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# What Explains the Distribution and Form of Non-Final Rising Contours in French as an L2?

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## Abstract

This paper focuses on the acquisition of continuation rises in French by Mexican Spanish learners. The study consisted of a cross-comparison between native and non-native productions of 15 Mexican learners of French, 10 French speakers and 10 Mexican Spanish speakers. We analyzed the different rising contours obtained at the end of 502 non-final prosodic phrases extracted from a large corpus in both languages. According to our results, learners of French almost always use an extra-rising pitch contour of the form LH\*HH% at the end of non-final IPs, whereas native French and Spanish speakers show a clear preference for rising contours of the form (L)H\*H% and L+H\*(! )H% respectively. As the occurrence of the extra-high contour cannot be attributed to a phonological transfer, three distinct explanations may be put forward to account for the observed forms: (i) differences in phonetic implementation; (ii) this form may be an unmarked form at the beginning of L2 acquisition process or (iii) the extra-high emerges as an expression of linguistic insecurity.

*Keywords:* French continuation rises, acquisition of L2 intonation

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## What Explains the Distribution and Form of Non-Final Rising Contours in French as an L2?

Despite the fact that prosody fulfills an important linguistic and communicative function in spoken language and is usually difficult to acquire in an L2, especially for adult learners (Cf. Chun, 2002), research on the acquisition of phonology in a second language mostly focused on the acquisition of segmental features, leaving aside the suprasegmental ones. In fact, studies on the acquisition of L2 intonation are still under-represented. Over recent decades, many works dedicated to the acquisition of intonation in an L2 rely on the hypothesis that the speakers' native language is a crucial factor that could constrain the emergence of the L2 prosodic structure, both at the phonological and the phonetic level (see among others Jilka, 2000; Mennen, 1999). This constraint on the acquisition process is well known under the term of interference or L1 transfer. It is a process by which speakers carry over linguistic patterns from their native language (L1) to the second language (L2).

In many works, non-native prosodic patterns, which display prosodic deviations from the target language canonical patterns, have been attributed to some sort of L1 transfer. This analysis is not always valid, as a simple transfer cannot explain many prosodic patterns produced by learners. In recent studies on the acquisition of German by English speakers (Gut, 2009; Trouvain & Gut, 2007), of French by Mexican Speakers, (Santiago & Delais-Roussarie, 2012), of English by French Speakers (Horgues, 2013), it has been found that prosodic forms observed in L2 oral productions are not observed in the learners' first language, nor in the native oral productions. Moreover, similar prosodic forms in both L1 and L2 languages are not observed in learners' productions (Santiago & Delais-Roussarie; to appear). Therefore, these results show that L1 transfer and interferences remain, in some cases, a controversial issue to account for non-native prosodic differences.

In a recent study, Santiago and Delais-Roussarie (to appear) have shown that Mexican learners of French use an extra-rising contour (H\*HH%) in addition to the final rising contour (H\*H%) at the end of information-seeking yes/no and wh-questions. In the case of yes/no questions, the authors argued that the occurrence of H\*HH% could be attributed to an L1 transfer, since this form is often observed in native oral productions of Mexican Spanish speakers. Nevertheless, in wh-questions, where the form H\*HH% occurs often, it cannot be analyzed in terms of transfer: H\*HH% is a very marked form in Mexican Spanish wh-

questions. As a consequence, the authors argue that this final contour is rather related to the L2 acquisition process itself. It can either be a signal of linguistic insecurity, or represent a primitive prosodic feature that is used at the beginning of any acquisition process at the end of interrogative utterances (see Chen, 2005; Gussenhoven & Chen, 2000; for a discussion about the use of rising pitch contours in questions and its relation to the Effort Code and the Frequency Code).

In this paper, we will concentrate on the realization of non-final rising contours that occurs at the right edge of non-final prosodic phrases (Intermediate Phrase or ip and Intonational phrase or IP). This study endeavors to clarify how L2 learners use rises in different structural prosodic positions. This paper focuses on the acquisition of continuation rises associated to non-final prosodic phrases (IPs and ips) by Mexican learners of French as an L2. Our objective is twofold:

1. To provide a description of the distribution of extra-rising tonal contours in learners' productions of French as an L2 (this form occurring at the end of non-final IPs),
2. To explain what could motivate the occurrence of such a form.

In the light of our results, we will show that several factors have to be taken into consideration to account for the occurrence of these forms. Three types of independently motivated factors may be put forward: (i) this pitch contour is a result of differences in phonetic implementation; (ii) this form may be an unmarked form at the beginning of L2 process or (iii) the extra-rising contour could be interpreted as a mark of linguistic insecurity.

