Onomatopoeias in Puyuma

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1 Introduction

Puyuma (ISO 639-3 *pyu*; Glottolog *puyu1239*) is an Austronesian language indigenous to southeastern Taiwan. Despite revitalization efforts over the past few decades, Puyuma remains severely endangered with most fluent speakers aged over 65 (Teng 2008, 2018). Like many other western Austronesian languages, Puyuma exhibits synthetic morphosyntax with highly productive prefixation and infixation processes. It also makes productive use of partial reduplication for transcategorial operations. In terms of subgrouping affiliation, Puyuma constitutes a single-member primary branch of the Austronesian family (Blust 1999) and exhibits elaborate morphology that can be traced back to Proto-Austronesian (Teng 2008; Blust 2013; Blust & Chen 2017). In this chapter, we lay out common word-formation strategies of Puyuma's onomatopoeia.

2 Position of onomatopoeia in the language system

Before entering the core discussion, an overview of onomatopoeic vocabulary in Austronesian is in order. Blust's series of work on Austronesian comparative morphology (1988, 2013, 2022) has revealed that nearly 23% of Austronesian monosyllabic roots are onomatopoeic. Such roots typically require other morphological processes to form an independent word, although some roots can stand alone as a free morpheme (Blust 2013: 369). These roots behave like phonesthemes (or submorphemes) in carrying a generalized semantics, while differ from English phonesthemes (e.g. *gl*, *fl*...) in constituting a whole syllable. See Blust (1988, 2022), Geraghty (1990), Lee (2009), and Zorc (1990) for further details about onomatopoeic vocabulary in Austronesian languages.

Onomatopoeia in Puyuma has not been systematically analyzed, although many onomatopoeic expressions have been documented in previous work. Teng's (2008) reference grammar discusses onomatopoeic expressions in Nanwang Puyuma as part of her description of the language's reduplication morphology. Cauquelin's (2015) Puyuma-English dictionary also includes sporadic notes for onomatopoeic lexical items. Cheng, Pakawyan, and Kagi's (2017: 153-59) wordlist documents 58 sets of expression listed as onomatopoeia, including sounds from animal, action, and natural environment. A comprehensive analysis of word-formation strategies observed with the language's onomatopoeia, however, awaits future investigation.

3 Description of onomatopoeia

This chapter provides an overview of onomatopoeia in the Nanwang Puyuma. This is the phonologically most conservative dialect where a series of voice stops from Proto-Puyuma, /b/, /d/, /ɖ/, and /g/, remains intact. Other dialects have undergone lenition processes with these stops weakened to fricatives (/ɦ/, /ß/, /v/, and /ʁ/) (Ting 1978). A look into Nanwang's onomatopoeic expression would therefore allow for a finer approximation towards onomatopoeia used in Proto-Puyuma prior to these sound changes. This would enable a better understanding of the sound-meaning relationships of these terms and provide a clearer picture of sound symbolism in Proto-Puyuma and early Austronesian morphology. Except where otherwise indicated, the data presented in the chapter comes from primary fieldwork on Nanwang Puyuma. We also include

existing descriptions in previous publications and an e-archive (https://e-dictionary.ilrdf.org.tw/) hosted by Council of Indigenous Peoples, Ministry of Education, Taiwan.

3.1 Phonology

Nanwang Puyuma exhibits 18 consonants and four vowels. These phonemes display relatively few phonotactic constraints – any vowel can occur as a nucleus; all consonants may appear either as onset or coda (Teng 2008). The complete phoneme inventory is laid out below in Tables 1 and 2, where Puyuma's orthography is also presented. We adopt the orthographic symbols hereafter.

