A LEXICAL AND POST-LEXICAL PROSODIC DOCUMENTATION OF EMBALOH LANGUAGE

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ABSTRACT

This research investigated the prosody of the Embaloh language, which has yet to be widely explored, to document and preserve the language. The method used is data collection of spontaneous and non-spontaneous speeches from 12 native speakers. Prosodic analysis was then carried out based on visualising and observing speech sound waves using the autosegmental-metrical theory (AM) framework. The results show that prominence tends to be on the right edge at both lexical and post-lexical prosodic levels. The findings show that the Embaloh language is outside the mainstream of Austronesian languages, which places word stress at the penultimate syllable. At the post-lexical level in interrogative intonation, phrases with a question word are marked by the pitch accent located at the target question word in the nuclear contour of the phrase. The pitch accent follows the position of the question word in the intonation phrase, forward or backward, with one of the following tones: H* (high), LH* (low-high), or LHL* (low-high-low). The intonation of the question is indicated by the H(high) tone at the end of the phrase. The H (high) tone also acts as a boundary tone represented by H*% (high).

Keywords: intonation; prosody; lexical; post-lexical; Embaloh; Dayak

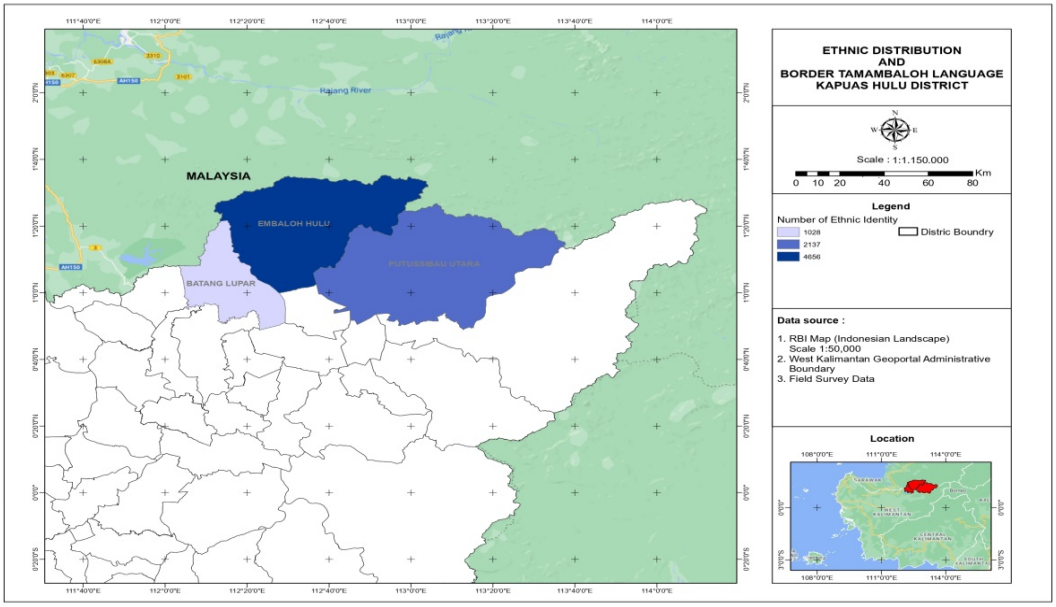
Introduction

As the third largest island in the world, Borneo or Kalimantan Island is home to some 100 Austronesian languages, and they are poorly documented (Smith, 2017). The area in Borneo where the language is the least documented is West Kalimantan (Adelaar, 2010a). The Embaloh language with the ISO code 639-3, also known as the Tamambaloh language or Maloh language, is one of the less documented languages on the island of Borneo. This language is spoken by the Tamambaloh Dayak tribe, one of the Dayak tribes in the deep interior of West Kalimantan. The tribe that lives around the Embaloh River and upstream of the Kapuas River still maintains their traditional cultures, including marriage (Barella, 2020). Based on our interviews, the tribe is still practising swidden agriculture. The Embaloh language is estimated to have at most 10,000 speakers (Eberhard et al., 2022). According to the local administrative authorities, there are about 7,000 Embaloh speakers. In our survey in May 2022, the distribution of this small language was not broad, which was only around (1) Embaloh Hulu Subdistrict (in the Villages of *Banua Martinus, Menua Sadap, Pulau Manak, Banua Ujung, Saujung Giling Manik, Ulak Pauk, Langan Baru,* and *Tamao*), (2) Batang Lupar Subdistrict (in the Village of *Sungai Ajung* at *Dusun Nanga Ngaun* and *Dusun Ganti*; the Village of *Labian* at *Dusun Tumbali* and *Dusun Ukit-Ukit*; the Village of *Labian Ira'ang* at *Dusun Bakul* and *Dusun Kereng Lunsa*) and (3) North Putussibau Subdistrict (in the Village of *Nanga Nyabau*, *Benua Tengah, Sungai Uluk Palin, Lauk,* and *Jangkang*). All the distribution areas of the Embaloh language are in Kapuas Hulu Regency. The distribution area of the Embaloh language is very far in the interior of West Kalimantan, bordering Sarawak, Malaysia, in the heart of Borneo Island (see Figure 1). The Embaloh Dayak tribe has only been accessible by road since 2020.

