

# **Early phrasing patterns in Catalan and Spanish multi-word speech**

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## **Abstract**

Previous research on early multi word speech has shown that the capacity to unify the intonational contour of two word utterances is not fully developed during the first productions by Italian children (D’Odorico and Carubbi, 2003; Frota, 2010; Veneziano, Sinclair & Berthoud, 1990) and that two word utterances are mostly spoken with accent on both words (Chen and Fikkert, 2009). Moreover, some others maintain that different types of two-word utterances undergo different developmental trajectories (Behrens & Gut, 2005). The database for this investigation is a CHILDES corpus consisting of the spontaneous speech of four Catalan (Gisela, Guillem, Laura and Pep) and a Spanish child (Irene) (from the Serra-Solé and the Llinàs-Ojea corpora). A total set of 591 target two-word utterances were segmented and prosodically transcribed, in Cat\_ToBI and Sp\_ToBI (Prieto et al., 2009 and Estebas-Vilaplana & Prieto, 2010) using Praat (Boersma & Weenink, 2005) and Phon (Rose et al, 2006). The results showed that children produce between 90 and 97% of expected phrasing patterns in two word utterances, indicating that children are able to project prosodic words to the intonational phrase level from the beginning of the two-word period. Finally, the results also reveal interesting effects of syntactic structure and accentual properties of the target words on phrasing development.

## **Introduction**

The focus of this investigation is the transition from single to multiword utterances in the early stages of acquisition of Catalan and Spanish, and specifically on describing the phrasing patterns found in Catalan and Spanish children early multi word speech. Children must achieve the right skills in organizing their speech prosodically in the acquisition process, and an important diagnostic criterion to test the target acquisition of two-word utterances is the presence of a unifying intonation contour and a lack of an intervening pause (Behrens & Gut, 2005; D’Odorico & Carubbi, 2003; Bloom, 1970; Scollon, 1979; Crystal, 1986; Veneziano et al., 1990).

Previous research on the acquisition of multiword utterances described an early stage of single word utterances (that is, two-word utterances are pronounced prosodically as two separate phrases) followed by a multiword stage in which the multiword utterances are prosodically integrated (D'Odorico & Carubbi, 2003; Bloom, 1973; Scollon, 1979; Crystal, 1986; Veneziano et al., 1990; Dore, 1976; Fónagy, 1972; see Behrens and Gut 2005 for a review). In other words, it has been claimed that in early stages of acquisition, prosodic words are not systematically projected to the intonational phrase level (Frota, 2010).

This research maintains that a transitional phase is the first step in the process of multi word speech acquisition. After this, the two word phase proper takes place. The first phase is named Successive Single Word Utterances by some authors (D'Odorico & Carubbi, 2003; Bloom, 1973; Scollon, 1979; Crystal, 1986; Fónagy, 1972; Snow, 1995; Veneziano et al., 1990; Dore, 1976; Behrens and Gut 2005). According to them, it consists of two single word utterances that are in close temporal proximity but are non integrated prosodically (Scollon, 1979; Crystal, 1986; Veneziano et al., 1990). The second phase consists in the production of two-word utterances with a unified intonation contour without the presence of an intervening pause (Behrens & Gut, 2005). On the other hand, Successive Single Word Utterances (SSWU) are characterized by the stress on both of its words which are separated by a pause (Bloom, 1973). A clear example showing both phases is one provided by Veneziano et al. (1990) in their study of a French child (from 1;5.23 to 1;8.15). Representing the SSWU phase, they use an example produced by the child in which he pronounces a word and repeats it in close temporal contiguity within the same turn (C stand for child and M for mother):

C: **Ku. Ku** (looking at a mechanical toy that has just stopped working)  
'encore'= 'again'.

M: *encore? Tu veux encore?* (C looks at M who winds up toy).  
'again'? you want again?'

C: *Kor*  
'encore'= 'again'.

On the other hand, and to show an instance of the two word utterances stage proper, they show the following example where a child utters a word and then, after repeating it, he adds a second one:

C: *pié* (trying to fit a shoe to a doll).  
'foot'.

C: *pié. Pié bébé* (continues the same action).  
'foot. Foot baby'.

