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Extra-Sentential Elements, Prosodic Restructuring, and Information Structure.
A Study of Clitic-Left Dislocation in Spontaneous French.

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Abstract
The aim of this study is to discuss the hypothesis according to which prosodic prominence and pragmatic salience are closely related. To do so, we focus on French clitic-left dislocated subjects, namely those constructions where the subject occupies a position in the left periphery where co-refers with a resumptive clitic pronoun within the main clause. Scholars have made the hypothesis that the different degree of prominence of the pitch accent on the last syllable of the dislocated NP depends on the degree of salience in the discourse: the more the topic referred is salient, the less the pitch accent is prominent. We semi-automatically process 101 sentences extracted from spontaneous speech corpora for prosodic and pragmatic analysis. A comparison of the two coding suggests that the mapping between prominence and salience is not that straightforward in spoken French, as it only concerns the class of shift topics. From this we conclude that if prosodic prominence plays any pragmatic role, it is not that of signaling salience, but rather a particular organization of discourse.

Index Terms: clitic left dislocation, prosodic phrasing, prosodic restructuring, prominence, topic, salience, spontaneous French.

1. Introduction

In the Prosodic Theory framework [1], French clitic-left dislocated elements, as the NP ma mère in the utterance ma mère, elle est institutrice ‘My mother, she is a teacher’, are predicted to be phrased as Intonational Phrases (IP) [2], i.e. followed by a strong prosodic break, realized in French by a pitch rise associated to a lengthened syllable, optionally followed by a silent pause (see, among many others [3] and [4], and the dislocated NP underlined in Fig. 3, §6 below, for an illustration). The phenomenon is also known for other Romance languages such as Italian [5] or Catalan [6], where it has been formalized with the Align-Topic rule:

(1) Align-Topic: Align the right edge of a left-dislocated element with the right edge of an Intonational Phrase.

In recent literature nevertheless, it has been shown that left-dislocated NPs, as well as other extra-sentential elements, can be subjects to restructuring phenomena, and be phrased as Intermediate Phrases (ip) or Accentual Phrases (AP). In other words, they can be ended by a perceptually less strong pitch accent (see [7], [8] and below, Fig. 4 and Fig. 5 for attested spontaneous data). Avanzi (see [9]), for instance, says that the alignment rule formulated under (1) is violated in 70% of the cases in his corpus (around 441 clitic-left dislocated constructions extracted from spontaneous speech), and therefore proposes the following restructuring rule:

(2) Align-Topic restructuring: Align the right edge of a left-dislocated NP with the right edge of an Intermediate Phrase or the right edge of an Accentual Phrase.

The reasons that motivate prosodic restructuring are numerous. Speech rate and metrical length have been mentioned to be strong factors (see among others [2] and [8] for example). As for clitic-left dislocations, some scholars have made the hypothesis that the prosodic variation of the boundary degree of the dislocated NP could be explained in pragmatic terms (see e.g. [3], [10]-[12]). According to these authors, the degree of strength of the pitch accent associated with the last syllable of the NP would depend on the activation status of the referent denoted by the NP in discourse. Strongly salient referents would not need to be prosodically prominent, while unactivated or new referents need to be strongly prominent when they are uttered for the first time. The generalization expressed under (3) resumes this hypothesis:

(3) Prosody/Pragmatic Interface Hypothesis: the more the topic is salient in the discourse, the less the right edge of the dislocated constituent is prominent.

To our knowledge, the hypothesis formulated within (3) has not received any empirical accreditation yet. In this paper, we provide empirical data in order to test such a hypothesis, by analyzing a set of sentences extracted from spontaneous speech corpora and independently annotated for a prosodic analysis and for a pragmatic analysis.

2. Material

2.1. Data

101 declarative sentences containing a clitic-left dislocated NP subject were extracted from two spontaneous spoken corpora, representing two varieties of French: Northern (Parisian) French [13], and Southern French [14]. All the NPs of the extracted sentences comprise 2 or 3 syllables only, initiate a new prosodic utterance (they occur after a silent pause or a strong prosodic break) and are coreferent with a 3rd person subject clitic pronoun (il/elle/s). In all, 22 speakers (17 females, 5 males), each performing between 1 and 10 utterances, were analyzed.

2.2. Prosodic processing

Once transcribed, each utterance was processed with the EasyAlign script [14] running under Praat [16], which provides a 3-layer automatic segmentation: phone string, syllable string, and graphemic word string. The alignments are manually checked and corrected by one of the authors.

