

# Intonational Aspects of Imperatives in Mexican Spanish

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## Abstract

This paper sheds new light on the intonation of imperatives in Mexican Spanish. Results from a production experiment based on scripted speech show that imperative sentences have two different nuclear configurations depending on the position of the imperative verb ( $V_I$ ): (i)  $(L+)H^*L\%$  with  $V_I$  in sentence-final position, and (ii)  $L^*L\%$  with  $V_I$  in non-final position. The pitch accent on  $V_I$  in non-final position is characterized by a late peak ( $L+>H^*$ ). However, if the sentence is uttered with some sort of emphasis, the nuclear configuration in the non-final context can also be rising. While these results partly confirm claims made concerning the nuclear configuration in [1], they contradict the findings in [2], who attested strong pitch accent variation on  $V_I$ .

**Index Terms:** Intonation, Imperatives, Mexican Spanish, Spanish ToBI, Pitch Accent, Nuclear Configuration

## 1. Introduction

While intonational aspects of imperatives in Peninsular Spanish have attracted considerable attention (e.g. [3], [4], [5], [6]), there are only few studies on Mexican Spanish which also follow different goals. Work [2], for example, examines the pitch accent realization on  $V_I$  in sentence-initial position (as in *Abre la puerta!* 'Open the door!'). He does not consider the nuclear configuration (i.e. the nuclear pitch accent plus the following boundary tone), which is located on the sentence final DP *la puerta* 'the door'. His results show a three-way variation in the pitch accent on  $V_I$  (a predominant *late H peak*, but also an *early H peak* and a *peak with no distinct rise*; [2], p. 355). [1], in turn, concentrates solely on the nuclear configuration, thereby neglecting the pitch accent on  $V_I$ , since  $V_I$  is non-final. They transcribe the nuclear configuration as  $L+H^*L\%$ . Despite the thorough study, the results in [1] are typically based on imperatives which include final elements such as *ahorita mismo* in *¡Ven aquí, ahorita mismo!* 'Come here, right now' (see [1], p. 340). In this example, a prosodic boundary (H-) occurs between *ven aquí* and *ahorita mismo* (with another between the  $V_I$  *ven* and the adverb *aquí*). For this reason, it is not clear whether the elements after  $V_I$  are actually part of the imperative or whether they should be understood as added, extra-sentential elements. Thus, the question arises as to whether [1] really transcribe the imperative intonation or merely the intonation of some added, facultative material. Both studies ([1] and [2]) share the common characteristic of failing to consider  $V_I$  in sentence-final position, and as such it is unclear whether their claims also hold for  $V_I$  in final position. In a pilot study based on semi-spontaneous speech (and not on scripted speech, as is done here), [7] show that the nuclear configuration of imperatives actually differs depending on the position of  $V_I$  (final  $V_I$ :  $L+H^*L\%$  vs. non-final  $V_I$ :  $L^*L\%$ ). However, their study is based on a very small set of data in which only thirteen instances of final  $V_I$  occur (such as *¡Cállate!* 'Be

quiet!'). While the utterances with non-final, here sentence-initial  $V_I$ , have the form of the sentences used in [2], all utterances with final  $V_I$  contain only one metrically strong position. The pilot study thus seems to confirm the assumption that long declaratives (consisting of at least two metrically strong positions) in Spanish and Catalan are realized by a rising prenuclear accent and a low or falling nuclear configuration, while short declaratives (with only one metrically strong position) are realized by a rising nuclear accent and a low boundary tone (see [8]). The question arises as to whether  $V_I$  in sentence-final position also shows a rising accent when preceded by other material. We are not aware of any previous study addressing this issue in Mexican Spanish.

