

# SUBJECTS, OBJECTS AND INTONATIONAL PHRASING IN SPANISH AND PORTUGUESE\*

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*Abstract.* This article investigates the role of prosodic length and syntactic complexity on intonational phrasing in Spanish and European Portuguese. Spanish presents a clear tendency to divide utterances into (S)(VO) phrasings, depending on branchingness. In EP (SVO) is the predominant phrasing, but a long branching subject can trigger the phrasing (S)(VO). The main differences between the two languages are analyzed as arising from two properties: the different syntactic position of subjects (external or internal to Extended VP) and the different parameters of prosodic weight (number of syllables vs. number of words/branchingness) realized by each language. Constraints of the syntax-prosody interface and prosodic constraints on the maximum size of major phrases refer to these properties and produce different outcomes. The preference shared by EP and Spanish to have the material in a VP contained in the same major phrase (disallowing (V)(O) phrasings) also stems from a syntax-phonology constraint.

## 1. Introduction

There has been evidence in the linguistic literature that the placement of intonational boundaries is determined by other factors apart from syntactic boundary location. Factors such as information structure, constituent weight and speech rate play a major role in phrasing decisions, that is, factors outside the domain of syntax. One of the most often cited factors pertaining to phonology proper that have been shown to influence intonational phrasing has been prosodic constituent weight or heaviness, in the sense that a prosodic constituent that is heavy has a greater tendency to be phrased independently. Prosodic heaviness can be measured along the level of syllable structure or along higher levels of prosodic structure. Thus, the degree of length in terms of number of syllables, feet, or prosodic words of a constituent may be relevant for determining phrasing, as long sequences tend to form independent constituents. But in other cases it is prosodic branchingness that may

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have an effect on phrasing, that is, whether a prosodic constituent contains more than one prosodic constituent of the immediately lower level (i.e., a phonological phrase containing two or more prosodic words is heavy, the same as an intonational phrase containing two or more phonological phrases). Also, high prominence levels may make a constituent heavy, as an effect of focus, for instance. There are several bibliographical references that deal or mention the issue of prosodic heaviness. Among others, see Nespor & Vogel (1986), Zec & Inkelas (1990), Oliva (1992), Ghini (1993), Truckenbrodt (1995), Guasti & Nespor (1999), Selkirk (2000), Frota & Vigário (2001), Prieto (2005), Jun (2003).

On the other hand, certain syntactic constituents are also known to influence intonational phrasing, in the sense that they usually form independent Intonational Phrases (IPs), as in the case of topics or parentheticals, for instance. Some scholars have also argued that heaviness understood as syntactic complexity or branchingness may also play a role in intonational phrasing (cf. Nespor & Vogel 1986, Kanerva 1990, Schütze 1994, Rice 1987, Frascarelli 1997, 2000, among others). Nespor & Vogel (1986: 196–205) further suggest that there are syntactic conditions on restructuring of IPs. Basically, IP boundaries can only be inserted at the edges of DPs or CPs (NPs and S', in the notation used by the authors), and a stronger constraint states that NPs cannot be broken into two or more IPs. Another constraint disfavors the insertion of IP boundaries between a verb and an obligatory (i.e., lexically subcategorized) complement of a verb. At the level of Phonological Phrases, Nespor & Vogel (1986) argue that nonbranching complements phrase together with a preceding verb, but branching complements form Phonological Phrases by themselves separate from the verb.

An important point to stress is that phrasing at higher levels of the intonational hierarchy is variable or flexible, affected by factors such as constituent length and rate or style of speech, as several researchers have noted (Selkirk 1978, 1984, Bing 1979, Nespor & Vogel 1986). To give an example of the importance of length of constituents, a sentence such as *My friend's baby hamster always looks for food in the corners of its cage* could be pronounced all in one IP, as in (1a), or broken into several IPs, as in (1b-c) (from Nespor & Vogel 1986: 194). However, although a shorter sentence such as *The hamster eats seeds all day* can also be broken into two or three IPs, as illustrated in (2b,c), these divisions are claimed to be less acceptable than those in (1b,c). Nespor & Vogel argue that there is a tendency to avoid sequences of very long or short IPs, and to prefer IPs of a uniform 'average' length. The authors do not specify what they mean by average length, but the contrast between (1) and (2) seems solid:

- (1) a. [My friend's baby hamster always looks for food in the corners  
of its cage]<sub>IP</sub>  
 b. [My friend's baby hamster]<sub>IP</sub> [always looks for food in the  
corners of its cage]<sub>IP</sub>  
 c. [My friend's baby hamster]<sub>IP</sub> [always looks for food]<sub>IP</sub> [in the  
corners of its cage]<sub>IP</sub>
- (2) a. [The hamster eats seeds all day]<sub>IP</sub>  
 b. [The hamster]<sub>IP</sub> [eats seeds all day]<sub>IP</sub>  
 c. [The hamster]<sub>IP</sub> [eats seeds]<sub>IP</sub> [all day]<sub>IP</sub>

A phenomenon related to phrasing and heaviness is the linear ordering of constituents determined by relative length or prosodic weight, such as the case commonly known as Heavy NP Shift. As Guasti & Nespor (1999) point out, although in many languages it is preferred to place a longer constituent after a shorter constituent, having an order in which the longer constituent is placed before the shorter constituent is not ill-formed and ungrammatical but simply dispreferred. Thus, in Italian and English, (3a) and (4a) are preferred over (3b) and (4b), but the latter are not ungrammatical. This issue is important because it suggests that we should speak of cross-linguistic *tendencies* rather than absolute patterns.

- (3) a. Hanno spedito [dei fiori] [a una cantante molto brava].  
 they-have sent some flowers to a singer very good  
 'They have sent some flowers to a very good singer.'  
 b. Hanno spedito [a una cantante molto brava] [dei fiori].  
 they-have sent to a singer very good some flowers  
 'They have sent some flowers to a very good singer.'
- (4) a. He threw [into the wastebasket] [the letter from the principal  
decoder].  
 b. He threw [the letter from the principal decoder] [into the  
wastebasket].

Several studies have recently revealed language-particular preferences in prosodic grouping. For instance, based on broad focus (i.e., neutral) declarative sentences containing a subject, a verb and an object, in that linear order (i.e., SVO), the following phrasings have been reported for different languages. For Catalan, Prieto (1997, 2005) and Elordieta, Frota, Prieto & Vigário (2003) show that the majority of utterances are divided intonationally as (S)(VO), that is, the subject forms its own intonational unit and the verb and the object form another intonational unit. However, in this language there is also a strong tendency to create prosodic or intonational units of similar sizes, so when subjects are short

and objects are long, (SV)(O) phrasings are more common. In English, (S)(VO) phrasings are claimed to be the most common (cf. Nibert 2000). In European Portuguese (EP henceforth) Frota (2000), Frota & Vigário (2001), Elordieta et al. (2003) show that (SVO) is the basic phrasing, that is, the whole utterance forming one single intonational phrase, although very long subjects can be separated from the predicate by an intonational break. For Spanish, there are two contradicting reports: on the one hand, Nibert (2000) concludes that the default type of phrasing in Spanish must be (SV)(O). On the other hand, Elordieta et al. (2003) obtain a large majority of (S)(VO) phrasings for Spanish. The results obtained by Elordieta et al. (2003) will be presented in detail in section 3, where the difference with Nibert's (2000) results will also be discussed.

Despite all the evidence showing the various factors that determine the division of utterances in intonational constituents and those references to phrasing tendencies in different languages, the truth is that a comparison of these factors has not been examined in a systematic fashion within languages or crosslinguistically. To our knowledge, there are no studies that try to test the relative strength or importance of purely prosodic factors over syntactic factors or vice versa, either for a particular language or across languages. This point highlights the need of quantitative studies on intonational phrasing tendencies. Furthermore, the question still remains as to what are the parameters that define weight at the prosodic or intonational level: number of syllables, number of prosodic words, number of syntactic words, prosodic or syntactic branchingness? Finally, it is important to stress that languages show phrasing tendencies or preferences, rather than absolute, inviolable principles on IP construction. Thus, a framework that allows both for competition between constraints and for variation seems suitable to account for intonational phrasing differences.

Given the need to elucidate the issues stated above, our goal in this article is to investigate the influence of constituent phonological length in terms of number of syllables and presence of (different levels of) syntactic branchingness on prosodic boundary placement in two Ibero-Romance languages: European Portuguese and Spanish. In particular, it is our aim to determine how subject and object NPs are intonationally phrased in these two closely related languages, as a function of both their syntactic and phonological make-up. It will be shown that Spanish presents a clear tendency to divide utterances into (S)(VO) phrasings, with branchingness playing a role, whereas in EP (SVO) is the predominant phrasing, with length in number of syllables playing a role as a trigger of (S)(VO) phrasings. The main differences between the two languages are analyzed as arising from a syntax-prosody mapping property - the different syntactic position of subjects (external or internal to Extended VP) - and a prosody proper property - the way each language realizes prosodic weight (number of syllables vs. number of words/branchingness).

## 2. Methods

The speech materials on which the present research is based are drawn from a comparable database created for Catalan, European Portuguese (EP), and Spanish (Elordieta et al. 2003). This Romance Languages Database (RLD) was designed to allow a direct comparison among the languages at stake with regard to the manipulation of constituent length and syntactic complexity in SVO sentences. In D'Imperio, Elordieta, Frota, Prieto & Vigário (2003), Italian was added to the RLD.

