Interaction between word order, information structure and intonation in Puyuma

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Introduction

Puyuma is an Austronesian language spoken in Taiwan, i.e. one of the languages often referred to as Formosan (although this is not a genetic grouping). According to Blust (1999), Puyuma is one of the primary subbranches of the Austronesian family, as are several of the other Formosan languages: according to general consensus, regardless of grouping, all Austronesian languages outside Taiwan represent a single sub-branch, whereas the Formosan languages represent between 3 and 9 separate primary sub-branches of the family. It follows that typological information on Formosan languages like Puyuma may have bearing on our understanding of properties of the Austronesian language family as a whole.

Puyuma is verb initial and displays variations in word order, thus VOS, VSO and SVO order occur, as exemplified in (1)

(1) Variations in word order in Puyuma

'My father plants sweet potatoes.'
VOS: semarem dra bunga i namali
V O S
SVO: i namali semarem dra bunga
S V O
VSO: semarem i namali dra bunga[1]
V S O

This variation was shown in Huang 2000:73ff. and replicated by one of the authors, Arthur Holmer, by collecting non-spontaneous material (in 2009). Speakers were asked to translate sentences from Chinese to Puyuma. Though word order variations were recorded the reasons for them remained unclear. Our new research question is what conditions word order in Puyuma at clause level, at NP level and within relative clauses. To answer this question we perform an investigation by integrating syntax, information structure and prosody. In this paper we present first steps in our analysis.

Word order in Austronesian languages

[1] We adopt the Puyuma orthography of Teng (2008) which is an adaptation of the standard orthography established in 2005 by the Council of Indigenous Peoples (an office under the Executive Yuan of the government of Taiwan). This is the system currently used in schools.

One of the crucial problems of word order in Austronesian in general, and in Formosan languages in particular, is the mismatch between the extremely head-initial order at clause level (VOS or VSO) and the tendency for NP modification to be prenominal (both ADJ-N and REL-N are attested as possible, or even preferred, orders in various Formosan languages, as well as in other Austronesian languages outside Taiwan). According to traditional word order typology, it would be expected that a verb-initial language should display N-REL and N-ADJ order, given that these harmonize with head-initial structure, and given that both N-REL and N-ADJ are in fact dominant among the languages of the world, both head-initial and head-final. Various studies have been conducted to attempt to explain this mismatch (e.g. Tang 2008, Comrie 2008, Liu 2005, Holmer 2007), but no convincing explanation has as yet been forthcoming.

One generalization which has been uncovered is that there is a certain correlation between restrictivity and pre-nominal modification, and between non-restrictivity and post-nominal modification. In some of the languages involved, there is no one-to-one correspondence, however, e.g. in Puyuma non-restrictive modification can only be realized post-nominally, whereas restrictive modification can be either prenominal or post-nominal (Teng 2008). In the Atayalic Jianshi Squliq the situation seems to be partially reversed (cf. Liu 2005), although Atayalic languages are otherwise quite liberal when it comes to order variation within NP.

One of the reasons for this mismatch is part of the nature of word order typology. Traditionally, word order typology is expressed in terms of headedness, i.e. the contrast between head-initial and head-final structure, and the assumed harmony between levels (a language which is head-initial at one level will be expected to be head-initial at all levels). Certain mismatches do obtain (e.g. German, which is head-initial at clause level, leading to verb-second word order, but head-final at VP level), but these often also reflect historical change (we know that the earliest sources of Germanic do display head-final word order, i.e. SOV). According to this view, N is the head of the NP, and modifiers are dependents, and we therefore we would also expect V-initial order to correlate with N-ADJ and N-REL order. At the same time, it has previously been observed, even by Greenberg (1966) himself, that the word order correlation which seems weakest is that involving adjective placement within NP.

There is a possible solution to be found here. Generally, word order in Austronesian is considered to be verb-initial, but perhaps a more suitable term might be predicate-initial, irrespective of the word class or grammatical role of the elements involved. We will illustrate this by citing examples from the Atayalic language Seediq. Similar facts have also been cited for Tagalog and other languages. In Seediq, the idea of "Pawan drank wine" can be translated by means of two different word orders: VOS (a) and SVO (b). However, the information-structural implications of each are not the same, as can be seen from the translation. The SVO pattern is perhaps more aptly translated by an English cleft. However, there is no evidence of a separate cleft construction in Seediq: it is only the linear order which distinguishes the two constructions.

a) mnimah sino ka Pawan
drank wine NOM Pawan
'Pawan drank wine.' (< 'What did Pawan do?')

b) Pawan ka mnimah sino
Pawan NOM drank wine
'Pawan was the one who drank wine.' (< 'Who drank wine?')

