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The tritonal pitch accent in the broad focus declaratives of the Spanish spoken in Cuenca, Ecuador: An acoustic and sociolinguistic analysis

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ABSTRACT

This paper presents an acoustic and sociolinguistic analysis of the Andean variety of Spanish spoken in Cuenca, Ecuador, a variety reputed for its “sing-song” intonation. 1,628 pitch accents were analyzed to establish an inventory of broad focus declaratives for this variety. Noteworthy is that a tritonal pitch accent, most frequently attested in other focal contexts, occurred 312 times (19%) throughout the corpus and in all utterance positions. This result is compared to the contexts in which the tritonal has occurred in other Spanish and Romance varieties. Finally, the sociolinguistic portion reveals that gender (as opposed to age or socioeconomic status) is a key variable and explores the possible motivations for the use of the tritonal pitch accent.

1. Introduction

Nestled in a valley in the southern Ecuadorian Andes lies the country’s third largest city of Cuenca, in the province of Azuay. The city is known for ceramics, Panama hats and other handicrafts made of straw, but also the sing-song intonation of its inhabitants. While sharing many segmental features with the nation’s capital city of Quito, as many scholars and authors have remarked (Boyd-Bowman, 1953; Toscano Mateus, 1953; Lipski, 1994; Encalada Vásquez, 2007), the most identifying speech feature that sets the two cities apart is precisely the prosody of each. Though the intonation of Cuenca is reputed as unique and easily identifiable by many of these authors, it remains a very understudied variety, and analyses couched in frameworks of intonational phonology are lacking. In an effort to fill this gap in research, at least in part, this paper presents a portion of data from a larger project that was inspired by the many inventories presented in the volume of Prieto and Roseano (2010). We have narrowed the discussion to Broad Focus Declaratives (from here on, BFDs) to serve as a starting point in establishing a pitch accent inventory of the Cuencan variety, focusing specifically on the unique tritonal pitch accent present in the pragmatic context in question. Additionally, a sociolinguistic analysis of this complex pitch accent was performed in order to determine its usage according to age, gender, and socioeconomic status. This is a novel approach, as the majority of previous acoustic and theoretical work on Spanish intonation does not emphasize social factors driving variation.

2. Background

2.1. Intonation in Spanish declaratives

When discussing the phonological and phonetic representations of the intonational patterns of various utterances, it becomes necessary to disambiguate the differing pragmatic functions a declarative utterance can produce. Declaratives are given a dichotomous classification according to the focus of a statement, which can refer to, for example, whether or not the information presented is emphasized to any degree by the speaker, which can result in differences in the relative prominence of individual words (Ladd, 1980; de la Mota, 1997; Face, 2000, 2001, 2011; amongst many others). An element under focus, or communicatively highlighted, which exhibits reflexes in the speech signal, can be as large as an entire utterance or only a group of words within an utterance (Ladd, 1980, 1996; Hualde, 2002; Face, 2011; to only name a few).

A BFD is a specific type of declarative in which no particular element is emphasized (i.e., focalized); in other words, everything is equally highlighted (Ladd, 1996). For example, if a speaker were to ask the question, *¿Qué pasó?* 'What happened?' an interlocutor could respond, *Se me olvidaron las llaves* 'I forgot my keys.' In this response to the question, all the information is neutrally conveyed, meaning each word is uttered with equal importance, and therefore, every constituent of the phrase has equal emphasis (hence the term "broad").

Acoustic studies of BFDs in many varieties of Spanish have resulted in an inventory of several common prosodic characteristics. These commonalities include an F0 rise associated with every stressed syllable, with each peak within a prosodic phrase being slightly lower than the preceding one, which is a pattern known as *downstepping,* which concludes with a final descent to the baseline pitch level, known as *final lowering*. This final lowering pragmatically marks a terminal discourse junction. These characteristics have been found in Castilian Spanish by, for example, Face (2001, 2002, 2010, 2011) and Face and Prieto (2007), and in Mexican Spanish by Prieto et al. (1995) and Prieto et al. (1996), as well as in the Spanish of Quito, Ecuador (O'Rourke, 2010).

As previously mentioned, one common characteristic of Spanish BFDs is that each F0 peak is associated with a stressed syllable. More specifically, in non-phrase-final position, F0 movement toward peaks begins at a valley at the onset of the stressed syllable and then rises throughout the stressed syllable before reaching its peak in a post-tonic syllable (Prieto et al., 1995; Sosa, 1995; Prieto & Roseano, 2010; to name a few).

The final stressed syllable of an utterance is known as the *nucleus*, which also tends to house a peak, as noted by Kvavik (1988), Martínez-Celdrán et al. (2003), and Prieto and Roseano (2010), among a wealth of others, and often behaves distinctively to the peaks that appear earlier in the utterance, or *prenuclear* peaks. The two most common patterns in Spanish BFDs present a low tonal target in nuclear position (i.e., final lowering) or an F0 rise that reaches its peak height within the temporal constraints of the stressed syllable (i.e., a circumflex nuclear configuration). In the latter case, tonic alignment contrasts with the post-tonic alignment that is common in prenuclear phrase position. A nuclear stressed syllable is also known to be metrically strongest; in a BFD, such prominence is often associated with final lengthening (Ortega-Llebaria, 2006; Ortega-Llebaria & Prieto, 2007, 2010; Ortega-Llebaria et al., 2007).

2.2. Autosegmental-Metrical Model

The Autosegmental-Metrical Model (henceforth, AM model) (Pierrehumbert 1980; Ladd, 2008) theorizes the existence of High (H) and Low (L) tones that are associated with metrically strong, or stressed, syllables. These H and L tones make up phonological units known as pitch accents, which can be identified in an F0 pitch track as a *peak* or a *valley*, respectively. Pitch accents can consist of a single H or L tone (i.e., monotonal) or a combination of both tones (i.e., bitonal).

The AM model proposes the theoretical existence of various phonological levels, each of which carry their respective phonological information that can be found in the intonational contours of any given utterance. The *Intonational Phrase*, or IP, can be perceived both visually and audibly by pauses before and after the string of speech it contains. The termination of an IP (signaled by the symbol %) containing a BFD is most commonly realized in Spanish as an L% *boundary tone* (Beckman et al., 2002; Hualde, 2005; Rao, 2009; to highlight a few). The pitch accent associated with the last stressed syllable of a phrase is denoted as the *nuclear* accent, as it receives the most salience according to Chomsky and Halle (1968), a theory that posits that domain-final words receive the greatest relative salience. Conversely, then, all pitch accents associated with preceding stressed syllables within the same IP are labeled *prenuclear* accents.

The level directly beneath the IP is considered the *Intermediate Phrase* (henceforth, ip), which can be identified by its corresponding phonetic cues of pausing, duration, fluctuations in pitch range, and F0 rises on the final syllable of the ip to signal the continuation of a thought or conversational turn (Rao, 2009). Within an ip can be found *Prosodic Words* (PWs), or perceptually prominent words, which comprise the next level down within the AM hierarchy. An unstressed word combined with a following stressed word can jointly form a PW. Below the PW in this hierarchy is the syllable level, which is, in turn, comprised of one or more segments, as well as both stressed and unstressed possibilities. Figure 1 presents a schematized version of the levels described here, which could match the production of an utterance such as [[*Carmen*]$_{ip}$ [*lavaba los platos*]$_{ip}$]$_{IP}$ ('Carmen used to wash/was washing the dishes').

Intonational Phrase Tier:		IP		
Intermediate Phrase Tier:	ip		ip	
Prosodic Word Tier:	PW	PW		PW
Syllable Tier:	σ σ	σ σ σ	σ	σ σ
	Carmen	*lavaba*	*los*	*platos.*

Figure 1. Figure representing the prosodic hierarchy with regards to IP, ip, and PW, as well as the syllable tier. The underlined syllable symbols and syllables themselves represent stressed syllables with which tones are associated in the utterance *Carmen lavaba los platos* 'Carmen used to wash/was washing the dishes.'

2.3. Spanish ToBI analyses

The development of prosodic notation proposed for English, Japanese (and other languages) by Pierrehumbert (1980), Beckman and Pierrehumbert (1986), Pierrehumbert and Beckman (1988), and Ladd (1996) has evolved into the creation of Sp_ToBI for the Spanish language by Beckman et al. (2002), later revised by those such as Face and Prieto (2007), Estebas and Prieto (2008), and Hualde and Prieto (2015). The monotonal pitch accents included in Sp_ToBI are H* for the high tones and L* for the low tones, with the asterisks indicating that they are associated with a stressed syllable. See Figure 2 for schematic representations of these monotonal pitch accents. These two are phonetically manifested as F0 plateaus in the upper or lower region of a speaker's F0 range.

For bitonal pitch accents, we begin with the phonetic realization of the rising bitonal, L+H*, which is described as an F0 rise through the stressed syllable, with the peak being achieved at or before the end of the same syllable. Similarly, L+¡H* contains a rise throughout the stressed syllable, with a peak occurring at or before the end of the syllable, but it is distinct from L+H* in that the peak occurs significantly higher than its counterpart. Both of the phonetic realizations of these pitch accents are distinguishable from that of the third rising pitch accent, L*+H, which contains a valley throughout the stressed syllable, followed by a clear F0 rise and peak occurring in the post-tonic syllable. The final bitonal included in the pitch accent inventory provided by Beckman et al. (2002) is the falling bitonal, H*+L. The realization of this bitonal begins with a high F0 that falls to the lower portion of the speaker's range within the stressed syllable.

