The sound of ergativity: morphosyntax-prosody mapping in Samoan*

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1. Introduction

Cross-linguistically, in ergative systems, the absolutive case is often thought of as the unmarked (or least marked) case (Dixon 1994, Manning 1996). Samoan, an ergative Polynesian language from Samoa and America Samoa with default VSO word order and *without lexically contrastive tone*, has never been considered an exception to this rule of thumb (Chung 1978, Mosel and Hovdhaugen 1992). However, in this paper, we present evidence that in fact, ergative case-marking patterns have tonal correlates in Samoan: surprisingly, the absolutive case is tonally marked: we hypothesize that *in Samoan, a high boundary tone (H-) occurs at the left edge of absolutive arguments*.

Thus, in the sentences below exhibiting ergative-absolutive (1), absolutive-oblique (2), and ergative-absolutive-oblique case-marking patterns (3),[1] we contend that not only the prepositional ergative case marker *e* and oblique case marker *i*, but also the absolutive case marker *H-* is present.

(1) na lalaga e le malini **H-** le mamanu. (erg-abs)
past weave erg det.sg marine **abs** det.sg design
'The marine weaved the mamanu.'

(2) na manogi **H-** le meleni (i le malini). (abs-obl)
past smell **abs** det.sg melon obl det.sg marine
'The melon smelled to the marine.'

(3) na 'ave e le malini **H-** le meleni i le manini. (erg-abs-obl)
past give erg det.sg marine **abs** det.sg melon obl det.sg fish
'The marine gave the melon to the fish.'

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[1] We use Samoan orthography in the examples: ' = [ʔ], g = [ŋ], and $\bar{V}$ = [V:].

This finding came out of data from our fieldwork to describe the intonational system of Samoan.[2] The distribution of the absolutive H- that is the focus of this paper defied prosodic explanation but had a stunningly simple interpretation when we turned to morphosyntax.

We further hypothesize from our data that the H- boundary tone at the left edge of absolutive case is a *lexical tonal case marker*, although we give alternative syntax-prosody mapping possibilities in §4. The strongest rationale for this is that the absolutive H- shows insensitivity to prosodic conditioning and patterns like the other case markers in Samoan in not being realized under *pro*-drop or extraction. Yet, the absolutive H- does display some characteristics of a postlexical tone marking the edge of a prosodic phrase: it blocks F0 downtrend and is realized on the last mora of the word preceding the absolutive argument, not on the argument itself.[3] Thus, current evidence suggests the absolutive H- is a boundary tone that is not prosodically conditioned, challenging the assumption that boundary tones are tied to the prosodic hierarchy.

The rest of the paper is organized as follows: we provide a brief overview of Samoan prosody (§2), present evidence that an H- is left-aligned to absolutive arguments (§3), and then discuss the implications of this apparent absolutive tonal case marking (§4).

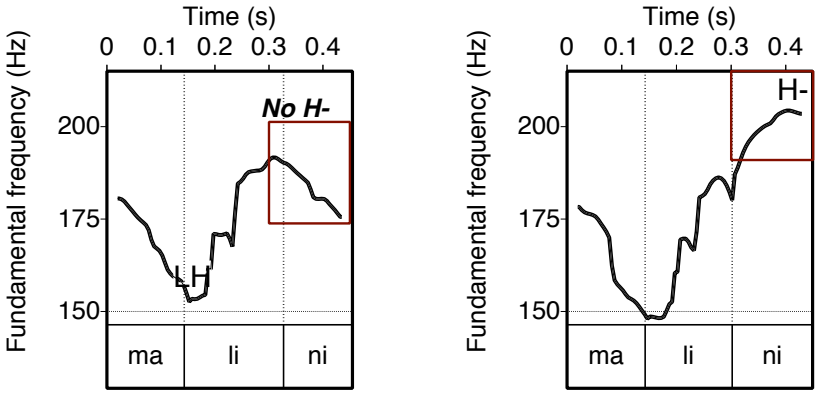
2. A brief overview of Samoan prosody

In order to frame the H- associated with absolutive case in the context of the prosodic system of Samoan, we provide a brief overview of Samoan prosody in the formal register, *tautala lelei*. Samoan is an intonational language without lexically contrastive tone. Stress is quantity-sensitive, with long vowels and diphthongs counting as heavy, and the basic primary stress pattern aligns moraic trochees at the right edge (Zuraw et al. 2008), e.g. *ma(líni)* 'marine', *(mànu)(má:)* 'dove'. Describing the intonational system in terms of the autosegmental-metrical framework (Ladd 1996, i.a.), the default pitch accent that occurs in each content word is a LH rise over the mora receiving primary stress (Orfitelli and Yu 2008), and declaratives end in utterance final low tones. High boundary tones are also part of the intonational inventory and occur between the first conjunct and the conjunction in coordination and at the domain edge that Koopman (to appear) describes as being between the left periphery and the outer T domain.