D'Odorico & Carubi (2003), in a study made to a sample of 32 Italian children from 13 to 14 months old, show that the capacity to integrate prosodically two or more words in a single intonational contour is not fully developed during the production of the first multi word utterances. Moreover, they maintain that an increase in the complexity of the relationship between the words integrating the utterances, corresponds to an increase in vocabulary size. Besides, Frota (2010), in her study of Portuguese children reaches the conclusion that each prosodic word is projected separately. She maintains that the intonational development is largely independent of the onset of the two word stage. In addition, she shows that only the 17% of IP internal stressed syllables are accented and that it is only after children are 1;09 when they start making prosodic integration. Furthermore, Chen and Fikkert (2007), according to the obtained data of a study made to 3 Dutch children between 1;4 and 2;1, state that two word utterances are mostly spoken with accents on both words. Moreover, they believe that accent placement is governed by neither the semantic relations expressed nor the information status of each word. On the other hand, Behrens & Gut (2005) analyzed the data of a Dutch child from 2;0 to 2;3. They maintained that different kinds of two word utterances undergo different developmental trajectories. Due to this reason, they divided the utterances produced by the child in different syntactic combinations: Noun+Particle, Noun+Infinitive, Determiner+Noun and Noun+Noun. Their results showed that the Noun+Noun combinations follow a different trajectory than the rest. According to these results, they included Noun+Noun combinations within the SSWU group because they share the same prosodic characteristics: they are produced with a pause between words, which is the

longest one of all the combinations analyzed; moreover, both of its words are stressed.

Several prosodic parameters have been analyzed as key aspects to test the prosodic integration of multiword speech. Those features are the intonation contour, the length of pauses and the duration of word syllables (e.g. Bloom, 1973; Branigan, 1979; Scollon, 1979; Crystal, 1986, Veneziano, Sinclair & Berthoud, 1990; D'Odorico & Carubbi, 2003). Three important prosodic features differentiate SSWU from two word utterances, namely: stress, pause and the intonational contour.

### *Stress*

According to Crystal (1986) the stress in SSWU is present in both words constituting the utterance, while in two word utterances, the stress is greater in one of the two words. Moreover, Behrens and Gut (2005), Veneziano, Sinclair & Berthoud (1990) and D'Odorico & Carubbi (2003) support this conclusion. On the other hand, the data obtained by Chen and Fikkert (2007) shows that both words in two word utterances are produced with stress, which, in their opinion, is caused by the children's attempt of trying different accent types.

### *Pause*

According to Scollon (1979), pauses are key aspects when trying to differentiate between SSWU and two word utterances. Behrens & Gut (2005) maintain that SSWU intermediate pauses are longer than intermediate pauses in two word utterances. Veneziano & Sinclair (2000) considered that an intermediate pause higher than 500 ms belongs to a SSWU, whereas Branigan (1979) sets the limit on 400 ms. As a result, according to him, a pause between 100 and 400 ms corresponds to a two word utterance.

### *Intonational contour*

A single intonational contour is achieved when both words present an integrated intonation. Veneziano & Sinclair (2000) support this, stating that a single intonational contour is considered to be an indication of the presence of two word utterances. On the other hand, SSWU are characterized by the intonation

contour of two separate single-word utterances (Bloom, 1973; Dore, 1975; Scollon, 1979; Wijnen, 1990; D'Odorico & Carubbi, 2003).

Even though most studies agree that early productions of multiword utterances tend to favor the production of non-integrated single word phrases, more needs to be known about the pace with which prosodic integration is produced, and which factors favor it. We would like to test the potential effects of syntactic factors, as Behrens & Gut suggest. We would also like to test whether the word's accentual properties (that is, whether words are accented or not) has an effect on early phrasing strategies. For example are combinations unaccented+accented utterances, like *la cullera* ("the spoon" in Catalan), or *que caus* ("don't fall" in Catalan) integrated earlier than combinations of accented+accented utterances like *un cocodril* ("a crocodile" in Catalan), *on estàs* ("where are you" in Catalan) or *aquí nene* ("here boy" in Spanish)? It is also important to test these issues with more languages and see whether they can be crosslinguistically valid.

The aim of this study is to describe the phrasing patterns found in Catalan and Spanish children early multi word speech. Data from the recordings of 4 Catalan-learning children (Serra & Solé CHILDES database) and from 1 Spanish-learning child (Linàs- Ojea CHILDES database) between 1;01 and 2;5 were analyzed both auditorily and acoustically with a focus on the prosodic analysis of multiword utterances. We will test whether utterances made out of two prosodic words are integrated or not in a single prosodic phrase, that is, whether they project to the intonational phrase level.

This paper is organized as follows. First, we describe the Catalan and Spanish participants and the syntactic and prosodic labeling used for the analysis of the data. Second, we present the results of the study, analyzing the development of each child phrasing patterns along with a quantitative analysis of their first productions of SSWU and two word utterances. Finally, we finish with the conclusions about whether Catalan and Spanish children are able to unify the intonational contour of two word utterances during their first productions.

## Method

### *Participants*

The empirical basis for this investigation is two CHILDES corpora, namely the Serra-Solé corpus for the four Catalan children, and the Llinàs- Ojea corpora for the Spanish child Irene. The feature that differentiates both groups of children is the language. The first group consists of four children, Pep, Guillem, Laura and Gisela, whose first language is Catalan. The parents of these children speak Central Catalan (this Catalan dialect is mostly spoken in the whole province of Barcelona, Spain). The second group is formed by Irene, a child who speaks Spanish. Irene's parents speak the Northern Peninsular Spanish variety (especially from Gijón, Spain). Everything is available at the CHILDES website.

