

## Mismatches between European Portuguese lexical and phonological words

*Kelly D. Burkinshaw*  
*University of Calgary*

### Abstract

This paper analyzes sandhi phenomena in European Portuguese in which coda consonants in word-final position are resyllabified to become onsets in two ways: by epenthesis when they occur at utterance boundaries (excluding /ʃ/), and by associating with following onsetless words (within the same utterance). I present an Optimality Theoretic account for why this resyllabification occurs, which includes a constraint against assigning moras to consonants (\*C $\mu$ ), and a constraint against having codas (No-CODA). These constraints work together to produce the facts we see in the European Portuguese data: /r/ and /l/, which I argue are moraic codas, are resyllabified in both environments mentioned above, but /ʃ/, which I argue is a non-moraic coda, is only resyllabified utterance-medially before onsetless words. I then discuss the ramifications that resyllabification across word boundaries has for the relationship between syntactic and phonological words, with reference to Selkirk's (2011a; 2011b) Match Theory; although there is correspondence between words on these two levels, those corresponding items need not consist of exactly the same number of segments.

## 1. Introduction\*

In this paper, I discuss sandhi phenomena in European Portuguese (EP). Codas seem to be dispreferred in this language (in fact, the inventory of codas is quite limited); in some environments, this means that speakers will arrive at outcomes which systematically redistribute codas so that they occur in the less-marked onset position, either occurring at the beginning of a following (originally onsetless) word, or with a following epenthetic vowel. This means, in many cases, that some words in particular utterances lose the codas they came with, and that other words gain those codas as onsets, where before they were onsetless. The phonological word is therefore a different animal than the original, underlying, syntactic word. In this paper, I consider the ramifications that this redistribution of segments has for the status of the phonological word in European Portuguese, using an Optimality Theory framework (Prince & Smolensky 2004).

This paper will be focusing on data from the Lisbon dialect of European Portuguese. In terms of the moraic status of its codas, EP is understudied, and so this paper will provide insight into previously-noted patterns which occur in the language. As well, I make initial hypotheses about the prosodic word structure of EP, upon which further studies could build.

In Section 2, I briefly introduce EP phonotactics. In Section 3, I introduce the phenomenon of coda resyllabification, and in Section 4, I give an Optimality Theoretic account of why this resyllabification occurs. In Sections 5 and 6, I consider the possible consequences that resyllabification has for the status of the phonological word and its relationship with the syntactic word, and I conclude in Section 7.

## 2. European Portuguese Phonotactics

European Portuguese has phonotactic restrictions which provide an avenue for research in phonological theory. Although a large number of consonants may occur in onset position in EP, including voiced and voiceless stops and fricatives, nasals, approximants, etc., it has a restricted inventory of coda consonants; syllables can only end in /l/, /r/, or /ʃ/ (Mateus & Andrade 1998; 2000).

There is some allophony associated with EP codas: /l/ surfaces as [ɫ] in codas (but [l] in onsets). As well, /ʃ/ surfaces as [ʒ] before voiceless consonants or utterance-finally, but undergoes voicing assimilation before voiced consonants to surface as [ʒ] (Cruz-Ferreira 1999; Mateus & Andrade 1998, 2000). Coda /r/ does not appear to undergo any allophony in the same contexts. For examples, see (1) below:

(1) European Portuguese codas (examples from Correia et al. 2010)<sup>1</sup>

parte	'part'	/ˈpar.ti/	[ˈpartɨ]
soldado	'soldier'	/sol.ˈda.du/	[soɫˈdadu]
mostru	'monster'	/ˈmõʃ.tru/	[ˈmõʒtru]
mesmo	'same'	/ˈmɛʃ.mu/	[ˈmezmu]

\* This research was supported by the Social Sciences and Humanities Research Council. The author would like to thank Dr. Laetitia de Almeida for verifying and editing transcriptions and translations of the EP data.

<sup>1</sup> Unless otherwise specified, examples in this paper are drawn from this database but may have been subject to editing.

As we see here, /r/ surfaces as [r], /l/ surfaces as [ɫ] in codas, and /ʃ/ surfaces as [ʃ] preceding a voiceless consonant and as [ʒ] preceding a voiced consonant.

