Phonological behaviour driven by morphosyntactic differences: Evidence from clitics in Brazilian Portuguese

Natália Brambatti Guzzo
UFRGS
nataliaguzzo@me.com

Guilherme Duarte Garcia
McGill University
guilherme.garcia@mail.mcgill.ca

Abstract

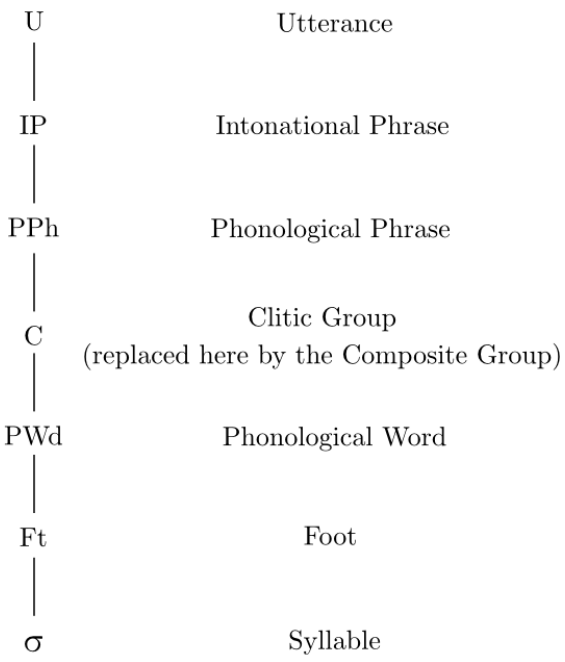
Brazilian Portuguese pronominal and non-pronominal clitics are generally assumed to undergo the same phonological phenomena. Both show vowel raising and vowel sandhi with the initial vowel of the host and thus differ from unstressed monosyllabic prefixes, which are not expected to undergo such processes (Bisol, 2000, 2005). However, an analysis of vowel raising in pronominal clitic *se* (3SG/PL.REFL/INDET/PASS) and non-pronominal clitic *se* ('if') shows that the phenomenon is significantly more frequent in non-pronominal *se*. This fact, as well as morphosyntactic distinctions between these two categories of clitics, indicates that pronominal and non-pronominal clitics are mapped onto the prosodic hierarchy in two separate domains. While non-pronominal clitics are prosodized in the phonological phrase (PPh), pronominal clitics are prosodized in the composite group (CG; Vogel (2009)), the domain between the phonological word (PWd) and the PPh onto which structures with compositional characteristics are prosodically mapped.

Keywords: Prosodic Representation, Brazilian Portuguese, Clitics, Vowel raising, Composite Group

1. Introduction

In early accounts in prosodic phonology (Selkirk, 1984; Nespor and Vogel, 1986), the hierarchy of prosodic domains (see Fig. 1) was regulated by a set of principles referred to as the Strict Layer Hypothesis (SLH). In addition to constraining the layering of domains and the assignment of head status to elements within constituents, the SLH posited that prosodic structures are non-recursive and exhaustive. In other words, a prosodic domain (*C*) can only be formed by elements from the lower constituent (*C–1*), and cannot contain any element of the same type (another *C*). In the SLH framework, for instance, a phonological word (PWd) could not contain another PWd, and a phonological phrase (PPh) would obligatorily contain only PWds (as opposed to containing a PWd and another constituent, such as a syllabe).

Figure 1: The prosodic hierarchy

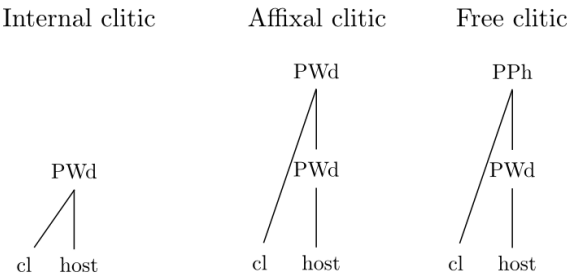


In a strictly-layered prosodic hierarchy, clitic structures are assigned to a particular prosodic domain, the *clitic group*, a constituent between the PWd and the PPh (Nespor and Vogel, 1986; Hayes, 1989). As prosodic domains are identified on the basis of (a) phonological processes observed and (b) specificities in syntax-phonology mapping (since Nespor and Vogel (1986)), the fact that clitic structures present specific phonological processes and morphosyntactic characteristics in a number of languages accounts for their prosodization in a particular domain.

However, later studies drew attention to the fact that clitics may behave differently in relation to their host (the adjacent prominent element) across languages and, within a single language, not all clitics undergo the same phonological and morphosyntactic phenomena (Selkirk, 1996). In Selkirk's (1996) approach, clitics were assigned to three categories, according to their relationship with the host: *internal*, *free*, and *affixal* (see also e.g. Peperkamp (1997) and Vigário (2003)). Whereas internal clitics attach directly to the phonological word (PWd) projected by their host, free clitics adjoin their hosts in a higher prosodic domain, the phonological phrase (PPh). Affixal clitics, on the other hand, recursively adjoin their host PWd (see Fig. 2). The behaviour of both internal

and affixal clitics corresponds to that of prefixes. While internal clitics are similar to prefixes that integrate the stem, affixal clitics are behave similarly to prefixes that adjoined a fully-formed PWd. Free clitics are more syntactically independent when compared to internal and affixal clitics and are thus considered phrasal affixes (see Anderson (2005)).

Figure 2: Types of clitics according to Selkirk (1996)



Selkirk's (1996) analysis is couched within the Optimality Theory (OT) framework (Prince and Smolensky, 1993), in which the problematic principles of the Strict Layer Hypothesis were converted into violable constraints (see also e.g. Truckenbrodt (1999)). As the skipping and repetition of levels were now presumed to emerge from constraint interaction, clitics no longer needed PWd status in order to be instantiated, and the apparent cross-linguistic variability in clitic behaviour was attributed to clitics being able to prosodize in distinct constituents. In other words, the optimal output for a clitic + host sequence could be assigned to different prosodic domains (the PWd or the PPh), in accordance to the ranking of constraints such as NONRECURSIVITY (*Assign a violation mark to any instance of prosodic recursion*) and EXHAUSTIVITY (*Assign a violation mark to any instance of domain-skipping*) in a given language. Under such premises, the *clitic group* was excluded from the prosodic hierarchy.

In Brazilian Portuguese (BP), pronominal and non-pronominal clitics (unstressed object pronouns and unstressed articles, prepositions and conjunctions, respectively) exhibit the same phonological phenomena. Both undergo vowel raising (e.g. *me chama* → m[i] chama 'calls me'; *de calor* → d[i] calor 'of heat') and vowel sandhi processes with the initial host vowel (e.g. *me espere* → m[i]spere 'wait for me'; *se esperarmos* → s[i]sperarmos 'if (we) wait'). These similarities in

behaviour between pronominal and non-pronominal clitics with regard to vowel raising and vowel sandhi have led some researchers to propose that both are prosodized in the same domain (see e.g. Bisol (2000, 2005)).

In this paper, we show that, despite the apparent similarity in phonological behaviour, pronominal and non-pronominal clitics differ with respect to the frequency at which vowel raising applies. We compare pronominal *se* (3SG/PL.REFL/INDET/PASS) with non-pronominal *se* ('if') in order to show that the phenomenon is significantly more frequent in non-pronominal clitics. The analysis focuses only on clitic *se* in order to avoid the influence of confounding phonological factors such as onset type and presence of coda in the clitic form. Differences in vowel raising, as well as distinctions in morphosyntactic behaviour, indicate that pronominal and non-pronominal clitics are prosodized in separate domains.