(1) *Table 1: Consonant inventory of Nanwang Puyuma (based on Ting 1978 and Teng 2008)*

	bilabial	alveolar	retroflex	palatal	velar	glottal
stops	p b	t d	ʈ <tr>		k g	ʔ <'>
nasals	m	n	ɖ <dr>		ŋ <ng>	
fricative		s				
lateral		l	ɭ <lr>			
trill		r				
glides	w			j <y>		

(2) *Table 2: Vowel inventory of Nanwang Puyuma (based on Ting 1978 and Teng 2008)*

	front	central	back
high	i		u
mid		ə <e>	
low		a	

All four vowels are attested in the manifestation of imitative sound symbolism (e.g., /s**i**ŋs**i**ŋ/ 'sound of bells,' /k**u**k**u**/ 'sound of roosters,' /t**ə**kt**ə**k/ 'sound of geckos,' /?**a**k?**a**k/ 'sound of crows'). Nanwang Puyuma also makes elaborate use of different manners of articulation for various onomatopoeic expressions (e.g., /**ŋ**iaw/ 'sound of cats,' /s**ə**ringsəring/ 'sound of rattles,' /**ʈ**əpuk/ 'sound of fruit dropping,' /**p**iwpiw/ 'sound of whistles'). Some onomatopoeias deviate from the language's standard phoneme inventory and make use of sound segments from the dominant languages Taiwanese Southern Min and Mandarin Chinese, such as /ŋo/ 'sound of cattle' and /p^{h}us/ 'sound of silent fart'. The vowel [o] and aspirated stops (e.g., /p^{h}/, /t^{h}/, /k^{h}/) are phonemic in these two languages but are not part of Puyuma's regular phoneme inventory. It is unsurprising that such segments appear in loanwords and onomatopoeias.[1]

3.2 Syllabic structure

Most free morphemes in Puyuma consist of two or more syllables (monosyllabic free morphemes are mostly grammatical words in V, CV, VC, or CVC structures). Polysyllabic words allow a maximum of two consonants occurring together across a syllable boundary. The template for disyllabic words is therefore (C)V(C)(C)V(C); however, no instances of VV and VCCV are attested (Teng 2008).[2]

Onomatopoeias in Puyuma generally follow the language's regular syllable structure patterns and fall under three types: (i) monosyllabic root that stands alone as onomatopoeic expression, (ii) disyllabic words, and (iii) polysyllabic words formed through reduplication or specific verbal affixation. The examples below in (3) illustrate type I onomatopoeias, where monosyllabic roots stand alone in their bare forms as an independent word; several disyllabic examples are also presented. The examples in (4) illustrate the use of reduplication as an iconic refection of the repetitive nature of the sound denoted. For clarity, we adopt Adelaar's (2000)

[1] According to Teng (2008:18), [o] is an allophone of /u/ when following a velar nasal (e.g., /guŋ/ [goŋ]), but an *u/o* alternation is rarely observed (Cauquelin 2015).

[2] Due to space limits, we set aside several related issues, such as syllabification and the possible combinations of medial consonant clusters. See Teng (2008) for details of these phonotactic constraints.

classification to illustrate the reduplication patterns (highlighted below in boldface). The verbal morphology involved in the reduplicated forms will be discussed in more details in section 3.4

(3) *Puyuma onomatopoeias in terms of syllable structure*

CV	*ngo* 'sound of rattle'
CVC	*beng* 'sound of cars'
CVCVC	*geras* 'sound of leaf rubbing'
CVVC	*ngiaw* 'sound of cats'
VCV	*unga* 'sound of crying babies'

(4) *Puyuma onomatopoeias with reduplication*

a. **Simple monosyllabic root reduplication: C_1VC_2-C_1VC_2**

'ak'ak	'crow'
'op'op	'sound of frogs'
kuku	'sound of roosters'
besbes	'sound of wind'
gerger	'wasp'
maymay	'duck'
kawkaw	'sickle'
kangkang	'plow'

b. **Monosyllabic root reduplication with <aC> (and <e>) infixation: C_1<aC>VC_2-C_1VC_2 or C_1<aC>VC_2<e>C_1VC_2**

pa-s<ar>ingsing	'sounds of bell' (as a predicate)
pa-tr<alr>angtrang	'sounds of earthquake' (as a predicate)
pa-tr<al>ingtring	'sound of cowring' (as a predicate)
pa-tr<ar>ik<e>trik	'sound of fire burning' (as a predicate)
pa-g<ar>as<e>gas	'sound of papers rubbing' (as a predicate)
pa-tr<alr>ap<e>trap	'sound of slippers' (as a predicate)

c. **Disyllabic root reduplication: $C_1V_1C_2V_2$-$C_1V_1C_2V_2C_3$**

drerudrerung	'sound of thunder' (as a predicate)
me-lraulraun	'sound of dog barking' (as a predicate)
pala-ngiangiaw	'sound of cat meowing' (as a predicate)
nguangua	'sound of crying baby' (iterative)