This paper is organized as follows. Firstly, we present the methodology used to gather, classify and annotate the data. In a second section, we provide a description of the various rising contours occurring at the end of non-final prosodic phrases. Then, in the last section, we discuss the main findings and give some concluding remarks.

## DATA AND METHODOLOGY

### Data Collection Procedure

The analysis proposed here has been performed on utterances extracted from a learner corpus, which consisted of spontaneous speech as well as scripted speech. The data collection and annotation procedure used to

develop the corpus followed the COREIL Protocol (Delais-Roussarie & Yoo, 2011). The latter has been designed to gather data in L2 in order to work on L2 prosody without making any strong presupposition on the transfer from the L1 to the L2. The COREIL protocol was thought in such a way as to allow (i) recording speakers from a wide range of L1 backgrounds; (ii) describing the prosodic characteristics of the L2 learners' productions, by comparing them to productions in their L1 as well as in the target language; and (iii) making contrastive analysis between oral productions in L1 and L2 with comparable sets of data. Further characteristics concerning the speakers and the tasks are presented in the next paragraphs.

**Participants.** For the purpose of this study, we recorded 35 participants who have been divided into three groups: (i) the learner group, which was composed of 15 Mexican learners of French (FL2) recorded in French; (ii) the French control group, which consisted of ten French native speakers recorded in French (FL1); and (iii) the Spanish control group which consisted of ten Mexican Spanish speakers recorded in Spanish (SL1).

As for the FL2 participants, they did not all have the same level of proficiency in French: six students were assessed at A2 level and 9 at B2 level according to Common European Framework of Reference for Language (CEFR). The difference in levels allows evaluating whether the occurrence of certain prosodic forms is related to specific proficiency levels (some forms may only occur at the beginning of the acquisition process). All students were attending French courses at the National Autonomous University of Mexico at the time of experimentation. As for the age of the subjects, no constraints were retained for the selection of the participants. However, we controlled the age at which they started learning French (all of them after 17 years of age). Table 1 summarizes the profile of the participants:

**Table 1.** Participants' profile (SD is given in parenthesis).

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)

**Tasks.** Various oral elicitation tasks were used to gather the data. This procedure is motivated by the fact that communicative and grammatical

competences may differ according to the oral task the participants have to perform. These tasks were organized in three major classes: The first one consists of a reading task, in which the subjects were asked to read short texts and dialogs. The second type regroups monologual oral production tasks, in which the subjects were asked to describe a painting and a picture. In the second case, depending on what is represented on the picture, the production may take the form of a simple narrative. The third type consisted of interactive oral productions: one interview and a role-play. For the study presented here, we extracted all the utterances from the monologual and interactive oral tasks.

### Classification of non-final prosodic phrases

The definition of non-final prosodic phrases results from the interaction of different linguistic information (syntactic, semantic or phonological). As for the syntax-prosody mapping, it is known that certain syntactic constituents align with designated prosodic phrases (see, among others, Selrkirk, 1984). It has been shown that, for instance, root clauses, embedded coordinated clauses, left peripheral constituents or incidental constituents call for the realization of an IP boundary at their right edge in French and Spanish (see Avanzi 2011, Delais-Roussarie et al., 2004; 2000; Feldhausen, to appear; Astruc, 2005; among others).

In this study, we have mostly taken into account syntactic criteria to define and classify non-final IPs. This procedure had the advantage of being more robust and allowing a better cross-comparison between native and non-native productions. By taking into account few syntactic criteria and considering a small set of constructions, we extracted a total of 502 non-final prosodic phrases<sup>1</sup>, which were prosodically marked by the realization of a continuation rise at their right edge. The prosodic phrases that were chosen and extracted display no disfluency, at least sentence internally, and were mostly produced in broad-focus contexts. The non-final prosodic phrases may be classified in two broad categories depending on the type of information that is taken into account for their construction:

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<sup>1</sup> We had extracted 527 non-final IPs but 25 among them were discarded from the current study as they were realized without any clear intonational marking or with a non-rising nuclear contour. Note however that the rising contour was used in more than 80% of the cases.

1. Non-final IPs in Clause-Chaining (CC): non-final IP boundaries occur at the end of each clause, when a sequence of clauses is uttered in chain. The various clauses may be coordinated or just joined. In (1), the clauses *Je m'appelle Marie* (my name is Marie) and *j'aime le français* (I love French) are phrased in two different IPs, which occur in sentence non-final position, the last IP of the sentence being *j'étudie journalisme*.