The Embaloh language is grouped into the Tamanic language family, such as the Kalis and Taman languages (Adelaar, 2010a, 2010b; Soriente, 2012; Wadley, 2013). Tamanic languages have many similarities with the languages in South Sulawesi, such as the Toraja and Bugis. Adelaar (2010b) asserts that the Tamanic languages and languages in South Sulawesi are distinct subgroups within the West Malayo Polynesian family. Eberhard et al. (2022) classify the Tamanic languages, including the Embaloh language, into the South Sulawesi language subgroup. It should be noted that the location of Tamanic languages is far from the location of the languages of South Sulawesi, which is on different islands. The distance between the two is about a thousand kilometres. The separation of Tamanic languages, including the Embaloh language, from the languages in South Sulawesi gave rise to three theories, namely (1) the migration of the South Sulawesi people to the island of Borneo (2) the migration of the Bornean people to South Sulawesi, or (3) a group of speakers from other places split off to Borneo and South Sulawesi (Adelaar, 2010b).

Figure 1

Map of the Embaloh Language Distribution Area



The significant influence of Malay and Iban Dayak languages as the dominant languages along the Kapuas Hulu and Embaloh rivers puts the Embaloh language under pressure. Many research informants said that most Embaloh Dayak children no longer learned the Embaloh language. According to Adelaar (1995), many speakers of the Embaloh language can speak Iban, and this ability has absorbed a lot of Iban vocabulary into the Embaloh language (Adelaar, 1995). This matter has also been confirmed by one of our informants, a native speaker and an Embaloh language preservation activist, Ms. Claudia Liberani. Additionally, our observations in the field found that many speakers of the Embaloh language can also speak the Malay language, and the language influenced the Embaloh language.

Basic information about the phonological aspect of the Embaloh language is provided in Adelaar (1995) and Buu (2009). The Embaloh language has a five-vowel system, namely, /i, e, a, o, and u/. This language has 14 consonants /p, t, k, b, d, g, j, m, n, ɲ, ŋ, r, l, s/, and two semivowels /w, y/. The glottal sound /ʔ/ in that language is not phonemic. The word stress in this language falls on the penultimate syllable and is not distinctive (Adelaar, 1995; Buu, 2009). Not much information can be obtained about the prosodic system of the Embaloh language other than the word stress given by Adelaar and Buu.

Prosody is an integral part of spoken language. It delivers linguistic grammar, emotional states, and communicative intents of speakers. Furthermore, prosody has essential roles in cueing other structures such as clause boundary location, preposition, and relative clause attachment (Cho, 2016; Prieto, 2015; Venditti & Hirschberg, 2013). Prosodic parameters, mainly fundamental frequency, play a major role at two main levels: word level (*lexical prosody*) and utterance level (*post-lexical prosody*) (Himmelmann & Ladd, 2008). At the lexical level, prosodic cues

contribute to marking a stress pattern of the word by a prominent constituent. At the utterance level, the parameters mark the distinction between sentence types (statements vs questions), and they are related to the informational and grammatical structures of the utterance (Horgues, 2013).

Prosodic studies at the word level reveal the prosodic characteristics of a language as a tonal language (lexical tone language), for example, in Mandarin or English, as a stressed language, or as a non-stressed language, for instance, in Betawi Malay (van Heuven et al., 2008). In tonal language, differences in tone can distinguish lexical meanings. In stressed language, there are prominent syllables in a word (Zanten & Goedemans, 2009), but the prominence of these syllables does not cause lexical differences. Stress is an abstract property of syllables in the word domain. These properties make a syllable in a word more prominent or stand out from other syllables (Dixon & Aikhenvald, 2003; Van Zanten & Goedemans, 2009). These prominences can only distinguish word classes, for example, the word "PERmit" as a noun and "perMIT" as a verb (Himmelmann & Ladd, 2008). There is a crucial difference between tone and stress. In the tone language, there is no difference in prominence associated with the syllables that make up the word, while stress is a culminating property: only one syllable is the strongest. A language can be a tone or a stressed language, but it cannot be both except for certain languages because of language contact (van Heuven, 2018; van Heuven & Faust, 2009).

Prosodic studies at the post-lexical level reveal contour patterns of sentence mode, for example, declarative-interrogative sentences and sentence accents or intonation phrase accents. In intonation contours, generally, low-rising contours are significantly more likely to indicate declarativeness, while high-rising intonation contours are significantly more likely to indicate interrogativeness (Jeong, 2016). Then, in spontaneous speech, speech exchange tends to be faster between speakers (Bazarbayeva et al., 2021). In standard Italian, for example, questions that require yes/no are marked with an ascending contour at the end of the phrase as well as the contour that doubles as boundary marking and describes the information status of the question, whether it is conveyed with low confidence or high confidence (Grice & Savino, 1997).