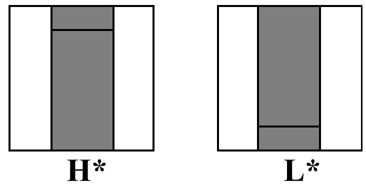


Figure 2. Schematizations of the two monotonals included in the Sp_ToBI labeling system. In each image, the first portion (shaded white) represents the pre-tonic syllable, the second portion (shaded gray) refers to the tonic syllable, and the final portion (also shaded white) depicts the post-tonic syllable. (Adapted from Aguilar et al., 2009).

The modifications to Beckman et al. (2002) begin with a distinction between early-rising peaks in nuclear position (i.e., L+H*) and late-rising peaks in pre-nuclear position (i.e., L*+H). It has become well-established within many varieties that a rising bitonal pitch accent pattern is the most common F0 movement found in prenuclear position of Spanish BFDs. This has been confirmed for Spanish by de la Mota (1995, 1997), Llisterri et al. (1995), Prieto et al. (1995), Sosa (1999), to highlight a few, and indeed attested for the Ecuadorian variety of Quito (O'Rourke, 2010). As stated previously, the peaks in prenuclear position of many varieties tend to be aligned post-tonically relative to the stressed syllable to which they are associated. In fact, Garrido et al. (1993) calculated that as many as 70% of all Spanish peaks occur post-tonically. In the case of proparoxytone words, the peak can also extend even further than the post-tonic syllable (Hualde & Prieto, 2015). Face and Prieto (2007) argue that L+H* and L*+H are contrastive for some varieties of Spanish, like Dominican, but allophonic for others, as is the case for the Spanish of Caracas, which concurs with the findings of Garrido et al. (1995), Prieto (1998), and Face (2001) for other varieties of Spanish. It has become clear that the dichotomous classification of L+H* versus L*+H does not appropriately distinguish all instances of bitonal F0 rises in Spanish BFDs. It is for this reason that the addition of a delayed rising pitch accent, L+>H*, was suggested by Face and Prieto (2007), which later became L+<H* in Hualde and Prieto (2015). Figure 3 depicts a current representation of the most common bitonal pitch accents of Sp_ToBI.

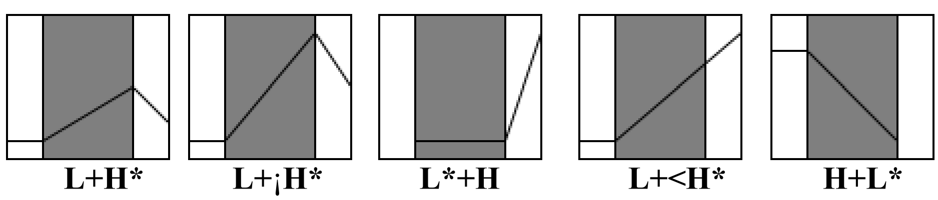
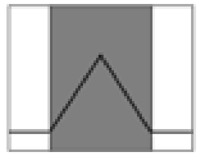


Figure 3. Schematizations of the five bitonals included in the Sp_ToBI labeling system. (Adapted from Aguilar et al., 2009).

Certain linguistic variables have been shown to affect peak alignment. For example, it has been attested for Peninsular Spanish that closed (CVC) syllables are more likely to house peaks that align with stressed syllables (Prieto & Torreira, 2007). Additionally, research on Peninsular Spanish has revealed that oxytone words are most frequently realized with L+H* (Llisterri et al., 1995). In contrast, Rao and Sessarego's (2018) study of the Chota Valley Spanish of Ecuador, which employs sociolinguistic methods, discovers paroxytone words to be realized most commonly with L+H*. This suggests that stress placement, as well as potentially syllable structure, may be phonological variables of interest affecting pitch accent frequency for the current study as well.

Finally, the addition of the tritonal pitch accent to the Sp_ToBI inventory was first proposed by Gabriel et al. (2010), who found the need in Argentinian *porteño* intonation patterns to include two L tones as well as a H* within the stressed syllable; in other words, two valleys that precede and follow a peak. This pitch accent depicts both a rise and a fall within the stressed syllable and is represented in the schematization in Figure 4.



L+H*+L

Figure 4. Schematization of the tritonal, L+H*+L.

Tritonal pitch movement has been attested in several Romance languages, including Pisa Italian (Gili Fivela, 2002), Alguerese Catalan (Prieto, 2008), and Brazilian Portuguese (Ferreira, 2008). Pešková et al. (2012) examined this unique configuration that "occurs predominantly in emphatic and contrastive contexts" in the Spanish of Buenos Aires (p. 371). Their analysis, in the form of a pseudo-longitudinal study that analyzed speech recordings collected in 1983 and 2008, finds that the tritonal is employed in nuclear position with overwhelmingly more frequency in the latter group. They identified only four instances of L+H*+L in this position in the 1983 recordings, compared to 27 occurrences in the 2008 interviews (Pešková et al., 2012, p. 377). The authors suggest the possibility that longer syllable duration lends itself to increased F0 movement within the stressed syllable, which indeed is confirmed by longer mean syllable duration times, specifically in the case of oxytone words (Pešková et al., 2012, pp. 382-383). They conclude that the tritonal is due to the influence of Italian, a language with which *porteño* Spanish has been in contact and that also possesses a tritonal (as previously mentioned for Pisa Italian). They base this assumption on the direct relationship between syllable duration and tonal shape, a conclusion originally reached by Stella et al. (2011; cited in Pešková et al. 2012) in Italian and Catalan.

Also striking, and very pertinent to the current study, is that Pešková et al. (2012) detected the low-high-low pitch accent in the spontaneous speech material they collected in 2008, an important contrast to the contrastive contexts reported in Gabriel et al. (2010) for semi-spontaneous speech. Building upon the findings of Gabriel et al. (2010), Feldhausen et al. (2011) performed a perception test of *porteño* nuclear pitch accents in both neutral and contrastive contexts to determine if the two pitch accent types are in fact categorical. After administering an identification and discrimination task, they found that the L* and L+H*+L scaling contrast was in fact categorical, and therefore, contrastive, phonologically-speaking.

Additionally, Terán and Ortega-Llebaria (2017) find the tritonal in rhetorical and biased wh-questions in the Spanish of Tucumán, Argentina. They describe its F0 excursion as a "hat shape" that occurs most frequently in first prenuclear position in this Argentinian variety, which is located in an Andean region of the country with a Quechua substrate.

García (2011, 2014) reveals this same tritonal pattern in Peruvian Amazonian Spanish, finding it in statements of narrow and contrastive focus. More recently, Vásquez and Velásquez (2019) also discuss a tritonal pitch accent, not only in Narrow Focus Declaratives (or NFDs), where a specific element is under focus, but also in BFDs in the Amazonian Spanish of Iquitos, Peru. This tritonal, interestingly, occurs on the stressed syllable of the first PW of an utterance, regardless of pragmatic context. The authors coin this unique pattern the *arranque tritonal* 'start-up tritonal,' which their analysis reveals as occurring in 32% of the NFDs collected and 30% of all BFDs (Vásquez and Velásquez, 2019, p. 562).

2.4. Ecuadorian Spanish intonation

Currently, acoustic studies of the prosodic patterns of Ecuadorian varieties of Spanish can be narrowed down to only a handful. In her study of laboratory speech, using the methodology as prescribed by the editors of the volume in which it appears, O'Rourke (2010) interviewed two subjects to obtain samples of BFDs, several forms of NFDs, interrogatives, imperatives, exclamatives, and vocatives. The resulting contours of many of these speech acts greatly resemble those of many other varieties, with the exception of some interrogative boundary tones. (For a complete inventory of the bitonals and monotonals found by O'Rourke, 2010, please see her section of Prieto & Roseano, 2010.)

In addition to O'Rourke's (2010) study of Quiteño Spanish, Stewart (2015) performed a ToBI-style analysis on the Media Lengua of Pijal, Imbabura (near the Ecuador-Colombia border). In this mixed language, as is expected for outcomes related to contact, he establishes L+H* as the predominant pitch accent in prenuclear and nuclear positions. These are also the results reported by Rao and Sessarego (2018) for the Spanish of the Chota Valley in Ecuador. Finally, Portocarrero (2019) performed a Sp_ToBI-style analysis of the semi-spontaneous speech of Cuenca, where he identifies rises and falls occurring within stressed syllables in contexts of narrow focus. Notably, however, he employs the notation L+^H* to identify this three-way F0 movement, explaining that it better illustrates the height and width of the peak, thus rejecting the necessity of considering these pitch accents as tritonals.

2.5. Sociolinguistic considerations

According to the theory of *orderly heterogeneity* (Weinreich et al., 1968) language varies from speaker-to-speaker and even within a single speaker. This variation, however, is structured, and we can identify extralinguistic variables, such as social considerations, that affect this linguistic variation. Blas Arroyo (2008) reiterates the relevance of these social elements in the Spanish-speaking world: '…the variables of sex, age and social class, three non-structural factors whose correlations with variation have demonstrated to be the most significant in both general sociolinguistics as well as in Hispanic (linguistics) in particular' (p. 157; our translation).[1] While studies exploring prosodic variation related to sex and age are more frequent, those investigating the relationship between social class and intonation are less plentiful and worth reviewing briefly here. Moreno-Fernández (1999) observes that more highly-educated participants lean towards rising and falling bitonal pitch accents in interrogatives, as opposed to only employing rising bitonals, which are preferred by the less-educated in the Spanish spoken in Alcalá de Henares. Martín Butragueño (2004) reveals that members of the lower-class, especially men, more commonly employ a circumflex nuclear configuration than females or members of other social classes in Mexican Spanish. Furthermore, of particular note is recent work on *fresa*, a variety of Mexican Spanish. Holguín Mendoza (2011) explores the relationship between gender and prosodic variation in speakers of this variety and notes that it is most frequently associated with femininity and inclusion into an upper-class social stratum. Impressionistic descriptions of *fresa* report that speakers of this variety often end their statements as if they were asking a question. An acoustic analysis by Holguín Mendoza (2011) indeed confirms that speakers of *fresa* employ boundary tones that are higher in their pitch range, such as M% and H% IP boundary tones. These studies underscore the need to investigate the variable of socioeconomic status and its effect on intonational features in the current study.

