

Prosody and Meaning in Interaction: The Case of the Spanish Discourse Functional Unit *entonces* 'then'

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Abstract

It is widely accepted in the literature that Discourse Functional Units (a.k.a. discourse markers, connectors, pragmatic particles) often show prosodic properties of separate intonation units and are also phonologically reduced. In this paper we investigate these hypotheses in the use of *entonces* 'then' in spoken Castilian Spanish. Acoustic measurements show that *entonces* is not an independent prosodic unit in the sense established by [10] and that it appears to be more closely linked to the following proposition than to the preceding one. The F0 contour of *entonces* is conditioned by the type of argument expressed in the proposition following it. The results also indicate that there is no significant phonological reduction in the use of *entonces* in the majority of cases.

1. Introduction

One of the most interesting aspects in the study of discourse is the treatment of those (generally small) linguistic expressions which are believed to be responsible for creating coherence in discourse structure. They have been referred to as markers, connectors, particles, etc. After [7] we refer to them as Discourse Functional Units (DFUs hereafter), since they can be considered as linguistic expressions without propositional content whose function is to carry only procedural meaning. Very often the prosodic properties of these forms are presented as distinctive features that can help us distinguish them from other parts of discourse. In the present paper we focus on the study of one of the DFUs in Spanish: *entonces* 'then'. We consider the acoustic features of this form (pause, pitch reset, break indices, tone level and reduction) in oral samples of male and female speakers of Castilian Spanish, collected by the authors. Our objective is to assess the widespread idea that DFUs are independent prosodic units and that very often show phonological reduction. Sections 2 and 3 introduce an overview of the characteristics of DFUs and the treatment of their prosodic properties in the literature. Section 4 presents the empirical study carried out by the authors, with a discussion of the results obtained. Section 5 contains the general conclusions achieved.

2. A brief overview of DFUs

The study of DFUs has evolved significantly in the last decade. From their treatment by traditional grammars as 'expletives', 'pause-filler' forms that do not contribute to the syntax of language, there has been a move towards a much deeper consideration of their role in structuring discourse, to the point of considering them as a linguistic category of grammar. The criteria and the methods used for their study

vary greatly depending on the theoretical perspective of the researcher. However, [7] shows how these forms are best defined in terms of their functionality within a discourse model and she proposes to treat them as Functional Categories in language. Taking up on these premises and following a discourse model of coherence relations ([8], among others) we understand DFUs as those parts of discourse which lack propositional meaning and which are responsible for making explicit coherence relations existing between segments carrying propositional information. Examples in (1) show the different interpretations that two propositional units may have according to the different connection established between them by each DFU.

- (1) i. I want to go to the movies tonight
because it's my birthday.
ii. I want to go to the movies tonight,
but it's my birthday.
iii. I want to go to the movies tonight,
after all, it's my birthday.

Besides, DFUs can be classified according to the type of coherence relation they represent. Coherence relations can be classified as semantic, pragmatic or textual, according to the nature of the meanings related. Two segments are connected through a semantic interpretation if the relation is established between their propositional contents. Two segments are said to have a pragmatic reading if the relation is established between the attitudes or beliefs of the speaker towards the reality of the events expressed by them. Finally, sequential relations can be considered to introduce argumentation mechanisms in discourse that express transitions to a different topic or a commentary (cf. [6]) and facilitate the transitions between speakers or turns and/or transitions to a different transaction (cf. [9]). According to these theoretical premises, we understand that *entonces* is a DFU in Spanish since it functions as a explicit marker of the relations established between propositional units. We identified three main types of relations that *entonces* represents: a *semantic* relation of sequential temporality; a pragmatic relation of logical and argumentative consequence and a textual relation of topic return. Examples (2 i-iii) illustrate each of these relations respectively:

- (2)
i. 1 *Y luego, separas las yemas de las claras,*
2 **entonces** *en un bol, pues pones la-*
3 *para... para batir a punto de... nieve, las claras.*

1 And then, you take the egg yolks apart from the whites,

- 2 **then** in a bowl, you put the-
 3 to... to beat until... stiff, the whites.
- ii. 1 *Está muy arregladito y muy curioso, sí.*
 2 *Sí, sí, sí.*
 3 *No, si le digo la verdad que tiene luz, que tiene luz,*
 4 **entonces** aunque aquí no haya ventanas está bien...
- 1 It's very well arranged and very nice, yes.
 2 Yes, yes, yes.
 3 Yes, I'm telling you the truth, it's bright, it's bright,
 4 **then** although here there are no windows it's fine.
- iii. <H2> *es muy fácil*
se rompe el... el pivotito éste de las cintas, además
que yo creo que es una cosa que deberíais ir
haciendo a medida que... que las fueráis grabando
enteras.
 <H1> *Claro.*
 <H3> *Claro.*
 <H2> **entonces** para borrarlas tienen que poner un
 papellito...
- <S2> it's very easy
 you break the...this little thing of the tapes, besides
 I think it's something you should be doing as
 you... you are recording them entirely.
 <S1> Sure.
 <S3> Sure.
 <S2> **then/so** to erase them you have to put a little paper.

