

THE PHRASING OF DISLOCATIONS IN FRENCH: COMPARING SPONTANEOUS SPEECH AND READING

Caroline L. Smith and Ricardo Napoleão de Souza

University of New Mexico
caroline@unm.edu, ricardofns@gmail.com

ABSTRACT

Spoken French makes extensive use of dislocations, where one phrase, usually the subject, is set off from the main clause, and within that clause, a pronoun is used. Previous findings are conflicting about the strength of the prosodic boundary, if any, between the dislocation and the main clause. We compare productions of dislocations in conversation and in identical sentences read aloud.

Both spontaneous and read tokens showed higher f_0 in the syllable preceding the putative boundary, although the difference was smaller in spontaneous speech. Durational variation was estimated using two methods to control for speaker and item variation; no lengthening was found in spontaneous speech, but it was substantial in reading. These results contrast with previous suggestions [7] that lengthening may mark this boundary more robustly than f_0 . The variation between speech styles suggests that all dislocations cannot be analysed by the same prosodic unit. [Support from NSF BCS-1251134.]

Keywords: prosodic phrasing, French, dislocations.

1. INTRODUCTION

Dislocations in French have been much studied, presumably due to their high frequency in the spoken language. The term “dislocation” refers here to a constituent that is outside the main clause of the sentence. Previous analyses of dislocations have suggested that they may be set off from the main clause by a prosodic boundary. Pauses, rises in F_0 , and lengthening of the last syllable of the dislocated element have been reported to mark such a boundary in reading tasks [8]. However, a number of recent studies investigating the acoustic properties of dislocations in spoken corpora show that often speakers use none [4, 6] or few of these properties to mark dislocations [7]. Even in an experimental reading task, Astésano et al. [2] found little or no prosodic marking for the type of dislocation analyzed here (see example 1). Our main question is thus the nature of the demarcation between dislocation and main clause. Understanding the phrasing of these constructions

may help elucidate the role, and number, of different levels of prosodic structure in French.

The present study investigates the extent to which speakers did or did not mark the boundary between the dislocation and the main clause in both a spoken corpus of conversational French and a controlled reading task. To our knowledge, this is the first study to compare directly the acoustic correlates of dislocations in spontaneous productions with identical sentences in reading.

Although both left and right dislocations occur, left dislocations seem to predominate in casual speech recorded in spoken corpora [1]. Left and right dislocations are very different prosodically, as well as in their role in information structure [8]. For these reasons we choose to focus on left dislocations only.

The spontaneous tokens analyzed here come from the Nijmegen Corpus of Casual French (NCCF, [14]). The most commonly found dislocations are dislocations of the subject, although various constituents can be dislocated ([2, 3]). Our analysis is based on subject dislocations like (1), taken from the NCCF; the conversation code identifier is given at the right. In this and the other dislocations analyzed in this paper, a subject pronoun stands in for the dislocated noun phrase in the main clause.

(1) Notre prof de maths, il a fait cours vendredi de la grève. (28-11-07_1)

Our math professor, he taught class Friday during the strike.

2. METHOD

2.1. Materials

Two sources of recordings were used. The speakers in the spontaneous NCCF corpus [14] were recorded in Paris and were mostly undergraduates. A small selection of utterances from the corpus that contain left dislocations were identified for use in this study. Only utterances that were interpretable out of context as complete sentences were considered for selection. Many were excluded because they contained disfluencies such as *eah*, or because their intonation was exaggerated in some

way. Ten utterances with left dislocations were chosen for analysis. These will be referred to as the “spontaneous” tokens.

The NCCF-supplied transcriptions for the spontaneous tokens were then used as printed prompts for recordings. The transcriptions contained no punctuation except a sentence-final period, so no suggestion of any sentence-internal boundary. The speakers who read these were recorded in Lyon and were slightly older than the NCCF speakers. Three males (M1, 2, 3) and three females (F1, 2, 3) were recorded individually in a quiet room. They each read approximately a hundred sentences of varied structures; the subset analysed here were distributed through the larger set. Each speaker read the sentences three times in different pseudo-random orders. These will be referred to as the “read” tokens.