In the a) example, the referent Pawan is known, and the new information is what Pawan did, namely "drank wine", whereas in the b) example, we know that someone drank wine, and the new information is the identity of this person, namely Pawan. In both cases, the new information precedes the given information. In both cases, the given information is marked by NOM case: this fits well with the attested fact that definiteness is generally expressed, in Seediq as in many other Austronesian languages, by placement in clause-final NOM position (cf. the contrast between (c) and (d)).

c) Meekanbunga ka qolic
eat.AF sweet.potato NOM rat
'The rat will eat sweet potatoes.'

d) Puqun qolic ka bunga.
eat-PF rat NOM sweet.potato
'The sweet potato will be eaten by a rat / rats.'

The underlying pattern in Formosan word order is therefore perhaps most aptly described, not as verb-initial, but rather as NEW-GIVEN. In this context, we are not necessarily dealing with head-initial structure as such, or not primarily, but rather with word order determined primarily by information structure. This being the case,

the REL-N order attested in Formosan languages is no longer necessarily a breach of word order typology.

We recall that the ordering pattern in several Formosan languages implied a tendency towards REL-N for restrictive relativization, and towards N-REL for non-restrictive relativization. Restrictive relativization implies that there is a known set of potential referents denoted by the noun, and the relativization (or the adjective) serves to uniquely identify which of these potential referents is actually intended in the given situation. In such a construction, the relativization as such implies new information, while the noun implies given information. If the order is REL-N, this can be rewritten in information-structural terms as NEW-GIVEN. Under such an analysis, REL-N is in fact the expected order.

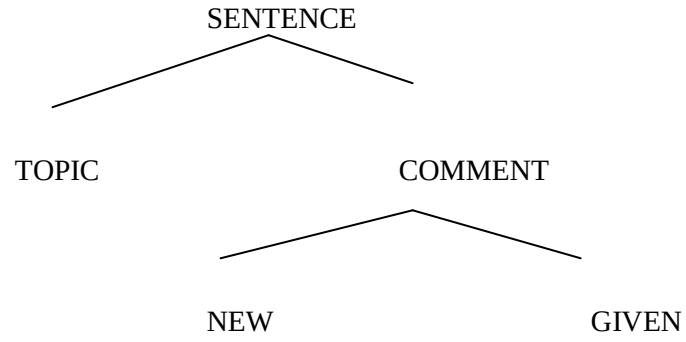
In contrast, N-REL rather correlates with non-restrictive relativization. In non-restrictive relativization, both N and the modifying relative clause construction represent new information (neither is given). Here, the ordering of NEW vs.GIVEN is irrelevant, and N-REL could thus be a reflection of head-initial word order.

If this analysis is on the right track, Formosan word order might conceivably represent the overlaying of information structure on an underlyingly head-initial word order pattern. Is is worth noting in this context that some of the languages which display a mismatch between NP-internal word order and clause-level word order (including both Persian and Basque, which both combine SOV order with N-ADJ word order) are also languages where linear order is not entirely fixed, but partly determined by information structure.

For Austronesian languages, and in particular Formosan languages, there is a further complication, as many Austronesian languages also have a clause-initial topic position, which reflects given information[2]. However, this clause-initial topic position serves, not so much to reflect previously given information, as for establishing a new topic for the discourse (prototypically spanning across several clauses). Therefore, this is not necessarily a problem for our proposed analysis, but rather may indicate that information structure may be relevant in different ways at different levels of clausal structure. This shows clear parallels to a multi-layered clausal structure such as that described by traditional generative syntax. A possible

[2] We thank Henry Y.L. Chang for drawing our attention to the relevance of this point.

application in our model might be the structure as shown below (where TOPIC would correspond to SpecCP in traditional generative syntax, while GIVEN corresponds more or less to SpecTP, the canonical subject position).



The implications of this tentative model are as yet unclear, but it could possibly suggest a partial solution of the word order mismatch found in several Austronesian languages.

Material and speakers

We performed recordings of the Nanwang dialect in Nanwang village in Taiwan in June 2011. There are less than 1000 speakers of this dialect (Teng 2008:3). Four speakers were recorded, three women and one men, aged between 58 and 78. The subjects were recorded using a portable Edirol R-09 digital recorder and a lapel microphone. Large part of recordings was also filmed. The material is transcribed and analysed (ongoing) using Elan and the *Praat* program.

