

# Prototypical and less prototypical patterns of reduplication in Formosan languages<sup>1</sup>

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## ABSTRACT

The goal of this study is three-fold: (i) reassess certain generalizations that have been made of various Formosan languages while (ii) trying to identify the different patterns of reduplication that are found, some of which being treated as “prototypical”, while others as less “prototypical” and (iii) relate the meanings carried out by reduplication in a more general way, as has been attempted in previous studies (cf. Tseng 2003 and Yeh 2003).

**Keywords:** Formosan languages, reduplication, typology, prototypical/less prototypical

## 1. INTRODUCTION

Since the end of the 1990’s, an influx of studies has been carried on reduplication in the Formosan languages within different orientations, both descriptive and theoretical. Though the literature on reduplication in most Formosan languages is now quite extensive, there is no overall description pertaining to this phenomenon. An attempt of this kind has recently been made by Lu (2003), who examines reduplication in Pazeh, Amis, Paiwan and Thao because certain of their reduplicative patterns are “strikingly similar” (p.2). Our aim is to fill in this gap in a much broader perspective.

The goal of this study is three-fold: (i) reassess certain generalizations that have been made of various Formosan languages while (ii) trying to identify the different patterns of reduplication that are found, some of which being treated as “prototypical”, while others as “less prototypical” (sections 2-3) and (iii) relate the meanings carried out by reduplication in a more general way (section 4), as has been attempted in previous studies (cf. Tseng 2003 and Yeh 2003). The following section sets the stage of this study by summarizing the research carried out on reduplication in Formosan languages.

## 2. PREVIOUS RESEARCH ON REDUPLICATION IN THE FORMOSAN LANGUAGES

In what follows, we provide an overview of the patterns of reduplication found in the twelve Formosan languages<sup>2</sup> (Amis, Atayal, Bunun, Paiwan, Pazeh, Puyuma, Rukai, Saisiyat, Siraya, Seediq, Thao and Tsou) where this phenomenon has been examined to a lesser or greater extent and the semantic meanings associated with them. Whenever necessary, additional notes are made to rectify or question these

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<sup>1</sup> This paper is still on-going and the present version is very tentative and preliminary. Please, do not cite without the permission of the authors.

<sup>2</sup> There are still fourteen extant Formosan languages, five of which are moribund and are preceded with an asterisk in the list that follows: Atayal, Amis, Bunun, \*Kanakanavu (about a hundred speakers left), \*Kavalan, Paiwan, \*Pazeh (one speaker left), Puyuma, Rukai, \*Saaroa (about a hundred speakers left), Saisiyat, Seediq, \*Thao (about twenty speakers left), and Tsou. Yami, the fifteenth language, is spoken on Orchid Island, which is politically part of Taiwan but is genetically closer to the Philippine languages (Batanic subgroup). The extinct languages consist of Keta(n)galan, Taokas, Papor, Babuza, Favorlang, Hoanya, Siraya, Makatao and Taivoan.

previous analyses. A summary is given in section 2.13.

## 2.1 Preliminaries

To avoid countless repetitions, we first introduce the orthography used to transcribe the Formosan languages and mention a number of definitions pertaining to the different patterns of reduplication found in these languages. These will be illustrated in subsequent sections in languages where they apply. Terms used by a minority of scholars will be defined in the course of the paper. We also briefly discuss the theoretical frameworks upon which the studies we will refer to have been carried out.

### 2.1.1 Orthographic conventions

The Formosan languages exhibit fairly simple phonemic inventory systems consisting usually of no more than twenty consonants and four vowels, which typically include: (i) a series of voiceless and voiced stops /p, t, k, q, ʔ, b, d, g/, (ii) an affricate /ts/, (iii) at least two fricatives, usually /s, z/, (iv) a series of nasal /m, n, ŋ/, (v) liquids /l, r/ and (vi) four vowels /a, i, u, ə/. Of course, there is great variation among these languages which has arisen through repeated phonological changes. They won't be detailed in the present paper. Most noticeably, Paiwan has developed a series of palatals /c, ɟ, ʎ/; Rukai, Paiwan and Puyuma exhibit a partial/full series of retroflexes /ɬ, ɗ, ʟ/. Atayal, Seediq, Bunun, Paiwan and Thao distinguish between velar and pharyngeal sounds, while Amis differentiates glottal and epi-glottal sounds (Li 1999). A few languages such as Squliq Atayal, Tsou, Maga Rukai and Saisiyat have developed more complex vocalic systems. All the consonants and vowels found in the Formosan languages are given in Table 2 below. Equivalent orthographic symbols used throughout this paper if they appear are added in square brackets.<sup>3</sup>

**TABLE 1 THE PHONEMIC INVENTORY OF THE FORMOSAN LANGUAGES  
【 CONSONANTS 】**

		labial	dental	palatal	retroflex	velar	pharyngeal	epi-glottal	glottal
stop	-vd	p	t	c [tj]	ɬ [tr]	k	q	ʔ [q]	ʔ [ʔ]
	+vd	b ɓ [b]	d ɗ [l]	ɟ [dj]	ɗ [dr]	g			
affricate			ts [c]						
fricative	-vd	f ɸ [f]	θ [th] s	ʃ [sh]	ʂ [s]	x	χ [x]	h [h]	h
	+vd	β [b] v	ð [z/dh] z	ʒ [z]	ʐ [z]	ɣ [g]	ʁ [rh]		
nasal		m	n			ŋ [ng]			
liquid			l ɭ [lh]	ɻ [lj]	ʟ [lr]				
trill/flap			r ɾ [r]						
glide		w		y					

<sup>3</sup> Most authors make use of a Romanized orthographic system, and this is the reason why we have followed this tendency here. Note that [θ] is represented as *c* in Thao, [ɬ] is written *d* in Amis and [d] is replaced by *l* in Tsou. We have kept these conventions here. In Maga Rukai where both [ə] and [e] occur, we have kept these two symbols to represent these vowels.

**【VOWELS】**

	front	central	back
high	i	ɨ ʉ	u
mid	e	ə [e], œ [oe] <sup>4</sup>	o
low	æ [ae]	a	

The basic syllable structure in most languages is CVC, though both Rukai and Tsou now exhibit a CV syllable structure. Consonant clusters occur in only a few languages (e.g., Tsou, Maga Rukai, Thao and Atayal). Conventionally, identical vowels are indicated by a colon ‘:’ but to avoid any confusion, we will consistently indicate identical vowels as: *aa*, *oo*, *ii*. These might represent either long vowels occurring in the same syllable, or two identical but distinct vowels belonging to two different syllables. If that is the case, we will indicate the syllable boundary with a dot ‘.’ Stress is usually non-phonemic, or if it is, it is predictable by rules, and thus does not need to be marked.

### 2.1.2 Definitions and constraint

The subsequent definitions apply to different *patterns* of reduplication. Patterns of reduplication (which will be outlined in the following subsections) are opposed to *structures* (that will be discussed in section 3) in that a pattern only refers to one type of reduplication, while a single underlying structure can subsume different patterns of reduplication which perform the same (or similar) functions. In that respect, we follow Blust (Forthcoming:chapter 3): “Patterns are surface phenomena while structures are the more abstract forms which underlie them.”

*Lexicalized reduplication* refers to a fossilized and thus no longer identifiable root that can be shown to have undergone full reduplication.

*Ca-reduplication* (Blust 1998) refers to the reduplication of the first consonant plus /a/, or the occurrence of /a/ if there is no initial consonant.

*C-reduplication* copies the first consonant of the first syllable.

*CV-reduplication* (also coined *first-syllable* reduplication) involves the reduplication of the first syllable, or the first vowel is if there is no onset.

*CVC-reduplication* consists of the reduplication of the first syllable including the coda or the first syllable and the onset of the second.

*CVV-reduplication* copies two syllables CV<sub>1</sub>.V<sub>1</sub> belonging to two distinct syllables. The output (i.e., the reduplicant) consists of a syllable with a long vowel, CVV-.

*Full reduplication* consists of the copying of the entire disyllabic root with or without the last consonant if there is any.

*CVCV-reduplication* reduplicates two syllables in tri- or quadrisyllabic words.

*CV.V-reduplication* reduplicates the first two syllables C<sub>1</sub>V<sub>1</sub>C<sub>2</sub>V<sub>2</sub> with the exclusion of C<sub>2</sub>.

*Righthward reduplication* (L. Chang 1998) copies the last or the last two syllables

<sup>4</sup> According to Wu (2004), the vowel /æ/ is a central back vowel, much closer to /a/ than what has been primarily reported, while /œ/ is a slightly rounded, mid central vowel, very close to /o/. A merger between a/æ on the one hand and o/œ on the other is in progress in Saisiyat (see also Wu and Zeitoun, Forthcoming)

of di-, tri- or quadri-syllabic roots, with or without the final consonant.

*Triplication* involves the reduplication of the same part or the totality of the root twice in a unitary process. This term is to be distinguished from *serial* reduplication, which consists of the reduplication of a segment that has already been reduplicated (Blust 2001).

The major cross-linguistic constraint that governs all these reduplicative patterns is that at most two syllables can be reduplicated.

### 2.1.3 Theoretical orientations

Whatever their theoretical background, most scholars treat reduplication as a kind of affixation, following Marantz (1982), Broselow and McCarthy (1983) and McCarthy and Prince (1999).

While Ross (1995), Blust (1998 and 2001), Adelaar (2000), Li and Tsuchida (2001), Zeitoun (2002) and Teng (forthcoming) discuss certain aspects of reduplication from a typological, historical or a language-specific point of view without committing themselves to a particular theory, all the other analyses have conducted within one of the following four theoretical approaches: (i) autosegmental, (ii) Prosodic morphology, (iii) operations and rule-ordering and (iv) OT.

Within the autosegmental model developed by Marantz (1982), reduplication is treated as a morphological process, whereby affixation and the copied material constitute a fixed template. This framework has been adopted by Yeh (2000b) to account for Bunun and Saisiyat reduplication.

Another framework laid out by Steriade (1988) has been taken up by Hsin (2000) in her analysis of Maga Rukai reduplication. In this framework, reduplication always begins with full reduplication; partial reduplication results from eliminating syllables or segments under certain operations, such as syllable markedness, transfer parameters and truncation rules, i.e., the surface form is obtained through rule ordering of different phonological constraints that apply to eliminate segments or syllables disallowed by the template.

Several studies (Chang 1998, Chen 2002, Wu 2002, 2003, Lu 2003, Tseng 2003, Lin 2004) have been carried out within OT, developed by McCarthy and Prince (1999) and derived from the prosodic morphology hypothesis (McCarthy and Prince, 1990); these account for reduplication in Formosan languages by providing a ranking among the set of violable Universal Grammar constraints.

As will be shown in section 3, all these three theories have been challenged when accounting for data drawn from different Formosan languages.

In this paper, there will be no attempt to commit ourselves to either a constraint-based or a rule-based approach. Rather, we will try to provide an overall description that will lead to a number of generalizations.

## 2.2 Reduplication in Amis

Reduplication in Amis (central dialect) has been examined by J. Wu (2000), C. Wu (2002), Chu (2003) and Lu (2003). Our presentation is drawn from the latter.

Lu (2003:91) mentions that Amis exhibits only two major types of reduplication: *Ca*-reduplication and rightward reduplication.

*Ca*-reduplication applies to nominal, numeral and verbal bases and is used to (i) form (abstract) nominalized nouns, (ii) count human referents and (iii) verbal aspect (continuous).

Rightward reduplication applies to trisyllabic and to disyllabic roots with or

without a medial consonant cluster. In the latter case, Lu (2003:96) concedes that this pattern could be identified as full reduplication but refutes this hypothesis on the basis of the semantic meaning attributed to it. He also mentions that rightward reduplication is specifically used with nouns and stative verbs (2003:92). In nouns, it yields quantification/collectivity (this latter notion being sometimes associated with a locative meaning, depending on the nominal base)<sup>5</sup>, and in stative verbs, it indicates intensity and/or refers to a multiplicity of referents.

Lu (2003) has not identified full reduplication in Amis. Full reduplication yields a plural/collective/distributive meaning in nouns and repetitive/continuous aspect in verbs, e.g. *cima* ‘who’ ~ *cima-cima* ‘anybody’, *posi* ‘cat’ ~ *posi-posi(-an)* ‘those cats, each cat’, *temok* ‘have heartbeat, palpitation’ ~ *temok-temok* ‘keep on having heartbeat, palpitation’.

