

Intonational Phonology of Samoan

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Abstract

This paper outlines the beginnings of an intonational phonology of Samoan in the framework of the autosegmental-metrical (AM) model. We propose that Samoan is a head language with stress-driven pitch accent, with two prosodic units above the Word: Intonation Phrase (IP) and Intermediate Phrase (ip). Primary stress realization is typically with a rising (LH) pitch accent, with secondary stress being inconsistently marked with a H* pitch accent. The intonation of declarative sentences consists of a series of rises on content words, with f0 declination throughout the utterance, and low boundary tones. Interrogatives differ from declaratives primarily in that their nuclear pitch accent is realized as a !H* pitch accent, rather than rising.

1. Introduction

Samoan is an Austronesian language from the Independent State of Samoa and the (U.S.) Territory of American Samoa and is spoken by about 370,000 people (Gordon 2005). Although Samoan is well known for its complex morphosyntax and ergativity, very little is known about its intonation, beyond a brief description by Mosel and Hovdhaugen (1992).

To our knowledge, our study is the first systematic investigation of Samoan intonation. In our study, we investigated Samoan intonation in the Autosegmental-Metrical (AM) framework. (e.g. Pierrehumbert 1980, Beckman and Pierrehumbert 1986, Ladd 1996). The intonation of a variety of languages but very few Austronesian languages has been described in this framework (Jun 1995). Thus, our model for Samoan intonation adds to our knowledge about the typology of prosodic systems of the world's languages. Moreover, establishing an intonational model for Samoan allows us to study the interface between rich syntactic phenomena in Samoan and prosody such as the prosodic reflexes of ergativity.

In the rest of this paper, we describe the methods used in Section 2, provide an overview of our results in comparison to Mosel and Hovdhaugen 1992 in Section 3, and propose the tonal inventory and prosodic structure of Samoan in Section 4.

2. Methods

The data for this study has been elicited from one male Samoan speaker (JF) from Apia who is 19. Elicitations took place through 13 weeks of fieldwork (November 2007-March 2008), one to two hours a week, in a soundbooth in the UCLA phonetics lab. The consultant wore a head-mounted microphone and utterances were recorded directly to a computer using *PCQuirer* (Scicon R&D) at 22kHz. Except where specifically noted, data are from the *tautala lelei* formal register of speech. Target sentences were extracted from the recordings and segmented and labeled in Praat 5.0.12 (Boersma and Weenink 2008). Mora and word boundaries and glosses were labeled on three tiers and tones were labeled on a tone tier using ToBI annotations (Beckman and Hirschberg 1994).

3. Comparison to Mosel and Hovdhaugen 1992

Mosel and Hovdhaugen (1992) note that Samoan intonation is “intimately linked to the accent pattern of the utterance” (p. 40), i.e. that it is stress-driven. They propose that the basic pattern of declaratives and interrogatives is different, cf. Fig. 1. Pitch accents are optional except for the final pitch accent in declaratives, which is realized as tone raising on the penultimate syllable. This obligatory final pitch accent is absent in interrogatives, where “usually the tone is pretty low on the two to three last syllables” (p. 41).