(1) *Je m'appelle Marie, j'aime le français et j'étudie journalisme.*

[*Je m'appelle Marie*]<sub>IP</sub> [*j'aime le français*]<sub>IP</sub> [*et j'étudie journalisme*]<sub>IP</sub>

'My name is Mary, I love French and I'm studying journalism.'

2. Non-final IPs in Extra-sentential Elements (EE): This group includes all IPs that correspond to extra-sentential elements (adverbial or incidental adjuncts that may consist of an adverbial phrase, a DP or even a clause CP) which are positioned at the left periphery of the sentence. In (2), the NP adjunct *el año pasado* (last year) is phrased as an autonomous IP, which occurs at the left periphery of the sentence.

(2) *El año pasado fui de vacaciones a Veracruz*

[*El año pasado*]<sub>IP</sub> [*fui de vacaciones a Veracruz*]<sub>IP</sub>

'Last year I passed my holidays in Veracruz'

For the intonational analysis, only non-final IPs produced with a rising contour at their right edge were analyzed. In addition to the syntactically based classification, a distinction between non-final IPs followed by a pause and non-final IPs without a pause was made to analyze the shape of the rising contours. This additional criteria allows to evaluate whether the form of the rising contour interacts with the presence or absence of a pause. Table 2 provides a summary of the different non-final IPs analyzed in this study.

**Table 2.** Classification of the non-final IPs

Group	IP-CC no pause	IP-CC pause	IP-EE no pause	IP-EE pause
FL1	59	68	24	2
FL2	47	134	10	6
SL1	39	75	31	7

## Prosodic annotation of the data

In prosodic studies, the aim of a prosodic transcription is to represent the prosodic events that occur during the production of an utterance and that fulfill linguistic functions. In any case, a transcription provides a symbolic encoding for a wide variety of events (mainly, shape and form of  $F_0$  movement, boundary strength, etc.). In the case of L2 learners' data, the prosodic annotation has to be thought in such a way as to allow analyzing accentuation and intonation for a system still under development and which will evolve in time. It is however important to note that it is not easy to distinguish in learners' productions the events that are phonological in nature from the one occurring at the phonetic level.

Since most of the prosodic annotation systems currently used rely on the assumption that the phonological system of the language to transcribe is known (see for instance the API and the ToBI systems), they are not easy to use with learners' data. So, we decided to use for all our data an automatic tool, the *prosographe*. The latter provides for each utterance a stylization of the pitch track on the basis of perception thresholds (Mertens, 2004). The prosodic analysis of the non-final prosodic phrases has been made on the basis of the semi-automatic stylization obtained with the *prosographe*. The generated stylization of the  $F_0$  trace indicates only the pertinent melodic movements without taking into account language-specific knowledge and was used to provide a symbolic encoding for the nuclear configurations at the end of non-final IPs. Two different rising contours occurring at the right edge of non final IPs were distinguished on the basis of their form: a rising continuation labeled (L)H\* H%, and an extra-rising continuation labeled (L)H\* HH%.

The rising contour (L)H\* H% consists of a rising pitch movement that starts within the last stressed syllable of the IP and does not span over more than 10 semitones. In addition, the high melodic target does not reach the top of the speaker's range. Due to differences in the French and Spanish prosodic systems, the (L)H\*H% contour is not implemented the same way in both languages. In French, the last pitch accented syllable of the IP is also the IP final syllable, whereas the last accented syllable is often the penultimate syllable of the IP in Spanish. Figure 1 represents the stylized pitch movement associated with a French example. The syllable /zik/ at the end of the word *musique*, which corresponds to the end of a clause, carries the nuclear contour LH\*H%. The rise spans over 9 semitones, but does not reach the top of the speaker's range (indicated by the pink dotted line on the figure). Figure 2 represents a stylized version