Following Vogel (2009), we acknowledge the problems with the *clitic group*, but also assume that a constituent between the PWd and the PPh, namely the *composite group*, is necessary. Regarding BP, the composite group accounts for the prosodization of pronominal clitics, whereas the PPh accounts for the prosodization of non-pronominal clitics. The composite group is the domain that accommodates prosodic structures with compositional characteristics. Pronominal clitics, being bound to their verb hosts and less susceptible to vowel raising, are more dependent on the adjacent structure than non-pronominal clitics. This proposal thus assumes that, while prosodic domains are subjected to violations to EXHAUSTIVITY and NONRECURSIVITY, the prosodic hierarchy also supports an additional domain, the composite group.

This paper is structured as follows: in section 2, we provide a brief definition of the term *clitic* and discuss the phonological phenomena that are observed in both pronominal and non-pronominal clitics in BP, as well as phenomena that differentiate clitics from unstressed monosyllabic prefixes. In section 3, we examine the distinctions between pronominal and non-pronominal clitics; more specifically, we discuss clitic fusion, which is present only in non-pronominal clitic sequences, and vowel raising, which is more frequent in non-pronominal clitics. We compare pronoun *se* (3 SG/PL.REFL/INDET/PASS) with conjunction *se* ('if'), in a southern BP dialect in which VR is variable in clitic position (the Italian Immigration Area dialect). The hypothesis of this analysis

is that VR in this BP variety is a gradient phenomenon, being less frequent in a lower level of the prosodic hierarchy (the composite group) and more frequent in a higher level (the PPh). This hypothesis is based on the fact, well reported in the literature about the BP vowel system (Bisol, 1981; Battisti, 1993; Leite and Callou, 2002; Vieira, 2002), that vowel raising is prevalent at the right edge of elements within the phrasal domain, but strictly constrained within lower constituents (such as the PWd). In section 5, we argue that the differences between pronominal and non-pronominal clitics in BP, as well as between clitics and prefixes, support a three-domain distinction for clitic and prefix prosodization.

2. The phonological behaviour of Brazilian Portuguese clitics

In general, the term *clitic* refers to non-prominent monosyllabic function words whose instantiation depends on an adjacent prominent element (the host) (Zwicky, 1977; Anderson, 2005; Spencer and Luis, 2012). In Brazilian Portuguese (BP), the elements that fit into this category are certain prepositions, conjunctions, articles, and object pronouns. These elements are subject to phonological phenomena that target unstressed final vowels in the language, such as vowel raising and vowel sandhi.

Table 1 lists the most frequently used non-pronominal clitics in BP. Table 2 shows the pronominal clitics in the language.

Clitic *pra* in Table 1 is a reduced form of preposition *para* 'to, for'. According to the definition of *clitic* followed here, *para* cannot be considered a clitic, as it is generally assumed to bear prominence (['pa.ɾɐ]). Feminine indefinite article *uma* is not listed in Table 1 either, as it is also regarded as prominent.

Note that, in Table 2, there are two instances of *se*. One of them is a reflexive pronoun and can be used with both singular and plural 3 per: *Ele se cortou* 'He cut himself', *Eles se cortaram* 'They cut themselves'. The other one is an indeterminate pronoun (e.g. *Aqui se come bem* 'Here one eats well'), which can also be accounted for as a passivizer (e.g. *Aqui se produzia vinho* 'Here, wine used to be produced = Here one used to produce wine').

The pronominal clitics in shaded cells are not frequently used in spoken BP. Instead of using

Table 1: Non-pronominal clitics

Clitic	**Gloss**	**Word class**	**Example**
de	of, from	preposition	de casa *of home*
com	with	preposition	com cuidado *with care*
por	by, for	preposition	por anos *for years*
pra	to, for	preposition	pra todos *to everybody*
em	in, at	preposition	em casa *at home*
a	to, for	preposition	a São Paulo *to Sao Paulo*
o	the (m.)	def. art.	o professor *the teacher*
a	the (f.)	def. art.	a professora *the teacher*
um	a (m.)	indef. art.	um professor *a teacher*
que	that	conjunction	que fiz *that (I) did*
se	if	conjunction	se quiser *if (you) want*
e	and	conjunction	e vocês *and you*

these accusative pronouns, speakers tend to either use a full NP (or a correspondent demonstrative pronoun) or to elide the direct object of the clause (e.g. *Você viu a Maria? Sim, eu vi.* 'Did you see Maria? Yes, I saw' — as opposed to *Você viu a Maria? Sim, eu* ***a*** *vi.*). Object pronoun *vos* (2 PER.PL) was omitted from the table, as its use is limited to certain legal documents and religious scriptures in BP.

Both non-pronominal and pronominal clitics undergo vowel raising. In fact, vowel raising in clitic position is a predominant phenomenon in most BP dialects (see Leite and Callou (2002)). This phenomenon (/e, o/ $\rightarrow$ [i, u]) is observed in clitics that present an underlying mid vowel (such as *de, se*), regardless of having a following coda consonant (such as *com, por*). The examples in (1) show vowel raising in both non-pronominal (1a)-(1b) and pronominal clitics (1c)-(1d), in clitics with and

Table 2: Pronominal clitics

Clitic	Classification	Case	Example
me	1 per sg	acc./dat./refl.	Ele me disse *He told me*
te	2 per sg	acc./dat./refl.	Ela te disse *She told you*
o	3 per sg (m.)	acc.	Ela o viu *She saw him*
a	3 per sg (f.)	acc.	Ele a viu *He saw her*
lhe	3 per sg	dat.	Eu lhe trouxe isto *I brought her this*
se	**3 per sg/pl**	refl.	Ele se cortou *He cut himself*
nos	1 per pl	acc./dat./refl.	Ela nos disse *She told us*
os	3 per pl (m.)	acc.	Ela os viu *She saw them*
as	3 per pl (f.)	acc.	Ela as viu *She saw them*
lhe	3 per pl	dat.	Eu lhes trouxe isto *I brought them this*
se	**3 per**	indet./pass.	Aqui se come bem *Here one eats well*

without a coda.

(1) a. por anos → p[u]r anos
for years

b. se quiser → s[i] quiser
if (you) want

c. nos disse → n[u]s disse
(he) told us

d. se cortou → s[i] cortou

(he) cut himself

Vowel raising is not a phenomenon exclusive to clitics. Although the process may be encountered in pretonic position (usually triggered by a following high vowel; e.g. p/e/dido → p[i]dido 'order'), it is usually identified with the word-final syllable (Leite and Callou, 2002; Vieira, 2002). As well as vowel raising in clitics, raising in word-final position is variable in certain Brazilian regions (such as in the Italian Immigration Area, which we will examine in greater detail in the next section). (2) shows examples of raising in word-final position, in both individual words (2a) and phrases (2b).

(2) a. nome → nom[i]
name

b. nome lindo → nom[i] lind[u]
beautiful name

BP clitics may exhibit vowel raising even when they are in focus position (3). However, they cannot undergo the process when they are placed at the right edge of a phonological phrase (PPh) (4). In (3), the focused clitic is marked with an F.

(3) Eu te disse para ir c[u]m$_{F}$ ele, não sem ele.
I told you to go with$_{F}$ *him, not without him*

(4) a. O [ki] ela disse?
What she said
What did she say?

b. Ela disse o [ke]?
She said what
What did she say?

c. *Ela disse o [ki]?

In (4), *que* ([ki]∼[ke]) is the emphasized element in all three sentences. As phrase-internal clitics ((3) and (4a)) can be emphasized *and* undergo vowel raising, it is not focus or phrasal prominence that block raising in (4c), but the position of the clitic in the sentence.

Que 'that, which', is perhaps the clitic that most frequently appears in phrase-final position. Other clitic forms may appear in short answers, and clitics in general may precede speech hesitations. In short answers (5), it not clear whether the clitic vowel may undergo raising. When clitics precede hesitations (6), on the other hand, vowel raising is observed. This may be due to the fact that constructions with hesitations maintain a slot for the element that follows the clitic, even though it is not manifested in speech.