Exhaustive combinations of two constituent length conditions and seven syntactic branching conditions are included in the RLD. Constituent length is measured in number of syllables with short constituents containing 3 syllables and long constituents containing 5 syllables (including function words). Subjects, verbs and objects may thus be either short or long. Syntactic complexity is measured by the absence/presence of branching in subjects and objects. Branching constituents are composed of a head noun and an adjective, or a head noun and a prepositional complement. Branchingness can be single or double, in which case the constituent is composed of a head noun, an adjective and a prepositional complement. The seven syntactic branching conditions and the two length conditions included in the RLD are shown in (5) (the numbers indicate the total number of sentences for each combination). Note that for each of the combinations studied, utterances with short and long verbs are also included. In the single branching cases, branching is achieved either by N AP or N PP (8 sentences for each). The two missing gaps result from the need to constrain the size of the corpus: it was thought that an effect of double branchingness could arise regardless of the complexity of the other constituent, and the double-branching S and O case was kept as a control.

(5)		<i>Non-branching S</i>	<i>Branching S</i>	<i>Double-branching S</i>
	Non-branching O	short & long 8	short & long 16	short & long 8
	Branching O	short & long 16	short & long 16	
	Double-branching O	short & long 8		short & long 4

Wherever possible, chosen words consisted of mainly sonorants. The different combinations of length and branchingness produced a total of 76 utterances per language. Examples of the speech materials are given in (6).

(6) a. *Non-branching Subject and Object – Short-Short-Short*

EP: A loura mirava morenos.  
 the blond-girl looked dark-haired-boys  
 'The blond girl looked at dark-haired boys.'

Sp: La niña miraba la noria.  
 the girl looked the turning-wheel  
 'The girl looked at the turning-wheel.'

- b. *Non-branching Subject and Object – Long-Short-Long*  
EP: A boliviana falava do namorado.  
the Bolivian-girl talked about-the boyfriend  
'The Bolivian girl talked about the boyfriend.'  
Sp: La boliviana miraba la mermelada.  
the Bolivian-girl looked the marmalade  
'The Bolivian girl looked at the marmalade.'
- c. *Non-branching Subject and branching Object – Long-Long-Long*  
EP: A boliviana memorizava uma melodia maravilhosa.  
the Bolivian-girl learned-by-heart a melody wonderful  
'The Bolivian girl learned a wonderful song by heart.'  
Sp: La boliviana rememoraba la mermelada de Magdalena.  
the Bolivian-girl remembered the marmalade of Magdalena  
'The Bolivian girl remembered Magdalena's marmalade.'
- d. *Branching Subject and branching Object – Short-Short-Short*  
EP: A nora da mãe mirava velhinhas lindas.  
the daughter-in-law of mother looked old-ladies beautiful  
'The daughter-in-law of (my) mother looked at beautiful  
old ladies.'  
Sp: La niña de Lugo miraba la noria nueva.  
the girl of Lugo looked the turning-wheel new  
'The girl from Lugo looked at the new turning-wheel.'

The utterances were read three times in random order by two speakers of each language. 912 target utterances ( $76 \times 3 \times 2 \times 2$ ) were obtained. The sentences were read as all new information, that is, the readers were instructed to utter declarative sentences as if they were answers to questions like 'What happened?'. Therefore, our data consists of broad focus utterances in reading style. Further, readers uttered the sentences at their usual speaking rate in reading style.

Speakers were educated females in their thirties, two of them native speakers of EP from the region of Lisbon and the other two native speakers of Spanish from the central region. The recordings took place in quiet rooms at the University of Lisbon for the two speakers of EP and in the homes of the two Spanish speakers. They were made on audiotape and minidisks and were later digitized for acoustic analysis into PCs, using PitchWorks (Scicon R&D) and SpeechStation2 (Sensimetrics). Prosodic analysis was done by at least two judges for each language. Judges were native speakers (for EP, the second and third authors; for Spanish, the first author and another linguist). After auditory assessment of each target utterance, a spectrogram, waveform and pitch contour was produced. Following auditory and visual examination of F0 contours, the pitch contours were phonologically transcribed according to the autosegmental-metrical model of intonation analysis (cf. Pierrehumbert 1980, Beckman & Pierrehumbert 1986, Ladd 1996 among the landmarks in the development

of this theoretical model). On our approach, intonational phrase boundaries were primarily determined according to a perception-based transcription. Cases where the two judges did not agree were acoustically inspected for intonational phrasing cues. Major intonational phrasing cues were: for Spanish, a continuation rise or sustained pitch, final lengthening, pitch reset, or a pause; for EP, a continuation rise or a fall to the utterance-base level, final lengthening and, optionally, a pause. If any of the stated cues for phrasing was found, a boundary was considered to be present; if not, no boundary was marked.<sup>1</sup>

### 3. Intonational phrasing: Compared results

In the tables below, the phrasing labels (SVO) and (S)(VO) indicate that no major intonational break is inserted in the first case whereas an intonational break is inserted between subject and verb in the second case. In this article we will refer to the intonational constituents resulting from the phrasing of the utterances as *Major Phrases*.<sup>2</sup>

Table I shows the percentages of (SVO) and (S)(VO) in the non-branching subject and object condition. It is clear from the results shown in this table that Spanish and EP behave differently: in the former language (S)(VO) is by far the most common phrasing; by contrast, in the latter, (SVO) is predominant. Notice that in Spanish there are no clear cases of (SVO) phrasing. When this pattern arises, it is always judged as ambiguous with (S)(VO), that is, the native listeners could not decide between these two patterns.<sup>3</sup>

<sup>1</sup> A quantitative description of the acoustics of phrase boundaries in the two languages is in progress, as part of a larger-scale project which includes Catalan and Italian, as well as four speakers per language (D'Imperio et al. forthcoming). For the present paper, we prefer not to run quantitative and statistical analyses on results from only two speakers and reserve such an analysis for the mentioned work in progress.

<sup>2</sup> Although the term has been used by McCawley (1968), Selkirk (1978, 1986), Selkirk & Tateishi (1991), Kubozono (1993), Nagahara (1994) and others to refer to a category that could be equivalent to an Intermediate Phrase or even a Phonological Phrase, by the term *Major Phrase* we here refer to an intonational constituent that covers the categories *Intermediate Phrase* and *Intonational Phrase* (Pierrehumbert & Beckman 1988). The reason for this deliberate ambiguity is that the nature of the intonational constituents involved in EP and Spanish does not always appear to coincide. In EP it seems clear that the constituents are Intonational Phrases. In Spanish, however, there is variation. In some instances the breaks dividing a subject phrase from the predicate are straightforward Intonational Phrases, cued by continuation rises, final lengthening, and a relative lower pitch level of the material following the boundary, and sometimes pauses, but in some other cases a break of a lower level was perceived between the subject and the verb phrase, cued by one or more of the properties just mentioned. We leave for future work the task of determining the exact nature of these constituents, by means of a detailed phonetic analysis of the acoustic cues in each case. Garrido et al. (1995) explore the possible existence of acoustic cues correlating with different kinds of boundaries and although their results are not conclusive, there seems to be a tendency towards final lengthening before boundaries as well as pitch reset at the Subject-Verb boundary in Spanish. In any event, it is clear that the Major Phrases we are referring to in both languages are all tonally marked, and the phrases of EP are the only ones signalled by prosodic breaks that have a tonal reflex in the language.

<sup>3</sup> For ease of illustration, we simplified the results shown to an average of the results of the two speakers in each language. For results per speaker, see Elordieta et al. (2003).

**Table I.** Intonational phrasing in the non-branching subject and object condition, for short and long subjects. Numbers are percentage values

Condition	Spanish		EP	
	(S)(VO)	(S)(VO)/(SVO)	(S)(VO)	(SVO)
Non-branching S and O				
Short S	79.5	20.5	0.0	100.0
Long S	79.0	21.0	4.0	96.0

As shown by the compared results in Table II, the same behaviour characterises the non-branching subject and short branching object condition. (S)(VO) is found in Spanish, whereas (SVO) characterises EP, the only difference being that with branching objects the (S)(VO) results are even more extreme in Spanish.

**Table II.** Intonational phrasing in the non-branching subject and short branching object condition, for short and long subjects. Numbers are percentage values

Condition	Spanish		EP	
	(S)(VO)	(S)(VO)/(SVO)	(S)(VO)	(SVO)
Non-branching S and short branching O				
Short S	96.0	4.0	0.0	100.0
Long S	96.0	4.0	4.0	96.0

In the branching subject conditions, whether S is short or long, the (S)(VO) phrasing amounts to 100% in Spanish, regardless of object length or syntactic complexity. Again, EP presents a radically different pattern with (SVO) still predominant in the branching subject cases. Only in the long branching S condition does the (S)(VO) phrasing rise from insignificant levels to nearly 40%, as shown in Table III.