A second tool is then used to categorize the prosodic break associated with the last syllable of each dislocated NP. On the
basis of four automatically measured acoustic parameters (relative syllabic duration, relative f0 average, slope contour amplitude and presence of an adjacent silent pause), the software estimates a degree of strength for the last syllable of the NP. Since the system has been described exhaustively in other works (see [17] and [18]), we will not go further in the presentation of the theoretical and methodological foundations which sustain it. Let’s just mention that the calculations rely on two fundamental principles. The first one is a **quantity principle**: the greater the number of acoustic parameters involved in the identification of a prominence and the distance from predetermined thresholds, the stronger the prominence is perceived. The second one is a **compensation principle**, which stipulates that if one of the classic parameters involved in the perception of prominence in French presents a low score, and another one a high score, there will be the same feeling of prominence as if the two involved parameters presented both medium score. The results of the calculation are provided in a dedicated tier: a mark comprised between 0/10 and 10/10 (from the less prominent to the more prominent) indicates the degree of strength of the break.

Fig. 3 presents a case of IP break: the intra-vocalic rise is not followed by a pause but anchored on a lengthened syllable. We don’t see such an increased duration for the final syllable of the NP analyzed in Fig. 4, which represents a typical IP boundary. Moreover, compared with the final syllable of the NP analyzed in Fig. 4, which presents a low score, and another one a high score, there will be the same feeling of prominence as if the two involved parameters presented both medium score. The results of the calculation are provided in a dedicated tier: a mark comprised between 0/10 and 10/10 (from the less prominent to the more prominent) indicates the degree of strength of the break.

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The topic referent can also be known to the hearer from world or shared knowledge, as in (6). The referent is less predictable than in the previous case, but it is still linked to the current topic: it is for instance an expected entity in a described scene, or it concerns a generic set of entities that are present in the speakers’ mind in the current discourse, etc. We coded this as a **shared topic**.

| 5 | y a un Laurence qui était métisse | there’s ‘Laurence who was of person of mixed race |
| 6 | là Aix-en-Provence, j’aime beaucoup mais euh mes racines elles sont à Grenoble | “Aix-en-Provence I like very much but um, as for my roots, they are in Grenoble” |

These three topic types were grouped in the same class B of **semi-active** topics (borrowing from [10]’s terminology). They do not have an antecedent with identical reference which is the topic of the current discourse, so they are not active in the speakers’ mind at the moment of the utterance; however, they are indirectly accessible from the current discourse, so they are not totally unexpected topics.

The last topc type was coded as a **shift topic**, and was put in a separate class of salience: class C. Its peculiarity is that it has been functioning as a topic in a previous discourse segment, but not in the **immediately preceding** one. In other words, the referent is re**introduced** as topic after an interruption. This means that the referent has an antecedent, but it is not active anymore in the speakers’ mind. As a result, the referent is not anymore the topic of the current discourse nor is predictable as topic of the upcoming discourse, since other referents could as well be.

In (7), speaker B resumes a topic (**les coqs**) that was introduced about 50 exchanges before, during which speaker A had been talking about other problems related to her apartment.

| 7 | A: le matin […] je suis réveillée par les coqs […] en morning […] I am awakened by the roosters […] |
| B: et les coqs ils sont dans la pépinière ou…? and the roosters SCL are in the nursery or…? |

What about the roosters, are they in the nursery?

We included other cases where the interruption was much shorter (sometimes extremely short) but still, since the topic had been dropped, it was not fully predictable. In (8), for instance, the speaker stops talking about the old lady – what the discourse was about at the beginning – in order to describe the lady’s bedroom, and then resumes the original topic.

| 8 | A: y avait aussi une vieille personne […] et un matin parce qu’ils la voyaient pas venir donc ils s’étaient dit tiens on va aller réveiller euh la même […] then the chamber was at moitié remplie de neige! |

Then there are many small dogs (`ceux-là ils aboient ils font un peu d’bruit mais… those ones SCL bark SCL make a bit of noise but ‘these bark, make a little noise, but…’). With both kinds of topic, the referent not only is ‘active’ in the speakers’ minds, but it is also **predicted** to be the upcoming topic. We therefore grouped them together in the same class A of active topics.