Stimuli consist of five main parts: material for basic prosodic investigation involving differences in focus placement, controlled stimuli to trigger differences in information structure, stimuli to trigger passive and active constructions, stimuli to trigger relative clauses, spontaneous retelling of a short film and of preparing rice cakes. Material was inspired by *Questionnaire on Information structure* (Skopeteas at al 2006) though we modified stimuli following our purposes and local particularities.

Prosodic typology and its implications for Puyuma.

Traditional prosodic typology recognises two main types of languages regarding their use of tone: tone languages and intonation languages. In tone languages like e.g. Mandarin or Thai, tone is used to convey lexical meanings. In intonation languages, like e.g. German, English or Russian, intonation is only used on the sentence level to convey different pragmatic meanings. Focusing in intonation languages is achieved by placing a pitch accent on a focussed word, while different implicit pragmatic meanings (surprise, delight etc) are often conveyed by variations in shapes of pitch accents (see e.g. Bryzgunova (1969) for description of Russian intonation). Recently, category edge-prominence languages (Jun 2005)) (or 'phrase languages' using Féry's term (Féry 2010) was proposed in order to account for languages which mainly use boundary tones for focusing and other pragmatic functions. Edge-prominence languages do not add pitch accents to focus a constituent but use instead boundary tones in this function. In these languages, information structure is often conveyed by morpho-syntactic means and focusing is achieved by changes in pitch level of phrasing tones (e.g. Patil et al 2008 about Hindi, Karlsson et al 2010 about Kammu), dephrasing (Jun 1993 about Korean) or insertion of a new boundary tone (Keane about Tamil, to appear).

It is worth to be noted that information structure and focus are two separate, though interacting, levels. Thus, information structure reflects division of utterances into "new" and "given" information, or anchor with already mentioned, with context, with common knowledge and addition of new information about it. Focus, on the other hand, is a highlighting of some communicatively important constituents. These focussed parts can be either new or given (Horne 1991).

Languages such as West Greenlandic (Arnold to appear), Korean (Jun 1998), Mongolian (Karlsson to appear) and the main Indian languages Hindi, Bengali, Tamil and Malayalam (Féry 2010) are described as edge-prominence languages. Their common features are lack of lexical stress and of pitch accents. Nearly only boundary tones can change to convey pragmatic focus.

Our first analysis of Puyuma prosody indicates that it belongs to edge-prominence language type. Almost every content word tends to build a prosodic phrase, called accentual phrase here. It is marked by a high boundary tone on the penultimate. Word final syllable gets high or low boundary tone, and their functions are discussed in next section.

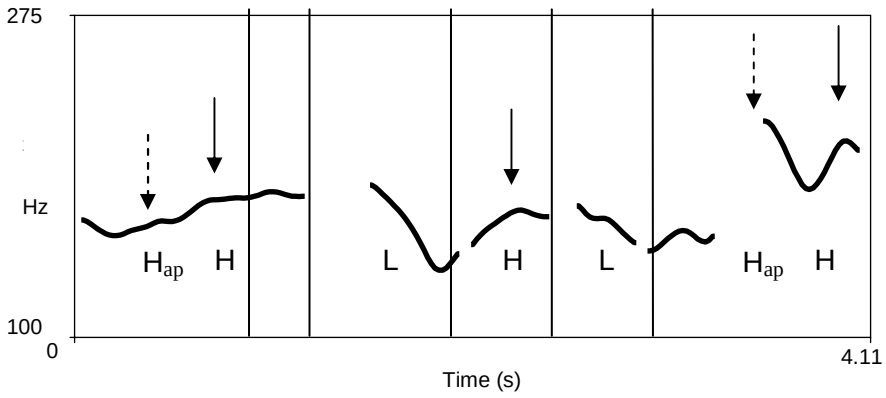


Figure 1. P*hrasing pattern and boundary types in read speech, a female speaker. The utterance is*
Muruma la ku walak na miateru
go.homePRF 1s child DET 3
"My three children came home"
Boundaries between words are shown with straight lines. Every content word gets a high tone on its penultimate (shown with dashed arrows) and a boundary tone on its final syllable (shown with plain arrows). High tones are transcribed with H, low tones are transcribed with L (low tones are assigned function words in the exemplified utterance), boundaries of accentual phrases on the penultimate are transcribed with H_{ap}.

