

Chapter 3: Intonational Phonology of French: Developing a ToBI system for French

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Abstract

The aim of the chapter is to propose a ToBI transcription system for French, F_ToBI. The system is designed in such a way as to (i) be (surface) transparent and easily learnable by researchers working in different theoretical frameworks; and to (ii) make the exchange of data more feasible. It is couched in the Autosegmental Metrical framework and follows the usual ToBI conventions. This is to facilitate research in prosodic typology in particular within Romance, for which ToBI-style systems are often used.

F_ToBI is designed to transcribe distinct intonation contours that are generally

accepted in the literature on French intonation and which are supported by the analysis of empirical data. While it is inspired by existing theoretical accounts of French phrasing and intonation – both within and outside the Autosegmental Metrical framework – it does not follow one single precursor, since its primary goal is to allow for an adequate and comprehensive transcription of French prosody in a cross-dialectal perspective.

3.1. Introduction and background

The aim of the chapter is to develop a ToBI system for French (henceforth F_ToBI). The system proposed here is couched in the Autosegmental Metrical framework of intonational phonology and observes the standard ToBI conventions (e.g. the labels are intended to represent phonological distinctions rather than differences in phonetic realisation) (Beckman & Hirschberg 1994, Beckman et al. 2005). This is to facilitate typological prosodic research in particular within Romance languages, for which ToBI-style systems are often used – as illustrated in this volume. Since various accounts and descriptions of the prosodic features of French varieties have been rooted in very different theoretical and methodological paradigms using different terminologies, it has been difficult to draw meaningful cross-linguistic and cross-varietal comparisons between individual descriptions and models.

Our main objective is to design a prosodic transcription system which encodes the phonological contrasts to be found in French intonation and which makes the exchange of data and analyses between varieties and between researchers more feasible. We aim to reach this objective by providing a standardised phonological transcription tool which is easily learnable and as surface transparent as possible, and which can therefore be used by researchers working in different theoretical frameworks with different types of data. The second requirement which we have placed on the system is that it transcribes those distinctions that are more generally accepted in the literature, and which are well attested on

the basis of empirical data. The system we propose here is inspired by existing theoretical models of prosodic phrasing and intonation of French, both within and outside the Autosegmental Metrical framework, and it does not follow one single precursor, but adopts features of a variety of models. By adopting this approach, we hope not to limit the applicability of the system to a specific community, which would defeat the purpose of facilitating data exchange.

The chapter is organized as follows. In the subsection 3.1.1 of the introduction, the French language and its varieties are presented, while section 3.1.2 is devoted to describe the main prosodic characteristics of French and to explain how they are encoded in F_ToBI. The second section (§ 3.2) describes the methodology used to gather the data and to develop the F_ToBI system. The third section (§ 3.3) presents a description of the nuclear contours that are used to mark specific sentence types in standard French. Like other chapters in this volume, this chapter covers statements, exclamatives, yes-no questions, wh-questions, imperatives, vocatives, enumerations and disjunctives. Examples of regional variation are discussed when their features differ from the standard variety.

3.1.1 French: geographical and historical aspects

French is a Romance language spoken on five continents in more than seventy-five countries or territories. In more than twenty-five countries across the world, French is either the official or the co-official language.¹ In Europe, it is spoken in France and Monaco, where it is the only official language; as well as in Belgium (Brussels and Wallonia), Italy (Aosta Valley), Switzerland (Romandy region), Luxembourg, and Vatican City, where it is a co-official language. According to the International Organization of the Francophonie (fr. *Organisation internationale de la Francophonie*, OIF), the estimated number of francophones – that is, persons capable to cope with everyday communication situations in French (Valantin 2007: 15) – in the world is 220 million. Most monolingual French speakers live in France, Canada

(Québec), Belgium, and Switzerland. Bilingual speakers with French as a second L1 live mainly in the French-speaking regions of Africa. In this chapter, we focus on European French which is currently spoken as a first language in France, Belgium and Switzerland.

Like all other Romance languages, French has its origin in varieties of spoken Latin. European French as spoken nowadays developed from the dialects spoken in the northern part of the Gallo-Romance area, which are grouped under the term of *Langue d'Oïl*, but was also influenced, through contacts, by some other Romance and non-Romance languages: *Occitan* or *Langue d'Oc* (see the chapter on Occitan, this volume), *Franco-Provençal* or *Arpitan* (spoken in the eastern part of France, in Italy (Aosta Valley) and in Switzerland (Romandy)) for the Romance languages, and *Breton*, *Basque*, *Dutch*, and *German*² for the non-Romance languages. That is, the historical development of the language and the multiple contact situations played a role in distinguishing the different varieties of French spoken in Europe. The geographical repartition between these different dialectal areas and the locations where the data for this study were recorded are shown on the map in Fig. 3.1.

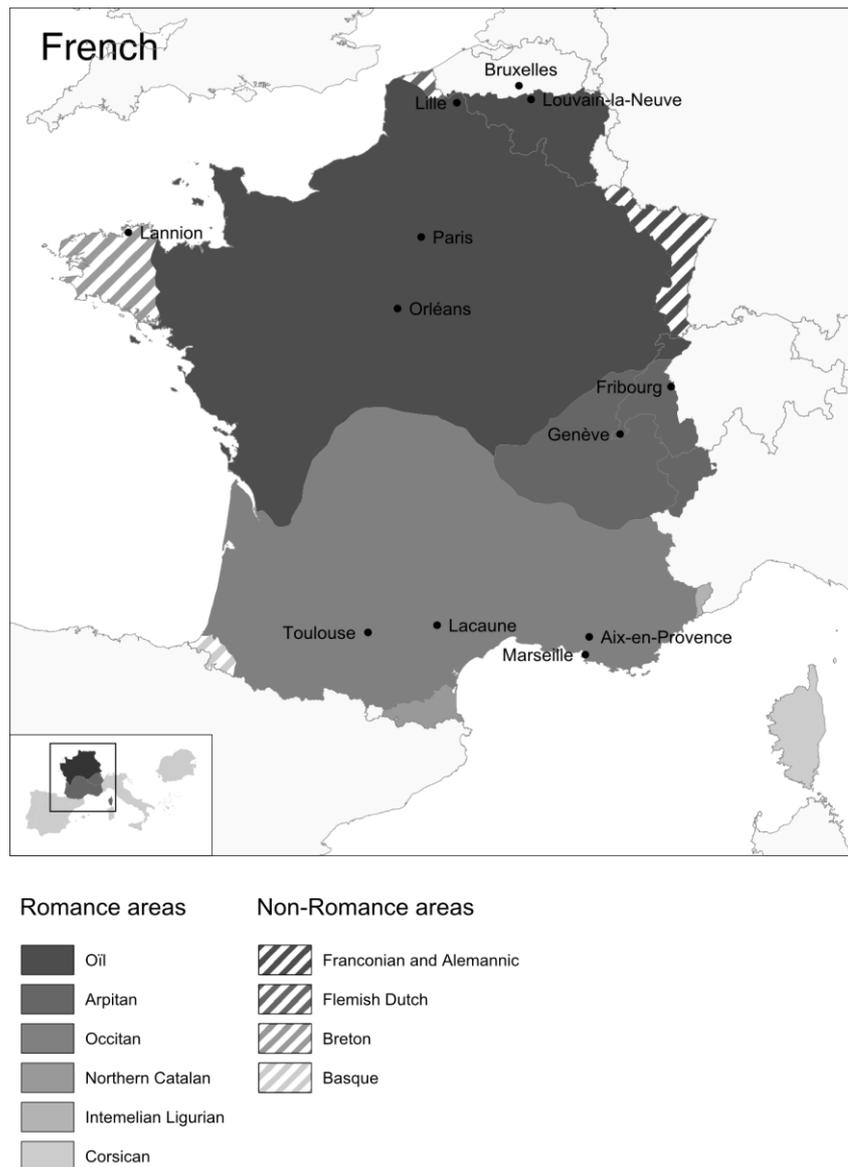


Fig 3.1: Map of the different dialectal areas and locations where data were gathered.³

Despite having a large number of dialectal varieties, it is important to note that, for historical reasons, French appears to be highly standardized. In the 16th century French becomes the official language of France, and the variety spoken by the royal court of Paris played a crucial role in providing a process of rigid codification which the language underwent in the following centuries. As a result the French language became one of the most highly standardized languages in the world (Lodge 1993).⁴ This official status and the history of France explain not only the expansion of the language, but also the fact that most studies

dedicated to French phonetics and phonology, even nowadays, focus on standard French, without taking into account regional variation (see, among others, Delattre 1966; Fouché 1969; Grammont 1933, and for a review Laks and Durand 2000). Only a few studies have been dedicated to the phonetics and phonology of regional varieties of French (see, among others, Léon et al. 1983, and more recently Detey et al. 2010; Gess et al. 2012; Simon 2012).

3.1.2 French prosody: main characteristics and encoding in F_ToBI

Studies on French Prosody have traditionally pointed out that accentuation, phrasing, and intonation are closely related in this language. One of the reasons for this is the lack of lexical stress which causes a strong syncretism between intonation and accentuation on the one hand, and between accentuation and phrasing on the other.

3.1.2.1 Accentuation and Phrasing

Unlike other Romance Languages, French has no lexical stress. The lexical representation of a word does not include metrical or tonal properties. Metrical patterns in French rely on the existence of two distinct stress types which are assigned at the phrasal level: an obligatory phrase-final, primary, stress, and an optional phrase-initial, secondary, stress. Both are realized with a pitch excursion, and are called final accent and initial accent, respectively (see Hirst and Di Cristo 1993; Jun and Fougeron 1995, 2000 among others).⁵ They will be encoded in F_ToBI.

Even if stress is not assigned at the lexical level in French, the distribution of the accented syllables is constrained by a partition of the French lexicon in two categories (see, for more details, Mertens 1987, 1993, 2008): words that may receive a primary accent on their last metrical syllable⁶, and words that can never be primary accented. Content words are generally treated as belonging to the first category, for instance, nouns, verbs, adjectives, and adverbs, and also some pronouns (*tout, chacun*, the tonic forms *moi, toi, eux*, etc.) as well as some polysyllabic prepositions (*pendant*, etc.), and some polysyllabic auxiliaries (*avait*,

étions, etc.). All other function words fall into the second category. Although they cannot receive a primary accent, they do sometimes receive an initial accent. Initial accents can be realized on a wide range of lexical units (including weak forms of pronouns, etc.).

Apart from playing a role in the construction of well-formed metrical patterns, the final accent has a demarcative function: it is a phrasal stress that marks the right edge of the smallest prosodic phrase, which has been variously called the Accentual Phrase (Verluyten 1982; Jun and Fougeron 1995, 2000; Welby 2006 among others), the Prosodic Word (Martin 1978, 1980, 2009), the Rhythmic Unit (Hirst and Di Cristo 1993 among others), and the Phonological Phrase (Delais-Roussarie 1996; Post 2000 among others), and which is called in F_ToBI the Accentual Phrase (AP). There is a broad consensus about the definition and characteristics of the Accentual Phrase: apart from being right bounded by a final accent, this prosodic phrase corresponds minimally to a lexical word and to all the function words that this word governs (see among others Garde 1968; Martin 1980; Mertens 1993; Post 2000). It has nevertheless been shown that morphosyntactic information is not sufficient to account for the distribution of the final accent, and henceforth, for the formation of APs. Metrical and rhythmic constraints come also into consideration, resulting in more eurhythmic metrical patterns than those that would be predicted by syntax alone (see, among others, Dell 1984; Martin 1987; Delais-Roussarie 1996; Jun and Fougeron 1995, 2000; Post 2000).

The initial accent has several distinct functions: it contributes in the generation of well-formed metrical patterns, but it may also have the effect of reinforcing the cohesion of the Accentual Phrase. In addition, some initial accents are emphatic and have a clear pragmatic function (see Di Cristo 1998 and Rossi 1985 for a distinction between different types of initial accents according to their function). The location of the initial accents may vary: they may mark the left edge of lexical words or prosodic groups (see Rossi 1985; Padeloup 1990; Di Cristo 1998; Jun and Fougeron 1995, 2000; Welby 2006), and thus be

associated with one of the first syllable of these units; they may also be realized on a clitic or on a weak form when they are realized to avoid metrical lapses (see, among others, Delais-Roussarie 1996; Jun and Fougeron 2000); finally, they may be associated with specific syllables or words when they express contrast or emphasis. Since it has been shown that initial accents are always realized by a F0 rise, and that there is no systematic way to differentiate them by their distribution or their phonetic implementation (see, among others, Astesano 2001, 2007), they will all be encoded with the same label in F_ToBI, that is Hi, where the *i* stands for *initial* and H for the high tonal target associated with the accented syllable.

Three types of phrases at different levels of the prosodic hierarchy are distinguished in F_ToBI. The Accentual Phrase (AP), the smallest of the three, is encoded in two ways in F_ToBI: a break index 2 is assigned at the right edge of any Accentual Phrase, and a pitch accent is associated with its last metrical syllable (see for more details section 3.1.2.3). Two additional types of prosodic phrases are referred to in F_ToBI: the Intonational Phrase and the Intermediate Phrase. The Intonational phrase (IP) is the largest prosodic phrase. It is characterized by the presence of a boundary tone at its right edge, a strong degree of phrase-final lengthening, and it is often followed by a pause. In sequences of clauses, each clause is frequently phrased as an independent Intonational Phrase, especially if it is a long clause (see Fig. 3.2, example (1)).

- (1) Où est-ce que tu vas, comment tu vas y aller et à quelle heure tu vas rentrer ?
 [(où est-ce que tu vas)_{AP}]_{IP} [(comment)_{AP} (tu vas y aller)_{AP}]_{IP} [(et à quelle heure)_{AP}
 (tu vas rentrer)_{AP}]_{IP}
 ‘Where do you go, how do you get there and at what time will you be back ?’

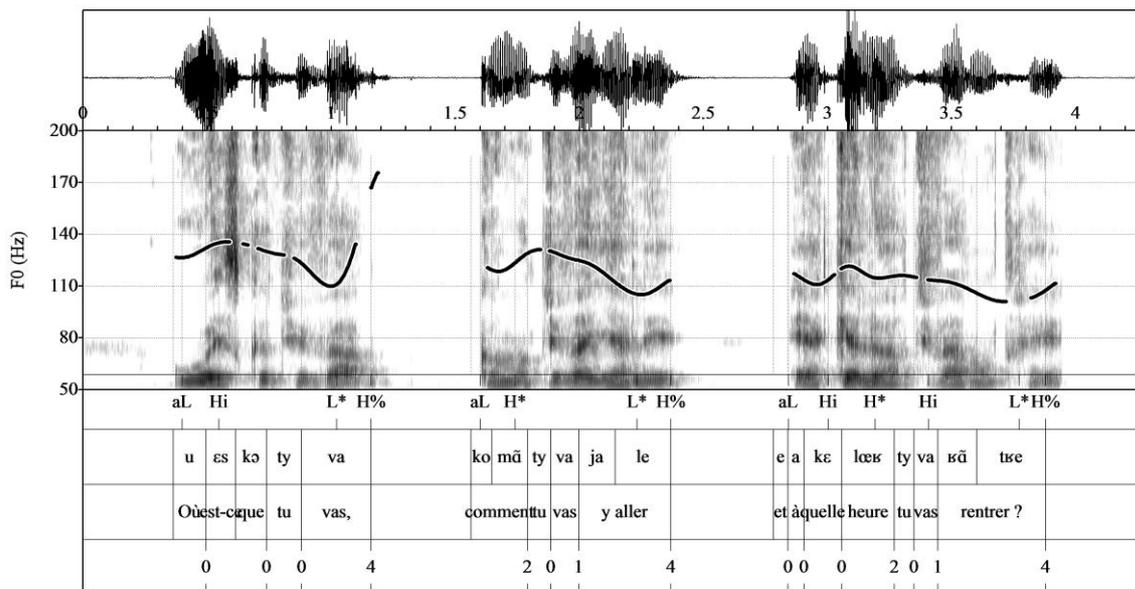


Fig. 3.2: Waveform, spectrogram and F0 track of the sentence in (1) produced by a swiss speaker (Geneva).

The Intonational Phrase is referred to in almost every study on French Prosody, regardless of the theoretical framework that is adopted (Verluyten 1982; Jun and Fougeron 1995, 2000; Di Cristo 1998, 2009a; Di Cristo and Hirst 1996; Post 2000 among others). In F_ToBI, this unit is indicated by the presence of a break index 4 at its right edge. In addition, on the tonal tier, its right edge will be associated with an IP boundary tone T%. (where T is L, H, !H).

The third level of phrasing, the Intermediate Phrase (ip), is larger than an AP and smaller than an IP. It is characterized by a relatively stronger degree of lengthening of the phrase-final syllable than that of an AP-final syllable. It is also tonally marked by the presence of a pitch movement on its right edge (H- or L-), whose form and relative height may differ from the one occurring at the end of the AP belonging to the same ip (see for more details section 3.1.2.2). In F_ToBI, the Intermediate Phrase is encoded by a break index 3 and the presence of a phrasal edge tone T- on the tonal tier. The level of ip has been argued for by some authors (see among others Michelas 2011; Michelas and D'Imperio 2012), while

others appeal to specific local restructuring mechanisms to account for this level of phrasing between the Accentual Phrase and the Intonational Phrase (see among others Post 2000, Post and Delais-Roussarie to appear). The occurrence of an Intermediate Phrase in a sentence is strongly influenced by its morphosyntactic structure and its length, since this unit allows restructuring several APs in a single larger prosodic unit as in:

- a long branching subject or object NP that includes two APs or more is often realized as an *ip*. In (2), for instance, (le directeur)_{AP} and (de l'hôtel)_{AP} are grouped in the same *ip*;

- a syntactic element that occurs in peripheral position or that needs to be syntactically separated from what follows often forms its own *ip* (e.g., clefted XP as in Fig. 3.12, § 3.3.1.2);

- non-final elements of an enumeration or a disjunction are often phrased in an independent *ip* (see Fig. 3.39 and Fig 3.40, § 3.4.7).

