

TONAL DISTINCTIONS BETWEEN EMPHATIC STRESS AND PRETONIC LENGTHENING IN QUEBEC FRENCH

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ABSTRACT

This study compares the tonal structures of stressed penultimate syllables in Quebec French and emphatic stress in the same spoken variety. Two main experiments have been conducted: the first was designed to highlight the tonal characteristics of emphatic stress in read and spontaneous speech. The second was concerned with the phonetic and tonal description of stressed, penultimate syllables as a result of a possible stress shift. Our results do not confirm the common assumption that penultimate, stressed syllables in Quebec French are the result of emphatic prominence. Emphatic stress is characterized by a LH tone on the target syllable followed by a more or less abrupt fall covering a particular domain depending on the speech style. By contrast, penultimate stressed syllables are characterized by a falling F0 modulation covering the lengthened syllable. The hypothesis that the tonal anchoring happens on the penultimate syllable could explain the variety of tonal patterns observed on the final syllables in those precise cases.

1. INTRODUCTION

Canadian French shows a particular rhythmic pattern caused by the phenomenon of pretonic lengthening [1], [2], [3]. This behavior of pretonic syllables is mostly related to intrinsically long vowels of the Canadian French vowel system /ɑ ɛ: ø ɔ œ ã õ ẽ ǣ / and short vowels lengthened by an optional rule [4]. Generally, this lengthening does not provoke the perception of stress on the penultimate; most of the time, stress stays on the final syllable of the accent group, according to Dell's metrical rules for French (1984). Nevertheless, stress is sometimes shifted to the penultimate syllable, and when it is, it is largely assumed to be a case of emphatic stress. Emphatic stress is usually realized by an abrupt pitch rise on the target syllable [6] or by a level high tone [6][7]. It seems that duration plays a limited role in the production of emphatic stress [8] [7]; this fact has reinforced our intuition that these two types of accents are not related.

In order to test this hypothesis, we have conducted two experiments, one dealing with emphatic stress in read and spontaneous speech and the other on stressed penultimate syllables in spontaneous speech only. Both experiments will be described in the next sections and results of the analyses will then be compared.

2. EXPERIMENT 1

This experiment investigates the tonal patterns of emphatic stress in two discourse situations: read and spontaneous productions from speakers of the Quebec City area. Instances of a subcategory of focus, that is, contrastive focus, in a series of read utterances (corpus 1), and genuine emphatic stresses included in spontaneous sentences (corpus 2) were investigated.

2.1. Corpus 1

Method. The speech materials were recorded in a sound-proof chamber at Laboratoire de phonétique at Université Laval, Quebec, with good quality equipment. The subjects were two men and two women all residents of the Quebec area for at least ten years, in their twenties and graduate students at Université Laval.

Corpus 1 was made of three main sentences and included neutral utterances as well as utterances containing contrastive stress in previously determined positions¹. The main sentences are:

- Nana va mimer sa maman.
(*Nana will mimick her mother.*)
- La Mallarma va mimer sa maman.
(*The Mallarma will mimick her mother.*)
- À Manama, Na mimait sa maman.
(*In Manama, Na mimicked her mother.*)

15 neutral utterances of each sentence and 7 utterances of each sentence containing a contrastive stress (one sentence for each underlined syllable) were produced in random order by each speaker. The total corpus contained 320 utterances, 80 per speaker. An acoustical analysis based on the comparison of fundamental frequency and syllable duration in target syllables in both contexts was performed with the CSL speech processing software (Kay Elemetrics). Moreover, pitch tracks have been extracted for all utterances, which were the basis of the tonal analysis described in the next section.

Tonal analysis. The tonal analysis constitutes a partial adaptation of Pierrehumbert's model for English intonation (1980) and the TOBI model [10]; the use of this model for Quebec French was first introduced by Cedergren et al. (1990). We also took into account the accent group model proposed by Jun and Fougeron (1995). This analysis is based both on perception and the actual pitch tracks. For the time being, we do not consider the break indices. We focus on the main pitch movements observed and their relation to perceptual cues such as the different accents and

boundary tones. The tonal analysis has the advantage of providing a global view of the intonational structures involved in an utterance. As noted by Ouelton (1996), in read as well as in spontaneous speech, prominence must be considered in the total intonational pattern of the sentence.

Results. The results of the acoustical analysis showed that even though duration and F0 played a role in the production of contrastive stress, they did not allow a general characterization of the phenomenon among the speakers. On the other hand, the tonal analysis performed on the same data proved much more fruitful in identifying a characteristic pattern of accentuation [14].

As shown in Figure 1, putting contrastive stress on one unit in the sentence has an effect on the target syllable and the units following it, compared to the neutral versions. The target syllable itself is affected by a rising tone, which is followed by an abrupt fall and the remainder of the sentence is deaccented, wherever the stress is put in the sentence. By contrast, the units preceding the contrastive stress remain basically unaffected. Even if we consider the variable pitch ranges of the four speakers, this pattern is extremely consistent and very little variation in the tonal structures is observed.

