Bitonal pitch accent and phonological alignment in Sardinian
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Abstract

This study presents new data on pitch accent (PA) alignment in Sardinian, a Romance language spoken in Italy. We propose that what has been described as “stress shift” involved in encliticization processes is not a change in the word level stress, but a change in the association of the pitch accent. Our claim is that word level stress remains in situ, and the falling tune which our data exhibit can be interpreted as a bitonal pitch accent (H+L*) associated with the entire verb + enclitic unit: the starred tone is associated with the rightmost metrically prominent syllable, and the leading tone is associated with the word-level stressed syllable. The theoretical questions we address are twofold: (i) how are the landing sites of the two tonal targets phonetically identified; (ii) how are the phonetic facts reconciled with prosodic structure.

1. Introduction

The study of intonation and pitch accent in phonology has received much attention in the recent literature. Topics of particular interest include the way in which pitch accents are associated with metrical structure and microvariation in tonal alignment (Grice 1995; Grice and Savino 1995; Ladd 1996; Grice et al. 2000; Face 2001; Frota 2002; Prieto et al. 2005; Elordieta and Calleja 2005; Mücke et al. 2009). With bitonal pitch accents, questions have been raised about the identification of the starred tone and its phonological association (Grice 1995; Arvaniti et al. 2000; Grice et al. 2000; Prieto et al. 2005; Sadat-Tehrani 2009). However, very little attention has been paid to the association of the leading/trailing tone of a bitonal pitch accent (Grice 1995: 187-191). In this article, we examine the association of the two tones in a bitonal pitch accent (H+L*) in Sardinian, focusing on how the landing sites of the two tonal targets are phonetically identified and how the phonetic facts are reconciled with prosodic structure.

The structures investigated in this paper involve verb + enclitic pronouns, which undergo what has been described as “stress shift” (Blasco-Ferrer 1988:112). (All imperative verb forms in this article are second person singular informal imperatives,
Most standard Romance languages do not have a change in stress patterns when an enclitic is added to a verb. In other words, when an enclitic pronoun is in postverbal position, the stress remains on the verb. Thus, for the example in (2), (2a) is the only acceptable form in Italian, and (2b) and (2c) are ungrammatical.

However, a number of Romance languages, such as Sardinian, southern Italian dialects, Corsican, Balearic Catalan, Gascon, and some Ligurian dialects, undergo stress shift when clitic pronouns follow the verb (Ordóñez and Repetti 2006).

In this article, we propose that what has been described as “stress shift” is not a change in the word level stress, but a change in the association of the pitch accent. Our claim is that word level stress remains on the verb, and the bitonal pitch accent (H+L*) is associated with the entire verb + enclitic unit: the starred tone is associated with the rightmost metrically prominent syllable, and the leading tone is associated with the word-level stressed syllable, i.e., the stressed syllable of the verb.

This article is organized as follows. In Section 2 we provide a brief overview of Sardinian phonology, and we describe the data that we use in this article. In Sections 3-4 we provide an acoustic analysis of the data, arguing that the best analysis is one which posits a bitonal pitch accent H+L* to account for the verb + enclitic patterns. We then show how the phonetic facts can be reconciled with phonological structure. We conclude the article in Section 5.
2. Sardinian

2.1 Literature on Sardinian phonology

In this section we will review some facts about Sardinian phonology that are relevant for the discussion at hand. We will examine the cross-dialectal variation involving verb + enclitic structures (Section 2.1.1), the characteristics of stressed syllables in Sardinian (Section 2.1.2), and the literature on intonation in Sardinian varieties (Section 2.1.3).

2.1.1 Variation in stress patterns

While it is a well-known fact that Sardinian undergoes “stress shift” with enclitics, there is great variation among Sardinian dialects. Stress patterns with verb + one enclitic vary among Sardinian subvarieties. In most Logudorese varieties, in Nuorese and in “central varieties”, there is no stress shift with one enclitic, as shown in (3) (Pittau 1972: 82-83; Atzori 1982: 27; Wagner 1984 [1941]: 23; Blasco-Ferrer 1988: 112; Jones 1993: 367, n. 8).

(3) No stress shift with one enclitic

Logudorese, Nuorese and “central varieties”

(a) [nára] ‘tell’
(b) [nára mi] ‘tell me’

However, in some Logudorese varieties, in the Barbargia area, and in Campidanese varieties, there is stress shift with one enclitic (Atzori 1982: 27; Blasco-Ferrer 1986: 111, 211, n.47; Blasco-Ferrer 1988: 112). The syllable to which the stress shifts depends in part on the subdialect (4a), and in part on the morpho-syntactic structure of the clitic pronoun (4b).

(4) Stress shift with one enclitic

(a) Penult or final stress depending on dialect variety

\[\text{[nára]} \rightarrow [nára mi] \]

1. The syllable to which the stress shifts depends on the specific subdialect and the morpho-syntactic structure of the clitic pronoun.
i) Ogliastra, Logudoro, Barbargia:
   [nará mi] ‘tell me’ (Blasco-Ferrer 1988: 112; 1986:211, n.47)

ii) Campidanese:
   [nara mí] ‘tell me’ (Blasco-Ferrer 1988: 112)

(b) Penult or final stress depending on nature of clitic pronoun
i) 3rd person singular dative (Campidanese):
   [nará ɖɖì] ‘tell him’ (Atzori 1982: 27)

ii) 2nd person plural reflexive (Campidanese):
   /setsei ozi ³ ‘sit yourself’ (Blasco-Ferrer 1986: 211, n. 39)

With two enclitics we generally find stress shift in all varieties, as shown in (5):
Nuorese (Jones 1993: 28), Logudorese (Blasco-Ferrer 1986: 114), Campidanese (Blasco-

(5) **Stress shift to penult with two enclitics**

(a) Logudorese and Nuorese: [nara mí lu] ‘tell it to me’

(b) Campidanese: [nara sì ɖɖu] ‘tell it to him’

These descriptions are mostly based on *impressionistic* transcriptions. Before
presenting the results of our phonetic investigation of these phases, we will briefly review
how stressed syllables in Sardinian have been described in the literature.

2.1.2 Stressed syllables in Sardinian

The structure of stressed syllables in Sardinian has been recently examined by Bolognesi
(1998), Lai (2002), and Molinu (2005), etc. For the purposes of this paper, the duration of
the stressed syllable is of particular interest. (See also Lai [1999: 143].)

