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# Heritage speakers' use of prosodic strategies in focus marking in Spanish

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## Abstract

**Aims and objectives:** The present study investigates how focus is prosodically realized by Spanish heritage speakers, and whether they show different patterns from Spanish monolinguals and English second language (L2) learners of Spanish.

**Design:** Prompt questions were auditorily presented to elicit participants' production of sentences with different scopes and locations of focus.

**Data and analysis:** Relative prosodic prominence between focused and non-focused constituents, as well as tonal alignment, were acoustically analyzed and compared across the groups. Additional strategies that participants used are also presented.

**Findings:** The results revealed that all three groups used multiple strategies, both prosodic and non-prosodic, to express focus in Spanish. However, the specific cues that were used differed in each group. Monolinguals and L2 learners clearly differed from each other in that the former preferred non-prosodic strategies (e.g., cleft constructions, complementizer *que* 'that'), while the latter used various prosodic strategies (e.g., relative prosodic prominence, early peak alignment, post-focal deaccenting). Heritage speakers, on the other hand, used a mix of strategies that were observed in both monolinguals' and L2 learners' speech.

**Originality:** Prosody is an understudied area in heritage language research. This is one of few studies that examined Spanish heritage speakers' use of prosodic cues in the realization of focus in Spanish and the first to extensively analyze various acoustic correlates of focus produced by Spanish heritage speakers.

**Implication:** The findings suggest that heritage speakers are flexible in their use of linguistic strategies as they are able to extract resources from their two language systems.

## Keywords

Heritage speakers, heritage language phonology, Spanish-English bilingualism, prosody, focus marking strategies

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## Introduction

Heritage speakers are children of immigrants who speak an ethnic minority language in a society where a different language is spoken as the majority language. In the context of the US, Spanish is the most spoken non-English language at home (Gonzalez-Barrera & Lopez, 2013); thus, heritage speakers of Spanish constitute the largest heritage population in the country (Benmamoun, Montrul, & Polinsky, 2010). While Spanish heritage speakers encompass a broad spectrum of individuals with different Spanish proficiency, type and amount of Spanish input, schooling, etc., what they generally have in common is that when they reach adulthood they become more dominant in the majority language (English) than their home language (Spanish) (Montrul, 2008, 2012; Valdés, 2001). Due to various socioeconomic values of Spanish (Lynch, 2014; Martinez & Schwartz, 2012; Stevens, 1992) and in order to stay connected to their ethnic group and culture (Carreira, 2013; Lacorte & Canabal, 2003), many heritage speakers enroll in Spanish second language (L2) courses to maintain or improve their Spanish skills (Beaudrie & Ducar, 2005; Lynch, 2014; Montrul, 2010, 2012; Oh & Nash, 2014). However, it can be problematic to place heritage speakers in the same classroom as L2 learners, because, apart from receiving variable amounts of input in Spanish in a restricted environment (Montrul, 2012), there are clear differences between heritage speakers and L2 learners in the way they acquire Spanish. While heritage speakers are exposed to Spanish and English naturalistically since birth or in childhood (native bilinguals), L2 learners whose native language is English generally learn Spanish around or after puberty via classroom instructions (late sequential bilinguals) (Montrul, 2012). Thus, studies in heritage language acquisition often compare Spanish heritage speakers and English L2 learners of Spanish to examine whether heritage speakers' early and naturalistic exposure to Spanish puts them in an advantageous position compared to L2 learners regarding their linguistic knowledge of Spanish and whether heritage speakers show divergent patterns from Spanish monolinguals due to reduced input in Spanish (Lynch, 2014; Montrul, 2012). Heritage speakers' linguistic knowledge of the heritage language has been investigated in various subfields of linguistics, such as syntax and morphology, but phonology is an understudied area in heritage language research (Montrul, 2010; Polinsky & Kagan, 2007). The present study examines Spanish heritage speakers' use of prosody when expressing focus in Spanish and whether they show similar or different patterns from those of L2 learners and monolingual speakers of Spanish.

## Background

### *Influence from dominant language to heritage language phonology*

Heritage speakers vary tremendously in their command of the heritage language (Benmamoun et al., 2010). However, no matter how fluent heritage speakers are in both languages, they are not simply 'two monolinguals in one person' (Grosjean, 1989), because bilinguals seldom use two languages in the exact same domains of interaction or use two languages to carry out the exact same conversations with each person with whom they interact (Valdés, 2001). First language (L1) and L2 phonetic systems are constantly engaged; thus, mutual influence between the heritage language and English sounds is inevitable (Flege, 1995; Grosjean, 1989) and the direction and strength of phonetic influence depends on factors such as the amount and circumstances of L1 and L2 use, language proficiency, etc. (Yip & Matthews, 2006). As Spanish heritage speakers are generally English-dominant, several studies have shown influence from English to Spanish phonology at both segmental (Amengual, 2012; Au et al., 2002; Henriksen, 2015; Rao, 2014; Ronquest, 2013, among others) and suprasegmental levels (Gries & Miglio, 2014; Robles-Puente, 2014, Zárata-Sánchez, 2015, among others).

## *Focus in Spanish and English*

Focus is defined as non-presupposed or new information in the utterance (Zubizarreta, 1998). Although many languages are similar in that focused constituents contain a word that receives a nuclear stress, the way focus is marked varies across different languages. In English, word order is relatively rigid. Thus, focus is usually expressed prosodically by stressing focused constituents in situ. Spanish, on the other hand, is a language with flexible word order. While prosody does play a role in focus marking in Spanish, it can also occur in conjunction with syntactic cues by moving focused constituents utterance-finally (Contreras, 1976; Donati & Nespor, 2003; Steedman, 2014; Zubizarreta, 1998). Focus can also be realized by stressing focused constituents in situ, but this is considered to be a marked form and it is used mainly to express contrastive focus (Hualde, 2005).

However, recently this argument has been challenged by several experimental studies that argued that Spanish native speakers in fact frequently stress focused constituents in situ, as in English, rather than moving them to utterance-final position (Domínguez & Arche, 2014; Gabriel, 2010; Gupton & Leal Méndez, 2013; Hoot, 2017). For instance, Hoot (2017) found that, when there was narrow subject focus, Spanish listeners rated S(ubject)V(erb)O(bject) order more acceptable than the supposedly felicitous VOS order. Similarly, Gupton and Leal Méndez (2013) found that Spanish native speakers maintained the canonical SVO order in the majority of the cases, instead of moving the subject utterance-finally. The findings of these studies suggest that prosody may play a larger role in focus marking in Spanish than what has been expected.

If focus can be realized prosodically in both Spanish and English, what are the prosodic cues that speakers use to mark focus? Several factors contribute to the prosodic marking of focus, including pitch, duration, intensity and pitch range, which are shared across many languages (Jun, 2005; Ladd, 2008). Focused constituents are generally produced with higher pitch, longer duration, higher intensity and larger pitch range, compared to non-focused constituents within the same utterance. There are also properties that are encoded differently in different languages. Spanish and English differ particularly in pitch contour. In English, words in a non-final position of a declarative sentence usually bear a high pitch accent (H\*), but when these words are focused, they are generally expressed with a rising pitch accent (L+H\*) (Beckman, Hirschberg, & Shattuck-Hufnagel, 2005) and the following non-focused words tend to be deaccented, lending prosodic prominence to the focused words (Burdin et al., 2015; Ito & Speer, 2008). In Spanish, while there is a large variation in pitch accent types (Kim & Avelino, 2003; Martín Butragueño, 2005, 2006), non-focused words in this position are usually produced with a rising pitch movement that continues throughout the stressed syllable until the syllable(s) that follow(s) (L+>H\*) (Estebas-Vilaplana, 2007; Prieto, van Santen, & Hirschberg, 1995). The rising pitch movement can also end within the stressed syllable (L+H\*) when these words receive narrow focus (de la Mota, 1997; Face & D'Imperio, 2005; Hualde, 1999).