Three intonational tones are important markers of prosodic constituents: pitch accent, phrase accent, and boundary tone. Pitch accent marks prominence. Phrase accent marks the end of intermediate phrases, and boundary tone signals the end of intonation phrases (Beckman & Pierrehumbert, 1986). Prominence in intonation phrases is qualitatively different from prominence at the lexical level. Word prominence is usually termed "stress", while prominence at the phrase level is termed intonational pitch accent (Shattuck-Hufnagel & Turk, 1996). Sadeghi (2021) found that the tonal structure in a fundamental frequency contour (F0) between the pitch accent and the end of the utterance differs in the two syntaxes. The L-L% tonal structure characterizes declarativeness and the L-H structure characterises interrogativeness. Furthermore, the intonation difference between statements and questions is limited to the characteristics of boundary tones and includes L and H tone patterns in the prenuclear domain and pitch accent (Sadeghi, 2021).

This prosody research will complete the information about the phonology of the Embaloh language. Due to the lack of Embaloh prosodic information,

documenting the language's prosodic grammar would help preserve the language. This study focuses on describing the prosodic system of the Embaloh language at the lexical and post-lexical levels. The observations in the study aim to observe the tone pattern through the contour of the fundamental frequency (F0). This article describes the prosodic system of the Embaloh language at the lexical and post-lexical prosody.

Methodology

Due to the lack of access to a phonetic laboratory, the data were taken at the location where the Embaloh speakers are staying. Therefore, field research was conducted. This study covers data collection in the field, interactions between the researchers and study subjects, and documentation (Queirós et al., 2017). The researchers spent 14 days in the field to collect the data. As Sherwood (2020) suggested, we set elicitation tasks to provide the speech data. We collected two types of data: spontaneous speech (*uncontrolled speech*) and non-spontaneous speech (*controlled speech*). The two data types are equally important (Yun et al., 2015). The recordings of spontaneous speeches contain more phonetic, phonological, and sociolinguistic phenomena and provide a broader perspective for researchers, providing a particular language's pragmatic and social context (Sherwood, 2020; Weonhee, 2015). In this study, 12 native speakers of the Embaloh language were involved, consisting of six males and six females. They were from different villages, social statuses, and occupations (see Table 1).

For the elicitation tasks, the first step was to gain spontaneous speeches, where we asked the informants or speakers to make unstructured narratives (Beckeman, 1997) by prompting them with open-ended questions. We let the speakers introduce themselves and tell their backgrounds in an informal conversation. In the second step, each speaker was asked to produce *an extended* descriptive narrative (Beckeman, 1997). In the last step, we asked the speakers to make short dialogues without guidance or text. They were allowed to choose any dialogue topics they used in daily conversations. Finally, we collected 12 personal introductions, 12 monologues (unstructured narratives), eight folktales (extended descriptive narratives), and 30 spontaneous question/answer conversations from them. The folktale titles can be seen in Table 1.

Table 1
Demographic Information of the Embaloh Language Speakers and Embaloh Folktales

Speaker Code	Status	Gender	Age	Occupation	Folktale Title	Address
KI	married	female	50	housewife	*Be' Saladang*	Balimbis, Banua Ujung
LL	married	female	39	farmer	*Bunining* (A story about an older woman who	Labian Iraang, Banua Ujung

					searches for fish)	
EN	married	male	48	farmer	The Origin of *Sao Langke Village*	Ulak Pauh
KMS	widow	female	53	housewife	*Kakek Sule* (A story about an old lazy man)	Banua Ujung
NN	widower	male	73	farmer	*Kakek Songkalang* (A story about an older man)	Banua Ujung
GK	widow	female	76	housewife	*Si Dudungus*	Bukung
LA	married	male	59	housewife	A story of the move of *Sao Langke*	Bukung
MS	married	male	70	farmer	*Kakek Utut* (*A story about the origin of Labian*)	Labian
DA	single	male	27	government officer	-	Labian
O	single	female	29	teacher	-	Iraang
KO	married	male	50	teacher	-	Banua Ujung
CL	single	female	26	unemployed	-	Banua Ujung

We provided a set of prepared sentences the speakers must read, remember, and state as naturally as possible to gain non-spontaneous data. The spoken sentence modes include declarative and interrogative sentences. The native speakers have corrected these sentences according to their habits. This kind of data was compared with the spontaneous data. Non-spontaneous speech data are also needed to investigate the prosodic structure of the Embaloh language words. For this purpose, we provided an expanded set of Swadesh word lists (Moris, 1955). We asked four speakers to pronounce these words. Then, we compiled a set of affixed words and asked the speakers to pronounce them.