First, stressed vowels are longest when they are in open syllables (Bolognesi
1998: 24). Stressed vowels are even lengthened in closed syllables. In the description of
the variety of Italian spoken in Cagliari, Canepari (1980: 84) notes that in a closed
syllable the stressed vowel is “semi-lengthened”. Second, the duration of the stressed
syllable is increased not only through vowel lengthening, but also through consonant lengthening: short intervocalic consonants (except /r/) tend to lengthen when preceded or followed by a stressed vowel (Canepari 1980: 84).\(^5\) Third, a stressed vowel is longest when it is in the penultimate syllable (vs antepenultimate syllable) (Bolognesi 1998: 24, 71).\(^6\) In fact, the vast majority of words have penultimate stress: approximately 85.2% of underived words have penultimate stress, but that percentage is actually higher since monosyllabic words and words with final stress are often realized with penultimate stress through word-final epenthesis of a vowel or syllable (Bolognesi 1998: 24).\(^7\) Finally, vowels are longest when they are stressed and accented (Bolognesi 1998: 24, 71).\(^8\) The accented syllable in Sardinian (i.e., the syllable receiving phrasal stress) corresponds to the stressed syllable of the final word of the phrase (Bolognesi 1998: 71).

We will see in Section 3, that these characteristics are reflected in our data. But first we will briefly review how Sardinian intonation has been dealt with in the literature.

### 2.1.3 Sardinian intonation

Sardinian intonation has received some attention in the literature: Contini (1992) and Lai and Zucca (2004) examine dialect variation in Sardinian intonation, and Contini (1984) and Lai (2002) provide experimental evidence of the role of F0 in differentiating questions and affirmative statements. Contini (1984) concludes that declarative sentences are characterized by a tonal peak on the initial syllable of the phrase, which he describes as a “level 3 peak” (Contini 1984: 148), followed by a fall on the post-accented syllable, while Lai (2004) notes that the F0 peak is on the pretonic syllable.

Another source is Canepari (1980, 1992) who studies the intonational patterns of regional varieties of Italian. For Cagliari Italian, he describes a slightly falling intonation for the “conclusive tone”: a fall from a low mid tone in pretonic position to a low tone in tonic position (Canepari, 1992: 202). A similar description is found in Schirru (1981-1982) for the variety of Italian spoken in Cagliari.

The falling intonational pattern associated with declarative sentences is also attested in our data. We will describe this pattern as consisting of a bitonal pitch accent: H+L*.\(^9\)
2.2 Data description

The stress shift patterns discussed in the literature are based mostly on impressionistic transcriptions, and there are no detailed phonetic analyses of these structures. In this paper, we provide an in-depth analysis of the intonation and durational characteristics of verb + enclitic phrases in Sardinian. In this section we describe the data collection and discourse context (Section 2.2.1) and the falling tune attested in the data (Section 2.2.2).

2.2.1 Data collection and discourse context

The data we investigate are from the towns of Seneghe (S1), Cabras (S2), Oristano (S3), and Milis (S4), all in the province of Oristano, where a variety of Campidanese is spoken (although it is near the boundaries of the Logudorese dialects). Data were collected during field research conducted in the summer of XXX by XXX, and recorded with a Zoom H4 digital recorder. The 3 male informants (S1~S3) and 1 female informant (S4) are all bilingual in Italian and Sardinian (non mutually intelligible languages).

The utterances were produced in a question and answer format, namely, the Sardinian speaker performed a translation task.

(6)  (a) Investigator (Q) (in Italian):

         Come si dice *dammelo*?

         (‘How do you say ‘give it to me’?’)

(b) Informant (A) (in Sardinian):

         [dzaimmiɖɖu]

         (‘give it to me’)

The linguistic identification of the discourse context involved in the data collection is significant since sentence level prosody conveys meaning that is intended for the entire phrase or utterance (Ladd 1996). The discourse context was a request for new information. In other words, the prosody of the target phrases in (6b) is best identified as broad focus, even though the verb is in the imperative form. However, the analysis presented in this paper can be extended to any type of bitonal pitch accent, including one used in imperative intonation.
2.2.2 Phonetic characteristics of the data

We find a consistent intonational contour in the speech data: a single falling tune (HL) throughout the entire phrase. This characteristic tune is consistent across all informants (S1–S4). We will inspect four examples in order to provide details of the characteristics of the falling tune found in the data. We will see that the High (H) tone is associated with the initial or second syllable of the phrase which corresponds to the lexically stressed syllable of the verb, and the Low (L) tone is associated with either the penultimate or antepenultimate syllable of the phrase which corresponds to either the last syllable of the verb or the (first) clitic.

The first example is provided in Figure 1, and illustrates a verb with initial stress followed by two clitics: /dzammiddu/ ‘give it to me’. The H tone target starts at the beginning of the vowel of the first syllable that coincides with the lexical stress of the verb. It then falls to the L tone target at the end of the vowel of the penultimate syllable.

![Figure 1 Falling tune of initial H and penultimate L: the phrase consists of a monosyllabic verb (σ) and two enclitics (σσ).](image)

The second example, shown in Figure 2, also illustrates a similar falling tune. In this example, the lexical stress of the verb is non-initial and a monosyllabic enclitic is adjoined to the verb: [abadiammi] ‘look at me’.
The high tone peak in this second example appears in the second syllable, and the low tone in the penultimate syllable. If we compare this to the first example, a difference emerges with respect to the location of H tone target, which was in the initial syllable in the first case and in the second syllable in the second case. On the other hand, the L tone target appears in the penultimate syllable in both examples. Based on these two examples, we may predict that the H tone is associated with either the initial or the second syllable (of the verb), and the L tone with the penultimate syllable (either part of the verb or the clitic).

Further examples reveal more locations for the tone targets (H+L). We see below that the H tone is associated with either the initial (Figure 3) or the second (Figure 4) syllable of the verb, as we have seen earlier. The L tone, on the other hand, is associated with the antepenultimate syllable (either part of the verb or the clitic) rather than the penult. (In the following figure, and also throughout the paper, we use a lower-case italicized “v” to represent an epenthetic vowel).\textsuperscript{11}
Figure 3 Falling tune of initial H and antepenultimate L: the phrase consists of a tri-syllabic verb with initial stress (σσσ) and two enclitics (σσv). The final vowel is epenthetic.

