Ca-reduplication in Formosan Languages

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Abstract. Ca-reduplication, a multifunctional pattern of reduplication where the reduplicants copy the first consonant of the stem and the vowel being fixed as /a/ (Blust 1998), is widespread in the Austronesian language family. This paper reports functions of Ca-reduplication displayed in Formosan languages, including two functions - marking reciprocity and deriving objective and instrumental nouns not reported in Blust (1998), and try to make clear the function of Ca-reduplication in marking tense and aspect which is remarked as not clear in Blust (1998). The conclusions include (1) the function of Ca-reduplication to form a special verb form is to mark durative or progressive aspect, and the Ca-marked verb forms are what have been reconstructed as PAN durative verb forms by Ross (1995), and (2) this seemingly non-iconic pattern of reduplication (cf. Blust 1998) in fact conveys an iconic meaning - INCREASE.

Keywords. Reduplication, Formosan languages, iconicity, nominalization, reciprocity, aspect

1. Introduction

Ca-reduplication with the reduplicant repeating the first consonant of the stem and the vowel being fixed as /a/ (Blust 1998: 30) is a pervasive pattern of reduplication in the Austronesian language family. Blust (1998), who coins the term Ca-reduplication, maintains that three functions, which are neither related to one another nor iconic, can be reconstructed for Proto-Austronesian (PAn) ‘Ca-reduplication – to derive numerals in counting humans, to form certain verb forms, and to form instrumental nouns.\(^1\) The Austronesian languages in Taiwan, though constituting only a very small number in the family, play a key role in the reconstruction of the protolanguage since they account for nine of the first-order primary branches from PAN (Blust 1999a). The nine primary subgroups include Atayalic (e.g. Atayal and Seediq), East Formosan (e.g. Kavalan and Amis), Puyuma, Paiwan, Rukai (e.g. Tana and Mantauran), Tsouic (Tsou, Kanakanabu, and Saaroa).

\(^1\) Yoruba exhibits a similar pattern where the reduplicant is the vowel /i/ with a high tone preceded by a copying consonant (Inkelas and Zoll 2005: 2-3). Rubino (2005: 15) characterizes such kind of reduplication as a complex reduplication construction in contrast to simple ones.

\(^2\) However, later in two publications, he points out that Ca-in PAN had two functions – to form numerals and instrumental nouns (Blust 1999b: 169, 2003a: 472).
In Blust (1998), five Formosan languages (Thao, Bunun, Kanakanabu, Amis and Puyuma) are reported to manifest the function of forming numerals in counting humans, four languages (Mayrinax Atayal, Thao, Tanan Rukai, Puyuma) make use of Ca-reduplication for the formation of verb forms, and four languages (Saisiyat, Thao, Puyuma, Pazeh) possess the function of forming instrumental nouns by way of Ca-reduplication. After these years, the publication of more theses, papers, and reference grammars on Formosan languages have brought us to a clearer picture of the functions of Ca-reduplication. For example, from the recent literature, we observe that (1) Ca-reduplication, being widespread in the Austronesian family, is not attested in Kavalan (Lee 2007); (2) in some languages, the distribution of Ca-reduplication is restricted – for example, it is not productive in Tsou (Zeitoun & Wu 2006: 123), and in Paiwan it is limited to certain specific meanings accompanied by another affix (Tseng 2003: 31); (3) functions not discussed (in Blust 1998 for example) have been proposed; (4) new data are found so that we can have a clearer picture of the function(s) regarded as not clear. In this paper, the functions Ca-reduplication attested in Formosan languages will be introduced, following with a discussion on the implications from the observations on the function and distribution of Ca-reduplication in these Formosan languages.

2. Functions of Ca- in Formosan languages

Apart from the three functions reported in Blust (1998: 29-30), Ca-reduplication in Formosan languages is found to display the functions of lexical nominalization and marking reciprocity. In this section, the functions of Ca-reduplication exhibited in the Formosan languages are examined. The languages under discussion include Amis, Atayal (Mayrinax), Seediq, Bunun (Isbukun), Kavalan, Paiwan, Pazeh, Puyuma, Rukai (Tanan and Mantauran), Saisiyat, and Thao, with the data and generalizations drawn from the published dictionaries, reference grammars, and theses.

2.1. Forming numerals in counting humans

In a survey of reduplication in languages around the world, Rubino (2005: 21) points out that with numbers, reduplication has been found to denote collectives, distributives, multiplicatives and limitatives. In light of this, the use of Ca-reduplication to form numerals in counting human seems to be peculiar. According to Li (2006), Ca-numerals in counting humans is attested in Atayal (Mayrinax), Seediq, Kanakanabu, Saaroa, Bunun (Isbukun), Thao, and Amis. As is pointed out in Blust