This paper unifies different perspectives and examines both (a) the nuclear configuration of imperative utterances in Mexican Spanish with  $V_I$  in sentence-final and sentence-initial position and (b) the pitch accent on the imperative verb. Three hypotheses H1-3 are established:

- *Hypothesis 1:* short imperatives, i.e. declaratives consisting of only an imperative verb (such as *¡Dámelo!* 'Give it to me!'), are realized with a rising nuclear accent (in accordance with [8]) and as such they don't show any pitch accent variation (as opposed to [2]).
- *Hypothesis 2:* Long imperatives (such as *¡Dame la mermelada!* 'Give me the marmalade!') should be realized with a low or falling nuclear configuration and a rising accent on  $V_I$  (in accordance with [8], but contradicting [1]); consequently, we do not expect any pitch accent variation either (in contrast to [2]).
- *Hypothesis 3:* Utterances with sentence-final  $V_I$  preceded by additional material are expected to be realized by a low or falling nuclear contour as in the case of long imperatives. There are several studies which question whether an imperative intonation really exists in Spanish ([3], [9], [2], [6]). If these authors are on the right track, long utterances with  $V_I$  in final position should not behave differently than long declaratives.

## 2. Methodology

A production experiment based on scripted speech was conducted in which three monolingual, native speakers of Mexican Spanish (one female from Torreón aged 23 [TF], one female and one male from México DF aged 25 and 33 [MF, MM]) uttered a total of 180 sentences (3 subjects x 30 target sentences x 2 repetitions). The material consisted of three conditions, C1-3 (which correspond to hypotheses 1-3):

- *Condition 1:* short imperatives consisting of one prosodic word, as shown in (1);
- *Condition 2:* long imperatives, with  $V_I$  in sentence-initial position, as shown in (2); and
- *Condition 3:* long imperatives with  $V_I$  in sentence-final position, as shown in (3). Since imperatives are typically

characterized by omitting the preverbal subject, the preceding material in (C3) is a conditional clause.

The imperative verb  $V_I$  is marked by bold letters. The metrically strong position of  $V_I$  is underlined, while the position of the nuclear accent is indicated by capitals.

¡Mírala! (1)  
'Look at her!'

¡Mira a BÁRbara! (2)  
'Look at Barbara!'

Si estás interesada, ¡Mírala! (3)  
'If you are interested, look at her!'

As can be seen in (1) and (3), the metrically strong position of  $V_I$  overlaps with the nuclear position when  $V_I$  is in final position. Only in (2), in which  $V_I$  is sentence-initial, can the two positions be distinguished from one another. By using sentences like that in (2), in which  $V_I$  is followed by an argument, we make sure that the prompts do not evoke additional, facultative material.

There were a total of 30 target sentences (i.e. 10 sentences per condition). These target sentences were accompanied by 15 filler clauses (consisting of simple DPs such as *Las manzanas* 'the apples' or constructions with clitic left-dislocations such as *El águila, la vendió mi hermano* 'The eagle, my brother sold it.'). (for details on the intonation of left-dislocations in Spanish see [10]). The stimuli were presented in a pseudo-randomized order on sheets of paper with approximately 6 sentences per sheet. The subjects were recorded in a quiet room and were told to read the stimuli out loud at a normal rate of speech only after having silently read and understood the sentence. The subjects read the entire set of stimuli two times. The recording sessions started with a small practice session. The data were recorded in a quiet room in Frankfurt (Germany) and Paris (France) using an audio interface (44 KHz sample frequency, 24-bits precision) and a condenser headset microphone. All recordings were stored as digitized wav-audio files. The F0 tracks were analyzed using *praat* [11]; the pitch tracks and spectrograms were used to guide the segmentation and the text-to-tune alignment. The tonal analysis is based on the ToBI annotation system for Spanish (Sp\_ToBI, [12], [13], [1]).

