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Lexical Tone in Metnyo Ambel

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In this paper, I outline the tone system of the Metnyo dialect of Ambel, an endangered Austronesian language spoken in the Raja Ampat archipelago in east Indonesia. The tone system of Metnyo Ambel is binary and privative: /H/ syllables contrast with toneless syllables. I will present data from monosyllabic and polysyllabic words, as well as words of varying morphological complexity, to show that tone is culminative, both at the level of the morpheme and in the output, but not obligatory. The realization of tone will also be described. In particular, I focus on the pitch patterns found on intonation phrase-final syllables, which depend on a complex interaction between lexical tone, intonational boundary tones (whether the word is lexical or grammatical), and the moraic weight of the syllable. Finally, the tone system of Metnyo Ambel will be compared with the prosodic systems of other nearby languages, including the closely related Ma'ya and Matbat.

1. INTRODUCTION.¹ Ambel is spoken by around 1,600 people on the island of Waigeo, in the Raja Ampat archipelago in West Papua province, Indonesia. It is an Austronesian language, belonging to the South Halmahera-West New Guinea (SHWNG) subbranch (see Blust 1978). Within SHWNG, Ambel is classified as a Raja Ampat–South Halmahera language (Remijsen 2001a:32–37; Kamholz 2014). Prior to this paper, the only published materials on Ambel were a wordlist in Smits and Voorhoeve (1992), and a wordlist and a one-page overview of Ambel phonology and morphology in Remijsen (2001a). While Remijsen does not look at the phonology of Ambel in detail, he concludes

1. The research presented in this paper is based on speech data recorded in Kapadiri, Waigeo. The data were recorded from Martinus Wakaf, Alfred Gaman, Aplena Awom, Yubel Kein, Magdalena Wakaf, Konstantina Wakaf, Selepe Wakaf, and Darius Wakaf. I offer them my sincere thanks for their collaboration. Special thanks are also due to Wolter Gaman for his help with finding transportation and accommodation, and Yubel Kein and Konstantina Wakaf for housing and feeding me during my time in Kapadiri.

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that the language does not have tone (2001a:161). A full descriptive grammar of Ambel is forthcoming (Arnold 2018).

In this paper, I present data collected from native speakers of the Metnyo dialect of Ambel. These data show that the language has lexical distinctions based on pitch, in a tone system in which syllables specified with High tone (/H/) contrast with toneless (/Ø/) syllables. The system is, therefore, binary and privative. There is only one /H/ syllable per morpheme; where two morphemes with /H/ specification come together to form a word, one of the /H/s is deleted to enforce culminativity in the output. Words without /H/ specification are also attested. The system is, therefore, not obligatory.

The remainder of this paper is structured as follows. In section 2, I provide a brief overview of the Ambel language and its speakers. This information gives the necessary background required to understand the tone system, which will be discussed from section 3 onwards. Section 3 describes the tonal phonology of Metnyo Ambel, as well as the intonation phrase-medial realizations of /H/ and toneless syllables. In section 4, I turn to the realization of pitch on intonation phrase-final syllables. This paper concludes in section 5, with a discussion of the Metnyo Ambel tone system in the wider typological, genetic, and areal context, and a consideration of some possible mechanisms for tonogenesis.²

2. AMBEL: AN OVERVIEW. Ambel is spoken in eleven villages on Waigeo, the northernmost island in the Raja Ampat archipelago. There are also some speakers in the administrative center of the island, Waisai, which is situated on the south coast. The Ambel language area is shown in map 1.

MAP 1. THE AMBEL LANGUAGE AREA

2. Throughout this paper, all transcriptions of Ambel use IPA conventions. In addition to the standard abbreviations listed in the Leipzig Glossing Rules, the following abbreviations are also used: AN, animate; INAN, inanimate; MID, mid-distance deictic root; PC, paucal number; POS.INT, positively biased interrogative marker; SEA, seawards deictic marker.

The youngest speakers of Ambel were born around the year 2000. Most of those born after 2000 have neither an active nor a passive command of the language. In addition, speakers of all ages are shifting to Papuan Malay, the local variety of Malay and the current lingua franca of the area (Kluge 2014). Ambel is, therefore, an endangered language. This is reflected in the Language Status EGIDS level 7 “shifting” that has been assigned to Ambel by Ethnologue (Simons and Fennig 2017). There are two main dialects of Ambel: Metsam, spoken in the villages Kalitoko and Warsambin, to the south of the Ambel area, and Metnyo, spoken in the remaining nine villages. The dialect described in this paper is the Metnyo dialect, as spoken in the village of Kapadiri on the north coast of Waigeo.

Ambel has five vowel phonemes: /i e a o u/. Vowel length is not phonemic. The phonetic diphthongs [ei] [ai] [oi] [ui] [iu] [eu] [au] [ou] are analyzed as realizations of underlying sequences of a vowel followed by a glide (/j/ or /w/). There are 14 native consonant phonemes: /p t k b d g s h m n r l w j/. There are also four loan phonemes: /tʃ/, /dʒ/, /ɲ/, and /ŋ/. Occurrences of the phonetic affricates [tʃ] and [dʒ] in native monomorphemic words are analyzed as realizations of underlying /tj/ and /dj/, respectively. With regard to the suprasegmental phonology, Ambel does not have lexical stress. The lexical tone system of Ambel is the focus of this paper, and will be discussed from section 3 onwards. Turning to phonotactics, the maximal syllable structure in Ambel is CCGV (for example, the first syllable of /mnjáran/ ‘diligence’), CCVC (for example, /mnát/ ‘strength’), or CVGC (for example, /lájn/ ‘sand’). Most syllables, however, are CV or CVC (for example, /gu/ ‘hole’; /hát/ ‘four’). Voicing is noncontrastive in syllable codas. Word length ranges from one to six syllables; mono- and disyllabic words are most common.

The structure of Ambel is generally analytic; for example, there is no tense/aspect morphology or case marking. There are, however, two areas in which the morphology is very rich: a system of verbal inflection marking the syntactic subject, and a system marking the possessor in a possessive noun phrase. Both systems distinguish first person inclusive and first person exclusive; in the third person, animate vs. inanimate entities; four numbers (singular, dual, paucal, and plural) for animate subjects or possessors; and, in the verbal inflection, two numbers (singular, nonsingular) for inanimate subjects. Number is not distinguished for inanimate possessors in the possessive morphology.

