) - (that is, to the

---

<sup>33</sup> Original: "é justamente este um dos contextos em que, necessariamente, há epêntese de uma vogal para "corrigir" a estrutura silábica, em nível lexical. [...] há a possibilidade de a vogal da palavra anterior preencher o núcleo dessa sílaba irregular, se não houver a epêntese". (MASSINI-CAGLIARI, 2005, p. 235).

counterpart of the elision process, its non-realisation) is not great - 147 cases (4.1 %), since, as we have seen, almost all vowel sequences could form a hiatus.

It is also important to highlight the behaviour of elision cases when the final unstressed vowel of the first word is /a/ and when the eluted vowel is /e/ or /o/. Through the analyses made, we show that the occurrence of elision with words whose unstressed vowel is /a/ is more restricted, happening more often in front of the same /a/ and, similarly to Massini-Cagliari (2005), we believe that this is crasis. With /e/ or /o/, the elision process can happen in front of all vowels.

Finally, another process was verified in the mapped corpus, the lowest in terms of frequency, one in which the second word's initial vowel is deleted or not realised - 4 cases (0.1%).

## Acknowledgements

We thank the São Paulo Research Foundation (FAPESP - Processes 2011/23104-0 and 2012/20947-0) for the funding of the entitled research.

CANGEMI, A. Estudos sobre o processo de sândi vocálico externo - destaque para a elisão - no português arcaico. *Alfa*, São Paulo, v.66, 2022.

- *RESUMO: Este estudo tem como objetivos principais o mapeamento e análise de processos de sândi vocálico externos nas cantigas religiosas portuguesas (Cantigas de Santa Maria) de Afonso X, o Sábio (século XIII). Os processos de sândi que ocorrem através da junção de palavras constituem elisão, ditongação, crase (MASSINI-CAGLIARI, 2005, para o português arcaico). Por meio deste trabalho e de um corpus não explorado (especialmente quanto aos temas linguísticos - SNOW, 1987, p. 478-480; MASSINI-CAGLIARI, 2005, p. 24-26), pretende-se contribuir para o alcance de um conhecimento mais profundo da história da prosódia portuguesa no período do seu reconhecimento como língua “independente” em relação ao latim.*
- *PALAVRAS-CHAVE: Processos Sândi; português arcaico; antigas galego-portuguesas medievais; cantigas de Santa Maria.*

## REFERENCES

ABAURRE, M. Acento frasal e os processos fonológicos segmentais. *Letras Hoje*, Porto Alegre, v. 31, n.2, p.41-50, 1996.

ABAURRE, M.; GALVES, C.; SCARPA, E. A interface fonologia-sintaxe: evidências do Português Brasileiro para uma hipótese top-down na aquisição da linguagem.

In: SCARPA, E. (org.). **Estudos da prosódia**. Campinas: Ed. da UNICAMP, 1999. p.285-323.

BECHARA, E. **Moderna Gramática Portuguêsa**. São Paulo: Companhia Editora Nacional, 1964.

BRESCANCINI, C.; BARBOSA, C. A elisão da vogal média /e/ no sul do Brasil. **Letras de Hoje**, Porto Alegre, v. 40, n.3, p. 39-56, 2005.

BISOL, L. Sandhi in Brazilian Portuguese. **Probus**, Dordrecht, v.15, n.2, p.177-200, 2003.

BISOL, L. Sândi vocálico externo. In: ILARI, R. (org.). **Gramática do Português Falado: Níveis de Análise Lingüística**. Campinas: Ed. da Unicamp, 2002. p.19-35.

BISOL, L. A elisão, uma regra variável. **Letras de Hoje**, Porto Alegre, v. 35, n. 1, p. 319-330, 2000.

BISOL, L. Constituintes prosódicos. In: BISOL, L. (org.). **Introdução a estudos de fonologia do português brasileiro**. Porto Alegre: EDIPUCRS, 1996. p. 247-261.

BISOL, L. Sândi vocálico externo: degeminação e elisão. **Caderno de estudos lingüísticos**, Campinas, v. 23, p. 83-101, 1992a.

BISOL, L. Sândi vocálico externo. In: ILARI, R. (org.). **Gramática do português falado: Níveis da análise lingüística**. Campinas: Ed. da Unicamp. 1992b. v.II. p.21-38.

BISOL, L. O ditongo na perspectiva da fonologia atual. **D.E.L.T.A.**, São Paulo, v. 5, n. 2, p. 185-224, 1989.

CANGEMI, A. **Sândi vocálico externo no Português Arcaico**. 2014. 208 f. Thesis (Doctor in Linguistics) - Faculdade de Ciências e Letras, Universidade Estadual Paulista, Araraquara, 2014. Disponível em: <https://repositorio.unesp.br/handle/11449/123907>. Acesso em: 01 ago. 2019.

CANGEMI, A.; ABREU, T. A utilização de uma metodologia em textos poéticos para estudos fonológico-históricos do português. **Eutomia**, Recife, v. 1, n.6, 2010. Disponível em: <https://periodicos.ufpe.br/revistas/EUTOMIA/article/view/1721>. Acesso em: 20 jun. 2020.