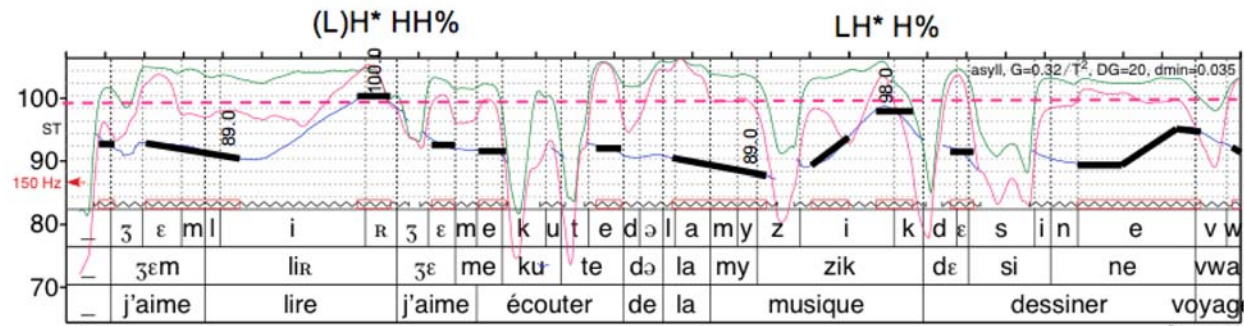
of the (L)H\*H% rising contour in Spanish. The rising movement starts with the H\* pitch accent associated with the last stressed syllable of the IP (/da/) and ends at the end of the last syllable of the IP. The rising movement of almost 6 semitones is thus realized on the tonic syllable /da/ and continues on the postonic syllable *ria*. In some cases, in particular in Spanish, the rising pitch movement reaches its maxima on the tonic syllable and remains high and stable on the following syllable until the end of the IP, forming a high plateau. This different phonetic implementation is encoded (L)H\*!H% but treated as a variant from (L)H\*H%.

The extra-rising continuation labeled (L)H\* HH% consists of an extra-rising movement observed in both languages, French and Spanish. This rising pitch movement starts at the beginning of the last accented syllable of the non-final IP and continues to the IP right edge in order to reach the top of the speaker's range. The rise spans over more than 10 semitones as illustrated in Fig.1 for the syllable /liʁ/ at the end of the non-final IP *j'aime lire* (to read). As we can see in this figure, the rising pitch movement reaches the top of the speaker's range indicated by the pink dotted line.

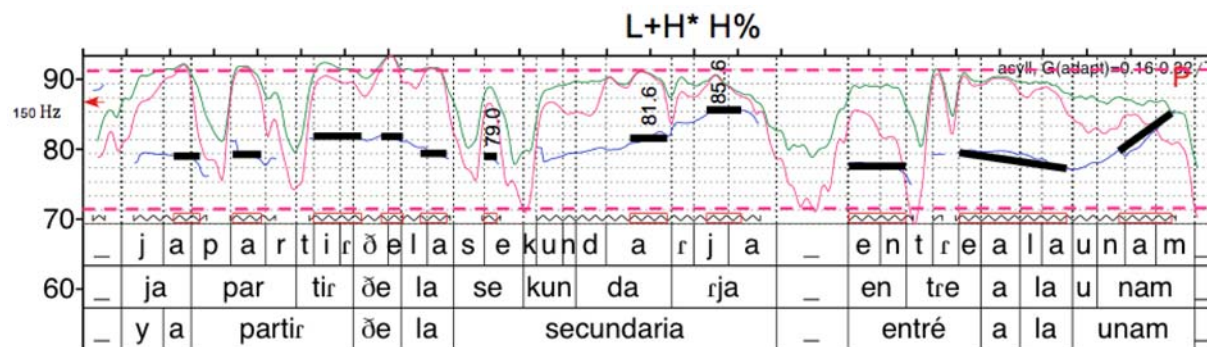
## RESULTS

At the phonological level, the rising pitch contours labeled (L)H\*H% and (L)H\*HH%) are used at the end of non final IPs in both Spanish and French. However, the two languages display differences in the way these contours are used and implemented. In French, which is considered in the literature as a 'rising language' (see Delattre, 1966; Di Cristo, to appear; and Vaissière, 2002 among others), the continuation rise occurring at the right edge of non final IPs is characterized by both a rising F<sub>0</sub> movement and a lengthening of the IP final syllable (this prosodic event is also known as Major Continuation in Delattre's approach). In Spanish, a rising pitch movement is realized at the right edge of non-final IPs. It is characterized by a tonal pitch movement spreading from the last pitch accented syllable to the IP boundary (Feldhausen, forthcoming, Butragueño et al., 2010; Quilis, 1993; Delattre, 1962; among others). In contrast to French, durational cues such as lengthening of the IP final syllable are not exploited by Spanish speakers.

