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Vowel lengthening in L2 Italian and L2 French: a cue for focus marking?

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Abstract

Our study investigates the role of vowel duration as a cue for focus marking in both L1 and L2 Italian and French. We aim to compare our data to highlight potential influences of the native language on L2 productions in the use of this cue. The analysis involves task-elicited speech from 60 participants: 15 native Italian speakers, 15 native French speakers, 15 French learners of Italian (L2), and 15 Italian learners of French (L2). Participants produced the same target constituent under four information-structural conditions: background, broad focus, identification focus, and correction focus. Results reveal that the information-structural function significantly influences stressed vowel duration in native Italian, with identification-focus and correction-focus constituents bearing longer duration than background and broad focus. However, the same pattern does not hold in native French. Crucially, this distinction is mirrored in the production of non-native speakers. Italian learners of L2 French, in fact, modulate duration based on the informational role of the constituent; in contrast, French learners of Italian L2 do not. We discuss these findings in relation to previous findings on other prosodic and syntactic markers of focus. Results are commented in light of typological differences in discourse-prominence marking and theories of L2 prosody acquisition.

Index Terms: focus, vowel duration, L2 prosody, French, Italian

1. Introduction

Information-structural categories such as background, focus, and contrast, can be expressed through diverse linguistic means across languages, many of them reconstructible to the umbrella-category of prosody [1]. Among prosodic features, duration of vocalic segments has been described as a significant cue in information-structure marking, with studies extensively exploring its use and impact in different languages [2, 3, 4, 5]. Studies dealing with focus-induced variation in duration are not abundant for French and Italian, perhaps because of the biased vision of Romance languages as prosodically ‘non-plastic’ in information-structure marking. In fact, the majority of works conducted on these two languages deals with the interaction between focus and tonal movements, treating vowel lengthening as a sort of side-effect [6, 7, 8]. Results from these studies suggest that the same mechanism observed in other languages holds for French and Italian: as the salience or contrast of a constituent increases, the duration of its metrically strong vowel also increases. In simpler terms, background constituents in an utterance tend to have shorter tonic vowels, while focused constituents exhibit longer duration, with contrastive *foci* showing the most significant lengthening. However, due to phonological differences between Italian and French, particularly the presence or absence of lexical stress, the phenomenon of vowel

lengthening is not anchored in the same way. In Italian, vowel lengthening is primarily associated with the nucleus of the syllable bearing lexical stress, while in French, lengthening typically affects the rightmost syllables of the focus units, i.e. those found in pre-boundary positions [9].

1.1. Implications for L2 Acquisition

This convergence-divergence of the same phenomenon, marked by different anchoring, is particularly noteworthy in the context of L2 acquisition. Studies, such as those conducted by [10] and [11], have demonstrated that managing stress, tone, duration and syntax in the expression of information-structure poses a challenge for L2 speakers. However, to the best of our knowledge, no study has explored the phenomenon with this exact combination of languages, Italian L1 and French L2 and viceversa. The aim of this work is to shed light on these issues, designing a methodology and collecting a corpus ad hoc. Preliminary analyses conducted on this corpus, which is the one we will use here, have shown that French speakers rely more on f0 movements than Italian speakers in marking focus. This tendency of native speakers is mirrored as L1 influence in the learner groups [12, 13]: Italian learners of French underuse intonation if compared to the target, and French learners of Italian behave the opposite way. With this present study, we aim to add information about duration, to test if this other prosodic cue can compensate for this disparity, or if it is inhibited by phonological differences in anchoring between Italian and French. Moreover, we want to explore whether L1 influence constrains L2 speakers’ use in differential marking of two focus subtypes, namely identification- and correction-focus, in the same way as happened with tonal movements.

2. Methodology

In the following paragraph, we will briefly outline the design of the study and the tools used for the analysis of collected data.

