Contribution to a grammar of intonation in French
Form and function of three rising patterns

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Abstract

The grammatical status of intonational contours is roughly uncontroversial in the literature on intonation although the definition of this notion may differ according to the different approaches. However, the status of the so called 'continuation rise' remains quite unclear. Is it a real contour or a 'default' F0 movement? Could it appear in focal position and if so, is it part of the nuclear inventory of contours? Is it formally and/or functionally different from other rises? From a study on spontaneous speech in French, we show that the 'continuation rise' in focal distribution has the same formal properties than in non focal one. On the contrary, we observe a clear formal difference between the 'continuation rise' and rising contours appearing in enumerations.

1. Introduction

1.1. Background

Whatever the approach, pitch movements of different length and scope have been considered as pertinent objects for the phonology of intonation. They can be taken as primitives as in the inventory of tunes of the British tradition for English (e.g., O'Connor & Arnold 1961) or as constructions as in the autosegmental-metrical (AM) framework (Pierrehumbert 1980). Sometimes the notion of intonational contour applies to the pitch configuration on the overall utterance, sometimes it concerns only the pitch movement around what is called the 'nucleus', i.e. the most prominent accent of the utterance. Most of the times however, the notion applies to F0 movements anchored on different kind of phonologically relevant domains.

In French, phonologically relevant F0 movements have been proposed to apply on the foot (the Tonal Unit in Di Cristo 1998), on the domain of the primary accent (Delattre 1966, the Accentual Phrase in Jun & Fougeron 2000) or on the domain of the nuclear accent (the

Intonation Unit in Di Cristo 1998, the Intonation Phrase in AM theory).

A tune called *continuation rise* is described as grammatical in many languages such as English and French, but also for instance Korean (Jun 1993) or Greek (Arvaniti 1991). The terms *continuation* refers to the meaning (function) of the tune. However, this meaning is ambiguous. In the AM framework, the *continuation rise* is usually described as the combination of a phrasal tone T- and a boundary tone T% - most of the time L-H% - and means that the phrase associated with it "is to be interpreted with respect to a succeeding phrase" (Pierrehumbert and Hirschberg 1990, 305). In Delattre's account of French intonation, the role of the "continuation majeure" (major continuation rise) "is clearly to aggregate small meaningful units into a larger one which is not the larger one in the sentence" (1966, 10, our translation). These two quotes give an idea of the kind of questions raised by the continuation rise: is it a final, nuclear tune as suggested by the AM analysis, or is it a non final one as suggested by Delattre?

A recent semantic model of French intonation (Marandin et al. submitted) has proposed that only contours occurring in focal position ("final contours") have a dialogical-epistemic meaning, i.e. they "signal which reception the speaker anticipates for her turn". The case of the continuation rise is not clearly addressed there, but its common meaning (see above) does not seem to be compatible with such a proposal. More radically, Delais-Roussarie (2005) defines "non final" F0 movements, as "default" F0 movements, which are entirely constrained by metrical and syntactical factors. So, is the continuation rise in French a default F0 movement or is it part of the focal inventory of contours?

1.2. Issue

An informal survey on different kinds of data shows that we find continuation rises as semantically defined by Pierrehumbert & Hirschberg in focal position and as defined by Delattre in non focal one.

The first question we address in this paper is thus the following: have these two distributionally different pitch configurations the same formal properties? If it is the case, we will have good reasons to think that it is the same contour.

We also observed on spontaneous speech that a small number of these rises which function is to signal that the following phrase "is to be interpreted with respect to a succeeding phrase" sound differently, especially when occurring on members of a list (see section 2.2.1. below for details).

The second question addressed here is then: what kind of formal difference can be described between continuation rise and list rise? We also try to explain what the status of such a difference may be and why it is grammaticalised.

2. Materials and Methodology

2.1. A corpus-based investigation

Data were extracted from the *Corpus of Interactional Data* (Bertrand & al., 2007) which consists of 8 hours of audio-video dialogues in French[1].

Each hour corresponds to a dialogue involving either two male or two female participants. In order to facilitate speech production, they were suggested one of the following two topics of conversation: either to speak about conflicts in their professional environment or about funny situations in which they may have found themselves involved. Moreover, all the participants were not only quite familiar with the lab but they were also familiar with each other. These conditions aimed at obtaining more spontaneous speech sequences.

In this study, two dialogs, the one between two males and the other between two females, were analyzed.