**TABLE 2, REDUPLICATION PATTERNS IN AMIS BASED ON LU (2003)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. Ca-reduplication	first consonant plus /a/	1. nominalization	$C_1V_1C_2V_2CVC \rightarrow$	<i>fa-fafoy-an</i>	pigpen
		2. counting of human referents	$C_1a-C_1V_1C_2V_2CVC$	<i>ta-tosa'</i>	two (persons)
		3. continuous/repetitive aspect		<i>mi-ra-rosaros</i>	keep sawing
2. rightward reduplication	last two syllables or penultimate C and last syllable without final C	1. quantification/collectivity	$C_1V_1C_2V_2C_3V_3C \rightarrow$ $C_1V_1C_2V_2C_3V_3-C_2V_2C_3V_3-C$	<i>romi'a-mi'a-l</i>	old men
		2. collective/locative	$C_1V_1C_2V_2C \rightarrow$ $C_1V_1C_2V_2-C_1V_1C_2V_2-C$	<i>itse-'itse-p-an</i>	a betel nut plantation
		3. intensification	$C_1V_1C_2C_3V_2C \rightarrow$ $C_1V_1C_2C_3V_2C-C_2C_3V_2-C$	<i>fuhtsa-htsa-l</i>	all very white
3. full reduplication	entire root	1. plurality/collectivity/distributivity	$C_1V_1C_2V_2(C) \rightarrow$	<i>posi-posi(-an)</i>	those cats/each cat
		2. continuous/repetitive aspect	$C_1V_1C_2V_2(C)-C_1V_1C_2V_2(C)$	<i>temok-temok</i>	keep on having palpitation

### 2.3 Reduplication in Atayal

Reduplication has been treated in Rau (1992) and W. Lin (2004) but neither study seem convincing enough to make full use of the data at hand. Thus, we base our study on the Formosan Language Archive ([formosan.sinica.edu.tw](http://formosan.sinica.edu.tw))<sup>6</sup> and refer to W. Lin (2004) and Huang (1993) whenever necessary.

Our analysis concords with Lin (2004) in that there is only one main pattern of reduplication in Sqliq Atayal -- which we label after her -- C-reduplication.

C-reduplication applies on di- and trisyllabic nominal and verbal roots. It is used to indicate (i) plurality/collectivity in nouns (ii) continuous/repetitive aspect in dynamic verbs and (iii) intensification stative verbs; (iv) according to Huang (1993) and W. Lin (2004) it also marks “future” tense; (v) C-reduplication is also found in co-occurrence with a number of affixes, most notably focus and nominalizing affixes, e.g., *n-niq-un* ‘food’; in co-occurrence with a prefix *m-/p-* it denotes reciprocity.

The deletion of the vowel after the first consonant makes it difficult to determine whether C- is derived from the same structure. We suspect that it has actually evolved from CV- and Ca- reduplication, the first structure carrying over (i)-(iii) and the

<sup>5</sup> Two notes are in order: (i) the meaning yielded by rightward reduplication in nouns is not plurality as assumed by Lu (2003); (ii) Lu (2003:94) analyzes bases (e.g., *angtsep* ‘burn’) as nouns whereas they actually are stative verbs.

<sup>6</sup> Twenty texts were recorded and preliminary analyzed by Y. Yeh (2003~4) with the help of E. Zeitoun on Sqliq as spoken in Jianshih Township, Hsinchu County. We are grateful to Y. Yeh for comments on this section.

second (iv)-(v).

W. Lin (2004:29ff) reports another pattern, “full reduplication”, that applies on so-called adjectives, nouns, verbs and numerals, with a wide array of meanings that correspond to those carried over by C(V)-reduplication. The kind of data she presents as evidence, e.g. *qexi’ qexi’* ‘very thin’, *qutux qutux laqi’* ‘every child’ and the doubling of NPs as in *qutux laqi qutux laqi’* are not found in the Archive. We leave this issue for further investigation.

**TABLE 3, REDUPLICATION PATTERNS IN SQU LIQ BASED ON Y. YEH (2003)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. C-reduplication	first consonant	1. plural/collective	$C_1V_1C_2V_2C \rightarrow$	<b>q-qmayah</b>	<i>all the fields</i>
		2. continuous/repetitive aspect	$C_1-C_1V_1C_2(V_2C)$	<b>b-n-buw</b>	<i>would drink</i>
		3. intensification		<b>z-zik</b>	<i>very deep</i>
		4. predicative/irrealis/future		--	
		5. reciprocity		<b>m-k-kut</b>	<i>cut each other</i>

## 2.4 Reduplication in Bunun

Reduplication in Isbukun Bunun has been well-documented in Yeh (2000b) and our account relies on her study, with a few modifications whenever necessary.

Besides lexicalized reduplication, three patterns of reduplication are attested in Isbukun Bunun, (i) full reduplication, (ii) CV-reduplication, and (iii) -CV-reduplication. CV-reduplication is the most productive.

Full reduplication occurs rarely in this language. It involves two subpatterns, the first in which the whole root including the coda is copied, and the second in which the coda is excluded from reduplication. No semantic function is drawn from the data, but it can be said to: (i) indicate intensification in nouns, (ii) change the lexical category of verbs and (iii) convey progressive aspect in verbs.

CV-reduplication applies to disyllabic roots with a CVCV, C(Y)VCVC or CVC/YCVC structure<sup>7</sup> and occurs quite frequently with an affix. It can be divided into four subpatterns, but only the first is very productive: (i) CVCV(C)  $\rightarrow$  CV-CV(C)CV(C), (ii) CYVCV(C)  $\rightarrow$  CYV-CYVCV(C), (iii) CVYCV(C)  $\rightarrow$  CV-CVYCV(C), (iv) CVCCV(C)  $\rightarrow$  CVC-CVCCV(C). It is used to indicate: (i) plurality on nouns, (ii) continuative/repetitive aspect on verbs and (iii) collectivity on stative verbs.

-CV- is actually in complementary distribution with CV-, and is triggered by PF suffixation. The same verbs occur with CV-reduplication. The fact that the same verb stem undergoes CV- reduplication in co-occurrence with an AF or IF affix. From the data at hand, it seems that -CV-reduplication only conveys repetitive aspect.

<sup>7</sup> We have modified slightly the syllable structures given in M. Yeh (2000b) to conform with our re-analysis of the data.

**TABLE 4, REDUPLICATION PATTERNS IN ISBUKUN BUNUN BASED ON YEH (2000B)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. lexicalized red.	entire root	--	--	<b>pilpil</b>	eyelash
2. full reduplication	disyllabic root with(out) coda	1. nominal intensification	$C_1V_1C_2(V_2C) \rightarrow$	<b>habas-habas-an</b>	<i>a long long time ago</i>
		2. lexical category change	$C_1V_1C_2(V_2C)-C_1V_1C_2(V_2C)$	<b>hud-hud</b>	<i>neck (&lt;drink)</i>
		3. verbal aspect	$C_1V_1C_2V_2(C) \rightarrow$ $C_1V_1C_2V_2-C_1V_1C_2V_2(C)$	<b>'ama-'ama</b>	<i>be carrying on back</i>
3a. CV-reduplication	first syllable with(out) coda (C)	1.plural	$C_1V_1C_2V_2(C) \rightarrow$	<b>sa-sadu'</b>	<i>is looking at</i>
		2. continuous/repetitive aspect	$C_1V_1-C_1V_1C_2V_2(C)$		
		3. collectivity	$C_1YV_1C_2V_2(C) \rightarrow$ $C_1YV_1-C_1(Y)_1C_2V_2(C)$	<b>ma-sya-syadh</b>	<i>all good</i>
			$C_1V_1YC_2V_2(C) \rightarrow$ $C_1V_1-C_1V_1YC_2V_2(C)$	<b>ma-da-daynadh</b>	<i>old men</i>
			$C_1V_1C_2C_3V_3(C) \rightarrow$ $C_1V_1C_2-C_1V_1C_2C_3V_3(C)$	<b>ma-pin-pinkaylas</b>	<i>wake s.o up</i>
		3b. -CV-reduplication	within stem	repetitive aspect	$C_1V_1C_2V_2(C) \rightarrow C_1V_1-C_2V_2-C_2V_2(C)$

### 2.5 Reduplication in Paiwan

Reduplication in Paiwan (so-called “northern” dialect) has been examined by A. Chang (1998, 2000), Lu (2003) and Tseng (2003). Despite the fact that the terminology and the data<sup>8</sup> vary to some extent, our description will refer to the last two studies, and to a lesser extent to A. Chang (2000).<sup>9</sup>

A. Chang (2000), Lu (2003) and Tseng (2003) recognize two main patterns of reduplication in Paiwan, (i) root reduplication (A. Chang 2000 and Tseng 2003) or rightward reduplication (Lu 2003) and (ii) *Ca*-reduplication. According to Tseng (2003:2), root reduplication is the most productive pattern. *Ca*-reduplication is less prototypical, not only from a phonological perspective but also from a semantic point of view as it exhibits more specialized semantic functions.

Though the terminology differs, Tseng (2003) actually argues, like Lu (2003), that root reduplication is suffixal. Disagreement arises, however, regarding the reduplicant base. According to Lu (2003:124ff) and A. Chang (2000), rightward reduplication applies to trisyllabic roots, disyllabic roots (with or without a medial consonant cluster) and monosyllabic roots<sup>10</sup>, with (in all cases) the final consonant excluded from reduplication. Tseng (2003) believes, on the other hand, that reduplication only applies to di- or tri-syllabic roots<sup>11</sup>. Her analysis relies on the assumption that words are minimally disyllabic since monosyllabic verbs, like \*kan ‘eat’ must occur with an infix <em>, thus as *k<em>an* ‘eat’<sup>12</sup>. Meanings carried over by root/rightward reduplication are, to some extent, consistent in these studies and can be summarized as follows: nouns are given a diminutive (Lu 2003)/facsimile (Tseng 2003)<sup>13</sup> interpretation, stative verbs are intensified while dynamic verbs are either interpreted as continuous/repetitive or referring to a plurality of participants in

<sup>8</sup> The analyses provided by A. Chang (1998) and (2000) differ rather drastically. In her (1998) paper, A. Chang classifies reduplication in Paiwan as prefixal and suffixal. In her (2000) study, she recognizes two different patterns of reduplication, root reduplication (term adopted by Tseng 2003), and *Ca*-reduplication. Though she further divides root reduplication into six subpatterns, she does not say anything about whether it is “prefixal” or “suffixal”.

<sup>9</sup> Reference is not made on lexicalized reduplication in Paiwan in any of these works. It exists though, as the following form attests, e.g., *bel-e-bel* ‘banana’.

<sup>10</sup> Lu (2003:127-129) mentions that when rightward applies to disyllabic stems, the lexical output resembles full reduplication, whereas when it applies to monosyllabic roots, the reduplicant is a CV sequence.

<sup>11</sup> She actually defines syllables as moras from which word final codas (but not word-internal codas) are excluded.

<sup>12</sup> Such a definition cannot account for words like *nyaw* ‘cat’, mentioned in Lu (2003:129).

<sup>13</sup> Tseng (2003) provides a network-like interpretation that won’t be detailed here. See section 5.

reciprocals.

Both Lu (2003) and Tseng (2003) qualify *Ca*-reduplication of “prefixed”. In both analyses, the semantic functions attributed to *Ca*-reduplication are problematic: Lu (2003) is unable to find coherent meanings associated to *Ca*-reduplication in nouns<sup>14</sup>, while Tseng (2003) does not recognize the relation between reduplicated reciprocal verbs and nouns (both refer to a plurality of participants)<sup>15</sup>. Based on their data, it can be ascertained that *Ca*-reduplication applies to nouns and verbs and serves to form (i) locative and instrument nouns and (ii) reciprocal verbs.

**TABLE 5, REDUPLICATION PATTERNS IN PAIWAN BASED ON LU (2003) & TSENG (2003)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. lexicalized red.	entire root	--	--	<b>bel-e-bel</b>	banana
2. rightward reduplication	last two syllables/moras or penultimate C	1. diminutive/fascimile	$C_1V_1C_2 \rightarrow C_1V_1-C_1V_1C_2$ (rejected by Tseng 2003)	<b>nya-nya-w</b>	wild cat
		2. intensification			
		3. continuous/repetitive aspect	$C_1V_1C_2V_2C_3V_3 \rightarrow$	<b>kamura-mura-w</b>	very small
		4. plurality of participants (reciprocal)	$C_1V_1C_2V_2C_3V_3-C_2V_2C_3V_3-C$		pomelo
	and last syllable/mora without final C		$C_1V_1C_2C_3V_2C \rightarrow$ $C_1V_1C_2C_3V_2C-C_2C_3V_2-C$ $C_1V_1C_2V_2C \rightarrow$ $C_1V_1C_2V_2-C_1V_1C_2V_2-C$	<b>ma-gong-gong-ngo-ng</b>	very crazy
3. <i>Ca</i> -Reduplication	first consonant plus /a/	1. nominalization	$C_1V_1C_2V_2CVC \rightarrow$	<b>pa-pacun-an</b>	place for looking
		2. reciprocal	$C_1a-C_1V_1C_2V_2CVC$	<b>ma-dra-dreqong</b>	bow to each other

## 2.6 Reduplication in Paze

Reduplication in Paze<sup>16</sup> has been discussed in several studies, including Ferrell (1970), Lin (1998, 2000), Blust (1999), Li and Tsuchida (2001) and Lu (2003). Our account draws on the last three. Controversies that arise regarding different patterns of reduplication are mentioned in the course of the presentation.

The following patterns are recognized in Paze: (i) lexicalized reduplication, (ii) full reduplication, (iii) rightward reduplication, (iv) *Ca*-reduplication, (v) CV-reduplication and (vi) CV:-reduplication involving vowel lengthening.

Lexicalized reduplication consists of a doubled root syllable, with a vowel inserted between the two syllables that usually “echoes” the first syllable (Li and Tsuchida, 2001:20). Blust (1999:354) notes that “no reduplication process was recorded with historically reduplicated monosyllables.”