Studies couched in the AM framework that implement Labovian methodologies are greatly lacking, as the vast majority analyze laboratory speech rather than spontaneous speech, despite certain studies reflecting significant prosodic

[1] "…las variables sexo, edad y clase social, tres de los factores no estructurales cuyas correlaciones con la variación se han demostrado más significativas tanto en la sociolingüística en general, como en la hispánica en particular" (Blas Arroyo, 2008, p.157).

differences between the two (Face, 2010). Barnes and Michnowicz (2013) and Michnowicz and Barnes (2013) are two researchers who have looked at social variables in Chipilo and Yucatecan Spanish varieties, respectively. Results of Chipilo Spanish show an increased frequency of L+H* than what is typical of other Mexican and Peninsular Spanish varieties, especially amongst younger female participants. In the latter study, they reveal a preference by women to employ L+H*, which, once again, is not characteristic of many other varieties of Spanish. Furthermore, Enbe et al.'s (2006) study on Argentinian Spanish finds significant differences in the intonation contours produced by men versus women of the same city, with women clinging to the "classic" variety typical of the majority of Spanish varieties. Likewise, Enbe and Tobin (2008) reveal that children from Buenos Aires prefer a more marked prosodic BFD pattern, indicative of politeness, almost twice as much as adult men. These studies confirm the need for additional intonation studies that explore social variables, as relevant variation has been attested with regard to suprasegmental features.

2.6. Summary of current agenda

Based on the review of relevant literature to this point, we address the following objectives in order to better understand the drivers of the unique intonation of Cuenca Spanish. First, we would like to explore the phonological context in which the tritonal occurs most frequently, with special attention given to ip and IP position, syllable structure, and stress placement. Second, we will investigate if the social factors of age, gender, and/or socioeconomic status affect the prevalence of the tritonal in the spontaneous speech of this variety.

3. Methodology

3.1. Participants and materials

The primary goal of the present study is to analyze the usage of tritonals in the spontaneous speech of Cuenca Spanish. First, we seek to determine the possible effects that syllable structure and stress placement may have on the frequency of tritonals. Second, we aim to analyze the potential influences of sociolinguistic factors on this three-toned pitch accent. We stratified the extralinguistic factors of the sample population by age, sex, social class, and education level, as outlined by Tagliamonte (2006). To achieve these goals, as much as was possible, equal numbers of both male and female participants were recruited. In the same way, we sought relatively equal numbers of participants from three age groups: 18-32-year-olds, 33-49-year-olds, and 50+ year-olds.

With regards to socioeconomic status, due to the intimate relationship between education level and socioeconomic status, both were considered in the interpretation of this variable. The occupations of the participants ranged from lawyers and post-secondary educators to sellers at the local market and *curanderas* 'shaman' (see the Appendix for a complete list of occupations and education levels of the participants). In the current study, occupations best described as "laborer" positions were considered to be of lower socioeconomic status, and non-laborer positions were considered to be of upper socioeconomic status. This was a socioeconomic classification inspired by Alvord et al. (2005), which discusses briefly the dichotomy of "laborers" on one end of the occupation spectrum and "professionals" on the opposite end of the occupational (and therefore, socioeconomic) spectrum. For the purpose of the present study, any participant with a post-secondary education was considered to hold upper socioeconomic status, and anyone with a secondary education or less was classified as representing lower socioeconomic status.

This stratification method resulted in interviews of 23 participants, with 10 being males and 13 being females. As of the summer of 2015, when the interviews were conducted, 10 were between the ages of 18 and 32, six were between the ages of 33 and 49, and seven were of the 50+ age group. Based on the parameters previously mentioned, 12 of the participants were identified as belonging to the upper socioeconomic grouping and 11 were identified as belonging to the lower socioeconomic grouping. The method for contacting potential participants was through the "friend-of-a-friend" (i.e., snowball sampling) method, as recommended by Milroy (1980). In order to ensure minimal immersive contact with other Spanish varieties with distinct intonational patterns, the subjects that were interviewed for the present study had not spent more than two entire calendar years living outside of the city of Cuenca.[2] All interviews were recorded using an Olympus WS-822 GMT Voice Recorder with 4 GB Built-In-Memory.

Upon completion of a language assessment to determine potential second language influences, participants were asked to perform a reading and a semi-spontaneous elicitation exercise to increase their comfort level during the interview. The remainder of the session consisted of the sociolinguistic portion, comprised of open-ended questions. These questions were organized in Labovian-style modules, with each question building upon the previous one, and each one being designed to elicit progressively more personal and emotional involvement on the part of the speaker. In this portion, participants were free to answer with whatever information they wanted to share. As the idea was to keep them talking and to move their attention away from their speech, the interviewer asked follow-up questions based on their answer to the previous question (also known as *Tangential Shift*; Labov, 1984).

3.2. Analysis

The interview recordings were reviewed in order to extract the clearest examples of BFDs. Any utterance perceived by the researchers to contain a portion under narrow focus was eliminated from the corpus to be analyzed, as were any and all interrogatives and other utterance types. After all recordings had been parsed into analyzable units perceived as BFDs, they were then analyzed using Praat (Boersma & Weenink, 2018). This same procedure has been used in previous work on the spontaneous speech intonation of Afro-Hispanic varieties (e.g., Rao & Sessarego, 2016, 2018; Butera et al., 2020).

The standard of F0 movement measuring greater or less than 7 hertz (Hz) was employed to distinguish valley-to-peak or peak-to-valley F0 movement from a plateau, thus allowing us to appropriately label pitch accents using Sp_ToBI conventions (see O'Rourke, 2005). This threshold has been identified as a significant and identifiable change in pitch by listeners in perception tests (Klatt, 1973; Pierrehumbert, 1979).

Figure 5 provides an example of the labeling system employed for this paper, including an ip boundary tone as well as the IP-final boundary tone.

[2] One exception to the "two-year" rule was made in order to include the data from LFS2 due to the fact that she was the only respondent that qualified as a true Spanish-Quechua bilingual (an issue that will be discussed in more detail). She lived in the rural village of Pindilig, outside of Cuenca, from birth until the age of twenty, before moving to the city, where she has lived for the past 64 years. It is the goal of this study to contribute to a comprehensive inventory of the intonational contours of Spanish, as opposed to Quechua, and therefore, monolinguals of Quechua were not interviewed for this study.

Additionally, monolingualism of Quechua within the city of Cuenca is at an extremely low percentage (15% in 1998), and therefore, would be difficult to access and adequately analyze (Haboud, 1998). In reference to Spanish-Quechua bilinguals in Cuenca, the reader is referred to Haboud (1998) for a more thorough discussion of the complex nature of quantifying this group of bilinguals in the city.

For the moment, it shall suffice to say that Spanish-Quechua bilingual speakers in the province of Azuay comprise some of the lowest percentages of this profile across all Ecuadorian Sierra provinces. Haboud further remarks that the use of Quechua in Cuenca in domestic and public market environments is disappearing at a more accelerated rate than elsewhere in the country. It is for these reasons that the analysis of the intonation of Quechua monolingual and Spanish-Quechua bilingual speakers of this region will be reserved for a future study.

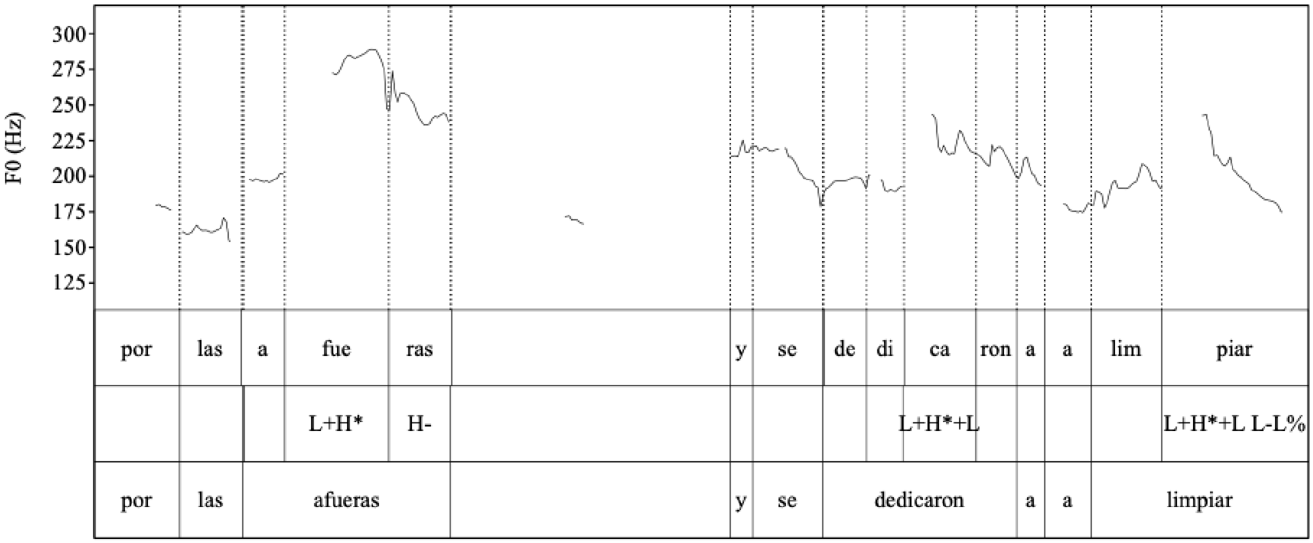


Figure 5. An example of the labeling system used in this project.