Adelaar (2000) provides a comprehensive generalisation of common reduplication processes in western Austronesian languages. Many of the reported patterns are attested in Puyuma's onomatopoeias. Simple monosyllabic root reduplication in Puyuma, exemplified above in (4a), is often used to denote sounds that are repetitive in nature. As Adelaar (2000: 35) notes, this type of reduplication often denotes an inherently iterative meaning. Some of the ideophones have even become generic nouns (e.g., animal names or tools). A second type of monosyllabic root reduplication involves infixation of <aC> between the onset and the nucleus of the reduplicant. The consonant allows three liquid variants *l*, *lr*, and *r*, as seen in (4b). There seems to be no specific rule governing their use (Teng 2008). Interestingly, Puyuma onomatopoieas that involve this type of fossilized reduplication often co-occur with the verbal affix *pa-*, which canonically functions as causative morphology in the language. This type of onomatopoieas often contain a linker in infixation form, such as <*i*> in Siraya (Adelaar 2000: 36) and <*a*> or <*e*> in Puyuma. Teng (2008: 37) notes that the phonological motivation for the vowel insertion may be to avoid cross-syllable consonant clusters.[3]

Disyllabic root reduplication, illustrated above in (4c), is characterized as granting reduplicant the form of its disyllabic root except for the last consonant (if there is one) (Adelaar 2000). In Puyuma, some onomatopoeic words undergo this type of reduplication with or without other affixation.

[3]Teng (2008) views <*a*>/<*e*> infixation as a process independent from the <*aC*> infixation. In those cases, she shows that the choice seems to be semantically driven. Verbal expressions with CVC<a>CVC normally show iterative meaning whereas those have schwa do not show iterative meaning. However, this generalization does not hold in the case of onomatopoeic words.

3.3 Stress and other suprasegmental properties

Word stress in Puyuma consistently falls on the final syllable and is therefore non-phonemic. Suprasegmental properties do not generally have a special role in the formation of onomatopoieas. A monosyllabic ideophone is stressed by default. Onomatopoieas with two or more syllables conform to the regular final stress pattern. It should be noted that in quotative constructions where the onomatopoeic expressions precede the verb *kema* 'say so,' the repetition of an onomatopoeic root, if without any other morphological operation, does not serve as grammatical parts of speech. In cases like these, they serve an expressive function by merely imitating the target sound. These primary onomatopoeias are not subject to regular suprasegmental properties. To what extent the speaker disregards the general phonetic/phonological system to sound more faithful to the source is essentially their own choice. Consider (5) for several interesting cases.

(5) *Puyuma onomatopoeias in quotative constructions*

a. **Prominent syllable (istress assignment boldfaced)**
*"**tuk tuk tuk**" kema* 'imitation of hammering sounds' vs. *tu<a>k<e>**tuk*** 'hammer'

b. **Lengthening**
"siwww" kema 'imitation of the sound of a car driving by'

c. **Vowel nasalization**
"nguã nguã" kema 'limitation of a baby crying'

3.4 Morphology and syntax

In what follows, we describe specific functional affixes observed in Puyuma's onomatopoeias. Primary onomatopoeias (i.e. proper sound imitations) in the language are usually simple in morphological structure. Many monosyllabic roots may stand alone (e.g., *tuk* 'hammering sound,' *beng* 'sound of airplane operating'), whereas others surface in the form of fossilized reduplication (e.g., *besbes* 'sound of wind,' *trengtreng* 'sound of a train'). Disyllabic roots also constitute a subclass of primary onomatopoeias (e.g., *seras* 'sound of rain,' *ngiaw* 'cat vocalization', *beru* 'sound of big objects plumping').

