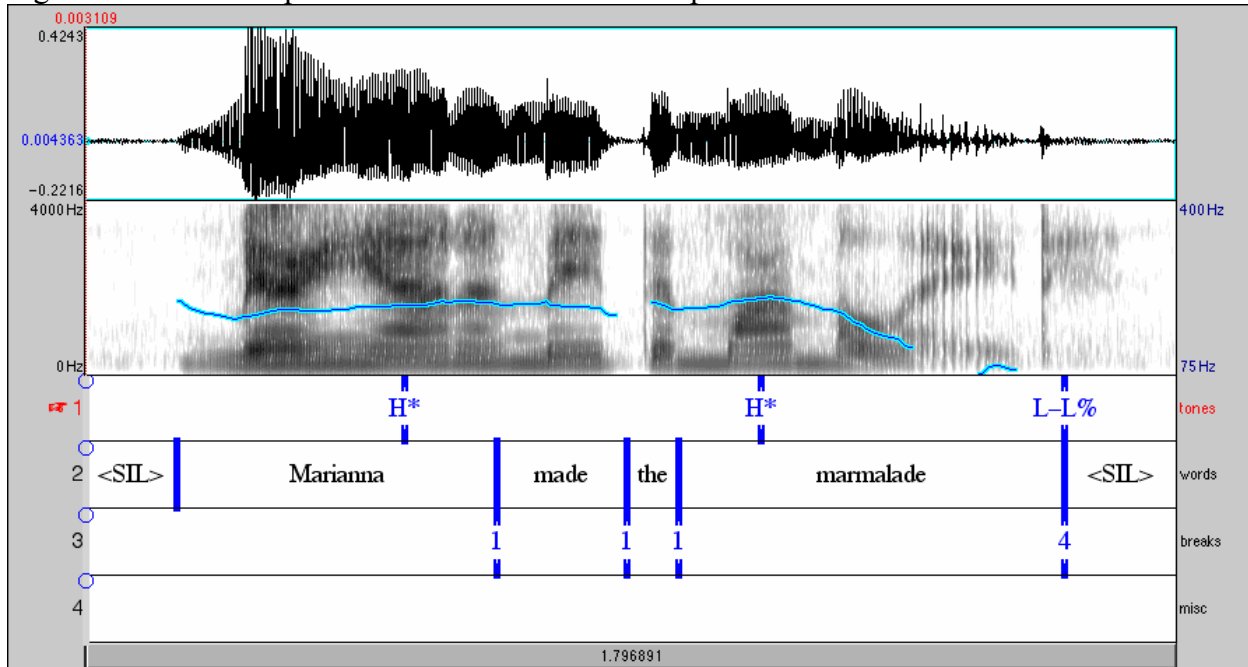


2.3 Two accents in an intonational phrase

In the English prosodic system, every intonational phrase contains at least one pitch accent (refs) and many intonational phrases contain more than one pitch accent. For example, the following utterance, <marmalade1>, contains two H*'s, followed by the boundary tone sequence L-L%.

Figure 2.3.1 Two H* pitch accents in an intonational phrase <marmalade1>



In this example, the speaker produced the sentence *Marianna made the marmalade* with a particular prosody. As we'll see later, this is just one of the many ways this string of words could be produced. But let's look in some detail at the prosody of this one; in particular, let's look at the prominence of the various syllables. Notice, for example, that two of the syllables sound more prominent than other syllables in the phrase: the *-an-* of *Marianna* and the *mar-* of *marmalade*. These are the pitch accented syllables, each associated with H*, like many that we have seen already. For this phrase, just as for the examples in Section 2.1, the phrase-final tonal markers are a Low phrase accent followed by a Low boundary tone, i.e. L-L%. You may have the intuition that the last of the two H* pitch accents is the strongest one; this final pitch accent in the intonational phrase is called the nuclear pitch accent (for historical reasons; see references to British intonation studies in the 1950s by Halliday and others).