## *Focus marking strategies used by Spanish-English bilinguals*

Research on focus marking in Spanish by Spanish-English bilinguals has been done mostly on the use of syntactic cues, particularly word order (Domínguez & Arche, 2014; Gupton, 2017; Gupton & Leal Méndez, 2013; Hertel, 2003; Hoot, 2017; Lozano, 2006). Studies have shown that, while English L2 learners of Spanish are able to acquire the SV/VS alternation in a native-like manner in some cases (Gupton, 2017), they often show optionality, accepting both SV and VS orders (Domínguez & Arche, 2014; Hertel, 2003; Lozano, 2006). That is, L2 learners are not able to completely expunge the dispreferred non-target option if it does not necessarily lead to ungrammaticality but rather to pragmatic anomaly (Sorace, 2000). Optionality has also been found with Spanish

heritage speakers. Hoot (2017) found that, while both Spanish monolinguals and heritage speakers showed preference toward SVO order when the context called for narrow subject focus, the heritage speakers accepted VOS order with higher ratings than the monolinguals. However, as Domínguez and Arche (2014) argued, SV/VS alternation does not occur in a categorical manner in native Spanish speech. Thus, the residual optionality found in L2 and heritage language research may be due to variability in Spanish input (Domínguez & Arche, 2014).

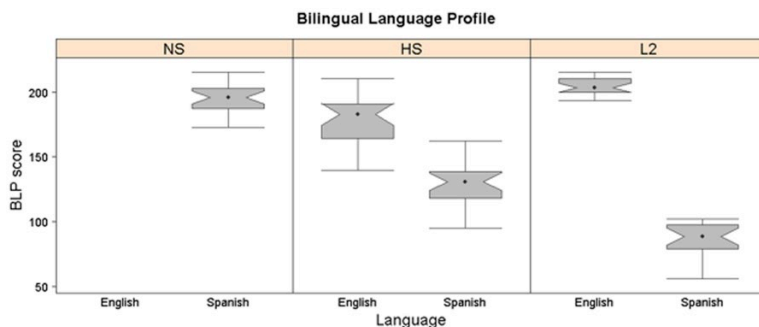
Compared to syntactic cues, little research has been done on bilinguals' use of prosody in focus marking. Zárate-Sández (2015) found that Spanish heritage speakers, similar to Spanish monolinguals, categorically perceived declarative utterances as either emphatic (narrow focus) or non-emphatic (broad focus) at stressed syllable offset, while this threshold occurred significantly earlier within the stressed syllable for English L2 learners and English monolinguals. Spanish heritage speakers have also shown divergent patterns from Spanish monolinguals. For instance, Gries and Miglio (2014) found that heritage speakers produced significantly more instances of pitch movement over the word when expressing new information, compared to given information. While this pattern was also found in English monolinguals, Spanish monolinguals did not differ in their use of pitch movement in the two contexts. The findings in these studies imply that Spanish heritage speakers perform like Spanish monolinguals in some aspects of focus marking, while they show divergent patterns in others (Benmamoun et al., 2010; Montrul, 2010, 2012). As various prosodic factors contribute to focus marking, the present study further examines Spanish heritage speakers' realization of focus in Spanish by analyzing multiple acoustic cues and investigates whether their behaviors differ from those of English L2 learners and Spanish monolinguals.

## **Methodology**

### ***Participants***

In total, 68 subjects participated in the study: 24 Spanish heritage speakers (HS) (18 F, 6 M) (average age: 21.04), 20 English L2 learners of Spanish (L2) (14 F, 6 M) (average age: 20.95) and 24 monolingual native speakers of Spanish (NS) (13 F, 11 M) (average age: 22.92). All subjects were college students or college-educated. The HSs and the L2s were recruited at a university in the Midwest, US, and the recruitment of the NSs took place at a university in central Mexico.

The HSs were first generation US-born Mexican-Americans, whose parents arrived to the US as adults from different areas of Mexico, primarily from the central-west region of the country. All HSs were native bilinguals of Mexican Spanish and American English. When asked about their use of Spanish and English, the HSs reported that they use Spanish (22.42%) far less frequently than English (76.25%). Moreover, their use of Spanish was generally limited to interactions with family members, while English was predominantly used in most settings. The L2s were native speakers of American English and grew up speaking only English. All the L2s started learning Spanish at a mean age of 13.25 (range: 10–20 years) and were enrolled in an upper-division undergraduate course in Spanish at the time of testing. With regard to current use of Spanish and English, the L2s also reported that they use Spanish (10%) far less frequently than English (89.5%). Lastly, the NSs participated in the study as a control group. The NSs were native speakers of Mexican Spanish born and raised in central Mexico, and were monolingually raised in Spanish. None of them learned languages other than Spanish until age 13.29, on average (range: 9–18 years). Although many NSs have learned a foreign language, mostly English, since they use Spanish most of the time (82.58%) and do not use the other language functionally, we concluded that it would be unlikely that these languages would have an effect on NSs' performance on Spanish and considered them as an adequate monolingual control group.



**Figure 1.** Participants' Bilingual Language Profile (BLP) scores in Spanish and English.

Participants' language dominance was measured using the Bilingual Language Profile (BLP) (Birdsong et al., 2012), which is a questionnaire that produces a continuous score of global language dominance, based on participants' self-report on their language history, language use, language proficiency and language attitudes in Spanish and English. In the case of the NSs, only the Spanish results are reported (see Figure 1). HSs' and L2s' BLP scores in Spanish and English were compared using a two-way mixed analysis of variance (ANOVA) with group (HS/L2) and language (Spanish/English) as independent variables and the BLP scores as the dependent variable. The *aov* function in R (R Core Team, 2016) was used for the analysis. For post-hoc pairwise comparisons, Tukey honest significance test (HSD) was conducted using the *TukeyHSD* function. Results showed that overall the BLP scores were significantly higher in English than in Spanish ( $F(1, 84) = 705.678, p < 0.001$ ). While no main effect of group was found, there was a significant interaction between group and language ( $F(1, 84) = 127.081, p < 0.001$ ). Post-hoc pairwise comparisons revealed that HSs' BLP scores in English were significantly lower than those of the L2s, whereas their BLP scores in Spanish were higher than those of the L2s ( $p < 0.001$ ). When comparing HSs' and L2s' BLP scores in Spanish with those of the NSs, a main effect of group was found ( $F(2, 65) = 364.1, p < 0.001$ ), which, as the post-hoc pairwise comparisons have revealed, was due to NSs' significantly higher BLP scores than those of the HSs and the L2s ( $p < 0.001$ ).

## Materials

Twelve items were used as context sentences that the participants read out loud to initiate a conversation (see *Procedures* below). The context sentences were presented in the subject (S)-direct object clitic (Cl)-verb (V) structure (e.g., *Liliana lo preparó*. 'Liliana prepared it.'). The subjects were Spanish paroxytone names and the verbs were transitive verbs in third person singular of preterit tense, which were preceded by a direct object clitic of third person singular *lo* 'it-masculine'. Clitic *lo* was used as the direct object instead of a full nominal phrase, given that sentences with clitics tend to have more flexibility in word order than those with a full nominal phrase (Gabriel, 2010).

Each context sentence was paired with three prompt questions, creating 12 triplet target items. The prompt questions elicited different scopes and locations of focus: broad focus (BF) (e.g., *¿Qué pasó?* 'What happened?'), narrow subject focus (S-focus) (e.g., *¿Quién lo preparó?* 'Who prepared it?') and narrow verb focus (V-focus) (e.g., *¿Qué hizo Liliana?* 'What did Liliana do?'). Apart from the 12 triplet target items, 36 sentences that had different structures from the target items (e.g., sentences with prepositional phrases) were used as fillers. Prompt questions were

followed by a sentence expressing failure of communication (*Perdón, no te oí*. ‘Sorry, I did not hear you.’). All the prompt sentences were produced by a male native speaker of Mexican Spanish.

### Procedures

A simulated interactive elicitation task was conducted using *PsychoPy2* (Peirce, 2007). The participants were instructed to imagine they were having a conversation with someone on the phone. They first read out loud the context sentences presented on the computer screen, as if they were initiating a conversation. After reading each context sentence, the participants pressed a key on the keyboard and listened to the pre-recorded prompt questions described above. Their task was to answer the questions as naturally as possible (see Example 1). The context sentences disappeared as soon as the key was pressed and nothing was shown on the computer screen from then on. All the items were presented in a randomized order and special care was taken to make sure that the triplets of the same context sentence did not appear in a consecutive order. An example of the task format is presented below.