The analysis started at the onset of multi- word speech. This tableau specifies the age range of each child, as well as the number of sessions and the number of target utterances under analysis:

Group	Name	Age range	Number of sessions	Number of analyzed utt
Catalan	Pep	1;01- 2;03	11	186
	Laura	1;05- 2;04	7	83
	Guillem	1;06- 2;02	7	73
	Gisela	1;06- 2;5	6	88
Spanish	Irene	1;02- 2;03	10	161
			Total	591

Table 1: Catalan and Spanish children age range, sessions and number of target utterances analyzed.

### *Materials*

Each child was videotaped every month from the start of the use of 25 words- or before- (between 0;11 and 1;8, depending on the child) until they are four years of age. In order to carry out our analysis, we have made a selection from all this data. The age range studied is indicated on Table 1 (between 1;01 and 2;5).



Furthermore, the data was collected recording spontaneous situations at home in daily circumstances with a parent and the researcher. The activities executed by the children included: having lunch or dinner, having a bath, playing with toys, reading a book, etc. For Catalan, the data were transcribed in orthographic form by a team directed by Miquel Serra and Rosa Solé, and is available on the CHILDES website (MacWhinney & Snow, 1985). For Spanish, the data was also transcribed in orthographic form and is available under the Llinàs-Ojea corpora in CHILDES. The total number of utterances analyzed is 591 (see Table 1).

### *Data analysis*

Statements, from the beginning of the multi word production until the children are 2;02, 2;03, 2;04 and 2;5 respectively were segmented and submitted to prosodic and syntactic analysis.

### *Syntactic Labeling*

As mentioned before, Behrens & Gut (2005) found that different types of two word utterances undergo different developmental trajectories. They concluded this after dividing Leo's (the German child they studied) utterances in four syntactic types: Noun+Particle, Noun+Infinitive, Determiner+Noun and Noun+Noun. Following up Behrens & Gut's proposal, we have coded the target 591 utterances into the syntactic categories showed in Table 2, from which only Det+N and N+N are categories in common with Behrens & Gut's study. All of them have been produced by every single child.

Type of Utt	Syntactic Categories	
<b>Identical Words</b>	<b>N+N</b>	<b>Det+ Det</b>
	Ex: <i>pilo, pilo</i> ("ball, ball" in Catalan)	Ex: <i>aquesta, aquesta</i> ("this, this" in Catalan)
	<b>V+V</b>	<b>Adv+Adv</b>
	Ex: <i>mira, mira</i> ("look, look" in Spanish)	Ex: <i>no, no</i> ("no, no" in Catalan and Spanish)
<b>Two Word Utt</b>	<b>Adv+ V</b>	<b>Adv+ Det</b>
	Ex: <i>no está</i> (" he is not" in Spanish)	Ex: <i>aquí este</i> ("here this one" in Spanish)
	<b>V+ Adv</b>	<b>Det+ Adv</b>
	Ex: <i>deixem aquí</i> ("leave here" in Catalan)	Ex: <i>este aquí</i> ("this one here" in Spanish)
	<b>V+N</b>	<b>Det+ N</b>
Ex: <i>vull aigua</i> ("want water" in Catalan)	Ex: <i>el cavall</i> ("the horse" in Catalan)	

Table 2: Most frequent syntactic categories produced by Catalan and Spanish children

### *Identical words and SSWU*

As mentioned before, a distinction between SSWU and two word utterances has been made (D'Odorico & Carubbi, 2003; Bloom, 1973; Scollon, 1979; Crystal, 1986; Fónagy, 1972; Snow, 1995; Veneziano et al., 1990; Dore, 1976; Behrens and Gut 2005). Our data shows that this is a correct but incomplete division, and that SSWU are not the only examples of two identical word pronounced together by children. It is true, on the one hand, that children produce SSWU with all the characteristics of this kind of utterances described before (regarding pauses, intonational contour and stress). Nevertheless, on the other hand, our children are able to produce two successive equal words in an utterance that do not fulfill the SSWU features (for instance: "*pilo, pilo*", "ball ball" in Catalan). In fact, those words characteristics are: the sharing of the same intonational contour, the lack of intervening pause and the stress of only one of its words. According to it, we have three kind of utterances:

- SSWU (two stressed words, pause, two intonational contour). For instance: “*buscala buscala*” (“look for it look for it” in Spanish).
- Two identical words (one stressed word, no pause, one intonational contour). For example: “*aquesta aquesta*” (“this this” in Catalan).
- Two word utterances (one stressed word, no pause, one intonational contour). For example: “*aqui llapis*” (“here pen” in Catalan).