(5) 'Você quer ver o filme com ou sem legenda?' 'Com.' ?C[u]m

'Do you want to see the movie with or without subtitles?' 'With.'

(6) Você disse que só vai lá s[i]...

You said that (you) will only go there if...

Unlike clitics, unstressed monosyllabic prefixes[1] are not expected to undergo VR in BP .

(7) a. re-fazer → r[e]-fazer *r[i]-fazer

re-do

b. co-produção → c[o]-produção *c[u]-produção

co-production

Vowel raising is more likely to apply when the prefix is followed by a syllable with a high vowel (e.g. *re-fiz* → r[i]-fiz '(I) re-did'). As noted above, such a phenomenon is also observed word-internally (e.g. *perigo* → p[i]rigo 'danger') in BP. However, in dialects in which vowel raising is variable in clitics, its application is not influenced by the quality of the following vowel (e.g. *s[i] falam* '3PL.REFL speak', *s[i] xingam* '3PL.REFL scold') (see Author, Year).

Both non-pronominal and pronominal clitics undergo vowel sandhi processes (diphthongization,

[1]BP prefixes seem to correspond to at least three prosodic categories: (i) prefixes that integrate into the word (such as *en* in *enlatado* 'canned', from stem *lat-(a)* 'can' *n*), (ii) unstressed prefixes that adjoin the word (such as *re* in *refazer* 'redo'), and (iii) prominent prefixes (such as *pós* in *pós-guerra* 'post-war'). Words in group (i) do not exist without the prefix (e.g. *latado), which is an indication that the prefix is integrated into the stem. Prefixes in group (iii) arguably have stress and thus correspond to PWds. In this paper, we will focus solely on prefixes from group (ii), as these have been assigned the same prosodic representation as pronominal clitics in European Portuguese (Vigário, 2003). For further discussion on the morphological and prosodic differences between these groups of prefixes in BP, see Schwindt (2001, 2008).

degemination, elision) in BP (Bisol, 2000, 2005). Like vowel raising, vowel sandhi is expected to occur between two words, but not word-internally (with the exception of diphthongization, which can apply word-internally as a mechanism for hiatus repair; e.g. mo.ɛ.da → [mwɛda] 'coin'). (8) shows some examples of diphthongization (8a), degemination (8b), and elision (8c) between two lexical words.

(8) a. livro aberto → livr[wa]berto
open book

b. casa amarela → cas[a]marela
yellow house

c. casa organizada → cas[o]rganizada
organized house

In these examples, the first vowel either becomes a glide or is deleted. Unlike vowel raising, which is obligatory in clitic and word-final position in most BP varieties, word-word sandhi processes are variable and affected by speech rate, stress position and prosodic constituency. Regarding stress position and prosodic constituency, degemination and elision may apply when the second element of the vowel sequence is stressed, but only if the second word of the construction is *not* at the right edge of a phonological phrase (Abaurre, 1996; Bisol, 2003) (9).

(9) a. cómo úvas]$_{\mathrm{PP_H}}$ → *com[ú]vas
(I) eat grapes

b. cómo úvas madúras]$_{\mathrm{PP_H}}$ → com[ú]vas madúras
(I) eat ripe grapes

Both non-pronominal and pronominal clitics can undergo diphthongization (10a) and degemination (10b) with the adjacent element.

(10) a. se aparecer → s[ja]parecer
if (it) appears

b. se esqueceu → s[i]squeceu

(he) forgot himself

Elision is observed especially in non-pronominal clitic + host structures, as it usually applies when the first vowel of the sequences is an /a/ (10) (Gayer, 2014). The clitic form in example (11) is the result of fusion between preposition *de* 'of' and feminine definite article *a*.

(11) maestro da orquestra → maestro d[o]rquestra
conductor of-the orchestra

Vowel sandhi is not verified when one-segment clitics (such as preposition *a*, definite articles *a, o*, and accusative pronouns *a, o*) are the first element of the vowel sequence. Juncture processes involving clitics in this position would imply the loss of their morphological structure and semantic information altogether (12a) (Bisol, 2000, 2005). However, when one-segment clitics are the second element in a vowel sequence, vowel sandhi may apply (12b).

(12) a. a arquitetura → *[a]rquitetura
the architecture
b. leva a bolsa → lev[a] bolsa
(she) takes the bag

Vowel sandhi processes are not expected to occur between the vowel in an unstressed prefix and the first vowel in the stem[2] (13).

(13) a. re-armazenar → *r[ja]rmazenar
re-store
b. re-armazenar → *r[a]rmazenar
re-store
c. re-ensaiar → *r[e]nsaiar, *r[i]nsaiar

[2]However, diphthongization can happen between a prefix and the following stem if it is the stem vowel that becomes a glide (e.g. *re-escrever* → *r[ej]screver* 're-write'). Degemination apparently can apply to prefix + stem sequences too (e.g. *co-operar* → *c[o]perar* 'co-operate'). Nevertheless, it might be the case that degemination is allowed in lexicalized constructions, in which the prefix has lost its status. In other words, a word such as *c[o]perar* (from *cooperar*) has a lexicalized meaning ('to help') and may undergo degemination; on the other hand, the structure that results from the addition of prefix *co* to the stem *operar* has a compositional meaning ('to operate something alongside someone') and thus cannot undergo degemination (*c[oo]perar*).

re-rehearse

Regarding the application of phonological processes, pronominal and non-pronominal clitics behave similarly, although they both differ from prefixes in BP. Based on this, one could propose that two forms of prosodization account for these three elements: one for prefixes only, and another for both types of clitics. However, pronominal and non-pronominal clitics are actually distinct in two aspects. In the next section, we show that pronominal and non-pronominal clitics present distinct morphosyntactic behaviour and that a particular morphosyntactic phenomenon, namely clitic fusion, targets non-pronominal clitics only.

3. Pronominal and non-pronominal clitics: morphosyntactic distinctions

Despite undergoing the same phonological processes, pronominal and non-pronominal clitics in BP differ in three main aspects: (a) only non-pronominal clitics display clitic fusion (e.g. *de* + *a* = *da* 'of-the.FEM'), (b) non-pronominal clitics exhibit a freer morphosyntactic behaviour, and (c) non-pronominal clitics are more likely to undergo vowel raising than pronominal clitics. This section will focus solely on morphosyntactic differences between pronominal and non-pronominal clitics in BP (items (a) and (b) above). The frequency at which vowel raising applies in both types of clitics and its relevance to the present analysis will be discussed in the next section.

3.1. Clitic fusion

Clitic fusion targets sequences of prepositions (such as *de*, *pra* and *por*) and articles (*a, o, um*). In such a preposition-article combination, the preposition usually loses its vowel (e.g. *de* + *a* = *da*, *pra* + *o* = *pro*), although in certain cases the resulting structure is a two-syllable function word (e.g. *por* + *a* = *pela*). (14) lists examples of clitic fusion between prepositions *de, com, pra, em* and definite article *o*. Fusion is also possible between these prepositions and feminine article *a* or indefinite article *um*. While the structures in (14a) and (14b) are invariably used in orthography, the structures in (14c) and (14d) are used mainly in spoken BP.

(14) a. caderno *de* + *o* estudante → caderno *do* estudante

notebook of-the student

b. colocado *em* + *o* correio → colocado *no* correio

put in-the mail

c. jantar *com* + *o* professor → jantar *co* professor

dinner with-the teacher

d. convite *pra* + *o* professor → convite *pro* professor

invitation to-the teacher

Fusion also applies in sequences of prepositions and demonstrative pronouns. As demonstrative pronouns in Portuguese are two-syllable function words (e.g. *este, esse, aquele* 'this, that, that over there'), the resulting combination is also a two-syllable function word (e.g. *de* + *este* = *deste* 'of-this').