3. Prosody and DFUs

Prosodic characteristics of DFUs have often been mentioned as important criteria to distinguish them from other parts in discourse. [9] mentions that these forms show a range of distinctive prosodic contours, such as tonic stress followed by a pause and phonological reduction. Other researchers have claimed that DFUs form a separate intonation unit ([5]). However, not much instrumental work has been done in the field to assess these issues. To our knowledge, the only work that uses a computerized pitch-extraction program is that of [4] for the study of *anyway*. Her analyses are based on the study of the pitch contours of this form in samples of male and female oral discourse. By examining the different intonational patterns of *anyway* she distinguishes three types: a marker and two adverbial homophonous forms. For Spanish, however, the studies done so far are based on auditory perception methods. In our opinion, only an instrumental study of the F0 contours of DFUs will help us determine whether they are separate intonation units and whether there is lessening of phonetic body.

The notion of intonation unit was introduced in the study of discourse several years ago by Chafe and associates. ([3]). An intonation unit is defined as a part of discourse (a) preceded and followed by a noticeable pause (0.3 seconds or greater); which presents (b) an overall decline in pitch level; and (c) a falling pitch contour in the end. The main problem of this definition, however, lies on the fact that intonation units are identified in terms of auditory perception only.

An analogous concept to the intonation unit is that of the *prosodic unit*, which unlike the former is defined on the premises of acoustic measurements. [10] propose this new notion and suggest that the most influential prosodic feature in

the identification of prosodic units is pitch reset, taken as a change in pitch direction relative to the following units.

With respect to the other feature often mentioned in the prosodic definition of DFUs, their phonological reduction, we also lack empirical evidence that this process occurs in all instances. The literature in the field does not always agree on the treatment of this feature. Although for many researchers reduction seems to be a clear indication that DFUs are part of the group of grammaticalized markers, for others phonological reduction is recognized as a feature that cannot distinguish DFUs from other grammaticalization processes ([2]). Our initial hypothesis is that DFU phonological reduction may be speaker- and context-dependent. Additionally, frequency of use probably determines whether some DFUs get permanently reduced.

4. Our study

4.1. Methodology

For the purpose of our study, we obtained 3 hours of recordings from 11 speakers, 4 male and 7 female, between 23 and 47 years old, all native speakers of Castilian Spanish. The recordings took place in the home environment of the speakers and under quiet conditions. We used a Marantz PMD tape recorder and a Sony Minidisc digital recorder, with an ATR20 unidirectional microphone and a Sony digital unidirectional microphone.

We gathered data from free and directed conversations. The first type was obtained through natural conversations with the authors of this paper, covering different topics, introduced both by the researchers and the subjects. The second type was elicited by asking the speakers to tell the stories appearing in three wordless comic strips (the same strips for all speakers). The aim of this task was to obtain data from narratives.

The recordings were then listened to by the two authors, and for the purposes of this pilot study we concentrated on *entonces* 'then'. The discourse segments preceding and following each DFU were digitized into a PC using the speech analysis program PitchWorks, by Sciconrd. For each token several variables were coded. The first one was Source of Coherence, which refers to the type of coherence relation established by *entonces*. They could be semantic, pragmatic and textual.

The next six variables were introduced to help us establish whether *entonces* was an independent prosodic unit. Pause Left and Pause Right would tell us whether *entonces* was preceded and followed by a pause, respectively. With Break Index Left and Break Index Right we wanted to get information on the level of juncture between *entonces* and the discourse units preceding and following it. Following the break indices proposed in ToBI [1], the values were set between 1 and 4. A value of 1 would indicate no perceived prosodic break between *entonces* and the word ending or starting the next segment, and 4 would indicate a clear prosodic break between *entonces* and the adjacent material, indicating an Intonational Phrase boundary. 3 was used to indicate a perceivable separation, although smaller than 4, and 2 served for those cases where a small separation level could be perceived. Pitch Reset Left and Pitch Reset Right would tell us whether the pitch level and pitch range was reset beginning with *entonces* or following it.

The next three variables were introduced to get information on the intonational properties of *entonces*, in order to test the validity of [10]’s claim that prosodic units present an overall decline in pitch level or falling final contour. We coded the tone level at the beginning and at the end of each occurrence of *entonces*, and the tone level at the beginning of the following segment. The three tone levels we observed were H, L and HL. According to the features proposed by [10] as identifiers of prosodic units, if *entonces* were a separate prosodic unit it should present a falling contour.