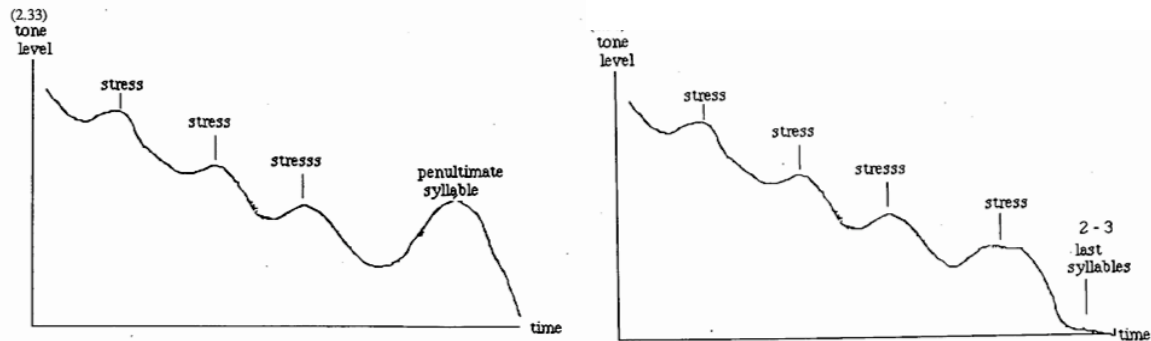


Figure 1. Sample intonational contours from Mosel and Hovdhaugen 1992: 41-42. (left) typical declarative, (right) typical interrogative.

Like Mosel and Hovdhaugen, we propose that Samoan intonation is stress-driven: Samoan is a pitch accent language. Among the world’s languages, this categorizes Samoan as a head language with English, German, Spanish, etc. For these languages, prominence at the post-lexical level is marked cumulatively on the head of a prosodic unit, in contrast to prominence realization in edge languages, where the edge of a prosodic unit is marked demarcatively, e.g. Korean, French, Japanese (Jun 1995).

Figures 2a and 2b illustrate the stress-driven nature of Samoan intonation. Comparing the final words in this near-minimal pair, we see that the nuclear pitch accent falls on the mora that receives primary stress. In Fig. 2a, the final word is *manu-lele* ‘bird’, which receives penultimate stress, but in Fig. 2b, the final word is *taiamita* ‘diameter’, a loanword which uncharacteristically receives antepenultimate stress. Thus, in Fig. 2a, the nuclear pitch accent occurs on the penultimate mora, while in Fig. 2b, the nuclear pitch accent occurs on the antepenultimate mora.

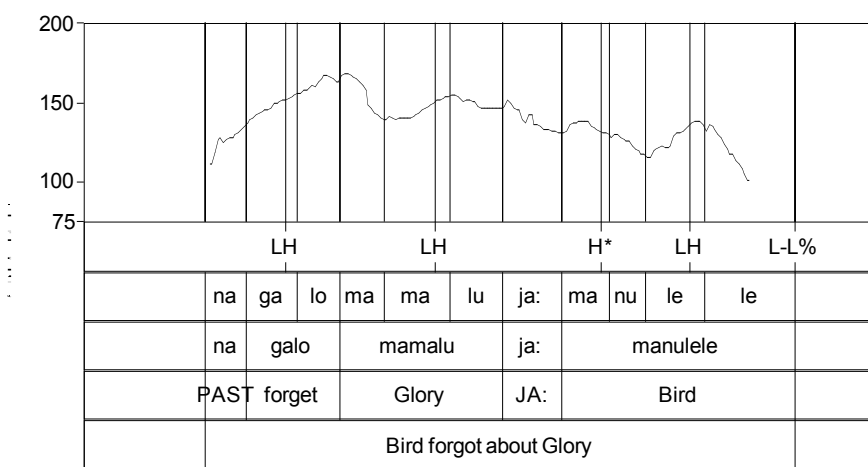


Figure 2a. Intonational contour showing nuclear pitch accent on penultimate mora of final word manulele 'Bird', the location of primary stress.