### 3. Results

#### 3.1. Results between speakers

The results for the nuclear configuration are given in Table 1. In Condition 1 (C1, short imperatives), the metrically strong syllable of  $V_I$  is tonally realized by either a high ( $H^*$ ) or a rising ( $L+H^*$ ) nuclear pitch accent (55% and 45%, respectively). A chi-square test shows that the difference in frequency between  $H^*$  and  $L+H^*$  is not significant ( $\chi^2 = 0.6$ ,  $df = 1$ ,  $p = 0.44$ ; [14] was used for the calculations). The IP edge tone is always low ( $L\%$ ). In Condition 2 (C2, long imperatives with initial  $V_I$ ), the predominant nuclear accent is a low tone ( $L^*$ ; 36 instances, 60%), followed by rising or high accents (25% and 10%, respectively) and a few instances of falling accents ( $H+L^*$ , 3 times, 5%). The difference between  $L^*$  and  $L+H^*$  /  $H^*$  is significant ( $\chi^2 = 3.947$ ,  $df = 1$ ,  $p = 0.047$ ). Again, there were only low IP edge tones (100%). In Condition 3 (C3, long imperatives with final  $V_I$ ), the metrically strong position of  $V_I$  is predominantly realized by a

high ( $H^*$ ) or a rising nuclear accent ( $L+H^*$ ), 46 times, 77%. There are some instances of low nuclear accents (9 times, 15%) and few cases of a falling accent (5 times, 8%). A chi-square test shows that the difference in frequency between  $H^*$  /  $L+H^*$  and  $L^*$  /  $H+L^*$  is significant ( $\chi^2 = 17.067$ ,  $df = 1$ ,  $p < 0.01$ ), i.e. the number of high or rising accents is significantly higher than the number of low or falling accents. All intonational phrase boundaries were realized by a low edge tone ( $L\%$ ).

While the metrically strong syllable of  $V_I$  in C1 and C3 is simultaneously the nuclear accent in the utterance,  $V_I$  in C2 is not part of the nuclear configuration, but belongs to the prenuclear area. This is not shown in Table 1.  $V_I$  in C2 is predominantly realized by a delayed peak  $L+>H^*$  (92%, 55 times) and sometimes can also be realized by a rising accent  $L+H^*$  (5%, 3 times) and a high tone  $H^*$  (3%, 2 times).

Table 1, *Nuclear configurations for each condition for all subjects (given in % and absolute numbers)*

C1	$H^* L\%$ (55%, 33)	$L+H^* L\%$ (45%, 27)		
C2	$L^* L\%$ (60%, 36)	$L+H^* L\%$ (25%, 15)	$H^* L\%$ (10%, 6)	$H+L^* L\%$ (5%, 3)
C3	$H^* L\%$ (47%, 28)	$L+H^* L\%$ (30%, 18)	$L^* L\%$ (15%, 9)	$H+L^* L\%$ (8%, 5)

Typical pitch contours for the three conditions are given in Figure 1 to 4. A typical contour for the short imperatives (C1) is given in Figure 1. The nuclear pitch accent on  $V_I$  is realized with a high plateau ( $H^*$ ), followed by a low IP edge tone ( $L\%$ ). Pitch contours for long imperatives (C2) are given in Figure 2 and Figure 3. Both contours share a pre-nuclear accent located on  $V_I$ , which is realized by a rising tone with a delayed peak ( $L+>H^*$ ). Additionally, the IP edge is realized by a low tone ( $L\%$ ). The two contours differ in the shape of the nuclear accent. While it is low in Figure 2, it is rising ( $L+H^*$ ) in Figure 3. As a consequence, the contours differ with respect to their nuclear configuration ( $L^* L\%$  vs.  $L+H^* L\%$ ).

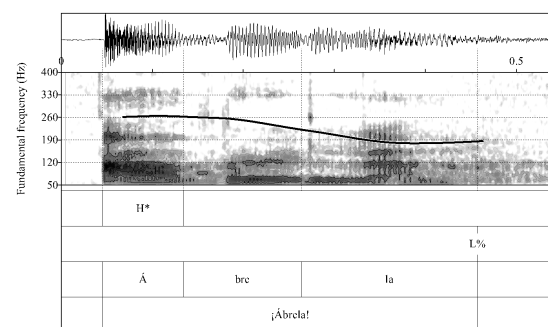


Figure 1: *Waveform, spectrogram, and F0 trace for the short imperative (C1) ¡Ábrela! 'Open it!' of speaker TF (sentence 2 17), produced with a high nuclear pitch accent ( $H^*$ ) and a low edge tone ( $L\%$ ).*