2.2. Methodology

2.2.1. Contours identification

Using Praat (Boersma & Weeninck, 2005), we labelled continuation rises defined under the following principles:

Formally, among rising movements associated with the domain of the primary accent we only retained those corresponding to major versus minor boundaries (see Portes & Bertrand 2006 for a discussion). A major boundary may correspond either to the nuclear (focal) position in the sentence or to other metrically strong positions such as for instance the end of a subject Noun Phrase at the Noun Phrase/Verb Phrase boundary or the right boundary of left dislocated elements or even to left detached Sentence level complements.

Functionally, we made a distinction between continuation following Delattre's definition versus Pierrehumbert & Hirschberg's one. We attributed the label *non final* (nf) to the first case and to other cases where a major continuation rise was not in a focal position (NP/VP boundary, left periphery as defined above). The label *final* (f)

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[1] The Cid, which makes a total of 10 women and 6 men, is an open corpus and is yet enriched of new recordings and annotations. It is a compromise between a task-oriented corpus such as Map-Task corpus and natural occurring data.

was attributed to continuation rises following Pierrehumbert & Hirschberg. The example (1) below illustrates the nf/f difference:

(1)   à la récrée **(nf)** juste avant **(nf)** tu vois, enfin, à la récrée **(nf)** vite, je vais le voir **(f)** je lui explique, quoi.

Note that we found rising contours which meaning did not correspond to continuation and that we left apart (for instance rises corresponding to questioning clauses).

We noticed that some continuation rises produce a different perceptual effect. These cases mainly occurred in enumerative context (on members of a list). We labelled this specific kind *Rising of List* (RL) versus *Rising of Major Continuation* (RMC) for the non specific case. Complete list is usually composed of three items (Jefferson 1991). However we labelled RL some contours occurring on one isolated item recognisable as pertaining to a list which is not expressed (Selting 2007), as illustrated in example (2) below:

(2)   je me rappelle une fois y en a un qui est arrivé carrément en pantoufles en cours. Je me rappelle le prof qu'y avait dit « m'enfin qu'est-ce que c'est que cette hist- ce gogo – je ne me suis pas réveillé **(RL)** », etc. quoi.

Note in this example that the RL contour appears in reported speech, which is quite frequent in our data.

A total of 1545 contours were obtained: 1397 RMC occurrences (493 focal and 896 non focal) and 148 RL.

2.2.2. *Acoustic parameters and statistical models*

We assume here that the formally most contrastive part of the contour concerns the pitch movements carried by the last two syllables since in French the primary accent occurs on the last syllable. The formal properties of the contours were captured through discrete points (targets) noted L (for the beginning of the rise) and H (for the rise higher value). These targets were rather a methodological choice than a real phonological one (see D'Imperio & al. 2007).

The measures performed were as follows:

- stressed syllable duration

- excursion between the initial minimum (L target) and the final maximum (H target) of the rise: The H target was automatically labelled whereas the L point was manually labelled because of problems of F0 continuity: we retained the last lower point before a plosive for example.

- latency between the temporal position of L and H pitch targets as defined above.

A mixed logit model (Bates & Sarkar, 2005) was fitted to test chosen acoustic parameters effects with speaker as grouping factor. A

logit model predicts the probability of a (binary) classification; a mixed model (Pinheiro & Bates, 2000) takes into account the speakers specificities, without using normalization procedures which are still debatable.

3. Results

Preliminary fit of the models shows that the stressed syllable duration was useless because it was correlated with the LH latency. Then we combined the logarithm of the two remaining parameters into a unique one, the LH slope, defined as:

$$\log((H\,Hz/L\,Hz) / LH\,latency)$$

It reflects the variation of the H/L ratio by time unit.

3.1. Model 1

The first model we ran related the probability that a continuation rise was in a non focal position to the LH slope. It was marginally significant (β=0.29, z=2.17, p=0.03). The predictions of the model are quite random (C index of concordance = 0.56)[2]. The f and nf contours cannot be distinguished by this slope parameter.

3.2. Model 2

The second model we ran related the probability that the rise was a Rising Major Continuation to the same parameter The LH slope (β=3.64, z=12.68, p<1.e-16) was highly significant. The fitness of this model is much better (C index of concordance = 0.84). That means the LH slope is valuable to account for the distinction between the two pitch contours: the higher the LH slope the higher the RMC probability.