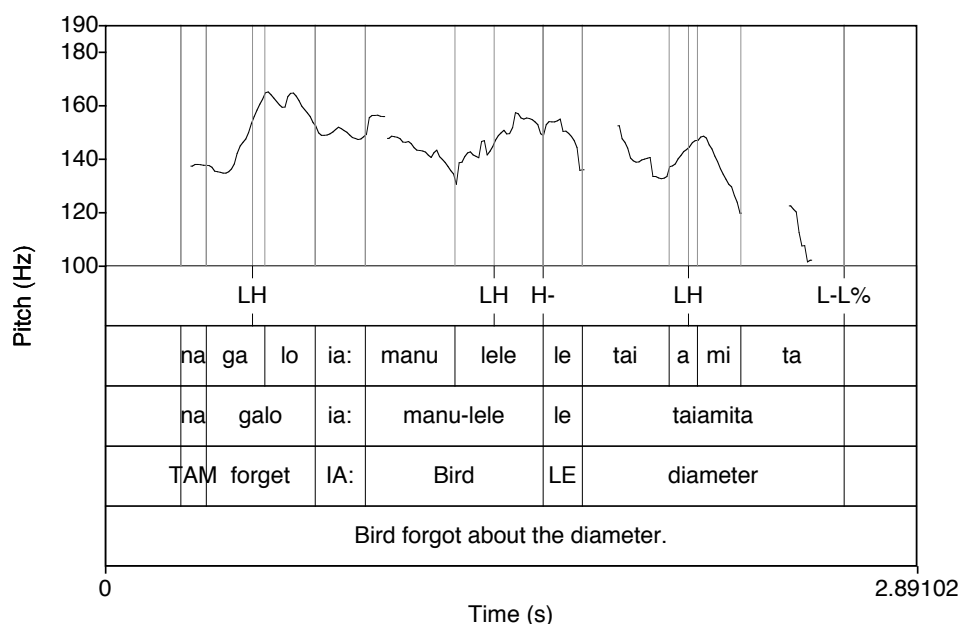


Figure 2b. Intonational contour showing nuclear pitch accent on antepenultimate mora of final word taiamita 'diameter', the location of primary stress.

The domain of pitch accent realization for Mosel and Hovdhaugen is the syllable. Recent work, however, suggests that stress is assigned in Samoan by building moraic trochees from the right edge of a word, and long vowels are bimoraic (Zuraw et al. 2008 and refs. therein). Thus, primary stress falls on the final vowel if it is long and otherwise on the penult.

Based on this, we propose that the domain of pitch accent realization is not the syllable, but the mora. Figure 3 compares the minimal pair *lele* 'fly', footed as (LL), which receives penultimate stress (Figure 3a), and *lelei* 'good', footed as L(H), which receives final stress

(Figure 3b). If intonation is sensitive to the syllabic level, we would expect to find pitch accent assignment to the syllable 'le' in both cases, which we do not. Instead, these two words are assigned pitch accents aligning to the penultimate mora and final foot, respectively.

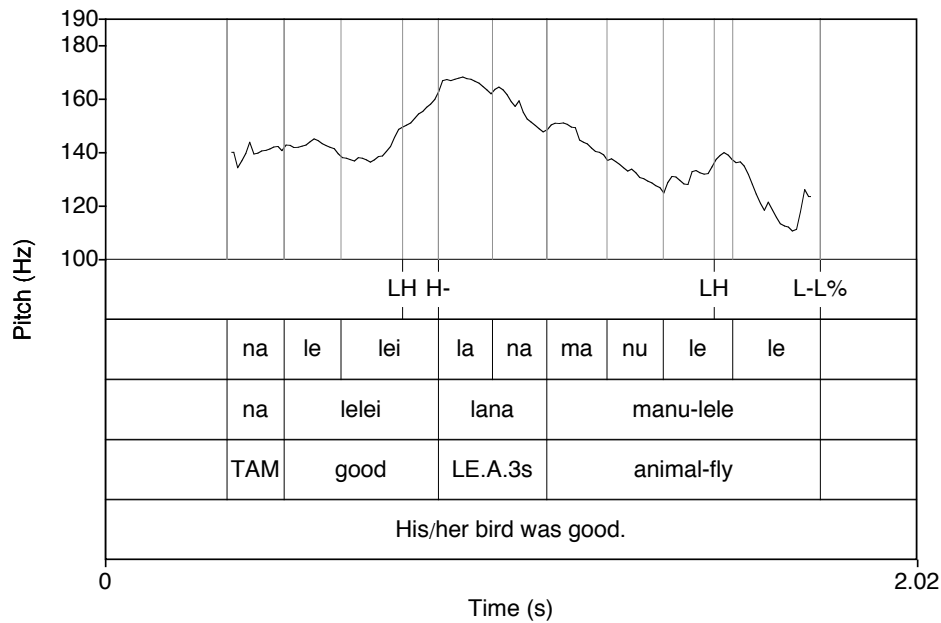


Figure 3a. Pitch accent on lele, footed as (LL), aligns to penultimate mora, which receives primary stress.