A pitch contour for long imperatives with final  $V_I$  (C3) is given in Figure 4. The conditional clause is composed of rising accents ( $L+>H^*$ ,  $L+H^*$ ) and a high edge tone ( $H$ ). A pause (of 132ms) separates the following  $V_I$  from the conditional clause. The nuclear configuration on  $V_I$  is composed of a high

tone (H\*) and a low IP edge tone (L%). As can be seen in Table 1, the typical nuclear configurations are no different from those in conditions 1 and 2 (cf. the contours on  $V_1$  in Figure 1 and in Figure 4). C3 differs from C1 and C2, however, through the presence of a sentence-internal break: While all sentences within conditions C1 and C2 show no sentence internal break, there is always a break in the sentences in C3. This break is located between the conditional clause and the imperative main clause, and is characterized phonetically by a rising contour at the end of the conditional clause, followed by a pause. The mean duration of the pause for all speakers is 236ms (not normalized).

Finally, we comment on some additional differences observed between the three conditions. The difference in frequency between H\* / L+H\* in C1 and H\* / L+H\* in C2 is significant ( $\chi^2 = 57.778$ ,  $df = 1$ ,  $p = 0$ ), as is the difference between H\* / L+H\* in C1 and H\* / L+H\* in C3 ( $\chi^2 = 15.849$ ,  $df = 1$ ,  $p < 0.01$ ). This means that the frequency of high and rising accents is significantly higher in C1 than in C2 or C3.

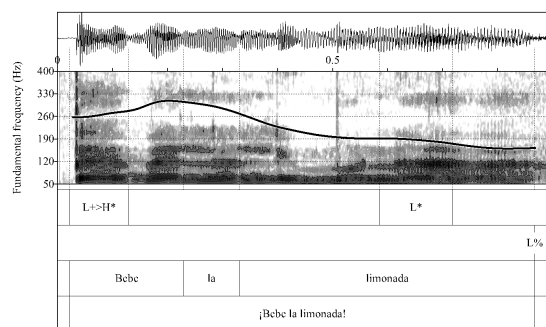


Figure 2: Waveform, spectrogram, and F0 trace for the long imperative (C2) ¡Bebe la limonada! 'Drink the lemonade!' of speaker TF (sentence 2\_25), produced with a delayed peak (L+>H\*) on  $V_1$  and a low nuclear configuration (L\* L%).

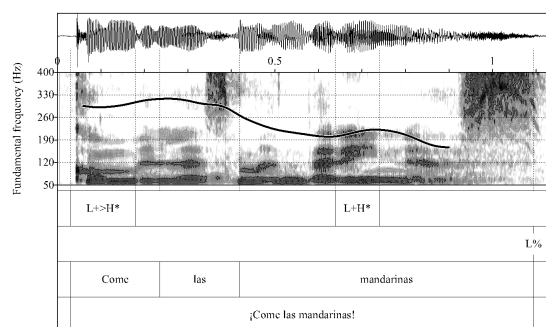


Figure 3: Waveform, spectrogram, and F0 trace for the long imperative (C2) ¡Come las mandarinas! 'Eat the tangerines!' of speaker TF (sentence 2\_21), produced with a delayed peak (L+>H\*) on  $V_1$  and a rising/falling nuclear configuration (L+H\* L%).

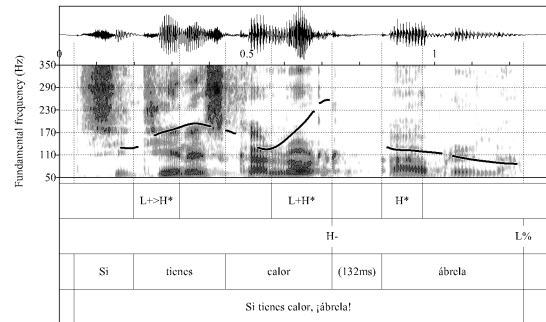


Figure 4: Waveform, spectrogram, and F0 trace for the long imperatives with final  $V_1$  (C3) Si tienes calor, ¡ábrela! 'If you are warm, open it!' of speaker MM (sentence 2\_7), produced with a high nuclear pitch accent (H\*) and a low IP edge tone (L%), preceded by a pause (of 132ms).