Pronominal clitics do not undergo clitic fusion in BP. Contrary to other Romance languages, such as Spanish, Italian, and European Portuguese (EP), BP avoids sequences of pronominal clitics. In contexts where pronominal clitics can form clusters in these other Romance languages, BP employs one of the following three alternatives (Farrell, 1990; Galves and Abaurre, 2002): (a) one of the clitics is dropped, (b) one of the clitics is substituted for a non-clitic pronoun, or (c) the full NP to which one of the clitics refers is maintained. (15) shows an example of a pronominal clitic sequence in Spanish (15a), and an example of pronominal clitic fusion in European Portuguese (15b). (16) shows BP alternatives to pronominal clitic sequencing and fusion. Note that, in all examples in (16), the direct object *o presente* 'the present' could be substituted for the clitic *o* '3SG.ACC'.

(15) a. yo te lo compro
I you.DAT it.ACC buy
I buy it for you

b. eu to compro to = te + o
I you.DAT it.ACC buy
I buy it for you

(16) a. Eu compro o presente **para ti** → Eu **te** compro.

*I buy the present for you → I you.*DAT *buy*

b. Eu compro o presente **para ti** → Eu **te** compro ele

*I buy the present for you → I you.*DAT *buy it.*NOM

c. Eu compro o presente **para ti** → Eu **te** compro o presente

*I buy the present for you → I you.*DAT *buy the present*

The examples in (16) present, respectively, possibilities (a), (b), and (c) listed in the previous paragraph. In all alternatives, the prepositional phrase *para ti* can be substituted for clitic *te*. In construction (a), the direct object is omitted. In construction (b), the direct object is substituted for the nominative (non-clitic) form of the corresponding pronoun. In construction (c), the direct object is maintained in the sentence.

Unlike European Portuguese, which allows sequences of both non-pronominal and pronominal clitics and clitic fusion with both non-pronominal and pronominal clitics (Luís, 2009), BP only allows clitic sequences and fusion with non-pronominal clitics. This may be due to a morphosyntactic constraint that regulates how (and if) pronominal and non-pronominal clitics can form sequences in BP. In the next subsection, we present additional morphosyntactic distinctions between pronominal and non-pronominal clitics.

3.2. Other morphosyntactic characteristics of BP clitics

Although both pronominal and non-pronominal clitics are proclitics in BP (Galves and Abaurre, 2002), several other morphosyntactic aspects differentiate these types of clitics. While non-pronominal clitics may potentially attach to hosts of any word classes (17), pronominal clitics attach to a specific type of host, namely the main verb of the clause (18). In (17), non-pronominal clitic *de* 'of, from' attaches to a verb (17a), a noun (17b), and an indefinite pronoun (17c). In (18), pronominal clitic *me* '1S.REFL' attaches to the main verb of each clause (*visto/vestir*). Additional verbs are italicized in (18).

(17) a. Cansado **de** correr.

Tired of running

b. Cansado **de** festas.

Tired of parties.

c. Cansado **de** tudo.

Tired of everything.

(18) a. Eu **me** visto.

I dress myself.

b. Eu *vou* **me** vestir.

I am going to dress myself.

c. Eu *vou tentar* **me** vestir.

I am going to try to dress myself.

Furthermore, only non-pronominal clitics allow the insertion of other elements between themselves and their original host (19a). The fact that BP pronominal clitics cannot be separated from their verb hosts (19b) is an aspect that differentiates BP from European Portuguese (Bermúdez-Otero and Luís, 2009). In (19), the inserted element is in bold.

(19) a. Cansei de correr. → Cansei de **tanto** correr.

I am tired of running. → *I am tired of running too much.*

b. Eu me cansei. → Eu me cansei **muito**. (cf. *Eu me **muito** cansei.)

I tired myself. → *I tired myself very much.*

As noted above, pronominal clitics cannot form clitic strings (16). Non-pronominal clitics, on the other hand, may appear in clitic sequences. In (20), non-pronominal clitics are in bold.

(20) **A de que** gosto é azul.

The one that I like is blue.

Morphosyntactic distinctions may be indicative of differences in prosodic mapping. Structures with distinct morphosyntactic behaviour often also present incompatible phonological behaviour, and such displays of incompatibility argue for their representation in separate prosodic domains. The case of BP clitics is interesting in that such elements seem to exhibit divergent morphosyntactic

behaviour but identical phonological behaviour. If we assume that phonological behaviour is decisive in assigning a given structure to a particular prosodic domain, then both pronominal and non-pronominal clitics should be represented in the same domain. In the next section, however, we will argue that pronominal and non-pronominal clitics in fact behave differently with regard to a phonological phenomenon that is observed in both of them, namely, vowel raising.

4. Frequency of vowel raising: clitic *se*

We pointed out in previous sections that both pronominal and non-pronominal clitics undergo vowel sandhi processes and vowel raising. We also noted that while vowel sandhi processes are variable and constrained by rhythm, vowel raising is categorical in clitic position in most BP varieties. Thus, if we wish to investigate possible phonological differences between pronominal and non-pronominal clitics, we should examine a variety in which a given phonological process is variable. Identical behaviour in relation to such a variable phenomenon may contribute to the assumption that these two types of clitics share the same form of prosodization.

In this section, we show that pronominal and non-pronominal clitics *do* behave differently in relation to vowel raising in a BP variety in which such a process is variable. The variety in question is that of the Italian Immigration Area (IIA) in the state of Rio Grande do Sul, an area in which most of the population has northern Italian ancestry. In the IIA, vowel raising is moderate in word-final position (around 50%, Vieira (2002), Author (2010)) and relatively frequent in clitic position (around 70%, Author, Year).

A closer examination of the clitic forms in the IIA sociolinguistic corpus used by Author (2010) reveals that clitics have a heterogeneous behaviour in relation to vowel raising. That is, while raising is categorical in clitics such as *em* 'in, at' and *e* 'and', it is relatively infrequent in clitics *de* 'of, from' and *te* '2 per sg'. Table 3, adapted from (Author, 2012), shows all clitic forms found in the author's 2010 analysis of /e/-raising in the IIA.

In table 3, the shaded cells correspond to pronominal clitics. Note that clitic *se* may be either pronominal (e.g. *ele se lava* 'he washes himself') or non-pronominal (e.g. *se você for* 'if you go'). At first glance, there is no clear indication that vowel raising is related to clitic type: whereas non-

Table 3: Frequency of VR in clitics

Clitic	**de**	**te**	**me**	**se**	**que**	**e**	**em**	**Total**
VR (%)	38%	42%	58%	69%	80%	93%	96%	73%
Tokens	1947	73	289	713	3023	1925	732	8702

pronominal clitics such as *que*, *e*, and *em* show high percentages of VR, non-pronominal *de* has, on the other hand, the lowest percentage among all clitics in the corpus. One possible assumption, then, is that vowel raising in clitics is conditioned by phonological context: as happens with word-final syllables in the IIA variety, raising in clitics is favoured by preceding sibilants and dorsals (such as [s] and [k]), and disfavoured by preceding coronal stops (such as [t] and [d]) (Roveda, 1998; Vieira, 2002). Vowel raising in clitics can also be conditioned by presence of coda and absence of onset, two factors that favourably influence the process in initial position in southern dialects of BP (Bisol, 1981; Battisti, 1993). Thus, in relation to vowel raising, the behaviour of clitics might be analogous to that of other unstressed positions in BP.

However, acknowledging that phonological context may play a role in clitic VR does *not* necessarily entail that morphological class has no part in the phenomenon. The most adequate way to test whether vowel raising is also morphosyntactically conditioned is to analyze such a phenomenon in the only clitic form that can be both pronominal and non-pronominal: clitic *se*.