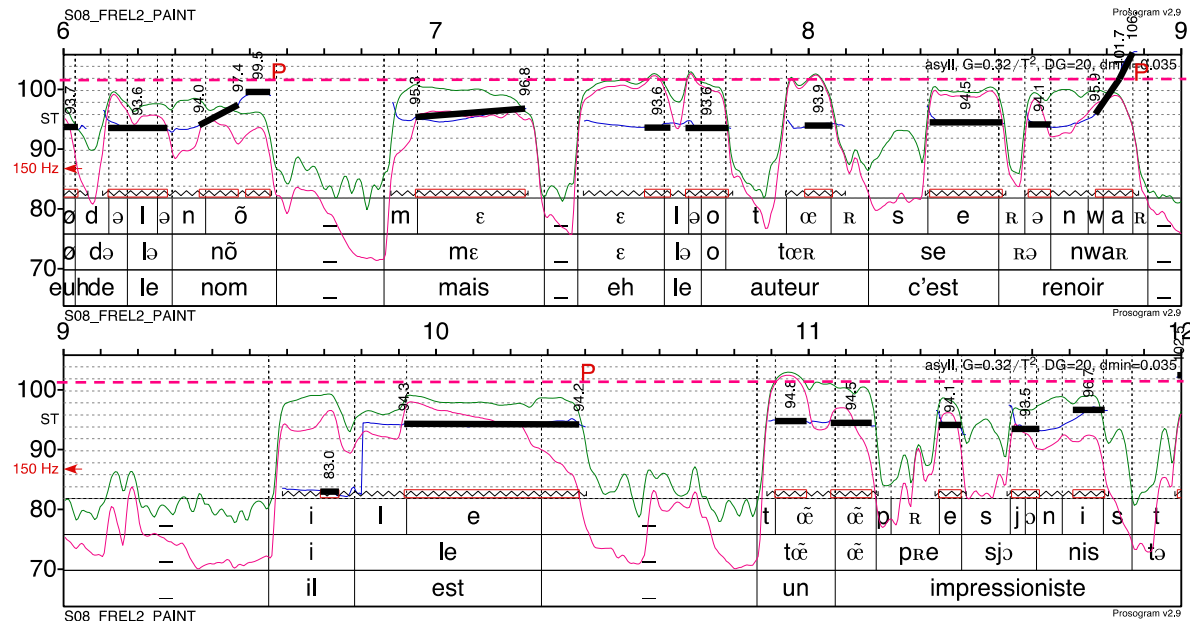




**Figure 1.** Stylization of F<sub>0</sub> obtained by the Prosographe for the sequence of clauses [j'aime lire]<sub>IP</sub> [j'aime écouter de la musique]<sub>IP</sub>... (I like to read, I like listening to music...)



**Figure 2.** Stylization of F<sub>0</sub> obtained by the Prosographe of the extra-sentential element in Mexican Spanish a partir de la secundaria (after middle school) fronted to the clause entré a la unam (I attended the unam pre-college) followed by a pause indicated by “\_”.

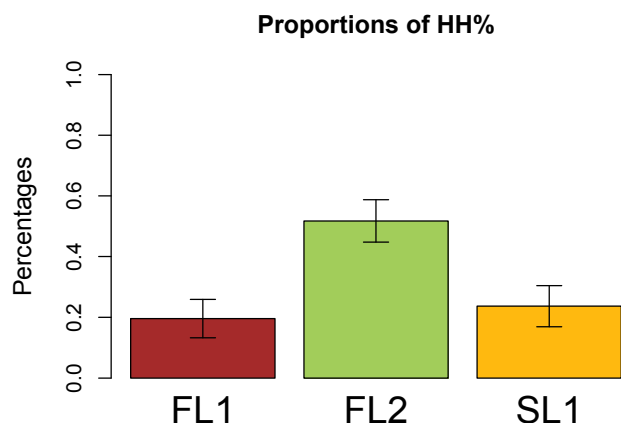


**Figure 3.** Stylization of  $F_0$  obtained by the Prosographe for the clause [le auteur c'est Renoir]<sub>IP</sub> ('the artist is Renoir') followed by the clause il est un impressioniste ('He is an impressionist') and followed by a pause indicated by "\_"

In our data, these differences in phonetic implementations have been observed in the productions of the native speakers of both Spanish and French. It is mostly due to differences in metrical patterns. Since the stressed syllable on which the rising pitch movement starts is often the penultimate syllable in Spanish, the rising contour spreads over the two last syllables of the IP, whereas in French the rise just occurs on the IP final syllable. Due to this difference, the continuation rise (L)H\*H% may be realized in Spanish with a short high plateau on the postonic syllable (encoded as H!%). Concerning the slope of the rise, we found that in both languages, in the native speakers' productions, the rising form (L)H\*H% (by contrast to the extra-rise (L)H\*HH%) is by far the most often observed in non-final IPs.