3. TONAL PHONOLOGY. As introduced above, the tone system of Ambel is culminative, but not obligatory. Following Hyman (2006, 2009), the nonobligatory nature of the system distinguishes it from a stress accent system, in which pitch may be used culminatively and obligatorily to mark metrical prominence. As will be described in 4.1, the tone-bearing unit in Ambel is the first mora of the syllable. As stress accent systems by definition target the syllable, rather than the mora (Hyman 2006: 233), this confirms the analysis of the word-prosodic system of Ambel as tonal.

In this section, issues relating to the phonology of tone in Ambel are described. Minimal and near-minimal pairs are presented in 3.1, alongside a description of the intonation phrase-medial realization of /H/ and toneless syllables, and culminativity is discussed in 3.2. Certain possessive constructions employ tone to mark the possessor; these constructions are discussed in 3.3.

3.1 TONAL CONTRASTS AND IP-MEDIAL REALIZATIONS. Monosyllabic minimal and near-minimal pairs demonstrating the underlying contrast between /H/ and toneless syllables are given in table 1. In this table, the intonation phrase (IP)-medial realizations are also provided.³

**TABLE 1. MINIMAL AND NEAR-MINIMAL PAIRS:
MONOSYLLABIC WORDS†**

/H/			/Ø/		
Nouns:					
/tún/	[tún]	‘moon’	/tun/	[tùn]	‘thorn’
/wów/	[wów]	‘steam’	/wow/	[wòw]	‘rainbow’
/jé/	[jé]	‘island’	/we/	[wè]	‘water’
/kút/	[kút]	‘coconut’	/kit/	[kit]	‘octopus’
/ná/	[ná]	‘kind of spear’	/ma/	[mà]	‘kind of eagle’
Verbs:					
/j-ún/	[jún]	‘1SG-pick.up’	/j-un/	[jùn]	‘1SG-know’
/sów/	[sów]	‘wash.1SG’	/sow/	[sòw]	‘fart.1SG’
/sín/	[sín]	‘exchange.1SG’	/sin/	[sìn]	‘catch.1SG’
/súp/	[súp]	‘bathe.1SG’	/sup/	[sùp]	‘repeat.1SG’
/d<j>ú/	[džú]	‘<1SG>pull’	/d<j>u/	[džù]	‘<1SG>obey’

† Phonetic realization in IP-medial position.

As can be seen from the phonetic data in table 1, IP-medially, /H/ syllables are realized [H], and toneless syllables are realized [L]. Pitch contours showing the IP-medial realization of the /H/ monosyllable /tún/ ‘moon’ as [H], and of the toneless monosyllable /tun/ ‘thorn’ as [L], are given in figures 1 and 2, respectively.⁴

Minimal and near-minimal pairs from disyllabic and trisyllabic words, as well as their IP-medial realizations, are provided in tables 2 and 3, respectively. Native roots without tonal specification are extremely rare in Ambel: of 1207 di- and trisyllabic nominal and verbal roots attested in the corpus, only 10 toneless native roots (0.83 percent) are attested. Nearly all shallow loans attested in the corpus, however, are toneless.⁵

The data in tables 2 and 3 show that, if a toneless syllable follows a /H/ syllable, the realization of the toneless syllable assimilates to the [H] target; it is then realized [H ~ M] (represented orthographically with a macron).⁶ Figure 3 is a pitch contour showing the

3. The IP in Ambel is defined as the minimal unit in fluent speech that can be preceded or followed by a pause. The IP is the domain of several intonation contours, which are used to mark utterances of different types, such as declarative, imperative, polar interrogative, and constituent interrogative. The IP-final realization of /H/ and toneless syllables depends, among other things, on the intonation contour of the utterance. The interaction between lexical tone and the boundary tones that characterize the intonation contours marking declarative/imperative and polar interrogative utterances will be discussed in section 4.

4. The root ‘say’ is /bine/, and is a Class III verb (see 3.2.1 for more on verb class). When Class III roots are inflected to mark a 1SG or 2SG subject, they take the infix /<j>/. When a /b/-initial Class III verb takes /<j>/-infixation, this is realized [dʒ].

5. The donor languages for these loanwords are typically Biak (another SHWNG language spoken in several settlements on Waigeo; van den Heuvel 2006), Tidore (a historically influential Papuan language spoken in South Halmahera; van Staden 2000), or varieties of Malay (most often Papuan Malay, the present-day lingua franca of Indonesian Papua; Kluge 2014). None of these languages is tonal.

FIGURE 1. IP-MEDIAL REALIZATION OF /H/ IN A MONOSYLLABIC WORD, /tún/ ‘MOON’: [H]

FIGURE 2. IP-MEDIAL REALIZATION OF /A TONELESS MONOSYLLABIC WORD, /tun/ ‘THORN’: [L]

IP-medial realization of the disyllabic word /pánje/ ‘morning’; this figure exemplifies the assimilation of the toneless second syllable to [H ~ M] when following the first syllable, which bears /H/.

Figures 1 and 2 above additionally show that /H/-assimilation crosses word boundaries. In 4.1, it will be shown that, IP-finally, monomoraic toneless syllables are realized Rise ([LH]). In figure 2, the toneless marker of negation /po/, which follows the toneless /tun/, is realized [LH], as expected. When following a /H/ syllable, however, as in figure 1, toneless /po/ is realized [H ~ M], due to assimilation to the [H] target of the preceding syllable.

6. The term ‘/H/ syllable’ does not include syllables that are underlyingly /H/, but which have undergone one of the processes of /H/-deletion that will be described in 3.2 and 3.3.

TABLE 2. MINIMAL AND NEAR-MINIMAL PAIRS:
DISYLLABIC WORDS†

	/H.Ø/	/Ø.H/	/Ø.Ø/
Nouns:			
	/kámuk/ [kámūk] ‘reciprocal namesake’	/kamúk/ [kàmúk] ‘in-law.1SG’	—
	/káбом/ [kábōm] ‘widow’	/kabóm/ [kábóm] ‘bone’	—
	/káwa/ [káwā] ‘kind of seaweed’	—	/kata/ [kātā] ‘cape’
Verbs:			
	/j-ám̄tin/ [jám̄t̄in] ‘1SG-fasten’	/j-amtén/ [jám̄tén] ‘1SG-name’	/ja-tin/ [jätin] ‘1SG-point’
	/j-ám̄i/ [jám̄i] ‘1SG-laugh’	/j-amí/ [jám̄i] ‘1SG-suck’	/ja-maw/ [jám̄aw] ‘1SG-want’ (< Malay)

† Phonetic realization in IP-medial position.