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3 Parenthesized are the languages examined in this study. Notice that the position of Pazeh is controversial. In Blust (1999a) it is classified as a Northwest Formosan language, but later in another paper (Blust 1999c) he classifies it as belonging to the Western Plain subgroup. Li & Tsuchida (2001) seems to hold that it bears a close relationship to Saisiyat, a Northwest Formosan language.
(1998), the use of Ca- in this function may be defective. The following table summarizes the Ca- numerals attested in the Formosan languages reported in Li (2006).\(^4\)

Table 1: Ca- numerals in Formosan languages

<table>
<thead>
<tr>
<th>Language</th>
<th>Numeral</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atayalic</td>
<td>Atayal</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
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<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Tsouic</td>
<td>Kanakanabu</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td></td>
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<tr>
<td></td>
<td>Saaroa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
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<td></td>
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<tr>
<td>Bunun</td>
<td>Bunun</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Western Plains</td>
<td>Thao</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>East Formosan</td>
<td>Amis</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 1, the use of Ca- numerals for counting humans is attested in five of the nine subgroups including Atayalic (Atayal), Tsouic (Kanakanabu and Saaroa), Bunun, Western Plains (Thao), and East Formosan (Amis).

### 2.2. Formation of verb forms

The function of Ca- reduplication in the formation of verb forms, according to Blust (1998: 34-35) is to indicate some kind of temporal or aspectual meaning, including future, durative or iterative, and progressive. For example, he cites the following Tanan Rukai examples from Li (1973: 281) to illustrate that Ca- reduplication marks progressive aspect.\(^5\)

(1) **Tanan Rukai (Li 1973: 281)**\(^6\)
   a. *ca-cuLul*
      \(\text{Ca-kill}\)
      \(\text{'be killing'}\)
   b. *ma-La~Liw*
      \(\text{ma-Ca-touch}\)
      \(\text{'be touching each other'}\)

\(^4\) A ‘+’ indicates Ca- is added to this number when counting humans. In Seediq, Ca- is attested only in the numeral two, and therefore is not included in the table.

\(^5\) Rukai also marks progressive by CVCV- reduplication (complete reduplication according to Li 1973: 280).

(i) **Rukai (Li 1973: 280)**
   a. *kan,kant*
      \(\text{RED-eat}\)
      \(\text{'be eating'}\)
   b. *uda~udal*
      \(\text{RED-rain}\)
      \(\text{'be raining'}\)

\(^6\) The phonetic symbols used for typographical convenience include: ng = [ŋ], ' = [ʔ], sh = [ʃ], lh = voiceless lateral fricative [l], b = [b], and capital D, T, L for retroflex [ɖ], [ʈ], and [ɖ] respectively. For glossing, Leipzig glossing rules are followed in general, with the following abbreviations added:

In addition, Mayrinax Atayal is cited from Zeitoun et al. (1996: 37) as an example of Ca-reduplication in marking non-actor voice future.7

(2) Mayrinax Atayal (Zeitoun et al. 1996: 37)
   a. ta-tuting-un-cu nku' 'ulaqi'
      Ca-beat-PV=1SG.NOM GEN child
      'The child will beat me.'
   b. ha-hihip-an ni' yumin 'i' limuy
      Ca-kiss-LV GEN Yumin NOM Limuy
      'Yumin will kiss Limuy.'
   c. ba-Ø-baiq nku' nabakis ku' xuil 'i' limuy8
      Ca-IV-give GEN old.man NOM dog ACC Limuy
      'The old man will give the dog to Limuy.'

Besides Atayal, Ca-reduplication can also mark future in Saisiyat. According to Yeh (2003), this function is limited to instrumental voice, as shown in (3).9

(3) Saisiyat: Instrumental Voice
   a. hini' malat si-kilmaeh ka kahoey
      this knife IV-chop ACC wood
      'This knife was used to chop wood.'
   b. hini' malat rim'an ka-kilmaeh ka kahoey
      this knife tomorrow Ca-chop ACC wood
      'This knife is going to be used to chop wood tomorrow.'

According to Zeitoun et al. (1996: 37), Amis and Puyuma also make use of Ca-reduplication to indicate future. However, unlike the case in Mayrinax Atayal and Saisiyat, Ca-reduplication marks future not only in non-actor voice, but also in actor voice constructions in Amis and Puyuma, as shown in the following sentences.

(4) Changpin Amis (Zeitoun et al. 1996: 38)
   a. ma-mi-kilim ci aki ci panay-an
      Ca-AV-look for NOM Aki ACC1 panay-ACC2
      'Aki is going to look for Panay.'

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7 Formosan languages, with the exception of Rukai, show a Philippine-type voice system (or Focus system in some studies) in which four categories—Actor, Patient (Undergoer), Locative, and Instrumental Voice—are distinguished. On the basis of case marking, the four voices fall into two large groups—Actor Voice (AV) and Non-Actor Voice (NAV) constructions. While the actor in Actor Voice constructions is marked as nominative case, it is marked as genitive case in the other three constructions. Therefore the three are subsumed under one category NAV (Ogawa and Asai 1935: 30). In Mayrinax Atayal, future of actor voice construction is marked by pa- (Huang 1995).
8 Note that instrumental voice affix is multifunctional: besides instrumental and beneficiary argument, it also marks the theme argument of transportation verbs and is thus dubbed under different terms such as accessory focus (Starosta, Pawley and Reid 1982), circumstantial focus (Huang 1993, Ross 1995).
9 Saisiyat makes use of the modal verb 'am to express actor voice future; to mark future in patient voice and locative voice constructions, the prefix ka-, which is argued to be an allomorph of Ca- is used (Yeh 2003).
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b. pa-palu'-en ni Aki ci panay
   Ca-beat-PV NOM Aki NOM panay
   ‘Aki will beat Panay.’