### *Prosodic labeling*

In order to transcribe the prosody of early productions of multi- word utterances, the Autosegmental Metrical model was used, as it has been proved to be successful in analyzing early intonation contours (see Prieto et al., 2011). The aim of the Autosegmental Metrical Model (AM) is to identify the contrastive elements in the intonation system. The combination of these elements produces the melodic contours that we find in the utterances of a language. The elements in the tonal level are contrastive units. We represent the tones with its English initials: H for high tones and L for low tones. In the phonological level of languages such as English or Spanish, the contours are associated with syllables that possess lexical accents (pitch accents) or with the end of the sentences (boundary tones) (Prieto, 2003). Thus, pitch accents are tonal events that are associated with the prominent syllables in a sentence. They can be monotonal (H\*) or bitonal (H+L\*). Boundary tones, on the contrary, are tonal events that are identified with the edges of prosodic phrases, if the edge is the right one, it is represented with the symbol % after the tone which can be high (H%) or low (L%). It can be the case for a sentence to have more than one pitch accent. If it is so, then, we use the term nuclear accent to identify the most prominent accent of the whole sentence, which will be the tonic syllable of the last word.

The target utterances were prosodically transcribed in Cat\_ToBI and Sp\_ToBI (Prieto et al., 2009 and Estebas-Vilaplana & Prieto, 2010) using Praat (Boersma & Weenink, 2005) and *Phon* (Rose et al, 2006). The following four tiers were coded:

- The orthographic tier: it contains the orthographic transcription of the text.
- The phonetic transcription tier: it contains the phonetic transcription of the text the child produces.

- The break Index tier: in which there are five indices of breaks: 0, 1, 2, 3 and 4.

- BI 0 mark cohesion between orthographic words. Orthographic words separated by BI 0 constitute a prosodic word (PrWord) that may bear only one pitch accent.
- BI 1 mark boundaries between prosodic words (PrWords). Items separated by BI 1 should carry at most one pitch accent each.
- BI 2 mark either a perceived disjuncture with no intonation effect, or an apparent intonational boundary but with no slowing or other break cues.
- BI 3 mark the boundaries of ips (intermediate phrases).
- BI 4 mark the boundaries of IPs (Intonational Phrases).

- The tone tier: in which the intonational contour of the utterance is analyzed by the Autosegmental Metrical Model.

Figure 1 shows an example of the prosodic transcription of a two-word utterance produced by Irene and Figure 2 shows an example of the prosodic transcription of a SSWU produced by Pep:

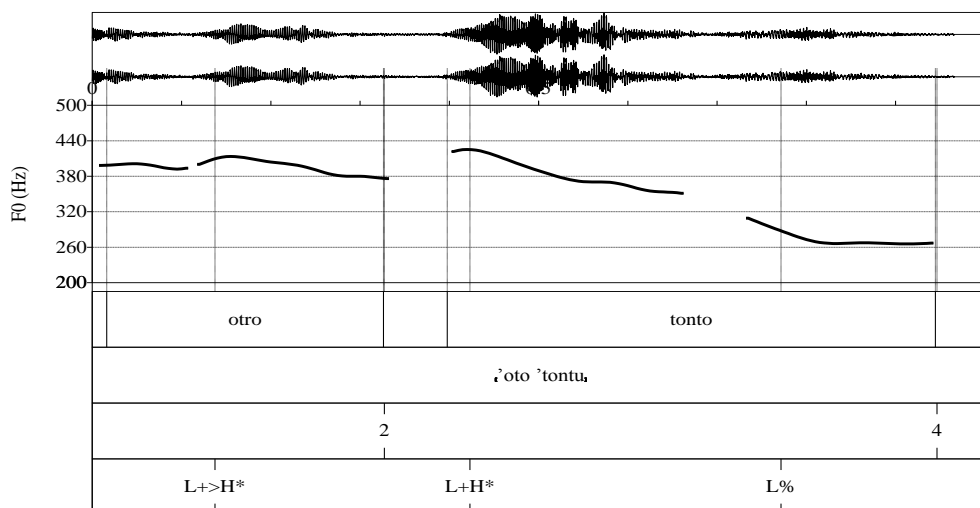


Fig. 1. Sp\_ToBI analysis of a two word utterance produced by Irene: "otro tonto" ("another silly boy")