TABLE 3. MINIMAL AND NEAR-MINIMAL PAIRS:
TRISYLLABIC WORDS†

	/H.Ø.Ø/	/Ø.H.Ø/	/Ø.Ø.H	//Ø.Ø.Ø/
Nouns:				
	/kásjawa/ [kásjāwà] ‘kind of manta’	/kabábat/ [kábábāt] ‘butterfly’	/kalabét/ [kálábét] ‘goanna’	/kapaja/ [kápājā] ‘papaya’ (< Tidore)
	/sábokol/ [sábōkòl] ‘kind of shellfish’	—	/sapurér/ [sàpùrér] ‘black-capped lory’	/sàdzara/ [sàdžàrà] ‘history’ (< Malay)
Verbs:				
	—	/j-agáli/ [jágālī] ‘1SG-dive’	/ja-gali/ [jágālī] ‘1SG-speak.language’	/ja-gali/ [jágālī] ‘1SG-help’
	—	/ja-kátu/ [jákātū] ‘1SG-fix.canoe’	/ja-kapá/ [jákápá] ‘1SG-pull.out’	/ja-katu/ [jákātū] ‘1SG-fold’

† Phonetic realization in IP-medial position.

3.2 THE SYSTEM AS CULMINATIVE. If we consider again tables 2 and 3, these data show that there is a maximum of one /H/ syllable per root. This is because the tonal phonology of Ambel is culminative at the level of the morpheme, in that no more than one /H/ syllable is permitted per morpheme. However, as two morphemes, both with a /H/ syllable, may come together to form a word, some morphologically complex words have more than one underlying /H/ syllable. In these cases, culminativity is enforced in the realization, in that one of the /H/s is deleted. Which one of the /H/s is

FIGURE 3. H-ASSIMILATION: THE IP-MEDIAL REALIZATION OF /pánje/ ‘MORNING’

deleted depends on the morphological make-up of the word. Multiple /H/ specifications may occur when a verbal root takes subject-marking inflection, and in nominal and verbal compounding.⁷ Each of these domains is discussed in turn.

3.2.1 Culminativity in subject-marked verbs. In Ambel, the syntactic subject is obligatorily marked on verbal predicates, using either a prefix or an infix (or both). Verb roots belong to one of four inflectional classes, depending on the morphological paradigm used to mark the subject. For example, a 1SG subject is marked with a prefix /j-/ on Class I and Class IV verbs, a prefix /j-/ on Class II verbs, and an infix /<j>/ on Class III verbs; a 3SG.INAN subject is marked with /aN=na-/ on Class I verbs, /aN=n-/ on Class II verbs, and /aN=/ on Class III and Class IV verbs. Verb class is lexically specified. Examples of verbs from each class, inflected to mark 1SG and 3SG.INAN subjects, are given in (1).

(1) Verbal subject-marking morphology:

a. Class I: /kátown/ ‘sit’

1SG subject: /ja-kátown/ ‘I sit.’

3SG.INAN subject: /aN=na-kátown/ ‘It sits.’

b. Class II: /ól/ ‘stand’

1SG subject: /j-ól/ ‘I stand.’

3SG.INAN subject: /aN=n-ól/ ‘It stands.’

c. Class III: /belémaj/ ‘be fast’

1SG subject: /b<j>elémaj/⁸ ‘I am fast.’

3SG.INAN subject: /aN=belémaj/ ‘It is fast.’

7. Certain types of serial verb construction in Ambel can also have more than one /H/ syllable. When two or more /H/ syllables occur within a serial verb construction, the mechanism for maintaining culminativity is the same as that described for subject-marked verbs below: that is, there is progressive /H/ deletion. However, owing to the lack of systematic data on the tonal phonology of serial verb constructions, they are not discussed in this paper.

8. As described in fn. 4, there is a morphophonological process in which /b/-initial Class III verbs are realized as [dʒ]-initial when inflected with /<j>/: thus, /b<j>elémaj/ is realized [dʒelémaj].

d. Class IV: /kábjal/ ‘float in water’

1SG subject: /ja-kábjal/ ‘I float in water.’

3SG.INAN subject: /aN=kábjal/ ‘It floats in water.’

In each of the four subject-marking paradigms, there are five prefixes that bear /H/ specification: /tút(a)-/ ‘1PC.INCL’, /atúm(a)-/ ‘1PC.EXCL’, /matúm(a)-/ ‘2PC’, /atúl(a)-/ ‘3PC’, and /ám(a)-/ ‘1PL.EXCL’.⁹ When these morphemes attach to a root with a /H/ syllable, a progressive process of /H/ deletion occurs: the first /H/ is realized [H], and the second /H/ is deleted. Consider the data in table 4, where the Class II verbal roots /áti/ ‘run’ and /abáj/ ‘play’ are inflected to mark 1SG, 1DU.INCL, and 1PC.INCL subjects.

TABLE 4. THE VERBS /áti/ ‘RUN’ AND /abáj/ ‘PLAY’, INFLECTED TO MARK 1SG, 1DU.INCL, AND 1 PC.INCL SUBJECTS[†]

	/áti/ ‘run’		/abáj/ ‘play’	
1SG	/j-áti/	[játi]	/j-abáj/	[jàbáj]
1DU.INCL	/tut-áti/	[tùtáti]	/tut-abáj/	[tùtábáj]
1PC.INCL	/tút-áti/	[tútāti]	/tút-abáj/	[tútābáj]

[†] Phonetic realization in IP-medial position.

While the 1SG and 1DU.INCL subjects in table 4 are marked with the toneless prefixes /j-/ and /tut-/, respectively, the 1PC.INCL subjects are marked with the /H/-toned prefix /tút-/. When this /H/ prefix attaches to a root with /H/ specification, the /H/ syllable of the root is realized [H ~ M] if it follows a /H/ syllable (as in the penultimate syllable of /tút-áti/ [tútāti] ‘1PC.INCL-run’), and [L] elsewhere (as in the final syllable of /tút-abáj/ [tútābáj] ‘1PC.INCL-play’). In other words, when a prefix with a /H/ syllable attaches to a root with a /H/ syllable, the /H/ of the root is deleted, and the syllable is realized as if it were toneless.

3.2.2 Culminativity in compounds. The second domain in which two /H/ syllables may occur within a single word is in nominal and verbal compounds. Compounds are words that are derived from two independent lexical roots. Nominal compounds are nouns formed of either a noun plus a verb (for example, /go/ ‘bamboo’ + /kápo/ ‘whistle (v.)’ = /go-kápo/ ‘flute’), or two nouns (for example, /kátin/ ‘stone’ + /tási/ ‘salt water’ = /katin-tási/ ‘stony coral’). Verbal compounds are verbs formed of a verb plus a noun (for example, /tán/ ‘go, walk’ + /we/ ‘water’ = /tan-we/ ‘urinate (polite)’).