The example in Figure 3, [komporamid(d)aza] ‘buy them for me’, depicts a pattern similar to that illustrated in Figure 1, where the H tone appears in the initial syllable. However, the L tone now seems to be aligned with the antepenultimate syllable. The final vowel in this example is an epenthetic vowel which is involved in the determination of the location of the L tone: with verb + enclitic phrases, the L tone is associated with the antepenultimate syllable only when the phrase ends in an epenthetic vowel. Jones (1997: 376) describes this epenthetic vowel as inserted in “absolute final position” with consonant final words: for example, a copy vowel appears in [andámuzu] ‘let’s go’ but not in [andámuz a ssa vésta] ‘let’s go to the feast’.

This antepenultimate L alignment is also found in Figure 4 below. In this example, the H tone appears on the second syllable.
Figure 4 Falling tune of second syllable H and antepenultimate L: the phrase consists of a di-syllabic verb with stress on the second syllable (σσ́) and one enclitic (σσν). The final vowel is epenthetic.

In this figure, the final vowel has the same quality as the preceding vowel [u], suggesting that it is also a copy vowel. The L tone target in this case is expected to appear on the antepenultimate syllable, and this is what we see.

One question is why the L tone is associated with the antepenultimate syllable if the final vowel is epenthetic. We can account for this in two ways, although we do not take a particular position in this paper: (i) the epenthetic vowel is invisible to tonal targets, i.e., if the final copy vowel is ignored, the L tone is associated, as above, to the penultimate syllable; (ii) the copy vowel is inserted after the tonal targets are assigned to specific positions.

In each of the four Figures above, the H tone is associated within the verb, while the association of the L tone varies. In Figures 1, 3, and 4 the L tonal target is associated with the clitic, while Figure 2 shows that the L tone target is aligned within the verb. This comparison tells us that the L tone target does not necessarily designate a morphosyntactic or lexical unit as its landing site (clitic or verb), but that there must be a phonological unit that determines the landing locations within the phrase. For the H tone target, the landing site coincides with the lexical stress of the verb: the initial syllable (Figure 1 and Figure 3) vs. second syllable (Figure 2 and Figure 4). On the other hand,
the landing site for the L tone target is either penultimate (Figure 1 and Figure 2) or antepenultimate (Figure 3 or Figure 4) depending on the presence/absence of a final copy vowel. Based on these facts, our first generalization can be stated as follows:

(7) *Falling tune in verb plus clitic phrases*: the H tone falls on the lexically stressed syllable of the verb, and the L tone on the penultimate syllable; when an epenthetic vowel is present at the end of the utterance, the L tone falls on the antepenultimate syllable.

Another auditory impression connected to the HL tone targets is that the syllable associated with L tone target is much longer than the one associated with H tone target. In other words, the L tone is associated with lengthening rather than the H tone. In addition, the lengthening is greater when the L tone is associated with the penultimate syllable than when it is associated with the antepenultimate syllable. This is precisely what is described in the literature (see Section 2.1.2 above). Bolognesi (1998: 71) says that in Campidanian Sardinian “the stressed vowel is considerably lengthened if phrasal stress falls on the penultimate. No lengthening takes place if it falls on the antepenultimate lexical vowel of the phrase.” This durational information is included in our generalization regarding tonal targets and their landing sites, as in (8):

(8) A. *Falling tune in verb plus clitic phrases*: the H tone falls on the lexically stressed syllable of the verb, and the L tone on the penultimate syllable; when an epenthetic vowel is present at the end of the utterance, the L tone falls on the antepenultimate syllable.

B. *Duration*: the syllable associated with the L tone is lengthened. Lengthening is greatest when the L tone is associated with the penultimate syllable.

We now turn to the phonetic investigations of tonal realization and segment duration, which confirm our impressionistic description in (8) and allow us to provide a precise account for the tonal alignment patterns.
3. Phonetic analysis of verb plus clitic phrases

This section offers a phonetic investigation of the vowel duration and tonal characteristics of our data, which include 246 utterances from four informants (S1~S4). The criterion used to select the utterances studied has to do with the quality of the vowels associated with the H and L tones: /i, e, a/. The actual number of phrases that matches our criterion relative to the total number of utterances is as follows: 62/138 (S1), 68/155 (S2), 52/154 (S3), 64/148(S4). We provide a phonetic analysis of these phrases, looking at pitch (Section 3.1) and duration (Section 3.2-3.3).

3.1 Pitch: falling tune in the data

The falling tune, which is one of the salient characteristics of the data, is further examined to identify the locations of the F0 peaks (H) and valleys (L) (vowels are labeled as \( V_{-H} \) and \( V_{-L} \)). This tonal examination, together with the durational results, will provide evidence that the falling tune can best be described as an H+L* pitch accent.

Local F0 values are measured for each syllable where either a H peak or a L valley appears. F0 values are calculated in four places: at the beginning of the designated vowel (a), at the end of the designated vowel (d), as well as at two intermediate points: the middle of the first half of the designated vowel (b), the middle of the second half of the vowel (c). F0 at points b and c are averaged pitch values: \( b=1^{st} \) half and \( c=2^{nd} \) half of the vowel. In addition, phrase-final vowels (\( V_F \)) are also included in the F0 analysis to capture the complete falling tune of the entire phrase. This is illustrated in Figure 5.

![Figure 5 F0 references within target vowel: \( V_{-H} (a-d) \), \( V_{-L} (a’-d’) \), and \( V_F (a''-d'') \)](https://example.com/figure5.png)
Vowels that carry a tonal target, either H or L, were manually identified and labeled as either $V_H$, $V_L$, or $V_F$. Four F0 values ($a$–$d$, $a'$–$d'$, $a''$–$d''$) from each vowel were then extracted using a Praat script. In Figure 5, for example, four F0 values ($a$–$d$) were taken for the vowel /a/ ($V_H$), four F0 values ($a'$–$d'$) for the vowel /i/ ($V_L$), and another four ($a''$–$d''$) for the vowel /u/ ($V_F$).\(^{12}\)

The following figure provides a representative F0 contour of the phrases with an initial H and a penultimate L. F0 values at each time reference are averaged respectively for each subject.

![Figure 6 Averaged F0 contour with penultimate L (within subject representation): F0 at the end point of the final vowel ($V_F$) is excluded in the figure because utterance final F0 values were not reliable mostly due to the voice quality at utterance final position.](image)

Each marker in the above figure represents a tonal target placement for each speaker. For the male speakers (S1~S3), the H target appears earlier in the initial vowels and retained over the syllable. It starts to fall at the end of the vowel to the L target, which generally appears close to the end of the penultimate vowel. When there is a sonorant coda, the L tone tends to continue to fall to the end of the coda. This falling continues to the end of the utterance ($V_F$). The only difference for the female speaker (S4) seems to be the relatively delayed H target, which tends to be formed within the later half of the vowel.
In the case with antepenultimate L, the falling tune is similar to that found with the penultimate L contour, but the duration of the vowel that carries the L tone target is shorter: \( V_L \) (antepenultimate) = 97.13 ms (SD=24.3) < \( V_L \) (penultimate) = 120.96 ms (SD=29.3). In the following section, we will examine the durational characteristics of the vowels associated with the H or L tonal target in more detail.