4.1. Methodology

The data in Table 3 were obtained from 32 sociolinguistic interviews performed in the IIA municipality of Name of Town (population: $\approx$ 26,000). Participants were selected based on sex (2 groups: male and female), age (4 groups: 18-30 years old, 31-50 yo, 51-70 yo, and 71 yo-older), and place of residency (2 groups: urban and rural). There are two participants per cell combination ($n = 2 \times 4 \times 2 \times 2 = 32$). These data were originally part of a sociolinguistic analysis of vowel raising in Name of Town, in which all unstressed positions were considered (initial, medial pre-stress, final, non-final post-stress, and clitic) (Author, 2010).

Before we proceed to describe the data analysis employed in the present study, a brief descrip-

tion of fundamental aspects of the IIA variety is provided.

4.1.1. The Italian Immigration Area variety

The Italian Immigration Area in the state of Rio Grande do Sul (Fig. 3) is the Brazilian region where many Italian immigrants settled after the year 1875. The vast majority of immigrants were from northern Italy, especially from the Veneto area. The Italian population who arrived at the IIA lived in relative isolation from Portuguese- and German-speaking neighbouring communities, primarily due to difficulties in transportation (De Boni and Costa, 1979).

Figure 3: The Italian Immigration Area in Rio Grande do Sul

Land distribution prioritized those who arrived first, and Italian immigrants ended up having neighbours from several areas in northern Italy. This means that immigrants had frequent contact with people who, despite being fellow Italians (or northern Italians), spoke a different language or language dialect.[3] This lead to the development of a local language variety (Frosi and Mioranza, 1975; De Boni and Costa, 1979). As most immigrants were Venetian, this local variety exhibited mostly features of Venetian dialects, such as the possibility of final syllables with sonorant codas, and metaphony when plural suffix -i is inserted.[4]

As the decades passed, IIA speakers had more contact with Brazilian Portuguese, and the local Venetian variety was circumscribed mainly to rural areas. However, the local Venetian variety influenced BP speech in the IIA, as certain characteristics that are usually associated with such a

[3]Whether the varieties spoken by Italian immigrants were dialects or languages is not relevant for this discussion.

[4]Example of word with a final sonorant coda: *cán* 'dog' (standard Italian: *cáne*). Example of metaphony with the insertion of plural suffix -i: fi[ó]r → fi[ú]ri 'flower'.

variety are transferred to IIA Portuguese. For example, IIA speakers may produce flap [ɾ] instead of vibrant [r] in onset position (e.g. *[ɾ]oupa* 'clothes', instead of *[r]oupa*), and may not palatalize alveolar stops /t,d/ before [i] (e.g. *[t]ipo* 'type', instead of *[t͡ʃ]ipo*). Speakers may also not raise /e, o/ in final or clitic position (e.g. *nom[e]* 'name', instead of *nom[i]*; *bol[o]* 'cake', instead of *bol[u]*; *m[e] chama* 'calls me', instead of *m[i] chama*; *d[o] lado* 'on-the side', instead of *d[u] lado*).

Sociolinguistic studies conducted in the IIA showed that these characteristics are strongly correlated not only with rural areas, but also with older age groups (see e.g. Battisti and Bovo (2004) for flap/vibrant alternation, Battisti et al. (2007) and Mauri (2008) for palatalization, and Roveda (1998) and Vieira (2002) for vowel raising in word-final position). Thus, in younger, urban groups, BP speech tends to adopt more *standard* characteristics (i.e., characteristics that are present in standard varieties), such as palatalization of alveolar stops and vowel raising in final and clitic position. This has been reported as change in progress in some of the aforementioned studies.

If there is a difference in vowel raising between pronominal and non-pronominal *se* in the IIA, we predict it will be more prominent in the speech of older, rural speakers. Younger, urban speakers, who have been increasingly abandoning IIA characteristics in their BP speech, may display categorical vowel raising in both pronominal and non-pronominal clitics, thus mirroring the standard BP variety.

4.1.2. Data Analysis

As in most sociolinguistic studies, the 32 participants of the present study were interviewed in their own homes or work places and were encouraged to talk about familiar topics. At times, participants' relatives or friends were in the room while the interview was being recorded. Although the resulting audio files are of good quality, they are not ideal for a thorough acoustic analysis. Occurrences of raising of the mid front vowel (/e/) were initially listened to and annotated by the first author, a native speaker of the IIA dialect, as a part of her 2010 study.

The starting point of the present analysis, then, are the occurrences of pronominal and non-pronominal clitic *se* included in Author (2010). We selected all instances of clitic *se* from the IIA corpus seen in Table 3 and reviewed the annotations made by Author (2010). To the 713 tokens of

se listed in the table above, we added other instances of *se* that had been previously ignored. Among these items were contexts of juncture and tokens that had been coded in a way that the searching tools initially used were not able to identify as instances of *se*.

With more items included in the list, both authors of the present study then listened to the interviews again, in order to assign each context to a category (*pronominal* or *non-pronominal*) and to double check the initial coding of vowel raising (performed by Author (2010)). We excluded tokens with a noisy background and those for which our judgements did not match. We then selected a representative sample of the remaining tokens ($\approx$ 30% of n = 827) and analyzed it using Praat (Boersma and Weenick, 2009), in order to confirm whether the formant patterns of such tokens were compatible with their initial coding.

All instances of pronominal *se* (reflexive, indeterminate pronoun, passivizer; see Table 2) were grouped in a single category (*pronominal*). Although non-pronominal *se* can only be a conjunction (see Table 1), it can appear in both direct object subordinate clauses (*Ela não disse se vinha* 'She did not say whether she would come') and conditionals (*Se você for, eu também vou* 'If you go, I go too'). Nevertheless, conjunction *se* was considered as one single category (*non-pronominal*) as well.

The data were modelled using a mixed-effects logistic regression (`glmer()` in R, R Development Core Team (2014)). The final model predicted VR based on clitic type (`TypeSe`) and age group. The model included a by-speaker random intercept as well as a by-speaker random slope for clitic type. Additionally, we analyzed the effect of other linguistic[5] and social variables on the phenomenon. All variables considered in this study are listed in Table 4.

4.2. Results

Both `Age` and `TypeSe` are significant predictors of vowel raising in our data. In Table 5, the positive intercept value confirms that reduction is significantly more frequent in the data ($\hat{\beta} = 2.77, \mathrm{p} < 0.00001$). However, pronominal clitics reduce the odds of reduction by a factor of 2.6 (`exp(0.94)`). Note that the effect size of age ($\hat{\beta}$) increases among older speakers, which confirms

[5] In the variable `followingContext`, the categories 'stops' and 'fricatives' are split into subcategories that specify place of articulation and voicing. The category 'Nasals' is split into subcategories that specify place of articulation.

Table 4: Social and linguistic variables

Social variables		**Linguistic variables**	
Sex	male female	Following vowel	high (i, u) mid (e, o, ɛ, ɔ) low (a)
Age	18-30 yo 31-50 yo 51-70 yo 71 yo-older	Following context	stops, fricatives affricates, nasals liquid, vibrant vowels
Region	urban rural	Distance from stressed syllable	from 1 to 5 (syllables)
		Type of *se*	pronominal non-pronominal

the fact that raising is more likely among young speakers. Being in the oldest age group (71-older) decreases the odds of vowel raising by a factor of 8.