There are other syllables that sound quite strong, but not as strong as the pitch accented syllables: e.g. the *Mar-* of *Marianna*, the word *made* and the *-lade* of *marmalade*. We can contrast several levels of prominence, from the weakest (i.e. reduced vowels like the *a-* of *about*, the *-a-* in the middle syllable of *marmalade* or the *-o-* in *mammoth*, written as a schwa in the International Phonetic Alphabet) to the intermediately strong full vowel that lacks any special phrase level prominence (e.g. non-pitch accented vowels like the *Mar-* of *Marianna*, mentioned above) to full vowels with phrase-level (pitch-accented) prominence, like the second *-a-* of *Marianna* and the first *-a-* of *marmalade*. This illustrates an important fact: not every full vowel that is marked in

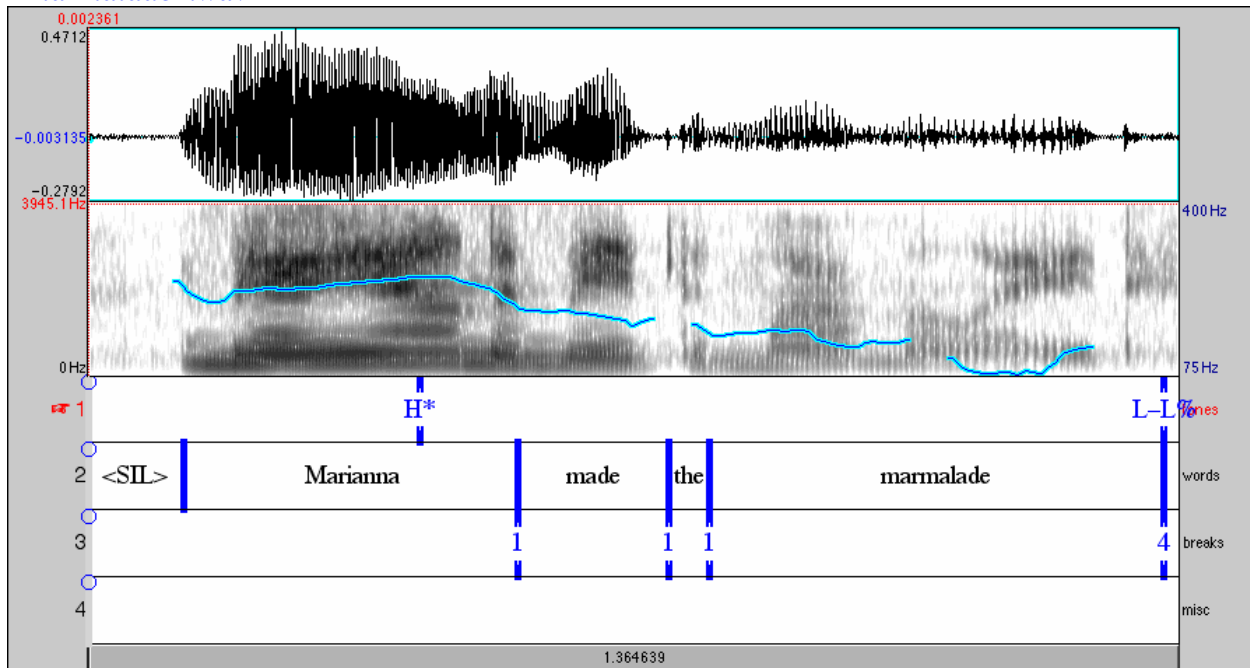
the lexicon as lexically stressed receives a pitch accent in every utterance, and full vowels that don't receive a pitch accent are less prominent, perceptually, than those that do. Also note that durational lengthening often accompanies pitch-accented syllables but can also occur at phrase boundaries. For example, the *-lade* of *marmalade*, in addition to being a full-vowel syllable, is also quite long because it is followed by the phrase boundary, but this extra duration is not associated with a pitch accent.

Finally, some of the syllables in this utterance are very weak: the *-ri-* and *-na* of *Marianna*, the word *the*, and the midword syllable *-ma-* of *marmalade*. These syllables have weak vowels, and sound much less prominent than either the pitch-accented or the non-accented full-vowel syllables.

This example illustrates the fact that the syllables of an utterance vary in their prominence, i.e. in how strong they sound compared to other syllables. We could rank the various degrees of syllable prominence, with pitch accented syllables highest, full-vowel lexically-stressed syllables lower, and reduced-vowel unstressed syllables lower still (Beckman and Edwards 1994). There is more to say about these issues, but we will save further discussion for a later section of the tutorial.