The speech sound waves were observed using the Praat programme at the analysis stage. It is a computer programme for analysing, synthesising, and manipulating speech developed by Paul Boersma and David Weenink (Boersma & van Heuven, 2001; Boersma & Wening, 2013). Visualising speech can help to analyse the correct intonation pattern (Costille, 2022). The SoundEditor window on Praat is tuned with a broadband spectrogram setting. A broadband setting accentuates the tone of speech more. The acoustic parameter that is the focus of observation is the fundamental frequency (F0). Meanwhile, the prosodic contour analysis used the Autosegmental-Metrical Theory (AM) framework. In the AM theory, intonation contours can be broken into intonational tones. Apart from explicitly being the

prosodic identity of a syllable, these tones can also be the identity of a broader phrase (Pierrehumbert, 1980). A tone contour consists of a sequence of tone levels. The HL pitch is a sequence of H (high) and L (low) tones.

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of the National Research and Innovation Agency, Republic of Indonesia (Protocol Code: 008/KE.01/SK/3/2022 (approval date: 31 March 2022)).

Results

Word Prosody

Words in the Embaloh language are generally formed in two-syllabic (disyllabic) formations, for example [lamba"] for "walk", [lindo"] for "face", [lila] for "tongue", [baba"] for "mouth", [silu"] for "nail", [dara] for "blood", [jolo] for "first", [ulu] for "head" and [torong] for "forehead". Some words are in polysyllabic form, with three or four syllables. Words with a three-syllable composition, for example, [tampilik] for "cheek", [tatawa] for "laugh", [mamama"] for "chew", [mariko] for "cook", [saringkan] for "vegetable", [atutung] for "gosong", and [kayoko"] for "left" are the second commonly found form in the Embaloh language. In contrast, word forms with a composition of more than three syllables are very rare. Words with four and five syllables are generally in the form of compound words or phrases, for example, [kalang ulu] for "pillow", [sarang bawi] for "pigsty" and [kalian bawi] for "pig quarry". Words consisting of only one syllable are also found in the Embaloh language. However, there are very few, for example, [o] for "yes", [ko] for "imperative auxiliary", [ja] for "only", [jang] for "calling for a boy", [dar] for "kitchen", and [but] for squirrel. Table 2 shows that the basic form of the lexicon in the Embaloh language consists of two or three syllables.

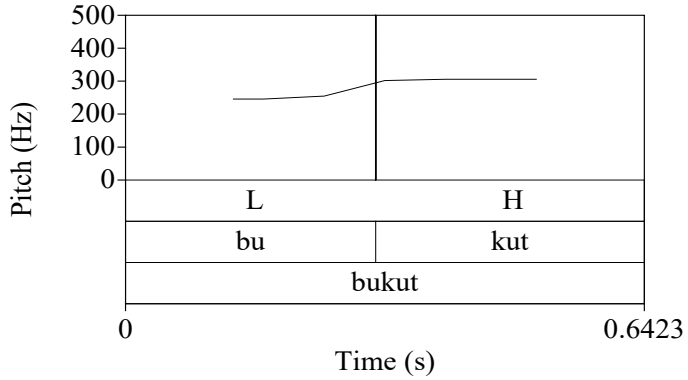
Most of the word stress in the Embaloh language is located on the right (right edge). However, the stress is not distinctive or distinguishes the lexical meaning. The location of the lexical stress in the Embaloh language is generally in the final syllable. The evidence in Figure 2 shows that the lexical stress is at the word's final syllable, for example, in [bukut] or "punch". A low, high tone is commonly used in prosodic words in the Embaloh language. The pitch increase from L to H is about 3–4 semitones. Acoustic properties that can mark the word stress consist of contour, intensity, and duration of a syllable that is longer than the duration of the previous syllable. If the stress is realised with an L tone, the intensity and duration of acoustic properties will be more prominent.

Table 2
Syllable Formation of Embaloh Language Words

Observed Word Shape	Number	Percentage
One syllable	12	2.5
Two syllables	285	63.3
Three syllables	110	24.3

Four syllables	37	8.1
Five syllables	4	1.6
Six syllables	1	0.2
Total	449	100

Figure 2
Word Stress at the Word's Final Syllable [bukut] "Punch"



In the Embaloh language, stress is generally consistent at the final syllable. The stress does not shift when the target word is affixed. For example, in polysyllabic (three syllables) words, the stress remains in the last syllable. Example (1a) – (1c) shows that affixation does not affect the position of stress. It remains at the end of syllables. Similarly, the same happens when the word turns into a passive form; the stress still occurs at the last syllable.

(1) a. [bu'kut] [mamu'kut]
"punch" "to punch"
base word *active form*

b. [ju'lu] [julu'ang] [taju'lu]
"push" "to push" "pushed"
base word *active form* *passive form*

c. [nuang] [manu'ang] [danu'ang]
"submit" "to submit" submitted
base word *active form* *passive form*

Interrogative Intonation with Question Word

In the Embaloh language, the position of question words in interrogative sentences, for example, [ai] for "what", [insa"] for "how much", [nanandisi] for "when", and [intain] for "who" are usually at the beginning of the sentence. However, in certain contexts, the interrogative sentences can be placed at the end of the sentence and are still considered acceptable sentences. Interrogative sentences containing