Analysis of the read tokens was limited to tokens that matched the speaker gender of the spontaneous token of the same sentence. Thus, for female speakers, there were six spontaneous tokens, and 52 read tokens available (6 X 3 speakers X 3 repetitions minus two cases of speaker error). For male speakers, four spontaneous tokens and 36 read tokens were analysed (4 X 3 X 3). Limiting analysis to tokens with matched speaker gender made comparison of f0 values simpler in the analyses reported in section 3.2.

2.2. Analysis

The EasyAlign [10] forced aligner was used to generate segment, syllable and word intervals in TextGrids for Praat analysis [5], which were then hand-corrected. French syllabification crosses word-boundaries freely so that word-final consonants provide the onset for the syllable whose vocalic nucleus begins a following word (*enchaînement* or *liaison*). However, in the recordings analysed here, there were numerous cases where glottalization between a word-final consonant and following word-initial vowel meant that a potential *enchaînement* was not realized. These cases resulted in variation in syllable structure both across and within speakers. The glottalizations were often long enough to result in 30-50 ms without phonation; these were treated as intra-sentential pauses.

Several measures focused on the syllables immediately preceding and following the putative boundary between the dislocated constituent and the main clause. The location of the boundary was defined in terms of the vowels in these syllables. Thus in example (1), the (potential) boundary falls between the words *maths* [mat] and *il* [il], but

speakers often produced *enchaînement* such that the syllables were [ma.ti]. In these cases the syllable whose vowel was the last vowel in the dislocated constituent, [ma], was treated as ending this constituent, and the syllable whose vowel was first in the main clause, [ti], was treated as beginning this clause.

2.2.1. F0 measures.

One of the primary markers of boundaries of Accentual Phrases, the smallest phrasal unit in French, is f0 movement, normally a rise [16]. Measures of f0 were made in Praat. For all tokens produced by female speakers, the range of analysis for f0 was specified as 100-400 Hz. Tokens from male speakers were analysed using a range of 50-250 Hz, with the exception of two tokens from speaker M2 where lower ranges were necessary to achieve good f0 tracking.

Determining the magnitude of specific f0 movements is difficult for various reasons, such as periods of voicelessness and the difficulty of defining where a rise or fall begins. For these reasons, rather than measuring a specific rise or fall, we simply obtained the difference between the mean f0 of the syllables of interest, and the mean f0 for the sentence as a whole. Comparing with the overall mean f0 provides a way to estimate the magnitude of rise or fall between these syllables and the speaker’s usual level, and partially controls for differences among individuals.

2.2.2. Measures of durational variation.

Two methods were used to estimate the amount of final lengthening or shortening on the syllable ending the dislocation and the syllable beginning the main clause. These methods control at least partially for speaker- and item-specific influences. One method was to compare the duration of the individual syllable to the average syllable duration (ASD) of the entire sentence. Comparing these differences across speakers, rather than the raw durations, takes into account that speakers differ in speaking rate. If the measured syllable is longer than the average syllable, then it may have been lengthened, but it may simply consist of more segments, or intrinsically longer segments, than the other syllables in its sentence.

The other method used takes these factors into account by calculating predicted duration of the target syllables using the database of segmental durations from [9]. The predicted duration of a syllable is the sum of the predicted durations of each segment as determined from this database,

which gives durations for each phoneme in French as a function of preceding and following context. The predicted duration of a segment is calculated as the average of the duration predicted by the preceding context and the duration predicted by the following context. (Possible contexts include a breath or hesitation before or after the segment.) Note that the segmental make-up of syllables varied depending on whether or not a speaker realized *enchaînement* in a particular token; predicted duration was calculated separately for each token as it was actually produced.