**Table III.** Intonational phrasing in the branching subject and non-branching object condition, for short and long subjects. Numbers are percentage values

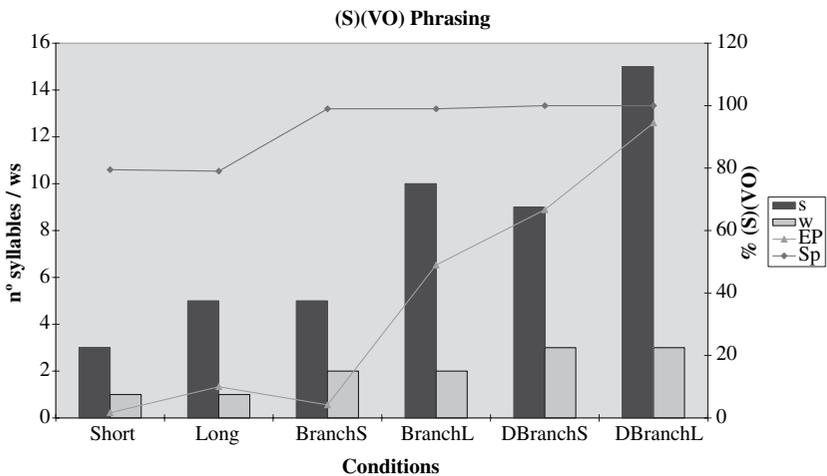
Condition	Spanish		EP	
	(S)(VO)	Others	(S)(VO)	(SVO)
Branching S and non-branching O				
Short S	100.0	0.0	0.0	100.0
Long S	100.0	0.0	39.5	60.5

In EP, the double-branching subject condition is the only one where the (S)(VO) pattern dominates. Even so, it is just with long double branching subjects that this phrasing pattern reaches similar levels to those obtained for any branching subject in Spanish. This is illustrated by the results given in Table IV.

**Table IV.** Intonational phrasing in the double branching subject and object condition, for short and long subjects. Numbers are percentage values

Condition	Spanish		EP	
	(S)(VO)	Others	(S)(VO)	(SVO)
Short S	100.0	0.0	67.0	33.0
Long S	100.0	0.0	94.5	5.5

These contrasting intonational phrasing tendencies in EP and Spanish are clearly depicted in Figure 1. The two languages only meet in the long double branching case, as Spanish favours (S)(VO) throughout all conditions while EP favours (SVO). In EP, (S)(VO) only increases with subject length.

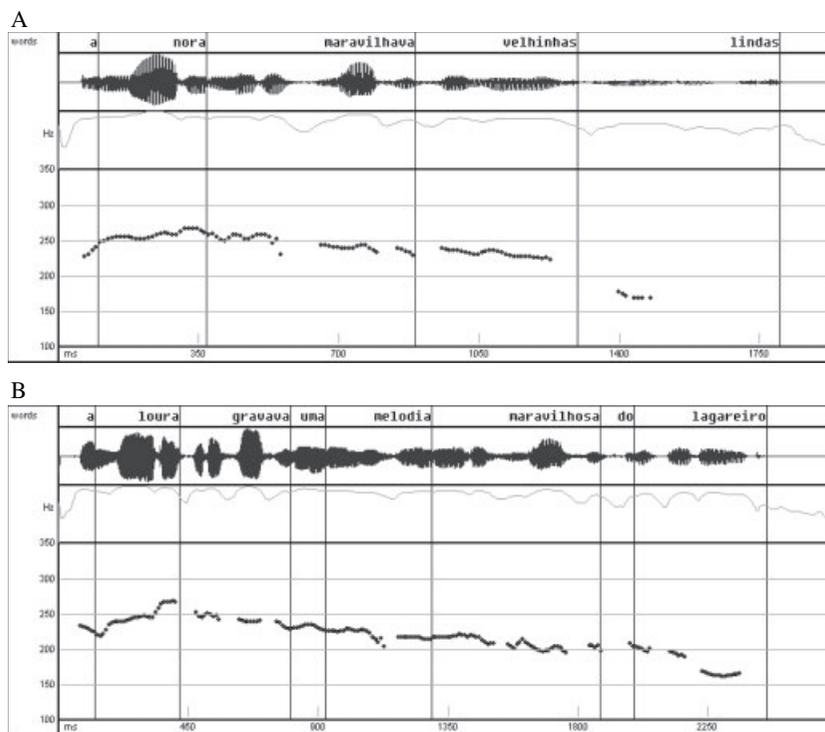


**Figure 1.** (S)(VO) phrasing in EP and Spanish. Syntactic complexity and constituent length conditions on the x-axis, number of syllables (s) and words (w) in the left y-axis, percentage of (S)(VO) in the right y-axis. Results of 456 utterances per language

## 3.1. Length effects on intonational phrasing

Figure 1 shows the presence of a length effect on intonational phrasing in EP. Subject length, measured in number of syllables, boosts the (S)(VO) pattern. This is shown by the contrast between short branching and long branching subjects, and the contrast between short double branching and long double branching subjects (see also Tables III and IV). In the former pair of conditions, syntactic complexity (both in terms of branchingness and number of words) is the same, only the total syllable number is different (5 syllables contra 10 syllables). The same holds in the latter pair (9 syllables contra 15 syllables).

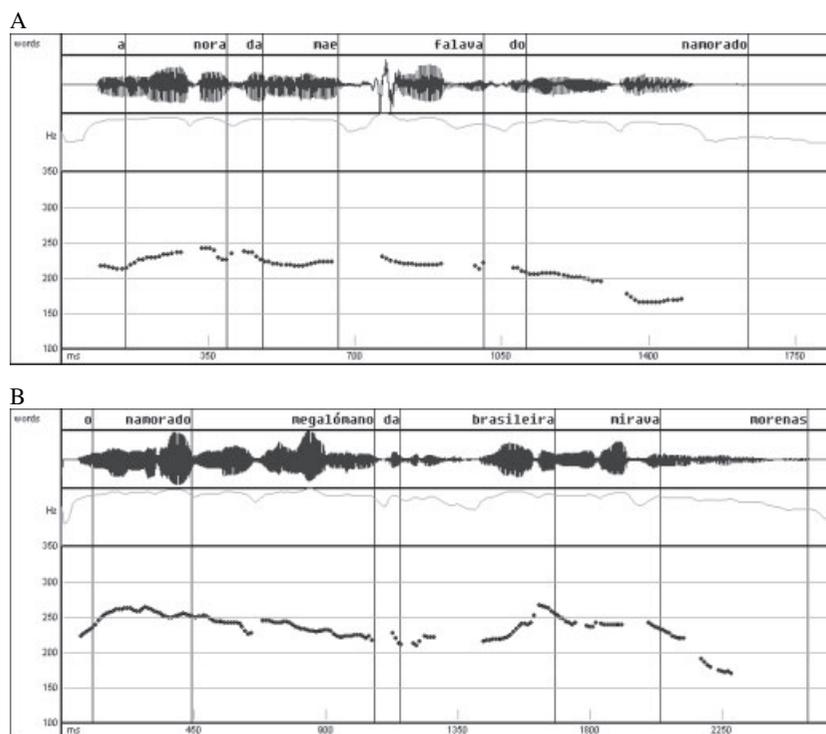
The length effect of the subject on how the utterance is intonationally phrased in EP is illustrated by the pitch contours in Figures 2 and 3. Despite the different branching status of S in Fig. 2 and Fig. 3 panel A, no break is introduced. S is simply too short to favour (S)(VO) phrasing.



**Figure 2.** F0 contours of two EP utterances: *A nora maravilhava velhinhas lindas* ‘The daughter-in-law marveled beautiful old women’ (panel A); *A loura gravava uma melodia maravilhosa do lagareiro* ‘The blond girl recorded a wonderful song from the olive-press man’ (panel B). Both utterances show (SVO) phrasing

An example of (S)(VO) is provided in Fig. 3 panel B, with a long double branching subject.

Contrary to subject length, object length yields no effect on phrasing in EP, as shown by the similar phrasing pattern of the examples in Fig. 2 which contain a 5 syllable O and a 15 syllable O. The distinct phrasing obtained in Fig. 3 points in the same direction: a 5 syllable object shows a (SVO) phrasing, whereas a 3 syllable object shows a (S)(VO) phrasing.