Fig. 1 shows how a high boundary tone H- is realized in the F0 contour; in Fig. 1a, a typical LH rise occurs over *lí*, the mora receiving primary stress in *malini*, and then falls in interpolation to the LH over the following word, but in Fig. 1b, the LH rise is followed by an H-, and this high boundary tone causes pitch to continue to rise to a high over the final mora in *malini*. *Malini* realized with a H- could be a conjunct, followed by the conjunction *ma* 'and', or the last word in the left periphery in SVO cleft-like constructions (17), or a non-absolutive argument followed by an absolutive argument (1).

[2]We recorded sentences from a 21 year old native speaker of Samoan from Apia in a sound booth at UCLA weekly from Fall 2008 to Fall 2009, using a head-mounted microphone; we recorded directly to computer using PCQuirer (Scicon R&D) at 22kHz and segmented and intonationally labeled utterances in Praat. All data described here were elicited in the formal register, *tautala lelei*.

[3]Another case where a H tone is phonetically realized at the end of the word preceding the object to be marked is the Igbo H tone marking subordinate clauses as described in Goldsmith (1976): 82.



(a) LH rise (b) LH rise followed by H-

Figure 1: The realization of H- on *ma(líni)*. Fig. 1a: When the H- is not present, after the LH rise over the penultimate mora receiving primary stress, F0 falls in interpolation to the next LH rise. Fig. 1b: When the H- is present, F0 continues to rise over the final mora.

3. A high boundary tone precedes absolutive case

In order to establish that a high boundary tone precedes absolutive case, we considered the following data sets: (i) a minimal set contrasting case-marking patterns (erg-abs, abs-obl) and word order in sentences with long arguments and (ii) a set of sentences in which the length of the predicate was manipulated (§3.1), (iii) a set of ditransitive sentences (erg-abs-obl case-marking) with word order permuted (§3.2), and (iv) minimal pairs for *pro*-drop and extraction of ergative vs. absolutive arguments (§3.3).

3.1 The H- and case marking patterns in long sentences

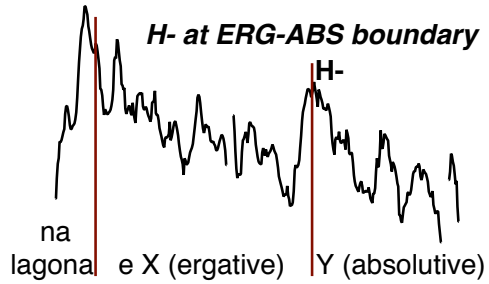
In any theory of intonation that assumes linearity of tonal structure, e.g., autosegmental-metrical theory as described in Ladd (1996), tonal structure consists of a string of local intonational events associated to points in the segmental string. This means that intonational events will enjoy greater separation in longer segmental strings, avoiding tonal crowding present in short segmental strings, cf. Bruce (1977). Thus, to maximize the visibility of boundary tones, we examined sentences with very long arguments of the form given in (4), elicited under broad focus (out of the blue).

(4) na Verb [X] [Y]

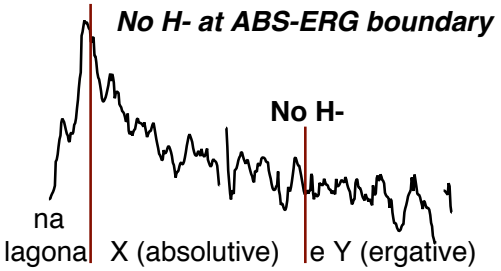
X = le maile a le milionea leaga mai Jerusalema i luga o le
det.sg dog of det.sg millionaire bad prep Jerusalem obl on of det.sg
mauga
mountain
'the dog of the bad millionaire from Jerusalem on the mountain'

Y = le manu-lele a le malini mamalu mai Apia
det.sg animaly-fly of det.sg marine glorified prep Apia
'the bird of the glorified marine from Apia'

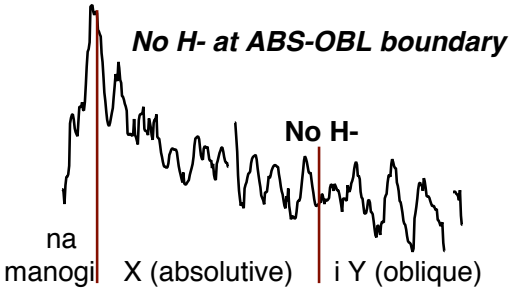
Keeping the surface form (4) constant, we varied the verb between *lagona* 'hear' and *manogi* 'smell' to produce ergative-absolutive and absolutive-oblique case-marking patterns, respectively, like those in (1) and (2). We also varied the word order, thus creating the fully crossed set of CASE-MARKING PATTERN (erg-abs, abs-obl) x WORD ORDER (VSO, VOS), from which we observed the following (Fig. 2): the H- was clearly present (over the last mora in *mauga*, the last word in the first argument X) between the two arguments when the absolutive argument was the second argument (Y), but not when the absolutive argument was the first argument (X).