- (1) Participant: *Liliana lo preparó*. ‘Liliana prepared it.’  
 Prompt: *Perdón no te oí. ¿Quién lo preparó?* ‘Sorry, I did not hear you. Who prepared it?’  
 Participant: \_\_\_\_\_

Although it is not as natural as collecting spontaneous speech data, this method was used with the intention that, compared to reading aloud tasks, it would allow participants to have more freedom to use various prosodic and syntactic cues to express different focus types, while eliciting the target lexical items and controlling for interlocutor effects. Before the initiation of the main task, a practice test with 10 items, which were not the target items, was conducted for familiarization with the task.

In both test locations (US and in Mexico), the productions were recorded in a sound-attenuated booth. In the US, the recordings were collected using an AKG C520 head-mounted microphone and a Marantz PMD570 solid state recorder with a sampling rate of 48 kHz and 16 bit sample size. In Mexico, the recordings were collected using an AKG C520 head-mounted microphone and a Zoom H4n handy portable digital recorder with a sampling rate of 44.1 kHz and 16 bit sample size. The sound files collected in the US were resampled to 44.1 kHz to match with the ones collected in Mexico.

### Acoustic analyses

Participants’ responses were first coded based on the word order of the response (S+Cl+V or Cl+V+S). Acoustic analyses were conducted on the stressed syllable of focused and non-focused constituents to examine whether focus is expressed prosodically through the relative prominence between them. Speech segmentation was first performed using EasyAlign (Goldman, 2011), which was later individually checked and manually corrected when needed. Suprasegmental information, that is, duration (ms), intensity (dB), pitch (Hz) and pitch range (Hz), was extracted using scripts in *Praat* (Boersma & Weenink, 2015). In order to control for individual differences, the raw values were normalized using *z*-score normalization. The relative prominence between the stressed syllable of the first content word (Syll\_W1) and that of the second content word (Syll\_W2) of each sentence (i.e., the subjects and the verbs) was compared across the three focus types. The idea is that if prosodic prominence is used to mark focus, the difference between Syll\_W1 and Syll\_W2 would be larger when the focus is on W1 than in other contexts. For instance, it is expected that the relative prominence between *-lia-* in *Liliana* and *-ró* in *preparó* in the sentence *Liliana lo preparó* would be larger if the focused constituent is *Liliana* than when *preparó* is focused or in broad focus context.



**Table 1.** Overall distribution of non-target structures.

	NS	HS	L2	Total
Prosodic boundary insertion	180 (61.02%)	85 (62.96%)	122 (68.16%)	387
Post-focal deaccenting	2 (0.68%)	16 (11.85%)	49 (27.37%)	67
Cleft construction	40 (13.56%)	22 (16.30%)	0 (0%)	62
Complementizer <i>que</i>	48 (16.27%)	1 (0.74%)	0 (0%)	49
Subject/Verb omission	25 (8.47%)	11 (8.15%)	8 (4.47%)	44
Total	295 (100%)	135 (100%)	179 (100%)	609

NS: monolingual native speakers of Spanish; HS: Spanish heritage speakers; L2: English second language learners of Spanish.

Apart from relative prominence, the degree of pitch ( $f_0$ ) peak displacement of W1, which was defined as the distance from the onset of the stressed syllable to the location of  $f_0$  peak, was analyzed. Since in Spanish  $f_0$  peak in non-final positions is generally displaced to a following syllable when the word receives a prenuclear pitch accent (L+>H\*) (i.e., not focused), it was of interest to see whether early alignment of  $f_0$  peak (L+H\*) is observed when W1 is focused, compared to when it is not. As the comparisons were made across tokens with varying stressed syllable durations, the  $f_0$  peak displacement values were normalized by dividing them into the duration of the stressed syllables.

Tokens that were produced with unclear boundaries, hesitation, stutter, creak throughout the utterance, wrong subject or verb, rising contour, no response, etc., were excluded from the analyses. Among the total number of 2448 tokens (68 participants  $\times$  3 focus types  $\times$  12 items), 504 tokens (20.59%) were excluded due to the reasons above.

## Results

### *Variability in focus marking strategies*

Among the remaining 1944 tokens, an additional 609 tokens (31.33%) were excluded in the acoustic analyses due to the insertion of a prosodic boundary, post-focal deaccenting, cleft constructions, the use of complementizer *que* ‘that’ and the omission of subject or verb, as acoustic analyses could not be performed for these tokens. Nevertheless, it is worth examining them further, because this indicates that speakers use multiple strategies to express focus in Spanish, apart from stressing the focused constituent in situ and inverting word order. The overall distribution of these structures is presented in Table 1.

The most common strategy that the participants used was the insertion of a prosodic boundary at the right-edge of the first content word (W1) (see Figure 2). A prosodic boundary was identified as a silent pause or glottalization, followed by a rising pitch contour at the word edge. As the prosodic boundary has a large effect on the suprasegmental information of the syllables located at the boundary (Cole, 2015), these tokens were not included in the acoustic analyses. Among the 387 tokens, only 41 tokens (10.59%) were produced with Cl+V+S order and no consistent pattern was found. Table 2 shows the results of S+Cl+V tokens. A similar pattern was found across the groups, in that a prosodic boundary was placed after the subject most frequently in S-focus. That is, the participants used this cue to mark S-focus.

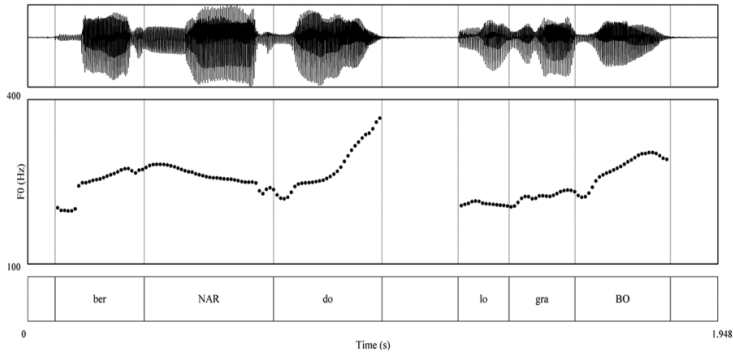
Another strategy that was used was post-focal deaccenting, which is characterized as a sustained glottalization (extremely low pitch) after a focused constituent (see Figure 3). Among the 67 tokens, only one token was produced with Cl+V+S order. In Table 3, the distribution of deaccenting is presented in S+Cl+V tokens. This strategy was most frequently found in L2s’ speech. As post-focal deaccenting is a strategy that is commonly used in English (Burdin et al., 2015; Ito & Speer, 2008), verb deaccenting after a focused subject found in the L2 data is likely to be due to influence from English. The HSs also used this cue, but to a lesser degree. In the NSs’ speech, only two tokens were observed.



**Table 2.** Distribution of prosodic boundary.

	BF	S-focus	V-focus	Total
NS	42 (25.45%)	75 (45.45%)	48 (29.1%)	165 (100%)
HS	20 (27.78%)	32 (44.44%)	20 (27.78%)	72 (100%)
L2	35 (32.11%)	52 (47.71%)	22 (20.18%)	109 (100%)

NS: monolingual native speakers of Spanish; HS: Spanish heritage speakers; L2: English second language learners of Spanish; BF: broad focus; S-focus: narrow subject focus; V-focus: narrow verb focus.

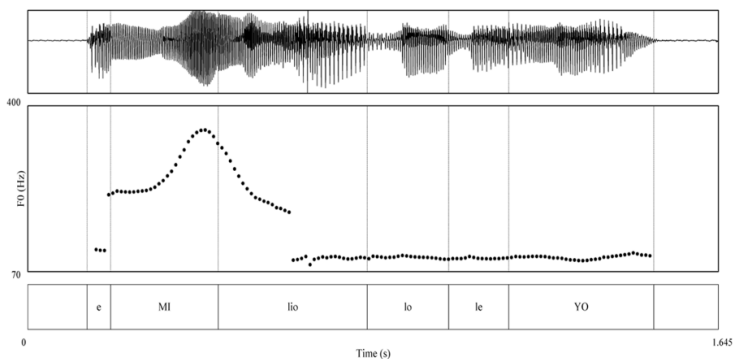


**Figure 2.** Prosodic boundary in [F Bernardo] lo grabó. ‘Bernardo recorded it.’ produced by a monolingual speaker.

**Table 3.** Distribution of post-focal deaccenting.

	BF	S-focus	V-focus	Total
NS	0	2 (100%)	0	2 (100%)
HS	3 (20%)	9 (60%)	3 (20%)	15 (100%)
L2	7 (14.29%)	31 (63.27%)	11 (22.44%)	49 (100%)

NS: monolingual native speakers of Spanish; HS: Spanish heritage speakers; L2: English second language learners of Spanish; BF: broad focus; S-focus: narrow subject focus; V-focus: narrow verb focus.