As an edge-prominence language, Puyuma should use formal means to convey information structure, tonal means being secondary ones. Since, to our knowledge, there are no special focus particles in Puyuma we assume that focussing may be achieved by strengthening of boundary tones. Information structure is conveyed by other means. As we attested word order variation in Puyuma, it may be the mean for information structuring.

Functions of Puyuma intonation

As we identified two types of major boundaries in Puyuma, low and high, the next question is what governs their choice. The easiest observed difference is between declaratives and yes-no questions. The utterance final boundary tone is high in declaratives and low in interrogatives, an unusual feature from typological point of view. This striking feature was shortly mentioned by Teng (2008:221) and is also attested in Paiwan, another Formosan language (Chen 2006) and Chickasaw, a Muskogean language (Gordon 2005). We found that low and high boundaries occur even within utterances. Thus, high boundaries occur as in (2):

(2) Occurrences of high boundary tones
[[VO] $_{high}$ [S]] $_{high}$

[[VS] $_{high}$ [O]] $_{high}$

[[S] $_{high}$ [VO]] $_{high}$

[noun $_{high}$ + adjective] $_{high}$

Low boundaries occur as in (3)
(3) Occurrences of low boundary tones
Intermediate between the syntactic constituents, are assigned function words:
[[V $_{low}$ O] $_{high}$ [$_{low}$ S]] $_{high}$
[[V $_{low}$ S] $_{high}$ [$_{low}$ O]] $_{high}$
[[S] $_{high}$ [V $_{low}$ O]] $_{high}$

[Adjective$_{low}$ + noun] $_{high}$

[Topic] $_{low}$ [clause] $_{high}$

[interrogative] $_{low}$

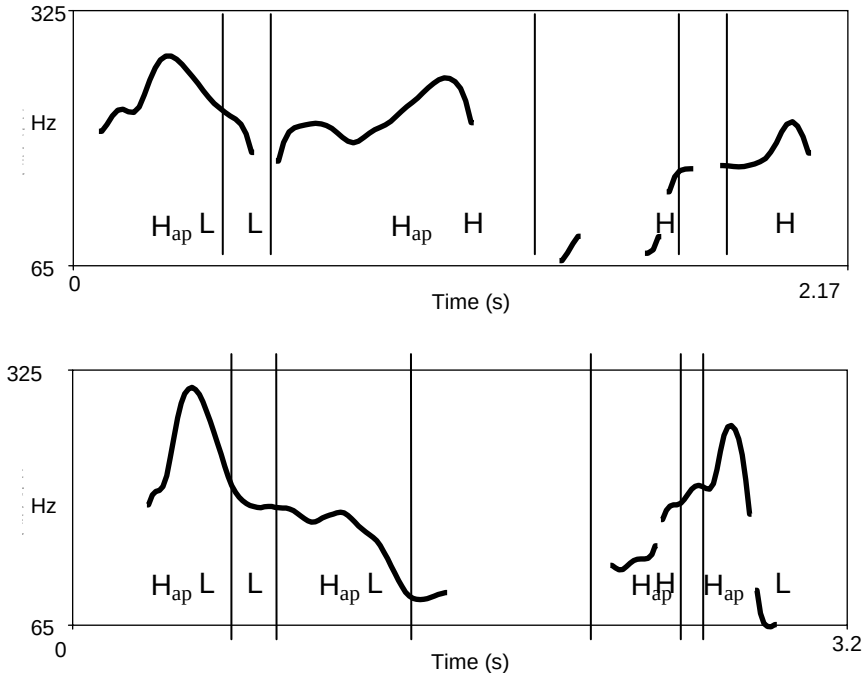


Figure 2. *Illustration of tonal courses of a declarative utterance (upper plot)*
Idriyu na bulrabulrayan maekan dra belbel.
This NOM woman eat OBJ banana
"This woman eats banana"
and of an interrogative utterance
Idriyu na bulrabulrayan i tremakaw dra belbel?
This NOM woman TOPIC steal OBJ banana
"Did that woman steal banana?"
Boundaries between words are shown with straight lines. H_{ap} denotes rising tones of accentual phrases and L and H denote major phrase boundaries on final syllables.