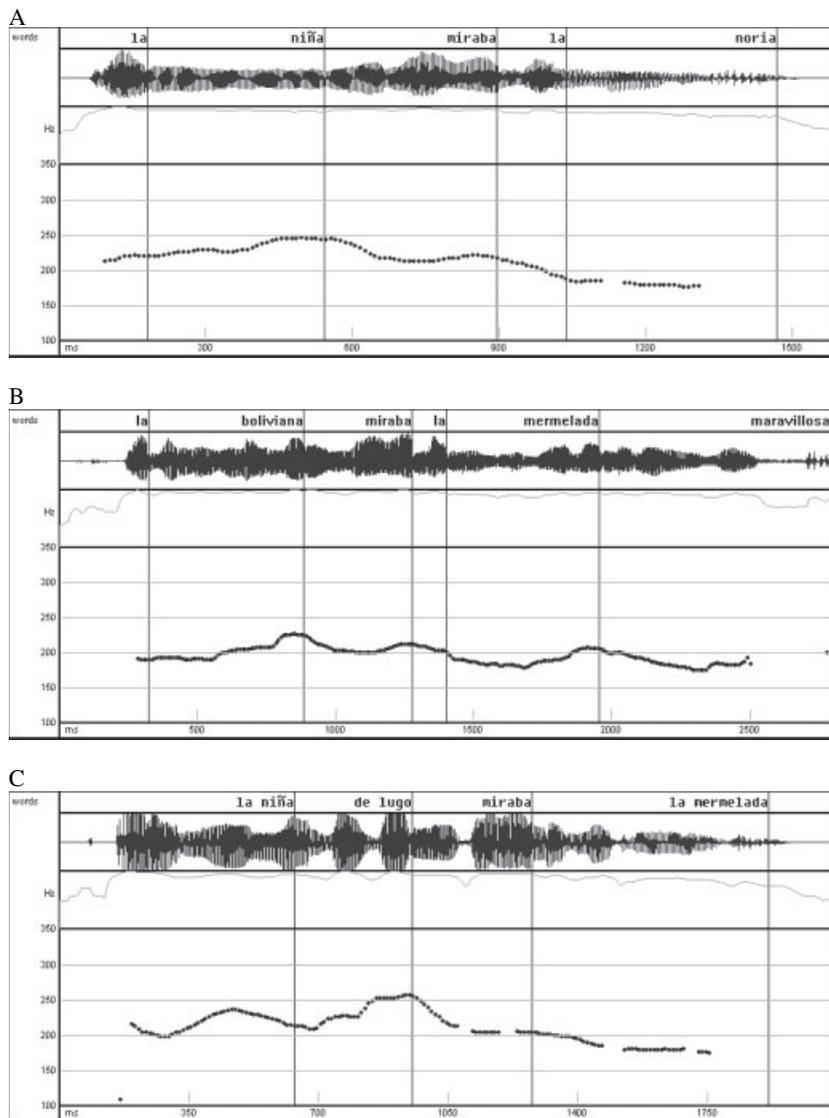


**Figure 3.** F0 contours of two EP utterances: *A nora da mãe falava do namorado* ‘The daughter-in-law of (my) mother talked about the boyfriend’ (panel A); *O namorado megalómano da brasileira mirava morenas* ‘The Brazilian girl’s megalomaniac boyfriend looked at dark-haired women’ (panel B). The first utterance shows (SVO) phrasing whereas the second utterance shows (S)(VO) phrasing

Like in EP, no length effect on the object is found in Spanish (e.g. short branching O shows more (S)(VO) than long branching O: 96% versus 86%, respectively). Unlike in EP, however, subject length does not affect intonational phrasing in Spanish. This is clear from Fig. 1, where the short/long conditions within each branching condition never contrast (see also Tables I–IV). In Spanish, a different factor affects the way in which utterances are phrased. This will be explored in the next section.

## 3.2. Branchingness effects on intonational phrasing

The Spanish results make clear that it is the branching of subject or object that is relevant and not constituent length in number of



**Figure 4.** F0 contours of three Spanish utterances: *La niña miraba la noria* ‘The girl watched the turning-wheel’ (panel A); *La boliviana miraba la mermelada maravillosa* ‘The Bolivian girl watched the wonderful marmalade’ (panel B); *La niña de Lugo miraba la mermelada* ‘The girl from Lugo watched the marmalade’ (panel C). All utterances show (S)(VO) phrasing

syllables.<sup>4</sup> Although (S)(VO) already predominates in the non-branching S and O cases, as shown in Table I and Fig. 1 and illustrated by the pitch contour in Figure 4, panel A, the branching status of the object favours this phrasing pattern: 79.5% contra 96% (see also Table II). An example of (S)(VO) phrasing with a non-branching S and a branching O is provided in Fig. 4 panel B.

Similar to branching objects, branching subjects also have a major effect on intonational phrasing. However, this effect is absolute with subjects: if a branching S is present (whether branching is single or double), then only the (S)(VO) pattern is selected (Tables III–IV and Fig. 1). An example is given in Fig. 4 panel C.

This effect of branchingness in Spanish is amenable to two possible interpretations. As in our database, a branching constituent always involves two lexical words; this also means that it is composed of two prosodic words. Consequently, the so-called branching effect may either be a true syntactic effect or a phonological effect due to the number of prosodic words involved. To disentangle syntax from phonology in the case of Spanish, in D'Imperio et al. (forthcoming) an extension of the database with morphosyntactic words consisting of more than one prosodic word is analyzed.

### 3.3. *Subjects, objects, and phrasing*

The compared results presented and discussed in the previous sections highlight the different ways in which subjects and objects are intonationally phrased in EP and Spanish.

Although the size of the subject is a relevant factor favouring (S)(VO) phrasing in both languages, in EP it is subject length in number of syllables that matters while in Spanish it is either syntactic branching or the number of (prosodic) words that counts. Putting it differently, the crucial factor at stake is clearly phonological in EP; in Spanish the situation requires further research, but it is certain that the number of syllables is not the key factor.

Objects also behave differently in the two languages. In EP, subjects and objects display an asymmetrical behaviour, as object length is irrelevant to intonational phrasing. In Spanish, branching is an important factor for both subjects and objects. It is worth noticing, however, that subject branching is in some sense more important than object branching: the latter *favours* (S)(VO) while the former *allows only* (S)(VO).

Finally, the prime difference between EP and Spanish is certainly the prevailing phrasing pattern shown by each of the languages: (SVO) in EP, but (S)(VO) in Spanish. Nonetheless, if an utterance contains a major prosodic break, this break is always placed after the subject, and not after

<sup>4</sup> In Elordieta et al. (2003) preliminary conclusions only stated an effect of branchingness for subjects, but a more careful study of objects also shows an effect of branchingness in phrasing.

the verb. That is, neither EP nor Spanish display patterns of (V)(O) phrasing. These differences and similarities in phrasing between EP and Spanish will be analyzed in the next section.

#### 4. Towards an analysis of intonational phrasing in EP and Spanish

##### 4.1. *Phonology and/or syntax*

We have shown that both in Spanish and in European Portuguese, if an SVO sentence is split into two major phrases, then the prosodic break necessarily occurs after the subject, but not after the verb. In the following paragraphs we propose to account for this observation.

As we have seen in section 1, a number of phonological factors may condition phrasing. Languages like Italian have been reported to show a preference for balanced constituents, symmetric constituents, and the location of the longest/heaviest constituent in the rightmost position (cf. Ghini 1993). However, it is clear that none of these factors could be held responsible for the location of major phrase breaks in our data from Spanish and Portuguese. This is shown by examples in (7–9): although in (7a) the two constituents are of uneven length, the phrasing given is attested; in (7b), by contrast, there is balanced constituency, but such phrasings are not attested in our data; (8a, b) show that phrasings with decreasing length/weight occur in our data, and phrasings with increasing length/weight are not necessarily good, respectively; finally, (9a, b) illustrate attested asymmetric phrasings and impossible symmetric constituency, respectively:

- (7) a. Sp (La niña) (miraba la mermelada de Magdalena).  
 the girl looked the marmalade of Magdalena  
 ‘The girl looked at Magdalena’s marmalade.’
- b. EP \*(O namorado megalómano) (da brasileira  
 the boyfriend megalomaniac of-the Brazilian-fem  
 mirava morenas).  
 looked dark-haired-fem  
 ‘The Brazilian’s megalomaniac boyfriend looked at  
 dark-haired women.’
- \* (A nora maravilhava) (velhinhas lindas).  
 the daughter-in-law marvelled old-ladies beautiful  
 ‘The daughter in law marvelled beautiful old ladies.’
- (8) a. Sp (La boliviana maravillosa de Badalona) (miraba  
 the Bolivian-fem wonderful from Badalona looked  
 la noria).  
 the turning-wheel  
 ‘The wonderful Bolivian from Badalona looked at the  
 turning-wheel.’

- b. EP \*(O namorado megalómano) (da brasileira mirava  
the boyfriend megalomaniac of Brazilian looked  
morenas).  
dark-haired-fem  
'The Brazilian's megalomaniac boyfriend looked at  
dark-haired women.'
- (9) a. Sp (La niña morena de Lugo) (rememoraba  
the girl dark-haired of Lugo remembered  
la mermelada de Magdalena).  
the mermelada de Magdalena).  
'The dark-haired girl from Lugo remembered  
Magdalena's marmalade.'
- EP (O namorado megalómano da brasileira)  
the boyfriend megalomaniac of Brazilian  
(mirava morenas).  
looked dark-haired-fem  
'The Brazilian's megalomaniac boyfriend looked at  
dark-haired women.'
- b. Sp \*(La niña morena de Lugo) (rememoraba)  
the girl dark-haired of Lugo remembered  
(la mermelada de Magdalena).  
the mermelada de Magdalena).  
'The dark-haired girl from Lugo remembered Magdalena's  
marmalade.'
- EP \*(O namorado megalómano) (da brasileira)  
the boyfriend megalomaniac of Brazilian  
(mirava morenas).  
looked dark-haired-fem  
'The Brazilian's megalomaniac boyfriend looked at  
dark-haired women.'

We may thus conclude that phonological factors such as those mentioned above do not account for the data obtained. Rather, we will put forth the hypothesis that our results follow from syntactic facts that impinge on the construction of prosodic structure. Specifically, we will propose that the syntactic position of subjects in EP and Spanish is crucial not only for accounting for the location of the prosodic break after the subject in both languages, but also for understanding the asymmetry between the two languages in terms of the number of major breaks found in that position.

#### 4.1.1. *The syntax of subjects in EP*

Let us first consider the syntax of subjects in European Portuguese. Currently there are two competing proposals for the syntactic analysis of

EP subjects: Costa (1996, 2001) and Costa & Duarte (2002), among others, have extensively argued that (one of) the argumental position for subjects in EP is Spec,IP, as shown in the representation in (10a); Barbosa (1995, 2000), by contrast, has strongly claimed that preverbal subjects are Clitic Left Dislocated (CLLDed) constituents and are base generated as adjuncts either to CP or to IP, as shown in (10b), and, in general, do not occur in Spec,IP.