(5) Nanwang Puyuma (Zeitoun et al. 1996: 38)
   a. Ta-Tekel-ku Da enay
      Ca-drink-1SG.NOM OBL water
      ‘I will drink water.’
   b. ku-na-niwan-ay iduna ruma
      1SG.GEN-sell-PV that house
      ‘I will/want to sell that house.’

Note that according to Tan (1997) and Wu (2006), what is being marked by Ca-reduplication in Puyuma and Amis is irrealis rather than future. For example Wu (2006: 127) treats Ca-reduplication as a marker for irrealis mood in Amis because “it can either express a not-yet-happening event/state in the future (6a) or non-happening event/state in the past (6b).”

(6) Amis (Wu 2006: 127)
   a. pa-palu-en ni sera ci kuyu
      Ca-beat-PV GEN Sera NOM Kuyu
      ‘Sera will beat Kuyu.’
   b. ma-mi-nanum kaku, mi-tapadang kisu
      Ca-drink-1SG.NOM AV-call 2SG.NOM
      ‘When I was about to drink, you called me. (So I didn’t drink.)’

Tan (1997) also dubs this function as irrealis because besides designating future, Ca-reduplication denotes volition (7) and marks the verb in negative imperative constructions (8).

(7) Puyuma (Tan 1997: 70)
   a. Ø-ta-ma-maku=yu
      AV-smoke-Ca-smoke=2SG.NOM
      ‘Do you want to smoke?’
   b. aDi=ku Ø-ta-ma-maku
      NEG=1SG.NOM AV-smoke-Ca-smoke
      ‘I don’t want to smoke.’

(8) Puyuma (Tan 1997: 56)
   a. Ø-Ta-Tekel Da raw
      AV-drink OBL wine
      ‘Drink wine!’
   b. aDi Ø-Ta-Tekel Da raw
      NEG AV-Ca-drink OBL wine
      ‘Don’t drink wine.’
According to Li (2000: 92) and Li & Tsuchida (2001: 28), future of patient voice in Pazeh can also be marked by reduplication, and from the example sentences provided, it seems that the reduplication belongs to Ca- pattern with a long vowel a.

(9) Pazeh (Li 2000: 93)
   a. xe’ed-en naki ki nuang
tie-PV 1SG.GEN NOM cow
   ‘The cow was tied by me.’
   b. xaa-xe’ed-en naki ki nuang
   Caa-tie-PV 1SG.GEN NOM cow
   ‘The cow will be tied by me.’

As for the function of marking a certain aspectual meaning, besides Thao and Rukai mentioned in Blust (1998), Puyuma and Pazeh also make use of Ca- reduplication to mark a certain kind of imperfective aspect. In Puyuma, it can mark progressive or habitual aspect, as shown in (10) and (11).

(10) Puyuma (Tan 1997: 73)
   a. d<em>a~deru Da paTaka i aTung
   Ca<AV>~cook OBL meat NOM Atung
   ‘Atung is cooking meat.’
   b. ku-da-La~Leken-aw nu-kiruan
   1SG.GEN-wet-Ca~wet-PV 2SG.GEN-clothes
   ‘I’m wetting your clothes.’
   c. ku-ba~bulu-anay na barasa kana kaLi
   1SG.GEN-Ca~throw-IV NOM stone OBL river
   ‘I am throwing the stone into the river.’

(11) Puyuma (Tan 1997: 75)

   ma-a~eken=ku Da paTaka
   AV-Ca~eat=1SG.NOM OBL meat
   ‘I have the habit of eating meat.’ or ‘I am eating meat.’

Pazeh also seems to mark its progressive aspect by Ca- reduplication with a long vowel (Li and Tsuchida 2001: 39).  

10 Note that according to Li and Tsuchida (2001: 22 & 39), CV- or CVV- can also mark the progressive aspect, as shown below.

(ii) Pazeh (Li and Tsuchida 2001: 22)
   a. di-dius ‘is scooping’
      CV-scoop
   b. su-suzuk ‘is hiding’
      CV-hide

(iii) Pazeh (Li and Tsuchida 2001: 21)
    dee-depex ‘is reading’
    CVV-read
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(12) Pazeh (Li and Tsuchida 2001: 39)
   a. yaku  kaa-ken dukul
       1SG.TOP Caa-eat taro
       'I am eating taro.'
   b. yaku  daa-daux dalum
       1SG.TOP Caa-drink water
       'I am drinking water.'