Only one /H/ is realized per compound; if more than one /H/ occurs in the compound, one is deleted. In this way, compounds are similar to subject-marked verbs. However, while it is always the second /H/ that is deleted in subject-marked verbs, which of the two /H/s is deleted in compounds depends on the prosodic headedness of the compound.

As an illustration, consider the data in table 5. In this table, data from semantically left-headed compounds—that is, compounds in which the left-hand element determines the meaning of the compound as a whole—are presented.¹⁰

9. The realization of the final /a/ of these prefixes is predictable based on the class of the root to which it attaches: if the verb is Class I or IV, the /a/ is present, whereas if the verb is Class II or III, the /a/ is not present. The /H/ element /tú/ in the paucal prefixes has grammaticalized from the numeral /túl/ ‘three’.

TABLE 5. LEFT-HEADED COMPOUNDS†

Components					Compound	
/H/ + /H/	/bém/	‘plate’	+	/wán/	‘canoe’	[bém-wán] ‘type of plate’
/Ø/ + /Ø/	/tjun/	‘sago biscuit’	+	/haw/	‘sago funnel’	[tjùn-hàw] ‘smoked sago’
/H/ + /Ø/	/áj/	‘wood’	+	/li/	‘outside’	[áj-li] ‘frame of house’
/Ø/ + /H/	/mo/	‘current’	+	/mú/	‘low tide’	[mò-mú] ‘low tide’

† Phonetic realization in IP-medial position.

While the compounds in table 5 are semantically left-headed, they are prosodically right-headed: the tone of the left-hand element is never realized, only the tone of the right-hand element. In other words, the /H/ of the left-hand element is deleted, and, thus, the realization of this element is always [L]. This is seen, for example, in the realization of both the /H/-specified element /áj/ ‘wood’ in the compound [áj-li] ‘frame of house’, and the toneless element /tjun/ ‘sago biscuit’ in the compound [tjùn-hàw] ‘smoked sago’ as [L]. The realization of the second element of the compound, however, does depend on the tonal specification of that element; thus, while the toneless right-hand element /li/ ‘outside’ is realized [L] in the compound [áj-li] ‘frame of house’, the /H/-specified right-hand element /wán/ ‘canoe’ is realized [H] in the compound [bém-wán] ‘type of plate’. That this process of /H/-deletion is different from the progressive process described above for inflected verbs is shown by compounds in which the first element bears a /H/ specification, such as /áj-li/ ‘frame of house’ or /bém-wán/ ‘type of plate’. If this were progressive, we would expect to see these compounds realized as *[áj-li] and *[bém-wán], respectively.

Whereas semantically left-headed compounds are prosodically right-headed, semantically right-headed compounds are prosodically left-headed. This is shown in the data provided in table 6.¹¹

TABLE 6. LEFT-HEADED COMPOUNDS†

Components					Compound	
/H/ + /H/	/láj/	‘sand’	+	/bít/	‘edge’	[láj-bít] ‘beach’
/Ø/ + /Ø/	/we/	‘water’	+	/lo/	‘place’	[wè-lò] ‘river’
/H/ + /Ø/	/bát/	‘ground’	+	/lo/	‘place’	[bát-lò] ‘garden’

† Phonetic realization in IP-medial position.

Unlike the left-headed compounds presented in table 5, the data in table 6 show that, for semantically right-headed compounds, the left-hand elements are realized in accordance with their underlying tone, and the /H/ of the right-hand element, if present, is deleted. Thus, the /H/-specified left-hand element /bát/ ‘ground’ is realized [H] in the compound [bát-lò] ‘garden’, and the toneless left-hand element /we/ ‘water’ is realized [L] in the compound [wè-lò] ‘river’. Similarly, the right-hand elements are always realized as if they were toneless. For example, the toneless element /lo/ ‘place’ in the compound [bát-lò] ‘garden’

10. The compounds in table 5 all consist of two nouns. All nominal compounds composed of a noun plus a verb are left-headed, as are all verbal compounds. Prosodically, noun-verb and verbal compounds behave the same as left-headed noun-noun compounds.

11. Only noun-noun right-headed compounds are attested in Ambel. There are no attestations of right-headed compounds in which the first element is toneless, and the second element has a /H/ syllable.

is realized [H ~ M], as is expected for a toneless syllable following a /H/ syllable, as is the /H/ element /bít/ ‘edge’ in the compound [lájn-bīt] ‘beach’.

3.3 TONE IN THE POSSESSIVE MORPHOLOGY. Before moving on to a description of the IP-final realization of tone in Ambel, let us briefly consider the role played by tone in certain possessive paradigms. All nouns in Ambel are specified for whether they are possessed in indirect possessive constructions or direct possessive constructions. In both indirect and direct possessive constructions, the word order is possessor–possessed. In indirect possessive constructions, the person, number, and animacy of the possessor is marked on a particle, using prefixes and suffixes. The inflected particle occurs before the possessed noun. This construction is exemplified in (2), in which the 3SG possessor is marked on the prenominal particle /ni/ ‘POSS’, using the prefix /i-/. In direct possessive constructions, the possessor is marked directly on the possessed noun, using prefixes and suffixes. As will be described below, in some of the direct paradigms there is additionally a suprasegmental affix (henceforth: suprafix). An example of a direct possessive construction is given in (3). In this example, the prefix /i-/ is again used to mark the 3SG possessor, this time attaching to the possessed noun /nú/ ‘same sex sibling’.

- (2) [mákaj bin pa]_{POSSR} [i-ni now pa]_{POSSD}
 child female ART 3SG-POSS opposite.sex.sibling ART
 ‘the girl’s brother’

- (3) [mákaj bin pa]_{POSSR} [i-nú pa]_{POSSD}
 child female ART 3SG-same.sex.sibling ART
 ‘the girl’s sister’

Direct possessive constructions can be subdivided into three groups, depending on the morphological paradigm used to mark the possessor. Nouns specified for possession using the first paradigm (henceforth: Direct I) refer to parts of wholes, and include all parts of plants, and most terms for animal and human body parts.¹² Six kin terms are specified for possession using the second paradigm (henceforth: Direct II): /awá/ ‘spouse’, /kamú/ ‘different generation in-law’, /má/ ‘father’, /njá/ ‘mother’, /nú/ ‘same-sex sibling’, and /tábju/ ‘grandchild, grandparent’. Finally, six nouns of association are specified for possession using the third paradigm (henceforth: Direct III): /gáin/ ‘name’, /kója/ ‘footprint’, /lu/ ‘shadow’, /pup/ ‘nest, spider web’, /(sá)gale/ ‘tail’, and /tálo/ ‘egg’. The Direct I, Direct II, and Direct III noun classes are all closed classes.