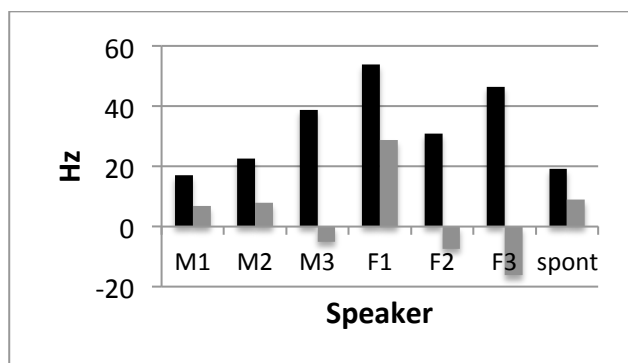
3. RESULTS

3.1. Global comparison of spontaneous and read productions

3.1.1. F0

For all speakers, the mean f0 for the syllable ending the dislocation was higher on average than the overall mean f0 for the sentence, as shown by the black bars in Figure 1. The maximum f0 for this syllable was 76 Hz higher on average for the read tokens, and 21 Hz higher for the spontaneous tokens. Inspection of the f0 traces shows that the higher f0 was virtually always achieved by a rise on the final syllable of the dislocation, although the male speakers in the NCCF tended to have minimal f0 movement.

Figure 1: Difference in Hz between f0 of measured syllable and mean f0 for the sentence as a whole. Black bars show the syllable ending the dislocation; grey bars show the syllable beginning the main clause. “spont” = spontaneous tokens.



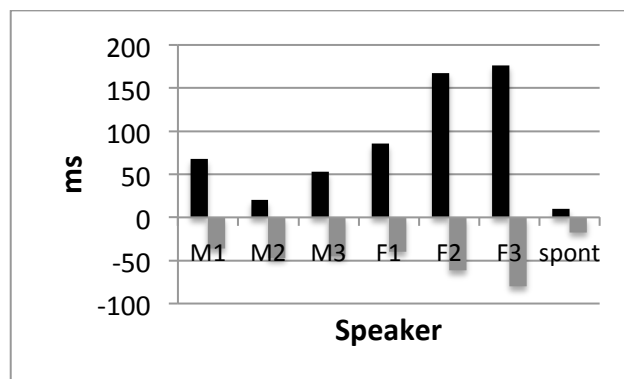
The syllable beginning the main clause (grey bars in Figure 1) was also higher than the overall mean for three of the Lyon speakers and for the spontaneous tokens, but was lower than the overall mean for three. All speakers had a higher mean f0 in the syllable ending the dislocation than in the syllable beginning the main clause.

The higher f0 at the end of the dislocations suggests that these are being produced as the end of at least an Accentual Phrase, which by default ends with a rise [11, 16].

3.1.2. Durations

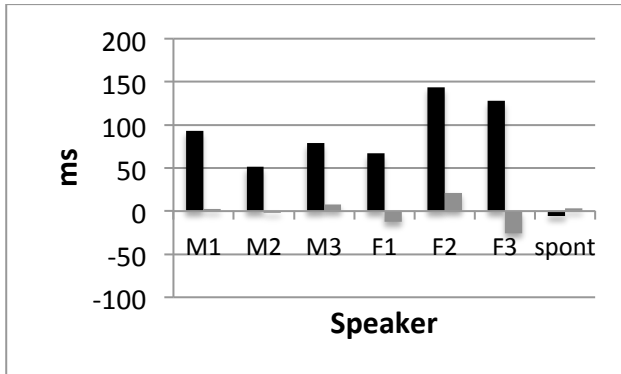
Comparison with average syllable durations shows lengthening in the syllable that ends the dislocation, and shortening in the syllable beginning the main clause. However, for the spontaneous tokens, the amount of lengthening or shortening did not significantly differ from 0 in a z-test. This is surprising since final lengthening is widely reported to be one of the hallmarks of the Accentual Phrase in French [11, 13]. It appears that the NCCF speakers did not conform to this, at least as far as is indicated by this method of estimating lengthening.

Figure 2: Difference in ms between duration of measured syllable and average syllable duration (ASD) for the sentence. Black bars show the syllable ending the dislocation; grey bars show the syllable beginning the main clause. “spont” = spontaneous tokens.