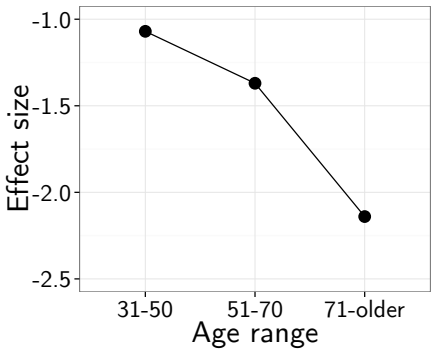
Table 5: Coefficient values for significant predictors in the mixed-effects logistic regression. $\hat{\beta} > 0$ indicates VR is favoured

Predictors	$\hat{\beta}$	Std. error	z value	p value
`(Intercept)`	2.77	0.40	6.91	< 0.00001
`TypeSePron`	-0.94	0.23	-4.09	< 0.0001
`31-50yo`	-1.13	0.50	-2.25	0.025
`51-70yo`	-1.41	0.50	-2.77	0.005
`71-older`	-2.07	0.55	-3.77	0.0001

These results are expected, since in the IIA the speech of older individuals is more influenced by the local Venetian variety, which has no vowel raising post-tonically nor in clitics. As pointed out by some researchers (e.g. Frosi and Mioranza (1975)), older speakers are often bilingual. Their Portuguese speech, then, presents some characteristics of the Venetian variety they speak.

Older speakers can be considered more conservative, in the sense that they preserve in their speech a characteristic that is associated with their Italian ancestry (non-raising). Younger speakers, on the other hand, seem to be moving toward the standard BP variety, which exhibits vowel raising

Figure 4: Gradient effect size by age group: lower odds of VR in older speakers



in both final and clitic positions. That this age difference is gradient is an interesting fact: vowel raising in clitic position seems to be gradually taking over the speech of the community, which indicates change in progress.[6]

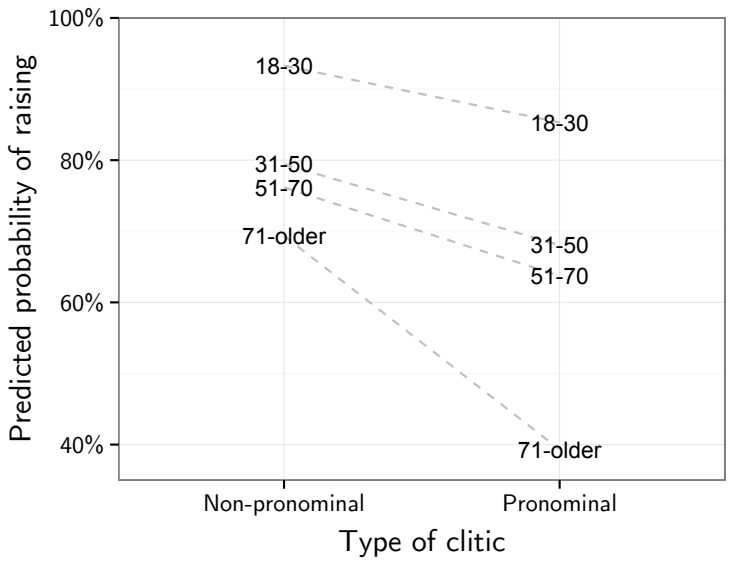
A closer examination of the data reveals that vowel raising is categorical in contexts of vowel sandhi (clitic *se* followed by a host starting with [i] or [e]; e.g. *se engana* → *s[i]ngana*[7] '(he) fools himself'). Thus, a model was run without contexts of juncture to verify whether this had an impact on the results. The logistic model *without* juncture predicts that pronominal clitics lower the odds of VR by a factor of 3.4 ($\hat{\beta} = -1.235, p < 0.00001$). In other words, even though the coefficient value is larger when compared to the model in Table 5, the significant negative effect of pronominal clitics remains.

Although vowel raising is observed in both pronominal and non-pronominal clitics, it is more frequent in non-pronominal clitics: whereas the overall frequency of raising in pronominal clitics is 62.3% (278/446 tokens), the overall frequency of the process in non-pronominal clitics is 80.3% (306/381 tokens). An inspection of by-speaker vowel raising application shows that, all data being considered, only one participant has more contexts of non-application than application in non-pronominal clitics. Considering pronominal clitics only, however, eleven speakers have more

[6]However, it may be the case that vowel raising has reached a stable level in the community and thus will not advance any further. If this is true, then next generations will not move on to categorically apply vowel raising in clitic position. Further research on vowel raising and other variable phenomena should be able to shed light on the matter.

[7]Although diphthongization is observed in the data, the tokens that are coded for juncture are only those that undergo degemination.

Figure 5: Predicted probabilities of VR by type of clitic and age group



contexts of non-application than application. When tokens with vowel sandhi are excluded from the data, twelve speakers have more non-application than application of vowel raising in pronominal clitics. In this case, one speaker has an equal number of tokens of application and non-application, and four other speakers reduce the difference between application and non-application of raising in pronominal *se*.

One additional observation should be made regarding the variable `followingVowel`. Our model shows that the quality of the following vowel (i.e., the vowel that is in the syllable following the clitic) has no significant effect on VR in clitic *se*. This confirms our assumption, mentioned in section 2 and discussed in greater detail in the next section, that clitics are *not* prosodized at the phonological word. Unlike pretonic vowel raising, clitic vowel raising is not conditioned by a high vowel in the following syllable (see Bisol (1981) and Battisti (1993) for analyses of raising in pretonic position).

Therefore, two factors seem to be at play in clitic vowel raising: the age of the speakers and the morphological class of the clitic. Whereas the results for `Age` signal to change in progress, with younger speakers raising the clitic vowel more frequently than older speakers, `TypeSe` indicates that speakers are aware of the fact that pronominal *se* and non-pronominal *se* are different. If

we assume that distinctions in phonological behaviour mirror morphosyntactic differences that are critical for prosodic mapping, then we can argue that pronominal and non-pronominal clitics are prosodized in separate domains.

5. Prosodic implications

In the previous sections, we showed that Brazilian Portuguese clitics differ from prefixes vis-à-vis vowel raising and vowel sandhi. Whereas these processes are observed in clitics, they are not expected to apply in unstressed monosyllabic prefixes. We also demonstrated that pronominal and non-pronominal clitics in BP have distinct morphosyntactic behaviour and significantly differ with regard to vowel raising application. These distinctions between the two types of clitics and between clitics and prefixes suggest that these elements present three separate forms of prosodization. If we consider that each clitic or prefix corresponds to a syllable, and the element to which they attach is a (phonological) word, the difference between the structures formed by clitic + host and prefix + stem resides not in the labels assigned to their members, but in the domain in which their prosodization occurs.

Following traditional approaches to prosodic structure (such as Nespor and Vogel (1986), Vogel (2009), and many others), we assume that a prosodic domain can be identified based on the phonological processes it presents. Considering that certain phonological phenomena may result from specific morphosyntactic configurations, we presume that particularities in morphosyntactic behaviour are also an indication of prosodic constituency. Based on these premises, we propose a the three-domain distinction for unstressed monosyllabic prefixes, pronominal clitics, and non-pronominal clitics in BP:

(21) a. Unstressed monosyllabic prefixes are prosodized in the phonological word (PWd).
b. Pronominal clitics are prosodized in the composite group (CG).
c. Non-pronominal clitics are prosodized in the phonological phrase (PPh).

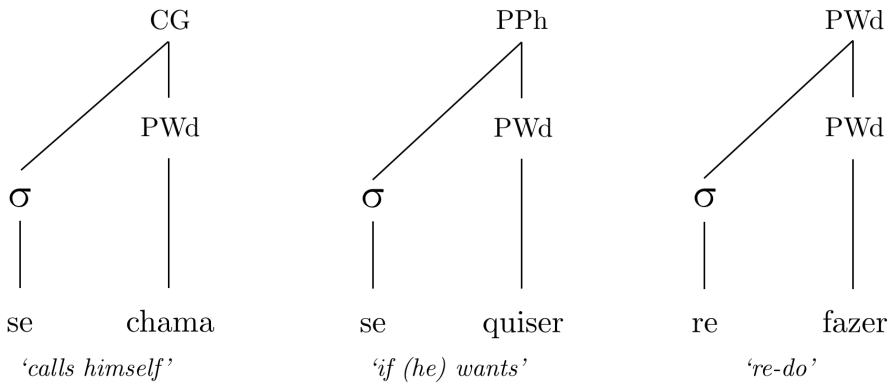
This distinction has certain implications: (a) in combinations of syllable + PWd, vowel raising and vowel sandhi are CG processes, in the sense that they are expected in the CG and above (in

the PPh), but not below it (in the PWd); (b) clitic fusion is a PPh processes, in the sense that it is expected in the PPh, but not below it (in the CG).

