Preboundary Lengthening Variation in French APs; Evidence for Prosodic Recursivity?\(^1\)

Nov 2, 2019 | SCAMS; Pomona College
Sihun Jung; UCSD

1 Introduction

- This presentation offers a Match-theoretical account of Michelas & d’Imperio 2012’s empirical study on French prosody. In the process of the account we encounter recursive prosodic structure.
- Michelas & d’Imperio 2012 (hereafter M&D) show that preboundary lengthening (hereafter PL) is longer in French accentual phrase edges that are aligned with ‘deeper’ syntactic breaks.
  - They survey two syntactic conditions: an XP internal NP/PP break and an XP-external NP/VP break. The latter being the ‘deeper’ break showing longer PL (hereafter PL*).
  - M&D’s reference to ‘syntactic depth’ is underspecified and needs a formal account.
- If this analysis is correct, PL/PL* distribution in French can be added to a list of gradient phonetic phenomena that furthers our understanding of the syntax-prosody interface.
  - I also add to a growing body of literature in search of recursive structures in prosody (Elfner 2015 on Connemara Irish).

2 Summary of M&D

M&D: How does the strength of syntactic boundary\(^1\) affect the preboundary lengthening\(^2\) cues of the French accentual phrase\(^2\) (AP)?

- Syntactic boundary: The exact variables in this study were NP internal breaks vs. NP/VP breaks. Dubbed ‘weak’ and ‘strong’ boundaries respectively.
- Preboundary lengthening (PL): The lengthening of the vowel segment that is located at the right-edge of a prosodic phrase, in this case, the French AP.
- Accentual phrase (AP, áP)\(^2\): A prosodic layer in French that is the lowest prosodic phrase (Jun & Fougeron 2000). Different segmental processes take place within each prosodic unit. In French most notably, liaison has been argued to take place within APs, but not between APs. APs are identifiable by an obligatory LH* pitch accent (final rise) on the last full syllable of the phrase.

Schematic of M&D’s experiment condition:

<table>
<thead>
<tr>
<th>SYNTAX</th>
<th>PROSODIC PHRASING</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) [… … … ×p]</td>
<td>(2) [… … ×p][… … vp]</td>
</tr>
<tr>
<td>NP internal áP break (weak)</td>
<td>NP/VP+áP break alignment (strong)</td>
</tr>
<tr>
<td>/i(^2)/ is the final vowel of each áP</td>
<td></td>
</tr>
</tbody>
</table>

- Where /i\(^2\)/ is the final vowel of each áP
- M&D Hypothesis: /i\(^2\)/ will be longer than /i\(^1\)/ as a result of it being aligned with the stronger syntactic boundary XP/YP break.
- M&D Conclusion: The hypothesis is confirmed.

Key takeaway from M&D:

1. (1) [{Les aMIS \(\alpha\P\) [de Pauline]]\(\alpha\P\) adoraient ce restaurant \(\L\)/\(\alpha\P\)}
2. (2) [{Tes aMIS \(\alpha\P\)} [demandaient la présidente]\(\alpha\P\)]

- In (1)-type sentences, \(\L\)/\(\alpha\P\) aligned with NP/PP break, a weak break. While in (2)-type sentences, \(\L\)/\(\alpha\P\) is aligned with an NP/VP break, which is a strong syntactic break
- (1)-type sentences show PL in their initial áPs, and (2)-type sentences show PL* in their initial áPs.

---

\(^1\) I extend my sincere gratitude to members of SemBabble at UCSD for constructive comments on an earlier version of this talk on October 15\(^*\). I also thank Emily Clem and Michelle Yuan for their invaluable guidance.

\(^2\) I use the different notation áP whenever an AP is represented as an element within prosodic phrasing structures. As I point out in footnote 4 below, the AP has yet to be understood in terms of mapping principles outlined in match-theory, and are mostly a descriptive element in French prosody.
Bottom-line for us: PL* and PL are gradient but distinct phonetic cues whose distribution has been linked to syntactic effects.