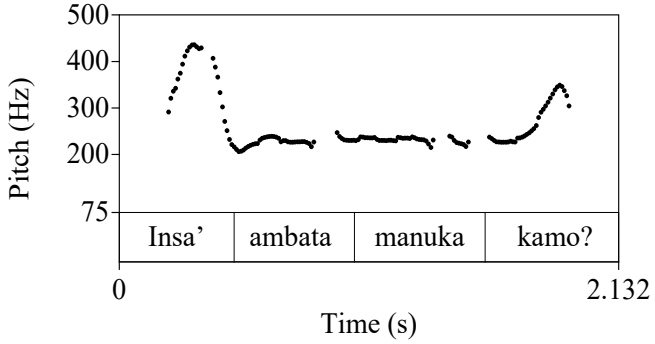
question words are usually marked by a nuclear pitch accent or a pitch accent on the question word. The tone H*, LH* or LHL* are the main characteristics of the tone accent in the question word. Because the peak of the tone of the intonation phrase is in the question word constituent, the pitch accent becomes the culminating domain of the intonation phrase at the location of the question word.

In Figure 3, the sentence "*Insa ambata manuka, kamo?"* Alternatively, "How many chickens does uncle have?" was spoken by a female Embaloh speaker in one intonation phrase with two phonological phrases or intermediate phrases, namely, (1) "*Insa ambata manuka"* and (2) "*kamo"*. The LHL tone marks the first phonological phrase, while the H% boundary tone marks the second phonological phrase. The boundary tone H% characterises the whole intonation phrase. The pitch accent, the culminating domain of intonation phrases, falls in the word "*insa"* or "how many". The highest pitch in the spoken intonation phrase characterises the pitch accent. The accent pitch, which falls in the word "*insa"* or "how many", becomes the head of the intonation phrase of the interrogative sentence.

If the question word is at the end of the sentence, the pitch accent will shift to the end of the sentence following the question word. This happens because the question word functioning to ask for information becomes the focus of the sentence information structure. In this context, the tone at the end of the sentence has a dual role: pitch accent and boundary tone. In example (2a), the pitch accent is at the beginning of the intonation phrase because the question word is at the beginning of the sentence. The intonation phrase in (2a) is marked by a boundary tone H%, which indicates interrogativeness. When the question word is in the middle of a sentence, the pitch accent will shift to the middle of the intonation phrase, as in (2b). In the sentence "*Kamo, asi jalu itatak iki?"* or "Uncle, what goods are cut by us?" the pitch accent shifted to the word "*asi*" or "what".

Figure 3

Interrogative Intonation Contour with Question Word at the Beginning of a Sentence



(2) a. [insa] [ambata manu ka kamo]?
LHL* **L** **H%**
"how many" "number" "chicken" "possess" uncle

"How many chickens does uncle have?"

b. [kamo] [asi] [jalu itatak iki]?
L **H** **LH*** **L** **H%]**
"uncle" "what" "goods" "cut" (passive verb) "we"

"Uncle, what goods are cut by us?"

In examples (3a) and (3b), the pitch accent is articulated by speakers in different intonation variations. In (3a), the pitch accent is at the beginning of the intonation phrase in the question word domain "*intain"* or "whom", while in (3b), the pitch accent is at the end of the intonation phrase and is still in the question word domain "*intain" or* "whom".

(3) a. [intain] [itiang iko kamo]
LH* **L** **H%**
"whom" "hit" "you" "uncle"

"Whom did you hit, uncle?"

The intonation contours in Figure 4 and Figure 5 show different locations of the pitch accent of the intonation phrase with the question word at the beginning and the intonation phrase with the question word at the end of the intonation phrase. This additional fact confirms that the pitch accent tends to be in the question word constituent in interrogative sentences with question words. If the question word is at the end of the intonation phrase, the tone of the question word has a dual role, namely, as a pitch accent and boundary tone. Phonetically, the typical peak of the nuclear pitch accent on the question word can reach 50-200Hz as measured from the baseline contour of the intonation phrase.

(3) b. [kamo] [maniang loa' intain]
LH **L** **H*%**
"uncle" "hit" "you" "whom"

"Uncle, whom did you hit?"

Figure 4

Interrogative Intonation Contour with Question Word "intain" (Whom) at the Beginning of a Sentence