(2) Le directeur de l'hôtel ne voulait pas voir le guide des touristes qui attendait à la réception.

[[(le directeur)_{AP} (de l'hôtel)_{AP}]_{ip} { (ne voulait pas voir)_{AP} (le guide des touristes)_{AP} }_{ip} { (qui attendait)_{AP} (à la reception)_{AP} }_{ip}]_{IP}

'The hotel director didn't want to see the tourist guide, who was waiting at the reception'

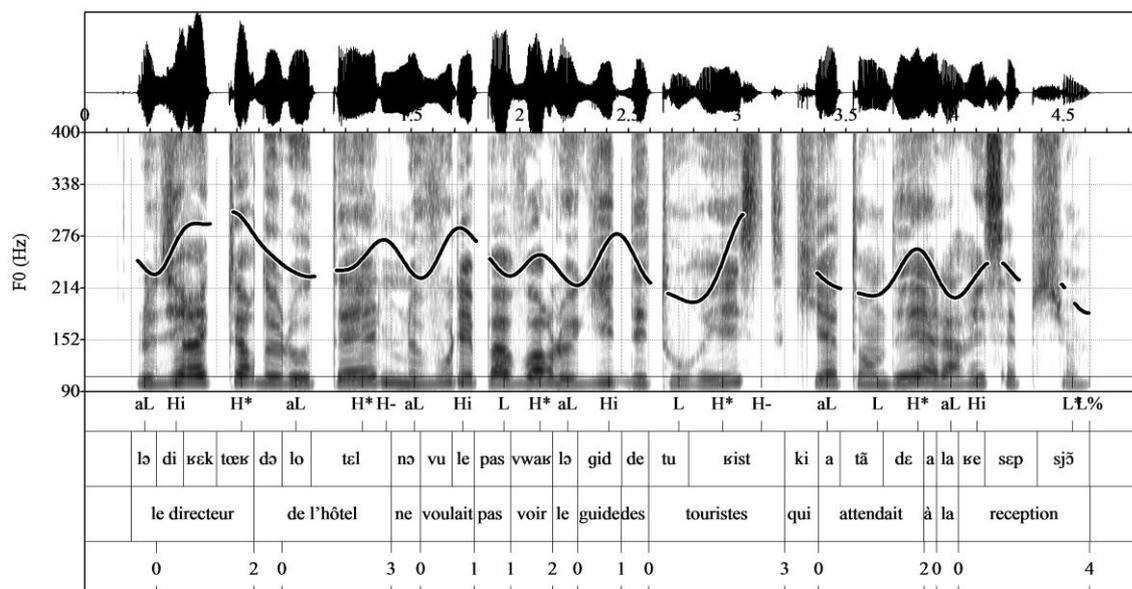


Fig. 3.3: Waveform, spectrogram and F0 track of the sentence in (2). (Laboratory experimental data collected by one of the authors)

3.1.2.2 Tonal patterns and phrasing

The intonational patterns observed in French tend to closely reflect the syncretism between accentuation, phrasing and intonation as previously mentioned. On the one hand, the distribution of the accented syllables demarcates prosodic groupings, as shown in the previous section. On the other hand, intonation plays a crucial role in indicating, by the form and the location of the intonational units, the modality of the utterance as well as the dependency relation between the various prosodic units (see, among others, Delattre 1966; Martin 1981; Mertens 1993; Di Cristo 1998; Post 2000, 2011).

The Accentual Phrase, which has been described in the previous section, plays a pivotal role in French intonation, which is usually described as a sequence of rising patterns. The default tonal contour associated with the Accentual Phrase consists of one or two rising pitch movement(s): an obligatory rise with the high target associated with the final accented syllable, encoded as H*, and an optional rise realized on the initial prominent syllable, encoded as Hi (see, among others, Jun and Fougeron 1995, 2000, 2002; Welby 2006). There

are two low targets, which do not always surface. The first low target is a boundary tone associated with the left edge of the AP, and the second low target is a phrasal tone realized before the final high target (see Jun and Fougeron 2000; Post 2000). The general tonal form associated with the AP is given in (3).

(3) Default tonal pattern associated with the AP

(aL) (Hi) (L) H*

The low boundary tone marking the left edge of the AP is encoded aL and is realized over AP-initial syllable(s), typically before the initial accented syllable (see Jun & Fletcher (in press)).⁷ This tone may not surface when the AP-initial syllable begins with an accented syllable. Note that this tone never contrasts with another tone of the same type. The initial rise Hi is associated with one of the first syllables, and never contrasts with a falling initial accent. The second low target, encoded L, surfaces more often when the AP contains an initial and a final rising accent (Hi and H* respectively), probably motivated by the rhythmic constraint. Though the second L tone is less distinctive than other AP tones, transcribing it allows a more surface-transparent system of transcription.

As shown in (3), the Accentual Phrase (AP) is usually characterized by the presence of a H* pitch accent on its last, metrically strong syllable (see Delattre 1966; Martin 1981; Post 2000; Jun and Fougeron 1995, 2000). In nuclear configurations, the H* pitch accent contrasts with a low pitch accent encoded L*, especially before a L% boundary tone (see e.g. Fig. 3.10). In non-final APs, the final accent may be realized as L*, as shown in Fig. 3.4., but in this position, the type of the pitch accent (L* or H*) is not contrastive. The realization as L* may be forced by dependency relations, as discussed in Martin's work (1980, 1981, 2009).

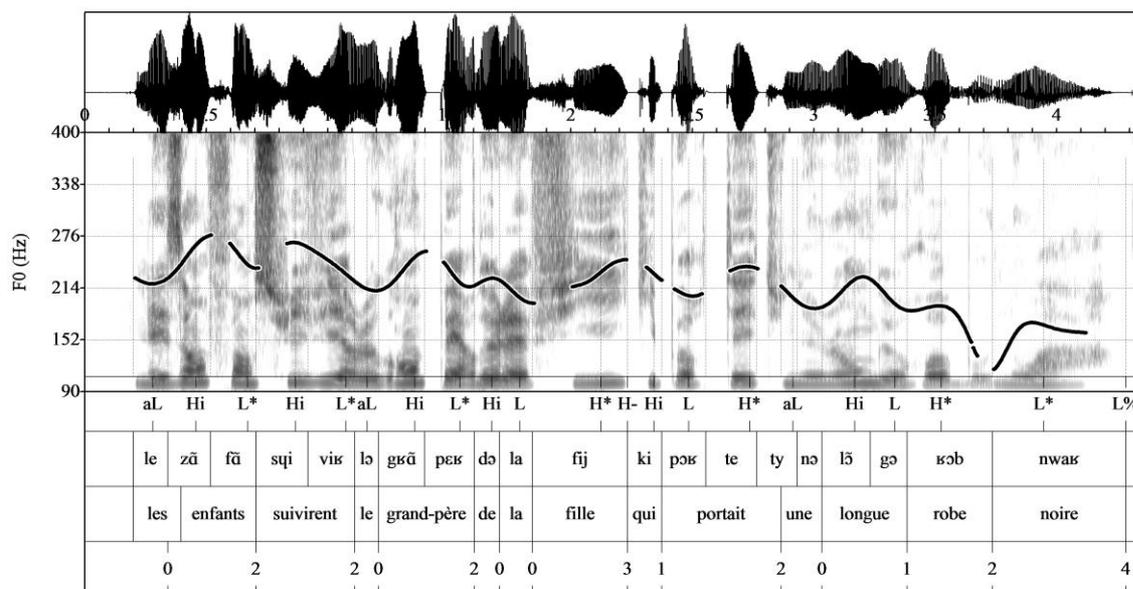


Fig. 3.4: Waveform, spectrogram and F0 track of the sentence *Les enfants suivirent le grand-père de la fille qui portait une longue robe noire*. ‘The children followed the grandfather of the girl that wore a long black dress’. (Laboratory experimental data collected by one of the authors)

As mentioned in the previous section, the right edge of larger prosodic phrases (the Intermediate Phrase and the Intonational Phrase) is characterised by the presence of a boundary tone. Studies on French have shown that the tonal movements associated with non-final prosodic phrases are usually rising (see Delattre 1966 with the minor and major continuation; Di Cristo 1998; Post 2000; Jun and Fougeron 2000 among others). Additionally, the form of this movement provides information about the way in which a prosodic phrase is related to the preceding one. The distinctions between minor and major continuation rise (Delattre 1966) or between LH* and LH* H- (or even LH* H%) in the Autosegmental Metrical framework (Post 2000; Jun and Fougeron 2000) refer to the same fact: when two minor groups form a larger phrase, the tonal movements associated with the right edge of each group indicate the dependency relation that exists between them (see also Martin 2009). For example in Fig. 3.5 (which represents the pitch track of sentence (4)) the tonal movement

realized at the end of the ip (i.e., *il réglait le déchargement des casiers*) shows a wider pitch range than that of the preceding pitch accent (i.e., H* on *déchargement*). This illustrates a case where an ip boundary blocks the downtrend of the peaks in the intonation contour.

(4) Il réglait le déchargement des casiers sur les chariots des mareyeurs (FR_EUROM 1 corpus, Chan et al. 1995)

[[*(il réglait)*_{AP} *(le déchargement)*_{AP} *(des casiers)*_{AP}]_{ip} {*(sur les chariots)*_{AP} *(des mareyeurs)*_{AP}]_{ip}]_{IP}

‘He was in charge of the unloading of the racks on the carts of the fish wholesalers.’

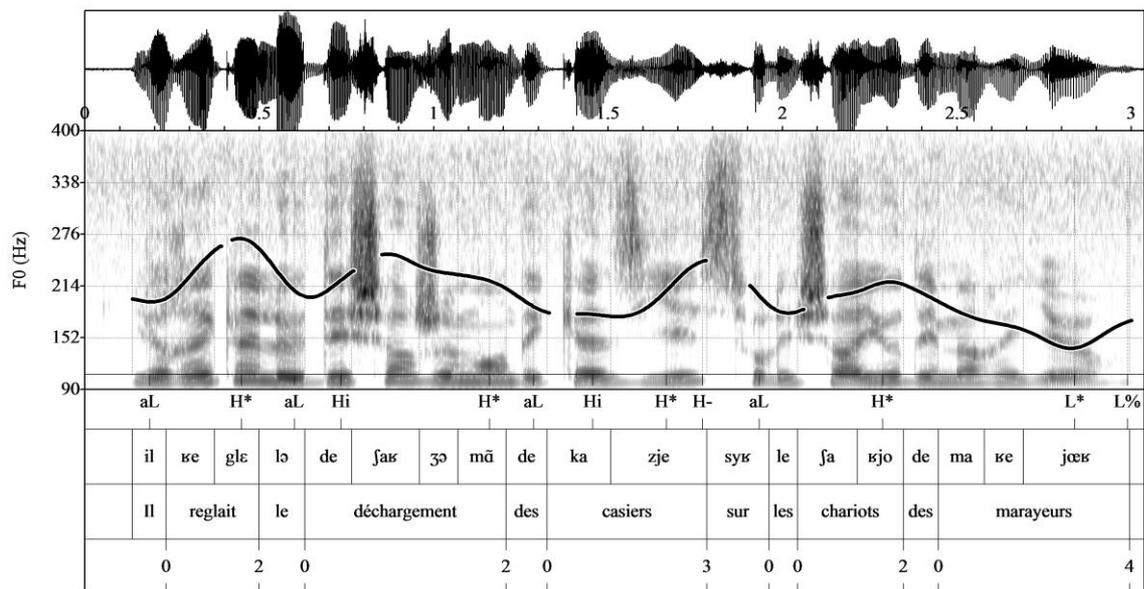


Fig. 3.5: waveform, spectrogram and F0 track of the utterance *Il réglait le déchargement des casiers sur les chariots des mareyeurs* ‘He was in charge of the unloading of the racks on the carts of the fish wholesalers.’ (from the EUROM 1 corpus).

In non final position, the most common ip-final boundary tone is high (H-): it occurs at the end of non-final elements in enumerations (see § 3.3.7), and at the right edge of non-final syntactic constituents (long subject or object NP as in Fig 3.3, 3.4 and 3.5 among others). The L- boundary tone occurs after a narrow focus XP in statements (see § 3.3.1.2),

but also in some enumerations with a list effect, the conjuncts being marked by a Hi on their very first syllable (see Fig 3.6).

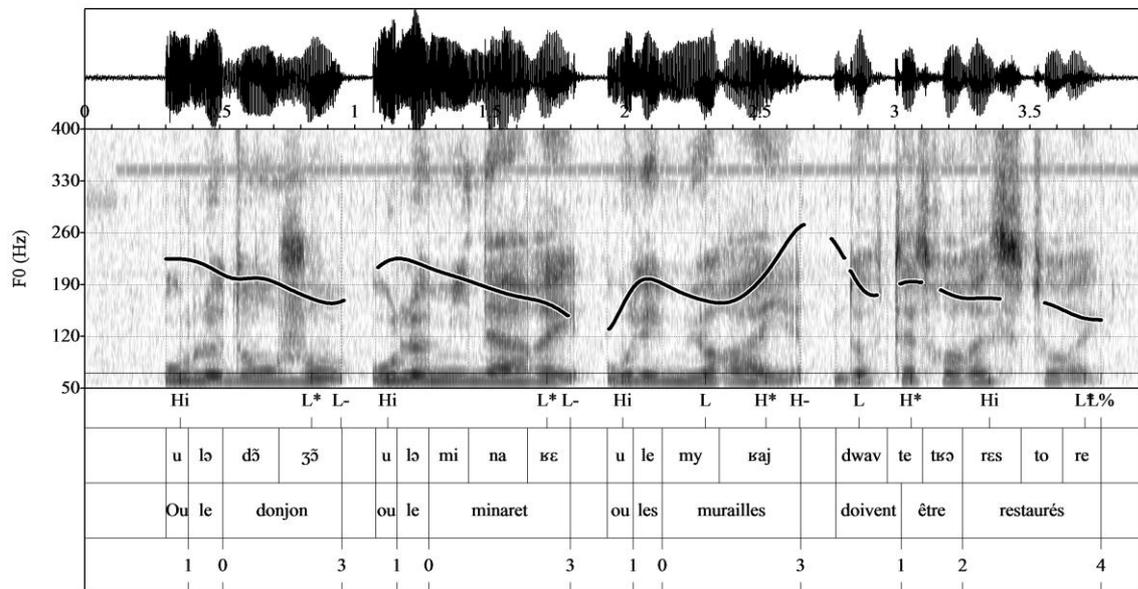


Fig. 3.6: Waveform, spectrogram and F0 track of the sentence *Ou le donjon ou le minaret ou les murailles doivent être restaurés* ‘Or the donjon or the minaret or the walls need to be restored’ produced by a female speaker from Paris (Conjunction Corpus, Pro-Gram project).

In addition, dependency constraints as pointed out by Delattre (1966) and especially Martin (1980, 1981, 2009) may lead to a realization of a continuation contour as falling (encoded L*L-). In Fig. 3.7, the pitch movement occurring at the end of the first ip (i.e., end of *Carcassonne*) is falling in order to be differentiated from the continuation rise H*H% realized at the end of *j’en ai ras le bol*.

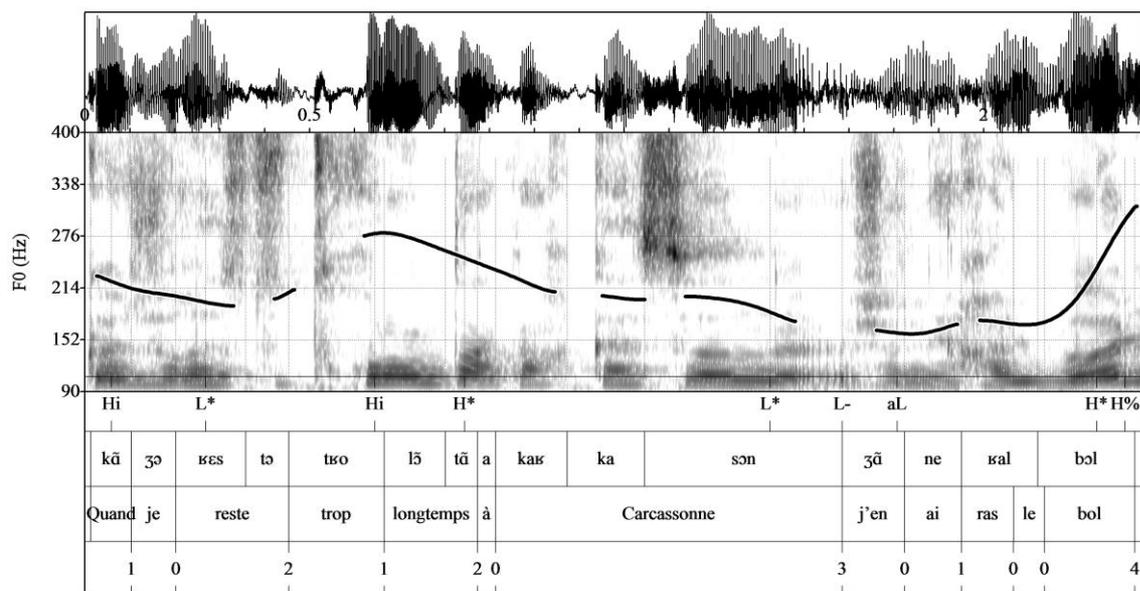


Fig. 3.7: Waveform, spectrogram and F0 track of the utterance *quand que je reste trop longtemp s à Carcassonne , j'en ai ras le bol...* ‘when I stay too long in Carcassonne, I get fed up’ produced by a speaker from Carcassonne (Southern variety). Extract from the ACSYNT corpus.