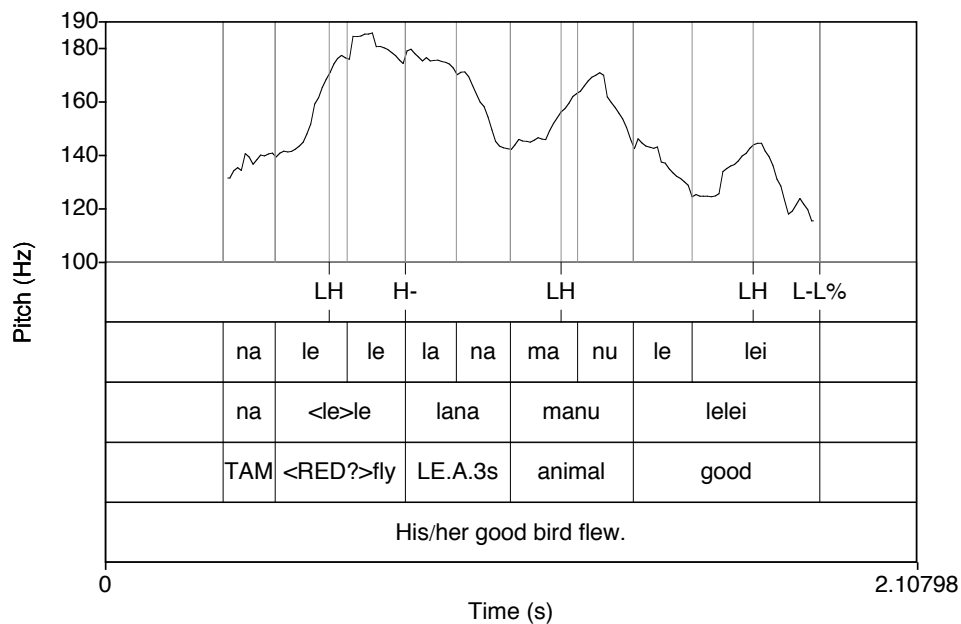


Figure 3b. Pitch accent on lelei, footed as L(H), aligns to final foot, which receives primary stress.

Based on both comparisons in Figures 2 and 3, we also propose, contra Mosel and Hovdhaugen, that nuclear pitch accent does not appear on a declarative-penultimate syllable—a positional assignment rule—but on the mora receiving primary stress in the final word. Finally, also in contrast to Mosel and Hovdhaugen, we propose that the nuclear pitch accent is not absent in questions, nor is the tonal contour at the end of questions random (cf. Section 4): rather, interrogatives receive a !H* nuclear pitch accent in contrast to a LH nuclear pitch accent in declaratives.

We summarize our proposal for Samoan intonational phonology in comparison to Mosel and Hovdhaugen's below in Table 1.