2.1. Sample

To examine the production of L2 Italian and L2 French speakers and investigate potential effects of L1 influence, we opted for an inter-individual, multi-group, fully-crossed design. We recruited four groups of participants: two test groups, French learners of L2 Italian (ITL2) and Italian learners of L2 French (FRL2), along with two control groups, native French speakers with no competence in Italian (FRL1) and native Italian speakers with no competence in French (ITL1). L2 groups are made up of adult speakers living in the target foreign country, not attending any foreign language courses. The sample is homogeneous across all four groups in terms of gender balance and age range (19-40). Special care was taken in circumscribing the speakers’ areas of origin, minimizing the impact of diatopic

variation. Our points of inquiry are the area of Turin (Piedmont) for Italian L1 and Italian L2 groups, and Paris and Île-de-France for French L1 and French L2. Table 1 provides an outline of the sample.

Table 1: *Population sample*

Grp	L1/L2	Part.	Age (mean)	Gender
ITL1	Italian/ -	N=15	25,6	M=3
FRL1	French/-	N=15	27,5	M=4
ITL2	French/Italian	N=15	27,4	M=7
FRL2	Italian/ French	N=15	32,5	M=8

The proficiency levels of L2 speakers, assessed through written and oral tests from intermediate to advanced, are noted but not extensively discussed in this study. Anyway, neither competence level nor length of residence emerged as predominant factors in the analyses presented.

2.2. Task

Experimental studies on prosodic focus marking face conflicting demands: the need for speech material with conversational value clashes with the phonetic analysis’s requirement for highly controlled, comparable prosodic units. To try and reconcile these demands, we chose a picture-story task (inspired by [14] and [15]), using semi-spontaneous, picture-constrained responses. Original stimuli were translated into Italian and French. Groups ITL1 and ITL2 completed the task in the Italian version, while groups FRL1 and FRL2 used the French version. The task is conducted as follows: first, the participant is presented with a PowerPoint slide containing a short story, accompanied by a caption serving as the baseline sentence. Then, the participant can proceed to the subsequent slides, which contain the same pictures along with different written questions. Examples from the Italian version are illustrated in Figure 1.



Figure 1: *Stimuli from the Italian version of the task.*

Participants can progress through the slides at their own pace and are instructed to respond to each question aloud, with no other guidance on how to formulate their answers besides a request to avoid one-word utterances. The questions are designed to elicit three types of focus-utterances: broad focus (bf), narrow-identification focus (id), narrow-correction focus (cr). Additionally, questions target various types of syntactic constituents: subjects, verbs, objects, adverbials. For this study, we focus on utterances targeting one specific type of syntactic constituent, namely subjects, in all possible conditions: broad, narrow-identification, narrow-correction focus, and background

(utterances in which the targeted focus constituent is the object). The target subjects are the words “Marie” in French and “Maria” in Italian, two proper names considered equivalent in both languages, composed of similar segmental material. Examples of questions and expected answers are provided below (focus constituents are underlined).

- q. Che cosa succede qui? **bf**
What’s going on here?
a. Maria compra il giornale in edicola.
Maria is buying the newspaper at the newsstand.
- q. Chi compra il giornale in edicola? **id**
Who’s buying the newspaper at the newsstand?
a. Maria compra il giornale in edicola.
Maria is buying the newspaper at the newsstand.
- q. Giulia compra il giornale in edicola, giusto? **cr**
Giulia’s buying the newspaper at the newsstand, right?
a. No, è Maria che compra il giornale in edicola.
No, it’s Maria who’s buying the newspaper at the newsstand.
- q. Che cosa compra Maria in edicola? **bg**
What’s Maria buying at the newsstand?
a. Maria in edicola compra il giornale.
Maria is buying a newspaper at the newsstand.

Recordings were carried out in a soundproof environment. Audio files were recorded in .wav format, with a sampling rate of 44100 Hz.