The boundary tones occurring at the end of Intonational Phrases play a role in signalling the modality of the utterance, even if there is no one-to-one relation between form and function (see among others Delattre 1966; Martin 1981; Di Cristo 1998 and Post 2000). In F_ToBI, these IP final boundary tones are generally either high or low, which is encoded respectively with the labels H% and L%.

3.1.3 Summary: Phrasing, Break Indices and Tonal primitives in F_ToBI

This section summarizes the various labels that have been chosen to develop F_ToBI on the basis of previous studies. Concerning phrasing, three levels of structuring are distinguished: the Accentual Phrase, the Intermediate Phrase and the Intonational Phrase. Following general ToBI conventions, the degree of juncture between words and phrases is encoded by means of break indices which are given after every word (function word or lexical word). ‘0’ is used for any juncture smaller than a lexical word final boundary (i.e., between a clitic and a lexical

word, or between two clitics), ‘1’ is for the juncture corresponding to a lexical word boundary within an Accentual Phrase (i.e., between two lexical words), ‘2’ is for the juncture corresponding to an AP boundary, ‘3’ is for the juncture corresponding to an Intermediate Phrase (ip) boundary, and ‘4’ is the juncture corresponding to an Intonation Phrase (IP) boundary.

As for the tonal labels that are used on the tonal tier in F_ToBI, they have been chosen in such a way as to allow transcribing all the distinctive tonal forms that can be observed, and to achieve a surface-transparent transcription system. Two distinct labels are used for the pitch accents: H* and L*. In addition, the edge tones may be either rising (H- and H%) or falling (L- and L%). In some positions mentioned in the introduction, however, these labels are chosen to refer to tonal events that can be interpreted to be allophonic variants (to encode syntactic dependency relations, for instance). These basic labels have been used to transcribe the data presented in section 3.2. Note however that a few additional labels will be introduced in section 3.3 to account for some nuclear configurations presented there.

3.2. Methodology

The data used to develop F_ToBI were gathered by means of a Discourse Completion Task (henceforth DCT, see Blum-Kulka et al. 1989). The French questionnaire for the DCT is based on the questionnaire initially used for Catalan (see Prieto 2001) and includes twenty-nine situations that were common across languages.

The data were collected in nine distinct locations that were chosen in such a way as to obtain a minimum of two locations for the different varieties of French spoken in the three major linguistic areas (Oïl, Occitan and Franco-Provençal): four locations located in the area where the *Oïl* dialects were originally spoken; three locations for the Southern varieties which

developed in contact with *Occitan*, and two locations from the East, which have *Franco-Provençal* (or *Arpitan*) as a substrate. The repartition is given in table 3.1.

Linguistic subgroups of Romance varieties	Locations belonging to each subgroup
Franco-Provençal area	Fribourg (CH), Geneva (CH)
Occitan area	Toulouse (F), Lacaune (F), Marseille (F)
Oïl area	Paris (F), Orléans (F), Lille (F), Louvain-la-Neuve (B)

Table 3.1: Locations belonging to the three areas of Romance varieties.

Here, CH = Switzerland, F = France, B = Belgium.

These locations also represent various European countries where French is spoken: one location for Belgian French (Louvain-la-Neuve), two locations for Swiss French (Fribourg and Geneva) and six locations for Metropolitan French, among which three for the North of France (Lille, Orléans and Paris), and three for the South (Lacaune, Marseille and Toulouse). These nine locations and the three subgroups of Romance varieties are shown on the map (Fig.3.1).

The number of speakers recorded in a given location varies greatly (from one to forty speakers); but the number of speakers examined for the present study in each location ranges between one and five, as shown in table 3.2.

<i>Oïl area</i>		<i>Franco-Provençal Area</i>		<i>Occitan Area</i>	
Location	Number of speakers	Location	Number of speakers	Location	Number of speakers
Lille	5 speakers	Fribourg	1 speaker	Lacaune	5 speakers
Louvain-la-Neuve	1 speaker	Genève	1 speaker	Marseille	3 speakers (twice the same item)
Orléans	2 speakers			Toulouse	4 speakers
Paris	4 speakers				

Table 3.2: Numbers of recorded speakers examined in each locations

During the recording sessions, the twenty-nine situations from the questionnaire were presented orally by the interviewer to the speaker, who then produced the sentence he or she would use in such situations. In Marseille, this procedure was done twice so that two utterances were analyzed for each speaker and for each situation. When the recording was

achieved, the participants of the F_ToBI working group in charge of a specific location selected from the data they gathered one or two samples for each of the twenty-nine situations presented in the questionnaire. Two elements prevail in the selection of the sample: (i) it should be one of the best samples to represent a given variety; and (ii) the quality of the audio file should be optimal. After the selection procedure, a set of two hundred ninety utterances (one utterance per location for each situation from the DCT, except for Marseille where two utterances were taken into account because of the repetition) was analysed to develop the F_ToBI system. All sound files presented in the figures are available at the *OUP Companion webpage*.

Using *Praat* (Boersma & Weenink 2012), a textgrid with two basic tiers (i.e. words and syllables) was created for each utterance. Then, for each location, two participants from the F_ToBI working group were designated to carry out the ToBI labelling. To do so, they inserted a tonal and a break index tier and used primarily the labels and break indices derived from previous studies on French intonation (see 3.1.2). However, when the labels did not allow them to transcribe a tonal pattern observed in the data, new symbols were proposed, which were subsequently discussed with the co-authors, and when necessary, they were added to the final inventory (as given in 3.3.8). As in other ToBI systems, the tonal labels are associated with the accented syllables (Hi and T*) and the boundaries of prosodic phrases (aL, T- and T%).

Some tonal patterns, which were described in previous studies on French prosody, did not occur in the gathered data, since the protocol did not allow eliciting words with a sufficient number of syllables and sentences with a relatively complex syntactic structure. So, additional data was used to describe these patterns. This data consisted either in utterances extracted from a published speech corpus (ACSYNT, Choi-Jonin and Delais-Roussarie 2006;

EUROM 1, Chan et al. 1995) or in experimental scripted data that were recorded by some of the authors while working on specific aspects of French intonation.

3.3 Intonation and phrasing

In this section, we present the main characteristics of the tonal patterns observed in the seven grammatical constructions that are covered throughout this volume: statements, exclamatives, yes/no-questions, wh-questions, imperatives, vocatives, and enumerations and disjunctions. In addition, when necessary, information on the morphosyntactic and lexical features is given.

Special attention is given to the nuclear contour, which refers to the final pitch accent and the following boundary tone of the construction under investigation. Note however that French intonation is different from other Romance languages in that the IP (and ip) is not directly composed of a sequence of pitch accents but a sequence of APs. So, the prosodic unit that governs a pitch accent is not an IP, but an AP.

As far as dialectal variation is concerned, differences in the intonational patterns observed in the various varieties are described when necessary. However, when no differences occur, the utterances given to represent a specific configuration are chosen mostly on the basis of the quality of the speech signal.

3.3.1 Statements

Traditional analyses of French intonation have always described statements as characterized by a falling contour (see, among others, Delattre 1966; Martin 1981; Di Cristo 1998).

However, the exact location of the falling tonal movement is related to the ground/focus articulation (see among others Di Cristo et al. 1999; Delais-Roussarie and Rialland 2007). In the following subsections, the intonation patterns of broad-focus, narrow-focus, and epistemically-biased statements will be described.

3.3.1.1 Broad focus statements

In all varieties of French, broad-focus statements are characterized by a falling contour at the end of the last IP in the utterance. The fall is realized on the last AP and is encoded by an L* pitch accent. The falling movement starts from a previous H tonal target that is either associated with the H* pitch accent from the previous AP, or with an initial rising movement Hi. In Fig. 3.8 and 3.9, the falling contour is preceded by an initial rise Hi that is associated with the initial syllable of the last lexical word *banane*. The prenuclear APs are all characterized by a rising movement aL H*. The realizations observed for this sentence type did not display intonational differences between the varieties. Note however that the phrasing did differ, but these differences were not related to dialectal variation: in Fig. 3.8, the verb *mange* and its direct object are phrased in the same AP, while they are phrased separately in Fig. 3.9.

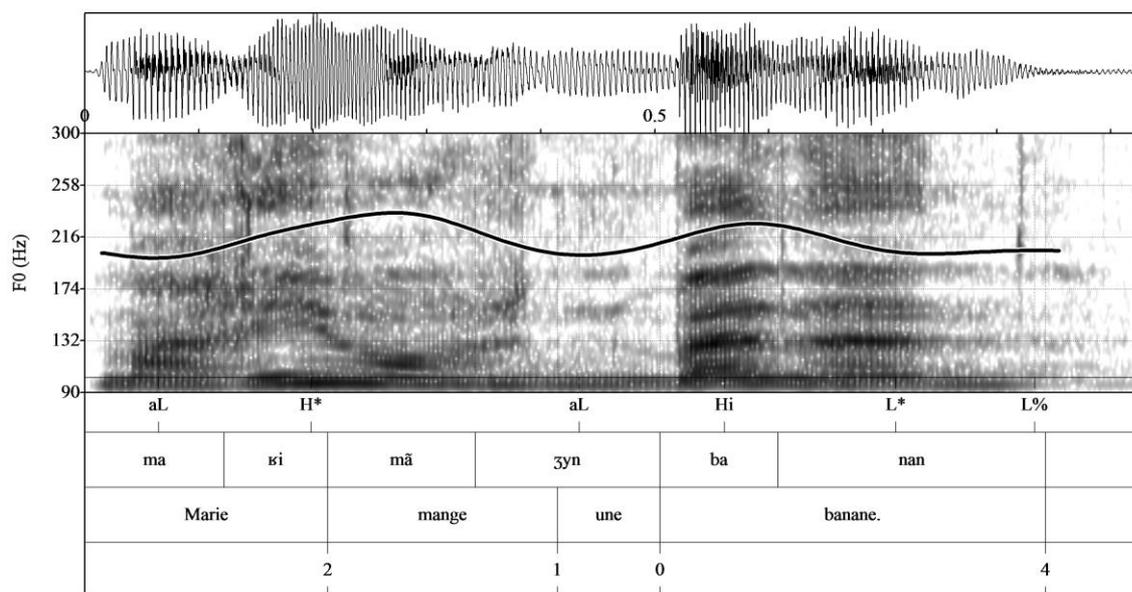


Fig. 3.8: Waveform, Spectrogram and F0 track of the sentence *Marie mange une banane* ‘Marie is eating a banana’ produced by a speaker from a southern variety (Toulouse).

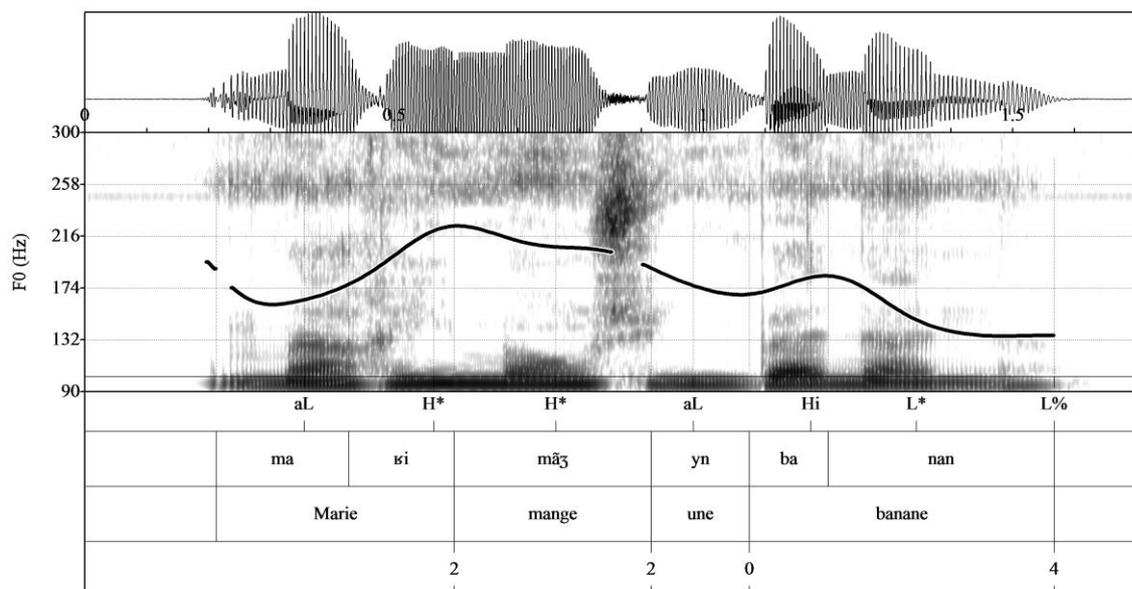


Fig. 3.9: Waveform, spectrogram and F0 track of the broad-focus statement *Marie mange une banane* 'Marie is eating a banana' produced by a speaker from a southern variety (Marseille) and segmented in three APs.

3.3.1.2 Contrastive narrow focus statements

In French, cleft constructions are often used to express contrastive narrow focus as shown in (5), but other constructions such as (6) are also possible to express narrow focus. In both cases, the intonation pattern used in our data is the same: a rising F0 movement, which can have a large pitch excursion, is realized on the initial syllable of the word in contrast⁸ (e.g., in Fig. 3.10 and Fig. 3.11, on the initial syllable [zo] from *des oranges*, where a liaison occurs between the determinant *les* and the noun *oranges*), followed by a pitch accent and an ip or IP boundary tone that are both realized in a reduced pitch range (respectively L*L- or L*L%). The postfocal sequence, i.e. the non-clefted part, is then realized as a low plateau that reaches its lowest level at the end of the utterance. The initial rising F0 movement due to contrastive focus is labelled Hi, and follows the aL AP-initial boundary tone that generally occurs at the left edge of APs. Thus, in all varieties, the contour used to express narrow focus statements is represented as Hi L* L-, the postfocal sequence being encoded L* L%.

(5) Non, ce sont des oranges que je veux

[[{(ce sont des oranges)_{AP}}_{ip}]{(que je veux)_{AP}}_{ip}]_{IP}

'It is some oranges that I want'

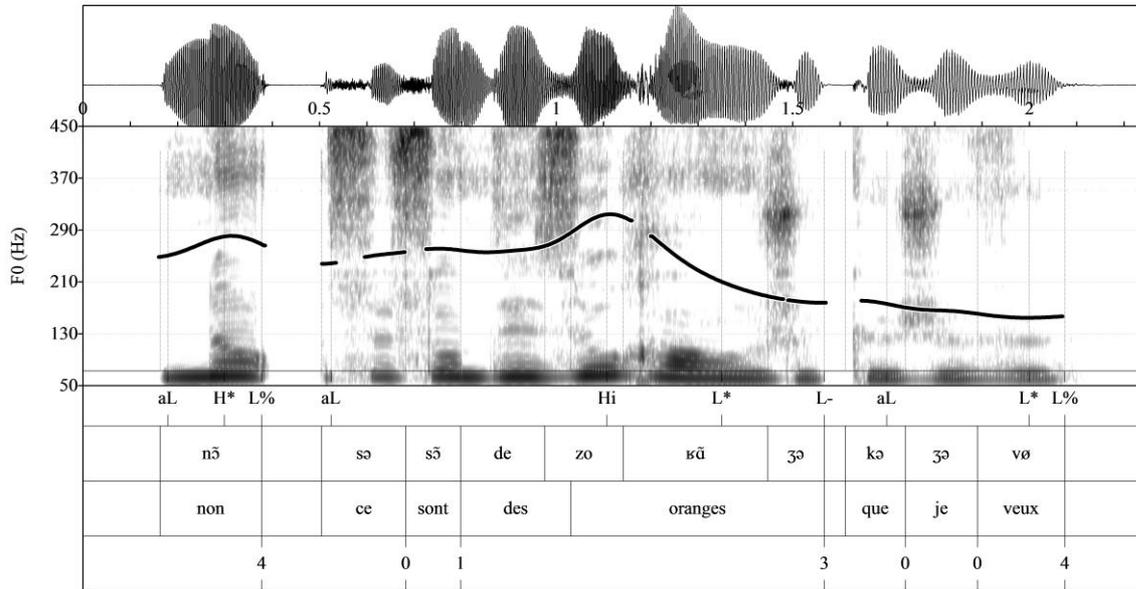


Fig. 3.10: Waveform, spectrogram and F0 track of the narrow-focus statement *Non, ce sont des oranges que je veux* 'It is some oranges that I want' produced by a speaker from a southern variety (Marseille).

(6) Je voudrais des oranges, s'il vous plait Madame.