Table 1. Comparison of proposals for Samoan intonational phonology

	Mosel and Hovdhaugen	Us
prominence realization	head-marking/stress-driven	✓
domain of pitch accent realization	syllable	mora
nuclear pitch accent <ul style="list-style-type: none"> - regularity of appearance - location 	<ul style="list-style-type: none"> - obligatory in declaratives only - declarative-penultimate syllable 	<ul style="list-style-type: none"> - obligatory in all utterances - assigned on mora receiving primary stress in final word
optionality of pitch accent assignment	prenuclear pitch accents are not obligatory	pitch accents are typically realized on all content words
pitch accent type	tone raising	✓ LH, but also H*, !H*
basic interrogatives <ul style="list-style-type: none"> - nuclear pitch accent 	absent	present, but different type than in declaratives
<ul style="list-style-type: none"> - utterance-final contour 	random: “usually the tone is pretty low on the two to three last syllables” (p. 42)	predictable: !H* on final word linked to mora with primary stress

4. Proposal of tonal inventory and prosodic structure of Samoan

In Samoan, content words consistently receive a pitch accent, most typically a rising tone on the mora receiving primary stress. The low (L) of this rising tone is aligned with the onset of the stressed mora. The realization of the high peak is slightly more variable. It can be realized within the nucleus of the stressed mora, at the edge of the stressed mora, or late, in the onset of the following mora. Variation in the extent of the high may be due to the presence of boundary tones (H-) or pitch accent on secondary stress. Further work is needed to address this.

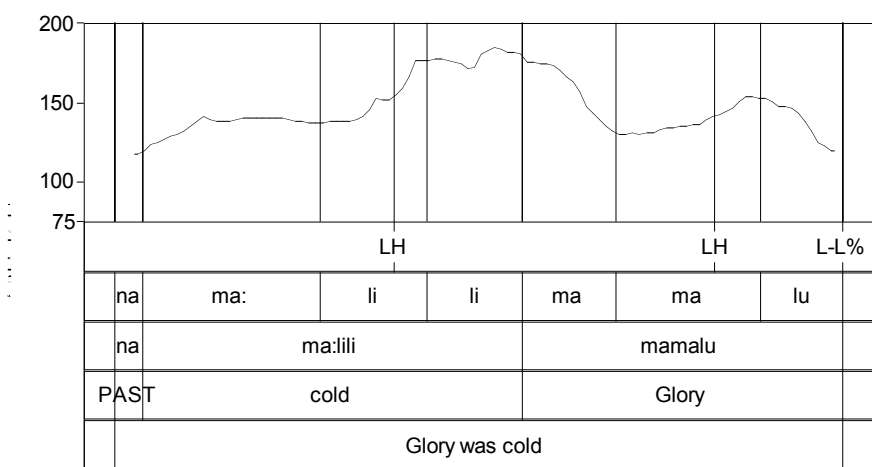


Figure 4a. Pitch accent on *ma:lili* aligns to penultimate mora, which receives primary stress. Only one (rising) pitch accent on *mamalu*, on the mora receiving primary stress (second *ma*).

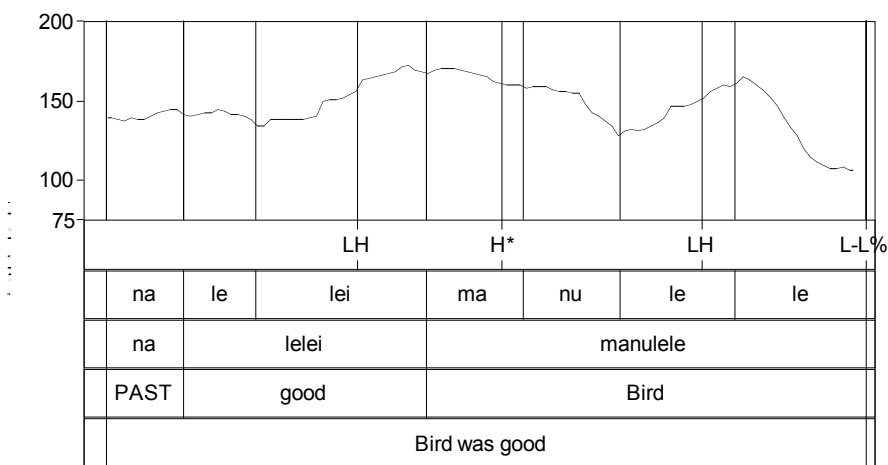


Figure 4b. Pitch accent on *lelei* aligns to final mora, which receives primary stress. In contrast to *Mamalu* in figure 4a, *Manulele* receives both a rising pitch accent on the mora with primary stress (*le*), and an *H** pitch accent on the mora with secondary stress (*ma*).