Full reduplication applies to disyllabic stems, leaving the final consonant out of the reduplicated portion. It implies plurality with nouns, repetitive or continuous aspect with dynamic verbs and intensity with stative verbs. While Blust (1999) makes a distinction between “full reduplication” and “leftward/rightward” reduplication in trisyllabic roots, Lu (2003) believes that CVCV- reduplication applies only to bi- and tri-syllabic dynamic verb roots, while rightward reduplication is found in both stative and dynamic verbs. This affirmation is not correct, as the following instances demonstrate: *maa-ka-lia-liak* ‘hate one another’ (*ma-liak* ‘hate’), *maa-ka-baza-bazah*

<sup>14</sup> Lu (2003) wrongly analyzes *ka-* in *ka-kay-an* ‘original language, as spoken by the ancestors’ as a reduplicated segment, but *ka-...-an* actually forms a circumfix ‘genuine, true’.

<sup>15</sup> She wrongly analyzes the prefix *ma-* occurring with *Ca*-reduplication as the “actor pivot for stative verbs”. For details, see Zeitoun (2002 and Forthcoming).

<sup>16</sup> Transcribed as *Pazih* since Li and Tsuchida (2001).

‘know one another’ (< ma-bazah ‘know’), i.e., stative verbs (like dynamic verbs) can also undergo full reduplication (or in his terms, CVCV-reduplication) to indicate a plurality of participants in reciprocals.

Ca-reduplication mostly derives (canonical and less canonical) instrumental nouns from verbs.

Both Li and Tsuchida (2001) and Blust (1999) mention CV-reduplication. They agree that it usually indicates a progressive, continuing or repetitive aspect. The former also indicate that CV-reduplication is used to form ordinals. CV-reduplication is not recognized by Lu (2003). On the other hand, he reports a CV:-reduplication<sup>17</sup> pattern, whereby the vowel in the first syllable is lengthened. Though also mentioned in Li and Tsuchida (2001), it is not clear whether lengthening is part of the reduplication process or occurs afterwards. The semantic overlap between CV-reduplication and CV:-reduplication (both indicate aspect) is not explained either.

**TABLE 6, REDUPLICATION PATTERNS IN PAZEH BASED ON BLUST (1999), LI AND TSUCHIDA (2001) AND LU (2003)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. lexicalized reduplication	root (CV(C))	--	--	<b>deng-e-deng</b>	boil in water
		--	--	<b>hir-i-hir</b>	grind
		--	--	<b>buk-u-buk</b>	bamboo pipe
2a. full reduplication	entire root except C#	1. plurality	$C_1V_1C_1 \rightarrow C_1V_1C_1-C_1V_1C_1$	<b>saw-saw</b>	persons
		2. continuous/repetitive aspect	$C_1V_1V_2C_2 \rightarrow C_1V_1V_2-C_1V_1C_2V_2C$	<b>mu-hiu-hium</b>	blow on s.t. <i>repeatedly</i>
		3. intensification	$C_1V_1C_2V_2C \rightarrow$	<b>ma-kuri-kuris</b>	<i>very</i> skinny
		4. plurality of referents in reciprocals	$C_1V_1C_2V_2C-C_1V_1C_2V_2C$	<b>maa-ka-baza-bazah</b>	know <i>one another</i>
2b. CVCV-reduplication	trisyllabic roots	same as 2a	$C_1V_1C_2V_2C_3V_3C \rightarrow$ $C_1V_1C_2V_2C-C_1V_1C_2V_2C_3V_3C$	<b>ma-haba-habahar</b>	<i>keep</i> flying
2c. rightward reduplication	last or last two syllables except C# of trisyllabic roots	same as 2a	$C_1V_1C_2V_2C_3 \rightarrow$ $C_1V_1C_2V_2-C_2V_2C_3$	<b>~ma-habaha-baha-r</b>	
				<b>kamala-mala-ng</b>	<i>very</i> sharp
3. Ca-reduplication	first consonant plus /a/	inst. nominalization	$C_1V_1C_2V_2V \rightarrow Ca-C_1V_1C_2V_2C$	<b>ka-kuxus</b>	razor (< shave)
4. CV-reduplication <i>not in Lu (2003)</i>	first syllable	1. continuous/repetitive aspect 2. formation of ordinal	$C_1V_1C_2V_2(C) \rightarrow C_1V_1-C_1V_1C_2V_2(C)$	<b>bi-bizu</b>	be writing
				<b>du-dusa</b>	the second
5. CV:-reduplication ? <i>not in Blust (1999)</i>	1 <sup>st</sup> syllable with vowel lengthening	progressive aspect	$C_1V_1V_2C_3 \rightarrow C_1V_1V_2C_1V_1V_2C_3$	<b>baa-bazu'</b>	<i>be</i> washing

## 2.7 Reduplication in Puyuma

Reduplication in Nanwang Puyuma is discussed in Teng (Fortchoming). Following Adelaar (2000), she mentions the following types of reduplication: (i) lexicalized root reduplication, (ii) Ca-reduplication disyllabic, (iii) CVCV-reduplication, (iv) first syllable reduplication and (v) rightward reduplication.

Lexicalized root reduplication refers to a monosyllabic “simple” or a “complex” doubled root (either verbs or nouns). Simple doubled roots represent the combination of the same root occurring twice, e.g., *sipsip* ‘to lick’. “Complex” doubled roots are infixes with either <aC>, <a> or <e>, e.g., *g<al>emgem* ‘numbness of the tongue’, *gis<a>gis* ‘to shave’, *sal<e>sal* ‘thin’<sup>18</sup>. Only simple double roots can undergo CVC-reduplication, e.g., *tu-pes-pespes-ay* [3S.Gen-Red-massage-LF] ‘he kept on

<sup>17</sup> We label this pattern CV:- to avoid the confusion with CVV-reduplication in Saisiyat.

<sup>18</sup> While <aC> is inserted just after the first consonant, <a> and <e> occur after the first syllable (CVC). <a> may also occur after the first vowel.

massaging (him)’. Lexicalized disyllabic root reduplication refers to the copying of a root, with or without the final coda, *kidrukidru* ‘armpits’, *kelrekelrek* ‘titillate at the armpit’, *kelrekelrengan* ‘small intestines’, *kamangkamang* ‘big spider’.

*Ca*-reduplication copies the first consonant followed by /a/ when the root is disyllabic, but duplicates the second consonant if the root is tri- or quadrisyllabic, e.g., *dalralrekeng* ‘will be wet’ (< *dalrekeng* ‘wet’). If there is no onset, then a vowel /a/ is prefixed to the root/stem, whatever the number of syllables in the root. *Ca*-reduplication is assigned four different meanings: (i) it forms instrumental nouns from verbs, (ii) it forms ordinal numbers (but its usage seems to be constrained by the occurrence of the prefix *puka-*, e.g., *puka-dra-drua* ‘the second’), (iii) it indicates progressive aspect or irrealis mood and (iv) it marks reciprocals.

Disyllabic reduplication refers to the reduplication of two syllables in di-, tri- or quadrisyllabic words, the final consonant being left out and subsumes two different patterns, cf. full and rightward reduplication. It implies plurality or generality with nouns, repetitive or distributive aspect with dynamic verbs and intensity with stative verbs.

First syllable reduplication applies mostly (though not consistently) to numerals for counting non-human referents.

Rightward reduplication is rare in Puyuma. It involves the copy of the last or last two syllables along with the final coda and yields plurality in nouns and intensity in stative verbs.

**TABLE 7, REDUPLICATION PATTERNS IN PUYUMA BASED ON TENG (FORTHCOMING)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1a. Lexicalized monosyllabic root reduplication	root	--	1. simple	<b>sipsip</b>	lick
		--	2. complex: -aC- infixation	<b>g&lt;a&gt;emgem</b>	numbness of the tongue
		--	<a> infixation	<b>gis&lt;a&gt;gis</b>	shave
		--	<e> infixation	<b>salesal</b>	thin
1b. Lexicalized disyllabic root reduplication	root with or without final C	--	--	<b>kidrukidru</b>	armpits
		--	--	<b>kelrekelrek</b>	titillate at the armpit
		--	--	<b>kamangkamang</b>	big spider
		--	--		
2. Disyllabic root reduplication	entire root	1. plurality	$C_1V_1C_2V_2C \rightarrow C_1V_1C_2V_2-C_1V_1C_2V_2C$	<b>drena-drenan</b>	mountains
	except final C	2. repetitive aspect	$(C_1)V_1C_2V \rightarrow (C_1)V_1C_2V_2-(C_1)V_1C_2V_2$	<b>turu-turus</b>	keep following
		3. intensity	$C_1V_1C_2V_2C \rightarrow C_1V_1C_2V_2-C_1V_1C_2V_2C$	<b>dawi-dawil</b>	very far
3. First syllable reduplication	first syllable	counting of non-human referents	$C_1V_1C_2V_2V \rightarrow C_1V_1-C_1V_1C_2V_2V-a$	<b>dru-drua-a</b>	two
4. <i>Ca</i> -reduplication	first consonant plus /a/ or just /a/ if no onset	1. nominalization	$C_1V_1C_2V_2C \rightarrow Ca-C_1V_1C_2V_2C$	<b>ta-tilru</b>	rope
		2. prog/irrealis		<b>k&lt;em&gt;a-kasu</b>	is bringing
		3. ordinals		<b>puka-dra-drua</b>	the second
		4. reciprocal		<b>ma-sa-sulud</b>	push each other
	2 <sup>nd</sup> consonant in tri-/quadrisyllabic roots	as above	$C_1V_1C_2V_2C_3V_3C \rightarrow C_1V_1CaC_2V_2C_3V_3C$	<b>da-lra-lrekeng</b>	will be wet
5. Rightward reduplication	last or last two syllables of di-/trisyllabic roots with final C reduplicated	1. intensification	$C_1V_1C_2V_2C_3V_3C_4 \rightarrow C_1V_1C_2V_2C_3V_3C_4-C_3V_3C_4$	<b>talrugang-gang</b>	very sturdy
		2. plur/distributive	$C_1V_1C_2V_2C_3V_3C_4V_4C_5 \rightarrow C_1V_1C_2V_2-C_3V_3C_4V_4C_5-C_3V_3C_4V_4C_5$	<b>kata-guwin-guwin</b>	spouses

## 2.8 Reduplication in Rukai

Reduplication has been investigated in three of the six dialects that constitute Rukai<sup>19</sup>: Budai (Shelley 1979), Maga (Hsin 2000) and Mantauran (Zeitoun Forthcoming). In this section, we only document reduplication in Maga and Mantauran Rukai, for two main reasons: (i) reduplicative patterns in Budai overlap in many ways with those found in Mantauran where they are more numerous, (ii) the syllable structure of Maga and Mantauran is different. Maga allows consonant clusters in initial position C(C)V, while Mantauran has a basic CV syllable structure.

According to Hsin (2000:158), there are two types of reduplication in Maga: *Ca*-reduplication and stem-reduplication, besides lexicalized reduplication.

*Ca*-reduplication must co-occur with a prefix that determines the meaning of the whole component (e.g., ‘become X’).

Stem reduplication subsumes two subpatterns: CV- and CVC-reduplication. CV-reduplication consists of the reduplication of the first syllable, with the reduplication of the simple or complex onset (thus, CV- or CCV-). CVC- involves the reduplication of the first syllable CVC-, or the first syllable along with the consonant of the second syllable CV.C-. In both cases, and relying on the data at hand, it seems that the onset in CVC-reduplication is always simple. Hsin (2000:163) mentions that “stem reduplication fulfills various semantic functions, depending on the category of the base it applies to [...] it intensifies the degree of stative verbs, signals the repetitive/continuative aspect in dynamic verbs and with nouns, it marks plurality.

In the Formosan Language Archive<sup>20</sup>, two other types of reduplication were spotted, unnoticed in Hsin (2000). They seem to be rather quite unproductive, though: full reduplication, e.g., *taka* ‘elder sibling’ → *tka-tka* ‘eldest sibling’, *u-tubi* ‘cry’ → *tku-tbu-tbi* ‘while crying’ (< *tku* ‘while’), *ma-broo* ‘good, beautiful’ → *ma-bro-broo* ‘very good, beautiful’ and rightward reduplication (only one instance), *k-brathi* ‘harvest sweet potatoes’ → *k-borthe-the* ‘keep on harvesting sweet potatoes’.

**TABLE 8, REDUPLICATION PATTERNS IN MAGA RUKAI BASED ON HSIN (2000)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. lexicalized reduplication	root (CV(C))	--	--	<b>blibli</b>	banana
2. <i>Ca</i> -reduplication	first consonant plus /a/	depends on the co-occurring prefix	$C_1(C_1)V_1C_2V_2$ → $Ca-C_1(C_1)V_1C_2V_2$	<b>ma-pa-pana</b> <b>aŋ-ka-kiti</b>	shoot at <i>each other</i> cut <i>oneself</i>
3a. CV-reduplication	first syllable	1. plurality 2. verbal aspect 3. intensification	$C_1V_1C_2V_2$ → $C_1V_1-C_1V_1C_2V_2$ $C_1(C_1)V_1C_2V_2$ → $C_1(C_1)V_1-C_1(C_1)V_1C_2V_2$	<b>a-bi-bik-ani</b> <b>o-drngə-drngədrngə</b> <b>ma-lo-loo</b>	<i>place full of pigs</i> <i>keep on drying</i> <i>very dry (clothes)</i>
3b. CVC-reduplication	2 <sup>nd</sup> syllable with(out) 2 <sup>nd</sup> syllable onset	same as 3a	$C_1V_1C_2C_3V_3$ → $C_1V_1C_2-C_1V_1C_2C_3V_3$ $C_1V_1C_2V_2C_3V_3$ → $C_1V_1C_2-C_1V_1C_2V_2C_3V_3$	<b>te-sdam-damraa</b> <b>ic-icoo</b> <b>mu-kan-kani</b>	<i>keep on cooking side dishes</i> persons <i>keep on coming</i>
3c. full reduplication	entire root	same as 3a except for 1.	$C_1(C_1)V_1C_2V_2$ → $C_1(C_1)V_1C_2V_2-C_1(C_1)V_1C_2V_2$	<b>tka-tka</b>	eldest sibling
3d. rightward reduplication	last syllable	repetitive aspect	$C_1(C_1)V_1C_2V_2$ → $C_1(C_1)V_1C_2V_2-C_2V_2$	<b>k-borthe-the</b>	<i>keep on harvesting sweet potatoes</i>

<sup>19</sup> See Li (1977) for details and subsequent work by Zeitoun (1995).