A total of 1,628 PWs (or tokens) carrying pitch accents were identified for statistical analysis; 1,156 tokens were in prenuclear position and 472 in nuclear position. The information to be analyzed was then coded for statistical analysis based on our three sociolinguistic categories of interest; for example, UFM2 was the second upper socioeconomic female from the middle-aged category (see the Appendix for the coding scheme employed, as well as further demographic information of all participants in this study).

We also coded for the linguistic variables of syllable structure and stress placement. Recall that Prieto and Torreira (2007) found peak behavior to differ according to syllable structure, with peaks appearing around the offset of the vowel for open syllables and near the consonant in coda position of closed syllables. The same authors also found that the length of peak delay was related to stress patterns, which necessitated exploring this issue in our study. These authors found that in words with proparoxytonic stress, the peak was delayed longer than in ones with paroxytonic stress, as was the case for paroxytonic words compared to oxytonic ones.

Overall pitch accent frequencies were calculated according to ip position, IP position, stress placement, and syllable structure. Pitch accent frequency was also calculated for the sociolinguistic variables of age, gender, and socioeconomic status. Values for all pitch accents were recorded in order to compare and contrast the tritonal frequency to bitonal and monotonal pitch accent usage.

4. Results

4.1. Overall phonological inventory

Upon acoustic analysis of the 1,628 pitch accents extracted from the data, the rising bitonal L+H* emerged as the most frequently employed pitch accent in the BFDs of this variety, accounting for 40.05% of all pitch accents analyzed. This tendency towards L+H* follows the pattern of many Spanish varieties in contact with another language (in this case, Quechua) as opposed to the post-tonically aligned bitonal, L+<H*, which only constituted 5.40% of all pitch accents. The falling bitonal H+L* was also very common, occurring at a rate of 19.72%. Interestingly, however, an almost equal number of pitch accents were realized as the tritonal, with 312 identified during analysis (including all upstepped, neutral, and downstepped allotones), or 19.16% of all pitch accents, a noteworthy percentage indeed (see Table 1).

	Token count	**Frequency**
L*	45	2.80%
L*+H	14	<.01%
H*	182	11.18%
L+H*	652	40.05%
H+L*	321	19.72%
L+<H*	88	5.40%
DA	14	<.01%
	1628	

Table 1. The number and frequency of monotonal and bitonal pitch accents in the total spontaneous BFD data set. (DA = Deaccented).

	Prenuclear	**% of all prenuclear pitch accents**	**Nuclear**	**% of all nuclear pitch accents**
L*	37	3.20%	8	1.69%
L*+H	12	1.04%	2	.42%
H*	135	11.68%	45	9.53%
L+H*	496	42.91%	159	33.69%
H+L*	222	19.20%	98	20.76%
L+<H*	66	5.71%	22	4.66%
DA	12	1.04%	2	42%
Total	1156	100%	472	100%

Table 2. The number of monotonal and bitonal pitch accents in prenuclear vs. nuclear position, as well as the respective frequencies of all pitch accents in the corresponding positions.

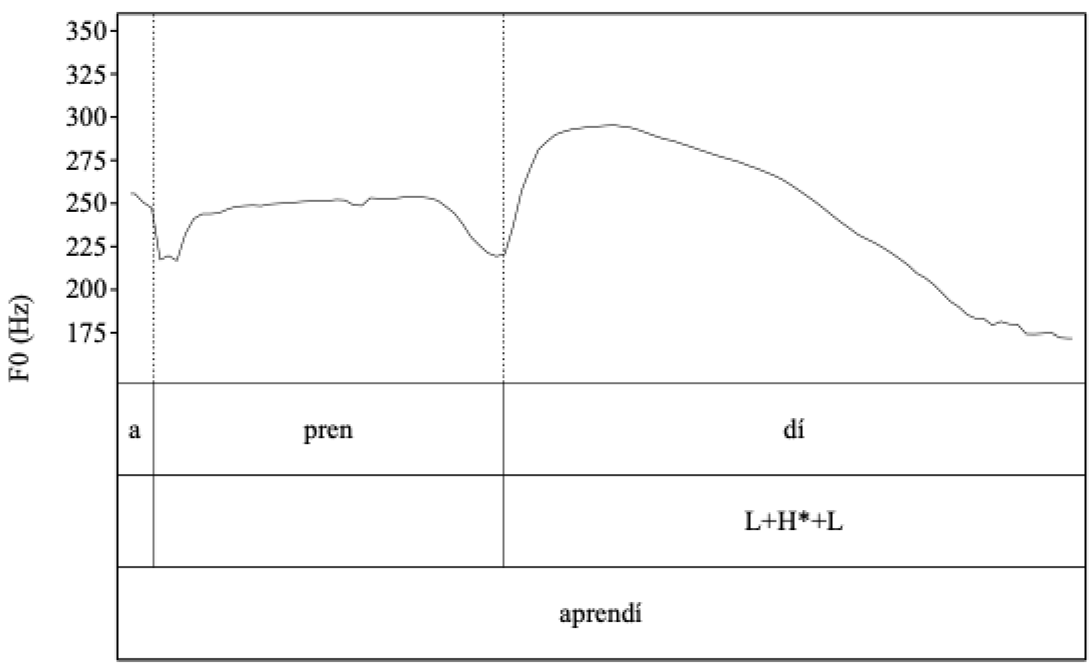


Figure 6. F0 track presenting a tritonal on the syllable -dí of the word *aprendí* 'I learned.'

Upon isolating prenuclear from nuclear pitch accents (see Table 2), the same results are found: H*, L+H*, and H+L* rendered the only significant percentages in the inventory of BFD prenuclear and nuclear pitch accents in the variety under study.

4.2. Highlighting tritonals

Figure 6 presents the F0 track of an example of the tritonals discovered during this study, with both a rise and a fall within the stressed syllable of the PW. In this case, the tonic syllable *-dí* in the word *aprendí* 'I learned' shows an F0 track starting at 229 Hz, which then proceeds to rise drastically very early within the syllable, reaching its peak at 299.4 Hz, and subsequently falling significantly to 184.4 Hz.

To determine the frequency of the tritonal pitch accent in prenuclear versus nuclear position and to establish any possible tendencies relative to this factor, Table 3 indicates the prevalence of this three-toned pitch accent according to phrase position. Table 3 also reveals the slightly increased frequency of prenuclear tritonals compared to those in nuclear position, calculated at 176 (or 56.41%) and 136 (or 43.59%), respectively. This slightly heightened frequency in prenuclear position is to be somewhat expected since this location offers more opportunities for pitch accents to be realized when compared to nuclear position; in other words, more words occur in prenuclear position, whereas only one word can occupy nuclear position.

	Prenuclear	% Prenuclear	Nuclear	% Nuclear	Total	% of Total Pitch Accents
L+H*+L	176	56.41%	136	43.59%	312	19.16%

Table 3. Number of prenuclear and nuclear tritonals and their respective percentages of total prenuclear and nuclear pitch accents compared to the total number of pitch accents. (Total prenuclear pitch accents = 1,156; Total nuclear pitch accents = 472).

In order to determine if Cuenca Spanish employs a "start-up" tritonal, as Vásquez and Velásquez (2019) found in Peruvian Amazonian Spanish, the results of ip-initial and ip-medial tritonals are presented in Table 4. As observed in this table, while the tritonal does occur in initial position, it is far more frequent in medial position, occurring at a rate of 91.48%. Along the lines of what was stated above, this could also be due to the fact that more words can occur in ip-medial than in ip-initial position. An ip-initial tritonal does not appear, however, to be present to the extent that Vásquez and Velásquez (2019) describe for Peruvian Amazonian Spanish.

	ip-initial	% of Prenuclear	ip-medial	% of Prenuclear	Total
L+H*+L	176	56.41%	136	43.59%	312

Table 4. Frequency of tritonals in ip-initial versus ip-medial position.

Some visual examples of prenuclear tritonals in the BFDs extracted from our data (from two different speakers, UMY and LFS) can be seen in Figures 7 and 8. There is clear evidence of a leading L tone preceding an H peak before falling to another trailing L tone, with all F0 movement occurring within the time constraints of the stressed syllables of the words *(me) perdí* 'I (got) lost' and *revienta* 'are broken.'

4.2.1. Effects of syllable structure and stress pattern

It is imperative at this point to consider the possible effects of stress placement and/or syllable structure on the usage of tritonals within the Spanish of Cuenca in order to identify any patterns that may be present. After analyzing the 312 tritonal pitch accents for syllable structure, overall, tritonals were realized in closed syllables more frequently than in open syllables, regardless of ip or IP position. As Tables 5 and 6 as well as Figures 7 and 8 illustrate, the data revealed that 165 (or 52.88%) tritonal tokens occurred in closed syllables, as opposed to the 147 that were found in open syllables (or 47.12%.) This finding is somewhat predictable, as the additional phonetic material of closed syllables increases their duration, which, in turn, provides more time for both a rise and fall to materialize within these syllables.