However, these three consonants may display additional allophony, depending on their following environment across word boundaries. I discuss this allophony below.

### 3. Coda Resyllabification

Although EP does have a small inventory of possible codas, several additional facts about the language indicate that codas are dispreferred. First, word-final codas which precede vowel-initial words in the same utterance will be resyllabified to act as the onset of the following word. Although /r/ is pronounced the same in both positions,<sup>2</sup> resyllabified /l/ is produced with the onset variant [l] rather than the coda variant [ɫ], and resyllabified /ʃ/ is produced as a [z], having undergone both voicing assimilation to match the vowel it precedes, and slight fronting. See the examples in (2) for illustration:

(2)	Coda resyllabification between words			
	pôr aqui	'to put here'	/ˈpɔr ɐˈki/	[ˈpo rɐˈki] <sup>3</sup>
	mal à	'bad for'	/ˈmaɫ a/	[ˈma la]
	pois é	'indeed'	/ˈpojʃ ˈɛ/	[ˈpoj ˈzɛ]

Note that in normal (underlying) onset position, [ʃ], [ʒ], [s] and [z] are all allowed, with no voicing assimilation to match following vowels. Change in voicing and fronting only occurs with resyllabified sibilants.

This could be likened to French liaison, where certain word-final codas, which would normally not appear, may surface in the onset position of a following (vowel-initial) word to prevent vowel hiatus, e.g. the first word final ‘r’ in *premier ministre* [pʁɛ.mje.mi.nistʁ] vs. *premier étage* [pʁɛ.mje.re.taʒ] (Tseng 2003:315, syllabification added). However, the French and EP phenomena are crucially different, due to the restricted nature of French liaison, and the unrestricted nature of EP resyllabification. In French, liaison is restricted mostly to the following environments: between a determiner and a noun, between two pronominal clitics, between a clitic and verb, in some fixed expressions, and in some other variable contexts (Tseng 2003:323). French liaison does not occur in every case where a potentially coda-final word precedes a vowel-initial one. EP resyllabification, on the other hand, is systematic; regardless of the syntactic category of the words, if a coda-final word precedes a vowel-initial one, resyllabification of the coda occurs.<sup>4</sup>

As well, another form of resyllabification occurs at the end of utterances in EP. When an utterance ends in an /l/ or /r/ coda, speakers will add a final epenthetic vowel so that the

<sup>2</sup> Or at least similarly enough that they are transcribed the same, as in Mateus & Andrade (1998, 2000) and Correia et al. (2010).

<sup>3</sup> Although the lack of allophony of /r/ makes its resyllabification not as easy to see as with /l/ and /ʃ/, there is evidence from child language that the resyllabification of /r/ does occur; Burkinshaw (2014) shows a case study where a child named Inês consistently produced /r/ as [l] in the resyllabified context.

<sup>4</sup> For an analysis of a similar phenomenon in another Romance language, Catalan, see Bermúdez-Otero (2006).

coda is syllabified as an onset (and /l/ in this position is realized as [l]) (Freitas 2003). See (3) below for illustration:

- (3) Utterance final coda resyllabification  
 Minha flor?<sup>5</sup> 'My flower?' /'mew 'flor/ ['mew 'florɨ]  
 Ao hospital. 'To the hospital.' /aw ɔʃpi'taʃ/ [aw ɔʃpi'tali]

These phenomena suggest that EP resists syllabifying consonants in coda position wherever possible. In their description of EP syllabification, Mateus & Andrade (1998) invoke a series of ordered steps for syllabification in which assigning consonants to coda position occurs last, as described below:

"If the consonants are underspecified, that is, [/r/, /l/ or /ʃ/], (those that can occur in Portuguese codas), they remain non-associated and become floating segments. At the end of base syllabification, these floating segments are assigned to the codas of the preceding rhyme." (Mateus & Andrade 1998)

Following an OT framework, rather than a rule-based one, this resistance to codas can be explained with a constraint against codas, such as proposed by Kager (1999) below:

- (4) No-CODA (Kager 1999:94)  
 \*C ]<sub>σ</sub> ('Syllables are open.')