3.2 Duration: lengthening of vowel associated with L tone

We will now examine the durational characteristics of vowels associated with a L tone vs. a H tone, beginning with the /a/ group. We will compare the /a/’s associated with a H tone and the /a/’s associated with a L tone to see if there are differences in duration. Our comparison is illustrated in (9): data are from S1, and the total durations of the phrases are provided together with the durations of vowel /a/. In (9a) the H tone is associated with the lexically stressed /a/, and in (9b) the L tone is associated with the final unstressed vowel of the verb.

(9)  (a) [abádia+mmi] ‘look at me’   (b) [teléfon+mmi] ‘call me’
     | |  
     H L  H L

Dur. of /a/-H = 78.22 ms.  Dur. of /a/-L = 110.7 ms.
(Dur. of phrase: 682.4 ms.)  (Dur. of phrase: 703.6 ms.)

It is clear that the /a/ associated with the L tone (9b) is longer than the /a/ associated with the H tone (9a). This is surprising for a number of reasons. First, the vowel in (9a) is lexically stressed, so we would expect it to be longer than a lexically unstressed vowel (9b); however, this is not what we find. Second, let us consider the structure of the syllables from which each /a/ is taken: the /a/ in (9a) (H-tone) is in an open syllable, and the /a/ in (9b) (L-tone) is in a closed syllable. We expect that the duration of /a/ would be longer in an open syllable (9a) than in a closed syllable (9b). Surprisingly, we find that the /a/ in the closed syllable (9b) is longer than the /a/ in the open syllable in (9a). Third, we might predict a longer duration of each syllable in the shorter word (9a), and a shorter duration of each syllable in the longer word (9b), given
word compression effects (Vayra et al. 1987; D'Imperio and Rosenthall 1999; Vayra et al. 1999; Kim and Cole 2005; Hajek et al. 2007). However, this is not the case in the given example.\(^{13}\)

The measurements in (9) are not limited to the vowel /a/. The following figure shows the durational comparison between V\(_{-H}\) and V\(_{-L}\) for three vowels /a, e, i/, and we see that the vowel associated with the L tone is consistently longer than the vowel associated with the H tone.

![Figure 7 Vowel durations associated with H and L tone.](image)

Figure 7 shows that vowels associated with the L tone target are much longer than the ones associated with a H tone target. For example /a/-\(_{L}\) is more than double the length of /a/-\(_{H}\): /a/-\(_{H}\) (M=65.7 ms, SD=12.5, N=15) vs /a/-\(_{L}\) (M=134.4 ms, SD=21.5, N=27). The other vowels show the same pattern:/e/-\(_{H}\) (M=60.7 ms, SD=16.9, N=47) vs /e/-\(_{L}\) (M=112 ms, SD=19.7, N=19); /i/-\(_{H}\) (M=66. 8 ms, SD=13.9, N=15) vs /i/-\(_{L}\) (M=109.3 ms, SD=24, N=64). The results are averaged across the subjects (3M, 1F). The one female informant showed very slow speech compared to the other three male subjects. We separated the results by gender, and the significant durational difference shown in the figure does not change, except that each of the total durations become shorter.

3.3 Duration: lengthening of vowel in penultimate vs antepenultimate position

We have seen that the durational differences among vowels correlate with the tone associated with them: vowels with a L tone are longer than the ones with a H tone. This is consistent across the three vowel groups and across speakers. We will now see that there
is a durational difference depending on the position of the vowel in the word. Figure 8 shows the length of the vowel /i/ associated with a L tone (/i/-L) in various positions in the word: penultimate /i/-L is significantly longer than antepenultimate /i/-L,

This tendency is not limited to the vowel /i/. In penultimate position, the duration of /a/-L averages 129.8 ms and /e/-L 116.8 ms, while in antepenultimate position, the duration of /a/-L is 115.3 ms and /e/-L is 74.5 ms.

These durational findings confirm the description of prominence in (8): vowels associated with the L target undergo lengthening, and vowel lengthening is greater for penultimate vowels than for antepenultimate ones. The durational prominence of penultimate /V/-L leads us to the conclusion that there should be a metrical source that assigns a phonological prominence to the penultimate vowel/syllable, which may or may not be part of a clitic. In the following sections, we provide a phonological analysis of the tonal pattern found in Sardinian, in order to capture the main characteristics of the data as well as to provide a general picture of where the Sardinian data can contribute to current theories of tonal phenomena.

4. Phonological analysis of verb plus clitic phrases

In this section, we suggest a phonological analysis of the data, namely, the falling tune can be described as a bitonal pitch accent whose primary and a secondary associations are described (Section 4.1-4.2). In Section 4.3 we propose a prosodic account of the tonal landing sites.
4.1 H+L* bitonal pitch accent

Now that we have explored the phonetic characteristics of the falling tune in the data, we consider the details of the phonological description based on the theory of intonation proposed by Pierrehumbert (1980). We have seen that the H tone associates with either the 1st or 2nd syllable, which coincides with lexical verb stress, and the L tone associates with either the penultimate or antepenultimate syllable, regardless of whether it is part of verb or clitic. In terms of duration, penultimate lengthening is evident, which is consistent with the description of Sardinian in the literature. We will provide an analysis of the falling tune as a bitonal pitch accent, which is connected to broad focus with scope on the entire verb plus clitic phrase. Specifically we need to decide whether the falling tune (HL sequence) consists of two independent pitch accents (H* and L*) or a bitonal pitch accent (H+L*).14 Observe the two examples shown in Figure 9 (a-b) (which correspond to Figures 1 and 3), where verb stress is on the initial syllable. The H tone target appears at the initial syllable, whereas the L tone target appears on the penultimate (a) and antepenultimate syllable (b).