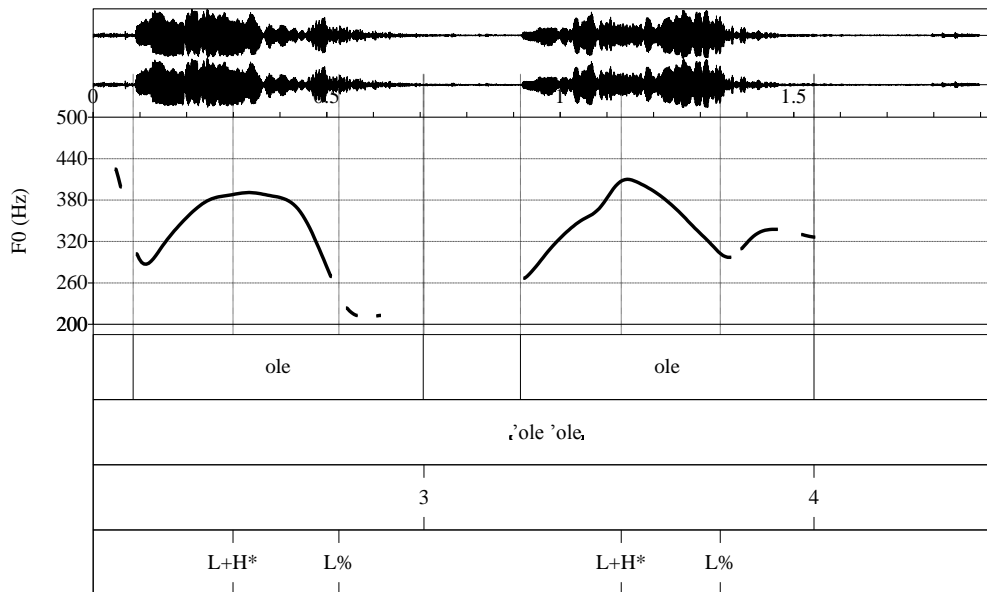


Fig. 2. Cat\_ToBI analysis of a two identical word utterance produced by Pep: “ole ole”.

As mentioned above, regarding phrasing, our aim is to distinguish between two basic types of prosodic utterances: SSWU and two word utterances (Bloom, 1973). The presence of an integrated two word utterance will be caused by the absence of an intermediate phrase boundary or a boundary tone. Another important differentiating prosodic feature will be the presence versus absence of a pause between the two words. Furthermore, all target utterances will be coded as having one prosodic word (1pw) or two prosodic words (2pw). The utterances integrating the first category (1pw) will systematically be produced with an integrated intonational contour, the absence of pause and with the attribute that only one of both words is accented. By contrast, utterances belonging to the second category (2pw) will be characterized by either two separate intonational contours or an integrated intonational contour. Finally, we also coded the accentual properties of each word. For example, unaccented+accented utterances, like *la cullera* (“the spoon” in Catalan), *a Ana* (“to Ana” in Spanish) or *que caus* (“don’t fall” in Catalan) and accented+accented utterances like *un cocodril* (“a crocodile” in Catalan), *on estàs* (“where are you” in Catalan) or *aquí nene* (“here boy” in Spanish).

## Results

Quantitative information about the production of Catalan and Spanish children phrasing patterns will be shown in this section. The target intonation contour and the presence of intermediate pauses have been taken into account.

### *Intonational Contour*

This subsection focuses on the analysis of the breaks of the analyzed utterances. Figure 3 illustrates the percentages of integrated and not integrated contours of the four Catalan children and the Spanish child in both languages. In this analysis, non-integrated consist of utterances with a boundary tone between the two words, namely H-, L-, or H% or L%.

The graph shows that the percentage of integrated contours is higher than the not integrated ones. On the one hand, Catalan children produce the 84,51% of utterances with an integrated intonational contour. This means that it is not a difficult task for those children to produce utterances without an intervening pause. They only fail to integrate prosodically the 15,48% of the utterances, introducing a boundary tone (L%) between words. On the other hand, Irene, the Spanish girl, unifies the intonational contour in 91,3% of the cases. Therefore, she produces a pause and a boundary tone (L%) only in the 8,7% of the analyzed utterances.

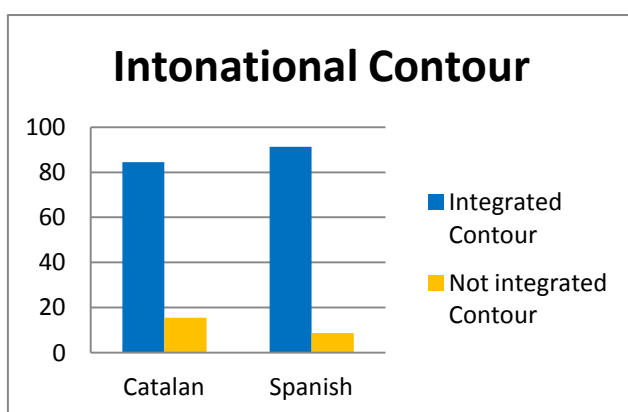


Fig 3 Percentages of the Integrated and not integrated intonational contour in Catalan and Spanish children

## Pauses

In this section we will centre our analysis on the pauses of the utterances analyzed. Firstly we will focus on the pauses produced by Catalan children, and secondly on the ones produced by the Spanish girl.