- (10) a. [IP S V [VP t<sub>S</sub> t<sub>V</sub>]]  
 b. [I<sub>CP</sub> S [I<sub>CP</sub> V [VP *pro* t<sub>V</sub>]]]

Each analysis seems to be supported by a number of arguments, but is also subject to the criticism of the proponents of the alternative proposal. Quite a number of arguments are brought up by Costa & Duarte in favor of the Spec,IP analysis and against the alternative view according to which preverbal subjects are fronted constituents. First, while word order in fronted constructions is variable for other constituents, it is fixed for subjects. This difference between subjects and Clitic Left Dislocated constituents suggests that subjects are not fronted. Second, according to Costa & Duarte, subjects in Spec,IP occupy an A(argumental)-position, while in the alternative proposal subjects are A-bar constituents. The facts of scope ambiguity related to reconstruction, which set apart A and A-bar moved constituents, show that subjects behave like A-moved, rather than A-bar moved constituents, and thus as being in Spec,IP, rather than adjuncts to I/CP. Also leading to the same conclusion is the fact that subjects' movement is limited, which means that they behave like A-moved constituents and unlike A-bar moved ones. Third, unlike in other languages that have been claimed to have CLLDed subjects, in out-of-the-blue contexts, the only possible word order in EP is SVO. Such behaviour is taken to indicate that preverbal subjects are in argumental position. Additionally, fronting is impossible in this discourse context (e.g. \*OSV), and since preverbal subjects are allowed in this discourse situation, this entails that subjects do not pattern like fronted constituents. Fourth, there are several asymmetries between CLLDed constructions and preverbal subjects. For instance, (i) definiteness effects obtain with CLLDed constituents but not with regular subjects, (ii) subjects trigger Agr(ement), unlike CLLDed constituents, and evidence is provided for this not being due to the pronominal status of Agr, since it is claimed that Agr is not pronominal, and (iii) subjects do not show minimality effects in subordinate contexts, unlike dislocated constituents. Finally, assuming the analysis of preverbal subjects as CLLDed constituents implies that the only argumental position for subjects is postverbal. Therefore, it would be expected that postverbal subjects would occur with some frequency in acquisition data. However, Adragão (2001)

shows that VSO order is very rare in children below 36-months acquiring EP. Acquisition data, therefore, do not support the analysis of subjects as CLLDed constituents.

Barbosa's argument in favour of Clitic Left Dislocated preverbal subjects in EP is essentially as follows. First, a generalization is proposed that in all null subject languages, subjects are clitic left dislocated. EP is seen to be one of the languages where the correlation between the presence of null subjects and CLLDed subjects holds. Then, the distribution of pronominal clitics in EP is claimed to indirectly support a structural asymmetry between 'regular' subjects and subjects that are proclisis triggers. Unlike regular subjects, and as also claimed by Costa & Duarte, Q(uantifier) P(hrases) are argued not to undergo topicalization or focus movement, but rather to occur in Spec,IP. By contrast, subjects in inflected infinitival complements of epistemic and declarative verbs and in indirect commands are shown not to rise to an A-position and thus not to occupy Spec,IP. These facts are related to the distribution of clitics in that the former type of subjects trigger preverbal clitic location, while the latter trigger post-verbal clitics. A prosodic constraint is then proposed to ban clitics from appearing in Intonational Phrase initial position, and syntax-phonology mapping rules are assumed to be such that topics (including regular subjects) form their own Intonational Phrases, and other preverbal constituents that are IP internal form an Intonational Phrase with the verb-clitic sequence. The fact that short subjects do not usually surface as independent Intonational Phrases is then proposed to result from a *simplification rule* (in the sense of Drescher 1993), which removes the subject's intonational phrase boundary when that constituent is short. According to this analysis, proclisis with fronted subjects would yield Intonational Phrase initial clitics, but these are ruled out by a prosodic constraint, and thus enclisis is the only possible derivation in this context. In the remaining cases, subjects are mapped as part of the same Intonational Phrase as the verb-clitic sequence, and therefore preverbal clitics may surface since they are not IP-initial.

It is not our goal here to discuss the two competing syntactic analyses for subjects. It is important to notice that both have been criticized and both are thought by their respective supporters to be able to accommodate potential problems. However, we should point out that only an analysis where subjects in general are inside the same syntactic domain as the verb and the object (i.e., inside Spec,IP) independently predicts that fronted constituents and subjects often display distinct prosodic behaviour. This prediction is borne out by the EP data (as amply shown in Frota 2000). In addition, independent accounts of EP clitic behaviour, which do not resort to the position of subjects, have been proposed in the literature (e.g. Frota & Vigário 1996, Vigário & Frota 1998, Duarte &

Matos 2000). We will therefore adopt the Spec,IP analysis for EP subjects. As will become clearer below, the data described in present article also supports this syntactic analysis.

#### 4.1.2. *The syntax of subjects in Spanish*

Until recently there have also been two competing analyses regarding Spanish subject placement. The classical position assumed was that preverbal subjects occupied the Spec position of IP, and that preverbal objects occupied a more external position, probably that of topics or left-dislocated elements adjoined to IP or CP, as illustrated in the schematic constructions in (11a, b) below, respectively. However, evidence brought forth by Ordóñez (1997) and Ordóñez & Treviño (1997) points to the fact that lexical D(eterminer) P(hrases) are left-dislocated, like preverbal DOs and IOs, as represented in (12). This alternative is also adopted with somewhat different details of analysis in Contreras (1991), Zubizarreta (1994, 1998) and Uribe-Etxebarria (1992).

- (11) a. [<sub>IP</sub> S V [<sub>VP</sub> t<sub>S</sub> t<sub>V</sub>]]  
 b. [<sub>I<sub>CP</sub></sub> **DO/IO** [<sub>I<sub>CP</sub></sub> S V [<sub>VP</sub> t<sub>S</sub> t<sub>V</sub> t<sub>DO</sub> t<sub>IO</sub>]]]

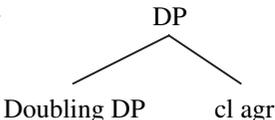
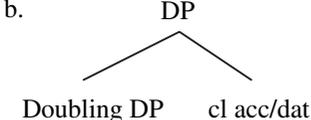
- (12) [<sub>I<sub>CP</sub></sub> S/**DO/IO** [<sub>I<sub>CP</sub></sub> V [<sub>VP</sub> *pro* t<sub>V</sub> t<sub>DO</sub> t<sub>IO</sub>]]]

The analysis in (12) is supported by a number of facts showing that preverbal lexical DP subjects do not have the same distribution as *pro*, which on all analyses would be inside IP/VP, and that they occupy the same position as other preverbal fronted complements.<sup>5</sup> First, in ellipsis constructions involving preverbal DOs and IOs followed by discourse polarity particles like *sí/no/también/tampoco* ‘yes/not/too/neither’, preverbal DOs or IOs cannot cooccur with lexical subjects, although they can with non-overt subjects (i.e., *pro*). Second, preverbal lexical DP subjects cannot cooccur with negative quantifiers such as *nada* ‘nothing’, *nadie* ‘nobody’, which suggests that they all occupy A-bar-positions and that preverbal subjects cause blocking effects for binding; no such effects are observed with a null subject like *pro*. Third, in cases of wh-questions with and without obligatory inversion, preverbal objects and subjects pattern alike; like preverbal objects, in cases of obligatory inversion, preverbal lexical subjects cannot intervene between the wh-word and the verb, but non-overt subjects (i.e., *pro*) can. Fourth, when lexical subjects and objects are quantifiers, they behave the same way with respect to scope. They cannot take wide

<sup>5</sup> Cf. Rigau (1988), Cardinaletti (1996) for the claim that preverbal lexical subjects and *pro* have different distributions in Catalan and Italian as well.

scope over negation or *wh*-words in preverbal position, while they can in postverbal position. Interestingly, the same pattern arises in English with topicalized quantifier phrases. This behaviour can be explained by assuming that preverbal subject DPs (and objects as well) are in an A-bar-position, not in Spec,IP, and that no further movement is licensed when a quantifier has already been moved to an A-bar-position (i.e., the quantifiers would have to move from their overt A-bar-position to a higher position in LF to take wide scope, and this movement would be blocked by the Principle of Unambiguous Binding, cf. Müller & Sternefeld 1993).

Ordóñez (1997) goes on to demonstrate that the relationship between preverbal DPs and agreement is parallel to the relationship between a clitic-doubled DP and its associated clitic. He proposes that the syntactic structure that holds between a lexical subject and an agreement head *Agr* is similar to the one holding between a DP object and its clitic (cf. (13a, b) below). Ordóñez suggests that the agreement head *Agr* is a clitic which the lexical DP merges with to form a more inclusive DP.

- (13) a.  b. 

To sum up, in this subsection we have presented arguments for a difference in syntactic location between preverbal subjects in EP and Spanish. Whereas in EP there are strong arguments for positing an IP-internal location for subjects (i.e., Spec,IP), in Spanish there are arguments for believing that they are IP-external (i.e., in an A-bar-position adjoined to or higher than IP). This will be relevant for our analysis of the difference in phrasing preferences between EP and Spanish that we have described in section 3. In the next subsection we will present this analysis, cast in a constraint-based framework.