2.3. Data preparation and statistics

Orthographic transcription of recordings was manually performed using Praat [16]. Segmentation at the word, syllable, and phone levels was done through WebMaus [17] and manually adjusted for errors. Mean vowel duration and standard deviation were then calculated for each speaker using the Polytonia script [18]. Each participant produced 30 utterances. For the analysis, we considered only 8 utterances per speaker, specifically those featuring target subjects in the four different focus conditions: 2 for background (bg), 2 for broad focus (bf), 2 for identification (id), and 2 for correction. During target utterance selection, we excluded instances from the dataset in which the target constituent was affected by disfluencies. Duration of the target vowel was extracted by hand. In the case of Italian, the target vowels are [i], the nucleus of the tonic syllable in “Maria”. In the case of French, the target vowel is also [i], located at the right edge of the focus constituent “Marie”. Our final dataset comprises 8 observations x 15 speakers x 4 groups, totaling 480 tokens. For the analysis, vowel duration was normalized to Z-scores using mean nuclei duration and standard deviation of each individual speaker. Statistics was run on R [19]. Normality of distribution was assessed through Shapiro-Wilk’s test [20] and visual inspection of residuals plots. We fitted a linear mixed model (estimated using REML and nlptwrap optimizer) to predict target vowel duration with focus context (formula: zDur ~ context). Standardized parameters were obtained by fitting the model on a standardized version of the dataset. 95% Confidence Intervals (CIs) and p-values were computed using a Wald t-distribution approximation. The model included speaker as random effect (formula: 1|speaker).

3. Results

In this section we will outline the results, starting from the two native groups and then moving to the L2s.

3.1. L1 Italian

Figure 2 shows the boxplot of normalized duration of vowel [i] in “Maria” in the four conditions: background, broad focus, identification, correction.

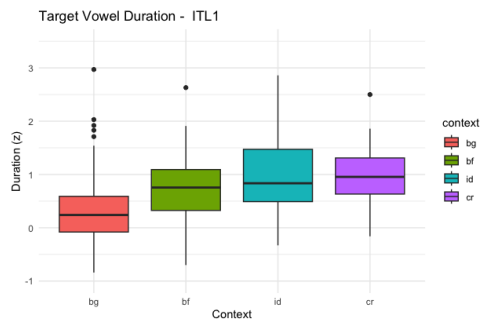


Figure 2: Boxplot of target vowel duration (ITL1 group).

The chart indicates an increase in stressed vowel duration across the four conditions, especially when transitioning from background to broad focus and narrow focus. In the case of identification and correction, there appears to be no significant variation in duration. The statistical model confirms these trends: considering the [bg] context as the baseline level, the effect of [bf] is statistically significant and positive ($\beta = 0.36, p < .001$). Both [id] and [cr] effects are also significant and positive compared to the baseline ($\beta = 0.70, p < .001$ for identification, $\beta = 0.75$ and $p < .001$ for correction), and they are also significant and positive compared to the [bf] conditions. However, they are not clearly distinguishable from each other.

3.2. L1 French

Figure 3 shows the boxplot of normalized duration for vowels [i] in target constituents “Marie”, in the same four conditions.

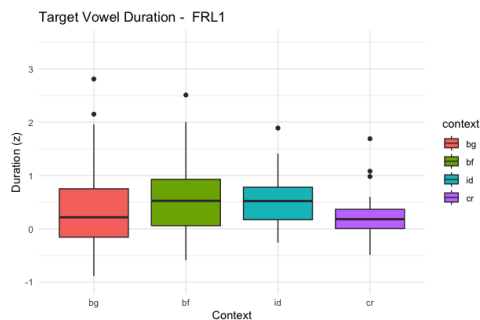


Figure 3: Boxplot of target vowel duration (FRL1 group).

The pattern observed for this group differs partially from that seen in native Italian speakers. Notably, in broad focus and identification contexts, the duration of the target vowel is significantly higher compared to the background. Unlike Italian speakers, however, the effect of the [bf] context is more pronounced than that of [id]. Specifically, the broad focus context exhibits a positive beta score ($\beta = 0.42, p < .001$), which is higher than that of the identification focus ($\beta = 0.23, p = 0.038$). This tendency to reduce duration from broad to narrow-focus contexts becomes even more apparent in the case of [cr], where the effect is negative compared to the baseline, although statistically non-significant ($\beta = -0.04, p = 0.762$).