If No-CODA were a high-ranking constraint in EP, this would explain the tendencies we see toward avoiding codas. However, there is some inconsistency in this pattern of coda resyllabification, and that is that utterance-final coda /ʃ/ is never resyllabified through final vowel epenthesis. As shown in (5) below, there is no vowel added to the end of utterances ending in /ʃ/, and /ʃ/ is realized as [ʃ] (rather than [z]):

- (5) Utterance-final /ʃ/  
 Não há mais. 'There is no more.' /'nẽw̃ 'a 'majʃ/ ['nẽw̃ 'a 'majʃ]  
 Estas estão boas. 'These are good.' /'ɛʃtɛʃ 'tẽw̃ 'boɛʃ/ ['ɛʃtɛ 'tẽw̃ 'boɛʃ]

In general, /ʃ/ seems to have special status in EP, which allows it to occur at the beginning of words preceding consonant clusters, as shown in the second word, *estão*, of the second example in (5); Fikkert & Freitas (2004) and Almeida (2011) analyze this extra position as the coda of an empty-headed syllable (CEHS). In EP orthography, words with this extra consonant are spelled with an initial 'e', indicating that either underlyingly or historically this was a non-empty syllable with a nucleus, but it is produced without one.

<sup>5</sup> In this example, the child produced an error in gender agreement ("Meu flor?"), but I have corrected it to reflect the proper agreement, since what is of interest is the utterance-final position of *flor* rather than the word choice made by the child.

In the following section, I address the limitations of using just NO-CODA to account for resyllabification, and expand on my OT account for the phenomenon by analyzing in detail which codas are resyllabified and why.

#### 4. The Moraic Status of EP Codas, and the Consequences for Resyllabification

So, if codas are generally avoided in the language, why are not all codas avoided equally as discussed in the previous section (i.e., /ʃ/ is not resyllabified utterance-finally), and why are some codas less constrained than others (i.e., /ʃ/ can occur as a CEHS)? A brief investigation of stress assignment in EP reveals a possible answer to both of these questions: that /r/ and /l/ are moraic codas, and /ʃ/ is not.

Regarding EP stress, Cruz-Ferreira (1999) says that EP words are most commonly (but not exclusively) stressed on the penultimate syllable, but that "lexical stress is distinctive," and can "[provide] very productive class-changing contrasts" (p. 128-129). In spite of the fact that stress is frequently defined lexically, meaning that it can occur on closed or open syllables alike, seemingly at random, there is still some evidence that coda weight can cause stress shift in related EP words.

In order to investigate the moraic status of codas, I looked at several pairs of related EP words from the Correia et al. (2010) data corpus, which follows the language development of five children learning EP as their first language, but also contains target (adult) transcriptions of words attempted by the children. Data in this corpus are organized into (recording) sessions – I looked at the final session for the child named Inês, as this represented the recording in which her vocabulary should be most varied and advanced. I selected pairs of words which differed by the presence of a coda, some of which are shown in examples (7) to (9) below. As shown in (7), there seems to be some evidence that stress can shift to syllables which are closed by /r/. This suggests that these closed syllables may be heavy in EP, and thus receive word stress by the Weight-to-Stress-Principle (WSP), defined by Kager (1999):

- (6) WSP (Kager 1999:155)  
Heavy syllables are stressed.

See the examples in (7) for illustration:

- (7) Stress shift to syllables closed by /r/
- |             |               |              |
|-------------|---------------|--------------|
| começar ... | 'to begin'    | [ku.mi.'sar] |
| começa ...  | 'begin.3sg'   | [ku.'mɛ.sɐ]  |
| dizer ...   | 'to say'      | [di.'zɛr]    |
| diz ...     | 'say.3sg'     | ['dij]       |
| apertar ... | 'to tighten'  | [ɐ.pɨr.'tɐr] |
| aperta ...  | 'tighten.3sg' | [ɐ.'pɛr.tɐ]  |

As we see in these examples, the infinitive form in each case (*começar, dizer, apertar*), which ends in an /r/ coda, has stress on the final closed syllable. When that /r/ is removed in the conjugation of the verb, stress occurs elsewhere in the word (in the case of *aperta*, the stress occurs on the remaining syllable closed by /r/). Further investigation is required to determine whether /l/ in codas shows the same behaviour; /l/ in codas is not as frequent in the Correia et al. (2010) data as /r/ in codas. As well, because /r/ is the ending for infinitives, examples with the type of alternation seen in (7) are much more common than for /r/ than for /l/.