According to Tsuchida (1976), in the two southern Tsouic languages Kanakanabu and Saaroa, imperfective aspect is marked by Ca-reduplication or a- depending on the subclass the verb belonging to; e.g. Kanakanabu: t-um-a-tani-ula‘maltreating’vs. ma-a-pana‘e‘shooting with a bow or gun’; Saaroa: m-ia-pa-puale‘pushing’ vs. u-a-pana‘shooting’.

Note that divergence in terminology is observed in different studies. Take Thao for example. The term durative or iterative is employed in Blust (1998) while progressive is used in Huang (2000). Compare:

(13) Thao
   a. haya  ‘azazak mi-lha-lhilhi (Huang 2000: 104)
       that child AV-Ca-stand
       ‘That child is standing.’
   b. mi-lha-lhilhi ‘keep standing’ (Blust 1998: 191)
       AV-Ca-stand

According to Bybee et al. (1994), the term progressive is referred to as durative or continual in reference grammar, and thus the two terms will be used in this study. Table 2 summarizes the function of Ca-reduplication in forming verbs in a certain temporal or aspectual frame attested in the named Formosan languages.

Table 2: Ca-reduplication in marking tense and aspect

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Language</th>
<th>Tense/aspect</th>
<th>AV</th>
<th>PV</th>
<th>LV</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>Saisiyat</td>
<td>Future</td>
<td>Ca-V-en</td>
<td>ka-V-an</td>
<td>Ca-</td>
<td></td>
</tr>
<tr>
<td>Atayalic</td>
<td>Atayal</td>
<td>Future</td>
<td>Ca-V-un</td>
<td>Ca-V-an</td>
<td>Ca-</td>
<td></td>
</tr>
<tr>
<td>East</td>
<td>Amis</td>
<td>Future</td>
<td>Ca-V&lt;um&gt;</td>
<td>Ca-V-en</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tsouic</td>
<td>Kanakanabu</td>
<td>Durative</td>
<td>C&lt;um&gt;a-V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Saaroa</td>
<td>Durative</td>
<td>m-Ca-V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western</td>
<td>Thao</td>
<td>Progressive</td>
<td>Ca-V</td>
<td>Ca-V-en</td>
<td>Ca-V-an</td>
<td>saa-Ca-V</td>
</tr>
<tr>
<td>Plains</td>
<td>Pazeh</td>
<td>Progressive</td>
<td>Ca-V</td>
<td>Ca-V-en</td>
<td>Ca-V-an</td>
<td>Ca-Vay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>habitual</td>
<td>C&lt;um&gt;a-V</td>
<td>Ca-V-aw</td>
<td>Ca-V-ay</td>
<td>Ca-V-anay</td>
</tr>
<tr>
<td></td>
<td>Puyuma</td>
<td>Progressive</td>
<td>Ca-V</td>
<td>Ca-V-i</td>
<td>Ca-V-i</td>
<td>Ca-V-an</td>
</tr>
<tr>
<td></td>
<td>Ruaki</td>
<td>Progressive</td>
<td>Ca-V</td>
<td>ki-Ca-V</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ruaki</td>
<td>Future</td>
<td>[a]y-Ca-</td>
<td>ay-ki-Ca-V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11 Note that in Blust (2003b: 56), the term durative is used in the description of this function in Ca-reduplication, and the entry mi-lha-lhilhi is marked as Stative/Iterative and glossed as ‘stand, be standing.’
12 The prefix ki- functions as a passive marker in Rukai.
The function of Ca- reduplication to mark future or progressive/durative aspect is attested in seven of the subgroups; it is not attested in Bunun and Paiwan.

2.3. Formation of instrumental nouns

The use of Ca- reduplication in the formation of instrumental nouns in Saisiyat, Pazeh, Puyuma, and Thao is reported in Blust (1998), who describes it as a pattern of derivational morphology and points out that the meaning of instrument can sometimes be opaque; therefore the term “canonical” is employed to refer to those cases of which the instrumental meanings are transparent like *comb, broom/brush, sieve, chopsticks, lids*, whereas those with opaque instrumental meanings like body parts or results of an action are referred to as ‘non-canonical’ cases. From our observation, the use of Ca- reduplication is productive in Saisiyat – not only the reflexes of PAN words such as *sa-sapoeh* ‘broom’ (from *sapoeh* ‘sweep’) and *ha-haep* ‘sift’ (from *haep* ‘sieve’) are attested, but as shown in (14), words referring to modern inventions not existent in traditional Saisiyat culture can be derived by Ca- reduplication.

(14) Saisiyat

a. ka-kakes  
   Ca-cold  
   ‘air conditioner’

b. ha-hiyop ka bokes  
   Ca-blow (of wind)  
   ‘hair dryer’

c. pa-pori  
   Ca-apply (balms)  
   ‘plaster’

d. pa-potoy  
   Ca-wrap  
   ‘bandage’

Besides, according to Huang (2002: 219), Atayal also resorts to Ca- reduplication for deriving instrumental nouns.