Comparing the measured durations to those predicted by [9] shows greater differences between the read and spontaneous tokens. While the read tokens still reliably show lengthening in the syllable ending the dislocation, as can be seen in Figure 3, there was a non-significant amount of shortening in these syllables in the spontaneous tokens. As for the syllable beginning the main clause, individual speakers varied, but none differed much from the predicted duration. For the read tokens, these results are consistent with previous findings that the Accentual Phrase-final accent in French is characterized by lengthening, but the AP-initial accent (if any) is not [11, 12, 15, 16]. The surprise is the divergence of the spontaneously produced tokens from this widely accepted model.

Figure 3: Difference in ms between duration of measured syllable and predicted duration for syllable with that segmental content, based on [9]. Black bars show the syllable ending the dislocation; grey bars show the syllable beginning the main clause. “spont” = spontaneous tokens.



3.1.3. Pauses

All breaks in phonation were analysed as pauses, although many were short periods of glottalization rather than a clear pause. This avoids making an arbitrary decision about what is long enough to constitute a pause. Only one of the spontaneous tokens included a pause, but it was long (521 ms). The scarcity of pauses in these data is somewhat artificial, since one criterion for selecting utterances from the NCCF was that they not include audible hesitation markers. The read tokens varied greatly: speaker M2 did not pause in any sentence, while speaker F2 paused in 14 out of 18. The average duration of a pause in the readings was only 81 ms.

3.2. Comparison of matched pairs of sentences

3.2.1. F0

The spontaneous production of each sentence was compared to the average of the read productions by speakers of the same gender (nine tokens, in most cases). The measure used, as above, was the difference between the mean f0 for a specific syllable, and the overall mean f0 for the whole sentence. For the syllable ending the dislocation, the values for the spontaneous and read tokens were highly correlated ($r=0.82$, $df=8$, $p<.01$). This correlation suggests that different sentences may favour more or less pitch movement, and that these tendencies were reflected similarly in spontaneous speech and reading. In contrast, for the syllable beginning the main clause, there was no correlation between the values for the spontaneous and read tokens ($r=0.43$, ns). The difference between the two syllables is not surprising if we consider that the dislocation-final syllable is being marked, and

therefore pitch movement on it is meaningful, whereas the syllable beginning the main clause has no specified pitch movement.

3.2.2. Duration

A comparison was also made of the durational patterns of the target syllables in the spontaneous and read productions. We predict that these should be correlated in the dislocation-final syllable, as f0 was, if the properties of individual sentences contribute to the degree of lengthening.

Performing this analysis was problematic because speakers' syllable structure was not consistent in seven of the ten sentences. Comparisons were limited to the subset of read tokens whose structure matched that of the spontaneous token of the same sentence. The basic measures used were the same as in 3.1.2, namely, the difference between the measured duration of a syllable and the ASD for the whole sentence, and the difference between the measured duration and the duration predicted by [9].

For the difference between measured duration and ASD, the correlation between the spontaneous tokens and the read tokens was 0.66 ($df=8$, $p<.05$). For the difference between measured duration and predicted duration, the correlation was 0.11 (ns). These equivocal results suggest that durational variation may be less related to properties of specific sentences than f0 variation is.

4. DISCUSSION

The principal question under investigation is the nature of the boundary between the dislocated constituent and the main clause. The higher f0 in the dislocation-final syllable is consistent with the proposal that this syllable ends an Accentual Phrase in both spontaneous and read productions. In read productions, this syllable was also lengthened relative to the ASD for the sentence, and to the predicted duration based on corpus averages. This is consistent with the syllable being final in an Accentual Phrase. The lack of lengthening in the spontaneous tokens challenges the notion that in spontaneous speech, the dislocation-ending syllables are final in any prosodic unit, and is surprising in that [7] suggests that lengthening marks the right edge of left dislocations in the absence of f0 marking. Our results were the reverse, with f0 marking more reliable.

The differences between the read and spontaneous tokens suggest that they may reflect different prosodic structures, and that speech style must be considered in proposing a phrasal analysis.

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