### 3.2. Individual results

As for the nuclear configurations attested in C1, each speaker realizes the two configurations H\* L% and L+H\* L%, see Table 2. There are some differences, however, with respect to the frequency of the realizations. While the two speakers from México DF prefer H\* L% over L+H\* L% (MF: 70% vs. 30%; MM: 55% vs. 45%), the speaker from Torreón realizes H\* L% less often than L+H\* L% (40% vs. 60%). For the nuclear configurations attested in C2, each speaker has a repertoire of three configurations, see Table 2. Only two configurations, L\* L% and L+H\* L%, were realized by each speaker. The speakers from México DF additionally use H\* L%, while TF uses H+L\* L%. The low nuclear configuration L\* L% is the prevailing choice for each speaker (MF: 60%; MM: 45%; TF: 75%). The rising-falling or circumflex contour L+H\* L% is the second most common choice for the speakers from México DF, while H+L\* L% is the second most common for TF.

Table 2, Nuclear configurations for each condition and each individual speaker (given in % and absolute numbers)

C1	MF	H* L% (70%, 14)		L+H* L% (30%, 6)	
	MM	H* L% (55%, 11)		L+H* L% (45%, 9)	
	TF	L+H* L% (60%, 12)		H* L% (40%, 8)	
C2	MF	L* L% (60%, 12)	L+H* L% (25%, 5)	H* L% (15%, 3)	
	MM	L* L% (45%, 9)	L+H* L% (40%, 8)	H* L% (15%, 3)	
	TF	L* L% (75%, 15)	H+L* L% (15%, 3)	L+H* L% (10%, 2)	
C3	MF	L+H* L% (55%, 11)	H* L% (45%, 9)		
	MM	L* L% (45%, 9)	H* L% (25%, 5)	H+L* L% (15%, 3)	L+H* L% (15%, 3)
	TF	H* L% (70%, 14)	L+H* L% (20%, 4)	H+L* L% (10%, 2)	

As for C3, there is not only clear variation between the speakers with respect to the number of different contours used (MF: 2, MM: 4, TF: 3), but also with respect to the most popular choice of the speakers. While MF and TF prefer high or rising nuclear accents, MM prefers a low nuclear accent. Furthermore, he is the only speaker to use a low nuclear configuration in C3.

Finally, in terms of the realization of the prenuclear accent located on  $V_1$  in C2, all three speakers strongly prefer the delayed peak  $L \rightarrow H^*$  (MF: 90%; MM: 95%; TF 90%). As a consequence, the frequency of the other realizations (which are  $H^*$  and  $L+H^*$ ) is very low. The delayed peak is realized significantly more often than the other tones across the speakers ( $\chi^2 = 41.667$ ,  $df = 1$ ,  $p = 0$ ).

#### 4. Discussion

Hypothesis 1 (short imperatives are realized with a rising nuclear accent and do not show variation) can be taken as fulfilled, since the nuclear accent is either high or rising. This supports the claims by [8] for short declaratives and contradicts [2], in which considerable tonal variation is attested on  $V_1$ . In defense of [2], however, it is important to note that short imperatives were not investigated in this work. We return to [2] in greater detail when discussing the results in the light of the second hypothesis.