The variable Reduction was set to code whether a token of *entonces* was phonologically reduced or not. If *entonces* were a prosodic unit, it should be phonologically reduced in the majority of cases.

The variable (Non-)Final captured whether a token of *entonces* was introducing a proposition that concluded the argument or narrative being developed (hence the value ‘Final’), or whether it was introducing a proposition that continued elaborating the argument or narrative in course (‘Non-Final’). The reason for selecting this variable was that in an initial exploration of the data we noticed that instances of *entonces* heading a final piece in the discourse presented a falling F0 contour, whereas in instances where *entonces* began a non-final proposition a rising or a flat contour were observed. We will present and discuss the results and correlations of this factor with the other variables in the next section.

The last variable considered was Sex, to check whether there were any correlations between sex and the other variables.

4.2. Results and discussion

A total of 88 tokens of *entonces* were obtained and coded. The values for the acoustic variables were established by visual judgments on the pitch tracks of the digitized portions and auditory judgments on the corresponding recordings. Then, a quantitative and statistical analysis using SPSS for Windows v. 7.5 was run on the coded data.

We present first the results of the acoustical part of the study, i.e., the performance of the variables Pause, Pitch Reset, Break Index, Tone Left, Tone Right, Tone Following, and Reduction. First, in agreement with [10], pauses do not play a significant role in the breaking of prosodic units. There was pause to the left of *entonces* in the majority of cases (76.13% of the total), and there was pause to its right in 37.55 % of the cases. But only in 29.5% of the total of cases was there pause on the left and on the right. Hence, *entonces* is not an independent prosodic unit with respect to pauses.

Next, we found that there was pitch reset beginning with *entonces* in 67.9% of the cases, and pitch reset after *entonces* in 25.6% of the cases. More importantly, only in 26.4% of the cases was there pitch reset to the left and to the right (NB: 10 cases were not computed because the final portion of the material preceding *entonces* did not register F0 levels, due to small intensity). Clearly, these results do not warrant the consideration of *entonces* as an independent prosodic unit. On the other hand, although statistically not significant, the results seem to indicate that there is a much bigger tendency for there to be pitch reset between *entonces* and the material preceding than between *entonces* and what follows. This adds to the results obtained for pauses, in the sense that there seems to be a tighter connection between *entonces* and what follows it than

between *entonces* and what precedes it. A correlation was found between pause and pitch reset to the left and to the right ($p < .001$ for the left and $p < .01$ for the right). No other significant correlation was found between Pause and the other variables, or between Pitch Reset and the other variables.

As for Break Index, we found that *entonces* presented a break index of 4 or 3 with the preceding material in 80.7% of the cases (break index left), and with the following material in 56.6% of the cases (break index right). Only in 31.1% of the total number of cases did *entonces* present a break index of 4 or 3 to the left and to the right, what suggests that *entonces* is not perceived as a separate prosodic or intonational unit. But in the line of the findings for Pause and Pitch Reset, it seems that there is a smaller tendency for *entonces* to be separated from what follows than from what precedes it, although the results are not statistically significant.

Tone Left, Tone Right and Tone Next provided the overall pitch level of *entonces*. We observed three intonation patterns for *entonces*: rise, sustained and fall, with the following distribution: 17.2% for fall, 43.7% for sustained, and 39.1% for rise (see figures 1-3 for illustrations). Hence, *entonces* does not appear to fulfill one of the requirements or properties that [10] claim characterize prosodic units, namely overall decline in pitch level (hence his term ‘declination units’) and final falling pitch contour.