Figure 9 Tonal description examples: The durations of the vowel associated with the L tone ([i]) in (a) and (b) are 101 ms and 79 ms, respectively. For the following consonant ([dd]), the duration is 166 ms in (a) and 119 ms in (b).
In the relatively short phrase (a) [dzɑm-mmmiddu] ‘give it to me’, the H target is followed by a fall. Considering the durational prominence on the L tone, and not on the H, the falling tune (HL) in this case can best be described as H+L*. On the other hand, in the case [komporam-omid(d)aza] ‘buy them for me’ in (b), H and L are two syllables away from each other, which may suggest that the two targets are independent pitch accents (H* and L*). The two possible descriptions of the pitch accent, either a bitonal PA (H+L*) or two PAs (H* L*), are illustrated in (10).

(10) a. [dzɑm-mmmiddu]  b. [komporam-omid(d)aza]
   i. Bitonal PA analysis  H+   L*  H+   L*  
   ii. Two PA analysis   H*   L*  H*   L*  

The two analyses in (10i) and (10ii) can properly describe the tune at hand, but each of them has advantages and disadvantages. The *Bitonal PA analysis* in (10i) attributes the falling tune to a H+L* bitonal pitch accent. This enables us not only to express the relative prominence in duration within the domain, but also to capture a transparent mapping relationship between prosody and meaning: a single pitch accent expresses a similar meaning (broad focus) in a consistent way. It also finds support in the fact that neighboring languages, such as Italian, have been described as expressing broad focus with a single pitch accent H+L* (D’Imperio 2002). One disadvantage of the bitonal analysis has to do with locality of the tonal event. How far can the two tonal components of a single pitch accent be separated from each other? For instance, H and L in (10b) are two syllables away from each other. This is problematic considering the fact that one of the common criteria in identifying bitonal pitch accents is a “local” drop, meaning that the H and L tones are a single tonal event (Pierrehumbert 1980).

The locality issue does not arise in the two PA analysis described in (10ii), because the two tonal targets are interpreted as two independent pitch accents. However, the coherent mapping relationship between prosody and meaning is lost in this two PA analysis: Is it H* or L* that expresses broad focus? Or is it a combination of both? Furthermore, if we were to analyze (10a) as H+L* and (10b) as the combination of H* and L*, assuming that both possibilities can be used to express broad focus, then the
choice between the two would depend on how far the lexical stress is located from the penultimate syllable. This implies a disconnect between the phonological description of the tune and its fundamental semantic role.

We have identified the main problem with the bitonal pitch accent analysis as having to do with the great distance between the two tonal components that are part of a single tonal event (a single pitch accent). This is problematic because the two tones of a bitonal PA usually describe a local pitch movement (Pierrehumbert 1980). For the bitonal PA analysis to be adopted, the landing sites for the two tones should be predictable. In the following section, we show how this can be done.

4.2 Tonal alignment: primary and secondary associations

A pitch accent is generally assumed to associate with a metrically prominent position, such as the syllable with primary stress. However, this principle cannot account for all of the cases described in the literature. For example, many cases of imperfect phonetic alignment between a tone and a segment are documented and discussed (Ladd 1996; Arvaniti et al. 2000). For example, Arvaniti et al. (2000) addresses this issue explicitly with bitonal pitch accents in Greek: no tonal target is exactly associated with the stressed syllable, instead the starred tone appears in the vicinity of the metrically prominent position.

In connection with the problem of imperfect alignment, Prieto et al. (2005) develop the notion of “phonological anchoring”, a notion adopted from Pierrehumbert and Beckman (1988)’s proposal of “secondary association”. (See also Grice [1995] and Grice et al. [2000].) Prieto et al. (2005) investigate possible contrastive alignment patterns of H* (in a L+H* PA) in three Romance varieties, where the same pitch accent seems to associate with variable prosodic boundaries such as mora, syllable, or word edge. They account for the alignment variation by attributing it to a secondary association of the H tone to a specific prosodic boundary, which can be language-specifically encoded in the phonological representation of the pitch accent. Thus, the primary association of any pitch accent is determined by a metrically prominent position in the phrase, but the secondary association, if specified in a language, finds edges as anchoring sites for the given tones. In the Romance varieties that they investigate, the secondary
association of the H* tone (within the L+H* PA) can be with a mora (a rise with a non-delayed peak), a syllable (a rise with a delayed peak), or a word edge (a post-tonic rise). The three-way alignment patterns in these three Romance varieties could not otherwise be distinguished based on the L+H* primary association alone.

Following this “phonological anchoring” hypothesis, we explore a possible account for the HL falling tune as a single tonal event, which we believe to be more advantageous in describing the data consistently. First, the pitch accent is assigned to a metrically prominent prosodic position: in our data, the penultimate or antepenultimate syllable, as illustrated in (11). In the case of a bitonal pitch accent, we assume that the leading tone is specified for its secondary association, namely, it associates to another metrically strong position, if one is available. That is, the landing site of the leading H tone is the next most prominent position in the phrase. (For more on the details, see Section 4.3.)

(11) Tonal association

a. \[ \begin{array}{cccc} \hline \sigma & \sigma & \sigma & * \\
* & * & * & * \\
\hline \end{array} \]

e.g., [dzammiddu]
(in Fig. 1)

b. \[ \begin{array}{cccccc} \hline \sigma & \sigma & \sigma & \sigma & * \\
* & * & * & * & * \\
\hline \end{array} \]

e.g., [abadiami]
(in Fig. 2)

c. \[ \begin{array}{ccccccc} \hline \sigma & \sigma & \sigma & \sigma & \sigma & v \\
* & * & * & * & * & * \\
\hline \end{array} \]

e.g., [komporamid(d)aza]
(in Fig. 3)

d. \[ \begin{array}{cccccc} \hline \sigma & \sigma & \sigma & \sigma & v \\
* & * & * & * & * \\
\hline \end{array} \]

e.g., [bendeiduzu]
(in Fig. 4)

The various possibilities are illustrated in (11): each example corresponds to Figures 1~ 4 shown earlier. In (11a) and (11b), the PA is associated with the penultimate syllable, and the leading H tone is associated with the stressed syllable of the verb. In (11c) and (11d), the PA is associated with the antepenultimate syllable and the leading H tone with the lexically stressed syllable. These examples support our earlier generalization in (8): the leading tone H is associated with the syllable which has lexical stress; thus, the variation of the H tone loci is predictable. The starred tone L* is associated with the penultimate syllable or the antepenultimate syllable in the presence of a copy vowel. We propose that the variation in terms of the location of the L* tone (penultimate or antepenultimate
syllable) is only true in the surface form. When the final vowel is epenthetic, it is not involved in the tonal association process.