Hypothesis 2 (long imperatives have a low or falling nuclear configuration and a rising accent on  $V_1$  in sentence-initial position) cannot be taken to be completely fulfilled, as the data give a rather mixed picture. Even though 65% of the data is realized by  $L^* L\%$  (60%) and  $H+L^* L\%$  (5%), 35% of the nuclear accents are either high or rising. Thus, the low or falling contours support the claims made in [8], while the high and circumflex contours show that the authors of [1] appear to be on the right track. In contrast to [1], though, no optional emphatic upstep of  $H$  was attested in our data. Additionally, our data show that long imperatives with  $V_1$  in sentence-initial position can indeed be realized with a low or falling nuclear configuration. This is in line with studies on neutral, broad focus declaratives in Mexican Spanish, which show that both contours,  $L^* L\%$  and  $L+H^* L\%$ , are typical nuclear configurations ([15], [16], and also [1]). As such, our work confirms the studies on Mexican declaratives, leading us to conclude that hypothesis 2 is simply too strict for Mexican Spanish. In terms of pitch accent variation, variation of pitch accents on  $V_1$  is possible in C2, but in contrast to the results of [2], the delayed peak is chosen by nearly all of the speakers (92%), with instances of non-delayed peaks being very rare (totaling 8%). A considerably larger number of instances of non-delayed peaks were attested in [2] (see p.359). Furthermore, [2] reports on a variation between three different pitch accents in 3 out of his 4 speakers, while in our data two speakers (MM and TF) use only two different pitch accents. In addition, the third pitch accent used by speaker MF occurs only once. Thus, as for C2, there is considerably less pitch accent variation in our data than in [2].

Hypothesis 3 (long imperatives with final  $V_1$  are realized by a low or falling nuclear configuration) was shown not to be fulfilled. The nuclear contour is typically either high or rising (77%), while the rest is low or falling (23%). In addition, the low or falling instances were mainly uttered by a single speaker (MM), while the other two speakers either did not realize any falling nuclear accent (MF) or did so to only a small extent (TF).

Due to the fact that the material preceding  $V_1$  is a conditional clause whose edge is obligatorily marked by a high edge tone accompanied by a pause, we wonder whether the entire sentence can really be considered to be a typical declarative utterance. The main clause, consisting of only  $V_1$ , behaves as the short imperative of C1. [17], [18], [19] have already noted that adjunct clauses have a considerable impact on the intonation of a sentence. This might explain the great variation in pitch accent observed between our speakers. While speaker MM varies between the low contour of typical declaratives and rising accents of short imperatives, MF and TF (almost) always choose the short imperative pattern. Interestingly, it was the male speaker who showed the greatest variation. The male speakers in [2] also use a greater number of different pitch movements.

Finally, our data confirm the results of [7], in which final  $V_1$  is shown to have a rising intonation for semi-spontaneous speech. The comparison of our study and that in [7] indicates that some differences exist with respect to the tonal realization of non-final  $V_1$  in semi-spontaneous and scripted speech with scripted speech showing less variation (see [20], [21], and [22] for studies on spontaneous speech in Spanish and a discussion of differences between laboratory and spontaneous speech).

#### 5. Conclusions

The contribution of this paper consists in presenting a unified perspective on (a) the pitch accent located on the imperative verb and (b) the nuclear configuration of imperative sentences - a view that has not taken been before. Coming from this perspective, we show that imperative sentences in Mexican Spanish have two different nuclear configurations depending on the position of the imperative verb: (i)  $(L+)H^* L\%$  with  $V_1$  in sentence-final position (as in short imperatives and imperatives preceded by a conditional clause), and (ii)  $L^* L\%$ , with  $V_1$  in non-final position (as in long imperatives). Long imperatives can also have a rising accent, which is in line with [1]. However, in contrast to [1], the circumflex nuclear configuration is not the prevailing choice of the speakers for (long) imperatives. In contrast to [2], we could not attest strong variation in pitch accent on  $V_1$  across the conditions. Our speakers strongly preferred the delayed peak  $L \rightarrow H^*$  in long imperatives and hardly realized the other pitch accents. High/rising accents such as  $H^*$  or  $L+H^*$  are either the most popular or sole choice in short imperatives (C1) and in long imperatives with final  $V_1$  (C3).

In this study, we hoped to answer the question of whether  $V_1$  in sentence-final position also shows a rising accent when preceded by other material. Our data were able to confirm this. Nevertheless, it would be interesting to see whether high or rising accents also occur when  $V_1$  is preceded by material other than a conditional clause. If so, this might shed further light on the ongoing discussion on whether differences exist on the tonal level between declarative and imperative intonation.

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