<sup>20</sup> Texts on Maga Rukai were actually recorded, transcribed and analyzed by Tien-hsin Hsin, under the supervision of E. Zeitoun.

Zeitoun (Forthcoming) classifies reduplication in Mantauran Rukai into four main patterns: (i) lexicalized reduplication, (ii) full reduplication, which further subsumes three subpatterns: CVCV-, CV.V- and rightward reduplication, (iii) partial reduplication, which includes CV- and Ca-reduplication (in co-occurrence with other prefixes) and (iv) a mixed pattern that involves -CV-, -CV.V- and -CVCV-reduplication within the root or the stem (i.e., neither leftward nor rightward).

Lexicalized reduplicated roots can undergo both CVCV- and Ca- reduplication, e.g., *vengevenge* ‘roll, encircle’ → *'ini-va-vengevenge* ‘roll oneself (into)’, *o-venge-vengevenge* ‘keep on rolling/encircling’.

Full reduplication only applies to disyllabic roots. CVCV- applies to tri- or quadrisyllabic roots and copies the first two syllables. CV.V- applies to disyllabic and trisyllabic roots. It copies the first two syllables but leaves out the second consonant, if any<sup>21</sup>. Rightward reduplication refers to the copy of the last syllable or the last two syllables of disyllabic or trisyllabic roots. The semantic functions carried out by CVCV-reduplication and rightward reduplication are rather quite similar: they indicate plurality in nouns (sometimes in co-occurrence with the plural marker *a-* or *la-*), repetitive or continuative aspect with dynamic verbs and intensity with stative verbs. They can also (i) refer to a plurality of participants in reciprocals (both in co-occurrence with dynamic and stative verbs as well as nouns), and (ii) usually co-occur with two types of nominalizers, *ta-...-an* ‘locative nominalizer’ and *'a-* ‘instrumental nominalizer’. The meanings carried out by CVV-reduplication are slightly different. It entails a diminutive meaning in nouns, a comparative degree in stative verbs, and habitual or repetitive aspect in dynamic verbs.

CV- reduplication involves the reduplication of the first syllable of a root. It is extremely rare in Mantauran Rukai and its semantic function is rather difficult to define with precision.

As in Maga Rukai, Ca-reduplication must co-occur with a prefix that determines the meaning of the whole component (e.g., in co-occurrence with *'ini-*, it implies reflexivity).

**TABLE 8', REDUPLICATION PATTERNS IN MANTAURAN RUKAI BASED ON ZEITOUN**  
(Forthcoming)

PATTERNS OF REDUPLICATION	REDUPLICATION DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. lexicalized reduplication	root (CV(C))	--	--	<b>o-vengevenge</b>	roll, encircle
2a. full reduplication	entire root	1. plurality	$C_1V_1C_2V_2 \rightarrow C_1V_1C_2V_2-C_1V_1C_2V_2$	<b>o-'odho-'odho</b>	carry often
		2. collective/locative		<b>ta-kane-kan-ae</b>	restaurant
		3. verbal aspect		<b>o-'rodho-'rodho</b>	<i>keep on mixing</i>
		4. intensification			
2b. CVCV-reduplication	first two syllables	same as 2a	$C_1V_1C_2V_2C_3V_3 \rightarrow C_1V_1C_2V_2-C_1V_1C_2V_2C_3V_3$	<b>a-sava-savare</b>	young men
				<b>'o-'ongo-'ongolo</b>	<i>drink often</i>
				<b>ma-dhala-dhalame</b>	<i>like/love very much</i>
2c. Rightward reduplication	last or last two syllables	same as 2a	$C_1V_1C_2V_2(C_3V_3) \rightarrow C_1V_1C_2V_2-C_2V_2(C_3V_3)$	<b>ta-saosi-osi-e</b>	lock
				<b>topa'ai-'ai</b>	dry in the sun often
				<b>tamako-mako</b>	<i>smoke often</i>
2d. CV.V-reduplication	first two syllables without C <sub>2</sub>	1. diminutive	$C_1V_1C_2V_2 \rightarrow C_1V_1V_2-C_1V_1C_2V_2$	<b>dhaa-dha'ane</b>	<i>small house</i>
		2. continuous/repetitive aspect		<b>ma-dhaa-dhalame</b>	<i>love more</i>
		3. comparative		<b>(o-)dhoo-dhodho'o</b>	<i>pour water often</i>
3a. Ca-reduplication	first C plus /a/	depending on the co-occurring prefix	$C_1V_1C_2V_2 \rightarrow Ca-C_1V_1C_2V_2$	<b>ma-pa-pana</b>	shoot at <i>each other</i>
				<b>'ini-ka-ke'ete</b>	cut <i>oneself</i>

<sup>21</sup> It is found in only four of the six Rukai dialects, Mantauran, Labuan, Budai and Tanan.

3b. CV-reduplication	first syllable (very rare)	1. plurality	C <sub>1</sub> V <sub>1</sub> C <sub>2</sub> V <sub>2</sub> →C <sub>1</sub> V <sub>1</sub> -C <sub>1</sub> V <sub>1</sub> C <sub>2</sub> V <sub>2</sub>	<i>ti-tina</i> <sup>22</sup>	middle-aged woman
		2. continuous/repetitive aspect			
		3. intensification			
4. Mixed pattern	-CV- -CVCV- -CVV-	same as 2 and 3	Same as in 2b, 2d and 3b	<i>dha-kerā-keral-ae</i>	river banks
				<i>o-iredhee-dheke</i>	plant <i>repeatedly</i>
				<i>ma-a-lo-loho-nga</i>	all already grown up

## 2.9 Reduplication in Saisiyat

Reduplication in Saisiyat has been investigated in detail by M. Yeh (2000a-b and 2003) and by Wu and Zeitoun (Forthcoming). The data and the analysis presented in this section are mostly drawn on this latter work.

Five patterns of reduplication in Tungho Saisiyat are attested: (i) lexicalized reduplication, (ii) *Ca*-reduplication; (iii) partial reduplication, which subsumes CV-, CVC-, CVV- and -CV- reduplication and (v) full reduplication. Among these five patterns, CVC- is the most productive and -CV- reduplication the rarest.

*Ca*-reduplication can apply to verbs and to a lesser extent nouns and serves to form (i) instrument nouns, usually derived from dynamic verbs but also sometimes from nouns (ii) reciprocal verbs and to indicate (iii) future tense in (dynamic) verbs marked as B/IF and (iv) intensification along with distributivity ('all very') of stative verbs.

There is no sharp semantic contrast between CV- and CVC-reduplication in Saisiyat. Both patterns apply to nouns and verbs which are interpreted as follows when reduplicated: (i) nouns suffixed with the locative nominalization marker *-an* may either indicate increase (cf. "a place full of") or diminution; (ii) stative verbs in co-occurrence with the suffix *-an* are attenuated (e.g., "a little"), (iii) dynamic verbs might either be given a continuous or repetitive interpretation. Interestingly, among these two patterns, affixes (verbal prefixes and the infix <om>) can undergo reduplication, e.g., *ma-ŋowip* 'forget' > *maŋ-ma-ŋowip* 'often forget', *f<om>βət* 'beat' > *fom-f<om>βət* 'keep on beating'. CVV-reduplication applies to di- and tri-syllabic roots of the type CV.VC(V) and copies the first three segments. In the output, the reduplicant consists of one syllable CVV- with a long vowel. It entails at least two meanings 'continuation' and 'attenuation', though we believe that it might semantically overlap with the other two partial reduplication patterns (CV- and CVC-).

-CV-reduplication is a very unproductive pattern found in two verbal bases with two different meanings, cf. "repetition" vs. "continuation".

Full reduplication is usually triggered, either by the suffixation of *-an* (on nouns) or *Ca*-reduplication (on dynamic verbs).

<sup>22</sup> *-tina* is actually a bound root.

TABLE 9, REDUPLICATION PATTERNS IN SAISIYAT BASED ON WU AND ZEITOUN

(Forthcoming)

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. lexicalized reduplication	root (CV(C))	--	--	<b>bishbish</b>	hurt
2. Ca-Reduplication	first consonant plus /a/	1. inst. nominalization	$C_1V_1C_2V_2V \rightarrow Ca-C_1V_1C_2V_2C$	<b>ka-kaat</b>	pencil (<write)
		2. reciprocal		<b>ka-kita'</b>	see each other
		3. future (I/BF)		<b>ba-baiw</b>	will be used to buy
		4. intensification		<b>ha-hopay</b>	all very tired
3a. CV-reduplication	first syllable	1. collective/locative	$C_1V_1C_2V_2(C) \rightarrow C_1V_1-C_1V_1C_2V_2(C)$	<b>ta-tawmo'-an</b>	place full of bananas
		2. diminution (+-an)		<b>ta-taw'an</b>	small house
		3. attenuation (+-an)		<b>ba-bain-an</b>	a little lazy
		4. continuative/repetitive aspect		<b>hi-hiyop</b>	keep on blowing
3b. CVC-reduplication	2 <sup>nd</sup> syllable with(out) final C or 2 <sup>nd</sup> syllable onset	same as 3a	$C_1V_1C_2C_3V_3C_4 \rightarrow C_1V_1C_2-C_1V_1C_2C_3V_3C_4$ $C_1V_1C_2V_2C_3V_3C_4 \rightarrow C_1V_1C_2-C_1V_1C_2V_2C_3C_4$	<b>bat-bato'-an</b>	place full of stones
				<b>loeh-loehong</b>	small mortar
				<b>har-harai'-an</b>	a little dirty
				<b>bil-bilith</b>	keep on touching
3c. CVV-reduplication	1 <sup>st</sup> syllable with 2 <sup>nd</sup> syllable vowel	1. attenuation (+-an)	$C_1V_1.V_2C_3 \rightarrow C_1V_1V_2C_1V_1.V_2C_3$	<b>boo-book-an</b>	a little rotten
		2. continuative aspect		<b>kaa-kaat</b>	keep on writing
4. -CV- reduplication	one syllable within root	continuous/repetitive aspect	$C_1V_1C_2V_2C_3 \rightarrow C_1V_1C_2V_2-C_2V_2C_3$	<b>hayayap</b>	fly here and there
				<b>maaririae'</b>	keep on swelling
5. Full reduplication	entire root	collective/locative(+an)	$C_1V_1C_2V_2C \rightarrow C_1V_1C_2V_2CC_1V_1C_2V_2C$	<b>walo'-walo'-an</b>	place full of sugar

## 2.10 Reduplication in Seediq

Reduplication in Seediq is reported in Holmer (1996), Y. Chang (2000) and Tsukida (2005). The first two studies concern the Paran dialect, and the third the Taroko (also referred to as Teruku or Truku) dialect. The description in this section is drawn from this latter work, which if not the most complete on this topic, is at least the most detailed<sup>23</sup>.

Tsukida (2005:294) mentions two kinds of reduplication in Taroko Seediq: partial and full.

Partial reduplication (or *Ce*-reduplication) consists of the reduplication of the first syllable of stems of three or more syllables. Reduplication causes the weakening of the vowel to schwa. It applies on verbal and nominal bases. It yields either (i) a reciprocal meaning<sup>24</sup> or (ii) an emphatic future in verbs and (iii) a plural meaning in nouns. It involves two subpatterns with stems beginning with a glottal stop. The first consists in the reduplication of the initial consonant of the second syllable,  $'VC_1V(C) \rightarrow C_1e-'VC_1V(C)$ <sup>25</sup>. The second consists in the reduplication of the glottal stop,  $'VC_1V(C) \rightarrow 'e-C_1V(C)$ . In both cases, schwa assimilates to the following vowel if it is /a/ or /i/ or to /i/ if the following consonant is /y/.

Full reduplication involves the reduplication of disyllabic roots, with the final consonant excluded. Vowels occurring in the reduplicated portion of the word are also usually weakened to schwa or assimilated to /i/ if the following consonant is /y/, e.g., *kuyuh* 'woman'  $\rightarrow$  *kiyi-kuyuh* 'women'. It is used to form plural nouns

<sup>23</sup> We have added translations not given in the original text.

<sup>24</sup> The reciprocal meaning of dynamic verbs is actually obtained through the sequence *mV-CeRed-*, reconstructed as *ma-CaRed-* in PAN in Zeitoun (2002 and Forthcoming) and should thus be analyzed as a subpattern of *Ca*-reduplication.

