

Acquiring Phrasing and Intonation in French as Second Language: the Case of Yes-No Questions Produced by Mexican Spanish Learners

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Abstract

In this paper, we propose a study of the final contours and the prosodic structure observed in yes-no questions in French as an L2. Our study consists in a cross-comparison of utterances recorded in French and Spanish in various settings, and produced by 15 Mexican Spanish learners of French (L2), 10 French speakers and 10 Mexican speakers. In the learner's productions, the intonational structure obtained may display some characteristics of their L1: (i) the final contour consists in an extra-high F0 rise, and (ii) the internal prosodic structure at the level of the Prosodic Word (PWD) is not clearly marked. By contrast, in the utterances realized by the French native speakers, it is clear that the form of the final contour is less important than phrasing. These findings prove that the acquisition of phrasing is more important than the acquisition of tonal patterns in French as an L2.

Index Terms: acquisition of prosody in L2, intonation, prosodic phrasing.

1. Introduction

In several studies dedicated to L2 acquisition of prosody (see [7] and [9] among others), it is argued that differences between the L1 and L2 prosodic system constrain the acquisition process, and may cause a transfer from the L1 to the L2. However, despite the importance of transfer, there are still several questions under discussion:

- Is the transfer from L1 to L2 the only explanation to account for learners' competence / oral productions?
- Which prosodic elements from the L1 are transferred to the L2?
- What explain the different prosodic realizations observed in learners' productions: differences in phonetic implementations or different categorical representations of the L2 phonology?

To answer such questions, we carried out a study focusing on the acquisition of prosody in French yes/no questions produced by Mexican Spanish learners. The goal of our study is twofold:

- Analyzing the final contours and the prosodic structure observed in yes-no questions in L2 French produced by Mexican Spanish Learners.
- Evaluating which characteristics of French intonation can be clearly derived from the observation of learner data.

The paper is organized as follows. We first outline the experimental procedure we used to collect and analyze the data. In the second section, the results of the analysis are presented. In the third section, we discuss the prosody of yes/no questions in L2 French and its acquisition. Finally, in

the conclusion we give a summary of the main findings of this study.

2. Methodology

2.1. Corpus design and data collection procedure

The data collection and annotation procedures have been designed in such a way as to avoid any strong presupposition on the weight of transfer from L1 to L2 in prosodic acquisition. The procedures should allow (i) to describe the prosodic characteristics of the learners' productions, (ii) to evaluate the role of L1 in the L2 acquisition process and (iii) to conduct a contrastive analysis of the oral productions in L1 and L2 with a comparable set of data (which have been gathered by adapting the COREIL corpus protocol [3]).

2.1.1. Choice of the speakers

35 speakers divided in three groups were recorded: 15 Mexican Spanish learners of L2 French (FR2), 10 French Native Speakers (FR1) and 10 Native Mexican Spanish Speakers (SPA). No constraints were imposed concerning the age of FR1 and FR2 speakers. Nevertheless, for FR2 speakers, it was desirable to choose participants who had started to study French as an adult (after 17 years of age).

Concerning the FR2 participants, their level of proficiency in French was controlled. For establishing the level, we used the Common European Framework of Reference for Languages (CEFR). Six university students positioned at A2 level and nine students at B1 level were recorded. All FR2 speakers were attending their French courses at the National Autonomous University of Mexico at the moment of the experiment.

The recording took place in a quiet room and was done with an Edirol R09 digital recorder. Table 1 shows the participants' profile:

Table 1. *Speakers' profile (SD in parentheses)*

Group		Speakers	Age Span	Average Age
FR2	Level			
	A2	6	18-34	23 (6)
	B1	9	21-55	27 (11)
FR1		10	18-55	35 (14)
SPA		10	23-38	30 (4)

2.1.2. The tasks

As the performance of any L2 learner may differ from one task to another (reading skill or oral interaction), the students were asked to perform several tasks during the recording session in order to acquire more representative data. Three distinct types of tasks were proposed to the speakers. The first type corresponds to reading tasks (RT). For the recording session, the speakers had to read several texts from the EUROM 1 corpus, as well as small dialogues that we created. The second task type consisted of monologue oral productions

(MOP). In this task, speakers had to describe a painting and tell a story from a picture. Finally, the third task type corresponded to interactive oral productions (IOP): speakers were interviewed (they were asked to talk about their projects, their experience in French courses, etc.), and had to play a role-play, in which they asked questions to complete an enrolment form.