#### 4.2. *A constraint-based analysis*

The differences in the syntactic location of preverbal subjects in EP and Spanish provide an interesting way of accounting for the prime difference in intonational phrasing in these two languages: the fact that the prevailing phrasing pattern in (SVO) in EP but (S)(VO) in Spanish. We may assume that the basic difference between EP and Spanish is that in EP subjects are internal to what we could call the Inflection Phrase or the Extended Projection of VP (Grimshaw 1991), below CP or other projections of the left periphery, whereas in Spanish preverbal subjects are in an A-bar-bar position external to IP or the Extended Projection of VP. Thus, in the spirit of Selkirk (1986, 2000), McCarthy & Prince (1993),

Truckenbrodt (1995, 1999) and others, we may posit the existence of an alignment constraint, that is, a constraint of the syntax-prosody interface which creates prosodic constituency from syntactic constituency, and that this constraint enforces the alignment of the left edge of the Extended Projection of VP with the left edge of a Major Phrase (MaP).<sup>6</sup> We formulate this constraint in (14):<sup>7</sup>

- (14) *Align-ExtVP,L: Align (ExtVP, L; MaP, L)*  
 “Align the left edge of an Extended Projection of VP with the left edge of a Major Phrase.”

In EP, the consequence of this constraint would be that the subject and the predicate (i.e., the verb and what follows) would fall in the same MaP, i.e., it would apply vacuously for the type of sentences that we are analysing. For Spanish this constraint would create a Major Phrase prosodic boundary between a subject and a verb (and what follows), meaning that the subject and the verb would fall in different Major Phrases. The different alignment correspondences that obtain in each language are represented in (15), where the correspondence between syntactic and intonational constituents is marked by the straight vertical lines. The phrasings obtained by obeying this constraint in each language are represented to the right of the horizontal double arrow:

- (15) EP: [<sub>ExtVP</sub> S V [<sub>VP</sub> t<sub>S</sub> t<sub>V</sub>]] ...  
           |  
           (MaP S V ... ⇒ (SVO))  
 Sp: [<sub>ExtVP</sub> S [<sub>ExtVP</sub> V [<sub>VP</sub> *pro* t<sub>V</sub>]]...  
           |  
           S (MaP V ... ⇒ (S)(VO))

Note that a more general alignment constraint like *Align (XP, L; MaP, L)* (Align the left edge of an XP with the left edge of a Major Phrase – Selkirk 2000) cannot be dominant, as the facts would not be accounted for otherwise. In EP, although it would derive no prosodic break between S and V (i.e., V is outside VP), it would posit a break between V and O, as well as between objects (i.e., different NPs). As seen in section 3, no breaks arise between V and O in EP, and there is evidence in the literature that no Major Phrase break intervenes between two objects (e.g. Vigário 1998, 2003, Frota 2000). Likewise, as

<sup>6</sup> See footnote 2 for discussion on the use of the term Major Phrase.

<sup>7</sup> We consider ExtVP a lexical projection, as it is a maximal projection headed by the lexical category V(erb). Still, we make a distinction between VP, which only contains the verb and the object, and ExtVP, which also includes the subject. This is an important structural difference.

seen in section 3, Spanish shows no Major Phrase breaks between V and O.<sup>8</sup>

As the results presented in section 3 show, EP and Spanish share a common property, which is that the Verb Phrase is not split into separate intonational constituents, that is, (VO) appears as a single constituent. (SV)(O) and (S)(V)(O) are nonexistent in EP and very rare in Spanish. A way to account for such a fact would be to assume the role of a constraint of the *Wrap-XP* type (Truckenbrodt 1995, 1999), which requires that the material contained within the boundaries of a syntactic maximal projection be included within a prosodic constituent of a certain type. Given the type of prosodic constituent involved in our data, this constituent must be a MaP. Hence, a constraint *Wrap-XP* would wrap together the verb and the following object. The constraint *Wrap-XP* also accounts for the fact that a subject NP or an object NP is not split into different MaPs in either language. That is, the words in a subject/object NP are always phrased together in one MaP:

(16) *Wrap-XP*

“The material contained in a syntactic maximal projection must be contained within a MaP in prosodic structure.”

Finally, it is necessary to find an account of the fact that in certain conditions in EP and Spanish there is a strong tendency to insert an intonational boundary that separates material that would otherwise form an excessively heavy constituent. As already stated in section 3, in EP a tendency to produce (S)(VO) phrasings can be perceived starting with cases of Long Branching Subjects (39.5% of the cases). The frequency of occurrence of this type of phrasing increases in cases of Short Double-Branching Subjects (67%), and it becomes by far the most common type of phrasing in cases of Long Double-Branching Subjects (94.5%). That is, when the subject has more than 8 syllables (Long Branching Subjects and Short Double-Branching Subjects are 9 or 10 syllables long), the percentages of (S)(VO) phrasings start being substantially frequent,

<sup>8</sup> Our database did not include examples with two objects, so unfortunately we do not have empirical evidence as to whether two objects are phrased separately or not, and we could not find any references in the literature regarding this issue either. However, according to the intuitions of the first author and to preliminary observations of data, in sentences containing two objects, breaks between objects only arise if the two objects contain at least two prosodic words, i.e. are prosodically heavy. In the absence of a proper experiment including double object constructions, we leave the issue open for further research. We also have to postpone partially a consideration of *Align (XP, R; MaP, R)* (Align the right edge of an XP with the right edge of a Major Phrase). This constraint cannot be dominant in EP, as it would predict a phrase break between S and V (i.e., a boundary would be aligned with the right edge of NP) contrary to fact (as well as between two Os, also contrary to fact). In Spanish, it would correctly predict a separation between S and V, but it would also predict a break between two Os.

increasing in frequency as the number of syllables in the subject increases. Interestingly, object length does not matter for this purpose, as sentences with short subjects (i.e., containing fewer than 8 syllables) and long VPs (with double branching objects, for instance) are still phrased in one single MaP.

As also stated in section 3, in Spanish the percentage of (S)(VO) phrasings increases with branching objects and with branching subjects. (S)(VO) is more frequent when objects branch than when objects do not branch (an increase from 79% to 96%). When subjects are syntactically branching, (S)(VO) is virtually categorical. Length, measured as number of syllables, does not play a role in (S)(VO) frequency of occurrence, as the percentages are almost identical with short and long subjects across conditions. Moreover, the frequency of occurrence of (S)(VO) is higher with Short Branching Objects than with Long Nonbranching Objects (compare the results in Tables I–II), and in both cases the object has the same number of syllables. The only difference is that in the first case the object is syntactically complex, i.e., it has a branching structure and contains two prosodic words.

Thus, both in EP and Spanish there exists a tendency towards inserting a MaP intonational boundary between the subject and the verb as the subject becomes longer. However, the two languages differ in the nature of the grammatical parameter under which *length* or *weight* is computed. In the case of EP, the length or weight of a constituent is calculated on the basis of number of syllables; a constituent seems to be considered long enough so that it should form its own MaP when it has more than 8 syllables. Branchingness is not relevant for phrasing decisions, as the similar percentages of phrasing in Long Nonbranching Subject and Short Branching Subject conditions shows (i.e., the same number of syllables exists in both cases, but in the latter the subject is syntactically complex). In Spanish, on the other hand, a constituent is heavy when it branches syntactically or prosodically (when it contains at least two prosodic words). Although *Align-ExtVP,L* already calls for the insertion of a MaP boundary between the subject and the verb phrase in Spanish, it appears that a heavy constituent enhances the urge to insert such boundaries, as evidenced by the increasing percentages of (S)(VO) phrasings. Interestingly, in Spanish object weight seems to be relevant for inserting a MaP boundary between the subject and the verb as well. This is another aspect in which Spanish and EP differ regarding the nature of *prosodic weight*, as in EP only subject length is relevant for MaP formation.

To account for such phrasing patterns, we can invoke the existence of a prosodic markedness constraint on the maximum size of prosodic or intonational constituents (cf. Selkirk's 2000 size constraints). Such a

constraint would work against having utterances consisting of excessively long or heavy MaPs, that is, it would trigger or favour the insertion of MaP boundaries breaking heavy MaPs. Thus, it appears that in EP a subject containing more than 8 syllables should constitute a MaP of its own, or stated in other words, a sentence should not be mapped onto a single MaP if it contains a subject with more than 8 syllables. MaPs which go beyond that length are considered heavy and are not favoured, and thus a phrase break tends to be inserted at the right edge of subjects. In Spanish, on the other hand, a MaP is heavy if the material that is mapped onto it is branching, i.e., if it contains two or more syntactic/prosodic words. In this language, heaviness is computed with respect to subjects and objects.

Stated more generally, we could define the size constraint as in (17):

(17) *MaximumMaP*

“A MaP should not contain more than

- (i)  $n$  syllables.
- (ii)  $n$  prosodic words, or  $n$  levels of syntactic branchingness.”

Languages instantiate either one of parameters (i) and (ii) for weight, and they establish the particular values for the number of syllables or prosodic words or the level of syntactic branchingness that is expressed as  $n$ . EP would realize parameter (i) for MaP weight (with the specific reference to subjects), and would set the value of  $n$  at 8. Spanish would realize parameter (ii). As already pointed out in section 3.2, we leave for future work the issue of elucidating whether it is syntactic branchingness or number of prosodic words in a MaP that counts for determining the heaviness of a prosodic or intonational constituent (D’Imperio et al. forthcoming). If it turns out that the relevant factor is the number of prosodic words in a MaP, then  $n$  would be set at 2, i.e., a MaP containing 2 PWds is heavy and should not include more material. If the relevant factor is proven to be syntactic branchingness, then the second alternative becomes more of a syntax-prosody interface constraint, which states that a branching syntactic constituent forms a heavy MaP, i.e., this MaP should not contain more material. Then the value of  $n$  is set at 1, i.e., a MaP should not be formed from material that has more than one level of syntactic branchingness.