If we observe the morphosyntactic behaviour of pronominal and non-pronominal clitics, it seems reasonable to suggest that non-pronominal clitics are prosodized in the phrasal level. Non-pronominal clitics present a freer morphosyntactic behaviour: whereas pronominal clitics select exclusively one type of host (the main verb of the clause, see (18)), non-pronominal clitics may have hosts of all word classes (see (17)). Furthermore, only non-pronominal clitics allow the insertion of other elements between themselves and their original host (see (19)).

A pronominal clitic + host sequence (*se chama* 'calls himself'), a non-pronominal clitic + host sequence (*se quiser* 'if (he) wants'), and a prefix + stem structure (*re-fazer* 're-do') are prosodically represented, respectively, in Fig. 6. The first representation indicates that an additional domain, the CG, should be included into the prosodic hierarchy. The cost of assuming another prosodic level is debated in the next subsection, along with alternatives to this additional domain proposed by different authors.

Figure 6: Prosodization of pronominal clitics, non-pronominal clitics, and unstressed monosyllabic prefixes in BP



5.1. The CG as a prosodic domain

Some initial approaches to prosodic constituency assumed the existence of a domain between the PWd and the PPh (Nespor and Vogel, 1986; Hayes, 1989). In these approaches, this domain was

the *clitic group*, and it belonged to a prosodic hierarchy ruled by the Strict Layer Hypothesis (SLH) (Selkirk, 1984; Nespor and Vogel, 1986), which for instance prohibited the skipping and the repetition of constituents. Under the SLH, every member of a clitic group should then correspond to the immediately lower prosodic constituent, namely the PWd. However, the fact that clitics do not exhibit fundamental PWd properties, such as correspondence with a lexical item or lexical prominence, and that clitics may present distinct cross-linguistic behaviour (Selkirk, 1996) led to the weakening of certain principles of the SLH.

With the introduction of Optimality Theory (OT) (Prince and Smolensky, 1993), the principles that regulated the well-formedness of the prosodic hierarchy were transformed into constraints. In particular, the principles that in the SLH advocated against level repetition (NONRECURSIVITY) and level skipping (EXHAUSTIVITY) were regarded as violable in the OT framework. The degree to which languages allow violations to these two principles apparently explained the cross-linguistic variability in clitic behaviour (see e.g. Selkirk (1996), Peperkamp (1997), and Zec (2005)). Thus, having become superfluous to explain clitic prosodization, the clitic group was excluded from the prosodic hierarchy.

However, one consequence of eliminating a prosodic constituent between the PWd and the PPh is the over-assignment of structures to a single prosodic domain. For example, having no clitic group in the hierarchy has lead to the conclusion that both prefixes and clitics in European Portuguese are prosodized as recursive PWds (Vigário, 2003). Although vowel reduction is observed in both elements, prefixes and clitics exhibit differences in morphosyntactic behaviour, which indicates that they are mapped onto the prosodic structure in distinct forms. In Brazilian Portuguese, in which a clear distinction between prefixes, pronominal clitics, and non-pronominal clitics can be made, the elimination of the clitic group has lead to various assumptions: (a) both unstressed prefixes and pronominal cltiics are prosodized in the PWd domain (compare, for example, Brisolara (2008) and Schwindt (2013)), and (b) both pronominal and non-pronominal clitics are prosodized in the PPh (Simioni, 2008)[8].

[8]Bisol (2005, 2000) suggests that clitic prosodization occurs in the clitic group. However, her analyses do not differentiate between pronominal and non-pronominal clitics, and consider that all function words, monosyllabic or not, are prosodized in the clitic group.

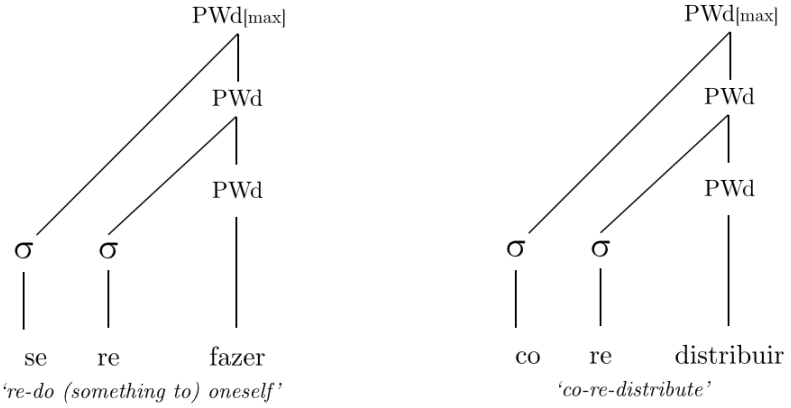
One recent solution to this problem is the proposal that minimal and maximal projections of a given prosodic constituent may be domain of application of specific phonological processes (e.g. Ito and Mester (2007, 2013); Elfner (2015)). In the case of BP, however, it is not clear how prefix and clitic structures would be distributed in minimal and maximal projections, and to which minimal or maximal projections (whether the PWd or the PPh) they would correspond. If we were to assume that both prefixation and pronominal clitic adjunction occur in the PWd, then we could argue that pronominal clitic prosodization occurs in the maximal PWd (the highest level of the PWd), since in a form with both a pronominal clitic and a prefix, the clitic would be external to the prefix (e.g. ***se*** *re-fazer* 're-do (something to) oneself').

In such an analysis, vowel raising is a maximal PWd phenomenon, as it is observed in the pronominal clitic, but not in the unstressed prefix. In that case, in a sequence of prefixes (e.g. *co-re-distribuir* 'co-re-distribute') the most external prefix should behave as a pronominal clitic, since it is located in the maximal PWd (see Fig. 7). In other words, if vowel raising applies in the maximal word, then we predict that prefix *co-* in *co-re-distribuir* displays the process more frequently than prefix *re-*. However, this does not seem to be the case for BP.[9]

If, on the other hand, we were to assume that both types of clitics are prosodized in the PPh, then pronominal clitic prosodization would invariably occur in the minimal level of the PPh, while non-pronominal clitic prosodization could occur at any level in the domain. In that case, a phrase formed by a non-pronominal clitic, a pronominal clitic, and a host (e.g. *que se chama* 'that calls himself') should exhibit the same behaviour as a structure formed by two non-pronominal clitics and a host (e.g. *que se chamasse* 'that if (he) called') (see Fig. 8). As argued in previous sections, pronominal and non-pronominal clitics not only exhibit morphosyntactic distinctions, but also differ with regard to frequency of application of a phonological process. Because the labels *minimal* and *maximal* are not circumscribed to the content of the prosodic structures, but to the prosodic structure itself, a minimal prosodic phrase will be classified so regardless of what element it contains it. In other words, a phrase will be minimal as long as it is the lowest level in the phrase domain.

[9] One of the assumptions of this proposal is that phonology refers to syntax as directly as possible, with PWds tending to match syntactic words, and PPhs tending to match syntactic phrases (Selkirk, 2011). As every element that is attached to or adjoins a given prosodic structure tends to be a syntactic node per se, the resulting prosodic structure is not flat. Some considerations regarding this assumption are presented in the next section.

Figure 7: Alternative prosodization for pronominal clitics (as a maximal PWd). This predicts that structures with a pronominal clitic and a prefix should behave as structures with two prefixes.