3.3. L1 inter-group comparison

The comparison of these results suggests a different use of durational cues by the two groups. While both French and Italian speakers mark the distinction between background and broad focus through significant vowel lengthening, this mechanism does not hold uniformly for narrow-focus (id and cr) in both languages. As expected, in Italian the narrowing of focus scope results in longer vowels. In French, conversely, the tendency appears to be the opposite: this might be explained by positing a trade-off relation of duration with other marking strategies, such as syntax. We will try to integrate and account for this factor in the discussion paragraph. The absence of lengthening for contrastive contexts in French could also be explained by the shift of prosodic prominence from the right to the left edge of the focus constituent, realized as the so-called *accent initial* (see [21]).

3.4. L2 Italian

We now discuss the results from L2 groups. Figure 4 represents the outcome of French learners of L2 Italian.

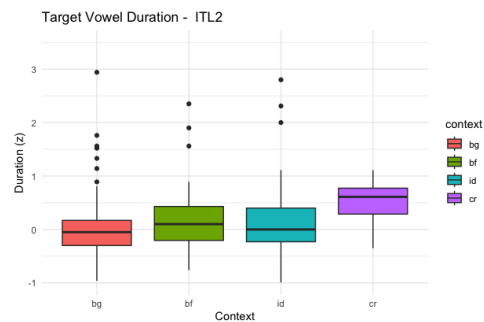


Figure 4: Boxplot of target vowel duration (ITL2 group).

Results from French learners of L2 Italian show overall good approximation to the target language. The analysis of their production suggests that all focus conditions are differentiated from the background baseline through vowel lengthening, even if not always with high significance. Specifically, the effect of context [bf] is positive but moderately significant ($\beta = 0.19, p = 0.016$); the effect of context [id] is statistically significant and positive ($\beta = 0.22, p = 0.006$), and the effect of context [cr] is again positive and statistically significant ($\beta = 0.44, p = 0.002$).

3.5. L2 French

Figure 5 in the next page shows the results for Italian learners of L2 French.

In this case, the only focus condition with significant vowel lengthening compared to the background baseline is broad focus. The effect of context [bf] is statistically significant and positive ($\beta = 0.53, p < .001$). The effect of context [id] is slightly positive but statistically non-significant ($\beta = 0.20, p = 0.138$), and the effect of context [cr] is very similar to that of [id], positive but statistically non-significant ($\beta = 0.21, p = 0.240$). Comparing these results to those of the two L1 groups, we observe that the behavior of L2 French speakers deviates from both the target and source languages. Overall, the narrow-focus conditions do not exhibit a clear differentiation from the other two conditions—background and broad focus—either through

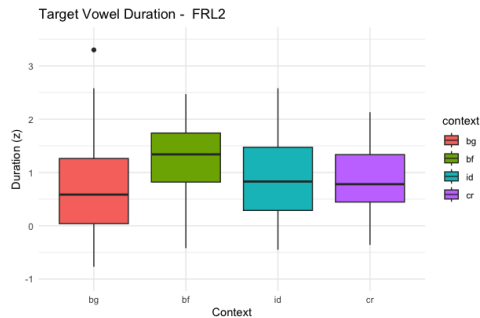


Figure 5: *Boxplot of target vowel duration (FRL2 group).*

a longer duration (as seen in L1 Italians) or a shorter duration (as observed in L1 French).

3.6. L2 inter-group comparison

Results of the L2 groups reveal differences and similarities between them and also with respect to their source and target counterparts. On the one hand, they share a common feature: in both L2 French and L2 Italian, vowel duration does not seem to be systematically used as a cue for distinguishing among all conditions. However, we highlight that French learners of L2 Italian do differentiate one condition from the other three, e. g. correction focus: interestingly, though, they make it in the opposed way of the FRL1 group, which showed a significant but negative effect for the [cr] condition.