Figure 4 also illustrates the tonal realization of lexical secondary stress in Samoan, which is a *H** pitch accent. ‘*Mamalu*’ in 4a is too short to receive a secondary stress, and we note that following the delayed high peak of the rising tone on ‘*ma:lili*’, there is direct interpolation to the low of the rising tone on ‘*Mamalu*’. In 4b, by contrast, the high of the verb ‘*lelei*’ is sustained in a high plateau, with interpolation beginning only in the mora prior to the nuclear pitch accent. By

assigning a H* pitch accent to the secondarily stressed mora ‘*Manulele*’, we are able to explain both the high plateau, and the ‘delayed’ interpolation to the low of the nuclear pitch accent.¹

The final pitch accent we propose in the tonal inventory of Samoan is the !H* pitch accent, which appears to be crucial in marking interrogative utterances (Figure 5).

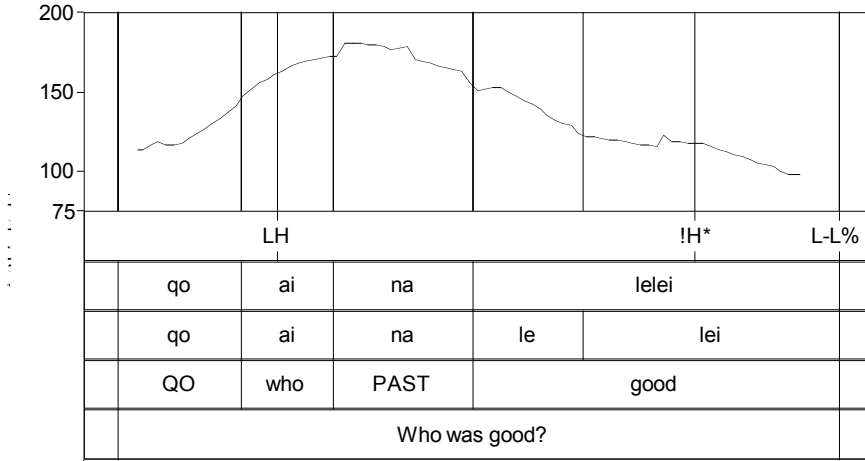


Figure 5. The nuclear pitch accent on *lelei*, unlike in declarative utterances, is realized as a !H*. This is true for both *Wh*-questions (above) and *Yes-No* questions (not shown).

Samoan has two prosodic units above the word level: the Intermediate Phrase (*ip*) and the Intonation Phrase (*IP*). Although the *IP* boundary is marked by both lengthening of the final mora and pitch reset, our data thus far do not provide clear evidence for or against either at the *ip* boundary. A schematic representation of the prosodic structure and tone affiliation of Samoan is shown in Figure 6.

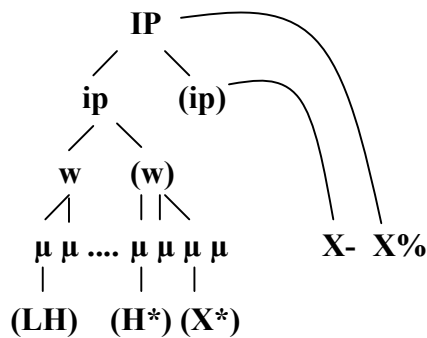


Figure 6. Samoan prosodic structure and tone affiliation.

IP: Intonation Phrase

ip: Intermediate Phrase

w: word

μ: mora

*X** = LH, !H*

X- = H-, L-

X% = H%, L%

¹ Secondary stress does not appear to be consistently realized by tone in Samoan fluent speech, although it is when words are pronounced in isolation. In numerous cases, we find instances of a word such as ‘*manulele*’ which does not receive a H* on ‘*ma*’, the mora which receives lexical secondary stress.

