

# Durational Cues and Prosodic Phrasing in French: Evidence for the Intermediate Phrase

## INTRODUCTION

It is generally agreed there are two prosodic units in French:

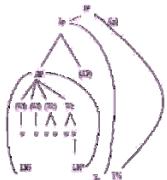
- a larger unit: the **Intonation Phrase, IP**
- a smaller unit: the **Accentual Phrase, AP**

There is some evidence for a third level of phrasing in French

But the existence of this **intermediate phrase (ip)** is still controversial.

## THEORETICAL FRAMEWORK

**Jun & Fougeron's model of French intonation**  
(Jun & Fougeron, 2000)



Jun & Fougeron proposed an intermediate level of phrasing (ip) to explain specific syntactic structures:



The ip definition of Jun & Fougeron is not sufficient:

- the ip distribution is restricted to specific structures
- the phonetic and phonological properties of the ip are still unclear

The question of the Noun Phrase/Verb Phrase break (NP/VP break) in French

- Delais-Roussarie (1995) proposed a constraint which aligns the right edge of an NP with the right edge of an IP in French.

- **HOWEVER:** No phonetic argument to justify that the NP/VP break corresponds to an IP boundary.

## ISSUES

- Is there an intermediate phrase in French?
- Are the boundaries cues gradual or categorial?

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## HYPOTHESES

- The ip is not restricted to specific structures
- The ip right boundary is aligned with a NP/VP break
- The ip right boundary is marked by stronger preboundary lengthening

## METHOD

### Stimuli

20 SVO utterances with the target syllables at 4 contexts:

Prosodic boundary condition	Sentences
1- at a PW boundary	Les grenadiers de Marrakesh ne poussent pas... <i>Pomegranates of Marrakesh do not grow up...</i>
2- at an AP boundary	Le sauna <sup>1</sup> AP de Paolo deviendra ... <i>Paolo's sauna will become...</i>
3- at an AP boundary which is also a NP/VP break	Le sauna <sup>1</sup> AP/XP deviendra... <i>The sauna will become...</i>
4- at an IP boundary	Le sauna <sup>1</sup> IP, d'après ce qu'on m'a dit... <i>The sauna, according to what I was told...</i>

### Measures

Target syllable and vowel durations (in ms) in the 4 contexts

### Task

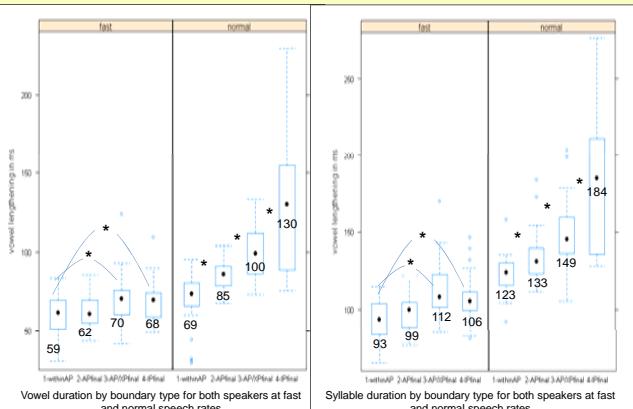
Two French native speakers read the sentences 4 times at normal and fast speech rates (for a total of 320 sentences)

### Statistics

Two linear mixed models

## RESULTS

### Vowel duration in (ms) Syllable duration (in ms)



## FINDINGS

### At normal speech rate

A syntactic constraint is responsible for the ip right boundary placement

ALIGN (XP,R;ip,R): align the right edge of a maximal syntactic projection with the right edge of an ip

### At fast speech rate

Only IP and AP/XP vowels were significantly longer than within AP vowels

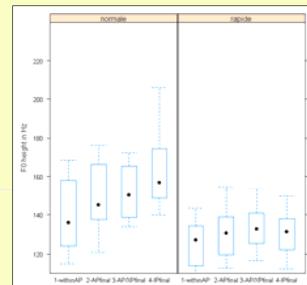


Despite the absence of lengthening, boundaries are tonally marked

## DISCUSSION

Is the syntactic constraint sufficient for the ip boundary placement?

### F0 Height in Hz



F0 values of AP/XP syllables are not significantly higher than AP final syllables



In the AP/XP condition, the NPs were always produced as a single AP

A length constraint might interact with the syntactic constraint

### What is the nature of the boundary cues discrete/gradient?



In a study to appear, Michelas & D'Imperio showed that the number of constituents did not affect the relative strength of phonetic cues associated to the ip boundary

## CONCLUSION

In French:

- AP/XP final syllables are significantly different from AP and IP final syllables
- A NP/VP break reinforces preboundary lengthening
- The results show a mixed marking for prosodic boundaries (compensatory effect between lengthening and tonal cues at fast speech rate)

## References

- Delais-Roussarie, E. Pour une approche parallèle de la structure prosodique: étude de l'organisation prosodique et rythmique de la phrase française. Thèse de Doctorat, Université de Toulouse Le Mirail.
- Fougeron, C., & Jun, S.A. (1998). Rate Effects on French Intonation: Phonetic Realization and Prosodic Organisation. *Journal of Phonetics*, 26, 45-70.
- Jun, S.A., & Fougeron, C. (2000). A Phonological Model of French Intonation, in *Intonation: Analysis, Modeling and Technology*, ed. By A. Botinis, Kluwer Academic Publishers, 209-242.
- Michelas, A., & D'Imperio, M. (to appear). Syntactic and Length effect on French Prosodic Phrasing.