2.2. Corpus 2

Methods. Data from spontaneous conversations were available for two of the four speakers, a man and a woman. The first author gathered a series of utterances containing a possible emphatic stress; these utterances were then submitted to three trained listeners whose task was to identify instances of emphatic stress. We kept the sentences for which at least two of the three listeners agreed with the first author about stress placement. Here are some examples extracted from this corpus (emphasized syllables are underlined):

- Regarde j'ai rien de neuf.
(*Look, I have nothing new.*)
- Ah oui c'est un beau petit bonhomme.
(*Oh yes it's a cute little boy.*)
- Si ça te tente pas, tu y vas pas.
(*If you don't feel like it, you don't go.*)

Since the tonal analysis appeared to be a more reliable method for identifying the characteristics of emphatic stress in read speech, we decided to apply directly this analysis to the spontaneous excerpts.

Results. Emphatic stress in spontaneous speech shows similar characteristics as those observed for contrastive stress in read speech. Indeed, the target syllable is affected by a rising tone (LH) and followed by a falling pitch movement, although it is less abrupt than in read speech. We believe that discursive constraints prevent the complete deaccentuation of the remaining part of the sentence and that emphasis is mostly based on the steepness of the LH tone. Besides, it is possible that the domain of deaccentuation is restricted to an intermediate unit, whose dimension is still under investigation, instead of the entire sentence, as observed with corpus 1. Figure 2 illustrates a typical case of emphatic stress in spontaneous speech.

In spontaneous speech, when emphasis targets the penultimate syllable, the rising tone is preceded, as in other sentence positions, by a steep valley which highlights the rising movement associated to the LH tone. This movement affecting both the antepenultimate and the penultimate syllables makes it possible for the final syllable to present varying tonal configurations.

3. EXPERIMENT 2

3.1. Corpus 3

Methods. The corpus of experiment 2 is made of a series of utterances extracted from sociolinguistic interviews [15] recorded in the Chicoutimi-Jonquière area (province of Quebec). Those excerpts contained a long penultimate syllable as perceived by three trained listeners. Among these sentences, they gathered 23 cases of stress shifting from final to penultimate syllable, which constitutes the object of the tonal study presented here. These are examples of the excerpts under investigation:

- Fait qu'y a pris pension.
(*So he took lodging.*)
- ...un des grands chercheurs de la bâtisse.
(*...one of the great researchers of the building.*)
- On a fait une intégration.
(*We made an integration.*)

An acoustical analysis performed with CSL confirmed the longer duration of syllables and nuclei when penultimate syllables were stressed. These increased durations follow from intrinsically long vowels and short vowels lengthened under certain conditions [16]. In order to work on comparable data, the tonal analysis described in previous sections was performed on that third corpus.

Results. The tonal configuration that characterizes the stressed penultimate syllables is a falling pitch movement limited to the stressed syllable, as shown in Figure 3. The conclusion of this movement reaches the lower pitch range of each speaker. We observed a variety of tonal configurations on the final syllable, which means that there is no tonal constraint affecting final syllables in this case. We note that the beginning of the penultimate syllables is marked by high pitch. According to Jun and Fougeron's (1995) analysis of the accent group in French, a LHLH configuration affects the relevant units; to realize the fall on the penultimate syllable, it is likely that the initial H of the accent group is anchored either on the beginning of the penultimate or on the antepenultimate. The falling movement would be the actualization of the middle HL sequence, leaving the final H free to be realized or not. The noticeable duration of the penultimate syllable makes possible the realization of the HL sequence inside the limits of the syllable domain. The pitch movement associated with the syllable duration is likely to provoke the perception of prominence on the penultimate syllable.

4. DISCUSSION

The results of the tonal as well as the acoustical analyses performed on the three corpora of Quebec French confirm the difference existing between emphatic stress and stress shifting associated to penultimate lengthening. The first case is characterized by a LH tone on the target syllable while the second is realized by a HL configuration restricted to the syllable domain of the penultimate. More precisely, it seems that the timing of the high tone is a crucial element in the distinction between the two phenomena: while it happens early in the syllable in penultimate stress shifting, it is anchored late in the syllable in the case of emphatic stress.

However, in both cases, pitch movements were involved and play a part in prominence identification. Besides, as mentioned in Experiment 1, the comparison between the values gathered from the different stressed and unstressed syllables did not allow us to make any reliable generalisations. According to the tonal analysis, the prominences perceived make sense only if they are interpreted in relation to the global tonal pattern of every independent production. As Shattuck-Hufnagel (1995) mentioned, perceived prominences could lose their perceptual salience if brought out of the utterances to which they belong to, that is to say, a phonological analysis is necessary to highlight the mechanisms of accent placement and tonal anchoring in larger domains than the lexical unit.