**Figure 3.** Post-focal deaccenting in [F Emilio] lo leyó. ‘Emilio read it.’ produced by a second language learner.

**Table 4.** Distribution of cleft constructions.

	BF	S-focus	V-focus	Total
NS	9 (22.5%)	20 (50%)	11 (27.5%)	40 (100%)
HS	4 (18.18%)	14 (63.64%)	4 (18.18%)	22 (100%)
L2	0	0	0	0

NS: monolingual native speakers of Spanish; HS: Spanish heritage speakers; L2: English second language learners of Spanish; BF: broad focus; S-focus: narrow subject focus; V-focus: narrow verb focus.

**Table 5.** Distribution of complementizer *que*.

	BF	S-focus	V-focus	Total
NS	41 (85.11%)	3 (6.38%)	4 (8.51%)	48 (100%)
HS	1 (100%)	0	0	1 (100%)
L2	0	0	0	0

NS: monolingual native speakers of Spanish; HS: Spanish heritage speakers; L2: English second language learners of Spanish; BF: broad focus; S-focus: narrow subject focus; V-focus: narrow verb focus.

**Table 6.** Distribution of subject/verb omission.

	S omission			Total	V omission			Total
	BF	S-focus	V-focus		BF	S-focus	V-focus	
NS	1 (4.8%)	0	20 (95.2%)	21 (100%)	0	4 (100%)	0	4 (100%)
HS	0	1 (20%)	4 (80%)	5 (100%)	0	6 (100%)	0	6 (100%)
L2	0	0	6 (100%)	6 (100%)	0	2 (100%)	0	2 (100%)

NS: monolingual native speakers of Spanish; HS: Spanish heritage speakers; L2: English second language learners of Spanish; BF: broad focus; S-focus: narrow subject focus; V-focus: narrow verb focus.

Apart from the two strategies above, the participants also expressed focus using syntactic structures that were different from the target structures. The examples of these strategies and their distributions are presented below (Table 4–6).

- (2) Cleft construction to mark S-focus

¿*Quién lo diseñó?* ‘Who designed it?’

- *Leonardo fue el que lo diseñó.* ‘Leonardo was the one who designed it (Table 4).’

- (3) Complementizer *que* ‘that’ to mark BF

¿*Qué pasó?* ‘What happened?’

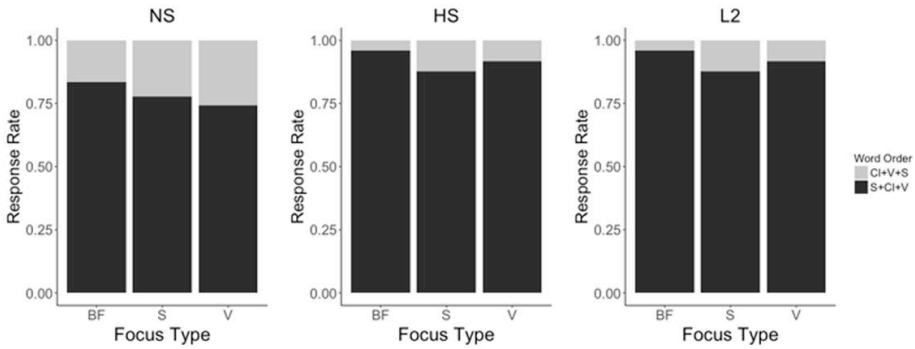
- *Que Leonardo lo diseñó.* ‘(I told you that) Leonardo designed it (Table 5).’

- (4) Subject/Verb omission to mark narrow focus

¿*Quién lo diseñó?* ‘Who designed it?’

- *Leonardo.* ‘Leonardo (Table 6).’

As seen in the distributions above, these strategies were mostly observed in NSs’ speech. The HSs also used them to express focus, but to a lesser extent. On the other hand, the L2s either never used these strategies or if they did they rarely used them.



**Figure 4.** Response rates of S+CI+V and CI+V+S structures.

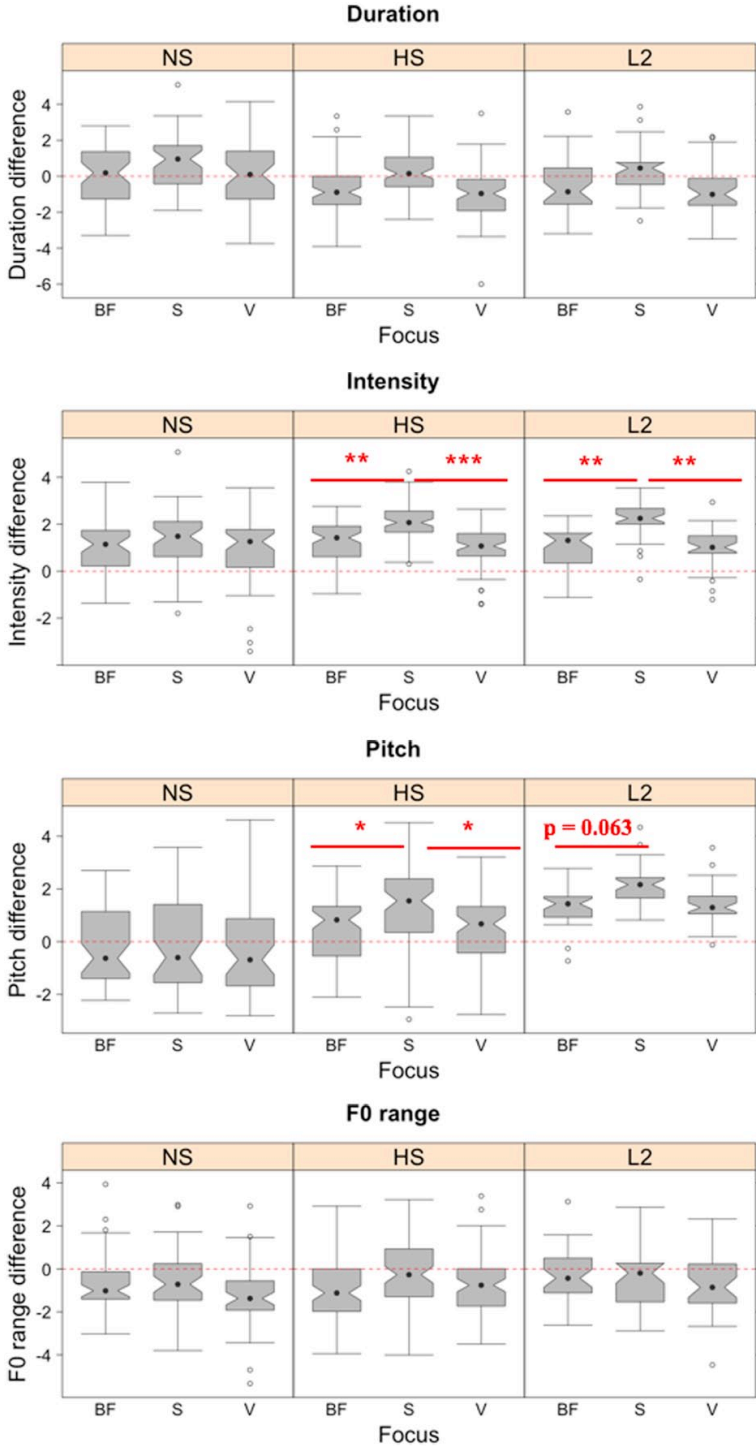
### Word order

The comparisons across the three focus types were done only with complete minimal triplets. That is, if a token was excluded due to any of the reasons above (see Acoustic analyses for exclusion criteria), the other tokens from the same triplet were also excluded from the analyses. Six-hundred-and-fifty-four (654) tokens were excluded in this process, resulting in 681 tokens to analyze. Figure 4 demonstrates the response rates of S+CI+V and CI+V+S structures across the groups. The majority of the participants' responses were constructed in the canonical S+CI+V order (87.22%), as opposed to the CI+V+S order, which occurred 12.78% of the time. The effects of group (NS/HS/L2), focus type (BF/S-focus/V-focus) and the interaction between the two fixed factors on participants' word order were examined using logit mixed effects modeling with subject and item as random effects. The best fitting model selected through backward elimination included random intercepts for subject and item with no slope terms. The *glmer* function in the *lme4* package in R (Bates, Maechler, Bolker, & Walker, 2015) was used for the analyses and the levels in each fixed factor were compared using simple contrast coding. Further pairwise analyses were conducted using the *lsmeans* function in the *lsmeans* package (Lenth, 2016). Results showed that there was a main effect of focus type for BF ( $\beta = 1.128$ ,  $SE = 0.519$ ,  $z = 2.175$ ,  $p < 0.05$ ), suggesting that overall there were more cases of CI+V+S order in S-focus (baseline focus type) than in BF.