Secondary onomatopoeias derive from some of these onomatopoeic roots through reduplication and certain verbal morphology. Having illustrated the patterns of reduplication available for the formation of onomatopoeic vocabulary in section 3.2, we show how these words acquire membership in one or another grammatical part-of-speech class.

(6) *Derivation of secondary onomatopoeias*

a. **Actor voice (AV) marking and other M- related verbal morphology**[4]
me-lraun 'bark (v.),' *me-lreslres* 'twist (v.),' *m-ayaayay* 'yawn (v.),' *keteket* 'step (on) (v.),' *kakap* 'climb (v.)', *ma-treptrep* 'have heartbeat (v.),' *ma-ging<a>ging* 'shake (v.)', *mi-kalkal* 'laugh (v.),' *mu-kulukulung* 'roll off (v.)…

b. **Non-actor voice marking**[5]
kelekelek-aw 'tickle (v.),' *suksuk-i* 'lock (v.),' *riterit-an* 'mow grass (for) (v.).' *riterit-u* 'mow (grass) (v.)'…

c. **<aC> infixation**
tr<alr>aketrak 'walk in wooden clogs (v.),' *b<al>etrbetr* 'throb (v.)'…

d. ***Pa-* or *pala-* prefixation**[6]

[4]There are three allomorphs for ** in Puyuma: **, *me-*, or *m-*. The choice of allomorph depends on the initial phoneme of the stem (Teng 2008:26-27). Under the traditional approach (Teng 2008), voice-marked verbs in Puyuma can be divided into intransitive verbs that take AV morphology and transitive verbs that carry non-actor voice marking. Teng's (2008:120-23) classification of intransitive verbs also incorporates other *m-* initial prefixes, such as *mi-* and *ma-*. The *mu-* prefix is another means to derive intransitive verbs in Puyuma (Chen 2020, Teng 2020).

[5]Non-actor (NAV) voice marking is three-fold in most of the Philippine-type languages. They are commonly referred to as patient voice (PV), locative voice (LV), or circumstantial voice (CV). As a mood-prominent language, Puyuma exhibits a formal distinction between the indicative (i.e., *-aw/-ay/-anay*) and the non-indicative (*-u/-i/-an*).

[6]Cauquelin (2015:6) identifies *<aC>* as an infix that attaches to bases to mean 'having the sound of' or 'having certain property of.' The prefix *pala-* attaches to nominal bases and translates as 'many, a lot of, accumulation of.' *Pa-* is a productive causative marker in Puyuma.

e. ***-an* suffixation**[7]
g<in>utrgutr-an 'the itchy part scratched,' *t<in>iktik-an* 'the thing carved'…

Philippine-type voice marking in Puyuma and other indigenous Austronesian languages of Taiwan constitutes a major morphological device for forming onomatopoeic verbs.[8] (6a) demonstrates the use of actor voice morphology ** for onomatopoeic verbs. Other actor voice (AV) prefixes that may participate in the derivation of onomatopoeic verbs are also listed there. In addition to AV-marked verbs, non-actor voice affixes may also be attached to an onomatopoeic and create a verb that takes a different argument structure. See example (6b) for a few examples where the undergoer of the event renders the syntactic pivot of the sentence. Other onomatopoeic verbs do not carry an overt voice marking. Instead, they employ *<aC>* infixation coupled with reduplication and *pa-* or *pala-* prefixation, as indicated in (6c-d). Finally, (6e) demonstrates the instances of derived patient nouns with the locative nominalizer *-an*.

The syntactic distribution of primary onomatopoeias is rather free. They can either stand alone as free utterance or occur on the edge of a sentence as a mini-clause, as shown in (7a-b). In quotative constructions marked by the verb *kema* 'say so,' the ideophone functions as the verb complement (7c). Finally, it is possible for a restricted set of primary onomatopoeias to occur in the argument position. In (7d), for example, the root *lraun* 'sound of a dog barking' serves as the oblique of the intransitive verb *kilengaw* 'hear.'