Evidence for the Intermediate Phrase in Samoan comes from instances in which the f_0 contour is unexpectedly high at sentence medial junctures (Figure 7)². In these cases, the high is seemingly not tied to the stressed mora of a content word, and therefore does not appear to be a pitch accent, but rather some sort of boundary tone. The lack of lengthening at these junctures, however, suggests that these boundary tones are phrasal accents rather than IP boundary tones.

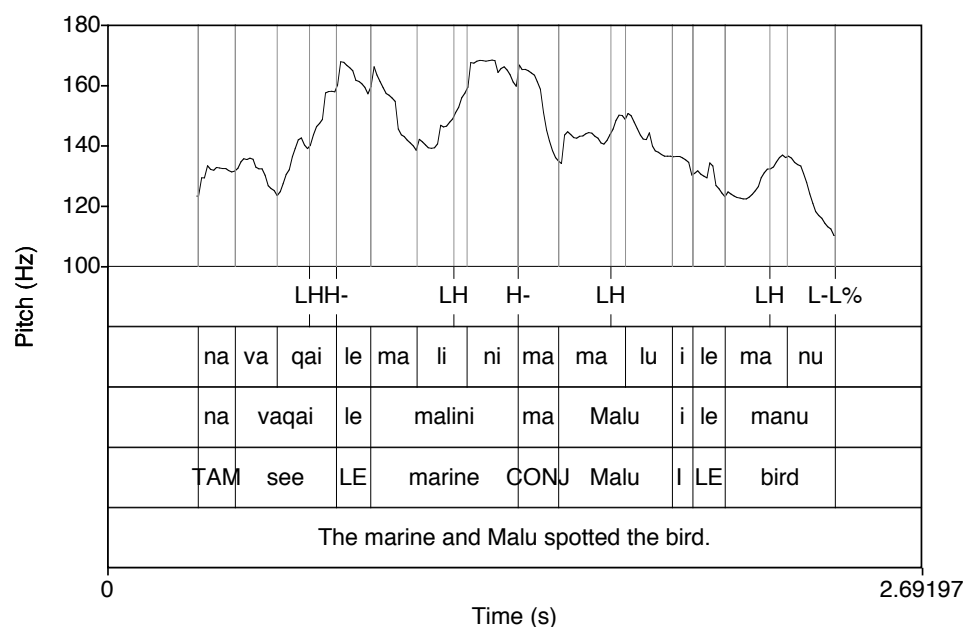


Figure 7. Example of H- boundary following first conjunct malini.

The Intonation Phrase (IP) of Samoan appears to have two possible boundary tones: L% and H%. Thus far, our findings suggest that the L% boundary tone is the more basic or unmarked boundary tone, occurring at the IP boundaries of both regular and clefted declarative sentences (Figure 8a), and both yes-no and wh-questions. In contrast, the H% boundary tone has only been noted in a particular pragmatic context which we refer to as the 'confirmation contour' (Figure 8b). In this situation, a speaker uses either the form of an echo-question or a regular question (either Yes-No or Wh) to ask for confirmation of an event or to indicate that he did not hear part of another speaker's utterance.

² To date, we have not found evidence of a sentence medial low phrasal accent (L-).