I can find no indication that syllables closed by /ʃ/ behave this way (i.e., they do not seem to attract stress); rather there are several counterexamples to indicate that /ʃ/ does not add weight to syllables it closes. As you can see in the examples in (8), there are cases where an added /ʃ/ does not cause a stress shift. In fact, I was able to find no examples where added /ʃ/ did seem to cause a stress shift.

(8) Examples where coda /ʃ/ does not cause stress shift<sup>6</sup>

amigo	'friend.MascSing'	[e'migu]
amigos	'friend.MascPl'	[e'miguʃ]
coisa	'thing.FemSg'	['kojzɐ]
coisas	'thing.FemPl'	['kojzɐʃ]

As well, looking at the examples in (9) below of the adjective *comprido* 'long', we see that stress shifts to a syllable that ends in a glide, indicating that glides may carry weight as well (compare *comprida* and *compridão*), but that stress does not shift to a syllable that ends in an /ʃ/ (compare *compridão* and *compridas*).

(9) More examples where coda /ʃ/ does not cause stress shift

comprida	'long.FemSg'	[kõ'pridɐ]
compridão	'long.very'	[kõ'pri'dẽw]
compridas	'long.FemPl'	[kõ'pridɐʃ]

Based on the lack of evidence for stress shift to syllables closed by /ʃ/, I conclude that /ʃ/ in coda positions is not associated with a mora. As discussed in Davis (2011), research has been done which suggests that in some languages, sonorant consonants can be moraic while obstruents are not, and thus syllables closed by sonorants may be heavy while ones closed by obstruents are light.

If this is the case for EP, this sheds light on the peculiarities of /ʃ/ in coda position, compared to the other codas. As stated above, although /ʃ/ is resyllabified utterance-medially when preceding a word that begins with a vowel, it is not resyllabified utterance-finally via the epenthesis of a final vowel. As well, /ʃ/ can occur word-initially before

<sup>6</sup> One might argue that there is no stress shift in these examples because the /ʃ/ suffix is an inflectional one, and inflectional suffixes often do not affect stress. However, it may be that /ʃ/ is allowed to be such an inflectional subject because it does not add a mora.

consonant clusters as a coda of an empty-headed syllable. Although it is possible that /ʃ/ does not have weight because it is an obstruent, since only three different phonemes are allowed in EP codas, it is difficult to make a concrete claim to this effect. It may be the case that because /ʃ/ may occur in an exceptional position (CEHS), it is allowed by extension to occur in the other position (codas, either utterance-final or before another consonant – the before-vowel context is discussed below) without having an effect on syllable weight by adding a mora.

Therefore, what seems to be avoided in the language is having a moraic consonant in a coda position. I surmise, then, that NO-CODA does not fully capture the patterns we see in EP, but rather there is a (violable) restriction against putting consonants in a position in which they must be given moras. Such a constraint might be formulated as below:

- (10) \*C $\mu$   
Consonants must not have moras (must be weightless).

A similar constraint called \*FINAL-C- $\mu$  is proposed in (Kager 1999:268), in which the final consonant of a syllable must not have a coda. For EP, I propose the more general constraint where no consonant should have a mora.

This does leave the question, however, of why /ʃ/ is resyllabified utterance-medially at all (i.e., before a word that starts with a vowel). If /ʃ/ is not moraic, then why is it being avoided in coda position in this case? It could be that speakers resyllabify /ʃ/ to match the general pattern of resyllabifying syllable-final consonants, as seen with /l/ and /r/. It could also be argued, perhaps more convincingly, that NO-CODA is still an active constraint in EP; in the utterance-final case for /ʃ/, we would see that NO-CODA is outranked by a constraint preventing the epenthesis of vowels (e.g. DEP-V).<sup>7</sup> To illustrate these constraints at work for /r/ and /ʃ/, see the tableaux in (11)-(14) below:

(11) Word-final /r/ preceding a vowel, *por aqui*

Input: /'por e'ki/	*C $\mu$	DEP-V	NO-CODA
a. ['por e'ki]	*!		*
b. <sup>EP</sup> ['po re'ki]			

(12) Utterance-final /r/, *flor*

Input: /'flor/ <sub>v</sub>	*C $\mu$	DEP-V	NO-CODA
a. ['flor]	*!		*
b. <sup>EP</sup> ['flori]		*	

<sup>7</sup> Some further work needs to be done on this, to account for why, if vowel epenthesis is a valid strategy for avoiding codas, it does not occur utterance-internally, for example within a word, or between a word that ends with a coda and a word that starts with a consonant.