As for learners' productions, the rising movements occurring at the right edge of non-final IPs differ from those observed in the data of the native speakers of both French and Spanish. On the one hand, learners have a tendency to use an extra-rising contour ((L)H\*HH%), which is not observed in native speakers' productions (FL1 nor SL2 groups). On the other hand, durational cues used by learners were different from the ones found in FL1 speakers: in the FL2 data, non-final IPs are not marked by durational lengthening, whereas the IP final syllables were almost always marked by a considerable lengthening in native French. Figure 3 illustrates the pattern observed in learners' production. It represents the non-final IP [et l'auteur c'est Renoir]<sub>IP</sub> followed by a pause in a CC context. The last syllable of the word *Renoir* carries an (L)H\*HH% contour, which is characterized by a rising pitch movement of more than 10 semitones and reaches the top of the speakers' range indicated by the pink dotted line.

The proportion of (L)H\*HH% and (L)H\*H% across the native groups (FL1 and SL1) and the learners (FL2) is given in figure 4. This illustration indicates that learners use more frequently the extra-rising contour than native speakers do.

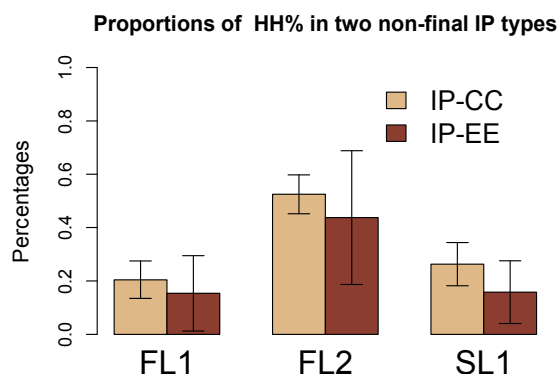


**Figure 4.** Percentages of extra-rising pitch contours associated to non-final IPs across the three groups.

In order to confirm whether the difference in the proportion of (L)H\* HH% used is statistically significant, we used R and *lme4* (Bates, Maechler & Bolker, 2012) to set up a linear mixed effects analysis of the relationship between *Contour* ((L)H\*H% or (L)H\*HH%) and *Group* (FL1, FL2 and SL1). As fixed effects, we entered *Group*, as random effects, we had intercepts for *Participants*, as well as by-*Participants* random slopes for the effect of *Contour*. Results obtained by modeling this analysis shows that all groups have a tendency to use (L)H\* H% for marking non-final IPs ( $|z|= 7.15$ ,  $p<0.001$ ). When comparing the proportion of (L)H\*H% and (L)H\*HH% observed in FL1 and FL2, we found significant differences: French native speakers use more (L)H\*H% than learners ( $|z|= 3.335$ ,  $p<0.001$ ). When comparing the same proportion of the same contours between FL2 and SL1 groups, we found significant differences as well: FL2 speakers use more often (L)H\*HH% than SL1 participants ( $|z|= 6.178$ ,  $p<0.001$ ). An ANOVA comparing this model with the effect in question (*Group*) against the model without this effect shows that all differences observed in the choice of the rising contour across the groups were significant ( $X^2(1) = 28.095$ ,  $p<0.001$ ).

These results confirm that the (L)H\*H% contour is by far the most frequently used by both the French and the Spanish native speakers. This contrasts with what is observed in the FL2 group. These results allow considering the (L) H\* HH% pitch contour as a marked form in both French and Spanish, even if French native speakers use proportionally less (L)H\*HH% contours than Spanish native speakers. By contrast, it appears that in L2 French (L)H\*H% and (L)H\*HH% are almost equally used. However, this cannot be attributed to an interference with the speakers' L1 since FL2 participants use more (L)H\*HH% than the SL1 speakers.

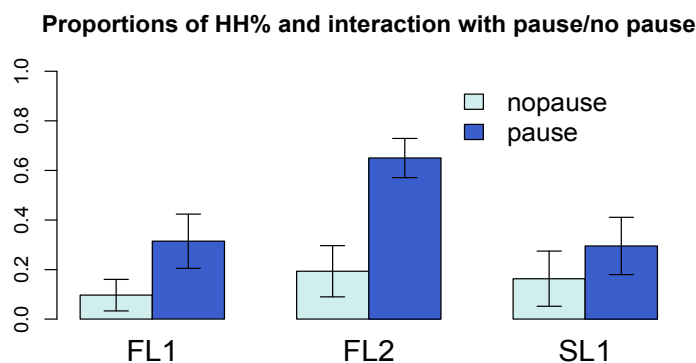
A closer analysis of the distribution of the extra-rising contour (L)H\*HH%, by taking into account the syntactic contexts, is represented in Figure 5, which shows the proportion of (L)H\*HH% observed at the end of the two different syntactic structures associated with non-final IPs: (CC) and (EE). As we can see, the (L)H\*HH% contour is proportionally equally distributed across the three groups, independently of the syntactic classification of the non-final IPs.