To summarize, the analysis of the falling tune as a bitonal pitch accent (H+L*) enables us to capture the connection between the tonal description and its associated meaning, to highlight the similarities between Sardinian and other Romance languages with a similar PA system, and to provide evidence that the two components of a single bitonal pitch accent need not necessarily be adjacent segmentally (e.g., when secondary association involved). We now need to specify in more detail the phonological anchoring sites, which we described above simply as “metrically prominent syllables”. In the next section we propose a prosodic account of the association of the H+L* bitonal pitch accent to the verb + enclitic pronoun phrases.

4.3 Prosodic structure of verb plus enclitic units

In this section we first review the literature on “stress shift” involving enclitics (Section 4.3.1), and we then explore a prosodic structure that can accommodate our bitonal analysis of the phrases (Section 4.3.2).

4.3.1 Romance stressed enclitics

As summarized in Ordóñez and Repetti (2006), Torres-Tamarit (2010), and others, the phonological literature on stress patterns involving “verbs + enclitics” in Romance languages is extensive. In this section we briefly describe the prosodic accounts of the attested patterns in order to situate our proposal within a more general context. The four patterns are illustrated below. (See also Ordóñez and Repetti [2006].)
(12) Stress patterns in Romance languages

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) <strong>Stress Stability</strong> (Italian)</td>
<td>imperitive: pórtə</td>
</tr>
<tr>
<td>(b) <strong>Generalized Penultimate Stress Shift</strong> (San Leucio del Sannio, Benevento, Italy)</td>
<td>‘bring’: pórtə</td>
</tr>
<tr>
<td>(c) <strong>Two-Clitic Penultimate Stress Shift</strong> (Naples, Italy)</td>
<td>‘sell’: vinnə</td>
</tr>
<tr>
<td>(d) <strong>Final Stress Shift</strong> (Perinaldo, Liguria, Italy)</td>
<td>‘bring’: pórtə</td>
</tr>
</tbody>
</table>

The example in (12a) illustrates the most common pattern, and that found in many standard Romance languages: regardless of the number or type of enclitic, stress remains on the verb. In (12b) we see a case in which the stress is always reassigned to the penultimate syllable in verb + enclitic units; this is attested in many southern Italian dialects and Sardinian. In (12c) the stress remains on the verb if one enclitic is added, but it is shifted to the penult if there are two enclitics; this pattern is also found in many southern Italian dialects and Sardinian. Finally, in (12d), we see that the stress can be shifted to the final syllable of the verb + enclitic structure, found in some dialects of Sardinian, Gascon, Catalan, Ligurian, and Argentinian Spanish. (For discussion of individual patterns, see Bonet [2009], Colantoni et al. [2010], Huidobro [2005], Moyna [1999], Peperkamp [1997], Torres-Tamarit [2010], and references therein.)

Many phonologists have proposed a prosodic account of the variation illustrated above in (12). We will use Peperkamp (1997)’s model as the basis. Peperkamp (1997), following Selkirk (1995), claims that patterns (12a-c) can be accounted for as different ways in which a clitic is incorporated into prosodic structure. (Pattern [12d] is not discussed in Peperkamp [1997].) For example, clitics may be incorporated into the Phonological Phrase (PP) resulting in the **Stress Stability** pattern (13a), into the Prosodic
Word (PW) resulting in the *Generalized Penultimate Stress Shift* pattern (13b), or they may be adjoined recursively to the PW resulting in the *Two-Clitic Penultimate Stress Shift* pattern (13c).\(^{16}\)

(13) Peperkamp (1997)

\[
\begin{array}{ccc}
\text{(a) PP-incorporation} & \text{(b) PW-incorporation} & \text{(c) PW-adjunction} \\
\begin{array}{c}
\text{PP} \\
\text{PW} \\
\text{verb clitic}
\end{array} & \\
\begin{array}{c}
\text{PP} \\
\text{PW} \\
\text{verb clitic}
\end{array} & \\
\begin{array}{c}
\text{PP} \\
\text{PW} \\
\text{clitic verb PW}
\end{array}
\end{array}
\]

Variations on the above model are also attested. Loporcaro (2000) suggests that in all Romance varieties clitics adjoin to the Prosodic Word; differences in stress assignment have to do with whether or not stress can be reassigned postlexically. Bonet (2009) and Torres-Tamarit (2010) account for the complex stress patterns in Catalan by positing a single PW for verb + enclitic units. Monachesi (1996) posits different prosodic structures for single clitics vs clitic clusters: one clitic adjoins to the host to form a single PW, while two clitics form a unit (PW) separate from the host resulting in a compound structure. Nespor and Vogel (1986) posit the Clitic Group as an independent layer in the prosodic hierarchy between the PP and the PW level, where clitics are adjoined; within this domain unique rules and constraints apply.

Although these proposals can account for certain cases, there are a number of problems with the purely phonological approach to enclitics and stress assignment when the full range of data is taken into consideration. For example, the morphosyntactic structure of the verb or enclitic may affect stress shift. In (14) San Leucio del Sannio, we find stress shift to the penult if the verb is a second person singular imperative, but there is no stress shift if the verb is a first person plural imperative. In (14b) Menorcan Catalan, stress shifts to the final syllable if the clitic is a third person masculine pronoun, while it shifts to the penult if the pronoun is feminine.\(^{17}\)
These patterns cannot be handled by the prosodic hierarchy alone. A solution to some of these problems has been suggested by Ordóñez and Repetti (2006): postverbal pronouns are not all the same. The term “clitic” has been used to refer to two different groups of pronouns that are morphosyntactically distinct: true clitics and weak pronouns (Cardinaletti and Starke 1999). The morphosyntactic problems identified above are solved if we adopt the “weak pronoun” analysis of some enclitics.

The “weak pronoun” analysis also helps us understand the phonological behavior of these postverbal pronouns. In their cross-linguistic investigation of weak pronouns Cardinaletti and Starke (1999) find that weak pronouns can be stressed, i.e., they consist of at least one foot. This analysis allows us to account for the cross-linguistic variation between languages that have Stress Stability with enclitics vs languages that have “stress shift” with enclitics: the former utilize true clitics in postverbal position, while the latter utilize weak pronouns. If we analyze the Sardinian enclitic pronouns as weak pronouns, we can explain why they can be stressed, and, in particular, for the purposes of our paper, the weak pronoun analysis provides a metrically prominent position for the PA to associate to. Given EXHAUSTIVITY, a foot must be dominated by a Prosodic Word. Therefore, we propose that the Sardinian postverbal pronouns are Prosodic Words. Our prosodic representation of “verb + weak pronoun” phrases is presented in (15).