(13) Word-final /ʃ/ preceding a vowel, *pois e*

Input: /'poʃf'ɛ/	*C $\mu$	DEP-V	NO-CODA
a. [ 'poʃf'ɛ]			*!
b. [ 'poʃ'zɛ]			

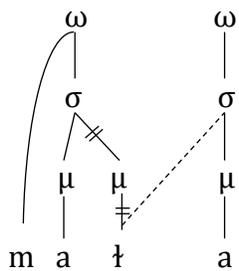
(14) Utterance-final /ʃ/, *mais*

Input: /'majʃ/ <sub>v</sub>	*C $\mu$	DEP-V	NO-CODA
a. [ 'majʃ]			*
b. [ 'majzi]		*!	

As we see in the tableaux, the difference between /r/ and /ʃ/ is that an occurrence of /ʃ/ in coda position does not violate the high-ranked constraint \*C $\mu$ , while an occurrence of /r/ in coda position does.

### 5. Consequences for the Phonological Word ( $\omega$ )

Regardless of why these resyllabifications occur, the fact remains that they do—this means that consonants which should fall on the right edge of the words that would normally contain them, instead occur as onsets at the left edge of the following word. Obviously this does not mean that these consonants are lexically specified on the following words, as they only occur there in this specific context: when an onsetless word follows another that would normally end in a coda. The syntactic word, and the phonological word, are defined as they always were, with the affected consonant occurring at the end of the first word. What about the phonological (produced) word, then? Considering the example in (15) below, is there one phonological word, or two? If there are two, where should we draw the line between them?

(15) /l/ resyllabification across two (lexical) words<sup>8</sup>

*mal à*, 'bad for'

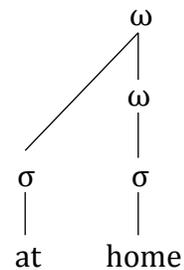
<sup>8</sup> Note that there is no need to account for the 'disappearance' of the mora in this example, since as the /l/ is resyllabified in an onset position, it never received a mora in the first place. Alternately, there may be a mora left behind which is only realized as stress, as we would see when examples such as in (7), which end in stressed syllables closed by moras, occur in the resyllabification context. In such a case, stress would shift (because of WSP) to the final (heavy) syllable, but then the coda would be pushed to the following syllable as its onset, and stress would remain on the final syllable of the first word, which is now open. See Bermúdez-Otero (2001) for discussion of similar interactions between constraints.

In the remainder of this paper, I consider the different possibilities for the division, or lack thereof, between these prosodic words.

### 5.1 *Two Become One*

There is some cross-linguistic motivation behind the possibility that these two lexical words are combined at the prosodic level to form one word. As discussed in Selkirk (1995, 1996) and Ito & Mester (2009), in English, function words (including prepositions) may optionally attach to words following them as prosodic clitics. This occurs with single syllable function words and prepositions: weak syllables which can lean on the words they precede, as with 'can,' 'her,' 'of,' and 'at' in the following sentence, "[Diane] [can paint] [her portrait] [of Timothy] [at home]" (Selkirk 1995; 1996). According to Ito & Mester (2009), these weak syllables attach to the following lexical words above the word level, forming an additional recursive word. See (16) below for illustration:

(16) English function word proclitics



If it were the case that the EP resyllabification happened between syntactic words that were grouped into a single phonological word, then we would expect to find resyllabification occurring in only restricted environments (as occurs with both the English examples and with French liaison), such as with function words, prepositions, or compounds. However, as we see in (17) below (some examples repeated from (2)), EP resyllabification occurs with a wide variety of words.