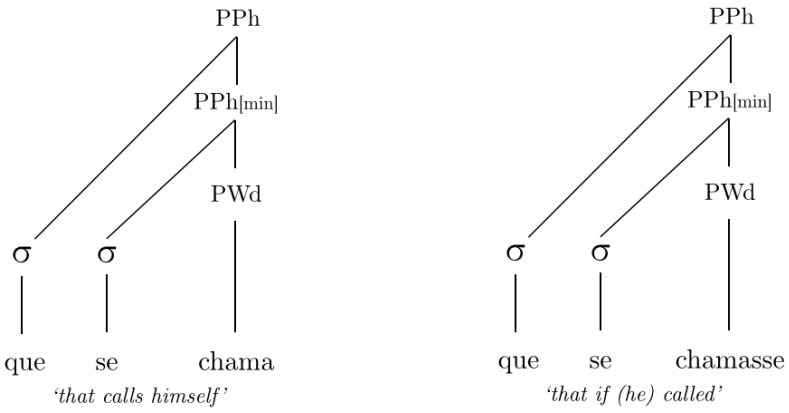
Thus, a minimal phrase with a pronominal or non-pronominal clitic is expected to display identical behaviour.

If we were to accept the representations in either Fig. 7 or 8 as true for BP, then we would have to admit that, in order to differentiate between pronominal clitics and prefixes and between pronominal and non-pronominal clitics, the prosodic hierarchy is somehow able to access the morphological labels of these elements. In other words, we would have to consider that, despite forming the same type of structure, pronominal clitics differ from prefixes and non-pronominal clitics because the morphological class of such elements is specified in the prosodic representation. This, however, would create a problem: the prosodic hierarchy would be enriched with morphological labels. In this case, instead of having an additional prosodic domain in the representation, we would need [min] or [max] specificities *and* morphological information in the prosodic structure.[10]

If we assume that prosodic constituents are the domain of application of segmental processes and are the result of specific syntax-phonology mapping constraints, then positing three domains for clitic and prefix prosodization in BP seems reasonable. In this analysis, we follow Vogel's (2009) proposal that an intermediate constituent between the PWd and the PPh, namely *composite group*

[10]Minimal and maximal projections are usually associated with prominence phenomena or prominence-related phenomena, not segmental processes (Ito and Mester, 2007, 2013; Elfner, 2015). As minimal and maximal levels respectively translate into non-recursive and recursive prosodic nodes, it may be the case that while they are not involved in the application of segmental processes, they are subject to specific boundary phenomena.

Figure 8: Alternative prosodization for pronominal clitics (as a minimal PPh). This predicts that structures with a non-pronominal and a pronominal clitic should behave as structures with two non-pronominal clitics.



(CG), is necessary in the prosodic hierarchy. Unlike the earlier clitic group, the CG is originally part of a prosodic framework in which violations to EXHAUSTIVITY are allowed (Vogel, 2009). Thus, a syllable corresponding to a clitic can skip the foot and the PWd levels before adjoining its host at the CG.

In our analysis, violations to NON-RECURSIVITY are also allowed, as we understand that instances of prosodic adjunction may yield recursive levels (following e.g. Selkirk (1996); Ito and Mester (2007)). As pointed out in this section, unstressed prefixes that adjoin a stem (as opposed to being integrated in it) yield a recursive PWd. We also suggest that the adjunction of a non-pronominal clitic to a structure already containing a clitic of the same type yields a recursive PPh (e.g. [a [que vi]$_{\text{PPH}}$]$_{\text{PPH}}$ 'the one which (I) saw').

The CG is the domain that comprises *composite* structures formed above the word level. This means that composite structures in morphosyntax tend to be mapped prosodically as CGs. In that case, compounds, whose form of prosodization was not clear in some early approaches to prosodic theory (Nespor and Vogel, 1986), should also tend to correspond to CGs. The motivation for the CG arises from cross-linguistic observations of the phonological behaviour of composite structures. In many languages, some compounds, certain clitic + host sequences, and certain prefix + stem sequences present particular phonological phenomena (Vogel, 2009). Under the premise that phono-

logical phenomena are regulated by prosodic constituency, it seems appropriate to assign structures with a particular phonological behaviour to a discrete prosodic domain.

Some aspects in the relationship between pronominal clitics and their hosts contribute to the idea that these elements form composite structures. Although pronominal clitics are independent syntactic nodes, they can only attach to one specific type of host (the main verb of the clause), from which they cannot be dissociated. In this sense, pronominal clitics differ from both unstressed prefixes and non-pronominal clitics. Both unstressed prefixes and non-pronominal clitics can attach to a wider range of elements, and non-pronominal clitics do allow the insertion of structures between themselves and their original host. An additional configurational distinction between pronominal clitics and unstressed monosyllabic prefixes is that, while the combination of pronominal clitic + host does not yield a new lexical item, the combination of prefix + stem does. This indicates that prefixation occurs in the domain where lexical matching is expected, namely the PWd (see e.g. Selkirk (2011)).

The prosodic mapping differences between pronominal clitics, non-pronominal clitics and prefixes have phonological consequences: (a) whereas vowel raising applies in the CG and the PPh (in pronominal and non-pronominal clitics), it is observed only under special circumstances in the PWd (in prefixes); and (b) whereas clitic fusion applies in the PPh (in non-pronominal clitics), it is blocked in the CG (in pronominal clitics).

Furthermore, vowel raising is also more frequent in non-pronominal than in pronominal clitics, which suggests that, in domains where the same processes are verified, their application may be gradient. In the case of vowel raising in unstressed syllables (prefixes and clitics), its application is gradually more frequent in higher prosodic domains. Vowel raising application thus obeys the following frequency scale: PPh $>$ CG $>$ PWd.

6. Final remarks

In this paper, we showed that pronominal clitics, non-pronominal clitics and unstressed monosyllabic prefixes exhibit fundamental morphosyntactic and phonological distinctions in Brazilian Portuguese, which argues for their representation in three discrete prosodic domains. While both

types of clitics exhibit vowel raising and vowel sandhi processes, such phenomena are not observed in unstressed prefixes. Pronominal clitics differ from non-pronominal clitics in morphosyntactic behaviour and in the frequency at which vowel raising applies. In morphosyntactic terms, non-pronominal clitics exhibit a freer behaviour, being able to combine with different word classes and to undergo clitic fusion. With regard to vowel raising, such a process is significantly more frequent in non-pronominal than in pronominal clitics.

The analysis of vowel raising in clitic *se*, which can be both pronominal and non-pronominal, indicates that the application of the process in independent syllables (i.e. syllables that are not part of simple PWds) is gradient. The behaviour regarding vowel raising application in prefixes, pronominal clitics and non-pronominal clitics thus mirrors the morphosyntactic behaviour of these elements: the more morphosyntactically independent the element is, the more likely it is to undergo vowel raising. In other words, the higher such an element attaches to a given structure in the prosodic hierarchy, the more likely it is to raise its vowel.

In the examination of vowel raising in clitic *se*, we also pointed out that `Age` influences the process in the analyzed BP variety: an increase in age range significantly lowers the odds of vowel raising application, or, in inverse terms, a decrease in age increases the odds of vowel raising application. This points to change in progress in the community, following tendencies verified in most BP dialects, in which vowel raising in clitic position is categorical.

By showing how pronominal clitics differ from both unstressed monosyllabic prefixes and non-pronominal clitics in BP, we proposed that an intermediate domain between the phonological word (PWd) and the phonological phrase (PPh), namely, the *composite group* (CG), is necessary to account for pronominal clitic prosodization (following Vogel (2009)). We argued that, while unstressed prefixes are prosodized in the PWd domain, pronominal clitics are prosodized in the CG and non-pronominal clitics, in the PPh. Regarding the application of phonological and morphosyntactic processes, the CG is the lowest domain where vowel raising and vowel sandhi apply in independent syllables, while the PPh is the domain of clitic fusion.

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