4. Discussion

In this section, we will summarize our main findings and compare them with the results from previous analyses on the same dataset, as well as with the existing literature.

4.1. Duration and intonation in the L1

Our results reveal that speakers from the native Italian group significantly use vowel lengthening to differentiate between non-focal and focal constituents in Italian, while native French speakers do not exhibit the same pattern. This finding is particularly intriguing when compared to results on intonation from the same corpus [13], which indicate that Italian speakers only moderately rely on intonation, especially when compared to their French counterparts. This may suggest a higher importance of durational cues in Italian compared to French, prompting interesting typological considerations. It is plausible that Italian speakers rely more on durational rather than f_0 cues because, in their language, word-level prominence (i.e., lexical stress) is encoded through duration rather than f_0 movements. In French, on the other hand, low-level prominence is also largely encoded by tonal movements at the prosodic boundaries. In any case, our results underscore the importance of considering both duration and intonation to capture nuances of prosodic marking, as perceived prominence can be linked to both—either together or individually.

4.2. Prosody and syntax: additivity or trade-off?

The results from both L1 and L2 French speakers indicate less vowel lengthening in more contrastive conditions, such as correction focus. This outcome may be unexpected, emphasizing the importance of maintaining a flexible protocol for data col-

lection. This flexibility allowed us to gather information about syntactic marking as well. Relying on the results from the syntactic analysis [13, 12], we know that syntactic marking through it-clefts is especially frequent in these groups. This observation could suggest a trade-off relationship between duration and clefting, with the latter being favored in more contrastive contexts.

4.3. Effects for L2 acquisition

Our data reveal that some characteristic features of the two source languages are manifested in the production of L2 speakers, albeit not uniformly across all aspects. In terms introduced by Mennen [22], we assert that L1 transfer predominantly influences the semantic level, rather than the realizational one: L2 speakers tend to differentiate among the same conditions as in their native languages. However, this differentiation is less pronounced compared to their L1 counterparts, indicating an overall underuse of prosodic cues to mark information structure. This conclusion is reinforced by the integration of intonation data on intonation [12, 13]: in fact, although durational cues and melodic cues may be used distinctly, and not always to the same extent, by native speakers, it is observed that both cues are under-utilized by L2 speakers. We believe that integrating results from both intonational and syntactic analysis is crucial for explaining this phenomenon. Specifically, we posit that prosodic marking of focus may pose more challenges for L2 speakers than syntactic marking due to the perceived higher syntactic similarity between French and Italian than their phonological resemblance. Consequently, French and Italian speakers lean more towards a strategy recognized as target-like, such as clefting; this tendency is demonstrated by our data [13, 12]. The high use of cleft sentences in narrow focus inhibits vowel lengthening, as if the durational cue becomes redundant in the presence of already significant syntactic marking. Moreover, the predominance of syntactic marking in L2 aligns with findings from studies on other language combinations (beyond perceived similarity). It has been observed that prosodic marking of focus is more challenging to acquire than syntactic marking [23], and focus marking through clefts has proven to be easier to process for L2 speakers compared to prosodic encoding [24].

5. Conclusions and perspectives

The study yielded intriguing results, particularly when integrated with findings from prior research on the same material. However, we acknowledge encountering certain challenges that could be addressed to ensure improvements in future work. A notable difficulty arose during the analysis of L2 speech due to the presence of disfluencies, which made it challenging at times to differentiate hesitations from intentional vowel lengthening. The impact of hesitation in speech planning may also have influenced duration measures, such as the mean of nuclei duration and standard deviation. Another significant consideration is that, despite the acknowledged importance of ecological validity in the possibility of integrating syntax in focus studies, the use of non-scripted speech resulted in considerable variation in speakers' responses. We are thus contemplating collecting data from a more controlled protocol to enhance the integration of these results.

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