(17) Further examples of EP coda resyllabification<sup>9</sup>

a.	pôr aqui	'to put here'	/'por e'ki/	['po re'ki]
b.	mal à	'bad for'	/'maʎ a/	['ma la]
c.	pois é	'indeed'	/'pojʃ 'ɛ/	['poj 'zɛ]
d.	mas eu	'but I'	/mɛʃ 'ew/	[ mɛ 'zew]
e.	seis anos	'six years'	/'sejʃ 'enuʃ/	['sej 'zenuʃ]
f.	mas esse	'but this'	/'mɛʃ 'esi/	[ 'mɛ 'zesi]
g.	maus amigos	'bad friends'	/'mawʃ e'miguʃ/	['maw ze'miguʃ]
h.	duas almas	'two souls'	/'dueʃ 'aʎmɛʃ/	['due 'zaʎmɛʃ]

<sup>9</sup> Examples (g) and (h) from Mateus & Andrade (2000), pages 12 and 144 respectively.

In the examples above, neither the first word nor the second is always a function word; for example we see *maus* ('bad'), an adjective, preceding *amigos* ('friends'), a noun. Nor is either always reduced, although it appears from *mas eu* ('but I') that they can be, as *mas* in this case has no stress.

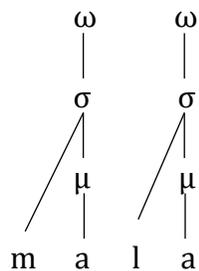
As well, it is clear that these examples cannot all be compounds (see *mal à, mas esse*, above); resyllabification simply occurs when a word ending in a coda is followed by a word beginning with a vowel. If the two are separated, we see no strange or unexpected effects such as those we see in French, where if the liaison context is not satisfied, the final consonant of the first word is not pronounced. Further consideration must be given to understand the shape and contents of the EP prosodic word, and whether multiple syntactic words may fall within it, but the variable nature of the words involved in resyllabification suggests that the pair does not uniquely fall together into one prosodic word.

### 5.2 Just the Two of Us

Beyond grouping two syntactic words into one phonological one, the other logical possibility is to count them as two separate phonological words. If this is the case, then we must decide how to divide them, given that resyllabification crosses a word boundary. If the coda is underlyingly a part of the first word, which it must be, but it is phonologically realized as a part of the second word, this still constitutes a mismatch between the syntactic word and the prosodic word, for both words.

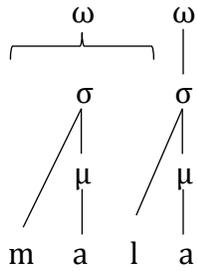
Consider the diagrams in (18) and (19), where I show two possible ways to divide the prosodic words. In (18), the word level is defined by the prosody, in that the /l/ in *mal à*, as the onset of the second syllable, falls under the second word.

#### (18) Prosodically-defined word division of *mal à*



In (19), on the other hand, the words are defined syntactically, following the underlying position of /l/ in the coda of the first syllable. This requires some machination of the word diagram, as the /l/, which surfaced as part of the second syllable, must be grouped with the first syllable at the word level:

(19) Syntactically-defined word division of *mal à*



As mentioned above, this second possible division of words is based on the syntactically-defined boundaries of the words. However, although such a diagram may be helpful to understand the resyllabification facts, its depiction of the prosodic words is critically misleading; the syllable tier and below depict phonological facts, and the word tier depicts syntactic ones. I therefore reject (19) as a possible division of the prosodic words involved in *mal à*, and conclude that they must be divided as in (18) above. Therefore, in the case of EP resyllabification, there is a distinct difference between the prosodic word and the syntactic one: When a word ending in a coda precedes one beginning with a vowel, the coda of the first (syntactic) word becomes the onset of the second (phonological) word.

In the following section, I discuss how such a mismatch can be accounted for using Selkirk's (2011) Match Theory.

## 6. Resyllabification and Match Theory

There is some precedent to the idea that EP has mismatches between the syntactic and prosodic word. In her 2011 chapter, Selkirk discusses Match Theory, in which there is a series of OT constraints which govern the relationship between syntax and phonology. These constraints occur at three levels; the clause, the phrase, and the word. Selkirk defines the word-level constraint, Match Word, as follows:

(20) MATCH WORD (Selkirk 2011a:439)

A word in syntactic constituent structure must be matched by a corresponding prosodic constituent, call it ω, in phonological representation.