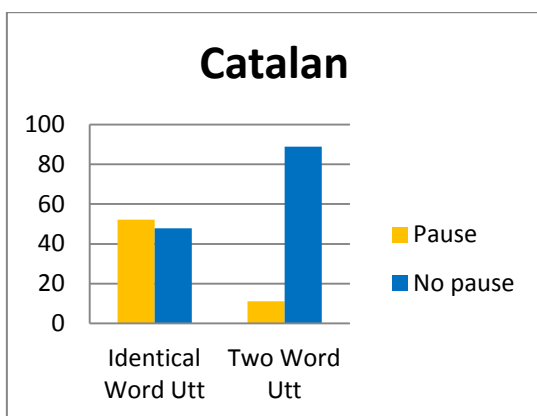


Fig.4. Catalan children percentages of pauses in identical word utterances and two word utterances.

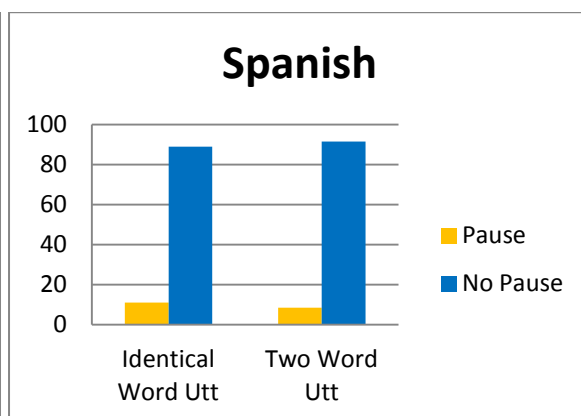


Fig.5. Spanish child percentages of pauses in identical word utterances and two word utterances

Figures 4 and 5 represent the percentages of the presence/absence of pauses in identical words utterances and two word utterances in Catalan and Spanish children. In general, the percentage of no pauses is higher on both groups. Focusing our attention on identical word utterances we can observe a disagreement between Catalan and Spanish children. On the one hand, Catalan children produce identical word utterances with a percentage of no pauses of the 47,83%, while Irene, the Spanish child, produces a 88,9%. The reason of this difference is that the greater examples of identical words produced by Irene are onomatopoeias (for instance: guau guau, “wof wof”), which is a kind of utterance produced without pauses by the Catalan children as well. Therefore, if the majority of analyzed utterances of Catalan children had been onomatopoeias too, the percentage of no pauses in those kinds of utterances would have been similar. Concerning Catalan, another point is that from all the identical words produced, the 52,17% corresponds to SSWU, due to its features: intervening pause, stress on both words and a non integrated intonational contour. This high percentage without pauses does not imply a wrong production by the child. Besides, SSWU is not synonymous of wrong productions. For instance, the SSUW “*aquesta aquesta*” (“this this” in Catalan), was produced by Pep (at 14;28), while he was playing, with a break index of “2”,

and a single intonational contour. On the contrary, we have examples like “*pilo, pilo*” (“ball, ball” in Catalan), produced by the same child at the same age, where the break index is “4”, which means that the intervening pause is too long to permit the unification of the intonational contour. In spite of this, the break produced is classified as an expected one because the situation and the context permitted it. Thus, a “4” break index do not always correspond to an erroneous production of the utterance. On the other hand, the remaining 47,83% corresponds to identical word utterances (two repeated words with its intonational contour unified, stress on one word and no pause). With respect to the Spanish girl, the 11,1% belongs to SSWU and the 88,9% to two identical word utterances. Importantly, and concentrating now on the behavior of two word utterances pauses, we observe that there are no differences between Catalan and Spanish children. In both cases, the 88,8% and the 91,44% respectively, two word utterances are produced with no pause (Figures 4 and 5) and with an integrated intonation contour (Figure 3).

### Syntactic Categories

In order to check if there is a connection between the presence of erroneous breaks and the syntactic categories of the two target words, we have divided the two word combinations into the four more frequent syntactic combinations. Due to the fact that the percentages of mistakes in two word utterances were very similar across languages (there is a difference of 2,6%), we have analyzed Catalan and Spanish children syntactic categories breaks all together.

Figure 6 illustrates that there is a dominance of “no breaks” in every category. They are produced between a 63,64 and a 94,12% more than unexpected breaks. The Det+ N category reach a 95,11% of success in its productions. The Det+ Adv the 97,06%. Moreover, the V+N combination offers a 81,82% of favorable results; whereas the Adv+ V provides a 92,86%. On the other hand, the percentages of unexpected breaks produced in these syntactic categories are: 4,89%, 2,94%, 18,18 and 7,14 respectively. These results indicate that the category providing more mistakes in its productions is the V+N one. Thus, children V+N productions present more problems than the others when integrating the intonational contour.