(14)  

(a) San Leucio del Sannio

No stress shift with 1pl imperative  [vənnɪmʊ]/[vənnɪmʊ lu] ‘sell’/‘sell it’
Stress shift with 2sg imperative  [vɪnnə]/[vənni llu] ‘sell’/‘sell it’

(b) Menorcan Catalan

Final stress with mas enclitic:  [narra li] ‘tell him’
Penultimate stress with fem enclitic:  [narrá la] ‘tell her’

(15)

```
PP  PW  PW
    Ft   Ft
verb weak pronoun
```
Support for the structure in (15) comes from Nuorese. In this Sardinian dialect, there is a “fixed paragogic vowel” which is different from the copy vowel described earlier. The “fixed paragogic vowel” is found after a stressed vowel in word-final position: [dáe] ‘give’ (Pittau 1972: 16-19). It is also found after an oxytonic verb which is followed by an enclitic cluster, suggesting that the verb is word-final: [dái milu] ‘give it to me’. When only one pronoun follows the verb, the “fixed paragogic vowel” is not present, suggesting that the verb is not word-final: [dá mi] ‘give me’. We analyze these patterns as follows: some postverbal pronouns are true clitics (for example, /mi/), while in clusters a weak pronoun is always used (for example, /milu/). The prosodic structure in (15) represents only a verb + weak pronoun unit, and not a verb + true clitic unit. (See Ordóñez and Repetti [2008] for details regarding this proposal.)

An alternative representation of the verb + weak pronoun unit is that they form a single PW. We reject this model for a number of reasons. First, the model presented in (15) allows us to account for the fact that the pitch accent associated with the verb + weak pronoun unit is associated at the phrase level (PP), while the single PW representation does not. Second, as far as we are aware, there are no PW-bound constraints that apply to our Sardinian verb + postverbal pronoun units.

The remaining questions we address in the next section include the following. How is prosodic structure involved in the tonal association of the bitone? And how is each tone aligned with a particular prosodic unit?

4.3.2 Prosodic structure and the H+L* bitonal pitch accent

We have seen above that the difference in prosody between a verb vs a verb + postverbal pronoun, has been understood as “stress shift”. We have also seen, however, that there is really not a “shift” in the word-level stress, since the verb’s stressed syllable remains metrically prominent. Instead, we propose that what changes is the association of a bitonal pitch accent H+L* to the entire verb + postverbal pronoun phrase. In particular, the starred tone is associated with the rightmost metrically prominent position, which happens to be the prosodic word that includes the weak pronoun in Sardinian. We will describe how the PA is phonologically associated to the verb + weak pronoun phrase, by
illustrating the phonological association derivationally.

One of the word-level stresses of the PP must be the most prominent, and in Sardinian it is the final word of the phrase that receives the phrasal stress (Bolognesi 1998: 71). It is this syllable that is associated with the L* tone and lengthening (if in penultimate position). In some cases, the penultimate syllable is part of the postverbal pronoun, and in other cases it is part of the verb. This is because Sardinian, like other Romance languages, undergoes phrasal resyllabification. (See Cardinaletti and Repetti [2009]).

The starred tone of the bitonal pitch accent is associated with the most prominent syllable of the phrase, and we suggested above that the leading tone is associated with the next most prominent syllable. In our data, that is the stressed syllable of the verb. (16a) is our representation of “verb + weak pronoun”, and (16b) shows an example of [dzámmiddu] ‘give it to me’.

(16) a.  
\[
\text{PP \rightarrow PA \rightarrow PW \rightarrow PW \rightarrow Ft \rightarrow Ft \rightarrow verb \rightarrow weak pronoun}
\]

b.  
\[
\text{PA = H+L*}
\]

We assume that broad focus introduces a specific pitch accent that is assigned to the relevant domain, which is PP in (16a). The semantic domain of the broad focus in the given data is the entire phrase, and thus the association of the pitch accent to the PP is transparent. Since the verb + weak pronoun phrase (PP) consists of two prosodic words, both will have a word-level stress (metrical prominence). The starred tone is specified to anchor to the rightmost metrically prominent position: the first syllable of the weak pronoun /mid/ is metrically prominent: it is the head syllable of a trochaic foot. The leading tone H is also specified to land at a metrically prominent position. Since the left PW is available for the leading tone, it anchors to the syllable with verb stress, which is /dza/. This foot is clearly trochaic because the following consonant /m/ is geminated: [dzám].

---
The proposed association and derivation allow us to make a couple of predictions. First, if there is only one PW available, L* is associated with the only metrically prominent position, and the leading tone H either within the same syllable or in the vicinity of the metrically prominent position. Second, the H+L* pitch accent will be associated with two prominent positions even when there are more than two PWs within a PP. We provide evidence for the latter prediction, and leave the former for future study.

If there are more than two PWs in a phrase, we predict that the L* tone is associated with the rightmost PW, and the leading tone is associated with the stressed syllable of the PW that is the next most prominent one. In our data, the leading tone associates with the stressed syllable of the immediately preceding PW. (For differences in prominence among various words in a phrase, see Lai [2002] and Lai and Zucca [2004].)

Below is the example of a phrase that consists of three PWs: /pesa tinde subitu/ ‘get up right away’ (verb + weak pronouns + adverb) from S4 (Milis). The metrical structure of the phrase is provided in (17a), and the pitch contour in (17b).

(17) a. \[ PA = H+L^* \]

b. ![Pitch contour](image)

Applying the weak pronoun analysis to Sardinian, the postverbal pronoun(s) can form an independent PW. Therefore, in (17a) we have three PWs in the PP: the first PW for the verb, the second for the weak pronouns, and the third for the adverb. Given the metrical structure in (17a), the PA (H+L*) that is introduced to the PP finds its primary association with the rightmost metrically prominent position, i.e., the stressed syllable [sú] of the adverb. Since the leading tone (H) is also specified to associate with a
metrically prominent position, it looks for the closest metrically prominent syllable, which happens to be the stressed syllable of the weak pronoun [tin]. Thus, the phonological association predicts the H leading tone to land on the weak pronoun, while the starred tone goes to the stressed syllable of the adverb. This association is confirmed by the pitch contour of the phrase in (17b), where the H and L tones are realized on the syllables predicted in (17a).