The Problem: The way M&D link this to syntactic depth is too vague.

p.826 “… earlier work on the syntax/prosody interface in French supports the existence of a direct interface between depth of syntactic structure and degree of preboundary lengthening (Gee & Grosjean, 1983; Monin & Grosjean, 1993; Keller et al., 1993);”

What is ‘syntactic depth’? What is the nature of that ‘direct interface’?

3 The Syntax-prosody debate

3.1 Situating the findings within a theoretical framework

Two different theoretical frameworks for understanding the syntax-prosody interface.

- Non-isomorphism = approach not taken in this talk

The traditional approach assumes a separate set of rigid principles for getting prosodic organization. Rigorous versions of Match theory mediate and greatly impoverish hierarchical complexity when translating syntax to prosody. Postulates such as the Strict Layer Hypothesis (Nespor & Vogel 1986; Selkirk 1986) within this framework forbid prosody from having recursive structure for example.

- Isomorphism = approach taken in this talk.

A newer approach operates on the assumption that prosodic structure strongly reflects syntactic hierarchy. In this view, “gradient phonetic evidence from pitch scaling and duration provide evidence for differences in the relative strength of prosodic boundaries” (Elfen 2015; 1170). M&D’s paper provides us with the gradient phonetic evidence: PL* vs. PL.

Elfen 2015 argues for a recursive prosodic structure in Connemara Irish. Versions of these theories nonetheless take Match theory as scaffolding to make prosodic structure from the syntax. Albeit the versions of Match theory used will be greatly relaxed to achieve higher isomorphism between syntax and prosody (disobeying the Strict Layer Hypothesis for example).

What does it mean that prosody is recursive?

- Simply means that we allow the formal representation of the prosodic hierarchy to contain nested structures of the same prosodic phrasing category:

Figure 2 Recursive instance of φ

Recursive occurrence
3.2 Trivial analysis of M&D

- Most studies in French intonation do not venture further than postulating a two-layer model for French prosody: Intonation phrase (IP) and the Accentual phrase (AP) (Jun & Fougeron 2000, Michelas & d’Imperio 2010 conference paper).
- If we are to keep to a two-layer prosody in French, the following trivial prosodic structure can be drawn for (1) and (2):

![Proodic structure of (1)](image1)

(3) Prosodic structure of (1), (weak boundary, PL on MIS syllable)

![Proodic structure of (2)](image2)

(4) Prosodic structure of (2) (strong boundary, PL* on MIS syllable)

- Under these trees, it is difficult to offer a structural account of why PL* would target [Tes amis]\* but not [Les amis]\*.
- Both âPs are IP initial and cannot be structurally distinguished for purposes of phonology.¹
- We can’t explain the empirical puzzle of having two different PL lengths.

4 Match-theory Analysis

4.1 The syntax of (1) and (2) type sentences in M&D

- For the purposes of analysis, we will assume the trees in (5) and (6) below for our underlying syntactic structure of (1) and (2) above.

![Tree of sentence in (1)](image3)

(5) Tree of sentence in (1): (DP internal break), weak

![Tree of sentence in (2)](image4)

(6) Tree of sentence in (2): (specTP/T split), strong break

- Trees are drawn to reflect v to T in French (Pollock, J.-Y., 1989)⁴

---

¹One less appealing analysis that comes to mind is to assume that i has an inherent limited speech time: The more âPs an i has, the shorter each âPs temporal window for realization will be. The effect observed in M&D would be a side effect of having all (1)-like sentences have more âPs in them than (2)-like sentences. (See appendix 1 for all their token sentences). (See also footnote 5 below for a definition of AP and how to count them).