*MaximumMaP* is thus a size constraint of the syntax-phonology interface, which in the case of EP states that a MaP should not contain a subject that exceeds 8 syllables. This constraint is hence an edge constraint, relevant only for the leftmost constituent in a sentence. This implementation of *MaximumMaP* would explain why long subjects favour (S)(VO) phrasings, whereas long objects do not; the constituent containing (VO) is rightmost in the utterance and thus does not violate

the size constraint. The edge effect at work here is not new; rather, it is well within the spirit of previous phrasing accounts that stress that rightmost phrases tend to be heavier whereas leftmost phrases tend to be lighter (e.g. Ghini 1993, Guasti & Nespor 1999, Frota & Vigário 2001). Also, it is important to remember that in EP the percentages of occurrence of (S)(VO) phrasings are 39.5% with Long Branching Subjects and 94.5% with Long Double-Branching Subjects. That is, the percentages of phrasings that satisfy *MaximumMaP* increase as the number of syllables in the subject increases. As we will see below, this can be expressed formally by calculating one violation of *MaximumMaP* by each syllable that exceeds the value of  $n$ .<sup>9</sup>

Before we proceed, however, it is important to recall how the construction of Intonational Phrases in EP (i.e., our MaPs) has been described in the prosodic literature. Weight (or speech rate/style) considerations apart, a syntactic root sentence is always mapped onto an intonational phrase in the language (e.g. Frota 1997, 2000, Vigário 1998, Grønnum & Viana 1999). In our terms, this can be restated in the following way: all the material within the Extended Projection of V is contained within a single MaP. Thus, major phrase breaks separating material within ExtVP are only forced by the presence of weight effects (or speech rate/style variations, not dealt with in this paper), as expressed in *MaximumMaP*. Other MaP break insertions not motivated by *MaximumMaP* violate a general constraint that penalises the insertion of intonational breaks. We can call this constraint *No Intonational Break* (or *\*IntBreak*):

(18) *\*IntBreak: No Intonational Break*

“No intonational breaks/boundaries should be inserted in an utterance.”

This constraint expresses the fact that producing breaks is costly from an articulatory-sensory point of view, as it adds structure and thus makes the prosody more complex. Thus, it would belong to the family of economy constraints against the creation of phonological structure, which has been summarized in the literature as *\*Struc* (Prince & Smolensky 1993: 25). Consequently, any intonational break has to be present for a good reason, namely to avoid the violation of *MaximumMaP*. Any violation of *\*IntBreak* not motivated by the violation of a higher-ranked constraint will necessarily lead to the rejection of the

<sup>9</sup> We are aware that the reader may wonder whether *MaximumMaP* should be maintained as the same constraint for EP and Spanish, given the different interpretations of the constraint in the two languages. However, we want to hold to this position because, despite these differences, it seems clear that the same type of constraint is at work, one that sets a limit to the size of MaPs, and also because it allows us to compare the phrasing patterns in EP and Spanish in a more direct way, with the same constraints.

respective phrasing candidates. This ensures that a break is not inserted unless the threshold of 8 syllables that defines the maximum size of a leftmost syntactic constituent is surpassed. Furthermore, a phrasing candidate becomes worse and worse with the increasing number of violations of *MaximumMaP*, and, conversely, its counterpart with a break is increasingly more preferred. Thus, it is in a language like EP, where breaks are not inserted within a SVO sequence by alignment constraints but only by constraints on weight, that the role of *\*IntBreak* becomes critically visible.

The tableaux below illustrate how the EP constraint ranking works: *Align-ExtVP,L*, *Wrap-XP*, *MaximumMaP* >> *\*IntBreak*. A syntactic structure (SVO in this case) serves as input to the generator of prosodic structure, following traditional assumptions of generative grammar that have been adopted in OT as well (cf. Truckenbrodt 1995, 1999, Selkirk 2000). Tableau (19) serves to illustrate the working of the constraint ranking for cases in which the subject is not long, i.e., it does not exceed 8 syllables. These are the cases in which the phrasing (SVO) is virtually categorical. The sentence chosen as example is *A nora maravilhava velhinhas lindas* ‘The daughter-in-law marveled beautiful old women’, that is, a sentence with the prosodic and syntactic conditions *Short Nonbranching Subject and Short Branching Object* (cf. Table I). Candidate (a) is the ideal candidate, as it violates no constraints. Candidates (b) and (c) violate *Wrap-XP* at least once, as well as *\*IntBreak*. Candidate (d) violates *\*IntBreak*.<sup>10</sup>

## (19)

NP[A nora] VP[maravilhava NP[velhinhas AP[lindas]]]	Al.-ExtVP,L	Wrap-XP	Max MaP	*IntBreak
☞ a. (A nora maravilhava velhinhas lindas)				
b. (A nora maravilhava) (velhinhas lindas)		VP!		*
c. (A nora maravilhava velhinhas) (lindas)		VP!, NP		*
d. (A nora) (maravilhava velhinhas lindas)				*!

Tableau (20) illustrates a case in which the subject is long, concretely a case with the syntactic and prosodic conditions *Long Double-Branching Subject and Short Nonbranching Object* (*O namorado megalómano da brasileira mirava morenas* ‘The Brazilian girl’s megalomaniac boyfriend looked at dark-haired women’), which almost always have the phrasing (S)(VO), as shown previously in Table IV.

<sup>10</sup> Sentences (b) and (c) were never attested in our corpus, although native speakers intuitively distinguish between the two cases, (b) being not as bad as (c), as predicted by the results in the tableau. In Frota (2000), one case similar to the phrasing in (b) was found (cf. Frota 2000: 366, (14c)). However, cases like (c) were not attested.

(20)

NP[O namorado AP[megalómano] PP[da brasileira]] VP[mirava NP[morenas]]	Align- ExtVP,L	Wrap- XP	Max MaP	*Int Break
a. (O namorado megalómano da brasileira mirava morenas)			13*!	
b. (O namorado megalómano da brasileira mirava)(morenas)		VP!	11*	*
c. (O namorado megalómano) (da brasileira mirava morenas)		N P!	2*	*
d. (O namorado megalómano)(da brasileira)(mirava morenas)		N P!	2*	**
<sup>☞</sup> e.(O namorado megalómano da brasileira)(mirava morenas)			7*	*

Candidate (e) is the most optimal candidate, as it does not violate *Wrap-XP*, unlike candidates (b)–(d). It exceeds by seven syllables the threshold of 8 syllables for a *MaP* containing a subject or the leftmost constituent in an utterance, and these syllables are computed as violations of *MaximumMaP*. It also violates *\*IntBreak*, but only in order to cause as few violations of *MaximumMaP* as possible, without violating *Wrap-XP*. Candidate (a) does not violate *\*IntBreak*, but the price it has to pay is that by each syllable that the *MaP* exceeds the limit of 8 imposed on *MaPs* containing subjects, a violation of *MaximumMaP* is accumulated, and in the end the resulting phrasing is undesirable compared to candidate (e). Thus, it seems that there is a threshold of violations of *MaximumMaP* that make a candidate that surpasses it non-optimal, even if it does not violate *\*IntBreak*. More data would be necessary to know where that threshold is exactly, but the data seem to indicate that it cannot be lower than 7, otherwise candidate (e) in (20) would be non-optimal. Such gradation in weighing makes sense due to the fact that counting syllables is the key factor at stake. The number of violations of *MaximumMaP* may only be critical when a tie between otherwise satisfying candidates occurs or when the degree of violation is too high. For a more developed formalisation of the pattern that we have presented here, perhaps a stochastic model of OT should be explored (cf. Boersma 1998, 2001, Hayes 2000, Boersma & Hayes 2001, Pierrehumbert 2001, and references therein), or a theory of weighted constraints (Guy 1991a, b, 1997). This is an issue that will have to be left for further research.

For Spanish, the issue is the difference in percentage of occurrence of (S)(VO) phrasings between utterances in which the subject and the object are nonbranching and utterances where the subject or the object are branching. In the former condition, 21.5% of the utterances displayed an ambiguous type of phrasing between (S)(VO) and (SVO), whereas in the latter condition such an ambiguity disappeared. We claim that *MaximumMaP* penalises pronouncing an utterance in a single *MaP* when one of the constituents is branching, i.e., it contains more than one word. In other words, once a syntactic constituent is syntactically complex, it becomes heavy and hence it should constitute a *MaP* on its own, without increasing the size of the *MaP* in which it would be otherwise contained. This constraint would enforce the insertion of a *MaP* boundary between the verb and its following object when the object is branching, but this is not

observed in the data. This fact can be explained by assuming that *Wrap-XP* is ranked higher than *MaximumMaP*, hence preventing the insertion of such a boundary. For Spanish, the interpretation of *MaximumMaP* is the one stated as (17ii), for which the number of prosodic words or levels of syntactic branchingness are relevant, not number of syllables.

The tableau in (21) corresponds to the Spanish sentence *La boliviana de Badalona miraba la noria* ‘The Bolivian from Badalona looked at the turning-wheel’, with a branching subject. Candidates (a), (b) and (d) violate *Align-ExtVP,L*, as a left edge boundary of a MaP is not inserted at the left edge of the ExtVP, and are hence eliminated when compared with candidates (c) and (e), which satisfy this constraint. Candidate (c) is eliminated because it violates *Wrap-XP*; the NP subject is split in two different MaPs. Candidate (e) satisfies this constraint, as well as *MaximumMaP*, and is hence the optimal candidate. The winning candidate only violates *\*Int-Break* once, but obeys the other constraints and is hence optimal.