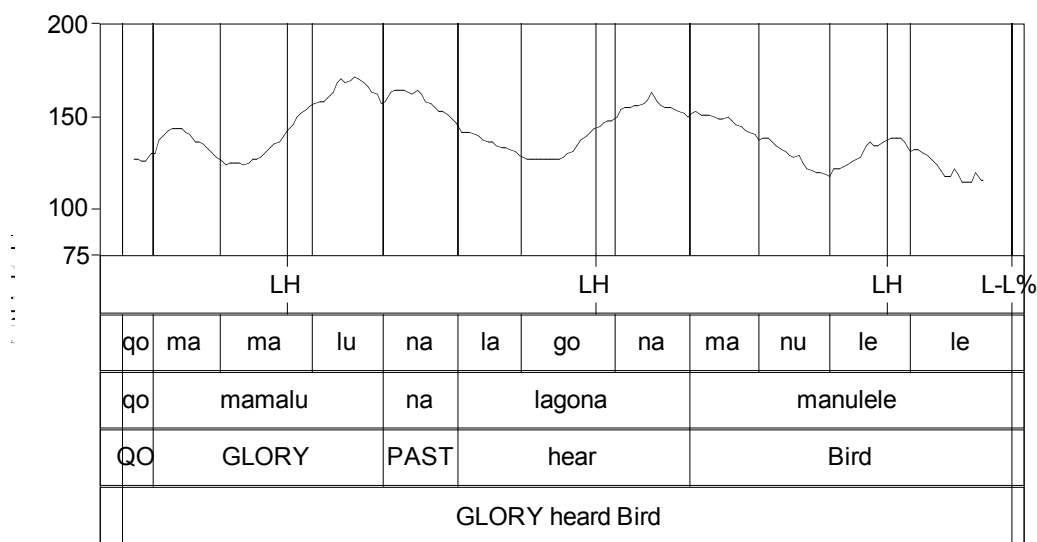


Figure 8a. Following the rising nuclear pitch accent, the L-L% boundary tone causes tonal crowding, stopping the High of the preceding nuclear pitch accent to be realized within the stressed mora, rather than late.

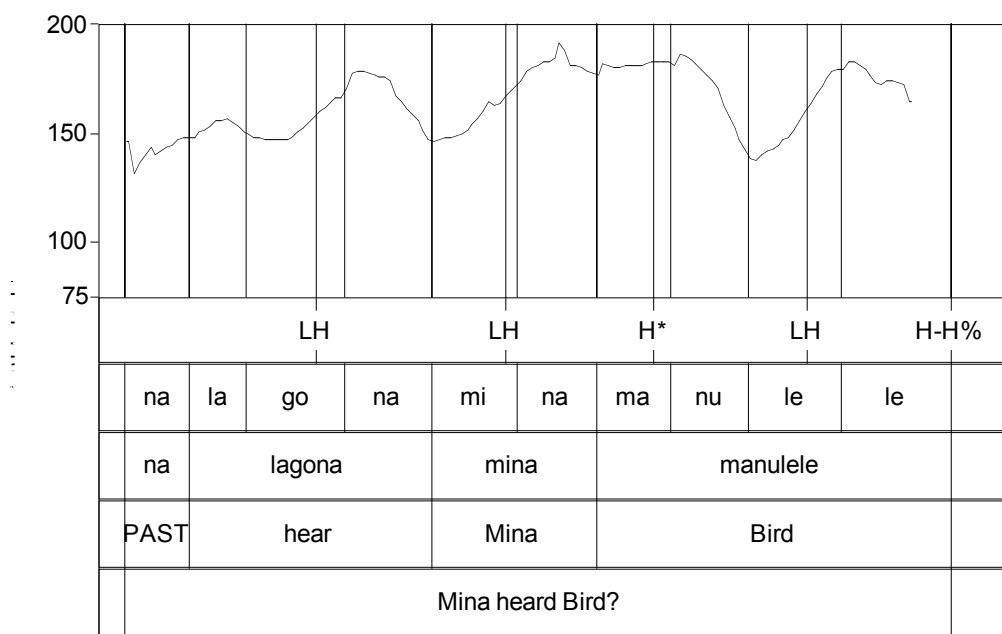


Figure 8b. This speaker of this utterance has not heard the previous speaker clearly, and is asking for confirmation that what he is stating is in fact what was said. In contrast to the regular declarative or yes-no version of this utterance, the sentence rises at the end, due to the H-H% boundary tone.

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