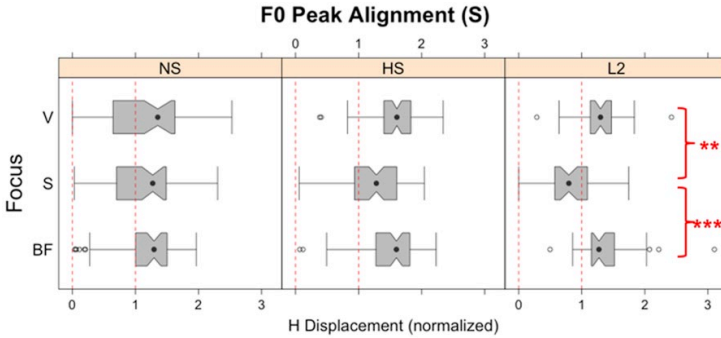
### Relative prosodic prominence

In order to directly compare the relative prosodic prominence of the minimal triplets, acoustic analyses were conducted on those that matched in word order. Among the 543 tokens that matched in word order, 510 tokens were produced in S+CI+V order and only 33 tokens were produced in CI+V+S order. Due to the largely unbalanced number of tokens of S+CI+V (93.92%) and CI+V+S orders (6.08%), the acoustic analyses were conducted only on those of S+CI+V order. The remaining data consist of minimal triplets produced by 43 participants (NS: 11, HS: 17, L2: 15). Since all the tokens were of S+CI+V order, from now on W1 will be indicated as S and W2 will be indicated as V. Figure 5 shows the difference in the normalized duration, intensity, pitch and pitch range between Syll\_S and Syll\_V across the three focus types. Values higher than 0 (marked with dotted lines) indicate that Syll\_S was produced with longer duration, higher intensity, higher pitch and larger pitch range than Syll\_V.

The effects of group, focus type and the interaction between the fixed factors on the normalized relative prominence (i.e., duration, intensity, pitch and pitch range) between Syll\_S and



**Figure 5.** Normalized relative prominence between the stressed syllables of the subject and the verb (\*\* $p < 0.001$ ; \* $p < 0.01$ ;  $p < 0.05$ ).



**Figure 6.** Normalized distance between stressed syllable onset and pitch peak (\*\*\*) $p < 0.001$ ; \*\*) $p < 0.01$ .

Syll\_V were analyzed using linear mixed effects modeling with subject and item as random effects. For all the measures, the best fitting model selected through backward elimination included a by-subject random slope for focus type. The  $p$ -values were obtained via the Satterthwaite approximation using the *lmerTest* package (Kuznetsova, Brockhoff, & Christensen, 2017). Results showed that there was a main effect of group (HS) on duration ( $\beta = -0.808$ ,  $SE = 0.357$ ,  $t = -2.262$ ,  $p < 0.05$ ), suggesting that overall HSs' duration difference between Syll\_S and Syll\_V was smaller than that of the NSs (baseline group). A main effect of group was also found on pitch for both the HSs ( $\beta = 1.137$ ,  $SE = 0.35$ ,  $t = 3.249$ ,  $p < 0.01$ ) and the L2s ( $\beta = 1.743$ ,  $SE = 0.398$ ,  $t = 4.385$ ,  $p < 0.001$ ). This indicates that HSs' and L2s' pitch difference was larger than that of the NSs. With regard to focus type, a main effect was found in all measures for BF (Duration:  $\beta = -0.844$ ,  $SE = 0.282$ ,  $t = -2.999$ ,  $p < 0.01$ ; Intensity:  $\beta = -0.819$ ,  $SE = 0.144$ ,  $t = -5.703$ ,  $p < 0.001$ ; Pitch:  $\beta = -0.661$ ,  $SE = 0.156$ ,  $t = -4.246$ ,  $p < 0.001$ ; Pitch range:  $\beta = -0.396$ ,  $SE = 0.198$ ,  $t = -1.998$ ,  $p = 0.052$ ) and V-focus (Duration:  $\beta = -1.044$ ,  $SE = 0.29$ ,  $t = -3.596$ ,  $p < 0.001$ ; Intensity:  $\beta = -0.953$ ,  $SE = 0.153$ ,  $t = -6.223$ ,  $p < 0.001$ ; Pitch:  $\beta = -0.69$ ,  $SE = 0.168$ ,  $t = -4.101$ ,  $p < 0.001$ ; Pitch range:  $\beta = -0.615$ ,  $SE = 0.214$ ,  $t = -2.874$ ,  $p < 0.01$ ). That is, the difference between Syll\_S and Syll\_V was larger in S-focus (baseline focus type) than in BF and V-focus. Apart from the main effects, significant or marginally significant interactions were found between group (L2) and focus type (BF) on intensity ( $\beta = -0.819$ ,  $SE = 0.359$ ,  $t = -2.28$ ,  $p < 0.05$ ) and pitch ( $\beta = -0.759$ ,  $SE = 0.409$ ,  $t = -1.856$ ,  $p = 0.07$ ), and between group (L2) and focus type (V-focus) on intensity ( $\beta = -0.727$ ,  $SE = 0.385$ ,  $t = -1.889$ ,  $p = 0.065$ ). That is, in these measures, the L2s distinguished S-focus from the other two focus types to a larger extent than the NSs.

Pairwise comparisons with group and focus type revealed that L2s' intensity difference was significantly larger in S-focus than in BF and V-focus and their pitch difference was larger in S-focus than in V-focus, although this difference only approached significance ( $p = 0.063$ ). The HSs demonstrated significantly larger values in S-focus than in BF and V-focus in both intensity and pitch difference. The NSs, on the other hand, did not show statistically significant difference between S-focus and the other focus types in any these measures. (see Figure 5 for the  $p$ -value levels).

### Pitch peak alignment

Figure 6 shows the degree of f0 peak displacement from Syll\_S onset in the three focus types. The two dotted lines indicate the onset and offset of Syll\_S. Thus, if a value is within the two lines, it suggests that the f0 peak was aligned within Syll\_S. The effects of group, focus type and the

interaction between the fixed factors on the normalized f0 peak displacement was analyzed using linear mixed effects modeling with subject and item as random effects. The best fitting model selected through backward elimination included a by-subject random slope for focus type. Results showed that there was a main effect of focus type for BF ( $\beta = 0.316$ ,  $SE = 0.073$ ,  $t = 4.31$ ,  $p < 0.001$ ) and V-focus ( $\beta = 0.332$ ,  $SE = 0.082$ ,  $t = 4.061$ ,  $p < 0.001$ ). This indicates that overall the f0 peak was displaced to a lesser degree in S-focus (baseline focus type), compared to BF and V-focus. Also, significant interactions were found between group (L2) and focus type (BF) ( $\beta = 0.673$ ,  $SE = 0.167$ ,  $t = 4.026$ ,  $p < 0.001$ ) and between group (L2) and focus type (V-focus) ( $\beta = 0.62$ ,  $SE = 0.193$ ,  $t = 3.217$ ,  $p < 0.01$ ). That is, the L2s distinguished the S-focus from the other two focus types to a larger extent than the NSs.

Pairwise comparisons with group and focus type revealed that the L2s displaced the f0 peak to a larger extent in S-focus than in BF ( $p < 0.001$ ) and V-focus ( $p < 0.01$ ). A similar pattern was found in the HS data, but the difference did not reach significance level. Regarding the NSs, the degree of f0 peak displacement was similar across the three focus types. Moreover, when comparing across the groups, L2s' f0 peak displacement in S-focus was significantly or marginally significantly lower than that of the NSs ( $p = 0.083$ ) and the HSs ( $p < 0.05$ ). No group difference was found in other focus types.