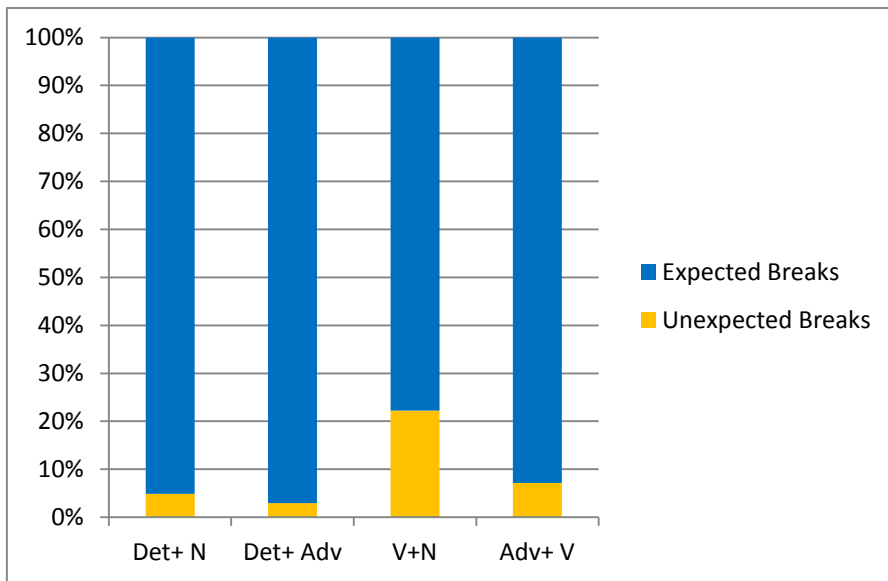


Fig.6. Percentages of no breaks and unexpected breaks in the syntactic categories analyzed

From this data, we observe that the two syntactic combinations that induce more unexpected breaks (namely V+N and Adv+V) correspond to accented+accented (acc+acc) combinations. Thus, these categories' accentual properties are different from the rest of combinations (namely Det+N, Det+Adv) which mostly appears in the unaccented+accented (unacc+acc) forms. Following up this observation, we have undertaken a more detailed quantitative study about the percentages of unexpected breaks in accented+accented and unaccented+accented combinations (see Figure 7).

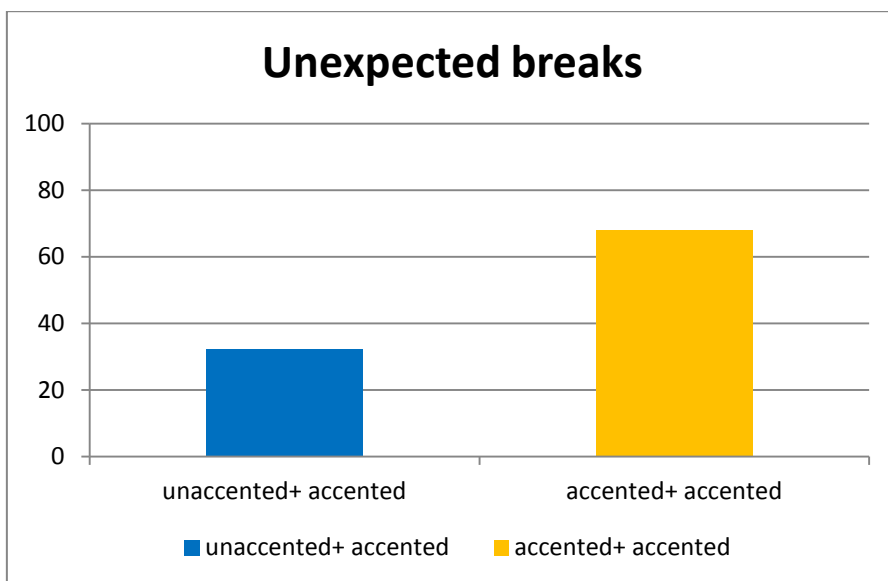


Fig.7. Percentage of Unexpected breaks in acc+ acc and unacc+ acc utterances

Figure 7 shows that unexpected breaks are produced a 67,74% in accented+accented combinations and a 32,24% in unaccented+accented ones. Thus, these data confirms that the accented+accented combination is the one that triggers more unexpected phrase breaks.

In order to analyze the developmental pattern of this accentual effect, we have broken down the data into the first three months for each child. Table 3 shows it:

Name	Age	Acc+Acc utt no breaks
Pep	14;28	75%
	15;22	100%
	18;22	93%
Laura	19;20	100%
	21;07	90%
	22;22	75%
Gisela	20;03	80%
	20;24	100%
	21;00	100%
Guillem	20;00	100%
	21;12	100%
	22;24	80%
Irene	14;05	85%
	16;16	90%
	22;16	83%

Table 3. Percentages of no breaks in acc+ acc utterances

The results in Table 3 show that the percentages of correct productions are high all along the sessions. Nevertheless, in the third month (and fourth month in Gisela) there is a worsening up to a 20% of mistakes. From this month onwards, all the productions increase in quality and the percentage of unexpected breaks drops. In sum, we observe that there are a mean of 90,12% of right productions of two word utterances in Catalan and Spanish children,

and that most of the mistakes produced take place in accented+accented combinations during the third/ fourth month analyzed.