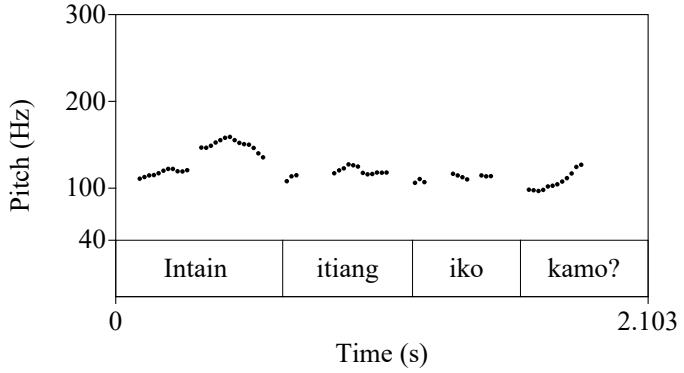
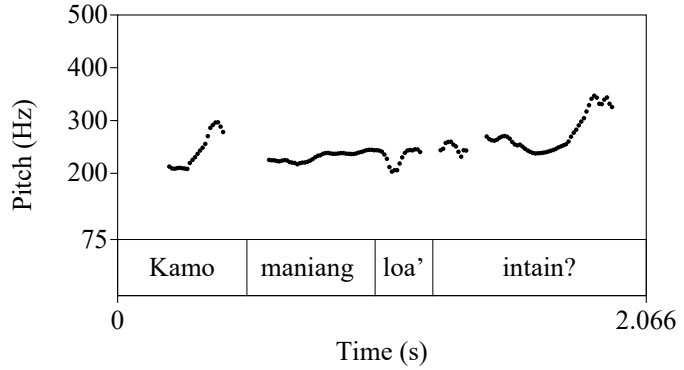


Figure 5

Interrogative Intonation Contour with Question Word "intain" (Whom) at the End of a Sentence



Yes/No Interrogative Intonation

It is called a yes/no interrogative sentence when the sentence needs a yes or no answer. This is also called an echoic or a polar question (Grice & Savino, 1997). This sentence does not use a question word. Lexically, this sentence is a declarative sentence, but it is pronounced with interrogative intonation so that semantically, it contains the illocutionary question sentence.

The intonation of interrogative sentences with yes/no answers (yes/no question) in the Embaloh language has differences and similarities with the intonation of interrogative sentences with question words. As previously explained, interrogative sentences with question words in the Embaloh language are characterised by pitch accents on the question words' constituents. If the question word shifts from the left side to the right side, the accent pitch follows the question word constituents. If the question word is on the right or at the end of the sentence, the accent pitch will also act as a boundary marker of the spoken intonation phrase.

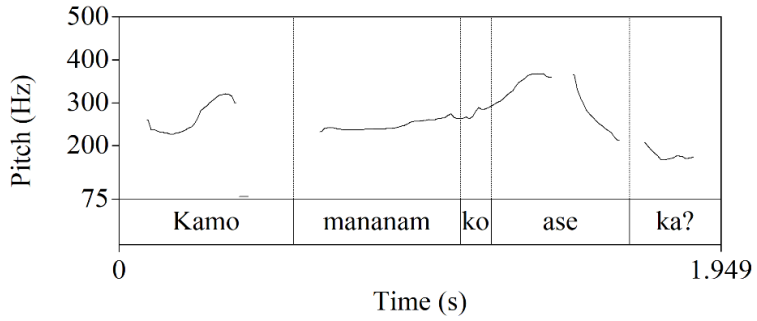
The boundary tone of the intonation phrases of interrogative sentences with question words in the Embaloh language is marked by H%.

The intonation of yes/no interrogative sentences in the Embaloh language is characterised by a pitch accent on the penultimate syllable or pre-final word. This intonation structure is different from the intonation structure of interrogative sentences with question words in the Embaloh language in terms of the location of the pitch accent. The pitch accent of interrogative sentences with question words in the Embaloh language usually follows the position of the question word in the sentence, while the accent pitch in yes/no interrogative sentences is always in the pre-final syllable in the spoken intonation phrase.

Figure 6 describes a sample of yes/no intonation contour in the Embaloh language, "*Kamo mananam ko ase ka?"* or "Uncle, did you plant paddy?" The interrogative sentence's pitch accent is located at the prefinal syllable at the second word, "*ase" or* "paddy", with the tonal structure H*. The boundary tone in yes/no interrogative sentences in this type of sentence is L%.

Figure 6

Yes/No Question Intonation Contour



(4)	[kamo]	[mananam	ko	ase	ka]?
	L H	**L**		**H***	**L%**
	"uncle"	"plant"	"you"	"paddy"	"question particle"

"Uncle, did you plant paddy?"

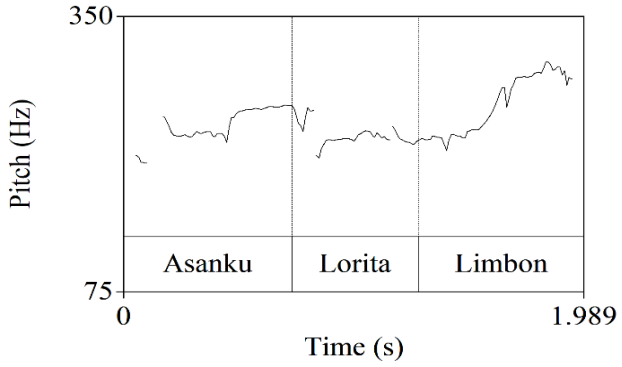
Declarative Intonation

The pitch accent location on the intonation contour of the statement usually falls on the last syllable of the intonation phrase. If it does not fall on that syllable, the pitch accent will fall on the penultimate syllable, but that rarely happens. The location of the pitch accent in the declarative intonation phrase is in line with the word stress in the Embaloh language, that is, the stress falls on the last syllable. The penultimate syllable with a pitch accent and the last syllable with or without a pitch accent usually experience extreme lengthening. Accentual lengthening in the last syllable also serves as a boundary tone with a tone of H*%. Boundary tones without a pitch accent have an L% tone. Suppose a declarative sentence intonation phrase consists

of two phonological phrases. In that case, the first has an H edge tone followed by an L tone as the beginning of the second phonological phrase, which becomes the domain of the pitch accent on the penultimate syllable or final syllable.