(7) *Primary onomatopoeias*

a. kebeng!
IDEO
'(imitation of sound of objects dropping on the ground)'

b. 'kok kok kok,' ulraya a trau i sabak?
IDEO IDEO IDEO exist PIVOT person LOC inside
"Knock knock knock," is anybody inside?'

c. seras kema na udralr
IDEO say.so PIVOT rain
'The rain rustles.'

d. kilengraw=ku dra lraun dra suan.
listen=1SG.PIVOT OBL IDEO POSS dog
'I hear a dog barking.'

Secondary onomatopoeias in Puyuma make use of a variety of verbal morphology and some nominalization devices to occupy the predicate or argument position in a sentence. The examples in (8) demonstrates their distribution patterns.

(8) a. sabelraw na suwan=lra, aw me-lrau-lraun
hungry PIVOT dog=PERF and AV-RED-IDEO
'The dog got hungry, and it barked.'

b. aremeng=lra, u-a suksuk-i na salikitr
be.late=PERF go-IRR lock-LV:IMP PIVOT gate
'It's late already. Go lock the gate.'

c. batring ku=tranguru', b<al>etrbetr
headache 1SG.PSR=head <aC>throb
'I have a bad headache, it is throbbing.'

d. pa-trungtrung na patringtringan, aru ka-radruk kaigi=lra
CAU-IDEO PIVOT bell will KA-gather meeting=PERF
'The bell is ringing. Gather up for the meeting.'

[7] Among all types of lexical nominalization in Puyuma, patient nouns are often formed by affixing *-an*, with or without an affixation of perfective aspect marker *<in>* (Teng 2008:135-36).

[8] Due to space limit, we are unable to provide an overview of Philippine-type voice morphology in this chapter. See Teng (2008) and Chen (2017) for an detailed discussion of Puyuma voice morphology.

e. tu=t<in>iktik-an kan siber idrini na banin.
3.PSR=<PFV>carve-NMZ GEN Siber this.PIVOT LK plank
'This is the plank carved by Siber.'

3.5 Semantics

3.5.1 Overview

Puyuma's onomatopoeias exhibit diverse semantics. Some are directly associated with a particular kind of sound source: *kuku* is associated with roosters, and *selrselr* is associated with frying. Onomatopoeias of this kind include natural sounds from inanimate source (*tu'tu'* 'sound of dripping,' *trepuk* 'sound of (fruit) dropping'), natural sounds from animate sources, including vocalizations (*ngiaw* 'cat vocalization,' *'op'op* 'call of a bullfrog') and corporeal sounds (*kalkal* 'sound of laughter,' *patraptrap* 'sound of clapping'), as well as sounds of human artifacts *beng* 'sound of a car,' *trektrek* 'sound of a clock ticking').

Not all Puyuma onomatopoeias are directly linked to a narrowly identifiable kind of sound source. Many imitate sounds of collision, compression, or friction in a comparatively generic fashion: *setrap* imitates the sound of cars colliding, *ngeritr* imitates the sound of tearing things, and *beru/kebut* imitates the sound of objects dropping with difference in size. Given the productivity, virtually any salient sound seems available for imitation in Puyuma.

Finally, it is noteworthy that Puyuma has a relatively rich inventory for bird calls. Some reflect the vocal quality of the calls made by different species, while others are used to forecast the weather or indicate omens (Cheng, Pakawyan, and Kagi 2017). In addition, our survey shows no instances of imitation of fish and sea creatures. This observation aligns with the living style of the ancestors of Puyuma people (i.e., mountain tribe).

3.5.2 Semantic relations

As mentioned earlier, primary onomatopoeias in Puyuma are mostly roots. With derivational processes such as reduplication, verbal morphology, and nominalization, most of them become secondary onomatopoeias. In some cases, secondary onomatopoeias denote the action or movement of the subject which emits the sound. Others denote the kind of thing that produces the sound represented by the corresponding primary onomatopoeia. Table 3 is a summary based on Cauquelin's (2015) dictionary.

