Prosodic features of non-final IPs in L2 French: a perception study
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This paper studies how L1 Spanish listeners evaluate different prosodic events associated to non-final Intonational Phrases (IPs) in L2 French. The main goal is to clarify whether the L2 French prosodic patterns that have been observed in Spanish learners’ oral productions are identified as prototypical prosodic forms for realizing non-final IPs in L2 French. The right boundaries of non-final IP’s are implemented with similar melodic shapes in both French and Spanish languages: pitch rises span less than 9 semitones and do not reach the top of the speaker’s range (LH*H% and L+H*H% respectively) [cf. 1, 3, 4]. Yet, it has been shown that Spanish learners of L2 French mark the end of non-final IP’s (boundary tones aligned with the right edge of coordinated sentences and extra-sentential elements located in the left periphery) by exploiting phonetic correlates that are not observed in L1 French oral productions: (1) an extra-rising melodic movement (LH*HH%) that spans more than 11 semitones reaching the top of the speakers’ range, and (2) a reduction of final vowel durations [2]. As these L2 prosodic cues could not be possibly related to an L1 transfer, it has been claimed [2] that only the L2 process acquisition itself could explain their emergence.

A perceptive test was carried out for three different groups of listeners for clarifying this issue: French native listeners (FL1), Spanish native listeners who were attending intermediate L2 French courses at the moment of the experiment (FL2), and Spanish native listeners (SL1). FL1 and FL2 listeners were tested in French, whereas SL1 were tested in Spanish. 73 participants completed the test (22, 32 and 19 listeners for each group respectively). Stimuli consisted of 32 resynthesized sentences containing one non-final IP. Stimuli were classified in two sets. Set (A) included 16 non-final IPs displaying two different shapes in the final pitch flexion: rising (H%) vs. extra-rising (HH%). Set (B) contained 16 non-final IPs displaying two different types of final vowel duration in their last syllables: Long (L) vs. Short (S).

Two native phoneticians in both languages recorded the stimuli. For both sets, the final shape of f0 and the durational cues of final syllables were manipulated with Praat in order to obtain perfectly coherent realizations of the different conditions tested here (figures 1 & 2). All participants were asked to read a paragraph presenting a scenario for each sentence. They had to listen to the resynthesized sentences inserted in each scenario and evaluate their melody within a 1 to 5 scale (1 = melody is inappropriate, 5 = melody is appropriate).

Results show an interaction between groups and scores given to stimuli in set (A) (figure 3): the SL1 group evaluated H% better than HH%, the FL1 group showed the opposite tendency, whereas FL2 did not show any preference for any of the two final rising contours. Scores given to set (B) (figure 4) show that there is a significant interaction between the groups and evaluations as well: the SL1 group evaluated condition S better than L, whereas the FL1 and FL2 groups did not show any preference for any of the two durational effects tested here. Two interpretations are suggested for explaining these results: (i) there is a discrepancy between perception and production of prosodic features in L2 French, but in L1 French as well, and (ii) learners do not judge the prosodic patterns tested here in the same way than native listeners do. These results may confirm that abilities in perception and production of prosodic features are not necessarily developed in parallel when learning an L2.
duration in order to obtain the label ++L

durations plus twice the S.D.,

was longer than the mean duration at once the standard deviation (S.D.)

of the syllable and the final one

and, the latter was considered as neither lengthened nor r

was manipulated so that HH% corresponded to a +11 semi-tones rise: the rising pitch trace was manipulated between the end of the pre-nuclear syllable and the final one (in French from the end of the syllable a to the end of the syllable ni of the word Annie and, in Spanish between the start of the last pitch accented syllable [ro] until the end of the syllable [ma] of the word Roma). In both cases, HH% reached systematically the top of the speaker range (horizontal dotted line). For obtaining H%, the same procedure was followed: H% corresponded to a +7 semi-tones rise (in this case, the French word Paris and the Spanish one judo display a similar shape of the H% contour). Finally, stimuli were resynthesized with the new final boundary tones.

**Figure 1.** Illustration of how recordings were treated for obtaining the HH% and HH% (bolded black lines in the gray squares). Firstly, we obtained the stylization of the entire pitch trace for each utterance with Praat. Then the final pitch flexion (indicated by the rising dotted lines in the gray squares) was manipulated so that HH% corresponded to a +11 semi-tones rise: the rising pitch trace was manipulated between the end of the pre-nuclear syllable and the final one (in French from the end of the syllable a to the end of the syllable ni of the word Annie and, in Spanish between the start of the last pitch accented syllable [ro] until the end of the syllable [ma] of the word Roma). In both cases, HH% reached systematically the top of the speaker range (horizontal dotted line). For obtaining H%, the same procedure was followed: H% corresponded to a +7 semi-tones rise (in this case, the French word Paris and the Spanish one judo display a similar shape of the H% contour). Finally, stimuli were resynthesized with the new final boundary tones.

**Figure 2.** Illustration of how recordings were manipulated for obtaining two different final durations associated to the end of non-final IPs: Long (L) vs. Short (S). Firstly a label was assigned to each nucleus standing for its vowel duration at each utterance, the latter was considered as neither lengthened nor reduced (label “0”). Instead, if the vowel duration was longer than the mean duration at once the standard deviation (S.D.), it was encoded as Long. For vowel durations plus twice the S.D., we used the label +Long, and so on. For obtaining the condition S, we reduced the vowel duration of the final syllables (in Spanish, the two last final syllables) so that they adopted the duration of the label “0”; instead, the condition L was obtained by increasing the vowel duration so that it corresponded to the label ++Long. When final vowel durations were labeled as +++Long (in French only), we reduced their duration in order to obtain the label “0”.

**Figure 3.**

**Figure 4.**

References