Upon examination of the stress placement of each word presenting a tritonal pitch accent, the data revealed paroxytone stress patterns to most commonly display evidence of the tritonal pitch accent, comprising 199 (or 63.78%) of the 312 tritonals (see Tables 5 and 6, Columns 6 and 7). This fact perhaps is not particularly unanticipated either, as paroxytone words constitute the most numerous stress pattern category in the Spanish language (Delattre, 1965). This, once again, is further evidence against the argument that the descending movement towards the trailing L tone in the three-way pitch accent is associated with the following L boundary tone. It cannot be associated with the L boundary tone because this material is located in the final rather than the penultimate syllable. Furthermore, a noteworthy remark upon deeper observation of Tables 5 and 6, however, is that within the paroxytone category, the majority of tritonal tokens were produced in open stressed syllables rather than closed ones. This fact is particularly interesting, as it violates the previous argument regarding prolonged syllable duration due to additional phonetic material, which would produce an increased opportunity for tritonals to materialize. The possibility that vowel lengthening could be a plausible explanation for this increased syllable duration seems to support, at least in part, the fact that open syllables are producing more tritonals. On the contrary, the presence of the consonant in syllable coda position could be preventing this vowel lengthening, and therefore, producing less time for the three-way movement of a tritonal to occur as frequently.

Not unforeseen, however, is the nearly negligible occurrence of tritonals amongst proparoxytone words, due to the limited number of words with this stress pattern in the Spanish lexicon. In contrast to the previously mentioned results of paroxytone words, oxytone words did follow the expected outcome, with closed syllables housing almost triple the frequency of tritonals as open ones, calculated at 49 in closed syllables, or 15.71% of all tritonals (Table 5, Columns 2 and 3), as opposed to 20 in open syllables, or 6.41% of all tritonals (Table 6, Columns 2 and 3). These oxytone results do follow the expectation that a closed syllable provides additional phonetic material for increased F0 movement to occur within the time constraints of the stressed syllable.

	Closed	**% of all tri-tonals**	**Total # of pitch accents according to stress & syllable**	**% of all pitch accents according to stress & syllable**	**Total closed & open**	**% of all tri-tonals**	**Total # of pitch accents according to stress & syllable**	**% of all pitch accents according to stress & syllable**
Mono	32	10.26%	135	23.70%	41	13.14%	173	23.70%
Oxy	49	15.71%	204	24.02%	69	22.12%	275	25.01%
Paroxy	82	26.28%	334	24.55%	199	63.78%	1157	17.20%
Proparox	2	0.64%	9	22.22%	3	0.96%	23	13.04%
Total	165	52.88%	682		312		1628	

Tables 5. Total occurrences of closed syllable tritonals according to stress placement compared to the total number of pitch accents.

	Open	% of all tri-tonals	Total # of pitch accents according to stress & syllable	% of all pitch accents according to stress & syllable	Total closed & open	% of all tri-tonals	Total # of pitch accents according to stress & syllable	% of all pitch accents according to stress & syllable
Mono	9	2.88%	38	23.68%	41	13.14%	173	23.70%
Oxy	20	6.41%	71	28.17%	69	22.12%	275	25.01%
Paroxy	117	37.50%	823	14.23%	199	63.78%	1157	17.20%
Proparox	1	.32%	14	7.14%	3	.96%	23	13.04%
Total	147	47.12%	946		312		1628	

Tables 6. Total occurrences of open syllable tritonals according to stress placement compared to the total number of pitch accents.

As previously alluded to, examples of this novel phenomenon in both oxytone and paroxytone words are provided in Figures 7 and 8. In Figure 7, both a rise and fall occur within the stressed syllable of the oxytone word *(me) perdí* 'I (got) lost.' On the other hand, Figure 8 presents the paroxytone word *revienta* 'are broken,' where a clear tritonal can be appreciated on the stressed syllable.

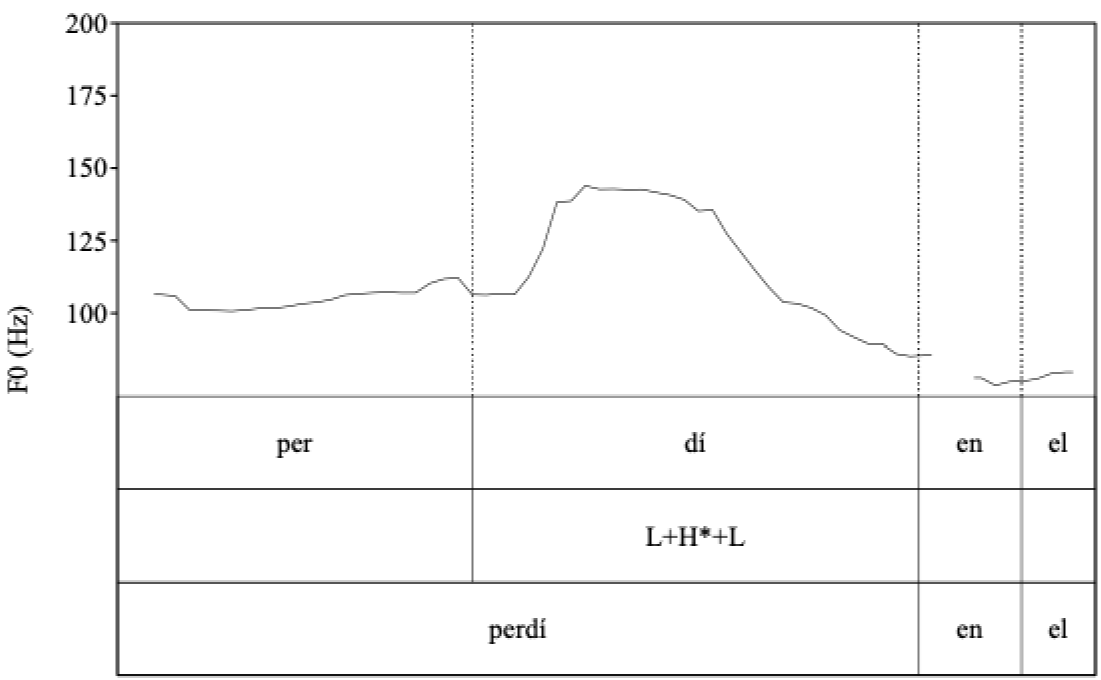


Figure 7. F0 track depicting a tritonal pitch accent in the oxytone word *(me) perdí* 'I (got) lost.'

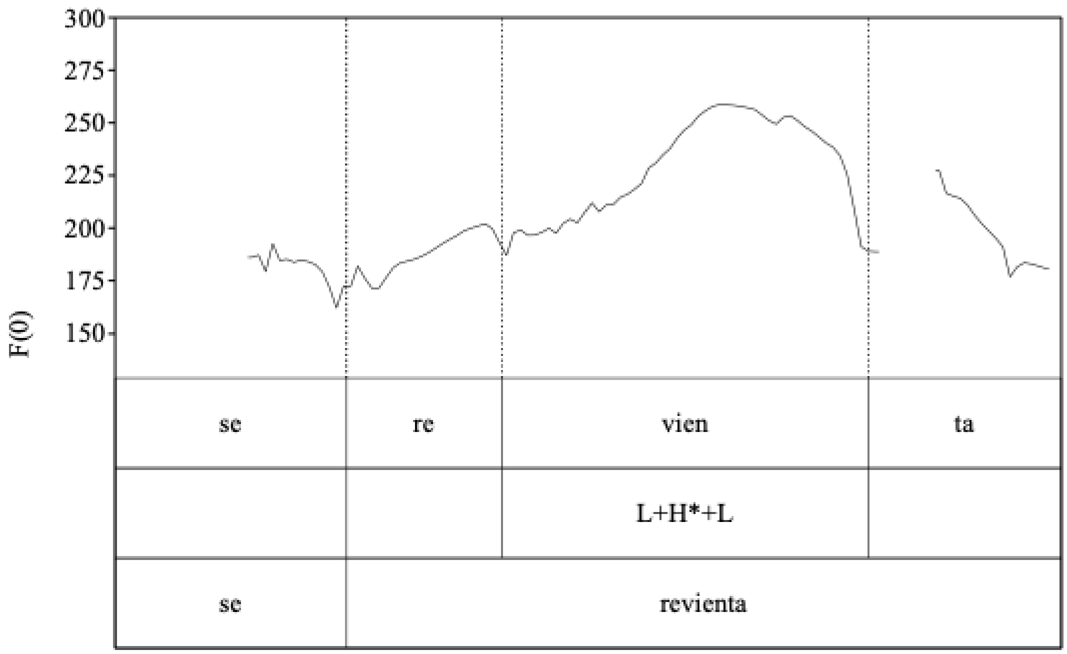


Figure 8. F0 track displaying a tritonal pitch accent within the paroxytone word *revienta* 'are broken.'

Also noteworthy in this regard is that a fair amount of monosyllabic words did appear as tritonals in the data, appearing 41 times (Tables 5 and 6, Columns 6 and 7). Even more curious is that 9 of these monosyllabic tritonals surfaced in open syllables, requiring an astounding amount of F0 movement within a rather restricted amount of phonetic material. One could surmise, based on these revelations, that the tritonal pitch accent is much more pervasive in this variety than a mere instance of coincidence due to phonological environment providing an elongated syllable duration.