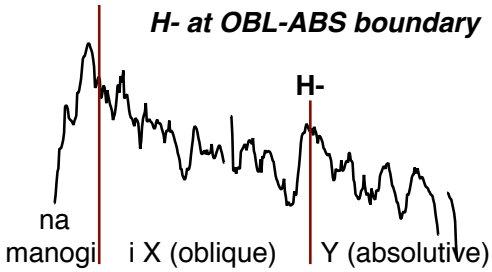
(a) erg-abs, VSO: na lagona e X **H-** Y



(b) erg-abs, VOS: na lagona X e Y



(c) abs-obl, VSO: na manogi X i Y



(d) abs-obl, VOS: na manogi i X **H-** Y

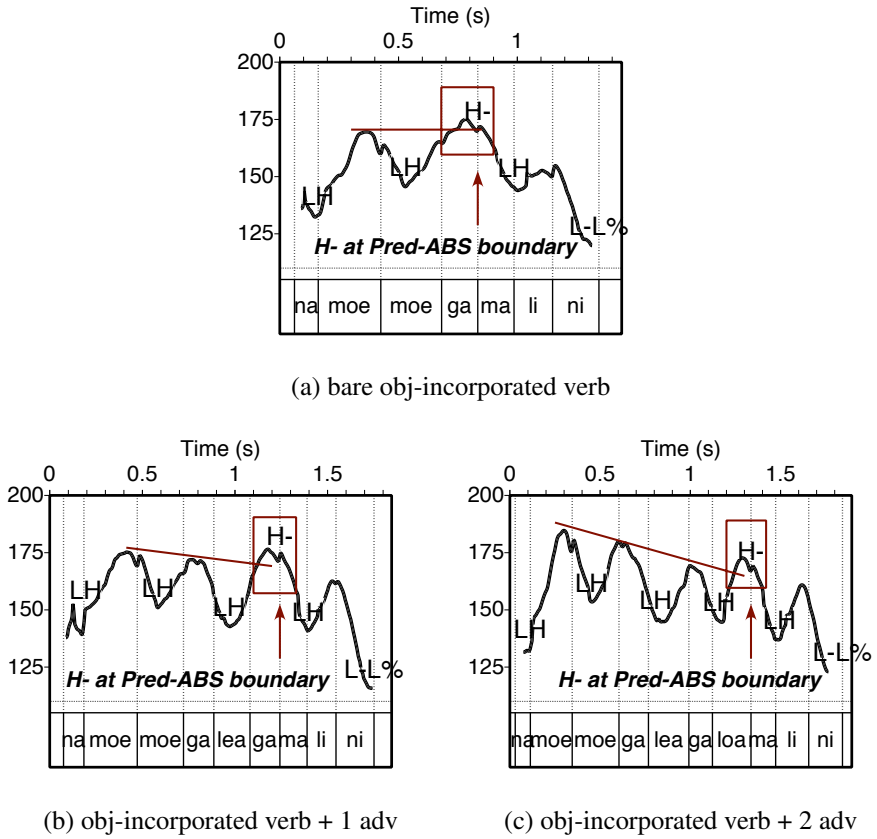
Figure 2: F0 contours showing that the presence of H- is conditioned by the interaction of case-marking and word order; X and Y defined in (4) above. For all figures—x-axis: time (0-≈7s), y-axis: F0 (90-200 Hz).

For these long sentences, the H- between the two arguments was especially apparent because it induced pitch reset and broke the F0 downtrend that occurred over the long preceding string of segmental material. However, examining the boundary between the predicate and the first argument for the presence of H- was hampered by the short stretch of segmental material in the predicate, just the bare verb. Thus, we augmented our data set of sentences containing long arguments with sentences where we manipulated predicate length: we took an object-incorporated verb *moe-moega* 'bed-sleep' ((5), Fig. 3a) and stacked on one adverb ((6), Fig. 3b) and then two adverbs ((7), Fig. 3c).

(5) na moe-moega] **H-** malini.
past sleep-bed **abs** marine
'The marines bed-slept.'

(6) na moe-moega leaga] **H-** malini.
past sleep-bed bad **abs** marine
'The marines bed-slept badly.'

(7) na moe-moega leaga loa] **H-** malini.
past sleep-bed bad then **abs** marine
'And then the marines bed-slept badly.'



(a) bare obj-incorporated verb

(b) obj-incorporated verb + 1 adv

(c) obj-incorporated verb + 2 adv

Figure 3: F0 contours for lengthened predicates. The H- tracks the boundary between the predicate and following absolutive, breaking the downtrend in preceding LH peaks (marked with line) when it occurs.