<sup>25</sup> In our mind, this pattern is a variant of the reciprocal *mV-CeRed* mentioned above.

**TABLE 10, REDUPLICATION PATTERNS IN SEEDIQ BASED ON TSUKIDA (2005)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. Partial reduplication	first syllable	1. plural 2. emphatic future	$C_1V_1C_2V_2CVC \rightarrow$ $C_1e-C_1V_1C_2V_2CVC$	<i>qe-qehuni</i>	trees
			$'VC_1V(C) \rightarrow 'e-C_1V(C)$	<i>'i-'iyah</i>	<i>will come</i>
2. Full reduplication	entire root except final C	plural	$C_1V_1C_2V_2C \rightarrow$ $C_1e_1C_2e-C_1V_1C_2V_2C$	<i>rede-rudan</i>	old men
3. <i>Ca</i> -reduplication	first consonant plus /e/	<i>Not reported</i> Corresponds to Tsukida's CV-reciprocal	$C_1V_1C_2V_2C \rightarrow mV-C_1e-C_1V_1C_2V_2C$	<i>me-se-sipaq</i>	hit <i>each other</i>
			$'V_1C_2V(C)-mV-C_2e'V_1C_2V(C)$	<i>me-se-'usa</i>	go <i>together</i>

### 2.11 Reduplication in Siraya

Adelaar (2000:33) mentions the following types of reduplication in Siraya: (i) monosyllabic-root reduplication, (ii) disyllabic-root reduplication, (iii) rightward reduplication, (iv) first-syllable reduplication, (v) *Ca*-reduplication, (vi) *pa*-reduplication<sup>26</sup>. Most of these include subtypes that are identified and illustrated in his study. However, on the basis of identical semantic functions and/or idiosyncratic properties, Adelaar actually only distinguishes four patterns among these: (i) (fossilized) monosyllabic root reduplication, (ii) disyllabic or trisyllabic root reduplication and rightward reduplication, (iii) first syllable reduplication and (iv) *Ca*-reduplication.

Monosyllabic root reduplication (coined *lexicalized* reduplication in this paper) consists of a doubled root syllable, with or without an extra element in the duplicated segment. It includes three subpatterns, (i) simple monosyllabic root reduplication, (ii) monosyllabic root reduplication with *-ar/-al-* infixation, (iii) monosyllabic root reduplication with linking *-i-*.

Disyllabic root reduplication consists of the copying of the entire disyllabic root except the last consonant if there is one. It includes four sub-patterns: (i) CVCV-CVCVC, (ii) (C)VCV-(C)VCV, (iii) VCVC-root > VC-VCVC, (iv) CVCey-root > CVCa-CVCey. Semantically, it yields (i) the plurality of nouns, the notion of “plurality” subsuming that of “variety, generality and indefiniteness”, (ii) the iterativity of dynamic verbs (distributive or habitual action), and the continuity, repetition or graduality of adverbs.

Rightward reduplication applies to disyllabic roots that have an initial vowel, a final vowel or both and to trisyllabic roots but semantically, it does not differ from disyllabic root reduplication.

First syllable reduplication is used in a systematic way to count non-human referents.

*Ca*-reduplication applies to nominal, verbal, and numeral bases. It is used to (i) nominalize verbs or nouns, thus yielding agentive, instrumental, patient or locative deverbal nouns as well as abstract nouns, (ii) to render a verb progressive, generic or stative and (iii) to count human referents<sup>27</sup>.

<sup>26</sup> Adelaar (2000) mentions that there is no distinction between disyllabic root reduplication and rightward reduplication and contends that *pa-* (in the sequence *pa-pa-*) actually represents a “false” reduplication pattern, i.e., it is not an instance of prefix reduplication, but rather a combination of causative *pa-* + transitive *ma-*.

<sup>27</sup> Adelaar (2000:49) notices that: (i) the unreduplicated *saat* ‘one’ can also refer to a human referent and (ii) *kuixpa* ‘eight’ is always unaffixed.

**TABLE 11, REDUPLICATION PATTERNS IN SIRAYA BASED ON ADELAAR (2000)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. Monosyllabic root reduplication	root (CV(C))	--	1. simple	<b>taptap</b>	shake off
		--	2. <i>-ar/-al-</i> infixation	<b>mi-harafhaf</b>	troubled
		--	3. linking vowel <i>-i-</i>	<b>dil-i-dil</b>	tremble
2a. Disyllabic root reduplication	entire root	1. plurality	$C_1V_1C_2V_2C \rightarrow C_1V_1C_2V_2-C_1V_1C_2V_2C$	<b>rava-ravak</b>	graves
	except	2. repetitive aspect	$(C_1)V_1C_2V \rightarrow (C_1)V_1C_2V_2-(C_1)V_1C_2V_2$	<b>litu-litu</b>	devils
	final C	3. Adv: continuity, repetition, graduality	$[VC]V_1C_1\text{-root} \rightarrow V_1C_1-V_1C_1VC$ $C_1V_1C_2ey\text{-root} \rightarrow C_1V_1C_2a-CVCey$	<b>ay-ayam</b> <b>vuna-vuney</b>	birds often
2b. Rightward reduplication	last or last two syllables of di-/trisyllabic roots except final C	same as 2a	$(C_1)V_1C_2V_2 \rightarrow (C_1)V_1C_2V_2-C_2V_2$	<b>vato-to-an</b> <b>avo-vok</b>	stony place act of eating
			$V_1C_1V_2C_2 \rightarrow V_1C_1V_2-V_1C_1V_2C_2$	<b>usi-using</b>	least (<little)
				<b>maku-toku-ko</b>	standing
3. First syllable reduplication	first syllable	counting of non-human referents	$(C_1)V_1C_2V_2C \rightarrow C_1V_1-C_1V_1C_2V_2C$	<b>ru-ruha ki rapal</b>	two feets
4. Ca-reduplication	first consonant plus /a/	1. nominalization	$(C_1)V_1C_2V_2 V \rightarrow Ca-C_1V_1C_2V_2C$	<b>na da-diri</b>	what has been sown
		2. prog/generic/stative		<b>ma-da-dilux</b>	lead (gen.)
		3. counting of human referents		<b>da-diri-en</b>	(when) sowing
				<b>ta-turu ki vual</b>	three people

Adelaar (2000) argues that reduplication operates on two different levels: lexical vs. morphophonemic. Monosyllabic root reduplication and first syllable reduplication apply on the lexical level (i.e., it can generally not undergo further reduplication), while di- and trisyllabic reduplication as well as *Ca-* reduplication operate on the morphosyntactic level.

## 2.12 Reduplication in Thao

Reduplication in Thao has been examined in detail by L. Chang (1998), Blust (2003), Huang (2000) and Lu (2003). The description provided in this section is based on the first two studies, which not only complement each other but are the most extensive.

L. Chang (1998:279) mentions that there are three productive patterns on reduplication in Thao, (i) full reduplication, (ii) *Ca-*reduplication and (iii) rightward reduplication, as well as two less productive patterns, CV-reduplication and triplication. There are also numerous instances of lexicalized reduplication.

Full reduplication applies to monosyllabic and disyllabic verbal bases with a first syllable of the type (C)V (i.e., with no consonant cluster as onset and no coda) and leaves out the final consonant<sup>28</sup>. It includes five sub-patterns: (i) CVCV-CVCVC, (ii) CVV-CVV(C), (iii) > VCV-VCV(C), (iv) CCV-CCV(C), (v) CV-CV(C). It fulfills three morpho-semantic functions: (i) it marks repetitive/continuative aspect in verbs and (ii) intensity in adjectives and (iii) it might produce a change in lexical category.

*Ca-*reduplication applies to disyllabic nominal, verbal and numeral bases. In trisyllabic bases, Blust (2003:190) mentions that it is not the first consonant that is reduplicated, but rather the second (or the first member of a consonant cluster). *Ca-*reduplication carries at least four functions: it serves (i) to form instrumental nouns, (ii) to count human referents, (iii) to mark the meaning of “smell of X (where X is an animal)” and (iv) to indicate repetitive/continuative aspect in verbs and intensity in adjectives.

Rightward reduplication (coined *suffixal* reduplication in Blust, 2003:194) occurs

<sup>28</sup> In that respect, L. Chang’s (1998) and Blust’s (2003) data differ from Huang’s (2000). The latter makes reference to one instance of full reduplication with the coda reduplicated, cf. *cupish* ‘count’ > *cupish-cupish-an* ‘school’ (p.65), recorded as *cupi-cupish-an* in Blust (2003:350)

in verbal bases of two or more syllables with a consonant cluster in initial or medial position. There is a semantic overlap between the semantic function carried out by rightward reduplication and full reduplication, i.e., rightward reduplication conveys the repetitive/continuative aspect of verbs, and is thus treated by Blust (2003:195) as a variant of full reduplication.

CV-reduplication applies mostly to verbal bases with a first light syllable (of the type CV). It conveys a repetitive meaning in motion verbs, but its semantic function in other types of verbs is rather unclear.

Triplication applies to verbal bases to mark repetitive/continuative aspect and might involve partial (e.g., *Ca-* or CV-reduplication) or full reduplication. According to L. Chang (1998:285), it also applies to “stems with a historically reduplicated CVC structure”.

**TABLE 12, REDUPLICATION PATTERNS IN THAO BASED ON CHANG (1998) AND BLUST (2003)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. lexicalized reduplication	root (CV(C))	--	--	<b>shishi</b>	shake (N)
		--	--	<b>karkar</b>	to chew
2a. full reduplication	entire root except final C with a first (C)V syllable	1. continuative/repetitive aspect	$C_1V_1C_2V_2C \rightarrow C_1V_1C_2V_2-C_1V_1C_2V_2C$	<b>ma-caka-cakaw</b>	very greedy
		2. intensification	$C_1V_1V_2C_2 \rightarrow C_1V_1V_2-C_1V_1V_2C_2$	<b>mi-dau-dauk</b>	keep still
		3. lexical category change	$V_1C_2V(C_3) \rightarrow V_1C_2V_2(C_3)-V_1C_2V_2(C_3)$	<b>ara-ara</b>	take, fetch, get
			$C_1C_1-V_1(C_2) \rightarrow C_1C_1V_1-C_1C_1(C_2)$	<b>bra-braq</b>	peck open
			$C_1V_1(C_2) \rightarrow C_1V_1-C_1V_1(C_2)$	<b>mash-du-du</b>	pass s.t. along
2b. rightward reduplication	last or last two syllables of di-/trisyllabic roots, except final C	continuative/repetitive aspect	$C_1C_1-V_1C_2V_2 \rightarrow C_1C_1V_1C_2V_2-C_1V_1C_2V_2$	<b>hh-ung-qizi-qizi</b>	protect, watch over
			$C_1V_1C_2C_3V_3C_4 \rightarrow C_1V_1C_2C_3V_3-C_2C_3V_3-C_4$	<b>mia-lundu-nduz</b>	go in a straight line
3. <i>Ca-</i> reduplication	first consonant plus /a/	1. inst. nominalization	$(C_1)V_1C_2V_2V \rightarrow Ca-C_1V_1C_2V_2C$	<b>ca-capu</b>	broom
		2. counting of human referents		<b>ta-turu</b>	three (persons)
		3. smell of animal		<b>tu-fa-fafuy</b>	odor of pig
		4. continuous/repetitive aspect		<b>c-m-a-capu</b>	keep sweeping
		5. intensification	$C_1V_1C_2C_3V_3V \rightarrow C_1V_1-C_2aC_3V_3V$	<b>pi-ta-t'ia-an</b>	cooking place
4. CV-reduplication	first syllable	repetitive aspect	$C_1V_1C_2V_2(C) \rightarrow C_1V_1-C_1V_1C_2V_2(C)$	<b>mu-tu-tusi</b>	go often
5. triplication	partial or full	repetitive aspect	$C_1(C_2)V_1C \rightarrow C_1a-C_1a-C_1(C_2)V_1C$	<b>mig-qa-qa-qa</b>	stop & start repeatedly
			$C_1(C_1)V_1C \rightarrow C_1C_1V_1-C_1C_1V_1-C_1(C_1)V_1C$	<b>makit-shka-shka-shkash</b>	be slowly overwhelmed by a sense of apprehension or foreboding

### 2.13 Reduplication in Tsou

Tsou is one of the best documented Formosan language. However, reduplication though mentioned in a number of works (see Tung et al. 1964, Ho 1976, Wright 1996, Zeitoun 2000 and 2005, Wu 2002) has never been examined in detail, except in Szakos (1994). The present account is mostly drawn from Zeitoun (2005).

Tsou exhibits two well-established patterns: CV-reduplication and *Ca*-reduplication.

CV-reduplication involves the reduplication of the first syllable of the base regardless of whether the onset is simple (C) or complex (CC), thus yielding two

subpatterns: CVCV → CV-CVCV and CCVCV → CCV-CVCV. If the root is vowel-initial, the initial vowel is reduplicated with a glottal stop preceding both the reduplication and the base-initial vowel as in *oko* ‘child’ → *’o-’oko* ‘children’. Wright *et al.* (1997) state that the glottal stop is actually present in the non-reduplicated base *’oko*. CV-reduplication marks plurality in nouns, repetition in dynamic verbs and intensification in stative verbs.