[[{(je voudrais)_{AP} (des oranges)_{AP}}_{ip}]{(s'il vous plait)_{AP} (madame)_{AP}}_{ip}]_{IP}

'I want some ORANGES, please, Madam'

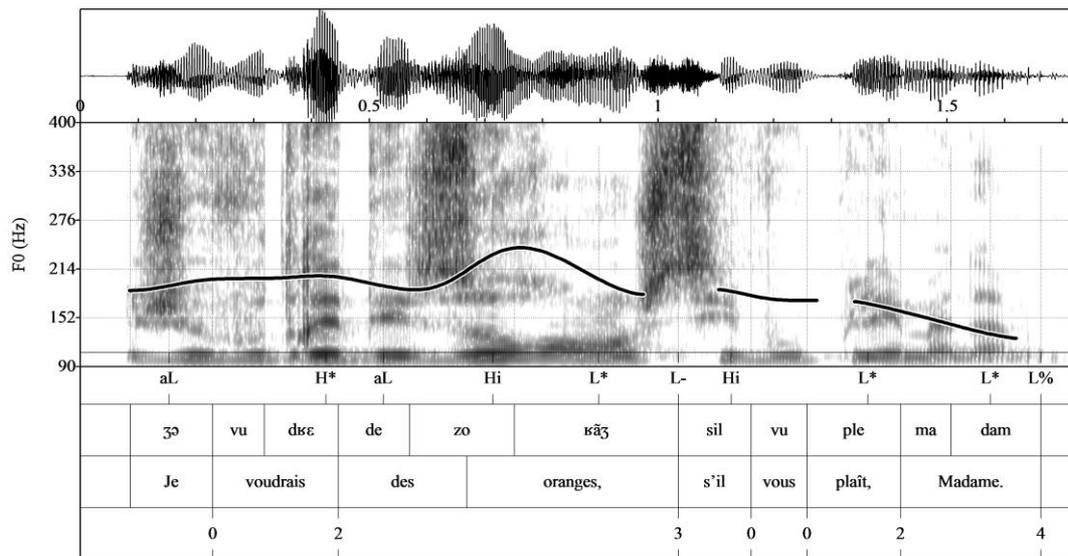


Fig. 3.11: Waveform, spectrogram and F0 track of the narrow-focus statement *Je voudrais des oranges s'il vous plaît, Madame* 'I want some ORANGES, please, Madam' produced by a speaker from a Northern Variety (Lille).

3.3.1.3 Epistemically-biased statements

Biased statements are defined here as statements which convey information about the attitude of the speakers. They can express doubt, obviousness, etc. The presence of a bitonal pitch accent is very frequent in the nuclear configuration of these statements, which contrasts with what is observed for other types of statements and forces us to add two more pitch accents to the initial inventory (see § 3.1.2)

In contradiction statements, i.e. when a speaker is categorically sure of what he says and knows that the hearer does not have the same opinion, a rising-falling contour is used in all varieties. It consists of a rise on the penultimate followed by a fall to mid. It is encoded by a H+!H* pitch accent followed by a !H% boundary tone. These two tonal elements are added to the inventory given in 3.1.2. In Fig. 3.12, the nuclear contour associated with the AP à *Limoges* has the form aL H+!H* !H%.⁹ The prenuclear AP is of the form aL H*. For this utterance, there appears to be no distinction between the different varieties.

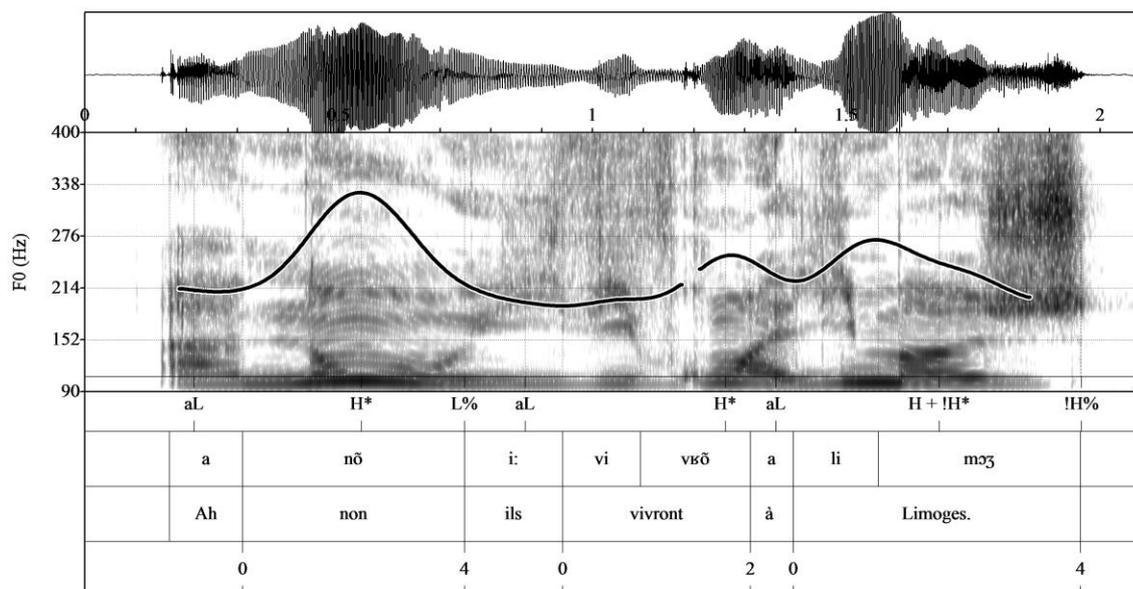


Fig. 3.12: Waveform, spectrogram and F0 track of the contradiction statement *Ah non, ils vivront à Limoges* 'No, they will live in Limoges', with which a speaker from Orléans (Northern variety) contradicts her interlocutor.

When a speaker considers the propositional content of the utterance to be obvious, he usually uses a rising or rising-falling contour. The rising-falling contour can take different forms, varying along two dimensions:

(i) the rising movement can be realized on the final syllable (H*), as in Fig. 3.13, or on the final two syllables (H+H*), as in Fig. 3.14.

(ii) the final movement may be rising (H%), as in Fig. 3.13, or falling, either to a low (L%), as in Fig. 3.14, or to a mid level, which makes it necessary to add the !H% boundary tone to the inventory given in section 3.1.2. the falling part may be a fall to low, as in Fig. 3.14, or may surface as a fall to mid. The latter will be encoded by a !H% boundary tone;

The choice between the realizations depends on the speaker and the variety. Note however that rising or a rising-falling to mid is more frequent in the Northern varieties, whereas a falling to low is more common in the Southern varieties in contact with Occitan (Lacaune, Toulouse), especially when spoken by older people (see Sichel-Bazin et al. 2012).

The contour in Fig. 3.13 consists of a rise on the accented syllable H* followed by a H% boundary tone (i.e. a rising contour), the penultimate syllable *ju* being lengthened.

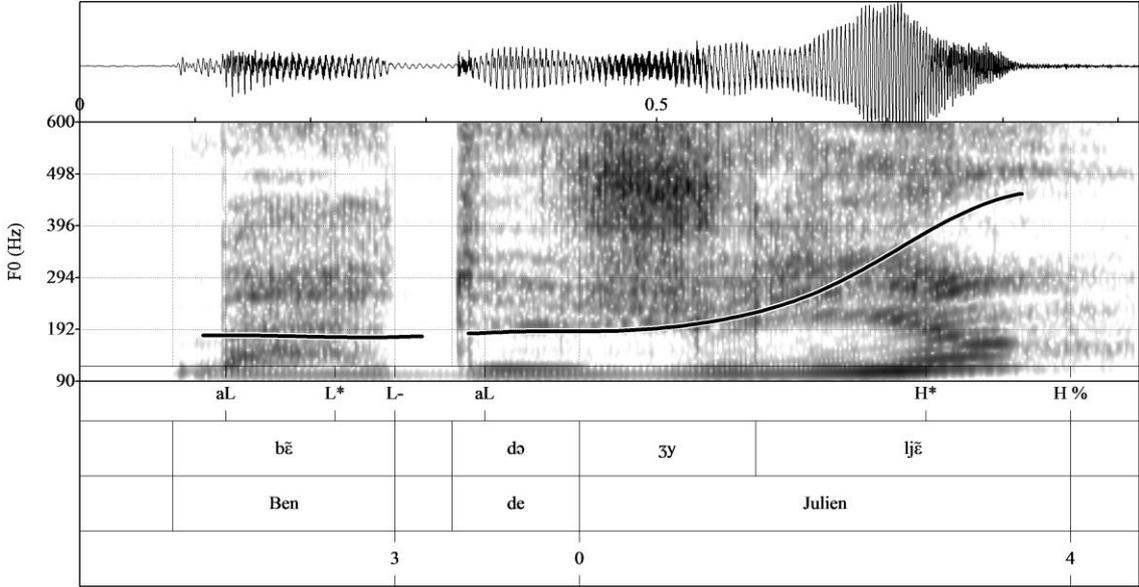


Fig. 3.13: Waveform, spectrogram and F0 track of the statement of the obvious *Ben, de Julien!* ‘ben from Julien’ produced by a speaker from a Northern variety (Orléans)

In Fig. 3.14, the rising part of the rising-falling movement is clearly realized on the final two syllable, with a H+H* pitch accent indicating a rise on the penultimate, and followed by a falling boundary tone (L- or L%). The contour is thus of the form H+H* L%.

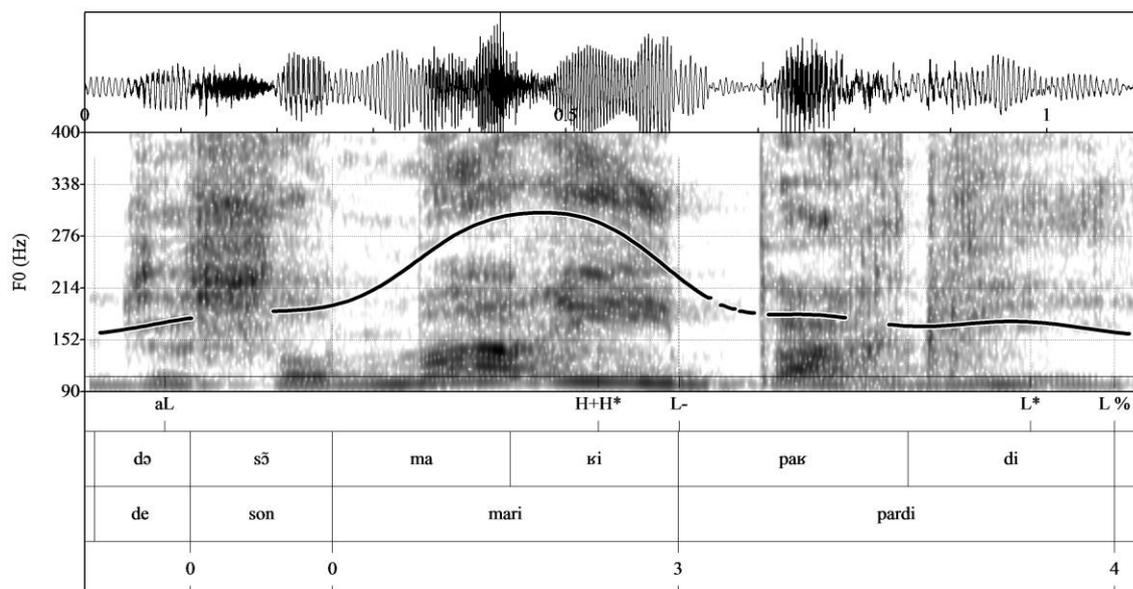


Fig. 3.14: Waveform, spectrogram and F0 track of the statement of the obvious *De son mari, pardi!* ‘From her husband, of course’ produced by a speaker from a southern variety (Lacaune)

3.3.2 Exclamatives

In French, the exclamative value of a clause is usually signalled by the presence of certain lexical items which enforce an exclamative interpretation of the utterance, and distinguish the exclamative from a statement or a question. Examples of such lexical items are adverbs (*si, tellement*), complementizers (*comme, que, etc.*), adjectives, and wh-determiners. In many cases, the use of such words is also linked to the presence of a verb, a noun or an adjective that is compatible with an expression of scalarity (see, among others, for a review Marandin 2010).

From an intonational point of view, exclamation is expressed in all varieties by a nuclear contour (L) H* L% which is associated with the last word of the exclamative sentence. The rising pitch accent may reach the top of the speaker’s range, but this is not obligatory. In addition, an initial rise Hi is realized at the beginning of the utterance, either on the exclamative lexical marker (*qu’est-ce que, que, comme, etc.*), which may also receive an

additional H* pitch accent if it is accentable, as shown in Fig. 3.15, or at the left edge of the IP.

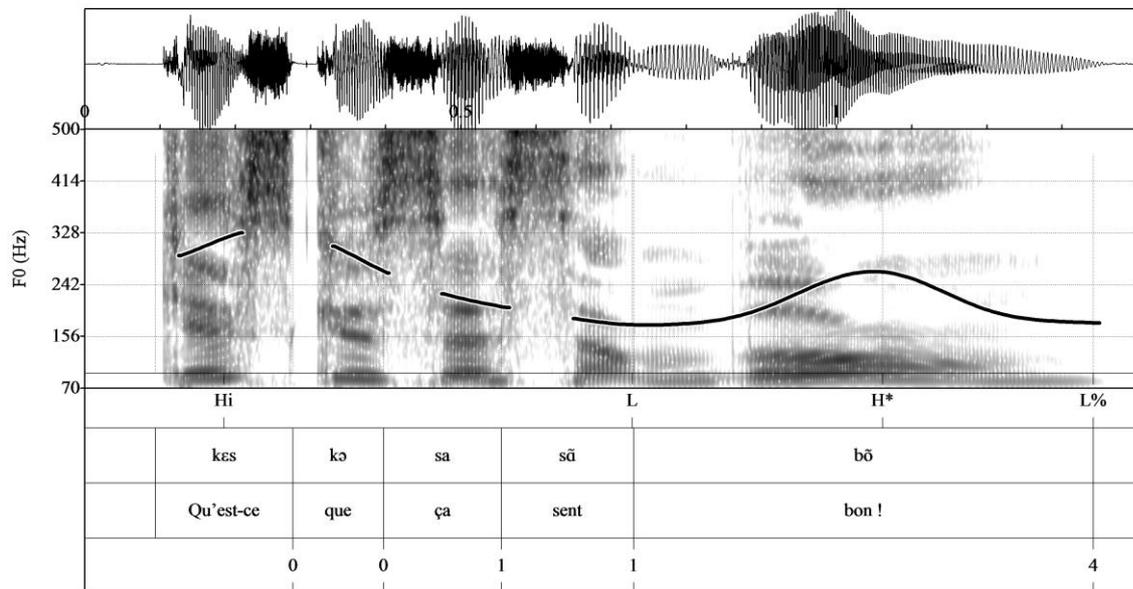


Fig. 3.15: Waveform, spectrogram and F0 track of the exclamative clause *qu'est-ce que ça sent bon !* 'what a nice smell !' produced by a speaker from a southern variety (Marseille).

3.3.3 Yes-no questions

Yes-no questions, also called polar questions, are questions whose defining characteristic is the fact that the expected answer is either 'yes' or 'no'. Before describing the intonation contours observed in different types of yes-no questions in various varieties of French, it is important to make some brief observations about the morpho-syntactic structure of these questions in French. As shown in (7), three distinct syntactic forms may be used: declarative word order without subject inversion (7a), interrogative forms with subject inversion (7b), and forms that start with an interrogative particle *est-ce que* (7c). Note however that the declarative form seems to be more frequent in echo yes-no question and in confirmation seeking questions.

- (7) a. Il est là ? 'He is here?'
 b. Est-il là ? 'Is he here?'

c. Est-ce qu'il est là?

3.3.3.1 Information-seeking yes-no questions

Information-seeking questions may be construed with no specific morpho-syntactic marker (i.e. subject inversion, interrogative markers, etc.), as in declarative question (7a). In this case, the intonation contour often plays a crucial role in allowing to distinguish the question from a statement or an exclamative. A rising contour $H^* H\%$ has often been observed in the data, as shown in Fig. 3.16. The high target at the end of the IP ($H\%$) may be very high (i.e. upstepped) or not; but neither one of these realizations is contrastive, nor are they linked to a specific variety. So the F_ToBI notation for this nuclear configuration is thus $H^*H\%$. In addition, in yes-no questions, prenuclear APs are generally realized in an overall rising intonation ($aL H^*$). If the nuclear AP presents an aL boundary tone, which is not obligatory, it is generally anchored with the left edge of the nuclear lexical item, so that other lexical words may appear without any tonal specification between the last prenuclear accent and the nucleus. Due to this, prenuclear peaks may sometimes be slightly delayed to the next syllable (see Fig. 3.17 or 3.19, for instance). Moreover, an L tone may be inserted before a final rising nuclear pitch accent even if there is no preceding H_i , contrarily to what happens in statements (see Fig. 3.17 or 3.19).