Compare the utterance (<marmalade1>) with <marmalade2> below, where only the syllable *-an-* in *Marianna* is prominent, or with the earlier examples in sections 2.1 and 2.2 that have only one pitch accent.

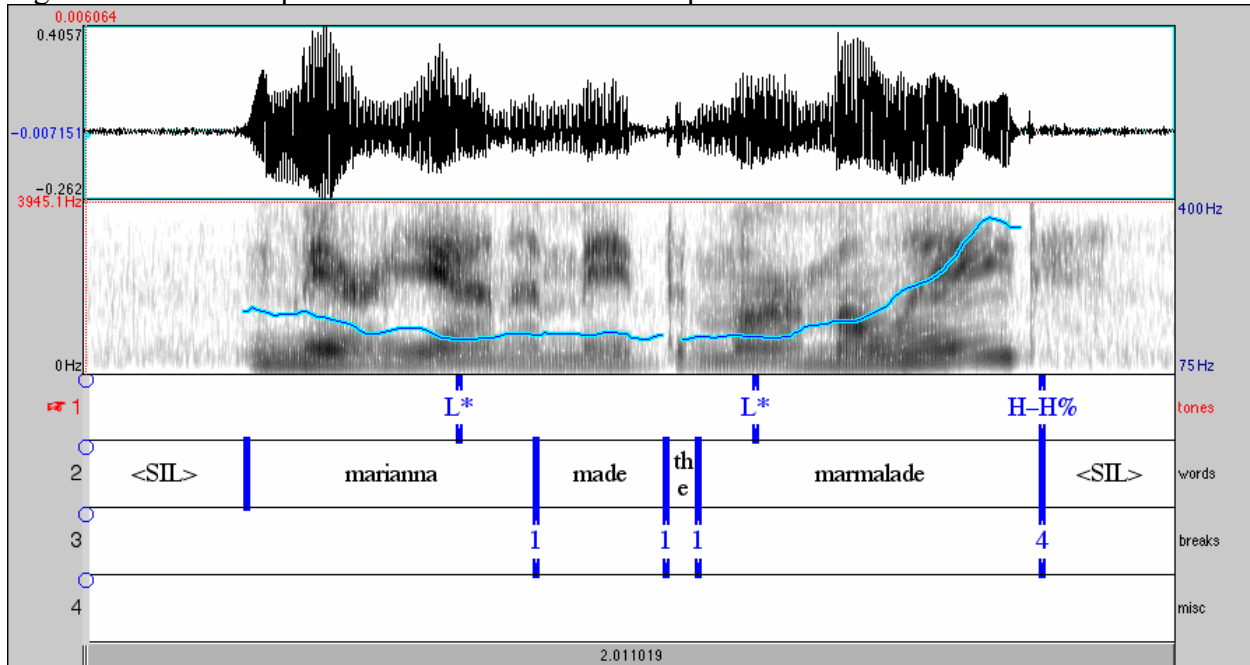
Figure 2.3.2 A single H* in an intonational phrase with the same words as Figure 2.3.1
<marmalade2.wav>



In the examples we have seen so far, an f0 peak or valley occurs on the accented syllable. This is often the case, but not always; we'll look at this question more closely later in the tutorial. But whether there is a sharp peak/valley and whether it is aligned with the accented syllable or not, the perception is that the syllable is more prominent than other syllables (or than it would be if it were not accented), and that this prominence is associated with an H* or a L* tonal event.