## **Conclusion**

This study investigated early multiword speech properties in four Catalan children and a Spanish child. We have analyzed 591 utterances that were produced between the age range of 1;02 and 2;5, depending on the child (see Table 1). The aim of the study was to describe the phrasing patterns found in those children, as well as testing whether, in early stages of acquisition, prosodic words project systematically to the intonational phrase level.

The results of the analysis of the phrasing patterns show that Catalan children produced a 84,5% of expected integrated phrasing patterns in two word utterances. In parallel, the Spanish child produced a 91,3% of integrated phrasing patterns. Thus, children learning both languages produce a very high percentage of prosodically integrated two-word utterances since the beginning of their production.

The analysis of our sample shows that the ability of Catalan and Spanish children to produce prosodically integrated two-word utterances is better than what it was expected according to previous studies (D'Odorico & Carubbi, 2003; Veneziano et al., 1990; Chen & Fikkert, 2007; Frota, 2010). As mentioned above, previous research on early multi word speech has shown that the capacity to unify the intonational contour of two word utterances is not fully developed during the first productions by Italian children (D'Odorico and Carubbi, 2003). We have shown how Catalan children are able to unify the intonational contour the 84,5% of the time they produce two word utterances. On the other hand, Irene's data also contradicts previous results in the literature, because she integrates the intonational contour the 91,3% of the time. This data shows that prosodic integration is achieved almost from the beginning of the multi word speech.

Interestingly, we have observed that identical word utterances and two word utterances behave differently with respect to phrasing. As mentioned before, the main difference between them is that identical word utterances are built with the same word repeated (repeated twice in our sample). Prosodically, we have observed that those two types of utterances are produced in two different ways:

1. Children do not integrate the intonational contour, they stress both words and place a pause between words.
2. Mostly in the case of two word combinations, children integrate the intonational contour, they stress one word (often the last one) and do not make a pause between words.

Our data shows that the 52,17% of two identical word utterances in Catalan children belongs to the SSWU category. These utterances, in spite of having features which seem to be erroneous when speaking about prosodic integration (because they have a non integrated intonational contour, a pause and two stressed words), are not wrong. Children are able to use them at the beginning of their productions, that is, when the context and the circumstances require them. They use it in a way adults also do. For instance, it is perfectly possible to say “*mira mira*” (“look look” in Spanish), with a pause, two stress and a non integrated contour if the circumstances permit it; for instance if the child is playing and wants his mother’s attention (like Pep does in this example picked up from the seventh session). That is why we do not consider SSWU to be wrong. On the other hand, two identical word utterances, which obtained a 47,83% in Catalan children sample, are also prosodically correct due to its features and the suitability for the context in which they are produced. The same happens with the Spanish sample, despite the percentages of two identical word utterances (including SSWU) are lower (as explained above this difference in percentages is due to the great use of onomatopoeias, which favored the integration of intonational contour and the lack of intervening pause). On the other hand, the data shows that two word utterances are produced with adult like prosodic phrasing. Catalan children produced no pause between them the 88,8% of the time, whereas the Spanish girl do it the 91,44%. Therefore our results differ from the conclusions of previous studies which asserted that each prosodic word is projected separately (Sonia Frota, 2010). In

relation to this, it seems that our results could be supporting previous studies which maintained that different types of two word utterances undergo different developmental trajectories, in which intermediate breaks vary in its duration (Behrens & Gut, 2005). That is why we decided to test the potential effects of syntactic factors.

Considering now the potential effects of syntactic combinations (namely Det+N, Det+Adv, V+N, Adv+V), it was found that V+N and Adv+V are the most difficult combinations to be integrated prosodically. These target combinations are produced with a non integrated contour and an intervening pause the 18,18% of the time in the case of V+N and 7,14% of the time in the Adv+V combinations. After obtaining these percentages, and noticing that those two categories (V+N and Adv+V) are formed by two accented words, whereas the rest (Det+N, Det+Adv) are made by an unaccented word (most of the time) plus an accented one, we tested whether the word accentual properties (that is, whether words are accented or not) has an effect on early phrasing strategies. The results showed that unexpected breaks are produced a 67,74% in accented+accented combinations and a 32,24% in unaccented+accented ones. This means that accented+accented combinations constitute more difficult combinations for children's prosodic integration in both Catalan and Spanish. The reason is that accented+accented combinations are produced with two pitch accents in the same intonational phrase, whereas unaccented+accented are built with just one. In sum, it has been shown that it is probably not the different syntactic combinations that regulate phrasing patterns, but the accentual properties of the target words. In this way, children would group prosodically following adults' strategies.

In sum, we can assert that all children in our sample produced expected phrasing patterns in the majority of their two word utterances, being capable of integrating two prosodic words in a single prosodic phrase from the beginning of their productions.

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