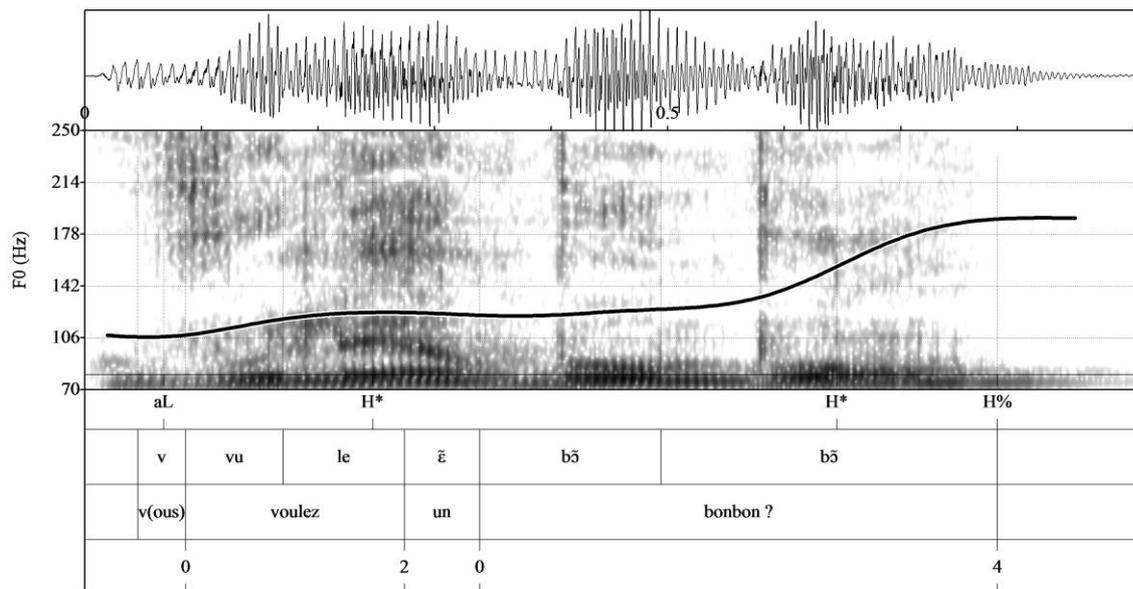


Fig. 3.16: Waveform, spectrogram and F0 track of the neutral yes-no question *Vous voulez un bonbon ?* ‘Do you want a sweet?’, produced by a Swiss speaker from Geneva.

In declarative yes-no questions, the Swiss speakers sometimes use a distinct contour, which consists of a rising-falling patterns of the form H* L% as shown in Fig. 3.17. Interestingly, the two forms H*L% and H*H% even occur in the speech of a single speaker, indicating that there is not only variation within the group but also intra-speaker variation. Further research is necessary to establish whether it is a free variant from the standard form H* H%, or a more polite form.

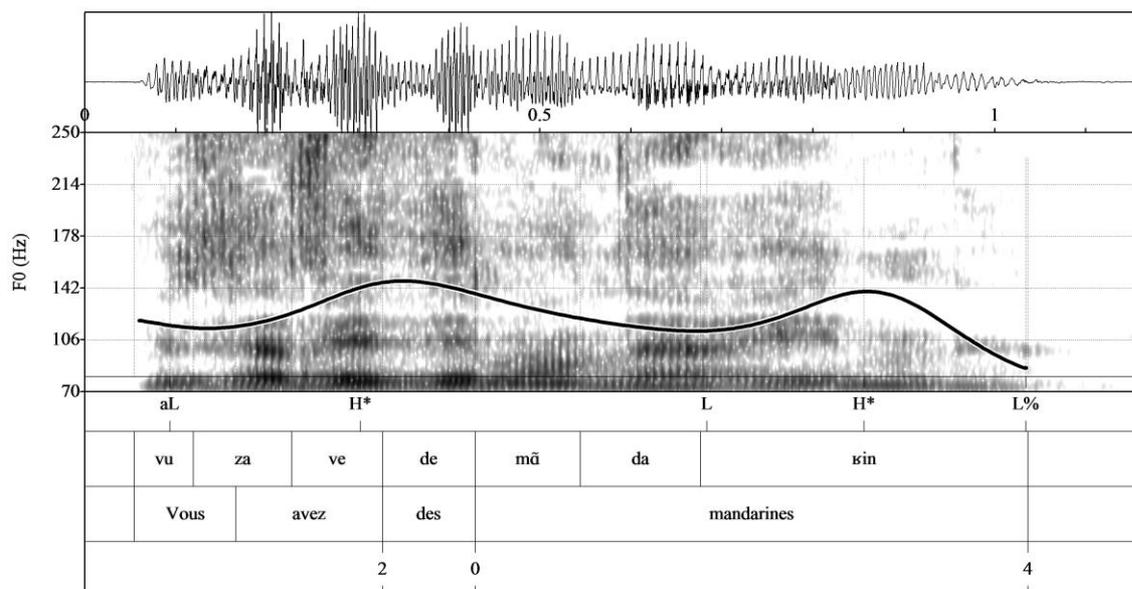


Fig. 3.17: Waveform, spectrogram and F0 track of the yes-no question *Vous avez des mandarines* ‘Have you got tangerines?’, produced by the same Swiss speaker from Geneva.

When lexical or morpho-syntactic markers are used in the question, the shape of the intonation contour is less stable: the final rise, indicated by the H% boundary tone, does not have to end at a very high pitch, as is shown in Fig. 3.18. In addition, it is preceded by a fall on the pitch accented syllable which is encoded by a L* pitch accent. This nuclear configuration is then of the form L*H%, and also occurs in questions expressing an order (see Fig. 3.20).

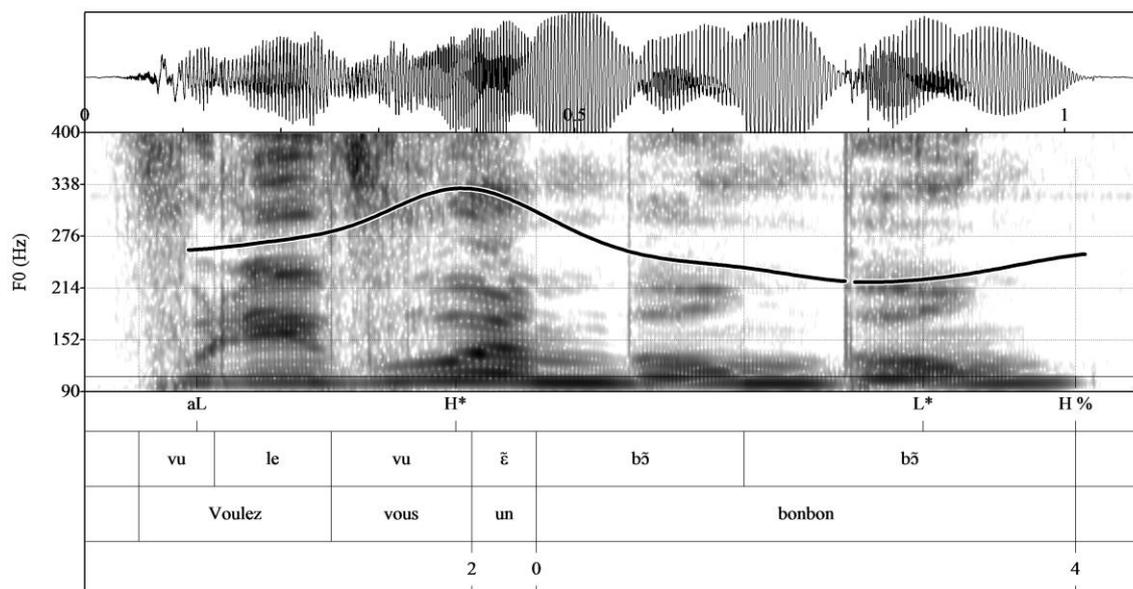


Fig. 3.18: Waveform, spectrogram and F0 track of the yes-no question with subject inversion *Voulez-vous un bonbon ?* ‘do you want a sweet?’, produced by a speaker from a southern variety (Marseille).

3.3.3.2 Imperative yes-no questions

Yes-no questions may be used to give an order. In these cases, the realizations obtained in all varieties are slightly different from information seeking questions. The difference relies especially on the presence of a fall and a lengthening on the penultimate syllable. In Fig. 3.19, the pitch contour falls after the H* pitch accent at the end of the prenuclear AP to reach a low point on the penultimate syllable (L), which, in addition, is lengthened. The nuclear configuration is then rising-falling LH*L%).

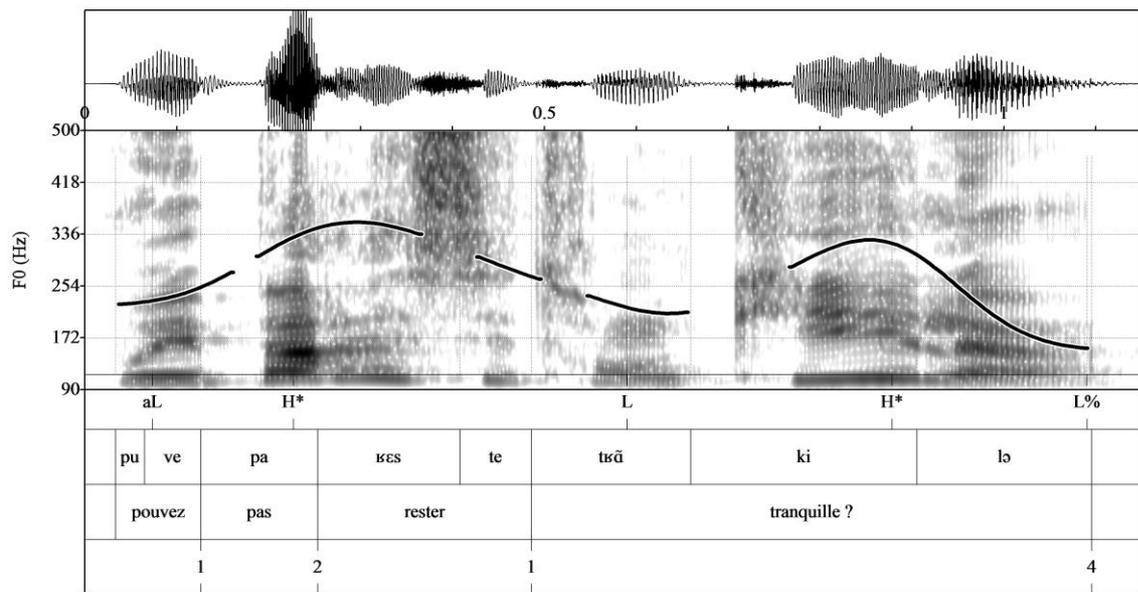


Fig. 3.19: Waveform, spectrogram and F0 track of the yes-no question ‘*vous pouvez pas rester tranquille?*’ ‘Can’t you stay quiet?’, produced by a speaker from a Northern variety (Lille), expressing a command.

Another nuclear configuration has been observed in questions expressing a command. It is also characterized by a fall and a lengthening on the penultimate. The fall reaches its lowest point on the last metrically strong syllable of the AP, which is encoded L*. The boundary tone is then rising. The nuclear contour is thus of the form L*H%, as shown in Fig. 3.20. Prenuclear accents in Fig. 3.19 and 3.20 are all H*.

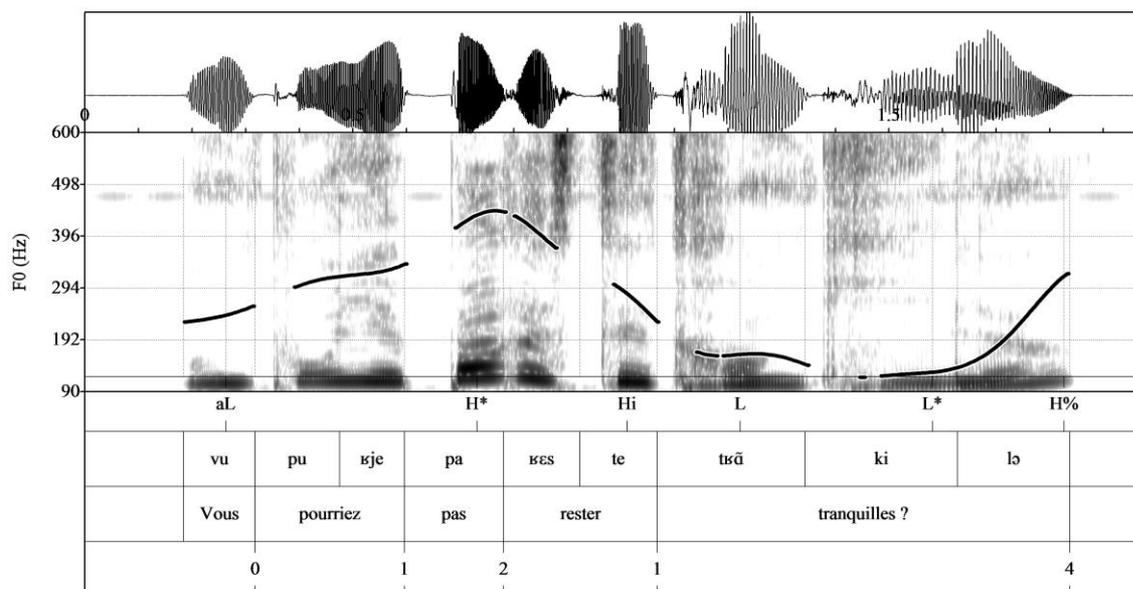


Fig. 3.20: Waveform, spectrogram and F0 track of the yes-no question *vous pouvez pas rester tranquille ?* ‘Couldn’t you stay quiet?’, produced by a speaker from a southern variety (Marseille), expressing a command

3.3.3.3 Echo yes-no questions

Echo questions are used in specific discourse contexts, when the speaker is not sure of what has been said or asked by the interlocutor. From a formal point of view, such a question is built with the same words as the original sentence and has a declarative structure.

- (8) A: Quelle heure est-il? ‘What time is it?’
 B: Une heure. ‘one o’clock.’
 A: Il est une heure? Is it one o’clock?

Such questions may just indicate that the speaker has not understood or heard what his interlocutor said or is not very sure about it, but they may also be used by the speaker to convey an opinion (such as surprise) about what has been said. When no specific epistemic or attitudinal stance is conveyed by the questions, the intonational pattern observed is generally the rising-falling contour L H*L%. It is thus different from what has been found in information-seeking yes-no questions. In Fig. 3.21, the rising-falling contour LH*L% is

realized on the syllable /nœʁ/, a H* pitch accent being realized on the last syllable of the prenuclear AP. This rising-falling contour has been observed in different varieties, with no clear geographical distinction.

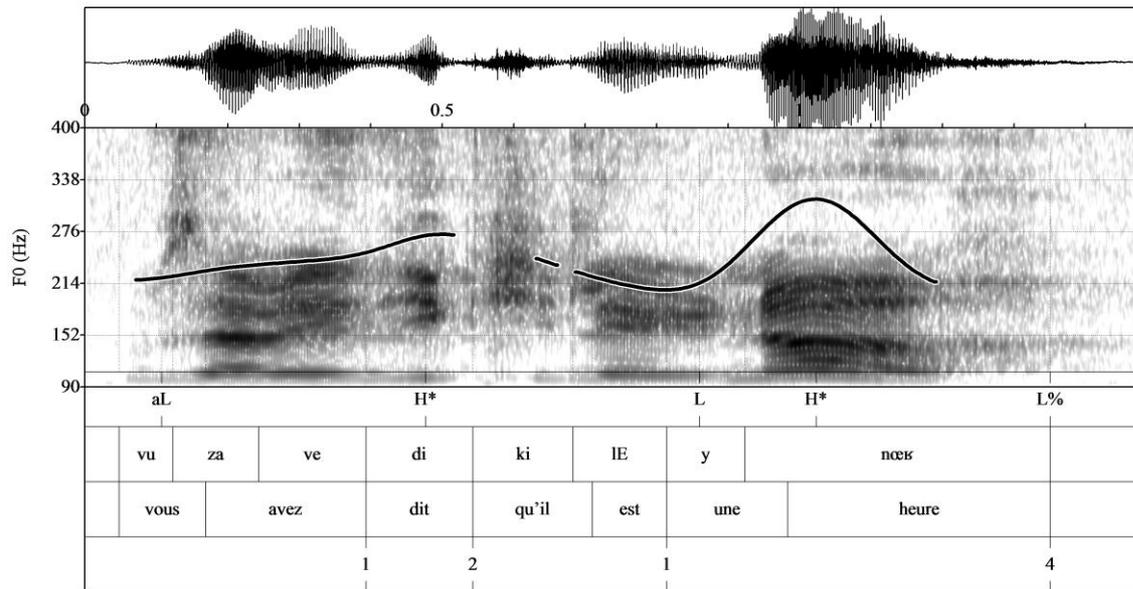


Fig. 3.21: Waveform, spectrogram and F0 track of the echo question *Vous avez dit qu'il est une heure ?* 'Did you say it was one o'clock?', produced by a Swiss speaker (Fribourg).

Echo questions may also be used to express incredulity, that is when the speaker wants to demonstrate that she or he is surprised by what was just said, or that she or he cannot believe it. In the latter case, the question is no longer truly a question. To express incredulity or disagreement about what has been said, the speaker uses a rising contour (encoded as H* H%), as shown in Fig. 3.22. The prenuclear APs are right-bounded by rising pitch accents H*. Note also that the penultimate syllable is often lengthened.