We found that a high boundary tone tracked the boundary between the right edge of the predicate and the left edge of the absolutive argument: up to the right edge of the predicate, the peaks of successive LHs followed a downtrend, but the LH peak followed by an H- over the last word in the predicate was always at least as high as the preceding peak.

Consistent with this data, we also found that an H- occurred between the end of the predicate and (absolutive) argument for an object-incorporated verb derived from a verb

taking erg-abs case-marking patterns, *gaoi-maile* 'dog-steal' (8) but that no H- occurred between the end of the predicate and (ergative) argument for the verb *gaoi* alone (9).

(8) na gaoi-maile leaga] **H-** le malini.
past steal-dog bad **abs** marine
'The marine dog-stole badly.'

(9) na gaoi leaga] e maile **H-** le manini.
past steal bad erg dog **abs** fish
'The dogs stole the fish badly.'

In summary, data from sentences with long arguments and sentences with long predicates revealed a distribution of high boundary tones consistent with the generalization that a high boundary tone occurs at the left edge of absolutive arguments.

3.2 Ditransitives: ergative-absolutive-oblique case marking patterns

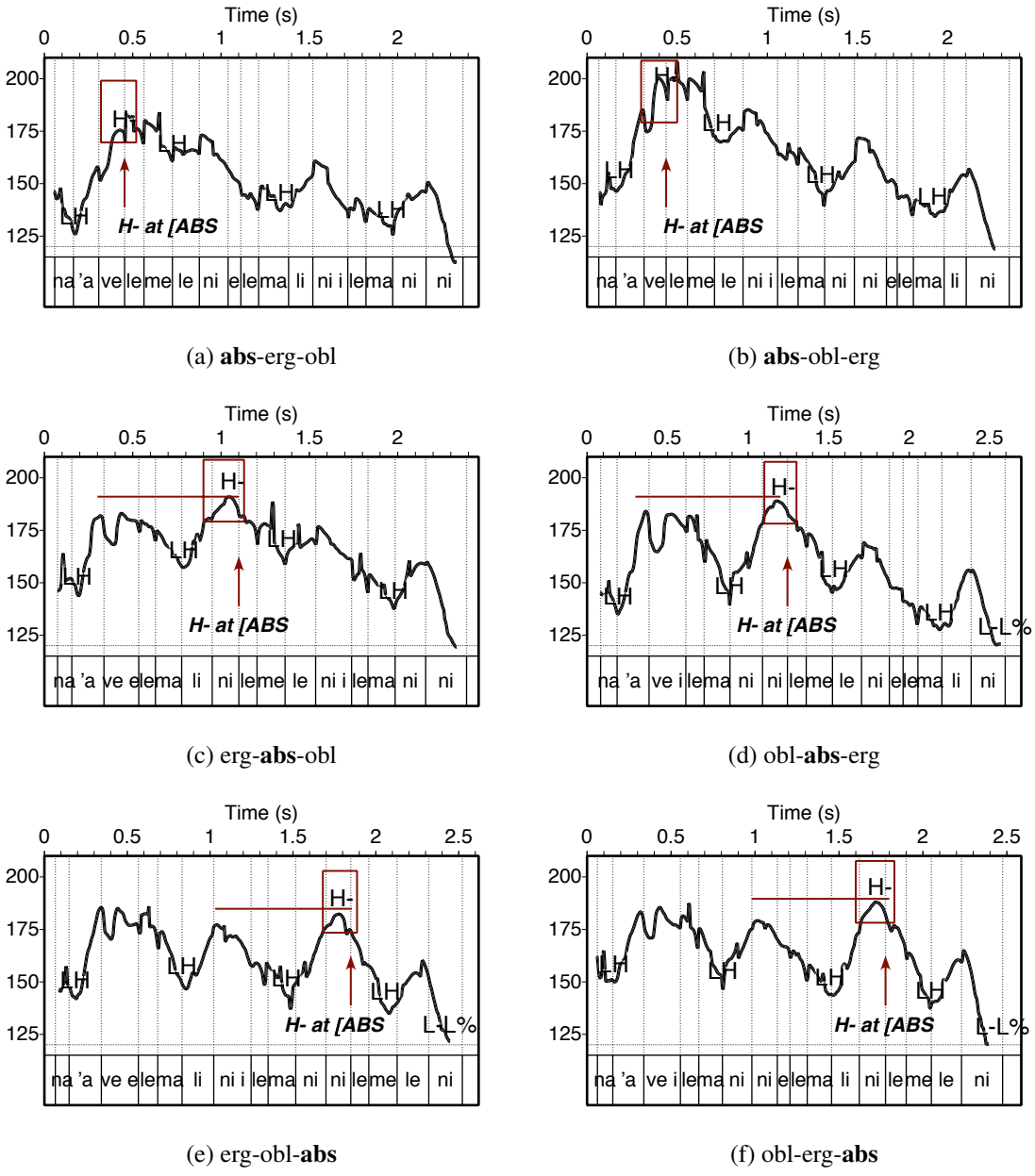
The distribution of H- across case-markings and word orders in sentences with long predicates strongly suggested that an H- occurred with absolutive arguments: the presence of H- between arguments was not conditioned by the case-marking pattern alone, e.g. erg-abs or abs-obl, nor by the word order alone, e.g. VSO or SVO, but by the interaction of the case-marking pattern and word order together: if the interaction resulted in an absolutive argument as the second argument, then the H- appeared between arguments. To confirm that the presence of H- was driven by the presence of an absolutive argument, independent of word order, we examined ditransitive sentences derived from the base sentence below (erg-abs-obl) in (10), elicited under broad focus.