**Fig. 5.** Distribution of (L)H\*HH% pitch contour in two non-final IP types: CC and Extra-sentential Elements (EE) across the three groups.

A linear mixed effects analysis between the *Contour* and *Group* interacting with the *Structure* (CC and EE) was carried out in order to see whether there were significant differences across the groups. As fixed effects we entered *Group* interacting with *Structure* and as random effects we had intercepts for *Participants*, as well as by-*Participants* random slopes for the effect of *Contour*. Results obtained by setting up this model show that there is no interaction between the *Group* and the *Structure* on the choice of the *Contour*. By comparing the proportion of (L)H\*HH% contours observed in the two types of non-final IPs across the three groups, it appears that all participants do not show a preference for the use of a specific tonal form ((L)H\*HH% or (L)H\*H%) in a given syntactic motivated type of non-final IPs.

Figure 6 is a graphical representation of the proportion of (L)H\*HH% used over (L)H\*H% under the condition pause/no pause across the groups. As we can see, the occurrence of (L)H\*HH% form is mainly affected by the presence of a pause:



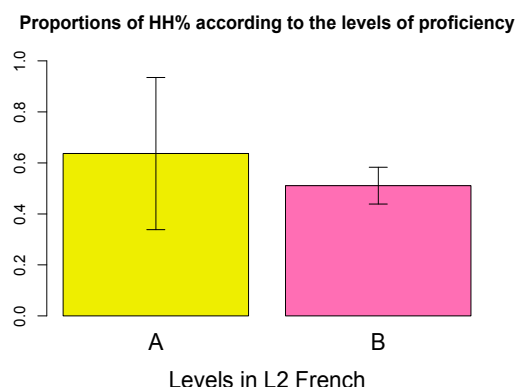
**Figure 6.** Distribution of (L)H\*HH% pitch contour under the condition “pause” and “no pause”

In order to evaluate whether the pause/no pause condition interacts in some ways with the L1 of the participants and affects the choice of the contour, we set up a linear mixed effects analysis between the *Contour* and *Group* interacting with the *Pause* (presence or absence). As fixed effects we entered *Group* interacting with *Pause* and as random effects we had intercepts for *Participants*, as well as by-*Participants* random slopes for the effect of *Contour*. Results of this analysis show that there is no interaction between the language group and the effect of the pause when choosing the form of the contour. However, the presence of a pause has an effect on the choice of the (L)H\*HH% contour independently of the speakers (only marginal effects being found for FL2 speakers). In other words, all groups have a tendency to use more often a (L)H\*HH% in contexts where a pause occurred.

As the proportion of pauses seemed to be different across the groups (learners realizing more pauses than native speakers), another linear mixed effects analysis between *Pause* (the presence or the absence of a silence) and *Group* was carried out. As fixed effects we entered *Group* and as random effects *Pauses*, we had intercepts for *Participants*, as well as by-participants random slopes for the effect of *Pause*. Results showed that the proportion of pauses is statistically different between FL1 and FL2 speakers: learners produce more pauses than FL1 ( $|z|=4.353$ ,  $p<0.0001$ ). However, no statistically significant difference in the proportion of pauses produced by FL2 and SL1 speakers were observed. An ANOVA comparing the model with fixed effects *Group* and *Pause* and *Participants* as random effects against one model without the effect in question (*Pause*) confirms this analysis ( $X^2(1)=15.618$ ,  $p<0.001$ ).

Finally, when comparing the distribution of (L)H\*HH% across the two different levels of proficiency in the learners' productions, it appears that

the (L)H\*HH% contour is more frequently used by students positioned at A2 than B1 level, as shown in Fig. 7.



**Figure 7.** Distribution of the (L)H\*HH% pitch contour across the A2 and B1 level

In order to evaluate whether there are significant differences in the use of the extra-rising form (L)H\*HH% between students according to their proficiency level (A2 *vs* B1), we carried out a linear mixed effects analysis between the *Contour* and *Level* (A2 and B1). As fixed effects we entered *Level* and as random effects *Participants*, we had intercepts for *Participants*, as well as by-*Participants* random slopes for the effect of *Contour*. The results obtained confirm that the proficiency level has an effect on the choice of the tonal contour: beginners (A2) produce more (L)H\*HH% than advanced students ( $|z| = 1.974$ ,  $p < 0.01$ ). An ANOVA comparing the model with fixed effects *Level* and with random effects *Participants* against one model without the effect in question (*Level*) confirms this analysis ( $X^2(1) = 0.6159$ ,  $p < 0.05$ ).