## Discussion

Our findings suggest that focus in Spanish can be expressed in various manners. Among the 1944 tokens considered in the study (after excluding the tokens with hesitation, stutter, etc.), in 609 cases (31.33%), the participants expressed focus using strategies other than the target S+Cl+V and Cl+V+S structures, such as the omission of non-focused constituents, cleft construction, complementizer *que* 'that', the insertion of a prosodic boundary and post-focal deaccenting. This implies that speakers use multiple strategies to express focus in Spanish, apart from stressing the focused constituents in situ and inverting the word order. However, while prosodic boundary insertion was the most common non-target structure used across the groups (NS: 61.02%, HS: 62.96%, L2: 68.16%), the use of other strategies differed based on their language background. As shown in Table 1, the L2s used post-focal deaccenting (27.37%), while the NSs barely used this strategy (0.68%). Moreover, while the NSs used cleft constructions (13.56%) and the complementizer *que* (16.27%), none of these strategies was found in the L2 data. The HSs showed a mixed pattern between the NSs and the L2s. Similar to the L2s, the HSs used post-focal deaccenting (11.85%) and rarely used the complementizer *que* (0.74%), but regarding the cleft constructions (16.3%), the usage rates were similar to those of the NSs. This finding indicates that, although HSs may show divergent patterns from both NSs and L2s, they are able to express focus in a more diverse way, using strategies from both Spanish and English.

Regarding the target S+Cl+V or Cl+V+S structures, among the 681 minimal triplets, an overwhelming number of tokens (87.22%) were produced with the canonical S+Cl+V structure regardless of group and focus type. While the results showed that overall the Cl+V+S structure was produced more frequently in S-focus, compared to BF, due to the low response rates, it is unlikely that the participants used this structure to mark S-focus in a consistent manner. Moreover, when examined across the groups, the response rates in S-focus did not show any significant difference from those in the other focus types. Despite the extensive use of the S+Cl+V structure, we should not jump to a conclusion based on the present data that Spanish speakers, regardless of their language background, prefer to maintain the canonical S+Cl+V structure, because it is also possible that this was an artifact of the task design. While the prompt questions in the present study were designed to elicit information focus, the sentence preceding the prompt questions (*Perdón, no te oí*. 'Sorry, I did not hear you.') may have led the participants to produce emphatic stress by moving the nuclear stress from the canonical

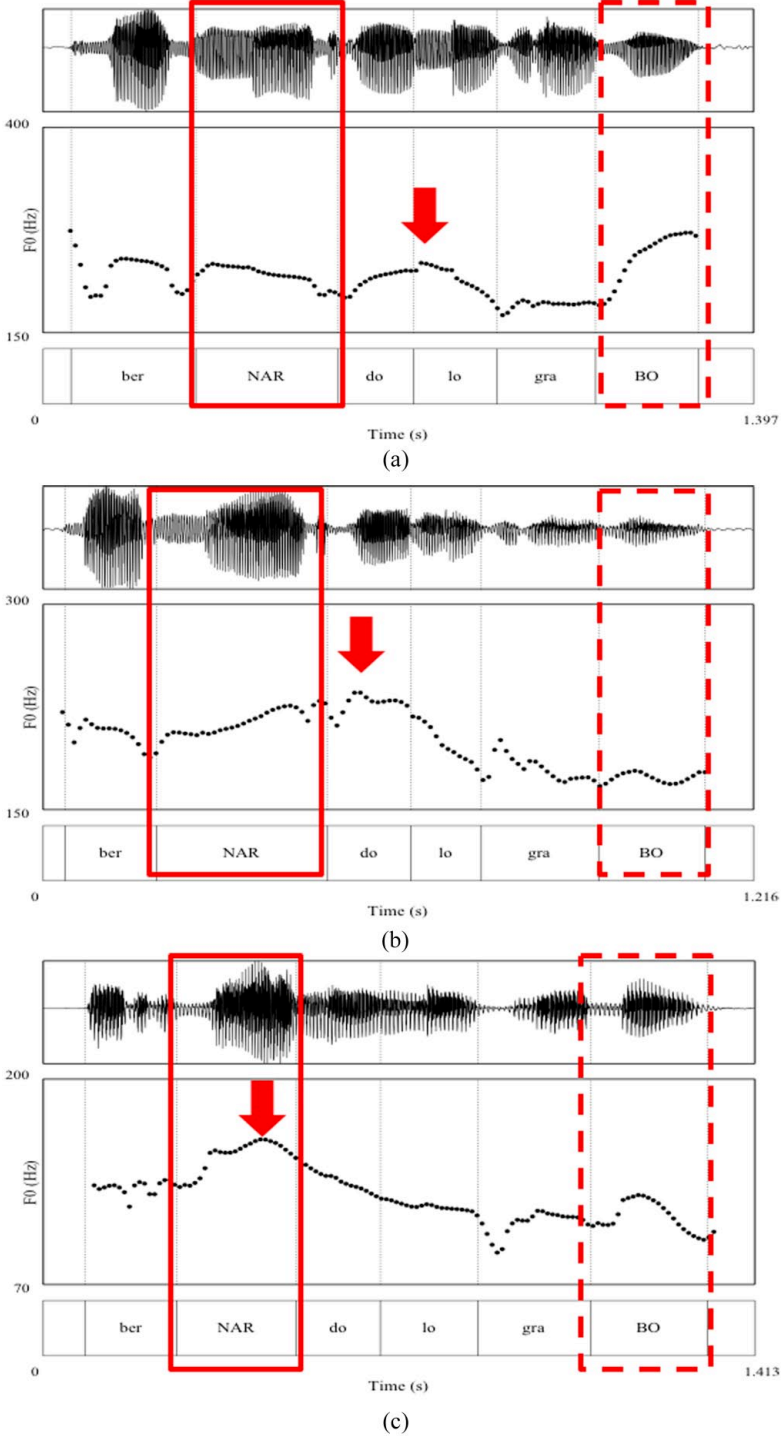


utterance-final position and, as a result, stress the focused constituents in situ. Another possible explanation is that the context sentences were all presented in the S+CI+V structure. Thus, the participants' responses may have followed this structure due to a priming effect. However, this seems to be less likely, given that a large number of responses did not follow the exact same structure as the context sentences. Among the 1944 tokens, 779 tokens (40.07%) were produced with a different structure. Further examination should be conducted to confirm this.

With respect to participants' use of relative prosodic prominence in focus marking, the present study compared the difference in duration, intensity, pitch and pitch range between Syll\_S and Syll\_V across the three focus types. The findings showed that HSs' and L2s' pitch and intensity difference was significantly larger in S-focus than in other focus types, suggesting that these are the main acoustic correlates that they use to express focus. The NSs did not show significant difference across the focus types. This is in line with Gries and Miglio's (2014) findings, which showed that Spanish monolinguals do not differ in their use of pitch movement when expressing new versus given information, while heritage speakers and English monolinguals produce new information with more instances of pitch movement. Although the acoustic property examined by Gries and Miglio (2014) (i.e., pitch movement across the word) does not exactly match with the ones in the present study, this finding suggests that HSs' and L2s' use of prosodic prominence when expressing focus in Spanish may be attributed to influence from English.

Interestingly, in the case of pitch, NSs' pitch difference values were below zero in more than half of the cases (64.74%; see Figure 5). That is, the subjects were produced with lower pitch than the verbs, which goes against the downstepped trend typically found in declarative sentences across various languages (Féry, 2016) (compare the solid and dashed boxes in Figure 7). This pattern was observed in all NSs' speech, except for one person. According to Kim and Avelino (2003), pitch peaks that are higher than preceding peaks often occur in Mexican Spanish, more frequently in narrow focus than in broad focus contexts. However, it is unclear whether the NSs used this strategy to mark focus, since they produced the verbs with higher pitch than the subjects regardless of whether they were focused or not. Rather, there may be other pragmatic values overriding the effect of focus. For instance, Martín Butragueño and Mendoza (forthcoming) argued that, while upsteps are favored by narrow focus, expressivity has a stronger effect on them than focus marking. Since the communication continued to fail (*Perdón, no te oí*. 'Sorry, I did not hear you.'), it is possible that the NSs used upsteps to point out that they were reiterating what they had already said, rather than to mark focus. Unlike the NSs, the L2s produced the subjects with higher pitch than the verbs in a categorical manner (97.3%) and the HSs showed a similar pattern, although to a lesser degree (70.78%). This may be due to some HSs following the NS pattern. Verbs with higher pitch than the subjects were found in the speech of seven out of 17 HSs, while this was the case for two out of 11 L2s. Thus, overall the HSs and the L2s followed the downstepped trend. While this may indicate that expressivity was not present in HSs' and L2s' speech, it is also possible that their realization of expressivity was different from that of the NSs. That is, the HSs and the L2s may have produced emphatic stress using prosodic prominence as a way to add an affective nuance to the focused constituents.