2.2. Yes-No questions: extraction and classification

To study the prosody of French yes/no questions and its acquisition, 301 utterances were extracted from RT and IOP. The questions were then classified on the basis of their linguistic structure. This allowed cross-comparing the different productions in the three language groups. Three types of yes/no questions were distinguished: (i) declarative questions (without any wh-word in the sentence), (ii) inversion questions (the subject pronoun is inverted) and (iii) questions with initial interrogative markers (the expression “est-ce que”).

For the study, all utterances presenting disfluencies in RT and in IOP were eliminated. The table 2 shows the total number of utterances obtained in RT and in IOP for each category:

Table 2. *Typology of yes/no questions*

Category	Example	Group	Number of utterances	
			RT	IOP
Declaratives	<i>Tu viens?</i>	FR1	20	21
		FR2	25	20
	<i>¿Vienes?</i>	SPA	60	43
Inversion	<i>Viens-tu?</i>	FR1	19	4
		FR2	24	0
Insertion of <i>Est-ce que</i>	<i>Est-ce que tu viens?</i>	FR1	20	11
		FR2	23	11
Total			191	110

2.3. Data analysis and prosodic annotation

The utterances on which our study is based were transcribed phonetically, and the transcription was represented on three distinct tiers in PRAAT: an orthographic tier, a syllabic tier and a phonemic tier. The segmentation was carried out manually.

As our study focused essentially on the form of the final contour (shape and size of the melodic movement) and on the marking of the prosodic structure (by F_0 movements or syllable lengthening), the data were prosodically annotated with special emphasis on the annotation of these two elements.

Concerning the movements realized at the end of the IPs (final contour), four different forms were observed. They were annotated with the following labels:

- L% for a falling movement of 2 semitones (st.). It is perceived as falling.
- 0% in case the F_0 track remains stable between the nuclear accented syllable and the pretonic syllable. The contour is then perceived as a plateau.
- H% for a rising contour with an increase of a maximum 10 semitones between the preaccented syllable and the syllable bearing the final contour. The movement is perceived as rising.
- HH% for an extra rising contour (the rise is over 10 st.). The movement is perceived as a very prominent rise.

In addition, the data were edited into prosodic words (PWD), a prosodic unit that can be seen as a basic unit in French and Spanish. For the analysis of the French data, we made a confrontation between a segmentation based on morpho-syntactic rules (any lexical word and the related grammatical words on its left side [8]) and the prosodic realizations observed in the productions. According to the grammatical rules, a sentence such as “*Vous prenez les réservations par téléphone?*” is divided into three PWD, which may be prosodically marked by a final accent: [*Vous prenez*] [*les réservations*] [*par téléphone*]. For the prosodic analysis, the presence of an accented syllable has been considered as a cue for the presence of a PWD boundary. In the data, the accented syllables were labeled H* when the F_0 values in the syllabic nuclei changed more than 2 st.

In Spanish, prosodic phrasing was analyzed at the level of the prosodic word. This prosodic unit is defined only by the presence of a lexical accent realized tonally [11]. For the analysis of this unit, we identified the syllabic position of lexical stress in content words and we verified if these syllables carried an accent. As an example, a sentence such as “*¿Se pueden hacer reservaciones por teléfono?*” is divided in four PWD on the basis of the presence of lexical accents: *PUEden, HaCER, reserVAciones, teLEfono*. To describe the presence of the accents, we adapted the notation suggested by [1] by using the symbols H*, L*, L*+H, etc., which are associated to stressed syllables.

Finally, to represent symbolically the prosodic structure (in PW) and the shape of the final contour, we used two approaches in parallel. On the one hand, an automatic stylization of F_0 was obtained for all the data set with the *Prosogramme*, a tool that provides automatically a stylization of the F_0 trace according to perception thresholds [10]. This stylization has the advantage of providing representations that are completely language-independent (see for discussions on this issue [2]), and of being useable for all types of data, even when the underlying intonational system is not known (as is the case here for FR2 speakers).

On the other hand, three expert phoneticiens (including the authors) listened to the utterances and identified the prominent syllables. From several careful listenings, they transcribed the form of the melodic movements associated with stressed syllables. These annotations were then compared to the stylization produced by the *Prosogramme* in order to solve any problem of disagreements.