The phenomenon of penultimate lengthening seems to expand in the Quebec French variety. Usually, the realization of a high tone on the final syllable prevents the stress shifting from final to penultimate syllable [16]. This is probably the reason why penultimate lengthening has been described previously as *pretonic lengthening*. However, one could understand more easily the reason why stress shifting has been previously associated with emphatic stress since for both phenomena, pitch movements are involved.

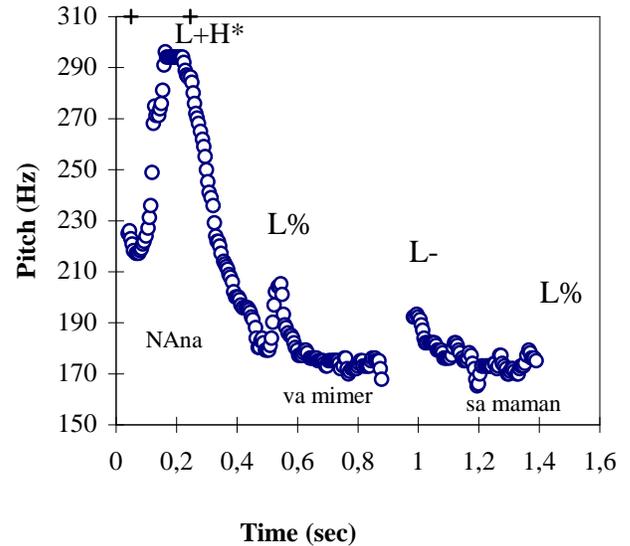


Figure 1: Contrastive stress on the first syllable of the utterance *Nana va mimer sa maman* (Corpus 1: read utterances).

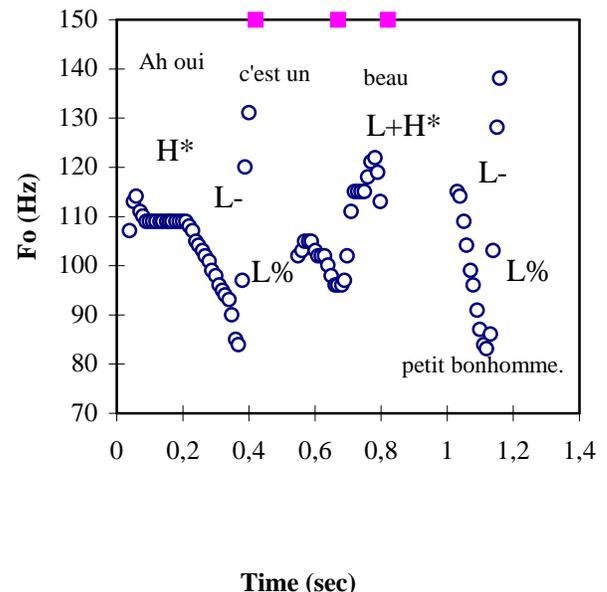


Figure 2: Example of emphatic stress on the word «beau» in «Ah oui, c'est un beau petit bonhomme» (Corpus 2: spontaneous speech).

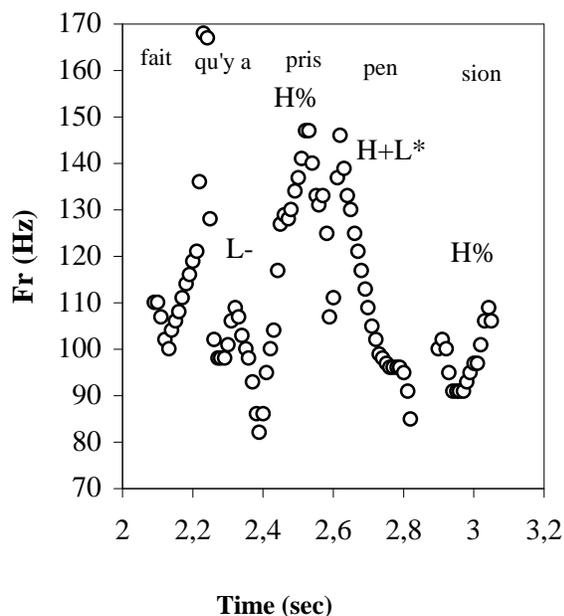


Figure 3: Example of penultimate lengthening with a perceived stress shifting from final to penultimate syllable in the excerpt «Fait qu'il a pris pension» (Corpus 3: spontaneous speech).

Acknowledgments

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ⁱ The sentences of this corpus were kindly provided by G. Ayers of Ohio State University and had been designed by Professor P. Touati of Lund University and herself for a study on tonal patterns in France French.