Group differences were also found in subject pitch peak alignment (see the arrows in Figure 5). The NSs displaced the peak to a post-tonic syllable in the majority of the cases (BF: 75%, S-focus: 69.23%, V-focus: 73.08%) and the pitch peak distribution largely overlapped across the focus types. For the L2s, peak displacement mainly occurred in BF (81.08%) and in V-focus (86.49%); in S-focus, it only occurred 29.73% of the time. This demonstrates that the L2s produced early peaks to express focus. With respect to the HSs, similar to the NSs, the peak was displaced most of the time in all three focus types. This finding supports the perception results in Zárate-Sánchez (2015) in which HSs' and NSs' threshold to categorically perceive declarative utterances as emphatic (narrow focus) or non-emphatic (broad focus) was located at stressed syllable offset,



**Figure 7.** Pitch contour of [<sub>p</sub>Bernardo] lo grabó. ‘Bernardo recorded it.’ produced by a monolingual speaker (a), a heritage speaker (b) and a second language learner (c) (solid box: stressed syllable of subject; dashed box: stressed syllable of verb; arrow: pitch peak).

while this threshold occurred significantly earlier within the stressed syllable for the L2s. While early peak alignment in focused constituents can occur in both Spanish (de la Mota, 1997) and English (Beckman et al., 2005), the parallel findings in Zárte-Sández's (2015) perception study and the present study suggest that early peak alignment is a robust acoustic correlate of focus in English, while it is not in Spanish. Thus, influence from English may account for L2s' sensitivity to early peak alignment. With respect to the HSs, although the difference did not reach significance level, HSs' peak was displaced less frequently in S-focus (74.07%), compared to BF (92.59%) and V-focus (93.83%). This indicates that English may have an influence on HSs' tonal alignment in Spanish, but to a lesser degree, compared to the L2s.

Overall, none of the three groups used word order to express focus. Rather, focus in situ was the most common form, which supports the findings of previous studies (Dominguez & Arche, 2014; Gabriel, 2010; Gupton & Leal Méndez, 2013; Hoot, 2017). However, the NSs did not mark focus prosodically, while the HSs and the L2s clearly distinguished focused constituents from non-focused ones using prosodic prominence, mainly pitch and intensity. In the case of the L2s, they additionally used early peak alignment to express focus. The HSs and the NSs, on the other hand, displaced the peak to a post-tonic syllable regardless of the focus type. The findings of other strategies also showed a mixed pattern in HSs' speech. While the NSs and the L2s clearly differed from each other, in that the former preferred non-prosodic cues (e.g., cleft dislocation, complementizer *que*) and the latter mainly used prosody to mark focus (e.g., post-focal deaccenting), the HSs demonstrated patterns that were observed in both the NSs and the L2s. The mixed patterns found in the HS data are in line with research in heritage language acquisition (Benmamoun, Montrul, & Polinsky, 2010; Montrul, 2010, 2012). That is, HSs demonstrate characteristics that are observed in both NSs and L2s. In some aspects, they behave more like the NSs and in others more like the L2s. The findings of this study provide evidence that heritage speakers' two sound systems are not independent from each other, but are constantly engaged (Flege, 1995; Grosjean, 1989). Thus, while heritage speakers are able to apply the same linguistic strategies as Spanish monolinguals in some aspects, they also show signs of English influence in others, similar to L2 learners.

## Conclusion

The response patterns observed in the present study are very interesting, as they suggest that it is not necessary to use certain cues in a categorical manner to signal focused elements. Other than stressing focused constituents in situ and changing word order, there are multiple ways to mark focus in Spanish and these strategies differ based on speakers' language experience. The present study showed that, while Spanish monolinguals inserted a prosodic boundary to mark focus, they showed preference for non-prosodic cues, such as the complementizer *que* 'that' to mark broad focus and cleft constructions to mark narrow focus. English L2 learners of Spanish rarely used these strategies. Rather, they used various prosodic strategies, such as relative prosodic prominence, early peak alignment, prosodic boundary insertion and post-focal deaccenting, which can be attributed to influence from their L1 (English). Regarding Spanish heritage speakers, they showed strategies that were observed in both monolinguals' and L2 learners' speech. As they are native bilinguals of Spanish and English, this finding suggests that heritage speakers can express focus in a flexible manner due to rich resources from their two language systems.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## References

- Amengual, M. (2012). Interlingual influence in bilingual speech: Cognate status effect in a continuum of bilingualism. *Bilingualism: Language and Cognition*, 15(3), 517–530.
- Au, T., Knightly, L., Jun, S., & Oh, J. (2002). Overhearing a language during childhood. *Psychological Science*, 13(3), 238–243.
- Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48.
- Beaudrie, S., & Ducar, C. (2005). Beginning level university heritage programs: Creating a space for all heritage language learners. *Heritage Language Journal*, 3(1), 1–26.
- Beckman, M., Hirschberg, J., & Shattuck-Hufnagel, S. (2005). The original ToBI system and the evolution of the ToBI framework. In S.-A. Jun (Ed.), *Prosodic typology: The phonology of intonation and phrasing* (pp. 9–54). Oxford: Oxford University Press.
- Benmamoun, E., Montrul, S., & Polinsky, M. (2010). *White paper: Prolegomena to heritage linguistics*. Retrieved from <http://scholar.harvard.edu/mpolinsky/publications/white-paper-prolegomena-heritage-linguistics>
- Birdsong, D., Gertken, L., & Amengual, M. *Bilingual Language Profile: An Easy-to-Use Instrument to Assess Bilingualism*. COERLL, University of Texas at Austin. Web. 20 Jan. 2012. Retrieved from <https://sites.la.utexas.edu/bilingual/>
- Boersma, P., & Weenink, D. (2015). *Praat: Doing phonetics by computer* [Computer program]. Version 5.4.14. Retrieved from <http://www.praat.org/>
- Burdin, R., Phillips-Bourass, S., Turnbull, R., Yasavul, M., Clopper, C., & Tonhauser, J. (2015). Variation in the prosody of focus in head- and head/edge-prominence languages. *Lingua*, 165, 254–276.
- Carreira, M. (2013). The vitality of Spanish in the United States. *Heritage Language Journal*, 10(3), 396–413.
- Cole, J. (2015). Prosody in context: A review. *Language, Cognition and Neuroscience*, 30, 1–31.
- Contreras, H. (1976). *A theory of word order with special reference to Spanish*. Amsterdam: North-Holland.
- de la Mota Gorrioz, C. (1997). Prosody of sentences with contrastive new information in Spanish. In A. Botinis, G. Kouroupetroglou, & G. Carayannis (Eds.), *Intonation: Theory, models and applications: Proceedings of an ESCA workshop* (pp. 75–78). Athens, Greece: ESCA.
- Domínguez, L., & Arche, M. (2014). Subject inversion in non-native Spanish. *Lingua*, 145, 243–265.
- Donati, C., & Nespors, M. (2003). From focus to syntax. *Lingua*, 113, 1119–1142.
- Estebas-Vilaplana, E. (2007). The phonological status of English and Spanish prenuclear f0 peaks. *Atlantis*, 29(2), 39–57.
- Face, T., & D’Imperio, M. (2005). Reconsidering a focal typology: Evidence from Spanish and Italian. *Rivista Di Linguistica*, 17(2), 271–289.
- Féry, C. (2016). *Intonation and prosodic structure*. Cambridge: Cambridge University Press.
- Flege, J. (1995). Second language speech learning: Theory, findings, and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 233–277). Timonium, MD: York Press.
- Gabriel, C. (2010). On focus, prosody, and word order in Argentinean Spanish: A minimalist OT account. *Revista Virtual De Estudos Da Linguagem*, 4, 183–222.
- Goldman, J. (2011). EasyAlign: An automatic phonetic alignment tool under Praat. *Proceedings of the 12th Annual Conference of the International Speech Communication Association*. Retrieved from <http://archive-ouverte.unige.ch/unige:18188>
- Gonzalez-Barrera, A., & Lopez, M. (2013). *Spanish is the most spoken non-English language in US homes, even among non-Hispanics*. Washington, DC: Pew Hispanic Center. Retrieved from <http://www.pewresearch.org/fact-tank/2013/08/13/spanish-is-the-most-spoken-non-english-language-in-u-s-homes-even-among-non-hispanics/>