The EP data does satisfy MATCH WORD to the extent that there is a syntactic constituent, the syntactic word, which does correspond to a prosodic constituent, the phonological word. However, these two types of word do not correspond exactly, as we saw above; they correspond but are not equal. Selkirk discusses mismatches between syntactic and phonological structure as arising from prosodic wellformedness constraints, which fits nicely with the account presented in Sections 3 and 4 of this paper, in which we saw that the constraints \*Cμ and No-CODA prevented the phonological word from ending with a coda. As Selkirk states in a presentation of her 2011 paper: "Prosodic wellformedness constraints,

not constraints on the syntactic-prosodic structure relation, are responsible for any divergence between syntactic constituency and prosodic constituency ('nonisomorphism') produced by the grammar" (Selkirk 2011b:Slide 22). This implies that the mismatches between the syntactic and prosodic word in EP arise purely because of the constraints which prevent the assignment of moras to codas and result in them being resyllabified as onsets.

Under this account, such mismatches are not only allowed, but are expected, to the extent that the language has constraints governing the edges of prosodic words and their relationships. Although the syntactic structure of EP provides one definition of words in the language, phonological constraints can manipulate those words at the phonological level, causing them to surface differently in speech than in the syntactic representation. This means that we are free to divide examples such as *mal à* into two prosodic words, with /l/ falling at the beginning of the second, without this causing any ramifications for the status of the word *mal* (with underlying coda /l/), or the word *à* (without the underlying /l/) at the syntactic level.

## 7. Conclusion

In this paper, I have presented data which show that EP speakers avoid having consonants in coda positions where possible by redistributing them into onset positions. I provided an Optimality Theoretic account of why they do so; they are avoiding assigning moras to consonants in the case of /r/ and /l/, and are also avoiding codas in general as we see with /ʃ/, although /ʃ/ cannot receive a mora. This explains why we see differences in behaviour between /r, l/ and /ʃ/: /r/ and /l/ alone may be resyllabified utterance-finally via epenthesis of a final vowel, and /ʃ/ may occur as a coda of an empty-headed syllable.

I then considered the ramifications that resyllabification might have for the status of the phonological word. Resyllabified consonants fall under the umbrella of the second phonological word rather than the first, even though they originate from the first syntactic word. This constitutes a mismatch between the phonological words and the syntactic ones, which have a consonant transferred between them. Following Selkirk's (2011) Match Theory, this occurs because constraints on phonological wellformedness can blur the lines between words provided by a speaker's syntax. If it is the case that a match between the syntactic word and the phonological word means that there is simply a correspondence between those items, it may also be the case that the items can differ in terms of the segments they contain (or in terms of the nature of those segments). Future work on this topic would benefit from a more in-depth analysis of prosodic phrases in EP, to determine whether words participating in resyllabification fall within the same prosodic phrase.

Also of potential relevance to this paper is work by Ito & Mester (2009), which suggests that the edges of words may not always be "crisp,"<sup>10</sup> leading to the possibility of sounds being ambisyllabic across word edges, and belonging to both the coda of the first word and the onset of the second. Although there seems to be no indication that resyllabified EP consonants are straddling a word boundary rather than shifting across it, it may prove

---

<sup>10</sup> Where having a crisp edge means that the spread or sharing of phonological/prosodic features is not allowed between words, as defined in Windsor (2012), from Ito and Mester (1999).

fruitful to consider constraints on the crispness of word edges in EP. In addition to this consideration, in my future work on this paper I will search for more data to analyze, as it would be beneficial for verification of the stress-shifting patterns of both /r/ and /l/, and the lack of stress shift for /ʃ/.