In the light of the results that were presented, it appears that the continuation rise of the form (L)H\*HH% is significantly more often used by learners than by native speakers. These results are further discussed in the following section.

## DISCUSSION AND CONCLUSION

The analysis of the data showed that the rising contours occurring at the end of non-final IPs are implemented differently in both French and Spanish. In French (in particular as spoken by native speakers), the rise is realized only on the IP final syllable, which is metrically accented, whereas in Spanish, it is realized over two syllables: the penultimate,

which is usually pitch accented, and the last syllable of the IP. This difference in phonetic implementation may explain why the tone bearing unit(s)/ domain –i.e., the pitch accented syllable and the IP final syllable– is lengthened in French, and not in Spanish: for the IP final rise to be realized on a single syllable, it is important to lengthen the duration. Apart from tiny differences in phonetic implementation, the nuclear contour that occurs at the end of non-final IPs may differ in the slope of the rise: the rise may span over less than 10 semitones (encoded as (L)H\*H%) or, by contrast, it can be an extra-rising contour, which spans over 10 semitones (encoded as (L)H\*HH%). From the analysis of the data, it appears that the unmarked form at the end of non-final IPs is the continuation rise (L)H\*H%. Note however that both forms occur in the productions of the native and non-native speakers in French and Spanish. As shown in the analysis, the use of the extra-rising contour does not depend on the syntactic context (IP boundary aligned with the right edge of a clause, or IP boundary at the end of extra-sentential elements) in all language groups. It is mostly motivated by the presence of a pause, as it occurs mostly in cases where the IP boundary is followed by a pause.

As for the difference between native and non-native speakers, the analysis of the data showed that the proportion of extra-rising contours ((L)H\*HH%) is much more important in learners' productions than in native speakers' productions (50% vs. 20 to 25% for the natives, see fig. 4). Note however that the distribution of both forms is the same in the different language groups. The use of the extra-rising form in the learners' production is of interest: as this form does not occur in native French nor in native Mexican Spanish, it cannot be attributed to some sort of transfer or interference. Other elements have to be invoked to explain the occurrence of this form in the learners' data. As pointed out by Gut (2007), and Trouvain and Gut (2009), among others, the presence of deviant forms in learners' productions may result from the acquisition process itself. In our data, we may wonder what could motivate the occurrence of the extra-rising contour (L)H\*HH% in learners' productions? Three distinct hypotheses are worth investigating.

The first one is related to the difference in phonetic implementation in both French and Spanish. As previously said, the rising contour occurring at the end of non-final IPs is always accompanied by a durational lengthening of the IP final syllable in French, whereas no lengthening occurs in Spanish. Spanish learners of French, unable to accurately lengthen the IP final syllable, may produce an extra-rise to realize a contour that differs from the one they normally use in their L1.



The second hypothesis, which may be related to the first one, relies on the idea that the (L)H\*HH% contour is the default melodic movement for marking prosodic chunking at an early stage of acquisition. This would explain why this form is even more frequently used by A2 learners than by B1. This observation is in compliance with what has been observed by Santiago and Delais-Roussarie (to appear) in a study dedicated to the intonation of neutral information-seeking questions. At an early stage of acquisition, an extra-rising contour is always used at the end of questions in French as an L2. Under this assumption, we would expect to find extra-rising forms in other L2 productions (and even L1 acquisition data) at the beginning of the acquisition process in many languages. Further research is currently carried out to confirm the validity of this hypothesis.

The third hypothesis relies on the idea that the extra-rising contour could be the expression of some sort of *linguistic insecurity*. When L2 learners show insufficient proficiency in one or more linguistic level(s) (for instance, in the use of some syntactic structures, in the choice of vocabulary items, or even in lack of fluency), they feel insecure about what they are trying to express. One of the well-known manifestations of this linguistic insecurity has to be found in the recursive use of pauses (Cf. Rianzansteva, 2001 who found that long pauses are related to proficiency in English as an L2). The presence of an extra-rising contour may also be a sign of linguistic insecurity. As the analysis of our data showed that the occurrence of the extra-rising contour is related to the presence of a pause (see fig. 6), the two elements could co-occur in learners' productions. Nevertheless, further research is necessary to verify whether the occurrence of these prosodic forms is always related to linguistic insecurity.

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