- Gries, S., & Miglio, V. (2014). New information in naturalistic data is also signaled by pitch movement: An analysis from monolingual English/Spanish and bilingual Spanish speakers. *Complutense Journal of English Studies*, 22, 11–33.
- Grosjean, F. (1989). Neurolinguists, beware! The bilingual is not two monolinguals in one person. *Brain and Language*, 36, 3–15.
- Gupton, T. (2017). Early minority language acquirers of Spanish exhibit focus-related interface asymmetries: Word order alternation and optionality in Spanish-Catalan, Spanish-Galician, and Spanish-English bilinguals. In F. Lauchlan, & M. C. Parafita Couto (Eds.), *Bilingualism and minority languages in Europe* (pp. 212–239). Newcastle upon Tyne: Cambridge Scholars Publishing.
- Gupton, T., & Leal Méndez, T. (2013). Experimental methodologies: Two case studies investigating the syntax-discourse interface. *Studies in Hispanic and Lusophone Linguistics*, 6(1), 139–164.
- Henriksen, N. (2015). Acoustic analysis of the rhotic contrast in Chicagoland Spanish: An intergenerational study. *Linguistic Approaches to Bilingualism*, 5(3), 285–321.
- Hertel, T. (2003). Lexical and discourse factors in the second language acquisition of Spanish word order. *Second Language Research*, 14, 273–304.
- Hoot, B. (2017). Narrow presentational focus in heritage Spanish and the syntax-discourse interface. *Linguistic Approaches to Bilingualism*, 7(1), 63–95.
- Hualde, J. (1999). Basic intonational contours in Spanish. Paper Presented at the First Sp-ToBI Workshop, Columbus, OH.
- Hualde, J. I. (2005). *The sounds of Spanish*. Cambridge: Cambridge University Press.
- Ito, K., & Speer, S. (2008). Anticipatory effects of intonation: Eye movements during instructed visual search. *Journal of Memory and Language*, 58(2), 541–573.
- Jun, S. (2005). Prosodic typology. In S. Jun (Ed.), *Prosodic typology: The phonology of intonation and phrasing* (pp. 430–458). Oxford: Oxford University Press.
- Kim, S., & Avelino, H. (2003). An intonational study of focus and word order variation in Mexican Spanish. In E. Herrera, & P. Martín Butragueño (Eds.), *La tonía: Dimensiones fonéticas y fonológicas* (pp. 357–374). Mexico City: El Colegio de México.
- Kuznetsova, A., Brockhoff, P., & Christensen, R. (2017). lmerTest package: Tests in linear mixed effects models. *Journal of Statistical Software*, 82(13), 1–26.
- Lacorte, M., & Canabal, E. (2003.) Interaction with heritage language learners in foreign language classrooms. In C. Blyth (Ed.), *The sociolinguistics of foreign-language classrooms: Contributions of the native, the near-native, and the non-native speaker* (pp. 107–129). Boston: Heinle.
- Ladd, D. (2008). *Intonational phonology*. Cambridge, MA: Cambridge University Press.
- Lenth, R. (2016). Least-squares means: The R package lsmeans. *Journal of Statistical Software*, 69(1), 1–33.
- Lozano, C. (2006). Focus and split intransitivity: The acquisition of word order alternations in non-native Spanish. *Second Language Research*, 22, 145–187.
- Lynch, A. (2014). The first decade of the heritage language journal: A retrospective view of research on heritage languages. *Heritage Language Journal*, 11(3), 224–242.
- Martín Butragueño, P. (2005). La construcción prosódica de la estructura focal en español. In G. Knauer, & V. Bellosta von Colbe (Eds.), *Variación sintáctica en español: Un reto para las teorías de la sintaxis* (pp. 117–144). Tübingen: Max Niemeyer.
- Martín Butragueño, P. (2006). El estudio de la entonación del español de México. In M. Sedano, A. Bolívar, & M. Shiro (Eds.), *Haciendo lingüística: Homenaje a Paola Bentivoglio* (pp. 105–125). Caracas: Universidad Central de Venezuela.
- Martín Butragueño, P., & Mendoza, E. (forthcoming). Prosodic nuclear patterns in narrow and broad focus utterances: Pragmatic and social factors in Central Mexican Spanish. In M. Uth, & M. García (Eds.), *Focus realization and interpretation in romance and beyond*. Amsterdam: John Benjamins Publishing.
- Martinez, G., & Schwartz, A. (2012). Elevating “low” language for high stakes: A case for critical, community-based learning in a medical Spanish for heritage learners program. *Heritage Language Journal*, 9(2), 37–49.

- Montrul, S. (2008). *Incomplete acquisition in bilingualism: Re-examining the age factor*. Amsterdam: John Benjamins Publishing.
- Montrul, S. (2010). How similar are adult second language learners and Spanish heritage speakers? Spanish clitics and word order. *Applied Psycholinguistics*, 31(1), 167–207.
- Montrul, S. (2012). Is the heritage language like a second language? *Eurosla Yearbook*, 12(1), 1–29.
- Oh, J. S., & Nash, B. A. (2014). Attitudes and motivations of adult Spanish language learners: A comparison of heritage language learners and second language learners. *Heritage Language Journal*, 11(1), 29–44.
- Peirce, J. (2007). PsychoPy—psychophysics software in Python. *Journal of Neuroscience Methods*, 162(1–2), 8–13.
- Polinsky, M., & Kagan, O. (2007). Heritage languages: In the ‘wild’ and in the classroom. *Language and Linguistics Compass*, 1(5), 368–395.
- Prieto, P., van Santen, J., & Hirschberg, J. (1995). Tonal alignment patterns in Spanish. *Journal of Phonetics*, 23, 429–451.
- Rao, R. (2014). On the status of the phoneme /b/ in heritage speakers of Spanish. *Sintagma*, 26, 37–54.
- R Core Team (2016). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Retrieved from <https://www.R-project.org/>
- Robles-Puente, S. (2014). *Prosody in contact: Spanish in Los Angeles*. Doctoral dissertation, University of Southern California.
- Ronquest, R. (2013). An acoustic examination of unstressed vowel reduction in heritage Spanish. In C. Howe, S. E. Blackwell, & M. L. Quesada (Eds.), *Selected proceedings of the 15th Hispanic linguistics symposium* (pp. 157–171). Somerville, MA: Cascadilla Proceedings Project.
- Sorace, A. (2000). Syntactic optionality in non-native grammars. *Second Language Research*, 16, 193–202.
- Steedman, M. (2014). The surface-compositional semantics of English intonation. *Language*, 90, 2–57.
- Stevens, G. (1992). The social and demographic context of language use in the United States. *American Sociological Review*, 57(2), 171–185.
- Valdés, G. (2001). Heritage language students: Profiles and possibilities. In J. K. Preyton, D. A. Ranard, & S. McGinnis (Eds.), *Heritage languages in America: Preserving a national resource* (pp. 37–80). McHenry, IL: The Center for Applied Linguistics and Delta Systems.
- Yip, V., & Matthews, S. (2006). Assessing language dominance in bilingual acquisition: A case for mean length of utterance differentials. *Language Assessment Quarterly*, 3(2), 97–116.
- Zárate-Sánchez, G. (2015). *Perception and production of intonation among English-Spanish bilingual speakers at different proficiency levels*. Doctoral dissertation, Georgetown University.
- Zubizarreta, M. (1998). *Focus, prosody, and word order*. Cambridge, MA: MIT Press.

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