3. Results and their interpretation

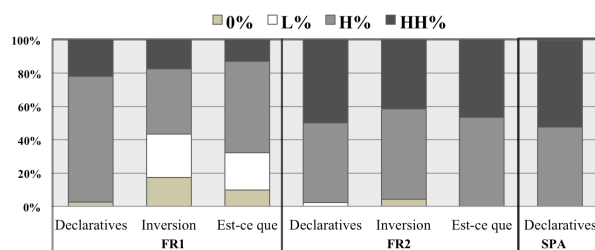
3.1. Form of the nuclear contour

In the entire corpus, the form of the final contour realized at the end of yes/no questions is either rising (H% or HH%), or falling (L%), or corresponding to a F_0 plateau (0%). The exact distribution of the various contours according to the language, the communicative setting and the question types is presented and discussed below.

3.1.1. Results

Figure 1 summarizes the distribution of the final contours observed in our corpus, in taking into account the linguistic form of the question and the language.

Figure 1. *Distribution of nuclear contours*



From the realizations observed, it appears that:

- The H% contour is the one that is used by far most frequently by FL1 speakers. Moreover, rising contours H% and HH% are used in more than 95% of the cases in declarative questions.
- Non rising contours are used in yes/no questions produced by FL1 speakers. They occurred in 30% of the cases in questions with an initial interrogative marker, and in 43% of the cases in questions with subject inversion.
- In Spanish yes/no questions, nuclear contours are always rising, which contrasts with what happens in French. The choice between H% and HH% does not seem to be associated to the number of syllables in the utterance nor to position of the stressed syllable in the last word.
- In the French utterances produced by FR2 speakers, the rising contours H and HH% are almost always used. These realizations are to a certain extent comparable to what happens in the speakers' L1.

3.1.2. Interpretation

From the observed realizations, rising nuclear contours are clearly associated with yes/no question intonation in Spanish. By contrast, a wide array of contours are possible in French, in particular in questions where the lexical content or the morpho-syntactic structure indicates the modality of the utterance (by the presence of a subject-inversion or by the use of an interrogative marker).

The contours generally used by non-native speakers (HH%) are completely acceptable in French, as no specific contour form is associated with yes/no questions in this language. Nevertheless, it is very important to note that FR2 speakers do not use a great variety of contours, in comparison to what FR1 speakers do. This shows that FR2 learners may be influenced by their L1 in selecting the form of the final contour.

It is very important to note that in classical description of yes/no question in French (see [4]), rising contours are usually described as the most canonical form. In our data, however, flat and falling contours are used by FR1 speakers, in particular in spontaneous speech.

3.2. Prosodic phrasing and tonal patterns

The observation of the data may be used to argue that phrasing is more clearly marked in French yes/no questions than in Spanish.

3.2.1. Realizations obtained and intonational analysis

In studies dedicated to the analysis of intonation in Spanish (see among others [1] and [5]), it is usually said that absolute

interrogatives (yes/no questions) have the following prosodic characteristics:

- A high tone is realized at the beginning of the utterance, it is followed by a F_0 rise that reaches its peak on the onset of the first stressed syllable and may continue until the following post-tonic syllable.
- After the rise and the high plateau, F_0 is gradually falling to reach its lowest level on the penultimate syllable of the utterance (usually stressed and encoded as L*).
- A final rise is then realized on the final syllable.

According to these tonal patterns, the syllables bearing a F_0 movement (and perceived as prominent) are only positioned on the first and last word of the utterance. The stressed syllables in the middle of the utterance are generally deaccented. In Mexican Spanish, it is also frequent that the final rising contour is realized with a sharp rise of F_0 [11]. In the SPA speakers' realizations, all these prosodic characteristics can be found: the PW are usually not indicated by a specific prosodic event such as syllable lengthening or realization of a melodic movement. Our findings show that the grouping of prosodic units in Spanish questions must be different than in assertions, where accented syllables and/or changes in pitch indicate more clearly prosodic units such as PWDs or intermediate phrases [6].

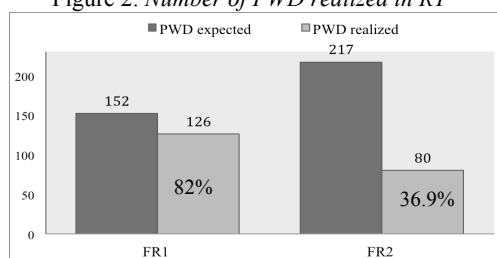
By contrast, in French, grouping in PWDs is usually indicated by the realization of an accent on the last syllable of the content word. In terms of phonetic implementation, accents are mostly indicated by durational lengthening and changes in pitch height. Moreover, dephrasing and deaccenting do not occur. Even in yes/no questions, the internal prosodic structure is clearly indicated (see [4] and [12]) among others).