## References

- Almeida, Letícia. 2011. Acquisition de la structure syllabique en contexte de bilinguisme simultané portugais-français. University of Lisbon Ph.D. Dissertation.
- Bermúdez-Otero, Ricardo. 2001. Underlyingly Nonmoraic Coda Consonants, Faithfulness, and Sympathy. University of Manchester, ms.
- Bermúdez-Otero, Ricardo. 2006. Phonological Domains and Opacity Effects: A New Look at Voicing and Continuancy in Catalan. Handout of paper presented at the workshop, “Approaches to Phonological Opacity”, GLOW 2006, Barcelona, 5 April 2006. Available online at [www.bermudez-otero.com/GLOW2006.pdf](http://www.bermudez-otero.com/GLOW2006.pdf).
- Burkinshaw, Kelly. 2014. Segmental and Prosodic Conditioning in the First Language Acquisition of Phonology. Memorial University of Newfoundland M.A. Thesis.
- Correia, Susana, Teresa da Costa & Maria João Freitas. 2010. Portuguese-CCF. University of Lisbon/CLUL/PhonBank.
- Cruz-Ferreira, Madalena. 1999. Portuguese (European). Handbook of the International Phonetic Association: A guide to the use of the International Phonetic Alphabet, 126–130.
- Davis, Stuart. 2011. Quantity. In John Goldsmith, Jason Riggle & Alan C.L. Yu (eds.), *The Handbook of Phonological Theory*, 104–140. 2nd ed. Blackwell Publishing Ltd.
- Fikkert, Paula & Maria João Freitas. 2004. The Role of Language-specific Phonotactics in the Acquisition of Onset Clusters. In Leonie Cornips & Jenny Doetjes (eds.), *Linguistics in the Netherlands*, 58–68. Amsterdam: John Benjamins.
- Freitas, Maria João. 2003. The Acquisition of Onset Clusters in European Portuguese. *Probus* 15. 27–46.
- Itô, Junko & Armin Mester. 1999. Realignment. In R. Kager, H. V. D. Hulst, and W. Zonneveld (eds), *The Prosody-Morphology Interface*, 188-217. Cambridge: Cambridge University Press.
- Itô, Junko & Armin Mester. 2009. The Extended Prosodic Word. In Baris Kabak & Janet Grijzenhout (eds.), *Phonological Domains: Universals and Deviations*, 135–194. Berlin and New York: Mouton de Gruyter.
- Kager, René. 1999. *Optimality Theory*. (Cambridge Textbooks in Linguistics). Cambridge: Cambridge University Press.
- Mateus, Maria Helena & Ernesto d’Andrade. 1998. The Syllable Structure in European Portuguese. *Documentação de Estudos em Lingüística Teórica e Aplicada* 14(1). 13–32. (24 May 2013).
- Mateus, Maria Helena & Ernesto d’Andrade. 2000. *The Phonology of Portuguese*. Oxford: Oxford University Press.

- Prince, Alan S. & Paul Smolensky. 2004. *Optimality Theory: Constraint Interaction in Generative Grammar*. Cambridge, MA: Blackwell Publishing Ltd.
- Selkirk, Elisabeth O. 1995. The Prosodic Structure of Function Words. In Jill N. Beckman, Laura Walsch-Dickey & Suzanne Urbanczyk (eds.), *Papers in Optimality Theory*, 439–469. (University of Massachusetts Occasional Papers 18). Amherst, MA: GLSA.
- Selkirk, Elisabeth O. 1996. The Prosodic Structure of Function Words. In James L. Morgan & Katherine Demuth (eds.), *Signal to Syntax: Bootstrapping from Speech to Grammar in Early Acquisition*, 187–213. Mahwah, NJ: Lawrence Erlbaum.
- Selkirk, Elisabeth O. 2011a. The Syntax-Phonology Interface. In John Goldsmith, Jason Riggle & Alan C.L. Yu (eds.), *The Handbook of Phonological Theory*, 435–484. Malden, MA: Wiley-Blackwell.
- Selkirk, Elisabeth O. 2011b. On prosodic structure and its relation to syntactic structure, again. Paper presented at the MIT Linguistics 50th Anniversary.
- Tseng, Jesse J. 2003. Edge Features and French Liaison. *The Proceedings of the 9th International Conference on Head-Driven Phrase Structure Grammar*, 313–333.
- Windsor, Joseph W. 2012. *When Nothing Exists: The Role of Zero in the Prosodic Hierarchy*. University of Calgary M.A. Thesis.

**Contact Information:**

Kelly Burkinshaw

[kburkins@ucalgary.ca](mailto:kburkins@ucalgary.ca)

School of Languages, Linguistics, Literatures & Cultures

University of Calgary

CHC 211, 2500 University Dr. NW

Calgary, AB, T2N 1N4

Canada