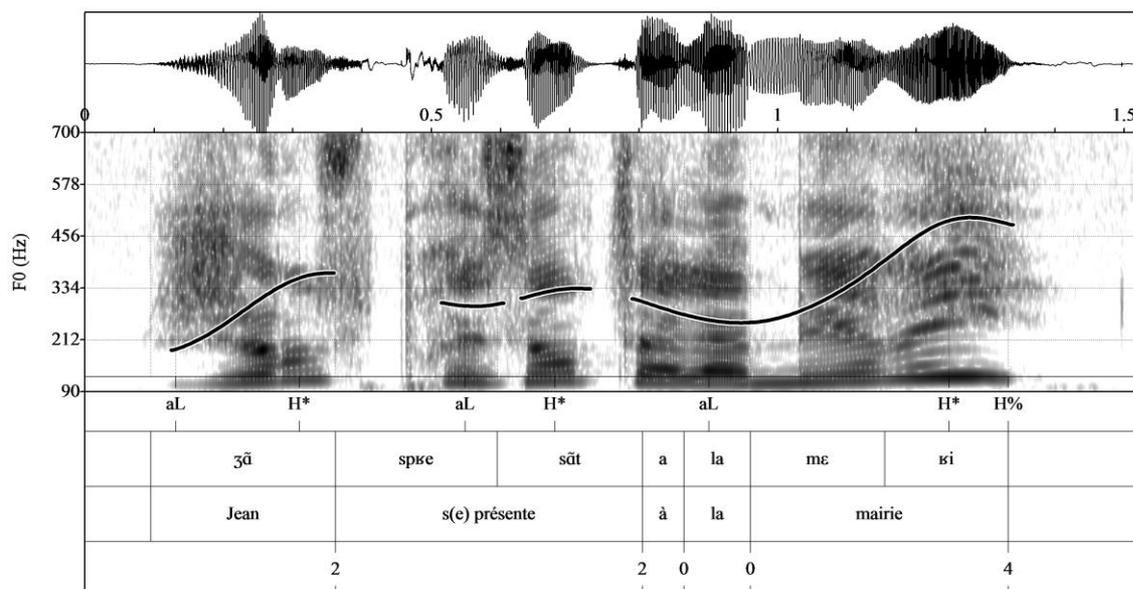


Fig. 3.22: Waveform, spectrogram and F0 track of the counterexpectational echo question *Jean se présente à la mairie?* ‘Jean is running for Mayor?’, produced by a speaker from a Northern variety (Paris)

3.3.3.4 Confirmation seeking yes-no question

Yes-no questions are also used to ask for confirmation or to express doubt (bias and ironical questions) or to give an order. The intonation pattern of confirmation-seeking questions is almost identical to what is observed in neutral yes-no questions (H* H%), but a lexical marker such as the adverb *bien* or the interrogative tag *non* is used, as shown in (9).

- (9) A: Je viendrais dîner demain, je pense. ‘I’ll come for dinner tomorrow, I think?’
 B: Tu viendras bien dîner ? ‘You are coming for dinner, aren’t you ?.’

In our data, the form of the contour was always rising (H* H%), as in information-seeking yes-no questions, but the final rise was always realized on the two AP final syllables, as shown in Fig. 3.23.

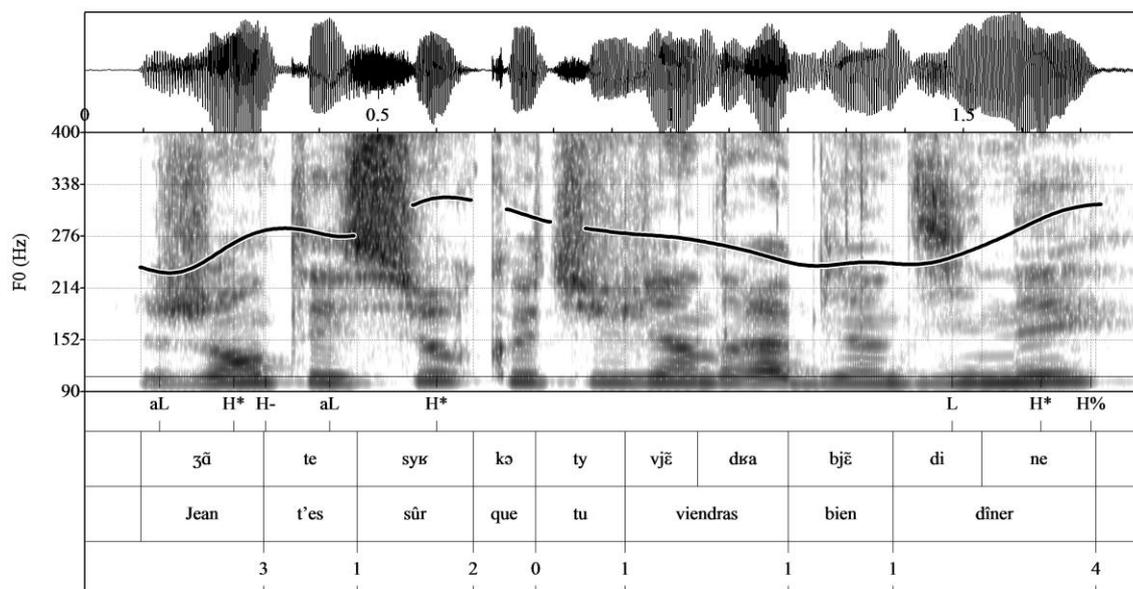


Fig. 3.23: Waveform, spectrogram and F0 track of the confirmation-seeking question *Jean, t'es sûr que tu viendras bien dîner?* 'Jean, you are sure that you will come for dinner?', produced by a speaker from a Northern variety (Orléans)

As the other question types, confirmation-seeking questions can be used to convey a specific meaning such as surprise or irony. In these cases, the contours observed in the various varieties are also mainly rising, as shown in Fig. 3.24. The H% boundary tone is sometimes upstepped, but further research will have to show if it is truly contrastive. The nuclear contour has thus been encoded H* H%.

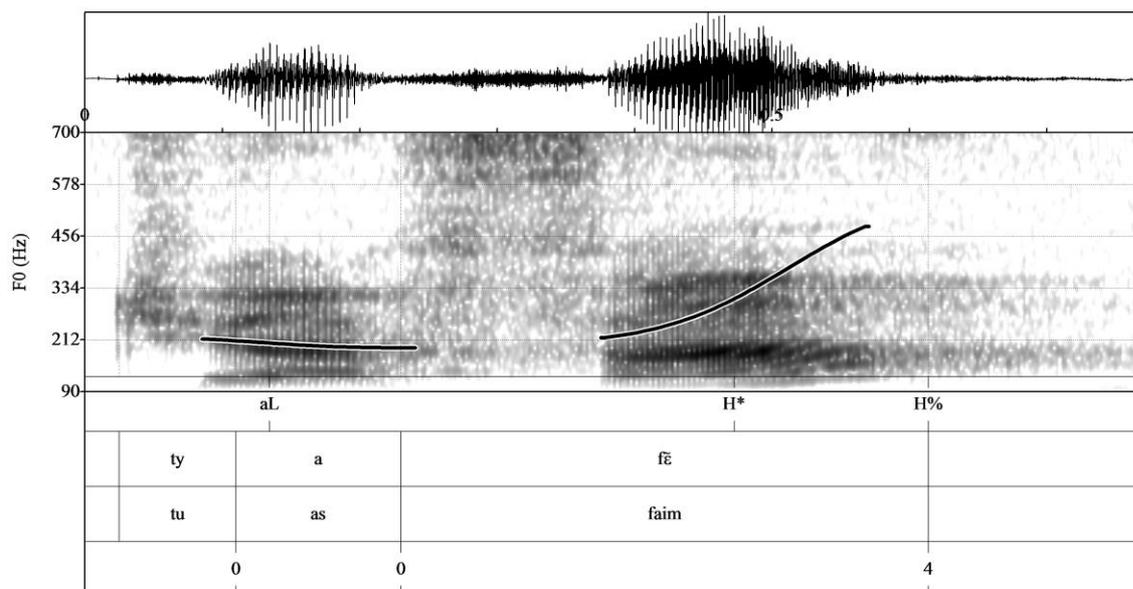


Fig. 3.24: Waveform, spectrogram and F0 track of the ironical yes-no question *Tu as faim ?* ‘Are you hungry?’, produced by a Swiss speaker from Fribourg.

3.3.4. Wh-questions

Wh-questions, which are also called partial or alternative questions, are delivered by four different syntactic forms in French: (i) the wh-word may be fronted and followed by a verb and an inverted subject, e.g., (10a); (ii) the interrogative marker *est-ce que* may be inserted between the wh-word and the rest of the sentence, with no subject inversion, e.g., (10b); and finally, (iii) the wh-word may appear in situ, that is, in the position where the related NP does normally appear, e.g., (10c); (iv) a fronted wh-word followed by the subject and the verb, without any inversion, e.g. (10d). According to several authors (Cheng & Rooryck 2000; Zubizarretta 2003), in-situ wh-questions are pragmatically distinct from fronted wh-questions, in particular, in calling for non-exhaustive answers. In this section, we will present two types of wh-questions: information-seeking wh-questions and echo wh-questions.

(10) ‘Where do you go?’

a. Où vas-tu ?

b. Où est-ce que tu vas ?

c. Tu vas où ?

d. Où tu vas ?

3.3.4.1. Information-seeking wh-questions

From an intonational point of view, information-seeking wh-questions are mostly marked by the presence of a rising movement associated with the wh-word or with one of the syllables of the wh-locution *est-ce que*. The latter is encoded Hi as in Fig. 3.25. When the wh-word is not a clitic (e.g. *qui, pourquoi, combien* etc.), it is possible to realize a H* pitch accent on its final syllable, as in Fig. 3.26. In wh-questions, the nuclear contour occurring at the end of the sentence is generally characterized by a fall (L*L%), as in Fig. 3.25. Other forms are nevertheless possible. In Fig. 3.26, for instance, the L* pitch accent is followed by a rising boundary tone H%. The variation occurring at the end of wh-questions is not contrastive.

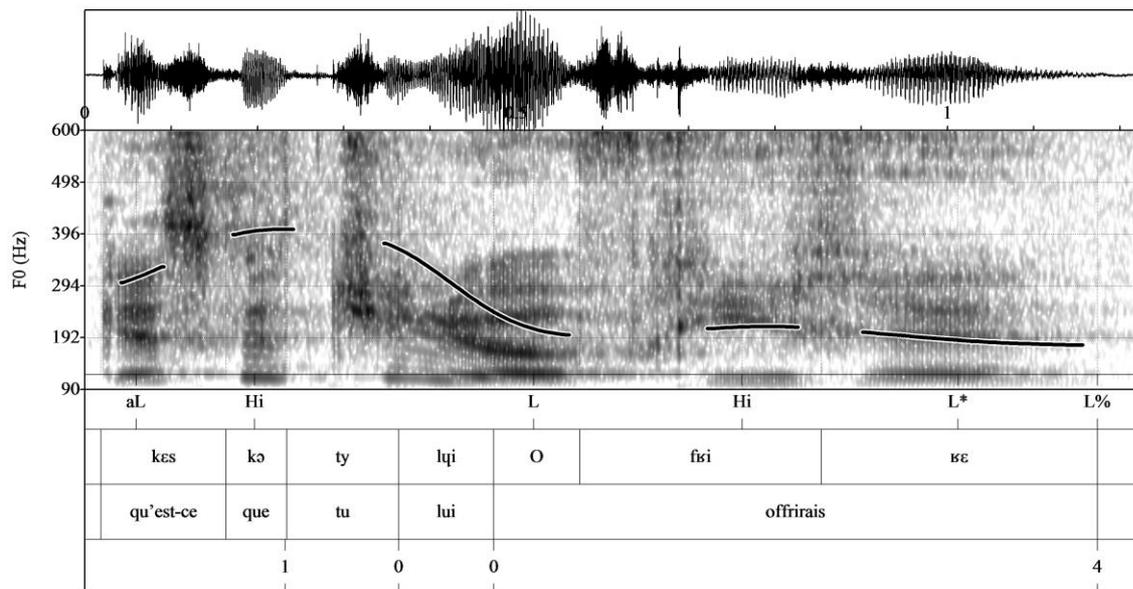


Fig. 3.25: Waveform, spectrogram and F0 track of the information-seeking wh-question *Qu'est-ce que tu lui offrirais* 'What would you offer her?', produced by a Swiss speaker (Fribourg).

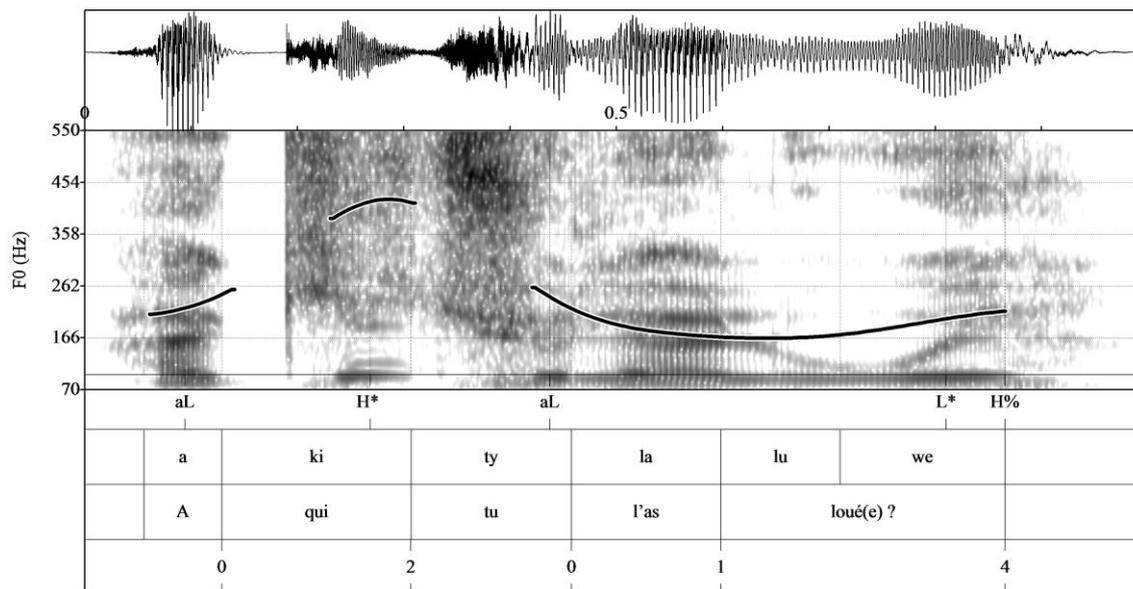


Fig. 3.26: Waveform, Spectrogram and F0 track of the neutral information-seeking wh-question *A qui tu l'as louée* 'To whom did you rent it?', produced by a speaker from a southern variety (Marseille).

When the wh-word is realized in situ, it is associated with the nuclear configuration, which is generally a rising contour of the form H* H% as in Fig. 3.27.¹⁰ Note also that the sentence is usually phrased in a single AP, even if it contains other lexical words that could be accented (e.g. *loué* in Fig. 3.27).

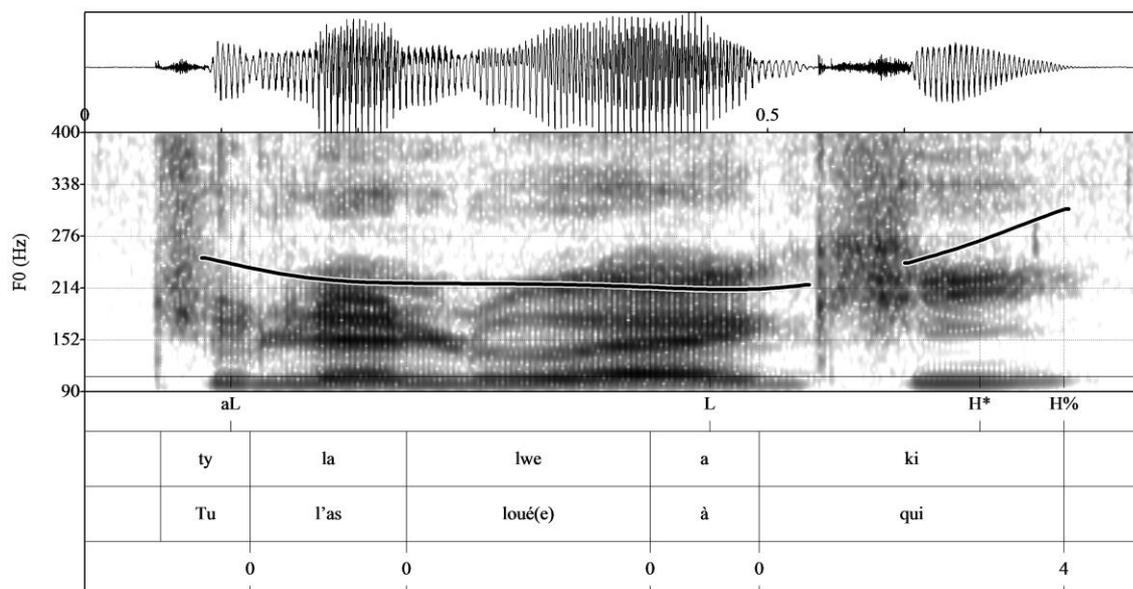


Fig. 3.27: Waveform, Spectrogram and F0 track of the information-seeking wh- question *Tu l'as louée à qui?* 'To whom did you rent it?' produced by a speaker from a Northern variety (Paris).

In some discourse contexts, wh-questions may convey a specific meaning and are not merely information-seeking. They may express the attitude of the speaker towards his interlocutor (e.g. giving him an order) or towards the propositional content of the question. In these cases, an initial rise is associated with the wh-words as in the other cases, but the final contour may be rising-falling or falling. In Fig 3.28, the wh-word is realized as an AP with a common rising pattern aL H*, and the nuclear contour is rising-falling (LH*L%). This contour is used by the speaker to show that he is disappointed by the attitude of his interlocutor(s).

