

## **Prosody-syntax interaction in spoken language production, the case of French attribute adjectives**

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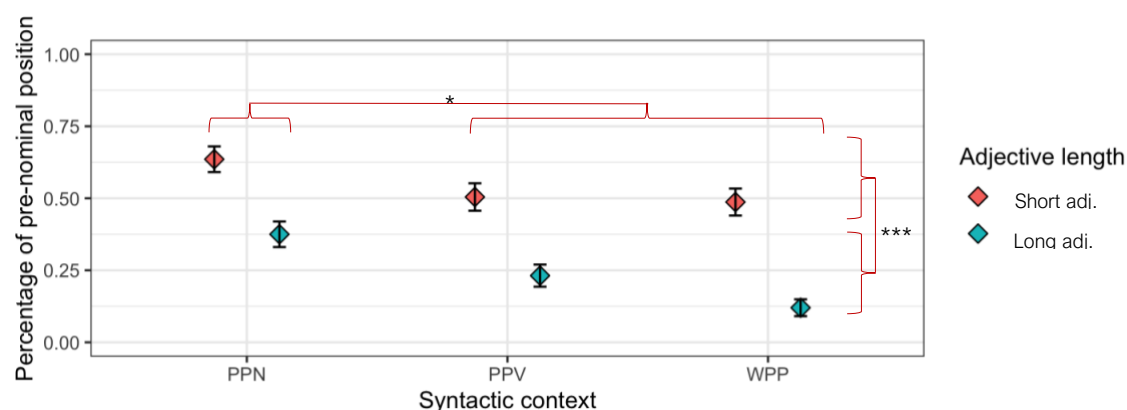
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Word ordering depends largely on syntactic constraints [1]. However, most work on linearisation leaves aside the role of prosody. In French, the accentuation system might influence a constituent positioning to favour more balanced rhythmic groups [2,3]. French allows the possibility for both pre- and post-nominal ordering of adjectives within the noun phrase [4]. In [5], it was found that longer adjectives were less often found in pre-nominal position than shorter ones (2 syllables) when the sentence included a noun dependent, which could be explained by prosodic factors [6]. This observation raises the question of the intervention of prosodic encoding in the formulator stages of Levelt's speech production model [7]. The study presented here aims to identify how prosodic constraints play a role in the choice of adjectives' positions, and to what extent they interact with syntactic constraints in spoken French. The task designed consisted of reconstructing a sentence from a word cloud displayed on a screen, and producing the sentence aloud. The sentences were constructed to vary in adjective length (2 vs 4 syllables) - the prosodic variable - and in the presence and type of prepositional phrase (none, noun dependent, verb dependent) - the syntactic variable. The selected adjectives could assume both pre- and post-nominal positions without altering their meaning, nouns were two-syllable long, and dependents were four-syllable long (see Table 1). 24 experimental items and 24 distractors were randomly presented to participants. Spatial location of words on the screen was randomized by items and participants. In total, 720 sentences were recorded from 30 participants, yielding 120 responses per condition. A mixed-effects logistic model was run on the position of the adjectives with prosodic and syntactic variables as fixed effects, and participants, adjectives and spatiality of adjectives as random effects. Results indicate that long adjectives are significantly more postponed (coeff.=-2.549 ;  $p<0.001$ ), and the noun-dependent condition significantly raises the proportion of prenominal adjectives, (coeff.=0.752 ;  $p=0.022$ ). Interactions are also significant for long adjectives and the noun-dependent condition (coeff.=1.115 ;  $p=0.02$ ), as well as the verb-dependent condition (coeff.=1.063 ;  $p=0.029$ ). As shown in Figure 1, for short adjectives, prenominal positioning increases only in the PPN condition (noun-dependent phrase). In contrast, for long adjectives it increases also in the PPV condition (verb-dependent phrase) in which case prenominal positioning cannot be attributed to syntactic factors. This suggests that rhythmical preferences play a role and that prosodic encoding might intervene parallel to syntactic encoding in the formulating stage of speech production [8].

Table 1: Example of an experimental item in the 6 condition and the two adjective placement alternatives. ADJ2 = 2-syllable adjective; ADJ4 = 4-syllable adjective; WPP = no dependent; PPN = noun dependent; PPV = verb dependent

| Primer                                  | Item                                                                                                            | Condition |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------|
| Elles ont signalé un<br>They notified a | sévère retard / retard sévère ( <i>severe delay</i> )                                                           | ADJ2WPP   |
|                                         | inévitables retard / retard inévitables ( <i>inevitable delay</i> )                                             | ADJ4WPP   |
|                                         | sévère retard du paquebot / retard sévère du paquebot ( <i>severe delay of the ship</i> )                       | ADJ2PPN   |
|                                         | inévitables retard du paquebot / retard inévitables du paquebot ( <i>inevitable delay of the ship</i> )         | ADJ4PPN   |
|                                         | sévère retard à tout le monde / retard sévère à tout le monde ( <i>severe delay to everyone</i> )               | ADJ2PPV   |
|                                         | inévitables retard à tout le monde / retard inévitables à tout le monde ( <i>inevitable delay to everyone</i> ) | ADJ4PPV   |

Figure 1: Percentage of pre-nominal positioning of the adjective by syntactic context and adjective length. WPP = no dependent; PPN = noun dependent; PPV = verb dependent



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