4. Discussion

Our results show that, according to LH slope, the non final continuation rise and the final (focal) one cannot be distinguished. At first sight, this observation contradicts the view, developed for instance in Marandin et al. (submitted), that the focal position of the utterance is firstly the locus of occurrence of a special inventory of contours, more diverse than in other distributions and with a specific semantism. In Marandin & colleagues' model, final contours have a dialogical-epistemic meaning which does not fit the function of the *continuation rise* (see section 1.1. above). One way to overcome the contradiction is to assume that the primary use of the continuation rise is non final (Delattre's proposal), but that its use in focal position

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[2] This index is a measure of the fitness of the model: 0.5. Predictions are random and 1: predictions are perfect.

has the consequence to delete the paradigm of final contours. This substitution allows deleting the instruction given to the Addressee to interpret the utterance, replacing it by the instruction to suspend the interpretation until the following phrase at least is completed. Figure 1 shows how we adapt Marandin and colleagues' proposal following our view:
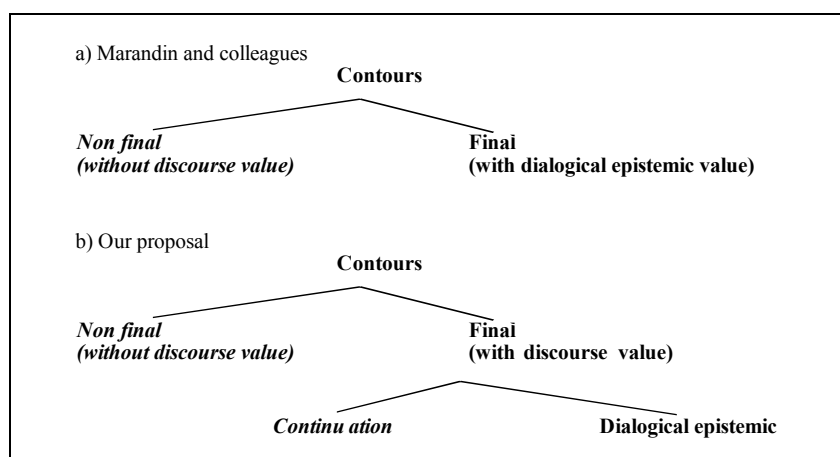

Figure 1: the hierarchy of intonational contours in French, adapted from Marandin (2006).

Note that in our view, the meaning of continuation as proposed above can be considered as a "discourse value" as it links together different chunks of text that could otherwise function as separated utterances (clause chaining). The continuation then functions as a unit-linking as previously highlighted by Matsumoto (2003). In some cases, only the intonation via the continuation can be used in talk-in-interaction as a turn-holding cue.

Concerning the rising contour appearing in enumeration context, it can be considered as a subclass of continuation rise as it also gives the instruction to delete the final paradigm and to interpret the current clause with the following one when appearing in focal position. Marandin (2006) proposes that each basic contour ("final contours") have a stylised version which is a "modified basic contour with specific formal features and a regular semantic import" (Marandin 2006, 20). The meaning of such stylised contours is explained as follows: "By using a stylized contour, the Speaker presents herself as playing the role of a speaker using the plain contour" (we call this the *quotation effect*).

We propose that the list rise corresponds to the stylised version of the continuation rise. The pertinent "specific formal feature" is a smaller slope of the rise (see section 3.2. above). If our proposal is correct, the quotation effect of the meaning of the stylised contour could be not only a "self"-quotation effect but a more general one. Actually, this effect appears to be very compatible with two of our observations: i) the fact that the list rise occurs very often in reported speech (thus a more general quotation effect); ii) the fact that it is used on an isolated phrase (see 2.2.1. above), triggering the interpretation of this phrase as the first member of a virtual list; or even on interrupted lists, meaning that the Addressee is supposed to finish it mentally. In the ii) case, the self quotation effect is metadiscursive: using the list rise is meaning *continuation* as such.

5. Conclusion

In this study, we showed that non final continuation rises aggregating smaller units cannot be formally distinguished from final (focal) continuation rises giving the instruction to suspend the interpretation until the following phrase at least is completed. Therefore, the continuation rise can not be considered as a "default" F0 movement resulting from metrical and syntactical constraints. Occurring on focal position, it has the status of a plain discourse level contour which has the specificity not to belong to the dialogic-epistemic contours' inventory but to delete this very paradigm to suspend the interpretation process. This status of a grammatical, meaningful contour is reinforced by the property of the continuation rise to have a stylised version as defined by Marandin (2006), i.e. what we called the list rise.

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