(15) Atayal (Huang 2002: 219)

a. ha-hirhir  
   Ca-saw  
   ‘a saw’

b. ca-capux  
   Ca-sweep  
   ‘broom’

The function of Ca- instrumental nominal does not seem to be attested in Bunun, Amis, and Paiwan. In Bunun, CV- reduplication is used in the formation of instrumental nouns.

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13 According to Blust (1998: 37-8), canonical instrument consists of the semantic categories most frequently marked as instruments cross-linguistically. They “tends to be cultural artifacts manufactured for a perceived purpose rather than natural objects that may serve a contingent purpose” and are commonly dynamic. The non-canonical instruments may be (1) passive or static, (2) body parts rather than cultural artifacts, or (3) may be results of actions rather than instruments for achieving them.
Bunun (Yeh 2000)

a. **ku-kulut** 'a saw'  
   CV-saw  

b. **tu-tubuk** 'a cover'  
   CV-cover  

c. **si-sinav** 'brush'  
   CV-wash  

Paiwan makes use of the instrumental voice prefix **si-** together with CVCV- or CV-reduplication to derive instrumental nouns, as shown in (17).

Paiwan (Chang 2000: 67)

a. **si-ereng-ereng** 'bedding'  
   si-CVCV-lie  

b. **si-ka-kan** 'dinner service'  
   si-CV-eat  

In Amis instrumental voice marker **sa-** is used for the same function, as shown in (18).

Amis (Wu 2000: 53)

a. **sa-palu** 'stick'  
   IV-beat  

b. **sa-pi-nginguy** 'tools for bathing'  
   IV-Pi-bathe  

Mantauran Rukai makes use of the prefix **'a-** in combination with reduplication to derive instrumental nouns. According to Zeitoun (2002b: 259) it is the reflex of Proto-Rukai **sa-**.

Mantauran Rukai (Zeitoun 2002b: 259)

a. **'a-Laki-Lakipi** 'glue'  
   'A-CVCV-stick  

b. **'a-hisi-hisihisi** 'a saw'  
   'A-CVCV-to.saw'  

In addition to Ca-reduplication, Pazeh also makes use of **sa-** to derive instrumental nouns (Blust 1998: 39-46, Lin 2000), as shown in (20).  

**Pazeh (Blust 1998: 39)**

14 According to Blust (1998: 39-40), **sa-** is in complementary distribution with Ca-reduplication rather than in competition for the same base. From Lin (2000) and Li & Tsuchida (2001), we find some examples showing the same root with both strategies yielding different results.

**Pazeh (Lin 2000: 94)**

a. **ba-biru** 'book, word'  

b. **sa-biru** 'pen'  

**Pazeh (Li & Tsuchida: 2001: 146)**

a. **ka-kazip** 'chopsticks'  

b. **sa-kazip** 'a type of iron trap'
a. sa-bazu 'soap, soapberry' 
SA-wash
b. sa-kirkir 'a saw'
SA-saw

Table 3 below summarized how the named Formosan languages derive instrumental nouns.

Table 3: Formation of instrumental nouns in Formosan languages

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Language</th>
<th>Strategy for forming instrumental nouns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atayalic</td>
<td>Atayal</td>
<td>Ca- reduplication</td>
</tr>
<tr>
<td>Northwest</td>
<td>Saisiyat</td>
<td>Ca- reduplication</td>
</tr>
<tr>
<td>East</td>
<td>Amis</td>
<td>sa-</td>
</tr>
<tr>
<td>Puyuma</td>
<td>Puyuma</td>
<td>Ca- reduplication</td>
</tr>
<tr>
<td>Paiwanic</td>
<td>Paiwanic</td>
<td>si-CVCV-, si-CV-</td>
</tr>
<tr>
<td>Rukai</td>
<td>Rukai</td>
<td>'a-CVCV-</td>
</tr>
<tr>
<td>Bunun</td>
<td>Bunun</td>
<td>CV- reduplication</td>
</tr>
<tr>
<td>Western Plains</td>
<td>Thao</td>
<td>Ca- reduplication</td>
</tr>
<tr>
<td></td>
<td>Pazeh</td>
<td>Ca- reduplication</td>
</tr>
</tbody>
</table>

Besides the four languages reported in Blust (1998), Mayrinax Atayal is found to make use of Ca- reduplication to form instrumental nouns. This function is attested in four out of the nine subgroups of language.

2.4. Derive objective and locative nouns from verbs

Apart from the three functions reported in Blust (1998), Ca- reduplication in some Formosan languages also assumes the function of lexical nominalization to derive argument nouns from verbs (Comrie & Thompson 1985). For example, in Atayal, Paiwan, Pazeh, and Bunun, Ca- reduplication is found to co-occur with patient voice suffix -un and locative voice suffix -an to derive objective and locative nouns, as shown in the examples below.