12. The following are exceptions to this generalization: /adí/ ‘tail of Wilson’s bird of paradise’, /báwin/ ‘womb’, /háhis/ ‘wrist’, /málkabjalat/ ‘kidney’, /pjá/ ‘hair’, /sót/ ‘crown of Wilson’s bird of paradise’, and /su/ ‘breast’ (all of which are possessed in indirect constructions); and /(sá)gale/ ‘tail’ (which is possessed in a Direct III construction; see below).

Most nouns referring to human and animal body parts and parts of plants can in fact be possessed in either direct or indirect possessive constructions, depending on whether the relationship between the possessor and the possessed is inalienable (i.e., if the body or plant part is a part of the possessor) or alienable (i.e., if the relationship between the body and plant part and the possessor is one of ownership). Inalienable relationships are communicated with direct possessive constructions, whereas alienable relationships are communicated with indirect possessive constructions. However, the possession of body and plant parts in indirect possessive constructions is extremely rare: for the purposes of exemplification, these nouns will henceforth be treated as if they were only specified for use in direct possessive constructions. For more on possessive constructions in Ambel, please see Arnold (2018).

There are two differences between the Direct I, Direct II, and Direct III paradigms. One is a segmental difference, in the way a 3SG possessor is marked.¹³ The second difference is prosodic. In all three Direct paradigms, for any possessor other than 1SG and 2SG, there is a process of /H/-deletion, which removes any underlying /H/ from the root. Additionally, in the Direct I and III paradigms, [H] is realized on the initial syllable of the inflected form when the possessor is 1SG or 2SG, regardless of the underlying specification of the root.

The deletion of underlying /H/ for all possessors other than 1SG and 2SG is exemplified in the paradigm for the Direct I noun /jói/ ‘heart’, given in table 7. As can be seen in this table, while the root /jói/ ‘heart’ has a /H/ specification on the initial syllable, this /H/ is only realized on the inflected form when the possessor is 1SG or 2SG. For all other person, number, and animacy combinations, the root is realized without tone. Note that, if the possessor is paucal or 1PL.EXCL, then the possessive prefix bears /H/ tone, like in the subject marking morphology described above. This /H/ is realized in the output, indicating that the process of /H/-deletion operates before these prefixes attach; that is, it targets the root.

TABLE 7. THE DIRECT I POSSESSIVE PARADIGM, ILLUSTRATED WITH THE NOUN /jói/ ‘HEART’

	SG	DU	PC	PL
1.INCL	jói-k	tu-joi-n	(a)tú-joi-n	t-joi-n
1.EXCL		um-joi-n	atúm-joi-n	ám-joi-n
2	jói-m	mum-joi-n	matúm-joi-n	mim-joi-n
3AN	joi	u-joi-n	atú-joi-n	yoi-n
3INAN			i-joi	

I analyze the initial [H] marking a 1SG and 2SG possessor in the Direct I and Direct III paradigms as the realization of a /H/ suprafix (transcribed /ΔH/).¹⁴ This suprafix attaches to the first syllable of the root; any subsequent /H/s are deleted, to preserve culminativity in the output. The output of affixation by /ΔH/ can be seen by comparing the paradigm in table 7 with the paradigm in table 8, for another Direct I noun, /tadjí/ ‘eye’. The roots /jói/ ‘heart’

TABLE 8. THE DIRECT I POSSESSIVE PARADIGM, ILLUSTRATED WITH THE NOUN /tadjí/ ‘EYE’

	SG	DU	PC	PL
1.INCL	tádjí-k	tu-tadjí-n	(a)tú-tadjí-n	tadjí-n
1.EXCL		um-tadjí-n	atúm-tadjí-n	ám-tadjí-n
2	tádjí-m	mum-tadjí-n	matúm-tadjí-n	mim-tadjí-n
3AN	tadjí	u-tadjí-n	atú-tadjí-n	tadjí-n
3INAN			i-tadjí	

13. Specifically, in the Direct I paradigm, a 3SG.AN possessor is unmarked, and a 3SG.INAN possessor is marked with /i-/ ‘3SG.INAN’; in the Direct II paradigm, a 3SG.AN possessor is marked with /i-/ ‘3SG’ (3SG.INAN possessors are not attested); and in the Direct III paradigm, both 3SG.AN and 3SG.INAN possessors are optionally marked with /i-/ ‘3SG’.

14. I analyze initial [H] in this way rather than, for example, as the output of a process of /H/-shift, because initial [H] occurs even when there is no underlying /H/ on the root. For example, toneless /su/ ‘nose’ is realized [súk] when marking a 1SG possessor, and [súm] when marking a 2SG possessor. As there is no underlying /H/ to shift in these cases, the more straightforward analysis is that the forms are additionally inflected with the suprafix /ΔH/.

and /tadjí/ ‘eye’ underlyingly bear /H/ tone on different syllables. However, when inflected to mark a 1SG or 2SG possessor, both are realized with [H] on the initial syllable.¹⁵

That there is no /H/ suprafix in the Direct II paradigm can be seen from the inflected forms of the Direct II noun /kamú/ ‘different generation in-law’, given in table 9. Like the Direct I paradigm, illustrated in tables 7 and 8, in the Direct III paradigm, /H/-deletion for all non-1SG or 2SG possessors means that there is no realization of the underlying /H/ of /kamú/ on these inflected forms. Unlike the Direct I and Direct III paradigms, however, the lack of the /H/ suprafix in the Direct II paradigm means that the realization of tone on forms inflected to mark a 1SG or 2SG possessor is on the same syllable as the underlying /H/ specified on the root (in this case, the second syllable).

TABLE 9. THE DIRECT II POSSESSIVE PARADIGM, ILLUSTRATED WITH THE NOUN /kamú/ ‘DIFFERENT GENERATION IN-LAW’

	SG	DU	PC	PL
1.INCL	kamú-k	tu-kamu-n	(a)tú-kamu-n	kamu-n
1.EXCL		um-kamu-n	atúm-kamu-n	ám-kamu-n
2	kamú-m	mum-kamu-n	matúm-kamu-n	mim-kamu-n
3AN	i-kamu	u-kamu-n	atú-kamu-n	kamu-n
3INAN	<i>not attested</i>			

4. IP-FINAL PITCH: TONE AND INTONATION. In this section, I turn to a phonetic description of the IP-final realization of lexical tone. IP-finally, the realization of /H/-toned and toneless syllables is determined by an interaction between lexical tone and the boundary tones used in the intonation contour of the utterance. The IP-final realizations in declarative and imperative utterances are described in 4.1, and in polar interrogative utterances in 4.2.