To conclude this section of phonological analyses, we have shown patterns related to the influences of syllable structure and stress placement on the frequency of tritonals, regardless of utterance position. We have found that closed syllable tritonals are overall most common, as were paroxytone words realized with this complex pitch accent. In all environments, however, the paroxytone words with tritonals tended to prefer open syllables rather than closed ones. In all situations, monosyllabic and other oxytone words followed a tendency towards closed syllables, with proparoxytone words always representing negligible calculations. The results of syllable structure and stress placement were nearly identical regardless of ip or IP position. We are able to conclude, then, that utterance position does not alter the effects of syllable structure and stress placement on the prevalence of tritonals in the Spanish of Cuenca.

4.2.2. Tritonals and social variables

In order to explore the distribution of tritonal (L+H*+L) usage according to the three extralinguistic variables considered in our study, Tables 7, 8, and 9 present the frequency results of this pitch accent by social consideration. The outcomes observed in Table 7, in regard to socioeconomic status, reveal a commanding preference of the lower-class for this complex pitch accent, producing almost double the number of tritonals versus the upper-class (65.06% versus 34.94%, respectively). Similarly, in Table 8, females also demonstrated a strong tendency towards L+H*+L, realizing almost double the tritonals calculated for males (64.74% as opposed to 35.26%).

	Upper	% of total	Lower	% of total
L+H*+L	109	34.94%	203	65.06%
Total pitch accents	891	54.73%	737	45.27%

Table 7. Number of tritonals according to socioeconomic status along with the respective percentages of total tritonals compared to the total number of pitch accents. (Total tritonals= 312; n=1,628).

	Female	% of total	Male	% of total
L+H*+L	202	64.74%	110	35.26%
Total pitch accents	912	56.02%	716	43.98%

Table 8. Number of tritonals according to gender along with the respective percentages of total tritonals compared to the total number of pitch accents. (Total tritonals= 312; n=1,628).

	Senior	% of total	Mid-aged	% of total	Young	% of total
L+H*+L	87	27.88%	102	32.69%	123	39.42%
Total pitch accents	459	28.19%	459	28.19%	710	43.61%

Table 9. Number of tritonals according to age along with the respective percentages of total tritonals compared to the total number of pitch accents. (Total tritonals= 312; n=1,628).

When examining the frequency values across the three age groups in Table 9, we do not observe such decisive differences. In this case, the only group producing a percentage of tritonals higher than the total number of pitch accents analyzed for that group was the middle-aged group, which produced 32.69% of all tritonals. The senior age group produced a percentage of tritonals just slightly lower than their total number of pitch accents, or 27.88% of all tritonals. The youngest group was the only group that realized a more noticeably lower frequency of L+H*+L than their total percent of pitch accents (39.42% versus 43.61%, respectively).

	LFS	% of total	LFM	% of total	LFY	% of total	LMS	% of total	LMM	% of total	LMY	% of total	Total
L+H*+L	26	8.33	59	18.91	46	14.74	28	8.97	27	8.65	17	5.45	312
Total pitch accents	84	5.16	148	9.09	198	12.16	180	11.06	89	5.47	48	2.95	1628

Table 10. Number and percentage that the tritonal pitch accent occurred amongst the lower-class participants while considering all three social variables at once. (Total L+H*+L= 312, Total pitch accents = 1,628).

	UFS	% of total	UFM	% of total	UFY	% of total	UMS	% of total	UMM	% of total	UMY	% of total	Total
L+H*+L	24	7.69	1	.32	46	14.74	9	2.88	15	4.81	14	4.49	312
Total pitch accents	137	8.42	76	4.67	269	16.52	68	4.37	146	8.97	195	11.98	1628

Table 11. Number and percentage that the tritonal pitch accent occurred amongst the upper-class participants while considering all three social variables at once. (Total L+H*+L= 312, Total pitch accents = 1,628).

Considering all three social factors at once, these results lead to a preliminary conclusion that lower-class middle-aged females lead the trend towards tritonal usage in the BFDs of Cuenca. We can also project for the moment that upper-class young males is the social group implementing the three-toned pitch accent least in their speech. To verify these assumptions, Tables 10 and 11 provide the frequency of tritonal usage parsed according to all three social factors.

Upon review of Tables 10 and 11, we find that the preliminary conclusion that the lower-class middle-aged female group is the most inclined to employ the tritonal is confirmed. This group accounted for, by far, the most occurrences of the pitch accent (18.91%). We also can observe that all of the lower-class groups produced percentages of tritonals greater than their total pitch accent percent, the lower-class senior males notwithstanding. Notably, the lower-class young females also presented a high occurrence of L+H*+L, comprising 14.74% of all cases of the complex pitch accent.

Upon further analysis of the table, however, it becomes apparent that the upper-class young females also demonstrated a strong tendency towards the tritonal, accounting for 14.74% of all tritonals.

On the other hand, we can partially affirm the claim that upper-class young males are the social classification trending towards the tritonal the least. This group only produced 4.49% of all tritonals, which was amongst the lowest occurrence rates of all socioeconomic classifications. Interestingly, though, the upper-class middle-aged females only produced one tritonal (or 0.32%). These values appear to diametrically oppose those found for their lower-class counterparts, who have already been the group established as the leaders in the trend.

5. Discussion and conclusions

The current study revealed a noteworthy presence of the unique three-part complex pitch accent, L+H*+L, in Cuencan BFDs, which is usually only attested in cases of narrow focus, with those cases being rarities as well. This pitch accent was not only established as occurring in BFDs, but was also determined to occur at a noteworthy rate of 15.22% (176 tokens) of all prenuclear pitch accents. In addition to L+H* in nuclear position, the tritonal was also very common in this position (at a rate of 28.81%, or 136 tokens), as was the falling bitonal H+L*.

Our descriptive analysis based on three sociolinguistic variables found the tritonal to be almost twice as frequent amongst the lower socioeconomic group compared to the upper classification. Similar results were found for gender, with females preferring this complex pitch accent at nearly double the rate as well. With regards to age, though we revealed the most use of the tritonal in the middle-aged group, the differences between the three groups were less convincing.

Prieto (2008) suggests that the tritonals employed by speakers of Alguerese Catalan could be a result of the peak being retracted so far toward the beginning of the tonic syllable that time allows for an interpolated low tone to occur within the same syllable, generating a three-part pitch accent. Early peak alignment, or the preference towards L+H* in prenuclear position rather than L+<H*, was the overwhelming tendency in Cuenca. This fact indeed lends itself to an area of future research in relation to the frequency of tritonals in this variety in order to confirm that the explanation provided by Prieto (2008) can also be ascribed to the current variety. A phonetic study into syllable duration and, more specifically, the timing and retraction of peaks associated with these stressed syllables, would be indispensable. Likewise, the increased frequency of tritonals occurring in words with open stressed syllables and its potential link to vowel lengthening reveals another area for future research.

The fact that prenuclear L+H* was strongly preferred by speakers of Cuenca Spanish provides an additional path to be explored with regards to the presence of a tritonal in this variety. As a tendency towards prenuclear L+H* aligns with the findings of an increasing number of studies on varieties of Spanish in contact, this serves ostensibly as evidence that language contact plays a key role in the prosody of Cuenca Spanish. The potential that this three-way pitch accent emerged as a result of diachronic or synchronic language contact seems very feasible, as appears to be the case in *porteño* Spanish. In fact, Encalada Vásquez (2007) suggests that the unique prosodic features of Cuenca Spanish could be remnants of the now extinct language of Cañari spoken in this region of Ecuador during pre-Inca times. Proving or disproving his theory, however, seems extremely unlikely given the fact that it is an unwritten language that fell into complete disuse centuries ago.

Another potential overarching motivation for the development and existence of such a recognizable intonation in the city of Cuenca, including the three-way complex pitch accent, could lie in the sociolinguistic branch of "intonation as identity." The works of Holguín Mendoza (2011, 2018) have investigated the highly socially-driven Mexican variety of *fresa*. Holguín Mendoza (2018) defines the *fresa* linguistic and cultural movement as a way to project "social meanings of whiteness, privilege, and upper-class femininity" (p. 6). Some parallels can be established between *fresa* and Cuenca Spanish, beginning with the significant role gender plays in determining prosodic patterns. Recalling that the tritonal was produced most frequently by females, the role of gender appears to mirror that of *fresa*, but with the reverse socioeconomic implication. As this complex pitch accent was most commonly employed by participants of the lower socioeconomic group, the potential remains that the tritonal, amongst other prosodic features characterizing Cuenca Spanish, could carry a certain level of social stigma. Our results suggest that the tritonal may represent a marker that identifies membership into the lower socioeconomic group. Taking this theory a step further with regards to intonation as identity, Pešková et al. (2012) suggest that the frequent use of tritonals in *porteño* is an effort by speakers to identify themselves as more "Italian," since the tritonal is much more characteristic of this language than Spanish. It is not difficult to surmise that the prestige variety in the country of Ecuador would be that of Quito, where the tritonal was notably absent from the pitch accent inventory in O'Rourke's (2010) analysis. Those speakers in Cuenca attempting to alter their speech to converge on the linguistic norms of the capital city could thereby be attempting to distinguish themselves from the lower socioeconomic population of the city by employing the tritonal less frequently. Further perceptual research on Cuenca Spanish could perhaps untangle whether or not the frequent use of tritonals is socially motivated in order to ascribe membership to a certain social group, as in the *fresa* and *porteño* cases. Future sociolinguistic studies into the social capital that unique intonational patterns carry, such as the tritonal, could bridge some of these gaps as well.