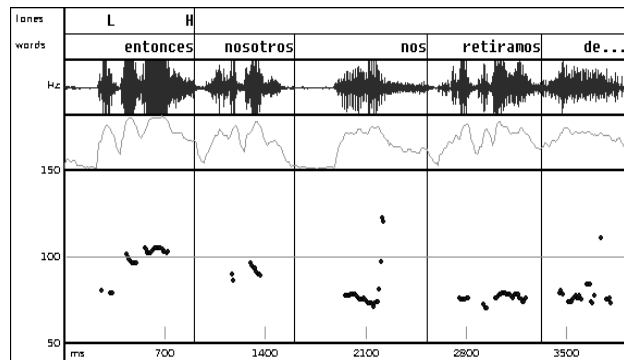


Fig. 1 *entonces nosotros nos retiramos de... then we retired from...*

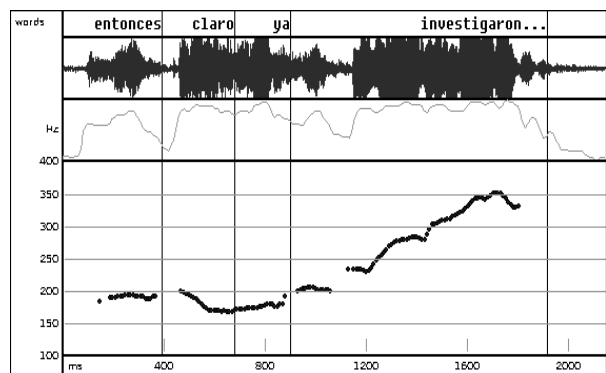


Fig. 2 *entonces claro, ya investigaron... then of course, they investigated...*

As for phonological reduction, only nearly half of the cases *entonces* appeared totally or partially reduced (48.9%). The results were not statistically significant. Hence, *entonces* does not have a phonologically reduced form, either, against what has been claimed for DFUs in the (impressionistic, not

instrumentally-based) literature. However, we observed a significant correlation between reduction and sex, as women present more cases of reduction than men (56.1% for women, 30% for men; $p < .001$).

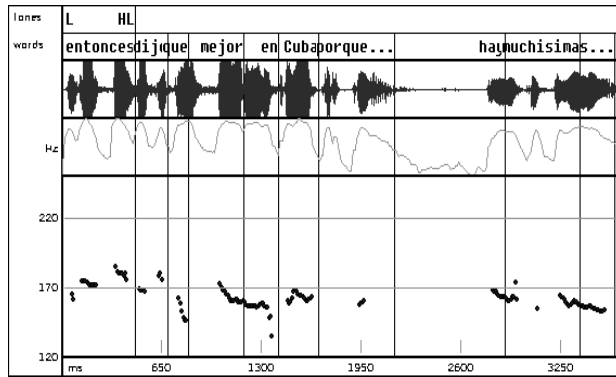


Fig. 3 *entonces dijo que mejor en Cuba porque... hay muchísimas más...
then he said that better in Cuba because... there are many more...*

Concluding so far, acoustic results from pauses, pitch reset, break indices, tone level and reduction indicate that *entonces* is not a separate prosodic unit, and that it has a tendency to associate or link itself with the proposition that follows it.

Although there were no significant correlations with acoustic features, we found a significant correlation between the F0 contour of *entonces* and the discourse feature (Non-)Final. We observe that in the cases in which *entonces* introduces non-final propositions (i.e., those that continue a line of argumentation or narrative), it presents a sustained or a rising F0 contour (50% and 48%, respectively), showing falling contour in only 1.6% of the cases. On the other hand, there is a clear association between falling F0 and final propositions, i.e., those that conclude the line of argumentation (62.5% of the cases). Nevertheless, it is important to notice that in final propositions there is also a considerable percentage of cases in which *entonces* shows a pattern of sustained F0 level (29.1%). The relatively small number of cases of final propositions do not allow us to draw solid conclusions on the possibility of there being a correlation between sustained pitch for *entonces* and final propositions in the line of argumentation/narration. A further study with a larger number of cases would be necessary in this regard. Table 1 shows each of the percentages in detail.

5. Conclusions

From the results obtained in our pilot study, it can be concluded that *entonces* is not an independent prosodic unit in the sense established by [10] and that it appears to be more closely linked to the following proposition than to the preceding one. No phonological reduction is observed in the majority of cases. As predicted, it seems that this feature is speaker dependent, with the female speakers more prone to the use of partially or totally reduced *entonces* than the male speakers, with independence of the type of discourse. A significant finding of our study is that the F0 contour of *entonces* is conditioned by the type of argument expressed in the proposition following it, namely that a falling contour

occurs when the proposition headed by *entonces* is the final proposition in the line of argumentation or narration, concluding the argument or the story, and a rising contour or a sustained pitch contour occur when the proposition headed by *entonces* is not the final proposition in the line of argumentation or narration but rather continues elaborating it. These results contribute to support the theory that DFUs in general are not independent segments in discourse, but part of a two-argument structure. They are linked to the second argument and make explicit the coherence relation by which this segment must be attached to the previous context.

	F0			Total
	FALL	SUST	RISE	
FINAL	15	7	2	24
% in F/NF	62.5%	29.1%	8.3%	100%
% in F0	93.7%	18.4%	6.3%	27.9%
% of total	16.3%	9.3%	2.3%	27.9%
NON FINAL	1	31	30	62
% in F/NF	1.6%	50.0%	48.4%	100%
% in F0	6.3%	81.5%	93.8%	72.1%
% of total	1.1%	36.0%	34.9%	72.1%
	16	38	32	86
% in F/NF	18.6%	44.2%	37.2%	100%
% in F0	100%	100%	100%	100%
% of total	18.6%	44.2%	37.2%	100%

$p < .000$

Table 1. % of F0 patterns of '*entonces*' according to type of following segment in the line of argumentation/narration.

6. References

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