In other utterances of our corpus, the topic referent is **inferred** from another referent because semantically related to it (cf. an *accessible topic* in [22]’s Topic Accessibility Scale, and a **sub-topic** in [10]). We call this an **inferred topic** ((5)).
3. Analysis and Results

The comparison of the two coding tasks (degree of prosodic strength and pragmatic activation state) allows us to provide an empirical account of the hypothesis formulated under (3) above.

3.1. Degree of prosodic frontier according to the topic type

As a first step, we test whether each topic type could be discriminated according to the degree of strength of the boundaries ending the NPs. ANOVA shows that there is a significant global effect of the topic type on the degree of the prosodic boundary ($F=3.66$ $p=0.00451^{**}$), but a post-hoc test shows that there is no significant distinction among all the categories. The only significant contrast concerns the Shift topic category with the Introduced topic, Inferable topic, Partial topic, and Shared topic categories respectively (Fig. 1).

Fig. 1: Classification of the different topics according to the strength of the prosodic break ending the dislocated NP. The ordinate indicates the prosodic score.

3.2. Degree of prosodic frontier according to the salience degree

We then compared the three classes of topic, offering a less fine scale, in order to check whether there was any correlation between the activation status of the referent and its prosodic strength boundary. We ran an ANOVA that shows a significant global effect of the topic class on the degree of the prosodic boundary ($F=7.793$ $p=0.000727^{***}$), but again, a post-hoc test shows that there is no significant distinction among the classes A and B, while there is between A and C and between B and C (Fig. 2).

Fig. 2: Classification of the topic classes according to the degree of strength of the prosodic break ending the NPs, with the prosodic score in the ordinate and the three topic classes in the abscissa: A (active), B (semi-active), and C (non active).

4. Discussion and Conclusion

In [10], a qualitative study is carried on the relation between prominence and pragmatic salience, based on examples of different types of detachment constructions extracted from spontaneous spoken French corpora. [10]’s classification of topic types approximately corresponds to the three classes of salience presented here. The conclusion drawn in [10] is that a different level of prosodic prominence corresponds to each topic class (the higher the prominence, the less salient the topic). In other words, generalization (3) is fully met in [10]’s study.

Our results, however, lead us to draw a different conclusion. No clear mapping between the degree of salience and the degree of prosodic prominence is given in our data, since only topics of class C, namely shift topics, are significantly more prominent than those of the other two classes, and no significant difference exists between class A and class B.

It is possible that, with a larger set of data, we may also show a significant difference between topics of class A and class B, as predicted by (3) and in compliance with [10]’s work. However, a more interesting explanation can be given to our results. Marking a shift topic does not just mean marking a topic that is not active: it aims at showing that the topic is not active anymore, namely that it was the topic of a preceding discourse segment, which must be retrieved in order to understand the upcoming discourse. In other words, prominence makes the listener aware of a particular organization of topics in the discourse.

Note that the difference in the activation state of a topic of class B (an inferable topic from previous discourse or from shared knowledge) and one of class C (a shift or introduced topic) is sometimes very subtle (shared topics, for instance, can be very weakly accessible to the speakers’ mind). Despite this fact, prosodic prominence consistently marks only the latter class. Therefore, it seems to be more important for the interlocutor to understand how the discourse is structured, rather than to simply be aware of the introduction of a new referent.

In conclusion, our data confirm that pragmatic features may be marked by accentual prominence; nevertheless, it is not (or not just) salience that is marked by this prosodic feature, as hypothesized in (3). Rather, prominence seems to signal a more subtle pragmatic phenomenon, namely the way different topics are organized and structured in a discourse.
5. References


6. Annexes

The figures below are ANALOR screenshots (see [9], [17] and [18]). In the abscissa, temporal values are given in milliseconds; in the ordinate, the values of F0 in a logarithmic scale can be seen. The transcription tiers are, from top to bottom: phone tier, syllable tier (both in SAMPA alphabet); automatic prominence detection tier and the orthographic word tier. Fig. 3 shows a left-dislocated element followed by an IP boundary, Fig. 4 shows a left-dislocated element followed by an IP boundary and Fig. 5 a left-dislocated element followed by an AP boundary. The final NP syllables are framed in red.

Fig. 3: ANALOR screen shot. Transcription of the utterance: le chat il était dans l’escalier il a dû le choper [CID]

Fig. 4: ANALOR screen shot. Transcription of the utterance: les gamins ils sont habillés à l’arrache [CID]

Fig. 5: ANALOR screen shot. Transcription of the utterance: la personne elle veut plus elle fait plus rien de ses journées [CFPP]