(21) Atayal (Mayrinax, Huang 2002: 222)
  a. na-niq-un ‘food; something to be eaten’
      Ca-eat-PV
  b. na-niq-an ‘restaurant; place for eating’
      Ca-eat-LV

(22) Paiwan (Chang 2000: 77, Tseng 2003: 59)
  a. ka-kan-en ‘food; something to be eaten’
      Ca-eat-PV
  b. ka-kesa-an ‘kitchen’
      Ca-cook-LV

(23) Pazeh (Lin 2000: 75-76, Li & Tsuchida 2001: 96)
a. ka-kita-en 'something to be looked at'
   Ca-look-PV
b. da-depex-an 'school'
   Ca-read-LV

(24) Bunun (Yeh 2000)
a. ka-kawn-un 'food'
   Ca-eat-PV
b. pa-pitiya-an 'kitchen'
   Ca-cook-LV

Note that in Saisiyat, the morpheme ka- co-occurs with patient voice -un and locative voice -an to derive objective and locative nouns. According to Yeh (2003: 26-27) Ca- and ka- are allomorphs, with ka- being the variant of Ca- occurring when the verb stems contain two identical/similar syllables or pa-.

(25) Saisiyat
a. ka-si'ael-en 'food'
   KA-eat-PV
b. ka-si'ael-an 'restaurant, place for eating'
   KA-eat-LV

2.5. Reciprocity

Zeitoun (2002a: 10) points out that ma-Ca- marks reciprocity for dynamic verbs in five languages including Paiwan, Puyuma, Saisiyat, Rukai (Mantauran), and Atayal. In the following, examples from recent publication on the named languages are cited for illustration.

(26) Atayal (Zeitoun 2002a: 9)
   ma-sa~siuwa' i' baicu' ki' yumin
   RECP-Ca~like NOM Baicu COM Yumin
   'Baicu and Yumin love each other.'

(27) Saisiyat (Zeitoun 2002: 7-8)
a. 'obay ki 'amoy ma-Sa-Sbet
   'okay and Amoy RECP-Ca-beat
   'okay and Amoy beat each other.'
b. 'obay ki 'amoy ka-koring
   'okay and Amoy Ca-beat
   'okay and Amoy beat each other.'

---

15 As the first vowel is /a/, we therefore cannot exclude the possibility of CV- reduplication.

16 According to Yeh (2003), the motivation for ka- to occur with verb stems containing two identical/similar syllables is to avoid more than two identical/similar syllables in one word. For words initiated with pa-, the motivation is to avoid mistaking the reduplicated part as the causative morpheme.
(28) Paiwan (Tseng 2003: 57)
a. maulau manasika ma-ka~ki~ki-m
   lost so AV-Ca-RED-search
   ‘They are lost so they are searching for each other.’
b. ma-ra~rakac a vatu tua vutjulj
   AV-Ca-pull NOM dog OBL meat
   ‘The two dogs each pull on the meat.’

(29) Mantauran Rukai (Zeitoun 2007: 59)\footnote{Zeitoun (2007: 247-248) points out that there are at least four reciprocal markers in Mantauran Rukai: ma-Ca-, ma(a)-, ma’-a-, and ma’a-pa-; she also remarks that ma-Ca- is unproductive.}
ma-ca~cengele
MA-Ca-see
‘see each other’

(30) Puyuma (Teng 2007: 57)
a. ma-Da~Dulum
   MA-Ca-replace
   ‘exchange’
b. ma-sa~sulud
   MA-Ca-push
   ‘push each other’

Note that except for the Saisiyat example (27a), all the other examples involve co-occurrence of Ca- reduplication with ma- to mark reciprocity.\footnote{There is a difference among authors in the analysis towards ma-, which often co-occurs with Ca- reduplication to mark reciprocity. Some analyze it as an Actor Voice prefix, some take it as a reciprocal markers, and others treat ma-Ca- as the marker for reciprocity. The glossing in general follows the analysis in the works cited.} For Puyuma, Teng (2007: 57) remarks that Ca- reduplication alone cannot indicate reciprocal relation although it belongs to the element marking reciprocity. On the basis of the fact that Ca- reduplication co-occurs with ma- to mark reciprocity, along with the fact that reciprocity in some languages such as Kavalan and Pazeh does not involve Ca- reduplication,\footnote{Reciprocity is marked by sim- in Kavalan (Li & Tsuchida 2006: 21), as in sim-pukun ‘hit each other’ (< pukun- ‘hit’) and sim-tayta ‘look at each other’ (< tayta- ‘look’). According to Zeitoun (2002a), Pazeh makes use of ma- to mark reciprocity, and reduplication indicates the participation of a plural subjects.} Lee (2007: 268) argues that what the reduplication signals is plurality or repetition,\footnote{Another piece of supporting evidence from Lee (2007) is: when the verb is further reduplicated, the meaning implies plural reciprocals or a chaining situation. Examples are from Zeitoun (2002a):}

\begin{enumerate}
\item[(vi)] Paiwan: mapa-qetsi ‘kill each other’ vs. ma-qa-qetsi-qetsi ‘kill one another’
\item[(vii)] Puyuma: mar-pa-na’u ‘look at each other’ vs. mar-pa-na’u-na’u ‘look at each other’
\item[(viii)] Mantauran Rukai: ma-ta-tovi ‘cry with/for each other’ vs. ma-ta-tovi-tovi ‘cry with/for one other’
\end{enumerate}
(31) Saisiyat

a. rima' ra-ra'oe: ka tatini'
    go Ca-drink NOM old.man
    'The elders went drinking in a feast.'

b. hiza' 'oya' niya minkoringan niya korkoring
    that mother 3SG.GEN woman 3SG.GEN child
    maymaw ha-haengih saboe
    can't help Ca-cry all
    'His mother, his wife and children could not help crying all together.'