Figure 7

Declarative Intonation Contour with Default Pitch Accent at the End of Intonation Phrase



(5) [asanku] [lorita limbon]
LH **L** **H*%**
"my name" "Lorita Limbon"

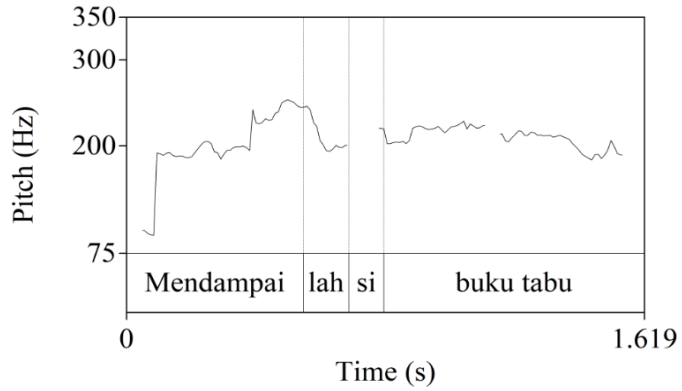
"My name is Lorita Limbon"

Figure 7 presents the default intonation contour of the declarative intonation phrases spoken by an Embaloh Dayak woman, "*Asanku Lorita Limbon*" or "My name is Lorita Limbon". The intonation phrase consists of two phonological phrases: "*Asanku"* or "my name", which acts as the subject, and "*Lorita Limbon"*, which acts as the predicate. The first phonological phrase, "*Asanku"*, is characterised by an LH tone structure. Tone H acts as the edge tone of the phrase. Then, the second phonological phrase, "*Lorita Limbon"*, begins with an L tone and ends with an H tone in the final syllable. However, the H tone in the phrase acts as a pitch accent and boundary tone that characterises the entire target intonation phrase, giving it the notation H*%.

A pitch accent in a declarative intonation phrase can shift when a constituent is given the focus of information. The pitch of the accent will be in the constituent of the word that is in focus, and the accent will be on the last syllable of the word; however, if the word contains a clitic, for example, enclitic "*–lah"* (the affirmation enclitic), the pitch accent of the focused word shifts to the pre-final syllable. In Figure 8, for the word *"mendampailah*", the location of the pitch accent constituent is located at the end of the first phonological phrase. This phrase also serves as a nuclear contour. The pitch accent in the phrase becomes the culmination of the target intonation phrase. In Figure 8, the pitch accent is not in the pre-final syllable in the first phonological phrase because the final syllable is occupied by the enclitic "*–lah*".

Figure 8

Intonation Contour with Default Pitch Accent at the End of Declarative Intonation Phrase



(6) [mendampai lah] [si buku tabu]
L H* **L** **L H%**
"comes up" enclitic "Si Buku Tabu"

"Si Buku Tabu (a name) comes up"

Discussion

The analysis shows that the Embaloh language has a prominent pattern at the word prosody level at the last syllable. The location of the stress or accent of the word is not affected by the number of syllables or the affixation process. The Embaloh language is more accurately categorised as fixed-stressed because the word stress tends to be consistent in the last syllable. For languages with fixed stress, just one rule determines the position of the word stress for the entire lexicon (van Heuven, 2018). The stress pattern categorises the Embaloh language as a language with a right-edge word stress system because the culminating constituent falls on the last syllable. We found no distinctive tonal contrast in the language. Therefore, the Embaloh language cannot be categorised as a tone language such as Mandarin or Iau. Word stress in the Embaloh language also functions as a boundary marking or a right edge marking for the word. Moreover, the word stress in the Embaloh language is typologically different from that in Indonesian. In Indonesian, the word stress is inconsistent in certain syllables (Zanten & Heuven, 2004). The pattern of fixed stress in the prosodic word system in Embaloh is also different from that in most Austronesian languages. Most Austronesian languages emphasise the penultimate syllable (Goedemans & Hulst, 2013). See also Stoel (2007), who found stress in the penultimate syllable in Manado Malay. This finding also differs from Adelaar (1995), which stated that word stress location in the Embaloh language was at the penultimate syllable. The word prosody of the Embaloh language also has different characteristics from one of the languages in the same subgroup, namely, the Bugis language, which is geographically located very far from the Embaloh language (about 1,000 kilometres). In this language, the stress falls on the

penultimate syllable in words with three or more syllables. However, the stress can fall either on the first or the last syllable in the words of two syllables. Moreover, the stress can be contrastive, for example, [ˈasu] for “dog” and [aˈsu] for “to go” (Valls, 2014). On the other hand, the word prosody of the Embaloh language is contrastive like the Bugis language.