(10) na 'ave e le malini le meleni i le manini.
past give erg det.sg marine det.sg melon obl det.sg fish
'The marine gave the melon to the fish.'

To be able to generalize over all word orders, we permuted word order and examined the distributional pattern of H- across all 3! = 6 word orders. If the appearance of H- was driven by the presence of the absolutive argument, then we expected the F0 realizations for the set of six sentences to be structured into three subsets, one for each slot the absolutive argument could appear in: word orders where the absolutive appeared in slot 1 (**abs**-erg-obl, **abs**-obl-erg), slot 2 (erg-**abs**-obl, obl-**abs**-erg), or slot 3 (erg-obl-**abs**, obl-erg-**abs**). We expected the F0 realizations for one subset to share a pattern different from those of another subset.

We found that sentences with the absolutive argument in slot 1 (Figs. 4a, 4b) showed a pattern of general downtrend, as the H- occurred early in the sentence, realized in the mora preceding slot 1; sentences with the absolutive argument in slot 2 (Figs. 4c, 4d) showed an H- in the middle of the sentence, realized in the mora preceding slot 2; sentences with the absolutive argument in slot 3 (Figs. 4e, 4f) showed a H- late in the sentence, realized in the mora preceding slot 3, most clearly breaking the downtrend in F0 over the course of the sentence. Thus, the data from all possible word orders in ditransitive

sentences supported that hypothesis that the presence of H- was driven by the appearance of an absolutive argument: an H- appeared at the left edge of an absolutive argument, regardless of the word order.



(a) **abs**-erg-obl

(b) **abs**-obl-erg

(c) erg-**abs**-obl

(d) obl-**abs**-erg

(e) erg-obl-**abs**

(f) obl-erg-**abs**

Figure 4: F0 contours for ditransitive sentences with word order permuted. The shapes of F0 contours can be categorized by which slot the absolutive argument appears in, slot 1 (Figs. 4a, 4b), 2 (Figs. 4c, 4d), or 3 (Figs. 4e, 4f). The H- produces a F0 (marked by a line) higher than that of the preceding LH peak.

3.3 *pro* drop and extraction: H- (dis)appears along with absolutive case

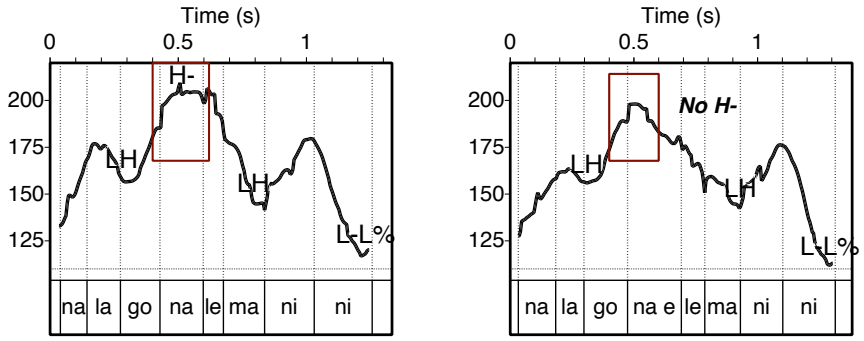
While the data above from long sentences and ditransitives provided evidence for a link between the presence of H- and the appearance of absolutive case, they had no bearing on if absolutive case *caused* the appearance of the H-: there could be an intermediate factor mediating the relation between absolutive case and the H-. For instance, an absolutive argument could happen to coincide with the edge of some syntactic domain and/or a prosodic phrase, marked by H-. To gather some data to bear on whether the presence of H- and the appearance of absolutive case is direct or indirect, we investigated the relationship between the distribution of H- in *pro*-drop and extraction of arguments, structures where overt case-marking was absent for ergative and oblique cases.

We compared the *pro*-drop of ergative and absolutive arguments in sentences with ergative-absolutive case marking patterns, e.g. *pro*-drop of the ergative argument in (11) and *pro*-drop of the absolutive argument in (12) below.