(9) *Table 3: Primary onomatopoeias and the derived meaning of secondary onomatopoeias*

Primary onomatopoeias	**Secondary onomatopoeias**
a. *drerung* 'sound of thunder'	*dradrerung* 'thunder (v.)'
b. *gemgem* 'sound of grinding one's teeth with anger'	*g<alr>emgem* 'be in a state of angriness'
c. *ringring* 'sound of frying'	*pa-ringring* 'fry (v.)'
d. *traptrap* 'sound of clapping'	*p<en>a-traptrap* 'clap (hands) (v.)'
e. *trektrek* 'sound of clock ticking'	*ma-trektrek* 'watch (n.)'
f. *singsing* 'sound of a bell ringing'	*singsing-an* 'rattle'
g. *besbes* 'sound of wind'	*besbes-an* 'fan'

4 Conclusion

Onomatopoeias in Puyuma are fairly diverse in terms both of semantics and of word-formation strategy. Primary onomatopoeias may appear in the form of monosyllabic roots (most of which undergo fossilized reduplication) or disyllabic ones. This conforms to Blust's generalization that Proto-Austronesian exhibited a high number of monosyllabic roots that are onomatopoeic (Blust 1988, 2022). Secondary onomatopoeias in Puyuma often derive from onomatopoeic roots and formed through various types of reduplication patterns, attachment of verbal morphology, or nominalization. Primary onomatopoeias exhibit rather simple syntax, generally appearing as free utterances, mini-clauses at the sentence edge, or verb complements in a quotative construction. Secondary onomatopoeias clearly function as members of grammatical part-of-speech classes. They occupy the predicate position with the aid of derivational voice marking or causative marking. They

may serve as a nominal given proper nominalization device. Puyuma onomatopoeias thus should not be considered as extra-systemic as they use the same set of reduplication patterns and morphological devices to function at the sentence-level.

Onomatopoeic expressions may exhibit greater or lesser degree of conformity to the phonological regularities usual for Puyuma lexicon. All vowels and consonants are observed in these imitations. The manner distinction between consonants is especially useful to represent the quality of the source sound. Some imitations borrow the phonetic inventory and suprasegmental features available in Taiwan's linguistic environment. Promising cases include the involvement of aspirated stops and vowel nasalization. Puyuma onomatopoeias represent a wide variety of sound types (see the appendix for details). With respect to sound of living creatures, it is noteworthy that the language exhibits a particularly rich inventory of bird calls, while lacks imitations for the sound of marine animals.

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5 Appendix

	onomatopoeia	meaning	English translation (if applicable)
1	seras	‘sound of rain’	swoosh
2	tu’tu’	‘sound of dripping’	
3	besbes	‘sound of wind’	whoosh
4	drerudrerung	‘sound of thunder’	rumble
5	geras	‘sound of leaf rubbing’	rustle
6	trepuk	‘sound of (fruit) dropping’	splat
7	traliketrik	‘sound of fire burning’	crackle
8	selrselr	‘sound of frying’	sizzle
9	lraun	‘sound of a dog barking’	arf
10	ngiaw	‘cat vocalization’	meow
11	kuku	‘call of a rooster’	cock-a-doodle-doo
12	’ak’ak	‘call of a crow’	caw
13	’op’op	‘call of a bullfrog’	
14	tektek	‘call of a gecko’	
15	ngarangarawan	‘sound of a bee’	buzz
16	ngengngeng	‘sound of a mosquito’	buzz
17	ngo	‘sound of cattle’	moo
18	kikiki	‘sound of a bird’ (ominous call)	
19	kalkal	‘sound of laughter’	ha ha
20	trepetrep	‘murmuring sounds’	
21	matreptrep	‘sound of heartbeats’	thump thump
22	patraptrap	‘clapping sounds’	clap
23	bengabengabenga	‘sound of a horn’	toot
24	sringsring	‘sound of a rattle’	
25	beng	‘sound of a car’	vroom
26	trengtreng	‘sound of a train’	choo-choo
27	tralingtring	‘sound of a phone’	dring
28	kalangkang	‘banging/hammering sounds’	clang
29	kebeng	‘sound of objects dropping on the ground’	boom
30	beru	‘sound of big objects plumping’	splash
31	singsing	‘sound of a bell ringring’	ding
32	trektrek	‘sound of a clock ticking’	tick tock