

# Prosody, syntax, macrosyntax

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## Abstract

Most of research work on French intonation has been conducted on prepared speech data (i.e. read speech), with various approaches ranging to purely syntactic (Rossi), Autosegmental-Metrical (Sun and Fougeron) or Phonosyntactic (Martin). This paper examines the bases of the phonosyntactic approach extended to spontaneous (non-prepared) speech data, described syntactically from a macrosyntactic point of view (Blanche-Benveniste, Deulofeu).

## Experimental intonation phonology

### Prosodic words

There is a general agreement to look on or around the accented (stressed) syllable for prosodic phenomena. Minimal prosodic units – prosodic words – contain one (lexical) stress and one optional initial stress. A minimum prosodic unit contains one or more content word (open class word), and optional grammatical words, constrained by a 7 unstressed syllable rule.

One content word forms a group with grammatical words through dependency relations with one stressable last syllable in French. Depending on the speech rate, stressable syllables are effectively stressed (with a final – primary - stress). If two groups have few syllables (in the order of 2 or 3) they can form a larger group with its final syllable stressed. If the group has a large number of syllables (say > 7), it will receive a secondary stress.

### Prosodic structure

The prosodic structure organizes hierarchically the prosodic words and is not level limited. Prosodic words have no pre-established standard pattern, as their melodic characteristics depend on the application of 2 rules:

IMS: Inversion of Melodic Slope rule

AMV: Amplitude of Melodic Variation rule.

The description of the final accent of a prosodic word usually uses phonetic features such as Length (i.e. syllable duration), melodic Rise or Fall, Amplitude of melodic variation, etc. Initial (secondary) accents do not play a role in the marking of the prosodic structure, and are therefore normally described with a melodic rise. Their role is only to ensure the presence of at least one stress in sequences of 7 consecutive syllables.

## Prepared speech intonation in French

In a phonosyntactic approach, the relationship between intonation and syntax in prepared speech is envisioned as follows: First a prosodic structure PS is assumed to exist in the sentence, independent but associated to the syntactic structure SS. In general, more than one PS can be associated to a given SS, the final choice being governed either by syntactic congruence or eurhythmicity, depending on the emphasis given to a) the syntactic hierarchy by the prosody, or b) by the balancing of the number of syllables at each level of the prosodic structure. More specifically:

1. The prosodic structure organizes hierarchically minimal prosodic words (stress groups);
2. Prosodic markers indicate the prosodic structure of the sentence;
3. Grammars of prosodic markers are specific to every language;
4. Specific realizations of prosodic markers characterize various dialects

The association between the syntactic and the prosodic structures is not straightforward, even in prepared speech. The constraints of this association can be summarized as follows:

- Planarity (no tangled structures);
- Connexity (no floating segments);
- Stress clash (no consecutive stressed syllables if the implied syntactic units are dominated by the same syntactic node);
- Syntactic clash (no prosodic grouping of stress groups – so at the lowest level in the structure - which are not themselves grouped in the syntactic tree by the same node);
- Stress group maximum number of syllables (a sequence of 7 syllables has a least one stress – either emphatic (narrow focus) or lexical, the number 7 depending on speech rate);
- Eurhythmicity (balancing the number of syllables in the prosodic structure, generally at the expense of congruence with syntax);
- Neutralization (phonological features not necessary to encode a given prosodic structure are not necessarily realized).

A 2 PW prosodic structure, instantiated by words of a sufficient number of syllables to involve a mandatory stress, would reveal a stress syllable whose phonetic realization has simply to be different from the above mentioned contours that could appear in its place. The following example shows this: *les hippopotames s'étaient étonnés*. The Subject NP and the VP contain each 5 syllables, forcing the realisation of a stress on the final syllable of *les hippopotames*. All the following examples use 5 syllables stress groups to achieve a rhythmically balanced prosodic structure.

Figure 1 (left). Pitch curve of the example *Les hippopotames s'étaient étonnés* with stressable syllables highlighted.