Ca-reduplication seems not to be productive anymore, because (i) in many instances, the base is not retrievable (cf. *\*hocng#* > *hahocng#* ‘man’, *\*mespingi* > *mamespingi* ‘woman’), and (ii) it often involves the obligatory occurrence of further affixes (e.g., *fnguu* ‘head’ + *doe-* ‘big’ > *doe-fa-fnguu* ‘big head’ and *fnguu* ‘head’ + *-a* ‘PV’ > *fafngua* ‘hit on the head (PV)’ while *\*fafnguu* is disallowed).

Tung *et al.* (1964:170) mention two other very rare reduplicative processes: (i) CVC-reduplication *mahafo* ‘take’ → *mah-mahafo* ‘take many times’ and (ii) the reduplication of two distinct syllables, e.g., *nat’ohaesa* ‘brothers’ → *na-na-t’o-t’o-haesa* ‘two brothers’, that for ease of convenience we label CVX-CVX- in this article, whereby X refers to the two original syllables copied through CV-reduplication.

**TABLE 13, REDUPLICATION PATTERNS IN TSOU BASED ON ZEITOUN (2005)**

PATTERNS OF REDUPLICATION	REDUPLICANT DOMAIN	MEANINGS	SUPATTERNS	EXAMPLE	GLOSS
1. Ca-reduplication	first consonant plus /a/	depends on the co-occurring prefix	$C_1(C_1)V_1C_2V_2 \rightarrow C_1a-C_1C_1V_1C_2V_2$	<i>doe-fa-fnguu</i> <i>fa-fngua</i>	big head hit on the head (PF)
2. CV-reduplication	first syllable	1. plurality	$C_1V_1C_2V_2CV \rightarrow$	<i>zo-zom#</i>	trees
		2. repetitive aspect	$C_1V_1-C_1V_1C_2V_2CV$	<i>cmo-cmoi</i>	bears
		3. intensification	$C_1C_1V_1C_2V_2CV \rightarrow$ $C_1C_1V_1C_2V_2CV$	<i>’o-’oko</i>	children
			$V_1C_2V_2CV \rightarrow$ $’V_1-C_1V_1C_2V_2CV$		
3. CVC-reduplication	first syllable including coda	repetitive aspect	$C_1V_1C_2V_2CV \rightarrow$ $C_1V_1C_2-C_1V_1C_2V_2CV$	<i>mah-mahfo</i>	take <i>many times</i>
4. CVX-CVX-reduplication	two distinct syllables	?	$C_1V_1C_2V_2CV \rightarrow$ $C_1V_1C_1V_1-C_2V_2C_2V_2-CV$	<i>na-na-t’o-t’o-haesa</i>	two brothers

## 2.14 Summary

A short summary is given in a form of two tables. The first (see Table 14) provides an overview of the different patterns of reduplication found in the twelve Formosan languages reported in the preceding sections. The second (see Table 15) mentions all the meanings that are associated with different types of reduplication patterns and their distribution in these languages.

**TABLE 14, OVERVIEW OF THE REDUPLICATION PATTERNS FOUND IN TWELVE  
FORMOSAN LANGUAGES<sup>29</sup>**

REDUPLICATION PATTERNS	DOMAIN OF REDUPLICATION	ALV	TAY	BNN	PWN	PZH	PYU	MG DRU	MN DRU	SAI	SIR	TRV	SSF	Tsy
1. lexicalized reduplication	without linking V	?	?	✓	✓	--	✓	✓	✓	✓	✓	?	✓	?
	with linking V			--	✓	✓	✓	--	--	--	✓	--	--	--
2. C- reduplication	first C	--	✓	--	--	--	--	--	--	--	--	--	--	--
3. Ca- reduplication	first C plus /a/	✓	--	--	✓	✓	✓	(✓)	(✓)	✓	✓	--	✓	(✓)
	first C plus /ae/	--	--	--	--	--	--	--	--	✓	--	--	--	--
	first C plus /e/	--	--	--	--	--	--	--	--	--	--	✓	--	--
4. CV- reduplication	first C and no coda	--	--	✓	--	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. CVC- reduplication	first syllable & coda		--	--	--	--	✓	--	--	✓	--	--	--	✓
	first syllable + onset of 2 <sup>nd</sup> syllable	--	--	(✓)	--	--	--	✓	--	✓	--	--	--	--
6. -CV- reduplication	2 <sup>nd</sup> syllable & no coda	--	--	✓	--	--	--	--	✓	--	✓	--	--	--
7. CV:- reduplication	first syllable with vowel lengthening	--	--	--	--	✓	--	--	--	--	--	--	--	--
8. CVV- reduplication	first two syllables CV.V-	--	--	--	--	--	--	--	--	✓	--	--	--	--
9. CV.V- reduplication	first two syllables but no C <sub>2</sub>	--	--	--	--	--	--	--	✓	--	--	--	--	--
10. -CV.V- reduplication	two syllables within root but no C <sub>2</sub>	--	--	--	--	--	--	--	✓	--	--	--	--	--
11. full reduplication	root; no C#	--	--	✓	--	✓	✓	(✓)	✓	--	✓	✓	✓	--
	root with C#	--	--	✓	--	--	✓	--	--	(✓)	--	--	--	--
12. CVCV- reduplication	trisyllabic root without C#	--	--	--	--	✓	✓	--	✓	--	✓	--	✓	--
	trisyllabic root with C#	--	--	--	--	--	--	--	--	--	--	--	--	--
13. -CVCV- reduplication	within trisyllabic root without C#	--	--	--	--	--	--	--	✓	--	--	--	--	--
14. rightward reduplication	last syllable	--	--	--	--	✓	✓	✓	--	--	--	--	✓	--
	last two syllables	✓	--	--	✓	✓	--	--	✓	(✓)	--	--	✓	--
	penult. C and last syllable without C#	✓	--	--	✓	--	--	--	--	--	--	--	--	--
15. CVX-CVX- reduplication	two distinct syllables	--	--	--	--	--	--	--	--	--	--	--	--	(✓)

<sup>29</sup> The abbreviations of the Formosan languages follows the code system established by Ethnologue (available on the Internet, cf. <http://www.ethnologue.com/web.asp>), ALV: Amis, TAY: Atayal, BNN: Bunun, PWN: Paiwan, PZH: Pazeh, PYU: Puyuma, DRU: Rukai (MG:Maga, MN: Mantauran), SAI: Saisiyat, SIR: Siraya, TRV: Teruku (Seediq), SSF: Thao, TSY: Tsou.

**TABLE 15, SEMANTIC FUNCTIONS ASSOCIATED WITH DIFFERENT REDUPLICATION PATTERNS**

REDUPLICATION PATTERNS	PART OF SPEECH	MEANING	ALV	TAY	BNN	PWN	PZH	PYU	MG DRU	MN DRU	SAI	SIR	TRV	SFF	Tsy
1. lexicalized reduplication	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2. C-reduplication	Noun	1. plur/collective	--	✓	--	--	--	--	--	--	--	--	--	--	--
	Verb (Dyn)	2. continuous aspect	--	✓	--	--	--	--	--	--	--	--	--	--	--
		3. future	--	✓	--	--	--	--	--	--	--	--	--	--	--
	Verb (Stat)	4. intensification	--	✓	--	--	--	--	--	--	--	--	--	--	--
	Verb (D/S)	5. reciprocal	--	✓	--	--	--	--	--	--	--	--	--	--	--
3. Ca-reduplication	Noun	1. nominalization	✓	--	--	✓	✓	✓	--	--	✓	✓	--	✓	--
	Num	2. counting of human referents	✓	--	--	--	--	--	--	--	--	✓	--	✓	--
	V (Dyn)	3. continuous / repetitive aspect	✓	--	--	--	--	✓	--	--	--	✓	--	✓	--
		4. reciprocal	--	--	--	✓	✓	✓	✓	✓	✓	--	✓	--	--
	V (D/S)	5. future/irrealis	--	--	--	--	--	✓	--	--	--	✓	--	--	--
		6. progressive aspect	--	--	--	--	--	--	--	--	--	--	--	--	--
	Stat.V	7.intensification &/or	--	--	--	--	--	✓	--	--	✓	--	--	--	--
		8. collectivity	--	--	--	--	--	✓	--	--	--	--	--	--	--
	Denominal	9. smell of animal	--	--	--	--	--	--	--	--	--	--	--	✓	--
4. CV-reduplication	Noun	1. plural	--	--	✓	✓	--	--	✓	✓	--	--	✓	✓	✓
		2. diminutive	--	--	--	--	--	--	--	--	✓	--	--	--	--
		3. collective/locative	--	--	✓	--	--	--	--	--	✓	--	--	--	--
	Verb (Dyn)	4. continuous / repetitive aspect	--	--	✓	--	✓	--	✓	✓	✓	--	--	✓	✓
		5. emphatic future	--	--	--	--	--	--	--	--	--	--	✓	--	--
		6. intensification	--	--	--	--	✓	--	✓	--	--	--	--	--	✓
	Verb (Stat)	7. attenuation	--	--	--	--	--	--	--	--	✓	--	--	--	--
		8. collectivity	--	--	✓	--	--	--	--	--	--	--	--	--	--
	Num	9. formation of ordinal	--	--	--	--	✓	--	--	--	--	--	--	--	--
		10. counting of non-human ref.	--	--	--	--	--	✓	--	--	--	✓	--	--	--
5. -CV-reduplication	Verb	repetitive aspect	--	--	✓	--	--	--	✓	--	✓	--	--	--	
6. CV:- red.	Verb	progressive aspect	--	--	--	--	✓	--	--	--	--	--	--	--	
7. CVV-reduplication	Verb (Dyn)	1. continuous / repetitive aspect	--	--	--	--	--	--	--	--	✓	--	--	--	
	Verb (Stat)	2. attenuation	--	--	--	--	--	--	--	--	✓	--	--	--	
8. CVV-reduplication	Noun	1. diminutive	--	--	--	--	--	--	--	✓	--	--	--	--	
	Verb (Dyn)	2. continuous / repetitive aspect	--	--	--	--	--	--	--	✓	--	--	--	--	
		3. comparative	--	--	--	--	--	--	--	✓	--	--	--	--	
9. -CV.V-reduplication	Noun	1. plural	--	--	--	--	--	--	--	✓	--	--	--	--	
	Verb (Dyn)	2. continuous / repetitive aspect	--	--	--	--	--	--	--	✓	--	--	--	--	
	Verb (Stat)	3. intensification	--	--	--	--	--	--	--	✓	--	--	--	--	
10. CVC-reduplication	Noun	1. plural	--	--	--	--	--	--	✓	--	--	--	--	--	
		2. collective/locative	--	--	--	--	--	--	--	✓	--	--	--	--	
		3. diminution	--	--	--	--	--	--	--	--	✓	--	--	--	
	Verb (Dyn)	4. continuous aspect	--	--	--	--	--	--	✓	--	✓	--	--	--	
		5. intensification	--	--	--	--	--	--	✓	--	✓	--	--	--	
	Verb (Stat)	6. attenuation	--	--	--	--	--	--	--	✓	--	--	--	--	
11. full reduplication	Noun	1. intensification	--	--	✓	--	--	--	✓	--	--	--	--	--	
		2. plural	--	--	--	--	✓	✓	--	✓	--	--	✓	✓	
		3. collective/locative	--	--	--	--	✓	--	✓	✓	--	--	--	--	
		4. distributive	✓	--	--	--	--	--	--	--	--	--	--	--	
	V→N	5. lexical category change	--	--	✓	--	--	--	--	--	--	✓	--	--	--
		Verb (Dyn)	6. continuous aspect	--	--	✓	--	✓	✓	✓	✓	--	✓	--	--
	7. intensification		--	--	✓	--	✓	✓	✓	✓	--	✓	--	--	
	Verb (D/S)	8. plurality of ref. in reciprocals	--	--	--	--	✓	✓	--	✓	✓	✓	--	✓	
12. CVCV-reduplication	Noun	1. plural	--	--	--	--	✓	--	--	✓	--	✓	✓	--	
		2. collective/locative	--	--	--	--	--	--	--	✓	--	--	--	--	
	Verb (Dyn)	3. continuous/repetitive aspect	--	--	--	--	--	--	--	✓	--	--	--	--	
		4. intensification	--	--	--	--	--	--	--	✓	--	--	--	--	
13. -CVCV-reduplication	Noun	1. plural	--	--	--	--	--	--	--	✓	--	--	--	--	
		2. collective/locative	--	--	--	--	--	--	--	✓	--	--	--	--	
	Verb (Dyn)	3. continuous/repetitive aspect	--	--	--	--	--	--	--	✓	--	--	--	--	
Verb (Stat)	4. intensification	--	--	--	--	--	--	--	✓	--	--	--	--		
14. rightward reduplication	Noun	1. quantification / collectivity	✓	--	--	--	--	--	--	--	--	--	--	--	
		2. collective/locative	--	--	--	--	--	--	--	✓	--	--	✓	--	

		3. plural	--	--	--	✓	--	--	--	--	--	✓	--	--
		4. diminutive	--	--	--	✓	--	--	--	--	--	--	--	--
	Verb (Dyn)	5. continuative aspect	--	--	--	✓	--	--	--	--	--	✓	--	✓
		repetitive aspect	--	--	--	✓	✓	--	✓	--	--	✓	✓	✓
	Verb (D/S)	6. plurality of referents (reciprocals)	--	--	--	✓	✓	--	--	--	--	--	--	--
		7. collectivity	✓	--	--	--	--	--	--	--	--	--	--	--
	Verb (Stat)	8. intensification	✓	--	--	✓	✓	--	--	--	--	--	--	--
15. CVX-CVX reduplication		meaning unknown	--	--	--	--	--	--	--	--	--	--	--	✓

Table 14 shows that some patterns of reduplication are more “prototypical” than others. We mean by “prototypical” the fact that these reduplicative patterns are linguistically productive and wide-spread and by “less prototypical” the fact that they are more restricted in use and/or in terms of language distribution. Among the fifteen patterns of reduplication that have been reported in the Formosan languages -- as will be shown in section 3, they can be reduced to two major structures including various patterns -- six are productively found in the Formosan languages: 1) lexical reduplication, 2) *Ca-* reduplication, 3) *CV-* reduplication, 4) full reduplication, 5) *CVCV-* reduplication and 6) rightward reduplication. All the others are less prototypical, and found only in very few languages.