The fact that Ca-reduplication in Puyuma also designates collectivity or plurality (Teng 2007: 56-58) and that in Thao it also forms distributive of statives (Blust 2003b: 191) lends support to the function of marking plurality in Ca-reduplication.

2.6. Summary

The table below summarizes the functions exhibited in the Formosan languages examined.21

Table 4: Functions of Ca-reduplication in Formosan Languages

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Language</th>
<th>Numeral</th>
<th>Tense/Aspect</th>
<th>Instrumental nouns</th>
<th>Patient/locative nouns</th>
<th>Reciprocity/Plurality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atayalic</td>
<td>Atayal</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Northwest</td>
<td>Saisiyat</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Western Plains</td>
<td>Pazeh</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Thao</td>
<td>Puyuma</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>East Amis</td>
<td>Paiwan</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Bunun</td>
<td>Rukai</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Mantauran</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Kanakanabu</td>
<td>Saaroa</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On the basis of the discussion, we come to the following observations about Ca-reduplication in the Formosan languages.

1. Ca-reduplication is multifunctional in Atayal, Saisiyat, Puyuma and Thao; among the four, Atayal, Puyuma and Thao have retained all the three PAN functions proposed in Blust (1998).

21 A '-' indicates this function is attested, '+' not attested, and a blank indicates no information is available to judge if this function is attested. Nominalization in Puyuma, Thao, and Rukai is dubbed '-' on the basis of the description provided in Teng (2007), Blust (2003b) and Zeitoun (2007).
2. Ca-reduplication in Amis, Bunun, Paiwan, Rukai, and Tsou exhibits restriction in function or distribution. In Bunun, it is only attested in the formation of numerals for counting humans and lexical nominalization deriving objective and locative nouns; in Paiwan it has lost all the PAN functions and functions only in marking reciprocity and deriving objective and locative nouns.

3. Verbal use of Ca-reduplication to mark tense or aspect is not less pervasive than the function to form instrumental nouns.

3. Relationships between different functions

Except for the function to form numerals, all the other functions involve the application of Ca-reduplications to verb stems. It thus is legitimate for one to wonder if the three functions -- marking future or imperfective aspect, deriving instrumental nouns, and marking reciprocity -- are related in any sense. In the following subsections, the function of Ca-reduplication in verb to mark certain temporal or aspectual information will be clarified, and then the relationships between the three functions will be brought to discussion.

3.1. The function of Ca-reduplication in the formation of verb forms

In Blust (1998), the function of Ca-reduplication in the formation of verb forms is remarked as being less clear than the other two functions. Later on in his two follow-up studies, this function is not included in the reconstructed functions of PAN *Ca-. Therefore, in Blust (1999) and Blust (2003a), only the formation of numerals in counting human and deriving instrumental nouns are included in the reconstructed functions of PAN *Ca-reduplication. The publication of Blust (1998) has directed the attention towards Ca-reduplication and other patterns of reduplication, and therefore more information on the functions of Ca-reduplication is available, leading to a clearer picture of this pattern of reduplication. For example, in Blust (1998: 48), function of Ca-reduplication to mark tense or aspectual information in Saisiyat and Pazeh is marked as not reported. Later on, this function in the two languages is reported in Li & Tsuchida (2001) and Yeh (2003) respectively. As mentioned in Section 2, this function is also attested in Amis (Zeitoun et al. 1996, Wu 2007), and two Tsouic languages: Kanakanabu and Saaroa (Tsuchida 1976). Not only that more languages are found to display the function of Ca-reduplication in verb to mark either future or durative, it is also found that some of the languages make use of Ca-reduplication in combination with different verb forms to mark both future and durative. For example, Blust (1998) reports that Puyuma makes use of Ca-reduplication to mark future. However, as shown in the following examples from Tan (1997) and Teng

22 The function to derive patient and locative nouns is not included in the discussion because the data is not sufficient enough for us to come to any conclusion.
Ca-reduplication in Formosan Languages

(2007: 57), Ca-reduplication in Puyuma marks future (or irrealis mood) as well as progressive aspect.

(32) Puyuma (Tan 1997: 70, 73)
   a. REDENTIAL-deru Da paTaka i aTung
       AV-Ca-cook OBL meat NOM Atung
       'Atung will cook meat.'
   b. d<em>a-deru Da paTaka i aTung
       Ca<AV>-cook OBL meat NOM Atung
       'Atung is cooking meat.'