The next example (<marmalade3>) shows that more than one L* pitch accent can occur in a single intonational phrase, just as more than one H* can:

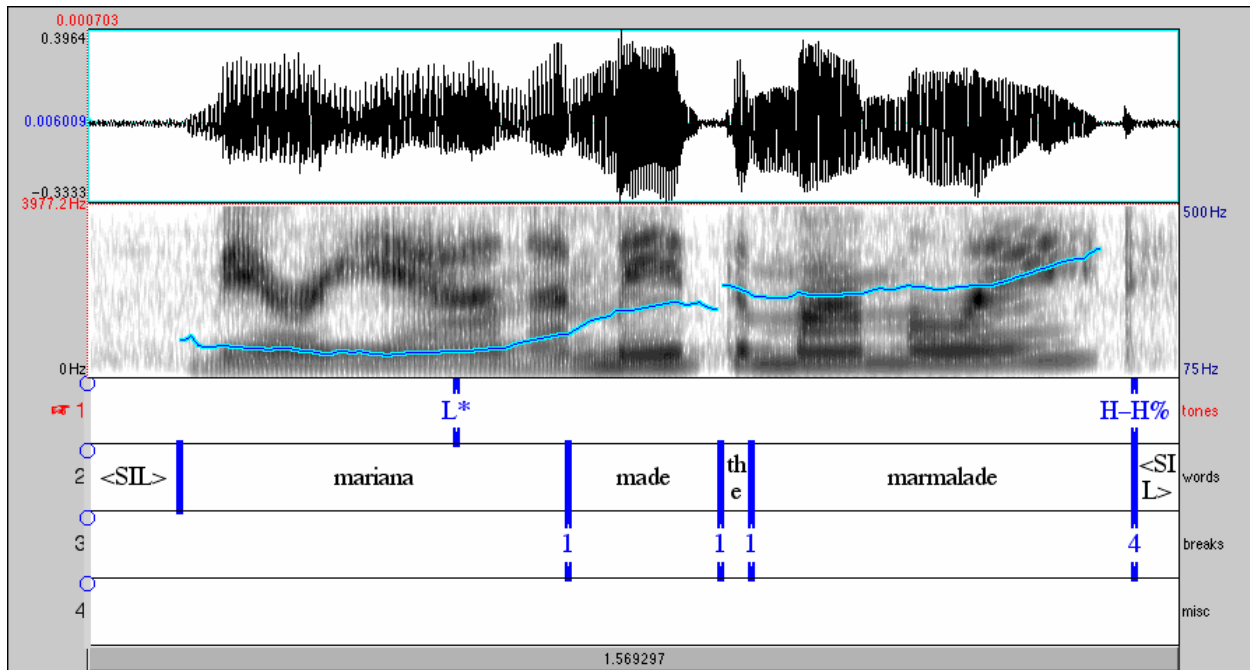
Figure 2.3.3 Two L* pitch accents in an intonational phrase <marmalade3.wav>



In this example, there are two prominent syllables: the *-an-* of *Marianna* and the *mar-* of *marmalade*, just as in the first example in 2.3. But in this case, both syllables carry low pitch accents and are labeled with L*. Because there are two L*'s in a row, the f0 appears to be somewhat flat. However, notice a slight rise between the two pitch accents and then a subsequent slight fall to the second L*. Later, we will give you suggestions on how to adjust the f0 display settings to more closely examine smaller f0 differences than those we've shown in these straightforward examples. This example in particular was chosen because it ends with H-H%: this provides a maximal contrast with the last L*, which makes it easier to recognize. The examples in sections 2.1 and 2.2 were chosen for similar, purely illustrative, reasons. But as we'll see later, H* and L* can occur with other final tones as well.

Compare the same sentence produced with a single L*, in <marmalade4>:

Figure 2.3.4 An example of an IP with a single L*. <marmalade4.wav>

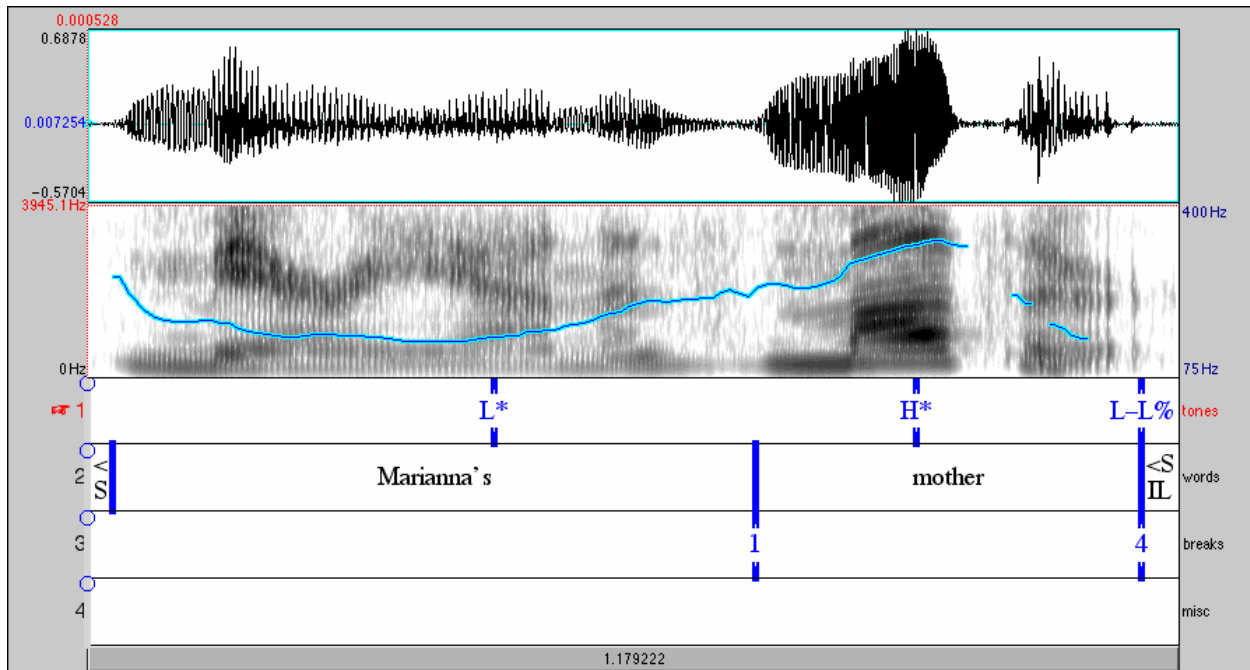


Here, there is only one pitch accented syllable; unlike in the previous example, the *mar-* in *marmalade* does not have an L*. The f₀ rises in response to the H-H% at the end of the intonational phrase.

Combinations of High and Low pitch accents can occur within the same Intonational Phrase as well. In the following example, <mother>, both *-an-* in *Marianna* and *moth-* in *mother* are prominent syllables. However, the tonal marker for *-an-* is Low, and therefore labeled with an L*, while the tonal marker on *moth-* is High and marked with an H*. The f₀ after the last accent indicates a Low phrase accent succeeded by a Low boundary tone (L-L%).

Figure 2.3.4 Example of an L* followed by an H* in a single IP

<mother.wav>



As more tonal markers are produced in an intonational phrase, the f_0 contour becomes more complex, because tonal elements can affect each other (see section 2.x+ for discussion). Another source of complexity is that the particular sound segments that make up the words of an utterance can sometimes have an effect on the f_0 contour. For example, some segments (like /p/, /t/, /k/, /s/, /f/) are unvoiced, which means that the vocal folds do not vibrate for some period of time, so the f_0 track is interrupted. You've seen this phenomenon in the example <afrika> in Section 2.2. Some segments are articulated in such a way that the vibration of the vocal folds is disturbed, so that rapid rises or falls may occur which are not part of the intended tone contour and would not occur if the same contour were produced on a different set of words. You may have noticed that in the *made the* portion on the examples *Marianna made the marmalade*, the f_0 disappears and seems to show local aberrations. A similar disturbance interrupts the f_0 track at the -'s and the -th- of *Marianna's mother*. Finally, some segments have a naturally higher f_0 than others (compare 'ee' with 'aw', 'ah' with 'm'). Learning to ToBI-label requires learning which aspects of the f_0 track are informative about the intonational contour that is intended by the speaker, and which aspects are due to other causes.

Introduced here:

Tonal patterns:

H* H* L-L%

L* L* H-H%

L* H* L-L%

Inventory introduced so far (no new elements were fully introduced in this section):

Tones:

H* high pitch accent

L* low pitch accent

L-L% low phrase accent, low boundary tone

H-H% high phrase accent, high boundary tone

Break indices:

0: word boundary erased

1: typical inter-word disjuncture within a phrase

4: end of an intonational phrase