CANGEMI, A.; MASSINI-CAGLIARI, G. Um olhar sobre a vogal epentética no Português Arcaico. In: MAGALHÃES, J. (org.). **Linguística in Focus: Fonologia**. Uberlândia: EDUFU, 2013. v. 10. p. 181-204.

COLLISCHONN, G. Sândi vocálico no Português Brasileiro: como o acento determina sua realização. **Letras & Letras**, Uberlândia, v. 28, p. 13-27, 2012.

COLLISCHONN, G. A interação entre acento e processos de (re) estruturação silábica: um desafio para a teoria da otimalidade. **Linguística**, Rio de Janeiro, v. 7, p. 87-98, 2011.

- COLLISCHONN, G. A sílaba em português. *In*: BISOL, L. (org.). **Introdução a estudos de fonologia do português brasileiro**. Porto Alegre: EDIPUCRS, 2005. p. 101-129.
- CRYSTAL, D. **Dicionário de lingüística e fonética**. Tradução e adaptação: Maria Carmelita Pádua Dias. Rio de Janeiro: Zahar, 2000.
- LEÃO, Â. **Cantigas de Santa Maria, de Afonso X, o Sábio**: aspectos culturais e literários. Belo Horizonte: Veredas & Cenários, 2007.
- LEBEN, W. **Suprasegmental Phonology**. 1973. 199f. PhD Dissertation (Doctor in Philosophy) - Massachusetts Institute of Technology, Cambridge, 1973.
- MAIA, C. **História do galego-português**. 2. ed. Coimbra: Fundação Calouste Gulbenkian/ Junta de Investigação Científica e Tecnológica, 1997.
- MASSINI-CAGLIARI, G. Sândi vocálico externo em Português Arcaico: condicionamentos lingüísticos e usos estilísticos. **Estudos Linguísticos**, São Paulo, v.35, p.76-94, 2006. Disponível em: <http://www.gel.hospedagemdesites.ws/estudos-linguisticos/edicoesanteriores/4publica-estudos-2006/sistema06/gcm.pdf>. Acesso em: 10 jun. 2022.
- MASSINI-CAGLIARI, G. **A música da fala dos trovadores**: estudos de prosódia do português arcaico, a partir das cantigas profanas e religiosas. Thesis (Lecturer in Linguistics) - Faculdade de Ciências e Letras, Universidade Estadual Paulista, Araraquara, 2005.
- MASSINI-CAGLIARI, G. O sândi vocálico externo no português arcaico visto pela teoria da otimidade. *In*: CASTRO, R.; BARBOSA, P. (org.). **Encontro Nacional da Associação Portuguesa de Linguística**. Braga: APL, 2000. v. II. p. 59-75.
- MASSINI-CAGLIARI, G. **Sândi Vocálico Externo nas Cantigas Medievais Portuguesas**. Araraquara: FCL – UNESP, 1999. Trabalho inédito.
- MASSINI-CAGLIARI, G. **Cantigas de amigo**: do ritmo poético ao linguístico: um estudo do percurso histórico da acentuação em Português. 1995. Thesis (Doctor in Linguística) – Instituto de Estudos da Linguagem, Universidade Estadual de Campinas, Campinas, 1995.
- MASSINI-CAGLIARI, G.; CAGLIARI, L. C. De sons de poetas ou estudando fonologia através da poesia. **Revista da Anpoll**, São Paulo, v. 2, n. 5, 1998.
- NESPOR, M. Vowel Degeminantion and Fast Speech Rules. **Phonology Yearbook**, Amsterdam, v. 4, p. 61-85, 1987.
- O'CALLAGHAN, J. **Alfonso X and the Cantigas de Santa Maria**: a poetic biography. Boston: Brill, 1998.

PARKINSON, S. As Cantigas de Santa Maria: estado das cuestións textuais. **Anuario de estudos literarios galegos**, Vigo, p. 179-205, 1998.

SNOW, J. T. Current Status of Cantigas Studies. *In*: KATZ, I. J.; KELLER, J. E. (ed.). **Studies on the Cantigas de Santa Maria: Art, Music, and Poetry**. Madison: The Hispanic Seminary of Medieval Studies, 1987. p. 475-486.

TRASK, R. **Dicionário de linguagem e lingüística**. Tradução e adaptação de Rodolfo Ilari. São Paulo: Contexto, 2004.

TENANI, L. O efeito de eurritmia e a degeminação. **Estudos linguísticos**, São Paulo, p.928-932, 2004.

TENANI, L. Domínios prosódicos e processos de reestruturação silábica. **Estudos linguísticos**, São Paulo, p.1-4, 2003.

TENANI, L. Sândi vocálico e estrutura prosódica. **Estudos linguísticos**, São Paulo, p.1-4, 2002.

XAVIER, M.; MATEUS, M. (org.). **Dicionário de termos linguísticos**. Lisboa: Cosmos, 1990. v.1.

Received on May 6, 2020

Approved on July 20, 2020