(11) na lagona **H-** le manini. (*pro*-drop of erg)
past hear **abs** det.sg fish
'*pro* (he/she/it) heard the fish.'

(12) na lagona e le manini. (*pro*-drop of abs)
past hear erg det.sg fish
'The fish heard *pro* (him/her/it).'

We found that an H- was present at the left edge of the argument when it was absolutive, in the presence of *pro*-drop of the ergative argument (Fig. 5a), but not when the argument was ergative, in the presence of *pro*-drop of the absolutive argument (Fig. 5b). Data from *pro*-drop in absolutive-oblique case-marking patterns were consistent; the H- was present for *pro*-drop of the oblique argument, but not for *pro*-drop of the absolutive argument.



(a) *pro*-drop of ergative argument (b) *pro*-drop of absolutive argument

Figure 5: F0 contours for *pro*-drop of ergative vs. absolutive argument in ergative-absolutive case marking patterns. An H- was present before the argument only for *pro*-drop of the ergative argument, not for *pro*-drop of the absolutive argument.

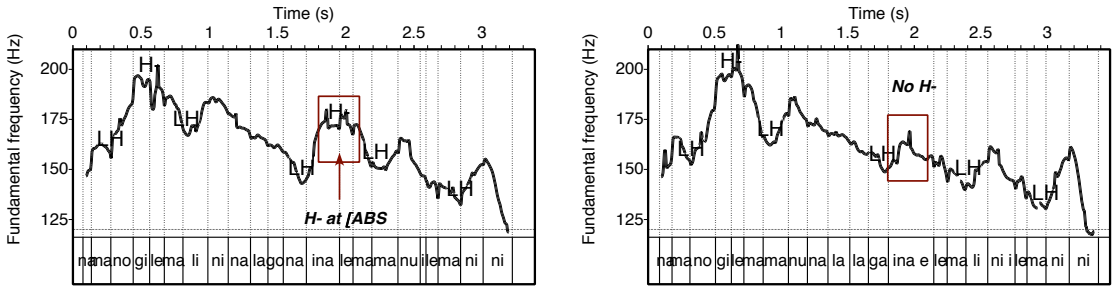
The facts from extraction paralleled those from *pro*-drop. In (13) and (14), we

show matrix clauses with absolutive-oblique case-marking together with embedded relative clauses with ergative-absolutive case marking. In (13), the ergative argument has been extracted from the relative clause; in (14), the absolutive argument has been extracted from the relative clause.

(13) na manogi H- le malini [na lalaga-ina **H-** le mamanu] i le
past smell abs det.sg marine [past weave-INA **abs** det.sg design] obl det.sg
manini. (extraction of erg)
fish
'The marine that weaved the design smelled to the fish.'

(14) na manogi H- le mamanu [na lalaga-ina e le malini] i le
past smell abs det.sg design [past weave-INA erg det.sg marine] obl det.sg
manini. (extraction of abs)
fish
'The design that the marine weaved smelled to the fish.'

We found that when the ergative argument was extracted, an H- was present before the remaining absolutive argument in the relative clause (Fig. 6a), but when the absolutive argument was extracted, no H- was present either before or after the remaining ergative argument in the relative clause (Fig. 6b).



(a) Extraction of ergative argument, cf. (13) (b) Extraction of absolutive argument, cf. (14)

Figure 6: F0 contours for extraction of ergative vs. absolutive argument from a relative clause. An H- is present in the relative clause when the ergative argument is extracted, but not when the absolutive argument is extracted.

In summary, data from *pro*-drop and extraction showed that the presence of H- was completely predictable based on the overt appearance of the absolutive argument: if the absolutive argument was not present, either due to *pro*-drop or extraction, then the H- did not appear. We thus have some possible counterevidence to the hypothesis that the H- marks the edge of some syntactic domain and/or a prosodic phrase which happens to be aligned with the left edge of the absolutive argument: assuming that the syntactic domain and/or prosodic phrase was not disturbed by *pro*-drop or extraction, then the missing absolutive argument should not have resulted in the absence of an H-, since the edge of the syntactic domain and/or prosodic phrase would still be present regardless of the presence of the absolutive argument.

4. Discussion

In the preceding section, we outlined evidence that a high boundary tone (H-) occurs at the left edge of an absolutive argument. In §3.1, we showed that in sentences with long arguments, an H- appeared between arguments, dramatically breaking the F0 downtrend, only if the second argument was absolutive. We also showed by systematically lengthening the predicate that the H- tracked the boundary between the predicate and the following argument, if it was absolutive. In §3.2, we showed that the observation that an H- preceded absolutive case could be generalized over word orders. This was because the shape of F0 contours over all possible word orders in ditransitive sentences (with all three cases present) patterned solely by whether the absolutive argument was first, second, or third: no matter where the absolutive argument occurred, its left edge coincided with an H-. Finally, in §3.3, we showed that the absence of the absolutive argument due to *pro*-drop or extraction resulted in the absence of the H-.