⁴ Note that once we assume v to T movement in French, the purported strong XP/YP boundary becomes a TP-internal boundary, undoing M&D’s crucial premises. This further shows the instability of referring to syntactic boundary strength. Additionally, I avoid the discussion on the complex internal structure of the subject DPs and how
4.2 Brief sketch of Match Theory

- Match theory at its core is a set of mapping principles that builds the prosodic structure from the syntactic structure. A standard postulation from Selkirk 2011 is as follows:

\[
\text{(7) MATCH CLAUSE/MATCH PHRASE/MATCH WORD: Each clause/phrase/word in syntax must be matched by a correspondent prosodic constituent, } \iota/\phi/\omega \text{ (simplified Match theory)}
\]

4.3 Intermediate phrase and the recursive account

- Match theory ‘translates’ syntactic structure into prosodic structure so that various phonological and intonational rules can apply to it without referencing the syntax.
- Match theory standardly assumes three layers of prosodic structure: ι, φ and ω
- Following mapping rules, syntactic projections are mapped to each layer

We apply the following mapping rule to the syntax, where φ is the intermediate phrase we newly postulate (taken from Elfner 2015, Selkirk 2011)

\[
\text{(8) MAPPING PRINCIPLE: “MATCH-PHRASE”}
\]

\[
X^{\text{Max}} \rightarrow \phi
\]

“For every syntactic phrase (XP) in the syntactic representation, there must be a prosodic domain φ in the phonological representation.” (abbreviated)

Note on mapping accentual phrases with match theory

- Following Elfner 2015, we also assume that prosodic structure ignores traces and phonologically null projections (Nespor & Vogel 1986).

---

5 In applying match theory to French, it would be useful if it could readily predict the boundaries of àPs and derive it from the syntax. However, no reliable method of predicting accentual phrasing from the syntax has yet been proposed (To my knowledge). It is, on the other hand quite a trivial matter to identify an àP descriptively, as àPs have an obligatory pitch accent H* at their right edges). According to Jun and Fougeron 2002:

“The AP contains one or more content words optionally preceded by one or more function words … though the number of syllables in one AP varies depending on word length and the syntactic/semantic structure of the phrase as well as factors such as speech rate and individual speakers (Fougeron & Jun 1998), an AP tends to contain an average of 2.3–2.6 words and 3.5–3.9 syllables”.

Following this description by Jun & Fougeron 2002, we can deduce that (1)-class sentences used by M&D would have been pronounced with more àP groupings than (2)-class sentences. (Though to be sure we would have to have access to the pitch labelling of all of them).

---

6 For work on evidence that interface structures must refer to \textsc{max}, \textsc{min} projections in the prosodic hierarchy, see Dowd 2009 for Irish synthetic agreement, Bennett and McCloskey 2008, Henderson 2008 for K’ichee’, among others.
The distribution of the gradient phonetic effects PL and PL* can be expressed as the following phonological rule:

\[(13) \quad \text{PL/PL* assigning rule:} \]

- PL* associates with the right edge vowel of an âP that is immediately dominated by \(\phi^{\text{MAX}}\). Elsewhere, (\(\text{NON-}\phi^{\text{MAX}}\)), assign standard PL.

5. Conclusion

- If the gradient phonetic evidence of PL and PL* in M&D is well-founded, it could in turn be used to motivate recursive prosodic structures in the syntax-prosody interface of French.
- For this to work we have postulated a new intermediate phrase \(\phi\) and applied standard Match-theory mapping rules such as MATCH-PHRAcSE and BINARY-MINIMUM(\(\phi\)).
- We also allowed the grammar to single-out maximal instances of \(\phi\) (\(\phi^{\text{MAX}}\))
- A simple phonological rule governs the distribution of PL* and PL using the minimal assumptions above.

6. Predictions and further research venues

- This approach has yielded an explicit theory generating predictions for further research in French prosody.
  - We predict for example which of the other âPs in M&D’s token sentences would get PL* or PL.
  - Namely, both verbs adoraient and demandaient would get PL*.
  - de Pauline would get simple PL.

References