Table 15 shows that certain meanings are more likely to be associated with certain parts of speech (see section 4 for details). The reduplication of nouns usually yields one of the following meanings: plurality, collectivity/location, quantification, intensification and diminution. The copying of dynamic verbs is likely to encode aspect (continuous, repetitive, progressive), mood (irrealis) and plurality (of participants). The reduplication of stative verbs usually yields intensification, attenuation, comparison, collectivity, the last two meanings being less prototypical than the two first. The reduplication of numerals is much more restricted. It is principally used to form ordinals or to count non-human/human referents.

### 3. A REASSESSMENT OF VARIOUS GENERALIZATIONS MADE IN PREVIOUS WORKS

The overview given in section 2 raises a number of problems that cannot be ignored. In what follows, we will first discuss the parts of speech which are prone to undergo reduplication, and those which cannot. Second, we will show that there is no consensus regarding the description of reduplication in Formosan languages. Third, we will argue that in certain Formosan languages, the reduplicant (or copying) domain does not always represent a prosodic unit (a foot, a syllable or a mora). Fourth, we will deal with certain claims that prove to be violated in some of these languages because they are based on actually false assumptions and that they need to be re-examined carefully. These four points are developed in turn in the following subsections.

#### 3.1. Parts of speech

Nouns and (dynamic/stative) verbs, i.e., words that constitute an “open class”, are more likely to undergo reduplication.

However, certain types of nouns cannot undergo reduplication or if they do, the reduplication patterns they can exhibit are very restricted. These include:

(i) personal nouns (cf. Paiwan *kivi* ‘girl’s/woman’s name’ ~ \**kivivi*, \**kivikivi* but Tsou *pasuya* ‘boy’s/man’s name’ ~ *pa-pasuya* ‘many boys/men called Pasuya’);

(ii) family names (cf. Mantauran Rukai (*la*)*pangolai* ‘clan’s name’ ~ \*(*la*)*pangopangolai* but Ng Puyuma *talawi* ‘household’s name/toponym’ ~ *talalawi-mi* ‘we (the Talawi) are all together’, \**talawilawi*),

(iii) “true” toponyms (i.e., toponyms that are not given based on the natural environment an ethnic group lives in). Compare for instance: Mantauran Rukai *'oponoho* ‘self-reference to the group/village’ (derived historically from PR \**swa-ponogo* [from-Ponogo]) vs. \**'oponoponoho* and Tsou *la-lauya* ‘village name (place of maples)’ < *lauya* ‘maple’ (Wright, 1996:56).

Some temporal adjuncts (today, tomorrow, yesterday) can undergo reduplication in certain languages, but not in others. Compare Tungho Saisiyat *rim'an* ‘tomorrow’ vs. *ri-rim'an-an* ‘morning’, Tsou *hucma* ‘the next day’ ~ *huhucma* ‘everyday’ vs. Mantauran Rukai *lo'idha* ‘yesterday/tomorrow’ ~ \**lo'idha'idha*. These temporal adjuncts should be viewed as “punctual”, designating a point in time, and are thus behaving a little differently from “non-punctual” temporal adjuncts (day, month, year etc.), which can usually be reduplicated, e.g., Puyuma *wari* ‘day’ ~ *wa-wari-wari* ‘everyday’, Mantauran Rukai *caili* ‘year’ ~ *caicaili* ‘every year’.

Among the closed class, few lexical categories can undergo reduplication: to our knowledge, only numerals (to indicate either a non-human or a human referent), e.g., Puyuma *drua* ‘two’ ~ *dru-drua-a* ‘two (non-human referents)’, Thao *tusha* ‘two’ ~ *ta-tusha* ‘two (human referents)’ (Blust, 2003:1027) and interrogative wh-words e.g., Central Amis *cima* ‘who’ ~ *cima-cima* ‘anybody’, which must then be treated as “polarity items” can. Thus, while Chu (2003:170) notes that pronouns can be reduplicated in Amis, e.g., *kakokako* [which should actually be transcribed as *kako kako*] ‘I am I’, we do not consider this type of structure as reduplication. In our mind, the first *kako* is the predicate, and the second, the nominative pronoun (i.e., the subject of the sentence). This is supported by the following example: *aaway kako kiso* ‘I am not you’.

### 3.2. Discrepancy in the terminology

The overview given in section 2 shows that here is no real consensus regarding the description of reduplication in the Formosan languages and this is reflected in the various terms used by scholars to account for this process.

#### 3.2.1 ‘Full’ vs. ‘partial’ reduplication

For a majority of scholars (Blust 1999, L. Chang 1998, Yeh 2000b, Li and Tsuchida 2001, Tsukida 2005, Wu and Zeitoun To appear, Zeitoun Forthcoming) ‘full reduplication’ is contrasted with ‘partial reduplication’. Since full reduplication refers in the Formosan languages to at least and at most two reduplicated syllables, Adelaar (2000) prefers to use the term ‘disyllabic root reduplication’ to describe this pattern.

Partial reduplication is basically defined as copying only the first syllable or the (first) light syllable of a word, that’s the reason why Adelaar (2000) adopts the term ‘first syllable reduplication’.

Discrepancies arise when a term is used in a rather different manner: For A. Chang (1998) and Tseng (2003) ‘root reduplication’ equates ‘full reduplication’ while Hsin (2000) labels ‘partial reduplication’ ‘stem reduplication’.

#### 3.2.2 ‘Prefixal’, ‘suffixal’, ‘infixal’ reduplication vs. leftward/rightward reduplication

Few scholars have described reduplication in terms of the position of the reduplicant within the base (root or stem), whereby reduplication is viewed as “prefixal”, “suffixal” or “infixal” – to our knowledge, only Blust (2003:195)<sup>30</sup> has

<sup>30</sup> Blust (2003:195) treats suffixal reduplication as “a variant (in the terms of Spaelti (1997) an ‘alloduple’) of full

done so – though most agree that reduplication either occurs at the left, the right, and to a lesser extent within a root or a stem. The above tripartite terminology is usually replaced by a C-V- template that enables to capture the reduplication process in question in a noncommittal fashion (as we have done in this paper), e.g., CV-, CVC-, CVV-, -CV- or -CV reduplication, a dichotomy being sometimes made between ‘leftward’ or ‘rightward reduplication’ (e.g., A. Chang 1998, Tseng 2003, Lu 2003).

### 3.2.3 Toward a more unified treatment

The relationship between certain types of reduplication, e.g., full reduplication and suffixal reduplication in Thao (Blust 2003), or full reduplication and CV.V-reduplication in Mantauran Rukai has been mentioned in passing in section 2. It is crucial to recognize that certain patterns of reduplication are actually variants of the same reduplicative process or underlying structure. In our mind, we can divide reduplication into the following bipartite dichotomy: partial vs. full reduplication, as has long been acknowledged.

Partial reduplication involves the reduplication of a light or heavy syllable or just the first consonant of a syllable. It can be represented as C-, CV-, CCV-, CYV-, CVC-, CVY-, CVV- (these seven patterns further belong to the same underlying structure, cf. Table 16) and *Ca-* (Table 17). The reduplication of the segment depends on the syllable structure of the language itself. Partial reduplication usually occurs as a prefix, but in some languages (e.g., Bunun, Thao, Saisiyat and Mantauran Rukai), it has been demonstrated that it can also apply as an infix.

TABLE 16, SUBPATTERNS OF PARTIAL REDUPLICATION

A. DI-/TRISYLLABIC ROOTS WITH NO CROSSING OVER THE SYLLABLE BOUNDARY				
Language	Root	Gloss	Reduplication	Gloss
a. CCV.CVC → C-CCV.CVC				
Atayal	<b>btunux</b>	‘stone’	<b>b-btunux</b>	‘a lot of stones’
b. CV.V → CV-CV.V				
Tsou	<b>pai</b>	‘rice’	<b>pa-pai</b>	‘field’
c. CCV.V → CCV-CCV.V				
Tsou	<b>cmoi</b>	‘bear’	<b>cmo-cmoi</b>	‘bears’
d. CYV.CV → CYV-CYV.CV				
Bd Rukai	<b>kwange</b>	‘gun’	<b>kwa-kwange</b>	‘toy gun’
e. CVC.CVC → CVC-CVC.CVC				
Tg Saisiyat	<b>pangrang</b>	‘pineapple’	<b>pang-pangrang-an</b>	‘a place full of pineapples’
f. CVY.CV(C) → CVY-CVY.CV(C)				
Tg Saisiyat	<b>’aewpir</b>	‘sweet potato’	<b>’aew-’aewpir-an</b>	‘a place full of sweet potatoes’
B. DI-/TRISYLLABIC ROOTS WITH CROSSING OVER THE SYLLABLE BOUNDARY				
a. CV.CVC → CVC-CV.CVC				
Tg Saisiyat	<b>lotor</b>	‘link’	<b>lot-lotor</b>	‘keep on linking’
b. CVC.CVC → CV-CVC.CVC				
Tg Saisiyat	<b>taw’an</b>	‘house’	<b>ta-taw’an</b>	‘children’s

reduplication.

				house'
c. (C)VC.CV → (C)VC-C.CV				
Thao (L. Chang 1998:284)	<b>agtu</b>	'contemplate'	<i>agtu-qtu</i>	'think about'
c. CV.VC → CVV-CV.VC				
Tg Saisiyat	<b>ra.am</b>	'know'	<i>raa-raam-an</i>	'know a little'

TABLE 17, SUBPATTERNS OF CA- REDUPLICATION

A. Ca-				
Language	Root	Gloss	Reduplication	Gloss
a. V(C).CVC → a-V(C).CVC				
Thao (Blust, 1998:54)	<b>m-iup</b>	'blow'	<i>a-iup</i>	'tube to blow on fire'
b. CV(C).CVC → Ca-CVC.CVC				
Tg Saisiyat	<b>botoe'</b>	'tie'	<i>ba-botoe'</i>	'rope'
c. CCV(C).CV(C) → Ca-CCV(C)-CV(C)				
Mg Rukai (Hsin, 2000:213)	<b>blibli</b>	'banana'	<i>ba-bibli</i>	'turn into a banana'
d. tri-/quadrissyllabic root → (C)V-Ca-CV(C)-CVC				
Puyuma (Teng, Forthcoming)	<b>dalrekeng</b>	'wet'	<i>da-lra-lrekeng</i>	'will be wet'
B. Ce-				
a. CV.CVC-roots → me-Ce-CV.CVC				
Seediq	<b>sipaq</b>	'hit'	<i>me-se-sipaq</i>	'hit each other'
b. 'V.CV(C)-roots → me-Ce-'V.CV(C)				
Seediq	<b>'usa</b>	'go'	<i>me-se-'usa</i>	'go together'
C. Cæ-				
a. C(=h or ?)V(C).CVC → Cæ-CV(C).CVC				
Tg Saisiyat	<b>haezaeb</b>	'stab'	<i>hae-haezaeb</i>	'knife'

Full reduplication subsumes also different patterns, whereby two syllables at most are reduplicated, with or without the inclusion of the coda. Are included within the notion of 'full reduplication' the following patterns: CVCV reduplication in trisyllabic roots, CV.V- reduplication in di- and tri-syllabic roots, which might occur in a prefixal, infixal or suffixal positions.

TABLE 18, SUBPATTERNS OF FULL REDUPLICATION

A. MONOSYLLABIC ROOTS: a. CVC → CVC-CVC				
Language	Root	Gloss	Reduplication	Gloss
Is Bunun	<b>hud</b>	'drink'	<b>hud-hud</b>	neck
b. CCVC → CCV-CCVC				
Thao (L. Chang, 1998:280)	<b>psaq</b>	'kick forward'	<b>ma-psa-psaq</b>	'will kick repeatedly'
	<b>qbit</b>	'share, portion'	<b>mi-qbi-qbit</b>	'portion out, divide into shares'

<b>B. Di-/TRISYLLABIC ROOTS: a. CV.V → CV.V-CV.V</b>				
Bd Rukai	<b>dae</b>	‘soil’	<b>dae-dae</b>	‘ground, earth’
<b>b. CV.CV → CVCV-CVCV</b>				
Central Amis	<b>cima</b>	‘who’	<b>cima-cima</b>	‘anybody’
<b>c. CV.CV → CV.V-CVCV</b>				
Mt Rukai	<b>kane</b>	‘eat’	<b>kae-kae-kaane</b>	‘keep on eating’
<b>d. CV.CVC → CVCV(C)-CV.CVC</b>				
Thao (Blust, 2003:194)	<b>fanuz</b>	‘wake up’	<b>fanu-fanuz</b>	‘wake up someone’
<b>e. V.CVC → VCV-V.CVC</b>				
Central Amis	<b>omah</b>	‘field’	<b>oma-omah</b>	‘each field’
<b>f. V.CV → V.CV-V.CV</b>				
Bd Rukai	<b>agi</b>	‘younger sibling’	<b>agi-agi</b>	‘younger siblings’
<b>g. CVC.CVC → CVC-C.CVC</b>				
Amis	<b>ang.rer</b>	‘bitter’	<b>ang.re-ng.rer</b>	‘very bitter’

### 3.3 Is the reduplicant domain always a prosodic unit?

One theoretical assumption when dealing with reduplication is that the reduplicant form is a prosodic domain. It has been tested in many languages that prosodic units, such as the mora or the syllable, play an important role in the reduplicative domain. However, reduplication in Formosan languages such as Thao, Paiwan, Amis (see Blust Forthcoming) and Saisiyat (see Wu and Zeitoun Forthcoming) challenges this hypothesis.