In the context of post-lexical prosody, the position of the question word in the intonation phrase determines the position of the pitch accent. The pitch accent with an F0 peak is usually in the question word domain and is always at the end of the syllable in the question word. If the question word is at the end of the phrase, the pitch accent is automatically located at the end of the phrase. The pitch accent will be at the beginning of the intonation phrase if the target question word is in front, but the peak F0 remains in the final syllable in the nuclear contour, which is the domain of the pitch accent. The position of the pitch accent, which is always on the question word, indicates that the focus of the information in the interrogative intonation phrase is on the target question word.

In the yes/no question intonation, it is identified that speech questions that require a yes/no answer seem only to provide one opportunity for the pitch accent position in the target intonation phrase, namely at the end of the phrase and the pitch accent position is always in the final syllable in pre-final words before the question particle. Questions with the particle “ka” in the Embaloh language, which is mandatory in yes/no question sentence syntax, seem to play a role in determining the location of the pitch accent in the intonation of yes/no question sentences, which is from the last syllable of the pre-final word. So, the pitch accent in the intonation of yes/no questions does not automatically act as a boundary marking. The boundary marking in intonation phrases of yes/no questions has an L% tone. It is increasingly clear that the intonation structure of yes/no question sentences differs from that of interrogative sentences with question words due to two factors: the location of the pitch accent and the boundary marking. The intonation phrases of interrogative sentences yes/no are represented by the tone structure L+H*+L% in the nuclear contour. In contrast, the intonation of interrogative sentences with question words at the end of the phrase is represented by the tone structure L+H*%.

The statement intonation phrases in the Embaloh language have a nuclear pitch accent at the end of the phrases. The phrases are characterised by the tone structure H*%. The tone also acts as a boundary marking. The statement phrase that becomes the domain of the pitch accent at the end of the syllable usually begins with an L tone. The L tone is the starting point for a phonological phrase that acts as a nuclear contour, that is, a phonological phrase that embodies the pitch accent or nuclear pitch accent. The nuclear pitch accent is part of the pitch contour and is the most prominent word in a prosodic characterised by the peak of the fundamental frequency (F0) (Roessig et al., 2019). The previous phonological phrase, even though it has an H tone at the end of the phrase, acts as a prenuclear contour in an intonation phrase.

The findings in this prosody research show that both the question intonation phrase with a question word at the end of the phrase and the statement intonation phrase end with an H% tone, which at the same time acts as a pitch accent or the culmination of the F0 intonation phrase. Then, what distinguishes the tone structure

of these two types of intonation phrases? The difference in the tone structure of these two types of intonation phrases in the Embaloh language lies in the relative peak of F0 and the relative duration of the increase in F0 of each type. The ascending but low contour structure in many languages indicates more declarativeness, while the significantly rising F0 contour tends to indicate interrogativeness (Jeong, 2016). Jeong's finding, however, contradicts Sadeghi's (2021) finding, which states that an L-L% tone structure characterises the statement mode, and the interrogative mode has an L-H tone structure. This study found that the intonation phrases of a language statement can have an L-H tone structure. An intonation structure can also represent a statement or question with a phonetic difference. This is unsurprising because the correspondence between intonation and sentence structures is not obligatory and unique (Hart et al., 1990).

Related to the correlation of word stress with the intonation contour of the Embaloh language, it can be explained that the consistent word stress in the final syllable in the language affects the post-lexical prosody system except for the intonation of question sentences that require yes/no answers because of the question particle factor. This exception also applies to statements with the affirmation enclitic "*–lah*" as shown in Figure 7. Lexical and post-lexical prosody in that language have similarities, i.e., the word stress and pitch accent are on the right edge, more precisely in the last syllable. In addition to occurring in the question intonation phrases with question words, this also occurs in statement intonation phrases.

Conclusion

At the prosodic lexical level, we conclude that the Embaloh language is fixed-stressed. It cannot be categorised as a tone language. The word stress in the Embaloh language is in the final syllable. On the one hand, the Embaloh language follows the general pattern of Austronesian languages in that the stress is located to the right of the word. On the other hand, it does not follow the general pattern of word stress locations in Austronesian languages, i.e., in the penultimate syllable. At the post-lexical prosody level, the intonation of interrogative sentences with question words in the Embaloh language is characterised by the pitch accent of the target question word in its nuclear contour domain and the last syllable of the question word being the culmination of the phrase. The H*% tone has a dual role as a pitch accent and boundary marking. In interrogative sentences that require a yes/no answer, the pitch accent with H* tone is in the pre-final word before the question particle, and the boundary tone for this intonation is L%. In statement intonation phrases, the pitch accent is at the end of the phrase and acts as a boundary marking. However, the location of the pitch accent will shift if there are words that are given a particular focus. Regarding phonology, this research significantly contributes to a better understanding of the Embaloh language prosody. This research also contributes to preserving the Embaloh language amid other more robust and better-documented languages in Borneo.

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