4.1 INTONATION PHRASE-FINAL REALIZATIONS OF TONE: DECLARATIVE/IMPERATIVE UTTERANCES. Declarative and imperative utterances are marked with a high-falling IP-final boundary tone (henceforth: HL%). How this boundary tone is realized depends on whether the IP-final word is grammatical or lexical.

Lexical words in Ambel belong to the following word classes: noun, verb, adverb, numeral, and the interjections /i/ ‘yes’ and /po/ ‘no’.¹⁶ If an IP-final word in a declarative or imperative utterance is lexical, the realization of the HL% boundary tone depends on the moraic weight of the final syllable. If the syllable is heavy, then both components of the HL% tone (that is, [HL]) are realized on the final syllable, whereas if the syllable is light, only the [H] component is realized. Segments that contribute to the moraic weight of a syllable in Ambel are the vowels /i e a o u/, and sonorant consonants (the semi-vowels /w/ and /j/, the liquids /r/ and /l/, and the nasals /m/ and /n/). Segments that can occur in the coda of a syllable but which do not contribute to moraic weight are the voiceless stops /p t k/, and the fricatives /s/ and /h/. Therefore, syllables that have only a vowel in the rhyme, or a sequence

15. The /t-/ prefix marking 1PL.INCL possessors only occurs on sonorant-initial nouns. This explains its absence in the paradigm for /tadjí/ ‘eye’ in table 8.

16. There is no separate class of adjectives in Ambel; adjectival notions are communicated with verbs.

of vowel plus a nonsonorant consonant, are monomoraic and thus light; syllables that have a vowel plus at least one sonorant consonant in the coda are bimoraic and thus heavy. Some examples of the IP-final realizations of monosyllabic words are given in table 10.

TABLE 10. IP-FINAL REALIZATIONS OF MONOSYLLABIC WORDS IN UTTERANCES MARKED WITH THE H% DECLARATIVE/IMPERATIVE BOUNDARY TONE

/H/		/Ø/	
Light syllables:			
[pú]	'paddle'	[mǒ]	'current (water)'
[láp]	'fire'	[gǒp]	'jambu fruit'
[bát]	'ground, earth'	[ǔt]	'head louse'
[sák]	'kind of bird of paradise'	[kák]	'cross-uncle'
Heavy syllables:			
[gám]	'night'	[ròm]	'seaweed'
[dów]	'rattan'	[nǒw]	'house'
[jêl]	'squeezed sago'	[hǔl]	'honey'
[lâjn]	'sand'	[pǒwn]	'umbrella'

As can be seen from table 10, if a toneless syllable of a lexical word appears in IP-final position, and the syllable is heavy, then the syllable is realized [LHL]. In this realization, the first [L] is the realization of lexical tonelessness, as described in 3.1; the [HL] component is a realization of the HL% boundary tone. If an IP-final toneless syllable is light, then it is realized [LH]. In this realization, the [L] is again the realization of lexical tonelessness, and the [H] is the first element of the HL% boundary tone. The IP-final realization of the HL% boundary tone on the heavy toneless syllable /tun/ 'thorn' is shown in figure 4, and on the light toneless syllable /we/ 'water' is shown in figure 5.

If a /H/-toned syllable of a lexical word appears in IP-final position, the [H] component of the HL% boundary tone applies vacuously, as there is already a [H] target derived from lexical /H/. Thus, a heavy IP-final /H/ syllable is realized [HL]. As the [L] component of the HL% boundary tone is not realized on light syllables, a light IP-final /H/ syllable is realized [H]. These realizations are exemplified in figure 6, showing the IP-final realization of the heavy /H/ syllable /tún/ 'moon' as [HL], and figure 7, showing the IP-final realization of the light /H/ syllable /láp/ 'fire' as [H].

As the [L] component of the HL% boundary tone is only realized on lexical words if the syllable is heavy, this indicates that the unit that bears the second element of this boundary tone is the second mora of the syllable; and as the [H] component is realized regardless of the weight of the syllable, this indicates that the unit bearing this element of the boundary tone is the first mora of the syllable. A similar analysis can be presented for the unit bearing lexical tone: as the [H] target of /H/-toned syllables is reached, regardless of syllable weight, this indicates that the first mora of the syllable is also the unit that bears lexical tone.

I turn now to the realization of the HL% Declarative/Imperative boundary tone on grammatical words, and how this interacts with lexical tone. Words from the following word classes are considered grammatical words in Ambel: articles; words derived from deictic units, including demonstratives; mode and aspect particles; and pronouns. If the

FIGURE 4. IP-FINAL REALIZATION OF A HEAVY TONELESS SYLLABLE
/tun/ ‘THORN’: [LHL]

FIGURE 5. IP-FINAL REALIZATION OF A LIGHT TONELESS SYLLABLE
/we/ ‘WATER’: [LH]

final word of the IP in a declarative or imperative utterance is grammatical, then the realization of the HL% boundary tone depends on three factors: (1) the tonal specification of the grammatical word; (2) the number of syllables in the grammatical word; and (3) the realization of tone on the previous word.

If a syllable in the IP-final grammatical word has /H/ specification, such as the aspect particle /rin/ ‘still’ or the 2DU pronoun /mowá/, then the realization is as if it were a /H/ syllable in a lexical word: that is, [HL] if bimoraic, and [H] if monomoraic. However, if the IP-final grammatical word is toneless, then the realization of the HL% boundary tone

FIGURE 6. IP-FINAL REALIZATION OF A HEAVY /H/ SYLLABLE
/dún/ ‘FISH’: [HL]

FIGURE 7. IP-FINAL REALIZATION OF A LIGHT /H/ SYLLABLE
/láp/ ‘FIRE’: [H]

depends on how many syllables there are in the grammatical word, and whether the grammatical word is immediately preceded by a /H/ syllable.