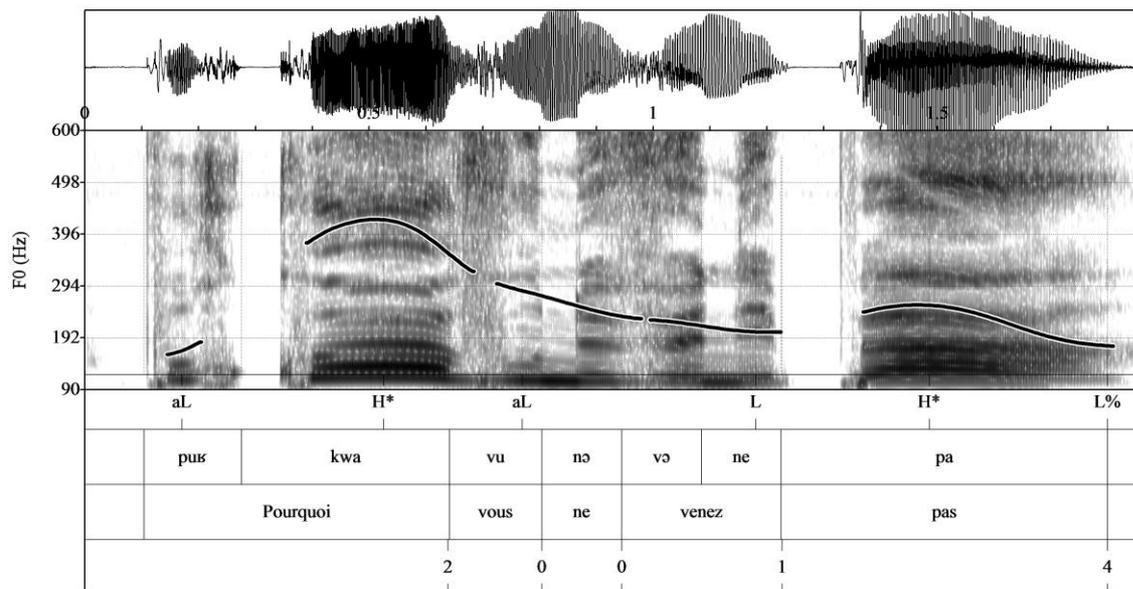


Fig. 3.28: Waveform, Spectrogram and F0 track of the biased wh-question *Pourquoi vous ne venez pas?* ‘Why don’t you come?’, produced by a speaker from a southern variety (Marseille).

In Fig. 3.29, the Hi is associated with the interrogative marker *est-ce que*, and the final contour is clearly falling L*L%. In our data, this pattern was observed in all varieties.

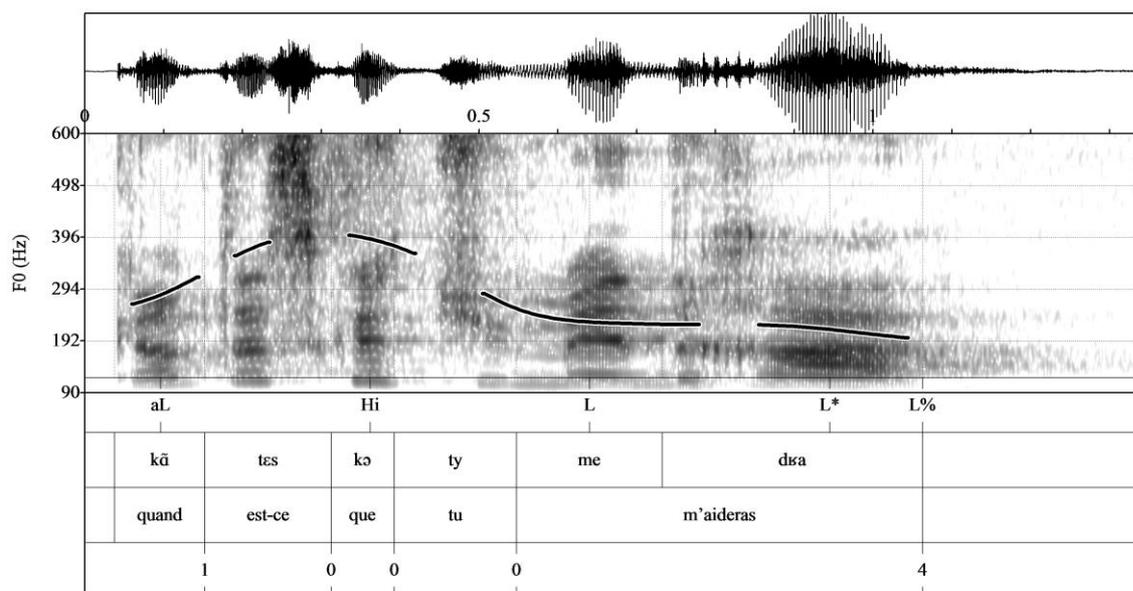


Fig. 3.29: Waveform, spectrogram and F0 track of the imperative wh-question *Quand est-ce que tu m'aideras?* 'When will you help me?', produced by a Swiss speaker (Fribourg).

3.3.4.2 Echo wh-questions

As said in section 3.3.3.2, echo questions are built with the same words as the original sentence, but their syntax is a bit different from other wh-questions in the fact that they never present subject inversion nor the question marker *est-ce que*. Pragmatically these questions are more comparable to yes-no questions, even if they may contain a wh-word: what is questioned in this case is the previously asked question as a whole (see (11)).

- (11) A: Vous habitez où? 'Where do you live?'
 B: Où j'habite? (You ask me) where I live?

Such questions may be neutral if the speaker has not understood what his interlocutor said or is not very sure about it, but they may also be used by the speaker to convey an opinion such as surprise about what has been said.

From an intonational point of view, two distinct nuclear contours were observed in the data: (a) a rising-falling contour, as observed in echo yes-no questions (see Fig. 3.23); or (b) a rising contour, as shown in Fig. 3.30.

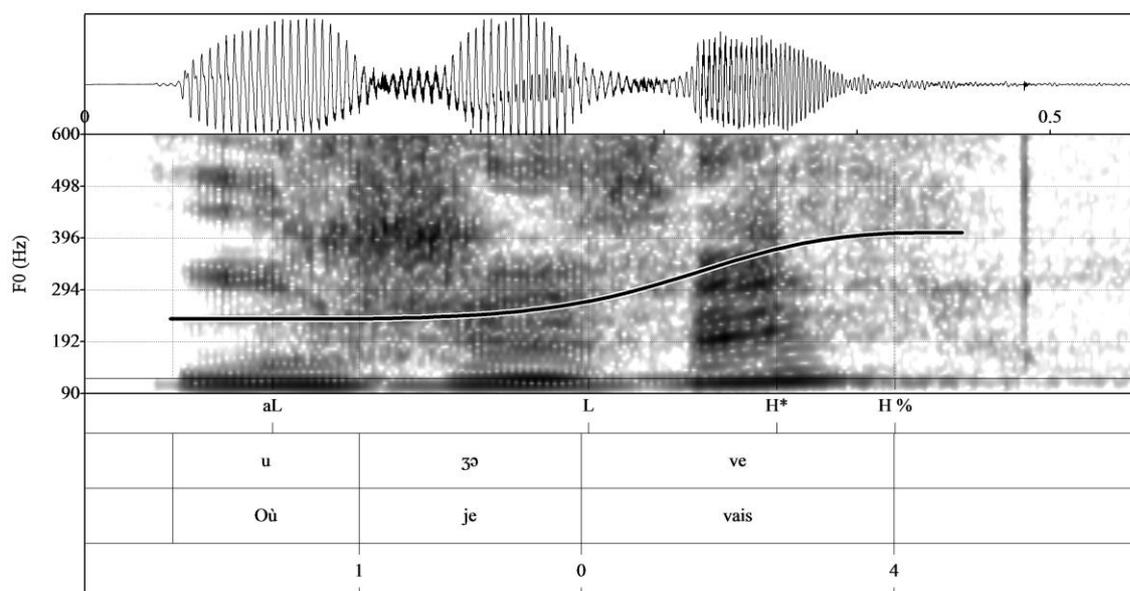


Fig. 3.30: Waveform, spectrogram and F0 track of the echo wh-question *Où je vais?* ‘where I go?’, produced by a speaker from a northern variety (Lille).

Echo wh-questions may also be used when the speaker wants to demonstrate that she or he is surprised by what was just said, or when she or he cannot believe it. In the latter case, the question is no longer truly a question.

When the speaker wants to express some form of surprise while repeating the question or statement that has just been uttered by the interlocutor, the nuclear contour consists of a rising contour (H* H%), as shown in Fig. 3.31. Note however that the penultimate is lengthened. The prenuclear AP consists of an initial rise Hi associated with the wh-locution and an H* pitch accent.

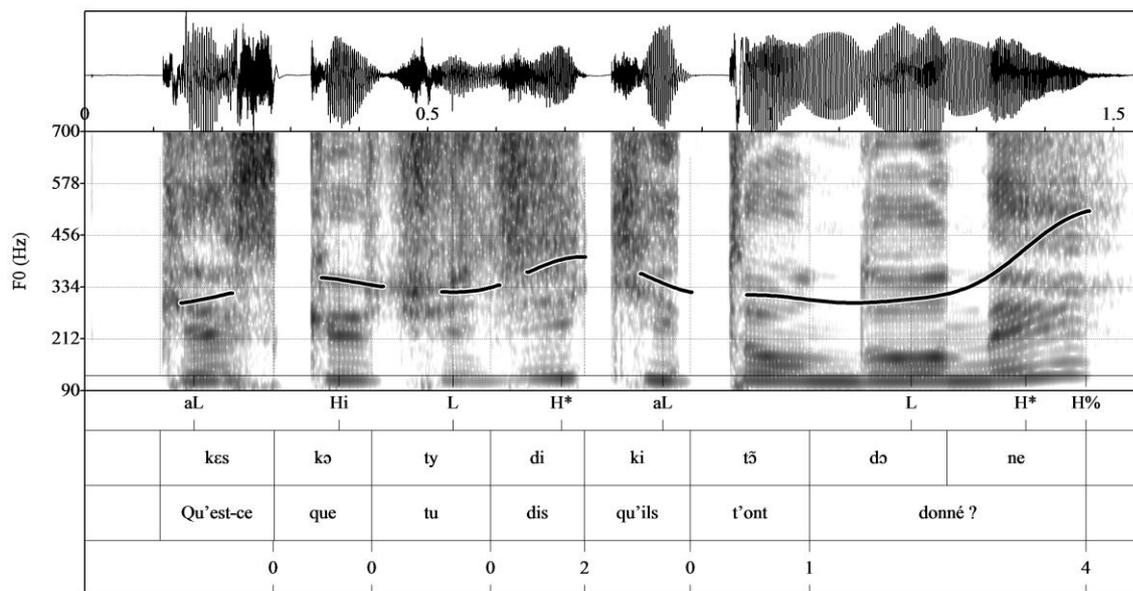


Fig. 3.31 Waveform, spectrogram and F0 track of the counterexpectational echo question *Qu'est-ce que tu dis qu'ils t'ont donné ?* ‘What did you say they gave you?’, produced by a speaker from a southern variety (Marseille).

3.3.5 Imperatives: commands and requests

In almost all sample sentences gathered in the various varieties, the intonation contour used in imperatives is rising-falling LH*L%, as shown in Fig. 3.32.¹¹ There is also some small degree

of inter-speaker variation. As an example, we have chosen another imperative utterance produced by the same speaker but realized with a rising form H*H%, as shown in Fig. 3.33.

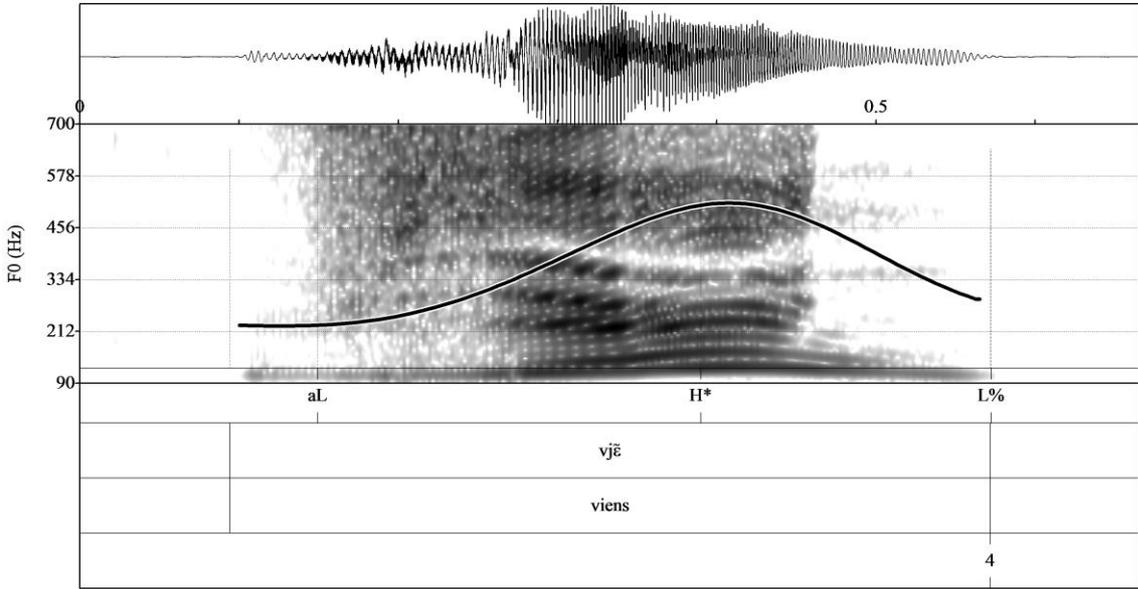


Fig. 3.32: Waveform, spectrogram and F0 track of the order *Viens!* ‘come!’, produced by a speaker from a southern variety (Marseille).

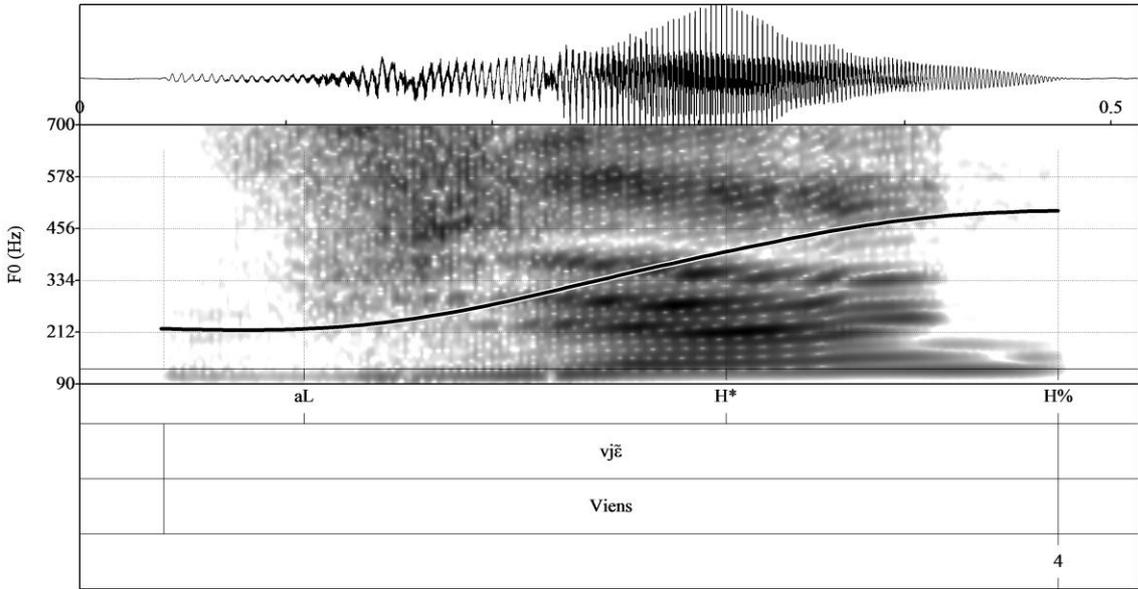


Fig. 3.33: Waveform, spectrogram and F0 track of the order *Viens!* ‘come!’, produced by the same speaker as in Fig. 3.32 (southern variety, Marseille).

and Fagyal 1997). This contour is thus encoded as H+!H*!H%. The lower level of the pitch accented syllables can be explained through the downstep of the pitch accented syllable (!H* from the bitonal H+!H*) and the boundary tone (!H%).