Like every study, the present study is not lacking in limitations. First, this study limited its analysis to BFDs and ignored all other speech acts and associated pragmatic variation, such as NFDs, imperatives, vocatives, etc., where tritonals have been established for other Spanish varieties. With regards to methodological limitations, we begin with the issue of "perceived BFDs." Though attempts were made to receive perception input from native speakers in Cuenca, these attempts failed for many reasons, and therefore, we had to rely on our own perception of BFDs rather than that of a native speaker of Cuenca. Additionally, regarding the participants that provided the data, some of the socioeconomic categories were only represented by one speaker's speech sample. With such a small representation, it is impossible to tease apart those features characteristic of the speech group as a whole from what is merely idiosyncratic in nature for that individual speaker. Furthermore, this study did not include bilingual Quechua-Spanish, Spanish-Quechua participants, which would have shed invaluable light on the question of language contact with the region's indigenous language.

Despite these limitations, this study has provided a unique attempt at characterizing the suprasegmental features of Cuenca Spanish. We presented the results of a Sp_ToBI analysis on the spontaneous speech of this very understudied variety, despite the significant attention it attracts in the region, in order to facilitate its comparison with the BFDs of other documented varieties. We identified an inventory of pitch accents frequent in the BFDs of the speech of this city, thus paving the way for future studies to expand to the inventories of other pragmatic speech acts. Finally, this study provided insight into the sociolinguistic context of this variety to serve as a point of departure for further studies in the field, especially in the emerging area of intonation as it relates to identity and social capital.

References

Aguilar, L., De la Mota, C., & Prieto, P. (2009). *Sp_ToBI Training Materials*. Retrieved from http://prosodia.upf.edu/sp_tobi

Alvord, S., Echávez- Solano, N., & Klee, C. (2005). La (r) asibilada en el español andino: Un estudio sociolingüístico. *Lexis*, *XXIX*(1), 27-45.

Barnes, H., & Michnowicz, J. (2013). Peak alignment in semi- spontaneous bilingual Chipilo Spanish. In A. M. Carvalho & S. Beaudrie (Eds.), *Selected Proceedings of the 6th Workshop on Spanish Sociolinguistics* (pp. 109-122). Cascadilla Proceedings Project.

Beckman, M., Díaz-Campos, M., McGory, J. T., & Terrell A. M. (2002). Intonation across Spanish, in the Tones and Break Indices framework. *Probus*, *14*, 9-36.

Beckman, M., & Pierrehumbert, J. (1986). Intonational structure in English and Japanese. *Phonology Yearbook*, *3,* 255-310.

Blas Arroyo, J. L. (2008). *Sociolingúística del español: Desarrollos y perspectivas en el estudio de la lengua española en contexto social.* Cátedra.

Boersma, P., & Weenink, D. (2018). *Praat: Doing phonetics by computer*, *Version 6.0.37*. Retrieved from http://www.praat.org/

Boyd-Bowman, P. (1953). Sobre la pronunciación del Español en el Ecuador. *Nueva Revista de Filología Hispánica*, *7*(1/2), 221-233.

Butera, B., Rao, R., & Sessarego, S. (2020). Afro-Peruvian Spanish intonation: A case of contact-induced language change. In R. Rao (Ed.), *Spanish phonetics and phonology in contact: Studies from Africa, the Americas, and Spain* (pp. 207-226). John Benjamins.

Chomsky, N., & Halle, M. (1968). *The sound pattern of English*. MIT.

de la Mota, C. (1995). *La representación gramatical de la información nueva en el discurso* [PhD Dissertation]. Universitat Autònoma de Barcelona.

de la Mota, C. (1997). Prosody of sentences with contrastive new information in Spanish. In A. Botinis, G. Kouroupetroglou, & G. Carayannis (Eds.), *Theory, Models and Applications. Proceedings from the ESCA Workshop, Athens, Greece, Septermber 18-20 1997* (pp. 75-78). University of Athens.

Delattre, P. (1965). *Comparing the phonetic features of English, German, Spanish and French.* Julius Groos.

Enbe, C., Gurlekian, J., & Tobin, Y. (2006). A laboratory analysis of suprasegmental features in normal and pathological speech of Buenos Aires Spanish according to the theory of phonology as human behavior. In M. Diaz-Campos (Ed.), *Proceedings of the Second Laboratory Approaches to Spanish Phonetics and Phonology* (pp. 83-105). Cascadilla Press.

Enbe, C., & Tobin, Y. (2008). Sociolinguistic variation in the prosody of Buenos Aires Spanish according to the theory of phonology as human behavior. In L. Colantoni & J. Steele (Eds.), *Selected Proceedings of the 3rd Conference on Laboratory Approaches to Spanish Phonology* (pp. 140-154). Cascadilla Press.

Encalada Vásquez, O. (2007). El cantado cuencano. *Universidad Verdad*, *43*, 63-77.

Estebas, E., & Prieto, P. (2008). La notación prosódica del español: Una revisión de Sp_ToBI. *Estudios de Fonética Experimental*, *XVII*, 263-283.

Face, T. L. (2000). Prosodic manifestations of focus in Spanish. *Southwest Journal of Linguistics 19*(1), 49-65.

Face, T. L. (2001). Focus and early peak alignment in Spanish intonation. *Probus, 13,* 223- 246.

Face, T. L. (2010). The necessity of both naturally-occurring and elicited data in Spanish intonational phonology. *Studies in Hispanic and Lusophone Linguistics*, *3*(2), 485-499.

Face, T. L. (2011). *Perception of Castilian Spanish intonation: Implication for intonational phonology*. Lincom Europa.

Face, T. L., & Prieto, P. (2007). Rising accents in Castilian Spanish: A revision of Sp_ToBI. In G. Elordieta & M. Vigário (Eds.), *Journal of Portuguese Linguistics, 6*(1), *Special Issue on Prosody of Iberian Languages*, 117-146.

Feldhausen, I., Pešková, A., Kireva, E., & Gabriel, C. (2011). Categorical perception of Porteño nuclear accents. In W. Lee & E. Zee (Eds.) *Proceedings of the 17th International Congress of Phonetic Sciences 2011, Hong Kong, China (ICPhS 17)* (pp. 116-119).

Ferreira, L. (2008). *High initial tones and plateaux in Spanish and Portuguese neutral declaratives: Consequences to the relevance of F0, duration and vowel quality as stress correlates* [PhD Dissertation]. University of Illinois at Urbana-Champaign.

Gabriel, C., Feldhausen, I., Pesková, A., Colantoni, L., Lee, S-A. […] & Labastía, L.et al., (2010). Argentinian Spanish intonation. In P. Prieto & P. Roseano (Eds.), *Transcription of Intonation of the Spanish Language* (pp. 285-317). Lincom Europa.

García, M. (2011). *The intonational patterns of the Peruvian Amazonian Spanish (PAS)* [MA Dissertation]. University of Stony Brook.

García, M. (2014). Sobre la duración vocálica y la entonación en el español amazónico peruano. *Lengua y Sociedad*, *14*(2), 5-29.

Garrido, J. M., Llisterri, J., de la Mota, C., & Ríos, A. (1993). Prosodic differences in reading style: Isolated versus contextualized sentences. *Proceedings of Eurospeech'93* (pp. 573-576).

Garrido, J. M., Llisterri, J., de la Mota, C., Marín, R. & Ríos, A. (1995). Prosodic markers at syntactic boundaries in Spanish. *Proceedings of the 13th International Congress of Phonetic Sciences* (pp. 370-373).

Gili Fivela, B. (2002). Tonal alignment in two Pisa Italian peak accents. In B. Bel I. & Marlin (Eds.), *Proceedings of the First International Conference on Speech Prosody* (pp. 339-342) SProSIG.

Haboud, M. (1998). *Quichua and Spanish in the Ecuadorian highlands: The effects of long-term contact* [PhD Dissertation]. University of Oregon.

Holguín Mendoza, C. (2011). *Language, gender and identity constructions: Sociolinguistics dynamics in the borderlands* [PhD Dissertation]. University of Illinois-Urbana Champaign.

Holguín Mendoza, C. (2018). Sociolinguistic capital and *Fresa* identity formations on the U.S.-Mexico border. *Frontera Norte*, *30*(60), 5-30.

Hualde, J. I. (2002). Intonation in Spanish and the other Ibero-Romance languages: Overview and status quaestionis. In C. R. Wiltshire & Camps, J. (Eds.), *Romance Phonology and Variation: Selected Papers from the 30th Linguistic Symposium on Romance Languages* (pp. 101-116). John Benjamins.

Hualde, J. I. (2005). *The sounds of Spanish.* Cambridge University Press.

Hualde, J. I., & Prieto, P. (2015). Intonational variation in Spanish: European and American varieties. In S. Frota & P. Prieto (Eds.), *Intonation in Romance* (pp. 350-391). Oxford University Press.

Klatt, D. H. (1973). Discrimination of fundamental frequency contours in synthetic speech: Implications for models of pitch perception. *Journal Acoustic Society of America*, *53*(1), 8-16.

Kvavik, K. (1988). Is there a Spanish imperative intonation? In R. Hammond & M. Resnick (Eds.), *Studies in Caribbean Spanish Dialectology* (pp. 35-49). Georgetown University Press.

Labov, W. (1984). Field methods of the project on linguistic change and variation. In J. Baugh & J. Sherzer (Eds.), *Language in Use* (pp. 28-53). Prentice-Hall.