Let's place the hypothesis that a high boundary tone occurs at the left edge of the absolutive argument in context of the case-marking and intonational system of Samoan. First, it is well known that ergative arguments are case-marked by a preceding *e* and that oblique arguments are case-marked by a preceding *i*, i.e. these case markers are segmental and act like prepositions. Thus, an H- absolutive marker is both like and unlike the ergative and oblique case markers. Like the ergative and oblique case markers, the absolutive H- is aligned to the left edge of the argument—it is prepositional, cf. (15).

(15) e ERG
i OBL
H- ABS

Unlike the other case markers, the absolutive H- is not segmental but suprasegmental: why would a case-marking system have two case markers be segmental and the other tonal?

In context of the intonational system of Samoan, the H- is not uniquely associated with absolutive case. Whether the high boundary tone that we hypothesize marks absolutive case is the "same" high boundary tone that appears in the intonational inventory of Samoan is unclear, but that high boundary tones have other functions than to mark absolutive case is clear. Thus far in our general investigation of Samoan intonation, we have found that a high boundary tone occurs: (i) in coordination, realized on the last mora of the first conjunct (16), and (ii) in the cleft-like SVO structure, realized on the last mora of what Koopman (to appear) terms the left periphery (17) .[4]

(16) na manogi H- le malini **H-** ma Malu i le manu. (H- in coord.)
past smell abs det.sg marine conj Malu obl det.sg bird
'The marine and Malu smelled to the bird.'

[4]It is not yet clear that these H-'s cannot also be analyzed as morphosyntactic. In addition, the presence of H- may be pragmatically conditioned, appearing utterance finally to express disbelief and in echo questions (Orfitelli and Yu 2008), and we've also observed utterance-final H- tones in longer stretches of discourse perhaps serving as continuation rises.

(17) ’o le malini] **H-** na manogi i le liona. (H- at edge of left periphery)
’o det.sg marine] past smell obl det.sg liona
‘The marine smelled to the lion.’

The distribution of these high boundary tones in Samoan intonation indicate a tight connection between syntax and prosody: coordination as in (16) is a syntactic operation, and the SVO construction is a cleft-like structure, with the subject in the left periphery. Therefore, when we ask is the absolutive H- the “same” as the H- for coordination and the left periphery, one important way to operationalize this is to ask: is the absolutive H- tightly connected to syntax like the other H- boundary tones in Samoan?

4.1 The encoding of absolutive H- in Samoan grammar

Bringing together the questions raised by putting the absolutive H- in context of the case-marking and intonational systems of Samoan, there are three possible ways that the H- at the left edge of the absolutive argument could be encoded in Samoan grammar:

(18) The H- is a lexical tonal case marker, the only tonal morpheme in an otherwise non-tone language [5]

(19) The H- postlexically marks the edge of a domain in the prosodic hierarchy

(20) The H- postlexically marks the edge of a syntactic domain (direct syntax-prosody mapping)

If the absolutive H- is encoded as a lexical tonal case marker (18), then the appearance of the H- should be completely predictable from the presence of an absolutive argument: if an absolutive argument is present, then the H- must be present at its left edge; if no absolutive argument is present, then no H- is present. In the data we presented in §3, we found that the observation that an H- preceded absolutive case was independent of case-marking pattern and word order—regardless of what case-marking pattern (ergative-absolutive, absolutive-oblique, ergative-absolutive-oblique) or word order was present, the appearance of an H- was predicted by the presence of an absolutive argument with total accuracy. We also found that the H- was absent if the absolutive argument was absent from *pro*-drop or extraction. Moreover, in other data not presented here, we found the H- was marked on pronouns in absolutive case as well, and in cleft-like SVO sentences like (17), the H- appeared on absolutive arguments after the predicate (showing potential evidence for insensitivity to focus conditions), as well as in interrogatives. Thus, the appearance of an H- at the left edge of absolutive arguments has been robust across all syntactic environments tested, supporting the view that it is encoded lexically.[6]

[5] This basic idea is not unprecedented in prosodic typology. Gordon (2005) proposes a morpholexical pitch accent H^{λ} on a particular verb class in Chickasaw’s intonational system.

[6] The only possible exception has been when the absolutive appears in the left periphery, e.g. *’o le malini* in (17), in which case the H- must be realized over the short and glottalized sentence-initial [ʔo]. In these cases, it’s not clear if there is an H-. If there is no H- and if ’o is analyzed as a topic marker, this could be parallel to cases where a topic marker overwrites another case marker, e.g. the Japanese topic marker *wa* (Akiyama 2002).