The realization of the HL% boundary tone on grammatical words of various lengths and preceded by words with different tonal specifications is given in table 11. As was shown in 3.1, there are three possible tonal specifications for disyllabic nouns: /Ø.H/, /H.Ø/, and /Ø.Ø/. In table 11, nouns representing each of these possible specifications are modified by either the article /pa/ ‘ART’, the demonstrative /wa-pa/ ‘DEM-MID’, or the directional demonstrative /wa-lu-pa/ ‘DEM-SEA-MID’.¹⁷ The syllables on which the HL% boundary tone is realized are highlighted in boldface.¹⁸

TABLE 11. THE REALIZATION OF IP-FINAL GRAMMATICAL WORDS WHEN FOLLOWING WORDS WITH DIFFERENT TONAL SPECIFICATIONS

	/pa/ ‘ART’	/wa-pa/ ‘DEM-MID’	/wa-lu-pa/ ‘DEM-SEA-MID’
/kabóm/ ‘bone’	[ká b óm pā]	[ká b óm wā pá]	[ká b óm wālú pà]
/ká b óm/ ‘widow’	[ká b óm pá]	[ká b óm wā pà]	[ká b óm wālú pà]
/kamus/ ‘dictionary’	[kámùs pá]	[kámùs wā pà]	[kámùs wālú pà]

Table 11 shows that, if the IP-final grammatical word is monosyllabic (for example, /pa/ ‘ART’), and is not immediately preceded by a /H/ syllable (for example, following /ká**b**óm/ ‘widow’ or /kamus/ ‘dictionary’), then the [H] component of the boundary tone is realized on the grammatical word, and the [L] component is not realized. However, if the IP-final grammatical word is monosyllabic and is immediately preceded by a /H/ syllable (for example, following /ká**b**óm/ ‘bone’), the HL% boundary tone is not realized at all, and the monosyllabic IP-final grammatical word is realized [H ~ M] (like an IP-medial toneless syllable).

If an IP-final grammatical word is disyllabic or longer (for example, /wa-pa/ ‘DEM-MID’ or /wa-lu-pa/ ‘DEM-SEA-MID’), then in most contexts the [H] component of the boundary tone is realized on the penultimate syllable, and the [L] component is realized on the final syllable. The exception to this is if the syllable immediately preceding the penultimate syllable of the grammatical word is a /H/ syllable (for example, /ká**b**óm/ ‘bone’ followed by the disyllabic /wa-pa/ ‘DEM-MID’). In this case, the penultimate syllable is realized [H ~ M], like an IP-medial toneless syllable; the [H] component of the HL% boundary tone is shifted one syllable to the right and is realized on the final syllable; and the [L] component of the boundary tone is not realized.

4.2 INTONATION PHRASE-FINAL REALIZATIONS OF TONE: POLAR INTERROGATIVE UTTERANCES. Polar interrogative utterances—that is, utterances in which the speaker is expecting a yes-no answer—are marked by an IP-final Extra-High boundary tone (henceforth: E%). Unbiased polar interrogatives (those where the speaker does not expect a positive or negative answer) are not marked morphologically or syntactically; the E% boundary tone is the only way in which unbiased polar interrogatives are distinguished from their declarative and imperative counterparts.¹⁹

As with the HL% boundary tone described above, the E% boundary tone in polar interrogative utterances interacts with the lexical tone of the final syllable. If the final syllable is /H/, then the syllable is realized Extra-High ([E]). This realization is shown in figure 8, with the IP-final /H/ syllable /tún/ ‘moon’.

17. The article /pa/ ‘ART’ has developed from the middle distance deictic root /pa/ ‘MID’.

18. The noun /kamus/ ‘dictionary’ is a borrowing via Malay.

19. Biased polar interrogatives, where the speaker is anticipating either a positive or negative answer, are marked with both the Polar Interrogative E% boundary tone and sentence-final question tags. For example, the tag /ni/ is used when the speaker anticipates a positive answer to his or her question, as in (i).

(i) Awa nj-áp   ido n-<j>dók   lenkawáj, ni?
 2SG 2SG-paddle when 2SG-<2SG>meet crocodile POS.INT
 ‘When you were traveling by sea you met a crocodile, right?’

FIGURE 8. REALIZATION OF THE E% BOUNDARY TONE ON THE IP-FINAL /H/ SYLLABLE /tún/ ‘MOON’: [E]

If the final syllable is toneless, then the [L] target is realized on the syllable, before the contour rises to the [E]. This is shown in figure 9, with the IP-final toneless syllable /tun/ ‘thorn’. The Extra-High final target disambiguates the realization of Polar Interrogative boundary tone on toneless syllables (that is, [LE]) from the realization of the HL% Declarative/Imperative boundary tone on light toneless syllables (that is, [LH]).

FIGURE 9. REALIZATION OF THE E% BOUNDARY ON THE IP-FINAL TONELESS SYLLABLE /tun/ ‘THORN’: [LE]

Unlike the HL% Declarative/Imperative boundary tone, the realization of the E% Polar Interrogative boundary tone does not depend on syllable weight. Nor does the realization depend on whether the IP-final word is lexical or grammatical; both are realized

identically. The latter point is illustrated in figures 10 and 11 with an IP-final grammatical word, the 3SG.INAN pronoun /ana/. The realization of this pronoun is the same, regardless of the tonal specification of the preceding word: with a [L] target on the first syllable, followed by the E% boundary tone on the final syllable.

FIGURE 10. REALIZATION OF THE E% BOUNDARY ON THE IP-FINAL 3SG.INAN PRONOUN /ana/ WHEN PRECEDED BY /ún/ ‘PICK UP’: [L.E]

FIGURE 11. REALIZATION OF THE E% BOUNDARY ON THE IP-FINAL 3SG.INAN PRONOUN /ana/ WHEN PRECEDED BY /un/ ‘KNOW’: [L.E]]

4.3 SUMMARY. A summary of the IP-final realizations of /H/ and toneless syllables discussed in this section, as well as the IP-medial realizations discussed in 3.1, is provided in table 12. As for grammatical words, the realization of lexical tone and the HL% boundary tone in declarative and imperative utterances depends on the length of the

word, and whether it is preceded by a /H/ syllable; only the realizations of the syllables of lexical words are summarized in this table.

TABLE 12. SUMMARY OF THE REALIZATION OF /H/ AND TONELESS SYLLABLES IN LEXICAL WORDS

Utterance position	Intonation type	Tonal specification and syllable weight			
		/H/		/Ø/	
		LIGHT	HEAVY	LIGHT	HEAVY
IP-medial		[H]		[L]	
IP-final	Declarative/imperative: HL%	[H]	[HL]	[LH]	[LHL]
	Polar Interrogative: E%	[E]		[LE]	

5. DISCUSSION. In section 3, data were presented to show that the word-prosodic system of Ambel is tonal, and that the system is best analyzed as a privative system, in which /H/ syllables contrast with toneless syllables. In this section, I discuss the tone system of Ambel with reference to the wider typological, genetic, and areal contexts, and explore some possible mechanisms for tonogenesis.