Ladd, D. R. (1980). *The structure of intonational meaning.* Indiana University Press.

Ladd, D. R. (2008). *Intonational phonology.* Cambridge University Press. (First edition 1996).

Lipski, J. (1994). *Latin American Spanish.* Longman.

Llisterri, J., Marín, R., de la Mota, C., & Ríos, A. (1995). Factors affecting F0 peak displacement in Spanish. In J. M. Pardo (Ed.), *Proceedings of the 4th European Conference on Speech Communication and Technology (Eurospeech'95)* (vol. 3, pp. 2061-2064).

Martín Butragueño, P. (2004). Configuraciones circunflejas en la entonación del español mexicano. *Revista Filología Española*, *84*(2), 347-373.

Martínez-Celdrán, E., Fernández-Planas, A. M., & Fullana-Rivera, N. (2003). Pre-nuclear tonal inventories of Spanish intonation. In *Proceedings of the 15th International Congress of Phonetic Sciences* (pp. 595-598).

Michnowicz, J., & Barnes, H. (2013). A sociolinguistic analysis of pre-nuclear peak alignment in Yucatan Spanish. In C. Howe, S. E. Blackwell, & M. Lubbers Quesada (Eds.), *Selected Proceedings of the 15th Hispanic Linguistics Symposium* (pp. 221-235). Cascadilla Proceedings Projects.

Milroy, L. (1980). *Language and social networks.* Basil Blackwell.

Moreno-Fernández, F. (1999). Aspectos socio-lingüísticos de la entonación en el español de Alcalá de Henares (Madrid): A propósito de dos enunciados interrogativos. In A. Morales, J. Cardona, H. López-Morales, & E. Forastieri (Eds.), *Estudios de lingüística hispánica: Homenaje a María Vaquero* (pp. 348-371). Universidad de Puerto Rico.

O'Rourke, E. (2005). *Intonation and language contact: A case study of two varieties of Peruvian Spanish* [PhD Dissertation]. University of Illinois at Urbana Champaign.

O'Rourke, E. (2010). Ecuadorian Andean Spanish. In P. Prieto & P. Roseano (Eds.), *Transcription of intonation of the Spanish language* (pp. 227-253). Lincom Europa.

Ortega-Llebaria, M. (2006). Phonetic cues to stress and accent in Spanish. In M. Díaz-Campos (Ed.), *Selected Proceedings of the 2nd Conference on Laboratory Approaches to Spanish Phonetics and Phonology* (pp. 104-118). Cascadilla Proceedings Project.

Ortega-Llebaria, M., & Prieto, P. (2007). Disentangling stress from accent in Spanish: Production patterns of the stress contrast in deaccented syllables. In P. Prieto, J. Mascaró, & M. J. Solé (Eds.), *Segmental and prosodic issues in Romance phonology* (pp. 155-176). John Benjamins.

Ortega-Llebaria, M., & Prieto, P. (2010). Acoustic correlates of stress in Central Catalan and Spanish. *Language and Speech*, *54*(1)*,* 73-97.

Ortega-Llebaria, Prieto, P., & Vanrell, M. M. (2007). Perceptual evidence for direct acoustic correlates of stress in Spanish. In *Proceedings of the XVIth International Congress of Phonetic Sciences* (pp. 1121-1124). Saarbrücken.

Pešková, A., Feldhausen, I., Kireva, E., & Gabriel, C. (2012). Diachronic prosody of a contact variety: Analyzing Porteño Spanish spontaneous speech. In K. Braunmüller & C. Gabriel (Eds.), *Multilingual individuals and multilingual societies* (pp. 365-389). John Benjamins.

Pierrehumbert, J. (1979). The perception of fundamental frequency declination. *Journal of Acoustical Society of America*, *66*, 363-369.

Pierrehumbert, J. B. (1980). *The phonology and phonetics of English intonation* [PhD Dissertation]. MIT.

Pierrehumbert, J., & Beckman, M. E. (1988). *Japanese tone structure.* MIT Press.

Portocarrero, A. (2019). *An analysis of intonation patterns in Ecuadorian Cuencano Spanish: A SP_ToBI description* [MA Dissertation]. University of Saskatchewan.

Prieto, P. (1998). The scaling of the L tone line in Spanish downstepping contours. *Journal of Phonetics*, *26*, 261-282.

Prieto, P. (2008). The intonational phonology of Catalan. In J. Sun-Ah (Ed.), *Prosodic*

Typology 2 (pp. 43-80). Oxford University Press.

Prieto, P., & Roseano, P. (Eds.) (2010). *Transcription of intonation of the Spanish language.* Lincom Europa.

Prieto, P., Shih, C., & Nibert, H. (1996). Pitch downtrend in Spanish. *Journal of Phonetics*, *24,* 445-473.

Prieto, P., & Torreira, F. (2007). The segmental anchoring hypothesis revisited: Syllable structure and speech rate effects on peak timing in Spanish. *Journal of Phonetics*, *35*, 473-500.

Prieto, P., Van Santen, J., & Hirschberg, J. (1995). Tonal alignment patterns in Spanish. *Journal of Phonetics*, *23*, 429-451.

Rao, R. (2009). Deaccenting in spontaneous speech in Barcelona Spanish. *Studies in Hispanic and Lusophone Linguistics*, *2*(1), 31-75.

Rao, R., & Sessarego, S. (2016). On the intonation of Afro-Bolivian Spanish declaratives: Implications for a theory of Afro-Hispanic Creole genesis. *Lingua*, *174*, 45-64.

Rao, R., & Sessarego, S. (2018). The intonation of Chota Valley Spanish: Contact-induced phenomena at the discourse-phonology interface. *Studies in Hispanic and Lusophone Linguistics*, *11*(1), 163-192.

Sosa, J. M. (1995). Nuclear and prenuclear tonal inventories and the phonology of Spanish declarative intonation. In *Proceedings of the XIIIth International Congress of Phonetic Sciences* (pp. 646-649). Stockholm.

Sosa, J. M. (1999). *La entonación del español: su estructura fónica, variabilidad y dialectología.* Cátedra.

Stella, A., Vanrell, M. M., Prieto, P., & Gili-Fivela, B. (2011). Focus largo e focus contrastive: Dati articolatori sull'allineamento tonale in italiano e catalano. Poster presented at the 7 convegno AISV (Associazione Italiana di Scienze delle Voce), Lecce, Italy, 26-28 January 2011.

Stewart, J. (2015). Intonation patterns in Pijal Media Lengua. *Journal of Language Contact*, *8*(2), 223-262.

Tagliamonte, S. (2006). *Analyzing sociolinguistic variation*. Cambridge University Press.

Terán, V., & Ortega-Llebaria, M. (2017). A description of Tucumán Spanish intonation in Argentina. *Open Linguistics*, *3*(1), 456-490.

Toscano Mateus, H. (1953). *El español del Ecuador.* Consejo Superior de Investigaciones Científicas.

Vásquez Aguilar, A., & Velásquez Chafloque, H. (2019). El arranque tritonal en el español amazónico de Iquitos. *Lexis*, *XLIII*(2), 561-586.

Weinreich, U., Labov, W., & Herzog, M. (1968). Empirical foundations for a theory of language change. In W. P. Lehmann & Y. Malkiel (Eds.), *Directions for historical linguistics: A symposium* (pp. 95-195). University of Texas Press.

Appendix

Due to several restructurings of the education system in Ecuador, participants reported different education level names based on the education structure employed at the time. For this reason, the approximate U.S. education level equivalent is provided to allow for comparison across the board.

Participant*	Gender	Age	Occupation	Education	Approx. U.S. Education Equivalent
UMY1	Male	32	Civil Servant	4th Level – Specialization	Master's
UMY2	Male	25	High-end Furniture Sales	Third Level	College / University
UMY3	Male	23	Information Technology	Bachelor's Degree	College / University
UMM1	Male	32	Lawyer / Economist	Master's	Master's
UMM2	Male	45	Legal Process Server	Secondary	High School
UMS1	Male	56	Business Owner	Superior	College / University
LMY1	Male	29	Furniture Construction	4 years of Secondary	High School (11th grade)
LMM1	Male	40	Construction / Market Vender	2nd year of High School	Some High School
LMS1	Male	80	Housekeeping / Food Service	6 years of Primary	6th grade
LMS2	Male	66	Security Guard	6 years of Primary	6th grade
UFY1	Female	29	Lawyer	University	College / University
UFY2	Female	22	University Student / Ballet Instructor	University	College / University
UFY3	Female	29	Professor of Gastronomy	Master's	Master's
UFM1	Female	40	Public Relations / Homemaker	Superior	College / University
UFS1	Female	50	Commercialization of Art	Did not finish Superior	College / University
UFS2	Female	80	Retired Business Owner	15 years	9th-10th grade
LFY1	Female	25	Market Vender	Did not finish Secondary	Some High School
LFY2	Female	27	*Curandera* / Market Healer	Training for Trade	Trade School
LFY3	Female	23	Secretary	Finished Secondary	High School
LFM1	Female	47	Market Vender	6th-7th of Basic	6th-7th grade
LFM2	Female	45	Market Vender	Basic	10th grade
LFS1	Female	51	Market Vender	Primary	6th grade
LFS2	Female	84	Agriculturist/ Market Vender	1.5 years of Basic	1st grade

*Coding scheme:

First Letter:	Second Letter:	Third Letter:
U = Upper-class	M = Male	Y = Young
L = Lower-class	F = Female	M = Middle-aged
		S = Senior