Our first analysis suggests that type of boundaries reflects "autonomy" status, the main meaning of low boundary being "I am not finished, the important part is coming" and high boundary signaling semantically autonomous part. For instance, we find low boundary in [adjective $_{low}$ + noun] combinations while the reverse order

displays high boundary [noun $_{high}$ + adjective]. In combination [Verb + Object] low tone is found for absolute transitive verbs as e.g. *sagar* “to like” and *semalpit* “hit”:

sagar dra aputr a babayan
like OBJ flower INDEF woman
‘Women (in general) like flowers’

sagar dra eraw na ma'inayan
like OBJ wine DEF man
‘The man likes wine.’

semalpit dra walak na babayan
hit OBJ child NOM woman
‘The woman hit a child.’

Similar for these combinations, and also for topic, is that low boundary signals constituent semantically dependent and needed to be expounded. Functions words are always assigned low tones (see Figures 1 and 2). These words mediate between syntactic groups and low tones function as connectors between these groups. Utterance final tone is always high, signaling finality, unless it is not an interrogative (see Figure 2).

Topic has a formal postposed marker *i*. However, intonational means can be used alone to mark topic. In this case, the only difference between SVO and S_{topic}VO structures is in use of high respective low boundary tone on the last syllable of S, S_{high}VO respective $S_{topic\ low}$VO. An example from our material are different answers generated by questions about pictures, as illustrated in (4):

(4)
Question posed: *What is the girl playing with, what is the boy playing with?*

L
malralrinay dra kalripang na babayan, na ma'inayan malralrinay dra malri
play OBJ umbrella NOM girl, NOM boy play OBJ ball
The girl is playing with the umbrella, the boy is playing with the ball.
VOS SVO

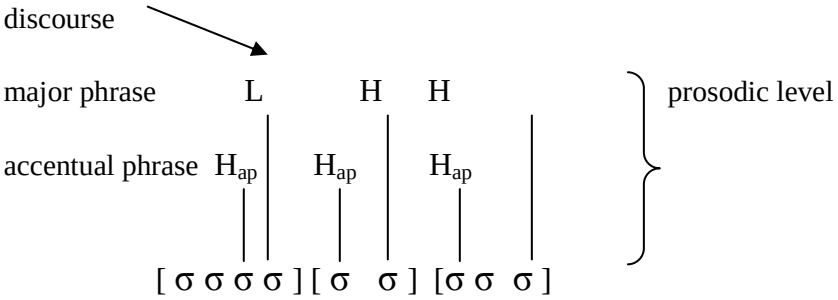
Question posed: *Who is playing with the umbrella, who is playing with the ball?*

H
na babayan na malralrinay kana kalripang, na ma'inayan malralrinay dra malri
NOM girl NOM play DEF.OBJ umbrella, NOM man play OBJ ball
The girl is the one playing with the umbrella, the boy is playing with the ball.
SVO SVO

The only difference between the clauses *na ma'inayan malralrinay dra malri* in these two answers is use of low boundary in the first case, marking “the boy” as a topic, and high boundary marking “the boy” as a subject.

To sum up, for his moment, we see evidence for Puyuma intonation as functioning on two levels, prosodic and discourse level. Schematically it can be represented as in (5)

(5) Levels governing distribution and choice of boundary types in Puyuma. The scheme exemplifies topic – comment structure: topic (first word) is assigned L boundary tone. Discourse level decides types of boundaries of major prosodic phrases (tentative notion used here for prosodic groups above the accentual phrase in the prosodic hierarchy) [3] σ = syllable, H= high tone, L = low tone, ap = accentual phrase.



End-word

Our first findings do not contradict the proposed description of Puyuma as an edge-prominence language. We find boundary tones of two types, high and low, and they are used for discourse purposes.

A very preliminary analysis of our newly recorded material indicates that variations in the word order may be triggered by information stricture. Thus, neutral all new sentences display the VOS word order while answering to the question of type Who + V + Obj (Who is eating the banana?) triggers the SVO word order, putting the new information first (see examples in (4) above). Thus, the proposed above ordering of information "new before given", though based on observations from Seediq, seems to hold for Puyuma.

While we see some indications on interaction between syntax and information structure in Puyuma, intonation seems to interact instead with discourse structure expressing the contrasts between topic and comment,

[3] In spontaneous speech the penultimate seems to be the position for prosodic realisation of affects and high degree of engagement (informal listening).

and more generally, between semantic autonomy and dependency of speech parts. Intonation may signal focus, and there are some indications for this in our material, but this is to be investigated.

Acknowledgements

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