Typologically, the word-prosodic system of Ambel is not unusual; it is similar to that described for several other languages. In Somali, for example, a single /H/ can be culminatively assigned to either the final or penultimate vowel of a word, but is not obligatory (Hyman 1981). The Kyoto and Tokyo dialects of Japanese have also been analyzed with systems in which accented syllables are culminative, but not obligatory (Kubozono 2012; see also Hyman 2006:237–38 on Tokyo Japanese). Most strikingly, the Ambel tone system is very similar to the tonal phonology of Una, spoken in the Star Mountains on New Guinea (Louwerse 1978). In Una, /H/ is culminative and obligatory in polysyllabic words, but is not obligatory in monosyllabic words. Metnyo Ambel comes remarkably close to this system: /H/ is culminative in all polysyllabic words and obligatory in most native polysyllabic words (recall from 3.1 that only 0.83 percent of native polysyllabic nouns and verbs are toneless), but is not obligatory in monosyllabic words.

Ambel is not the first Raja Ampat–South Halmahera (RASH) language to be described as tonal: at least two other RASH languages spoken in the Raja Ampat archipelago, Ma'ya and Matbat, have tone systems. The word prosodic systems of these two languages are richer than that of Metnyo Ambel. Whereas Metnyo Ambel has a single tonal specification, /H/, Remijsen (2007) analyzes Matbat with six tonemes (Extra High Fall, High Level, Low Rise, Low Level, Rise-Fall, and Low Fall), and Remijsen (2001a,b, 2002) analyzes Ma'ya with two tonemes (Rise and High), which are restricted to word-final syllables. Ma'ya also has contrastive lexical stress, which can occur on either the penultimate or final syllable of a word.

Remijsen (2001a:102–4) discusses the origins of the rich tone system of Matbat, and the unusual combination of lexical tone and contrastive stress in Ma'ya. He points out that neither of these prosodic systems is likely to have arisen spontaneously, and suggests that it is more likely that they have developed as the result of contact between the Austro-nesian languages of Raja Ampat and a Papuan substrate. However, no Papuan languages are spoken in Raja Ampat today. Remijsen thus hypothesizes that one or more tonal Papuan languages were once spoken in the archipelago, and induced tonogenesis in Matbat

and Ma'ya; but that these languages are now extinct. This conclusion is supported by Kamholz (2014:96–101), who does not find any convincing segmental predictors that point to spontaneous tonogenesis in either Ma'ya or Matbat. Additional support for the substrate hypothesis comes from the large number of lexical items with no identifiable Austronesian origin in Matbat and Ambel (Remijsen 2001a:103–4).

If we look to the Bird's Head peninsula of New Guinea—the closest mainland to Raja Ampat—indeed we find several tonal Papuan languages: Mpur, Abun, Sougb, and Meyah. One or more tonal Papuan languages related to one or more of these languages could once have been spoken on Raja Ampat.²⁰ The prosodic systems of these languages, however, are simpler than those of Matbat and Ma'ya. For example, Odé (2002a:50–51, 2002b) analyzes Mpur with three tones (High, Mid, and Low); similarly, Berry and Berry (1999:20–22) analyze Abun with three tones (High/Rise, Low, and Fall); Reesink (2000, 2002b:194–96) describes two tones in Sougb; and Gravelle (2002:121–23, 2004:44–54) analyzes Meyah with two “phonemic pitch levels” ([+HIGH] and [−HIGH]).²¹

Several scenarios could have given rise to the situation observed in the Raja Ampat archipelago, that is, the complex prosodic systems of Ma'ya and Matbat, and the simple prosodic system of Metnyo Ambel. For example, Ma'ya, Matbat, and Ambel may have developed tone through contact with a Papuan language with a more complex tone system than those observed in the present-day Papuan languages spoken on the Bird's Head; the system in Metnyo Ambel has subsequently simplified. Alternatively, Ma'ya and Matbat may have developed tone through contact with a Papuan language or languages with a rich tonal system, whereas Ambel independently developed tone through contact with a Papuan language with a much simpler system, akin to the Papuan languages spoken on the Bird's Head today. In a third scenario, Matbat and Ma'ya developed tone through contact with a tonal Papuan substrate, while Ambel developed tone spontaneously. In this third scenario, we would expect to see segmental predictors of tone in Ambel. Preliminary investigations, however, have not revealed any such predictors.

In order to explore these scenarios of tonogenesis more closely, systematic data are required to analyze the tonal phonology of Metsam, the dialect of Ambel spoken in the villages of Warsamdin and Kalitoko. Preliminary data suggest that the tone system of Metsam is richer than that of Metnyo, with two or possibly three tones. If the Metsam tonal phonology is more complex than that of Metnyo, this suggests that the Proto-Ambel system may also have been more complex, and has subsequently simplified in Metnyo Ambel. In addition, more data are needed to analyze the prosodic systems from

20. The Papuan languages spoken on the Bird's Head belong to several different language families: the East Bird's Head family (Meyah, Sougb; Voorhoeve 1975; Reesink 2002a); the West Bird's Head family (Moi, Tehit, Moraid, Seget; Voorhoeve 1987); a small family comprising Hatam and the extinct Mansim (Reesink 2002a); and three isolates, Mpur, Maybrat, and Abun.

21. As only two pitches are distinguished in Sougb and Meyah, Reesink (2000, 2002b:194–96) and Gravelle (2004) analyze the word-prosodic systems of these languages as “pitch accent” systems. However, Reesink (2000:99) presents a monosyllabic minimal pair in Sougb, *móg* ‘thorn, sharp’ vs. *mög* ‘flesh’, showing that High pitch is not obligatory. Similarly, Gravelle describes some Meyah roots and words in which two or even three syllables are [+HIGH], as well as polysyllabic roots without any [+HIGH] syllables (2004:51–54). Contrasts based on pitch in Meyah are, therefore, neither culminative, nor obligatory. According to the typology of Hyman (2006, 2009), the prosodic systems of Sougb and Meyah should thus be considered tone systems.

the several other RASH languages spoken on and around Raja Ampat, such as As, Biga, and Bata. All of these languages are severely underdocumented, and likely to be highly endangered. Preliminary data suggest that at least some of these languages may also have tone systems (Kamholz 2016). If this is so, data from these languages will be crucial in exploring the development of the word-prosodic systems of the Austronesian languages of Raja Ampat.

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