If the H- is encoded as a boundary tone left-aligned to some prosodic domain in the prosodic hierarchy (19), then we would expect prosodic lengthening/strengthening concurrent with the absolutive H- (Keating et al. 2003; Shattuck-Hufnagel and Turk 1998; Wightman et al. 1992, i.a.). If there is any such lengthening/strengthening, it must be subtle because it is not immediately perceptible, even in the long sentences discussed in §3.1. However, is there lengthening/strengthening concurrent with the H- tones in coordination and at the edge of the left periphery? If there is, it is also subtle. We are currently doing instrumental studies to look for evidence of prosodic lengthening for each type of H- tone.

In any case, arguing for the absolutive H- as a boundary tone on a prosodic domain requires positing some fixed prosodic unit associated with absolutive case. Yet, the appearance of the absolutive H- is insensitive to prosodic factors like length/heaviness, as it appears not only on long arguments, but even on pronouns: the prosodic phrasing associated with the absolutive argument does not behave like that of a fixed prosodic unit. Moreover, the existence of a prosodic domain associated with absolutive case would require a rich syntax-prosody interface, where case information gets passed from syntax to prosody, which is counter to theories of the interface when only unlabeled XP edges are passed (Hayes 1989, Nespor and Vogel 2007, Selkirk 1986, Truckenbrodt 1999), or when even less than that—just relative ranks of boundaries—are passed (Wagner 2005). Thus, if the absolutive H- were encoded postlexically in the syntax-prosody interface, it would necessitate a revision of our understanding of the mapping between syntax and prosody.

The other option for postlexical encoding of the H- is in a direct syntax-prosody mapping (20) where the H- marks the left or right edge of a syntactic domain. We argued against this due to the sensitivity of the H- to *pro*-drop and extraction of the absolutive argument, since *pro*-drop and extraction targets the absolutive argument and not a syntactic domain. However, this argument relies on the assumption that the syntactic domain that the H- would be marking is not disturbed during *pro*-drop and extraction.

We now consider the implications of the likeliest possibility for encoding, that the H- is a lexical tonal marker. If the absolutive H- is a lexical tonal morpheme, then immediate questions are how did Samoan develop two segmental case markers and one tonal one? Why is the absolutive case marker tonal? A tonogenesis story for an absolutive H- is not necessarily implausible, although there is no evidence for it. Proto-Polynesian has been considered to have an accusative case system, from which modern ergative case-marking systems in Polynesian languages were innovated (Chung 1977, 1978). Among the ergative Polynesian languages, Tongan is known to sometimes mark the absolutive with a preceding *'a*, as shown below (Churchward 1953: 67-68, as cited in Comrie (1978)).

(21) na'e tāmate'i 'e Tēvita **'a** Kōlaiate. (erg-abs)
past kill erg David **abs** Goliath
'David killed Goliath.'

(22) na'e lea **'a** Tolu. (abs)
past speak **abs** Tolu
'Tolu spoke.'

Chung (1978: 24, 52) states that this *'a* is thought to have descended from a Proto-Polynesian pronominal-proper article *a*, which occurs as *'ate* before pronouns in Samoan and Tongan after the oblique case marker and may also occur on the absolutive in Tongan or the nominative in Maori. Regardless of the exact diachronic relation between Proto-Polynesian *a* and its modern reflex in Samoan, studies on the interaction of vowel height and tone find that low vowels such as [a] may be associated with either high or low tone, depending on the language (Hombert 1977).

As for why Samoan might have a tonal case marker for absolutive and segmental case markers for ergative and oblique, one possibility could come from examination of the informal register of Samoan, *tautala leaga*. In this register, which makes up the bulk of the input a child learner of Samoan receives, case markers are typically dropped (Ochs 1982, 1986). There is no intonational work on *tautala leaga* yet, but if the absolutive H- is also present, it could play a role in contrast preservation of the different cases.

Another perspective on why Samoan might have a tonal case marker for absolutive case is that it could have been lexicalized from a postlexical high boundary tone marking some prosodic or syntactic constituent. Although we have suggested above that the distribution of the absolutive H- best supports the view that it is lexical and not postlexically assigned, the absolutive H- still exhibits characteristics that are typical of intonational high boundary tones: why should a lexical high tone case marker induce the dramatic pitch reset in the sentences with long arguments, cf. Fig. 2? The effect of the absolutive H- on pitch scaling seems occurs in shorter sentences as well. In its ability to induce long-range effects on F0 contour realization, the absolutive H- behaves like a typical postlexically assigned intonational boundary tone. The hybrid nature of the Samoan absolutive high boundary tone—on the one hand, with its phonetic realization consistent with postlexical intonational boundary tones, and on the other hand, with its distribution syntactically conditioned in a manner consistent with lexical assignment—could be evidence supporting the notion that boundary tones can occur independently of prosodic phrasing.

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