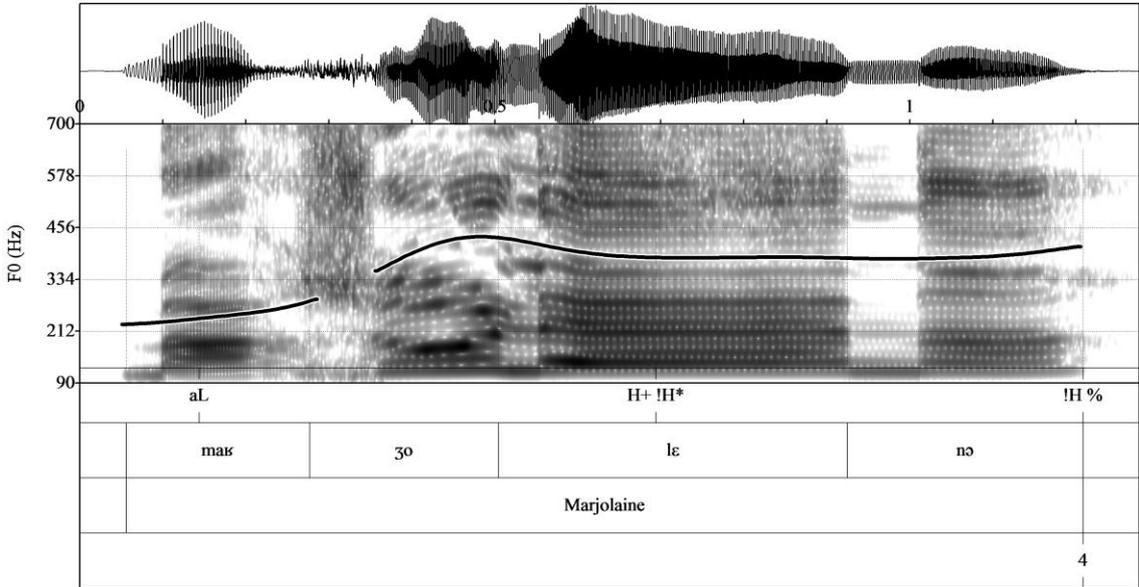


Fig. 3.35: Waveform, spectrogram and F0 of the vocative *Marjolaine!*, produced by a speaker from a Southern variety (Marseille).

When the speaker wants to be more insistent, he uses a rising-falling contour encoded H*L% as in Fig. 3.36. Note, however, that the rising movement starts from the left edge of the AP.

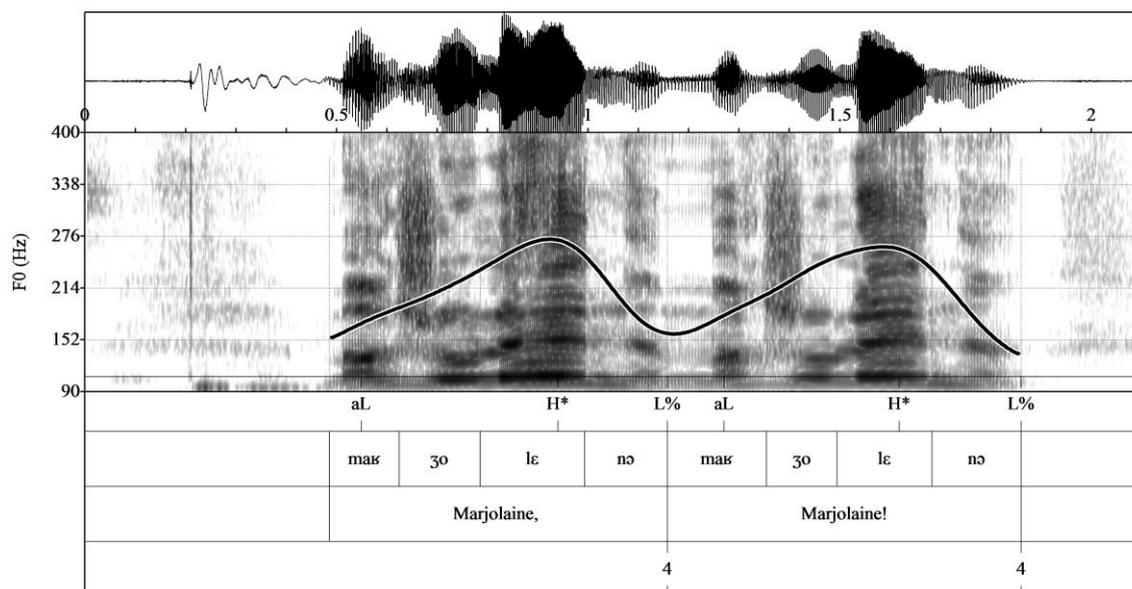


Fig. 3.36: Waveform, spectrogram, and F0 track of the vocative *Marjolaine, Marjolaine!*, produced by a speaker from a southern variety (Lacaune).

3.3.7 Enumerations and disjunctions

In an enumeration, the non-final elements are phrased in an AP, and sometimes in an ip or even an IP, depending mostly on the size of the elements and even the speaking rate.

Moreover, the elements in an AP may be phrased into higher level constituents when the list is relatively long. From a tonal point of view, the various non-final constituents generally end with a rising movement H*, H* H-, or even H* H%, which is followed by the initial L being associated with the left edge of the AP (aL). The last element of the list, which may be realized at the end of the sentence, is usually characterized by a falling contour L* L% in both statements and questions. In Fig. 3.37, the non-final elements are all treated as an ip and are realized as aL H* H-, while the last element displays a L* L% falling contour.

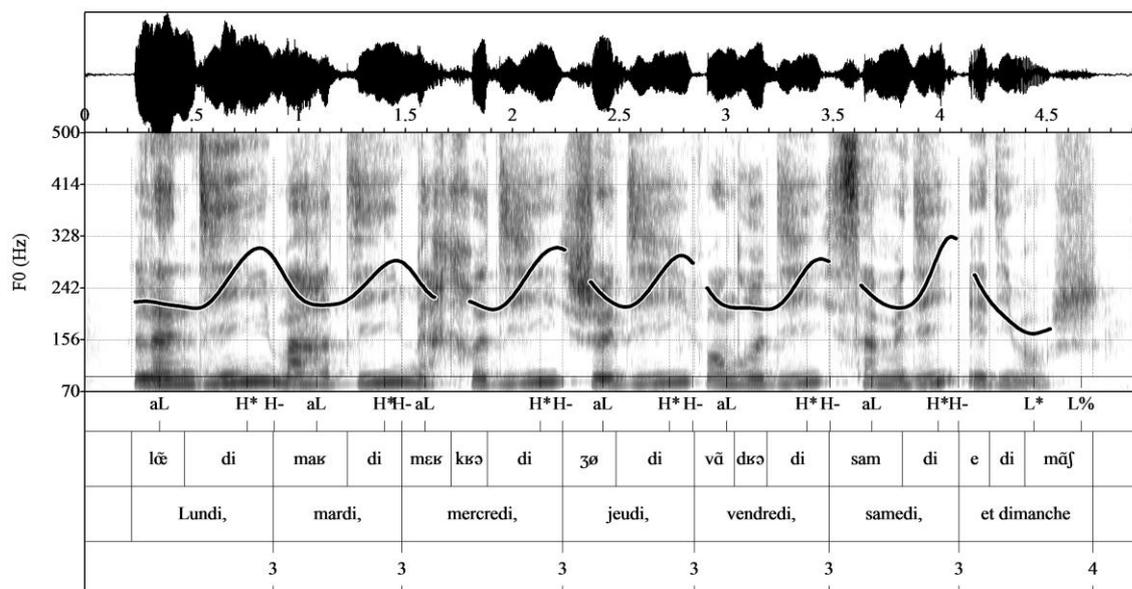


Fig. 3.37: Waveform, spectrogram and F0 of the enumeration *Lundi, mardi, mercredi, jeudi, vendredi, samedi et dimanche!* ‘Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday!’ produced by a speaker from a southern variety (Marseille).

While the rising movement is typical for non-final conjuncts, another contour is observed in specific contexts, when the speaker wants to emphasize on the listing effect. This contour consists of a falling tonal pattern encoded $Hi L^*(L-)$. It is shown in Fig. 3.6, and it has also been observed in political speech (see Feldhausen & Delais-Roussarie 2012).

As for disjunctions, the observed tonal pattern is always the same in all varieties. The first element consists of an ip which ends with a rising contour $H^* H-$, while the last element is characterized by the presence of a falling contour $L^* L\%$, as shown in Fig. 3.38.

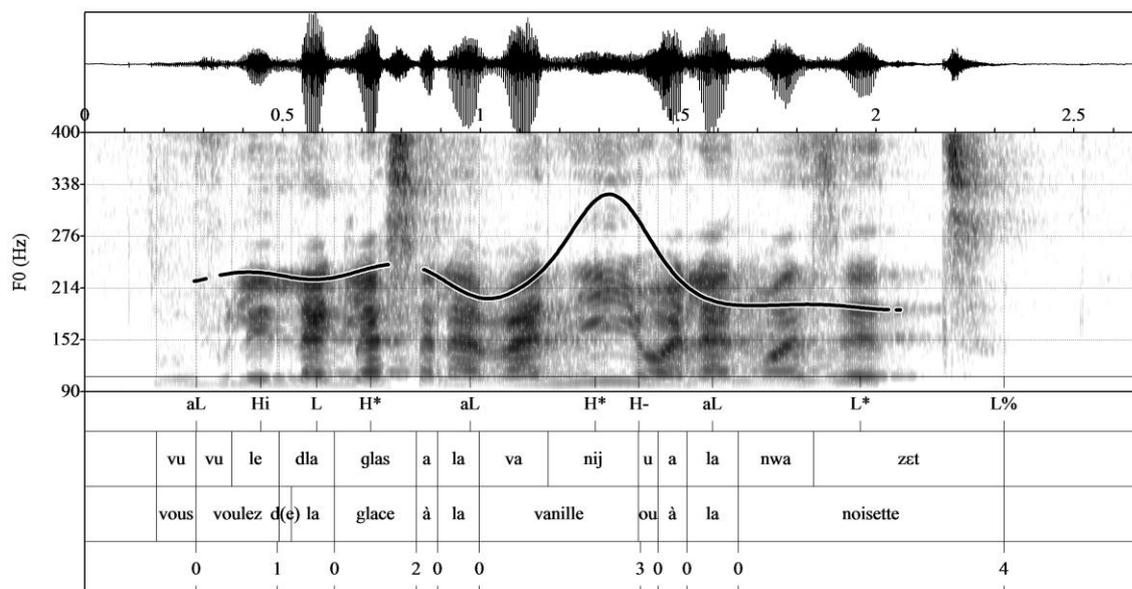


Fig. 3.38: Waveform, spectrogram and pitch track of the disjunction *Vous voulez de la glace à la vanille ou au chocolat?* ‘Do you want vanilla or chocolate ice cream?’ produced by a Swiss speaker (Fribourg).

3.3.8 Intonational analysis: summary

Before we review list of the various nuclear configurations analyzed in this section, it is important to note that two pitch accents and a boundary tone were added to the inventory given in section 1.1.3 (see also table 3.6).

Two bitonal pitch accents were proposed to account for the nuclear configuration occurring in contradiction statements and in vocatives ($H+!H^*$), and in statements of the obvious in Southern French ($H+H^*$). These pitch accents have a few features in common, that differentiate them clearly from H^* and L^* : (i) the bitonal pitch accents are characterized by a rise or a high plateau on the penultimate, which is often associated with a durational lengthening; and (ii) they only occur in nuclear configurations.

Besides the $L\%$ and $H\%$ boundary tone, a $!H\%$ boundary tone, which occurs after the $H+!H^*$ pitch accents, was added to the inventory.

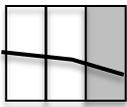
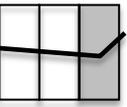
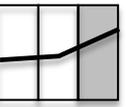
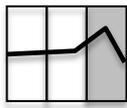
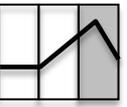
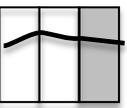
Nuclear Configurations	Sentence types where each configuration is used
 L* L%	<p>Broad focus statements, narrow focus statements, final element in enumerations and disjunctions, postfocal sequences, information-seeking wh-questions, imperative wh-questions.</p>
 L* H%	<p>Information-seeking yes-no questions, imperative yes-no questions, information-seeking wh-questions.</p>
 (L)H* H% ¹²	<p>Statements of the obvious in standard French, Information-seeking yes-no questions, confirmation-seeking yes-no questions, counterexpectational yes-no questions, information-seeking wh-questions, echo wh-questions, imperatives.</p>
 (L)H* L%	<p>Exclamatives, information-seeking yes-no questions (Swiss variant), imperative yes-no questions, echo yes-no questions, biased wh-questions, imperatives, vocatives (insistent call).</p>
 H+H* L%	<p>Statements of the obvious in conservative southern French.</p>
 H+!H* !H%	<p>Contradiction statements, vocatives (calling contour).</p>

Table 3.6: Inventory of the French IP nuclear configurations and their use in different utterance types.

3.4 Conclusion

In this chapter, we have presented the prosodic structure and the tonal inventory that are necessary to establish F_ToBI, a ToBI system to transcribe the intonation patterns of different varieties of French. In order to set up the inventory, the present chapter focused on different sentence types, and included nine varieties of French spoken in Europe. An analysis of the inventories that we created to transcribe the different categories of accents and boundaries suggests that a number of forms are in fact allophonic variants: For instance, in some contexts, L^* and L^- are allophonic variants of H^* and H^- respectively. In a limited number of cases, the phonological status of minimally different realizations of a form can be argued for. For example, it would appear that in rising configurations the bitonal pitch accents $H+!H^*$ and $H+H^*$, whose distribution is highly constrained in standard French, normally convey an attitudinal meaning, unlike the most frequently used pitch accent H^* . In addition, the total number of pitch accents and boundary tones in French is much more limited than that in other Romance languages, which could be explained on the basis of tonal crowding, due to the absence of postaccentual material in French.

We have also described a set of tunes that commonly occur in different sentence types. Here again, the number of tunes is relatively limited compared to what has been observed in other Romance languages. Among the tunes, only three ($L^*L\%$, $H^*H\%$ and $H^*L\%$) are used frequently. This limitation does not imply that the same functional contrasts that are conveyed by different tonal configurations in other Romance languages do not exist in French, but it means that other linguistic and prosodic features such as the use of lexical markers, presence of an initial rise, syllable lengthening or text-tune association come into play to differentiate an epistemically-biased yes-no question from an information-seeking question, an imperative from a yes-no question, etc. The strong syncretism between accentuation and intonation,

which is a special feature of French intonation among the Romance languages, may also partly explain the relatively small number of pitch accents and tunes.

As to intonational differences between the French varieties that were examined here, the same tunes and pitch accents are generally used for the same function in most varieties. This would mean that the differences across varieties are generally due to differences in phonetic implementation or to other prosodic phenomena (lengthening, etc.). Further research on this point is necessary to confirm this hypothesis. In any case, the development of the F_ToBI system proposed here will make it possible to compare the intonation of different varieties of French, as well as the intonation of French with the intonation of other Romance languages.

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[http://www.francophonie.org/IMG/pdf/La_francophonie_dans_le_monde_2006-2007.pdf].

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development of the system and on previous versions of the chapter have been very helpful.

We would also like to thank Joan Borràs-Comes for providing the map.

Note de bas de page

¹ A comprehensive list of countries where French is spoken can be found in Valantin (2007: I).

² French is in contact with two German dialects in particular: Franconian and Alemannic.

³ The map indicates the Romance and Non-Romance areas where French is spoken as a predominant language. Our data were collected from the cities shown on the map, except for Aix-en-Provence, Bruxelles and Lannion. The data presented in the *Interactive Atlas of Romance Intonation* (see Prieto et al. (2010-2014)) have been gathered in the following locations: Aix-en-Provence, Bruxelles, Neuchâtel, Lacaune, Lannion, Lille, Orléans, Paris, and Toulouse. By accessing the online Atlas, the reader can listen to sound examples gathered in the mentioned locations.

⁴ For more information on the history of the French language, see, among others, Walter 1988, 1993, 1998; Battye 1992; Darcy and Feldhausen 2013.

⁵ Some characteristics of French accentuation (e.g the close relation that exists between phrasing and accentuation, and the absence of distinctive lexical stress) have sometimes led to describe French as a language without stress (see, among others, Rossi 1980 and Vaissière 1991). It is important to say the terms *initial* and *final* may be misleading: the initial accent usually occurs pretty close to the beginning of the phrase, but not always. Moreover, this accent is not always realized on the first syllables of a word or even a phrase.

⁶ Final syllables whose nucleus is a schwa are considered as extrametrical (see, among others, Dell 1984).

⁷ The tag 'a' referring to an AP has been added after an AP-final High boundary tone, i.e., Ha, in AP-languages like Bangladesh Bengali, Georgian, and Korean. Jun (in press) proposed to add the tag 'a' before an AP-initial L boundary tone following the common usage of putting a tag in front of a boundary tone when the boundary tone is an initial tone of a prosodic unit (e.g., %H for an IP-initial H boundary tone, -H for an ip-initial High boundary tone).

⁸ Note, however, that a large pitch excursion due to narrow focus can also be realized on the final accented syllable, or both. (see Jun and Fougeron 2000).

⁹ Since *Limoges* is a bisyllabic word, one may be encline to analyze the rise on the syllable *li* as an initial rise encoded Hi, but such an analysis would not account for the realisations obtained in trisyllabic nouns such as *Valenciennes* or *Montpellier* which clearly show a rise on the penultimate syllable. However, further research with various words is necessary to confirm the robustness of the analysis given here.

¹⁰ In Di Cristo (1998), in-situ wh-questions are described as falling, but this form was not observed in our data.

¹¹ The rising-falling contour is not due to the reduced size of the utterance. Even in trisyllabic sentences such as *dépêche-toi*, the same pattern is observed.

¹² For the moment, one rising tonal configuration used for a wide range of sentence types is given in the inventory, but additional configurations such as rise to mid (that could be encoded as H*!H%) and rise to extra-high (H*^H%) may be added to distinguish statements of the obvious and counterexpectational yes-no questions from the other sentence types respectively. Further research is necessary as the analyzed data do not offer sufficient evidence for such a phonological contrast.