In these four languages, CVC-reduplication and rightward reduplication copy respectively either the consonant following or preceding the copied base, thus yielding: CV.C- (table 19) and C.CV(C)- sequences (table 20).

**TABLE 19, BREAKING OF THE SYLLABLE BOUNDARY IN CVC- AND CV.C SEQUENCES  
IN SAISIYAT**

(From Wu and Zeitoun, Forthcoming)

Root	Gloss	Reduplication	Gloss
<b>CVC → CV-CVC</b>			
<b>tishkobaoeh</b>	‘answer’	<b>ti-tishkobaoeh</b>	‘keep on answering’
<b>tilhaehael</b>	‘help’	<b>ti-tilhaehael</b>	‘keep on helping’
<b>taw’an</b>	‘house’	<b>ta-taw’an</b>	‘small house for children to play’
<b>tawmo’</b>	‘banana’	<b>ta-tawmo’-an</b>	‘a place full a bananas’
<b>CV.C → CVC-CV.C</b>			
<b>zingas</b>	‘stick’	<b>zing-zingas</b>	‘keep on sticking’
<b>habai’</b>	‘blow’	<b>hab-habai’</b>	‘keep on blowing’
<b>loehong</b>	‘mortar’	<b>loeh-loehong</b>	‘small mortar’
<b>bato’</b>	‘stone’	<b>bat-bato’-an</b>	‘a place full of stones’

TABLE 20, THE REDUPLICANT AS A PROSODIC CHIMERA IN SOUTHERN PAIWAN AND CENTRAL AMIS

(Based on Blust, Forthcoming:Chapt. 3)

Stem	Gloss	Derived stem	Gloss
Southern Paiwan			
<b>ga.lem.gem</b>	'hate'	<b>ma.-'a.-ga.lem.ge-m.gem</b>	'hate one another'
<b>draw.draw</b>	'forget'	<b>ma.-'a.-draw.dra-w.draw</b>	'forget one another'
Central Amis			
<b>ang.rer</b>	'bitter'	<b>ang.re-ng.rer</b>	'very bitter'
<b>ang.saw</b>	'smell of smoke'	<b>ang.sa-ng.saw</b>	'strong smoke odor (as in clothing)'

### 3.4 Re-assessing well-anchored assumptions

At least four assumptions – some of which are actually violated in some of the Formosan languages – need to be carefully re-examined: (i) the fact that affixes (prefixes and infixes) can undergo reduplication, (ii) the status of the vowel /a/ in *Ca*-reduplication, (iii) the possible/impossible reduplication of lexicalized reduplicated roots and (iv) whether a certain reduplication pattern can be given a specific meaning or whether they usually exists a semantic overlap between different patterns of reduplication.

#### 3.4.1 Reduplication of affixes

It has long been thought that affixes cannot undergo reduplication. However, data in the general overview given in section 2 shows that in a certain number of languages, e.g., Rukai, Bunun, Saisiyat and Thao, prefixes and infixes can undergo reduplication.

TABLE 21, REDUPLICATION OF PREFIXES AND INFIXES IN RUKAI, BUNUN, SAISIYAT AND THAO

Root/Stem	Gloss	Reduplication	Gloss
Rukai			
<b>to-dha'ane</b>	'build a house'	<b>'ini-ta-to-dha'ane</b>	'build a house oneself'
Bunun			
<b>m-a'un</b>	'eat'	<b>ma-ma'un</b>	'keep on eating'
Saisiyat			
<b>ma-ngoip</b>	'forget'	<b>mang-mangoip</b>	'forget often, keep on forgetting'
<b>sh&lt;om&gt;bet</b>	'beat'	<b>shom-shombet</b>	'keep on beating'
Thao (Blust, 2003:192)			
<b>mu-apaw</b>	'emerge'	<b>ma-mu-apaw</b>	'emerge repeatedly'

#### 3.4.2 The vowel in *Ca*-reduplication: fixed or non-fixed?

The fixed/non-fixed status of the vowel /a/ in *Ca*-reduplication remains controversial: L. Chang (1998), based on the hypothesis of emergence of unmarkedness (McCarthy and Prince 1994), analyzes /a/ as emergence of an unmarked default vowel in Thao. She believes that the vowel /a/ is not copied from the base but rather represents a fixed vowel. Tseng (2003), on the other hand, argues that the vowel /a/ undergoes a change in place feature. In both analyses, the vowel /a/ violates an OT constraint, MAX-BR in Chang (1998) and Ident-BR(f) in Tseng

(2003).

We believe, like L. Chang (1998) that in *Ca*-reduplication, the original vowel is replaced by a pre-specified vowel /a/ but that the phonology of a particular language might condition it: in section 2, we outlined briefly (i) the sole reduplication of C- in Atayal, which can be shown to historically derive from CV- on the one hand, and *Ca*- on the other, (ii) the occurrence of schwa /e/ in Taroko Seediq (as a neutral vowel, which can undergo further phonological changes as demonstrated in Tsukida 2005), (iii) the occurrence of /ae/ in Saisiyat, as a result of assimilation to a glottal sound, (cf. Table 17).

### 3.4.3 Can reduplication operate on lexicalized reduplicated roots?

Lexicalized reduplication has usually not received so much attention as more productive patterns of reduplication. However, it is clear from the data given in section two, that at least in four languages, Puyuma, Rukai, Siraya and Thao, lexicalized reduplicated roots can further undergo certain patterns of reduplication (e.g., CVCV- reduplication or *Ca*-reduplication). The sole language that has been shown not to allow the reduplication of lexicalized reduplicated roots is Pazeh.

### 3.4.4 Alloduples vs. duplemes

L. Chang (1998) labels, after Spaelti (1997), various patterns of reduplication carrying out the same semantic functions “alloduples” while specific patterns yielding a certain meaning (e.g., *Ca*- as conveying instrumental nominalization) are coined “duplemes”. In other words, while certain reduplication patterns are associated with certain semantic functions, the semantic functions carried out by other reduplicative patterns overlap to a certain extent. While it is true that different patterns of reduplication may overlap in their semantic functions (see section 4), it seems untrue that a certain pattern of reduplication can only convey one specific meaning in the Formosan languages. Why? First, because the meaning of a reduplicated base depends mostly on its lexical category (i.e., whether it is a noun, a dynamic or stative verb etc...). Second, because the (sometimes compulsory) co-occurrence of various affixes along with a certain reduplication pattern might yield a different interpretation. This is the case of *Ca*- reduplication. When *Ca*-reduplication applies on numerals, it usually refers to the counting of human referents. When it applies to verb roots, it usually yields instrumental nouns. However, it “looses” its instrumental meaning, even if it serves, somehow, to nominalize a verb, when it co-occurs with the suffix *-an* (locative nominalization). Compare: Tg Saisiyat *ra-romish-an* ‘a face full of beard’ (< *romish* ‘beard’) vs. *pang-pangrang-an* ‘a place full of pineapples’ (< *pangrang* ‘pineapple’).

## 4. MEANINGS ASSOCIATED WITH REDUPLICATION IN NOUNS AND VERBS

Both Tseng (2003) and Yeh (2003) have given insightful accounts of the semantic webs that relate the meanings carried out by various reduplication patterns in Paiwan and in Saisiyat. This will be the concern in this section. Our aim is slightly different, though. We would like to determine which meanings are the most productive and thus prototypical.

Kiyomi (1995) distinguishes two processes of reduplication, the first being iconic and the second non-iconic, through a cross-linguistic study based on thirty Malayo-Polynesian languages. The iconic processes involves: (i) a consecutive process and (ii) a cumulative process. Under the consecutive process, plurality in nouns and repetition/continuation in verbs are regarded as the most prototypical

meanings. In the cumulative process, intensity is treated as the most frequent meaning in both nouns and verbs. The non-iconic process consists of various meanings, among which diminution is viewed as prototypical.

In this section, we follow Kiyomi's (1995) classification in looking at the meanings associated with different patterns of reduplication in nouns (section 4.1) and verbs (section 4.2). These meanings are generally conveyed by partial reduplication and full reduplication, as defined in section 3.2.3.

## 4.1 Nominal reduplication

### 4.1.1 Reduplication as a consecutive process

The consecutive process yields plurality in nouns. At least three different notions can be subsumed under this category: quantification, collectivity (generally in association with location) and distributivity. The notion of 'plurality' is the most prototypical as it is present in all the languages except Saisiyat.

TABLE 22, REDUPLICATION AS A CONSECUTIVE PROCESS IN NOUNS

MEANING	LANGUAGE	EXAMPLE	GLOSS
Plurality	Pazeh	<i>saw-saw</i>	'persons'
Quantification	Atayal	<i>q-qmayal</i>	'all the fields'
Collectivity/location	Saisiyat	<i>ta-tawmo'-an</i>	'a place full of bananas'
Distributivity	Amis	<i>posi-posi-an</i>	'all the cats/those cats'

### 4.1.2 Reduplication as a cumulative process

The cumulative process yields intensification but this notion is not prototypical in Formosan languages.

TABLE 23, REDUPLICATION AS A CUMULATIVE PROCESS IN NOUNS

MEANING	LANGUAGE	EXAMPLE	GLOSS
Intensification	Bunun	<i>habas-habas-an</i>	'a long time ago'
	Maga Rukai	<i>tka-tka</i>	'eldest sibling'

### 4.1.3 Reduplication as a noniconic process

The noniconic process usually yields diminution or imitation/fakeness. Based on the data at hand, it seems quite rare in the Formosan languages.

TABLE 24, REDUPLICATION AS A NONICONIC PROCESS IN NOUNS

MEANING	LANGUAGE	EXAMPLE	GLOSS
Diminution	Paiwan	<i>kamura-mura-w</i>	'very small pomelo'
Imitation/fakeness	Saisiyat	<i>ta-taw'an</i>	'small house'
	Mt Rukai	<i>dhaa-dha'ane</i>	

## 4.2 Verbal reduplication

### 4.2.1 Reduplication as a consecutive process

The consecutive process yields repetition/continuation in verbs. Kiyomi (1995:1156) reports other meanings subsumed under this category, other than repetition/continuation: spatial extension, habitative, progressive, imperfective, and locative alternation. Except for habitative (found in few languages, to our knowledge, Rukai and Paiwan), the other meanings are not found in any of the Formosan languages included in this paper.

On the other hand, as pointed out in Kiyomi (1995:1156-1157), cross-linguistically, verbal reduplication usually yields a plural meaning, i.e., referring to a ‘plurality’ of participants usually involved in a reciprocal action, cf. ‘one another’. In stative verbs, reduplication might also produce a collective meaning.

**TABLE 25, REDUPLICATION AS A CONSECUTIVE PROCESS IN VERBS**

MEANING	LANGUAGE	EXAMPLE	GLOSS
Continuation	Saisyat	<i>mang-mangoip</i>	‘forget often’
Repetition		<i>h(om)i-hiyop</i>	‘keep on blowing’
Habitulative	Mt Rukai	<i>o-kae-kae-kaane</i>	‘eat usually’
Plurality of participants		<i>ma-pa-pana-pana</i>	‘shoot at one another’

#### 4.2.2 Reduplication as a cumulative process

The cumulative process induces intensification in stative verbs (sometimes in conjunction with a collective meaning). It subsumes another meaning, found only in Mantauran Rukai, cf. comparison.

**TABLE 26, REDUPLICATION AS A CUMULATIVE PROCESS IN VERBS**

MEANING	LANGUAGE	EXAMPLE	GLOSS
Intensification	Amis	<i>fuh-tsa-htsa-l</i>	‘all very white’
Comparison	Mt Rukai	<i>ma-dhaa-dhalame</i>	‘love more’

#### 4.2.3 Reduplication as a noniconic process

In the noniconic process, reduplication may yield different meanings, none of them prototypical, e.g., attenuation (Saisyat) and future (Seediq).

**TABLE 27, REDUPLICATION AS A NONICONIC PROCESS IN VERBS**

MEANING	LANGUAGE	EXAMPLE	GLOSS
attenuation	Saisyat	<i>shi-shiae’-an</i>	‘a little happy’
emphatic future	Seediq	<i>’i-’iyah</i>	‘will come’

## 5. CONCLUSION

This paper might not have introduce any new data but we hope that through this overall description, we will have helped understand better one aspect of the typology of the Formosan languages.

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