(21)

NP[La boliviana <sub>pp</sub> [de Badalona]] <sub>VP</sub> [miraba <sub>NP</sub> [la noria]]	Align-ExtVP,L	Wrap-XP	Max MaP	*Int Break
a. (La boliviana de Badalona miraba la noria)	*!		2*	
b. (La boliviana de Badalona miraba) (la noria)	*!	VP!	1*	*
c. (La boliviana) (de Badalona) (miraba la noria)		NP!		**
d. (La boliviana) (de Badalona miraba la noria)	*!	NP!	1*	*
☞ e. (La boliviana de Badalona) (miraba la noria)				*

The tableau in (22) corresponds to the Spanish sentence *La niña recordaba la noria de Lugo* ‘The girl remembered the turning-wheel from Lugo’, with a nonbranching subject and a branching object. Candidates (a)–(c) violate *Align-ExtVP,L*, as a left edge boundary of a MaP is not aligned with the left edge of the ExtVP. Candidate (d) violates *Wrap-XP*, as the VP is not contained in a single MaP. This constraint is also violated by candidate (b) and candidate (c) (one violation for NP and another one for VP). Now an interesting discussion arises regarding candidate (e), which represents the actually attested output. This candidate incurs in one violation of *MaximumMaP*, because the rightmost MaP contains three prosodic words or has two levels of branchingness (one between the verb and the NP and another one inside the NP). Maintaining the free ranking of *Align-ExtVP,L*, *Wrap-XP* and *MaximumMaP* that we have assumed for EP would mean that candidate (e) would tie with candidate (d) for one violation of a constraint each. However, candidate (d) incurs in one more violation of *\*IntBreak*. Hence, this situation would constitute evidence for the role of *\*IntBreak* in Spanish. Or, alternatively, *Wrap-XP* (and *Align-ExtVP,L*) could dominate *MaximumMaP*.<sup>11</sup>

<sup>11</sup> Note that this alternative would make the ranking in EP and Spanish different (in EP there is no evidence for the relative ranking between these three constraints).

(22)

NP[La niña] VP[rememoraba NP[la noria PP[de Lugo]]]	Align-ExtVP,L	Wrap-XP	Max MaP	*Int Break
a. (La niña rememoraba la noria de Lugo)	*!		2*	
b. (La niña rememoraba) (la noria de Lugo)	*!	VP		*
c. (La niña rememoraba la noria) (de Lugo)	*!	NP, VP	1*	*
d. (La niña) (rememoraba) (la noria de Lugo)		VP		**!
e. (La niña) (rememoraba la noria de Lugo)			1*	*

The examples in (21)–(22) serve to illustrate the way the same constraint ranking that we have suggested for EP works for Spanish as well. Other cases with double-branching subjects or objects would receive the same analysis, and hence all possible conditions would be accounted for.<sup>12</sup>

## 5. Conclusion

In this paper we have presented empirical results from EP and Spanish that indicate the main patterns of intonational phrasing of these two languages. The corpus from which these results are obtained was specifically designed to test the respective roles of phonological length (i.e., number of syllables of a constituent) and syntactic complexity (i.e., levels of branchingness of a constituent) in intonational phrasing. In EP, utterances are pronounced almost categorically in a single MaP (i.e., displaying a (SVO) type of phrasing), unless the subject is at least 8 syllables long. In that case, the subject tends to form one MaP and the rest of the utterance forms another MaP (i.e., (S)(VO)). This latter tendency is gradual, that is, it gets stronger as subjects become longer. Thus, the longest subjects of our corpus (15 syllables long) almost always form one MaP separate from the rest of the material in the sentence. This means that in EP constituent length (understood as number of syllables of a constituent) is relevant for MaP formation. In Spanish, on the other hand, our results showed an overwhelming tendency to separate subjects and the rest of the material (i.e., verb and object) in independent MaPs (i.e., in an (S)(VO) phrasing pattern). This pattern is virtually categorical with branching subjects, and in cases of nonbranching subjects the

<sup>12</sup> The few cases which received an ambiguous phrasing decision between (S)(VO) and (SVO) in nonbranching cases (cf. Table I) would perhaps require some additional thought. It is perhaps not a coincidence that such ambiguity arises in conditions with no branching constituents, and hence with no pressure from *MaximumMaP* to insert prosodic boundaries. Only *Align-ExtVP,L* would lead to the insertion of intonational boundaries. One may hypothesize that in these cases the force of the constraints imposing prosodic boundaries is smaller, and that *\*IntBreak* may be playing a role by pushing in the opposite direction, i.e., against dividing utterances into phrases. As pointed out earlier in the discussion of the analysis of the EP facts, perhaps this situation would be amenable to an account in terms of a stochastic model (cf. Boersma 1998, Boersma & Hayes 2001, Pierrehumbert 2001), or a theory of weighted constraints (Guy 1991a, b, 1997). We leave this issue for further research.

pattern also becomes stronger with branching objects than with non-branching objects. These results can be interpreted in two ways: that in Spanish it is number of prosodic words in a MaP that matters, that is, that a MaP can contain a maximum of two prosodic words, or that it is syntactic complexity (i.e., branchingness) that plays a role in creating differences in percentages of occurrence of (S)(VO) phrasings. Future work (cf. D'Imperio et al. forthcoming) will help settle this issue.

In our opinion these results deserve sufficient attention on their own, because to our knowledge it is the first study that controls carefully for phonological and syntactic parameters in order to discover the role of each in determining weight and intonational phrasing. However, in the second part of the article we have also attempted an analysis of the results, guided by the observation that the facts in the two languages under study suggested the interplay of several forces or tendencies that were amenable to an analysis in terms of competing grammatical constraints. The proposed analysis indicated the active role played by four constraints both for EP and Spanish and with the same ranking, a desirable result.

We provided evidence from the syntactic literature on the position of subjects in EP and Spanish that subjects in EP might be within ExtVP and outside ExtVP in Spanish. This syntactic difference would account for the clear difference between EP and Spanish regarding the phrasing of subjects, namely that unless they are more than 8 syllables long, subjects in EP are phrased in a MaP together with the following material in the utterance, whereas in Spanish the strong tendency is to pronounce subjects in an independent MaP. We proposed that a constraint of the interface between syntax and phonology such as *Align-ExtVP,L* enforces the insertion of a MaP boundary at the left edge of the Extended Projection of VP, and since subjects in EP are within ExtVP, the MaP boundary inserted at the left edge of ExtVP does not separate subjects from the predicate. In Spanish, however, the subject is outside ExtVP and thus the MaP boundary inserted at the left edge of ExtVP separates subjects from the rest of the material in the sentence.

In order to account for the pattern observed both in EP and Spanish that the material in the VP cannot be separated in MaPs, another constraint of the syntax-phonology interface was proposed, *Wrap-XP*, which holds the verb and the object together in one MaP.

The weight effects in EP and Spanish had to be accounted for. For both languages we assumed the existence of a constraint that sets a limit on the maximum size of MaPs, which we called *MaximumMaP*. For EP, this constraint states that a MaP should not contain a subject that exceeds 8 syllables. This constraint could be interpreted as an edge constraint, relevant only for the leftmost constituent in a sentence. For Spanish, the limit could be either two prosodic words or

one level of branchingness, assuming that a nonbranching constituent is level 1. Thus, it appears that in the case of EP, *MaximumMaP* would be a constraint operating on the phonological module of grammar (syllable count is purely phonological in nature), whereas the status of this constraint in Spanish seems unsettled for now: whether it is a prosodic constraint or a constraint operating on the syntax-prosody interface will be elucidated in future work.

The analysis of the phrasing patterns in EP and Spanish was completed with the assumption of the existence of a constraint against the insertion of prosodic boundaries within an utterance. Such a constraint, *\*IntBreak*, demands that the material in an utterance be pronounced in one single MaP, with no inner divisions. This constraint helped explain why EP speakers tend to pronounce utterances which do not contain subjects that are longer than 8 syllables in one single MaP. Correct results were obtained for EP and Spanish ranking this constraint below all others.

An interesting aspect of our analysis is that the same constraints are ranked in the same order in the two languages. The attested differences in phrasing tendencies between EP and Spanish arise from the different syntax of subjects and the different setting or definition of weight under the constraint *MaximumMaP*. However, the gradient percentages of occurrence of (S)(VO) and (SVO) patterns in EP with subjects that exceeded the limit set by *MaximumMaP* also show the necessity of adopting strategies used in frameworks dealing with variation and gradience in phonology and grammar. We left a deeper treatment of this issue for the future.

Finally, it is important to mention that the analysis proposed in this paper highlights aspects of syntax that are prosodically relevant. Indeed, the prosodic patterns attested in EP and Spanish could be used as evidence in support of one of the competing syntactic analyses for the position of subjects in the two languages under study (i.e., whether subjects in EP and Spanish occupy an internal or an external position with respect to IP or ExtVP). On the other hand, intonational breaks have been acknowledged to be perceptually salient cues, and if the frequency of occurrence of certain prosodic patterns is a reliable cue for syntactic structure, it may be hypothesized that prosodic bootstrapping of the syntax of subjects can take place (e.g. Morgan & Demuth 1996). That is, it makes sense to think that the syntax-prosody mapping observed in Spanish and Portuguese may help the Spanish learner build a different syntax for preverbal subjects than the EP learner does.

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