5. Conclusion

In this paper we have suggested that what has been described as “stress shift” involved in encliticization is a change in the association of the pitch accent to the entire phrase, and not actually a change in word level stress. Using both phonetic measurements of pitch and duration, as well as phonological analyses of the prosody of these phrases, we claim that word-level stress remains in situ, and the falling tune which our data exhibit can be interpreted as a bitonal pitch accent (H+L*) associated with the entire verb + pronoun unit. We have argued, within a derivational model, that the starred tone is associated with the rightmost metrically prominent syllable (the penultimate or antepenultimate syllable), and the leading tone with another metrically prominent syllable in the phrase (which happens to be that of the verb in most of the data we considered).

The postverbal pronoun in Sardinian can have a metrically prominent syllable to which a tone can associate because it is a weak pronoun and not a true clitic. For our purposes, the “weak pronoun” analysis provides a number of positive results; most importantly, the foot of the weak pronoun provides the metrically prominent position for the PA to associate with. Furthermore, the non-local alignment of the two tones provides empirical information that can help us better understand the connection between metrical structure and tonal alignment.

Our bitonal analysis provides crucial evidence of the need to incorporate a mapping relation between tonal description and intonational meaning in a more explanatory way. The non-local bitonality proposal increases the possible associations of tone to metrical structure and awaits further exploration on both empirical and theoretical grounds. Just as important is the documentation of this endangered Romance language whose complex and rich phonology holds many secrets yet to be discovered.
Notes

1 We standardize all transcriptions by indicating geminate consonants as “CC” even when
the original sources uses “C:”.

2 Wagner (1984 [1941]: 23) notes two accents: nàramì ‘tell me’.

3 Blasco-Ferrer (1986: 211, n. 36) reports that the final /i/ of the verb is not pronounced in
this form.

4 However, even in this context, some variation is present. Wagner (1984 [1941]: 25)
reports no stress shift in these phrases in the dialects of Nuoro and Macomer (nàramìlu)
and Désulo (nàramìddu). For Nuorese, Pittau (1972: 20-21) reports both non-shifted and
shifted stress with proparoxytonic verbs plus enclitics: [bòkina lu]=[bokiná lu] ‘call him’,
[bòkina mi lu]=[bokina mi lu] ‘call him for me’.

5 Post-tonic voiceless consonants lengthen more than pretonic voiceless ones, and
pretonic voiced consonants lengthen more than posttonic voiced ones (Canepari 1980).

6 See D’Imperio and Rosenthall (1999) for lengthening of vowels in stressed penults, but
not antepenults, in Italian.

7 See also Lai (2002) and Lai (2004).

8 See Turk and Dimitrova (2007) for a discussion of vowel lengthening in English,
comparing accented (i.e., phrasally stressed) vs unaccented words.

9 Floricic (2010) reports another intonational pattern (used with vocatives) in which the
pitch accent is associated with the pretonic syllable.

10 In some cases, the ‘new’ information in the answers may convey contrastiveness. For
example, a different prosody was found when the informant attempted to
correct/emphasize the clitic form of his/her initial answer. In these cases, the informant
employed the intonation for narrow (or contrastive) focus, which is known to differ from
broad focus prosody cross-linguistically (Ladd 1996). We exclude such cases in our
analysis.

11 The quality of the paragogic vowel in Figure 3 and elsewhere is identical to that of the
preceding vowel, i.e., it is a copy vowel: for example, /komporamid(d)azg/ ‘buy them (f.)
for me’ and /komporamid(d)oʒ/ ‘buy them (m.) for me’ (Contini 1987; Bolognesi 1998: 46).
Termed a “vocale paragogica mobile” (“mobile paragogic vowel”) by Pittau (1972: 16-19),
its use or avoidance in phrase-internal position varies greatly from dialect to
dialect and in different phonological contexts (Pittau 1972; Bolognesi 1998: 46).
Furthermore, it can be realized as a weak, nearly inaudible vowel (Bolognesi 1998: 46,
for Campidanese; Mameli 1998: 97-98, for central Logudorese), or as a very pronounced,
almost accented vowel. While ehenthesis in Sardinian is not the focus of this article, paragogic vowels are relevant to our study since they are involved in the determination of the tonal landing sites.

12 The acoustic specifications for the pitch analysis in Praat is as follows: 50 ms window length (broadband spectrogram), 10 ms time step, and voicing threshold ranging from 0.45 to 0.75. Data were recorded at a sampling rate of 44,000 Hz. Apparent errors, such as pitch doubling/halving, were manually corrected through pitch inspection.

13 The total number of syllables in (9b) is greater than or equal to the number of syllables in (9a) (four), so word-compression effects may or may not be relevant. However, even in cases where the total number of syllables is unquestionably different, the penultimate stressed vowel is always longer than the lexically stressed vowel. For example, the /a/ of [dzá_mm̥i-ddu], which is lexically stressed and associated with the H tone, is 60 ms, as opposed to the penultimate L-tone /a/ in (9b), which is 110.7 ms.

14 Although a H*+L bitonal pitch accent is also a possibility, we believe that this is the least likely description for the tune because it is unclear why the unstressed syllable would have a greater duration than the starred syllable.

15 We have described the discourse context as one of broad focus. This contextual meaning is adequately reflected in the description of intonation (Ladd 1983; Gussenhoven 1984; Pierrehumbert and Hirschberg 1990; Gussenhoven and Rietveld 1991).


17 Other morphosyntactic facts that cannot be handled in a purely phonological approach include the following. (i) The order of the clitics in a cluster affect stress shift: in all modern Romance varieties with the accusative-dative order of clitics, we find final stress with clitic clusters: Gascon: [porto-la-mú] ‘bring: it to me’; Menorcan Catalan: [du-la-má] ‘give it to me’. (ii) While many dialects exhibit variation with one enclitic (either stress stability, penultimate stress shift, or final stress shift), a single stress pattern is regularly attested with two enclitics: in the Sardinian dialect of Cabras, we find the following forms with enclitic /mi/: [píxa mi] ‘take me’, [pottá mi] ‘bring me’, [jívita mi] ‘comb me’, but there is always (ante)penultimate stress with two enclitics: [kompora mi da/za] ‘buy it/them for me’.

18 We do not address the question of whether or not two enclitics form a single PW or two separate PWs. For the purposes of this article, we assume the two weak pronouns cluster as a single PW.
The association of the H leading tone with the second PW and not with the first PW requires us to assume a constraint (e.g., LOCALITY) that ensures bitonal association is as local as possible. We will further explore this proposal in future studies.

References


Loporcaro, Michele. 2000. Stress stability under cliticization and the prosodic status of