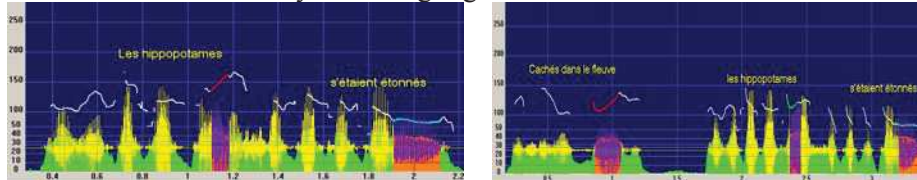


Figure 2 (right). Example *Cachés dans le fleuve les hippopotames s'étaient étonnés* with stressable syllables highlighted. In case of congruence between prosody and syntax, the accent on *fleuve* must be stronger than the one on *hippopotames*, which appears here as a larger rise of fundamental frequency and a longer syllable duration.

Figure 3 (left). Example *Les hippopotames étaient étonnés ils étaient cachés* with stressable syllables highlighted. In case of congruence between prosody and syntax, the accent on *étonnés* must be stronger than the one on *hippopotames*, which appears here as a contrast in melodic slope of fundamental frequency and a longer syllable duration.

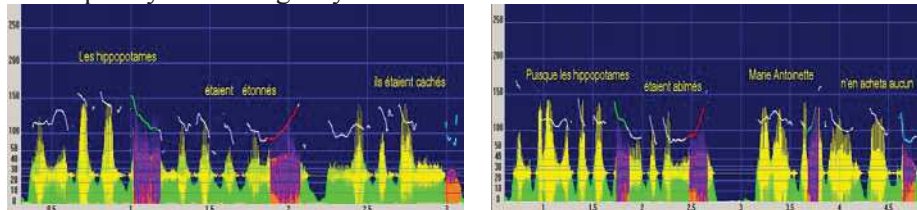


Figure 4 (right). Example *Puisque les hippopotames étaient abîmés Marie Antoinette n'en acheta aucun* with stressable syllables highlighted. In case of congruence between prosody and syntax, the accent on *abîmés* must be stronger than the ones on *hippopotames* and on *Marie Antoinette*, which is realized on the left by a contrast in melodic slope, and on the right by shorter syllable duration.

## Spontaneous speech intonation in French

The basic idea, derived from the work of C. Blanche-Benveniste (1990, 2002), J. Deulofeu and collaborators from the GARS group in Aix-en-Provence, envisions the sentence in spontaneous speech as a sequence of macrosegments, syntactically well formed in the classical sense, and in relations of parataxis or rection with each other (in glossematic terms, in dependency relations of combination and selection).

One of these macrosegments has a special function and is called the Noyau: the Noyau contains information on the modality of the sentence,

constitutes a complete sentence by itself, its modality can be changed without affecting other macrosegments, as the change of modality (positive to negative, declarative into interrogative, etc.). In the sentence macrosegments placed before the Noyau are called prefixes, inside the Noyau Incises (imbedded), and after the Noyau Suffixes or Postfixes, depending on the syntactic or prosodic nature of their relationship with the Noyau (see below).

According to this view, prosodic structure indicates a hierarchical organization within the sentence, by defining the relationships between macrosegments.

Figure 5 (left). Prefix + Noyau structure. The prefix *le lendemain* is integrated in the sentence by the prosodic structure, which assembles it with the Noyau *grande surprise*. The prefix bears a final rising melodic contour, contrasting with the falling final declarative contour on the Noyau.

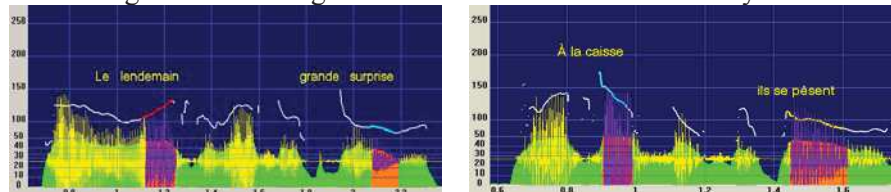


Figure 6 (right). Noyau + Postfix structure (= broad focus). The Noyau ends with a sharply falling melodic contour, whereas the Postfix ends with a falling declarative contour.

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