Our data confirm these analyses. In almost all the utterances produced by FL1 speakers, PWDs are clearly indicated by the realization of an accent. A high tone is realized on many accented syllables. Moreover, the height of the tone is usually important and shows that, even in long sentences, no clear downstep does occur. This contrasts clearly with what has been observed in Spanish. As a consequence, FR2 speakers should have some problems in segmenting yes/no questions in PWDs, as they may not know which acoustic cues to use.

3.2.2. Learner realizations and Interpretation

The tonal patterns observed in the yes/no questions realized by the learners are usually different from the ones produced by FR1 speakers. The differences rely on two major points: (i) the initial rising movement is usually far more important than in French and (ii) PWDs are not clearly indicated. Figure 2 compares the segmentation in PWDs in the utterances produced by FR1 and FR2 speakers in RT.

Figure 2. *Number of PWD realized in RT*



The figure shows that FR1 speakers mark phrasing by the realization of a tonal event at the end of almost all potential PWDs (a difference of 5 st. in average). By contrast, FR2 speakers do not mark accented syllables in PWDs.

4. Discussion and conclusion

The intonational patterns in yes/no questions observed in Spanish and French differs in several ways, among which we may mention:

- The form of the final contour, which is always rising in Spanish, contrary to French.
- The distribution and the relative height of the tonal events that occur sentence internally.
- The internal prosodic structure of the sentence and its phonetic realization.

These differences explain some of the problems encountered by Mexican Spanish learners while speaking L2 French. In short yes/no questions (formed by a single PWD), the tonal patterns observed are accurate in many cases. This results from the fact that the form of the final contour may vary in French. Even if the learners use a form comparable to the one used in their L1, this is not problematic. By contrast, in long yes/no questions (composed of two or more PWDs), the differences between the two speaker groups (native vs. learners) are more obvious. As a result, when learners do not indicate the internal prosodic structure of the utterance, in realizing tonal events on the stressed syllables, or even in using durational cues, the realizations are not accurate.

In a sentence such as in (1), three distinct realizations have been observed in our data, ranging from the less accurate (fig. 3) to the most accurate (fig. 5).

- (1) [(vous prenez) (les réservations) (par téléphone?)]IP
 *[(vous prenez les réservations par téléphone?)]IP
 ‘Can you make reservations by phone?’

Figure 3. Absence of PWDs and HH%

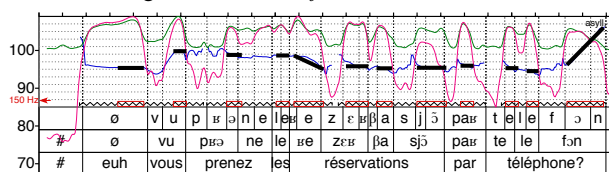


Figure 4. PWD last syllable lengthened and H%

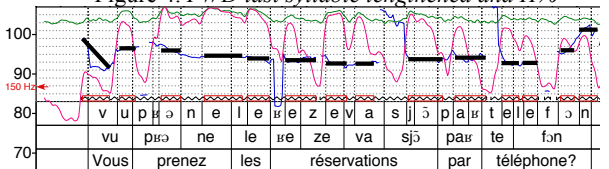
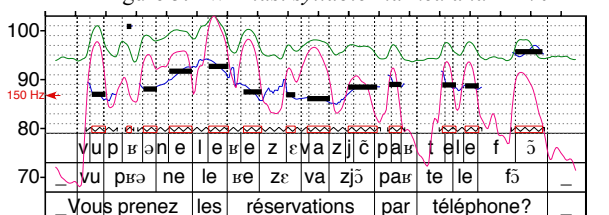


Figure 5. PWD last syllable marked and HH%



This study showed that the tonal patterns associated with yes/no questions cannot be analyzed by taking into account only the form of the final contour realized at the end of the IP. The internal prosodic structure and its realization are of great importance, especially in French. Three distinct realization types may be classified:

- If PWDs are not prosodically marked, the sentence is not prosodically licit, even if the final IP ends with a H% (Cf. Figure 1).
- If prenuclear accented syllables are not tonally marked but lengthened, the sentence is prosodically well formed (Cf. Figure 2).
- If PWDs are marked with H* and the final contour is H% or HH%, the sentence is prosodically well formed (Cf. Figure 3).

These findings will now be validated by perceptual tests.

5. Acknowledgements

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