(33) Puyuma (Teng 2007: 57)

<table>
<thead>
<tr>
<th>stem</th>
<th>progressive</th>
<th>irrealis</th>
</tr>
</thead>
<tbody>
<tr>
<td>kasu</td>
<td>k&lt;em&gt;a-kasu</td>
<td>ka-kasu</td>
</tr>
<tr>
<td>sanga'</td>
<td>s&lt;em&gt;a-sanga</td>
<td>sa-sanga</td>
</tr>
<tr>
<td>na'u</td>
<td>n&lt;em&gt;a-na'u</td>
<td>na-na'u</td>
</tr>
<tr>
<td>parekep</td>
<td>p&lt;em&gt;a-parekep</td>
<td>pa-parekep</td>
</tr>
<tr>
<td>re'ani</td>
<td>r&lt;em&gt;a-re'ani</td>
<td>ra-re'ani</td>
</tr>
</tbody>
</table>

As remarked in Teng (2007: 57), progressive aspect is marked by Ca-reduplication together with a voice marker, whereas future/irrealis mood is designated by Ca-reduplication to a verb stem. In other words, Ca-reduplication marking future and Ca-reduplication marking progressive aspect are attached to different verb stems. What has been shown above is the case for verbs in actor voice. Verbs in other voice also make a distinction between future and progressive, as shown in the table below.

Table 5: Tense/aspect system in Puyuma (Teng 1997: 16)

<table>
<thead>
<tr>
<th></th>
<th>AV</th>
<th>PV</th>
<th>LV</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>realis (nonfuture)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>past/present</td>
<td>V&lt;em&gt;um&gt;</td>
<td>V-aw</td>
<td>V-ay</td>
<td>V-anay</td>
</tr>
<tr>
<td>progressive</td>
<td>Ca-V&lt;em&gt;um&gt;</td>
<td>Ca-V-aw</td>
<td>Ca-V-ay</td>
<td>Ca-V-anay</td>
</tr>
<tr>
<td>irrealis (future)</td>
<td>Ca-V</td>
<td>Ca-V-i</td>
<td>Ca-V-i</td>
<td>Ca-V-an</td>
</tr>
</tbody>
</table>

The past/present forms do not carry any aspectual information and therefore the adding of Ca-reduplication contributes the meaning of progressive. For future, Ca-reduplication co-occur with the verb stem or the verbs marked with suffix -i or -an. Bybee et al. (1991: 21) points out that for aspectual future, future reading is obtained from context. This seems to be the case in Pazeh. The future form in Pazeh is marked as Ca-V-ay, and the progressive form is Ca-V; according to Li & Tsuchida (2001: 40), -ay is the irrealis marker indicating future. In other words, the meaning of future is contributed by -ay. The morphological realization of tense, aspect and mood in Pazeh is presented in the table below.

---

21 In Teng (1998), m- is used to cover all the variants of actor voice affixes. We choose to present it as -um- because the example in (32) and (33) contain this infix; also, it can accommodate the facts in other languages.
Table 6: Tense, aspect and mood in Pazeh

<table>
<thead>
<tr>
<th></th>
<th>AV</th>
<th>PV</th>
<th>LV</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realis</td>
<td>Neutral</td>
<td>mu-V</td>
<td>V-en</td>
<td>V-an</td>
</tr>
<tr>
<td></td>
<td>Perfective</td>
<td>m&lt;in&gt;u-V</td>
<td>&lt;in&gt; V</td>
<td>&lt;in&gt; V-an</td>
</tr>
<tr>
<td></td>
<td>Progressive</td>
<td>Ca-V</td>
<td>Ca-V-en</td>
<td>Ca-V-an</td>
</tr>
<tr>
<td>Irrealis</td>
<td>Future</td>
<td>Ca-V-ay</td>
<td>Ca-V-en</td>
<td>Ca-V-ay</td>
</tr>
<tr>
<td></td>
<td>Anticipate</td>
<td>mu-V-ay</td>
<td>V-aw</td>
<td>V-ay</td>
</tr>
<tr>
<td></td>
<td>Imperative</td>
<td>V</td>
<td>V-i</td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 6, verbs marked with -um-, -en, and -an alone are normally dubbed as neutral because they do not convey any tense or aspect information. In other words, the meaning of progressive or durative is carried by Ca- reduplication. However, the meaning of future is rendered through the co-occurrence of Ca-reduplication with the affixes belonging to the irrealis category. In the reconstruction of Ross (1995), these forms are called projective, and they signal such meanings as intention, possibility and exhortation.

Table 7: PAN verbal morphology (based on Ross 1995)

<table>
<thead>
<tr>
<th></th>
<th>Actor</th>
<th>Undergoer</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicative</td>
<td>Neutral</td>
<td>&lt;um&gt; V</td>
<td>V-en</td>
</tr>
<tr>
<td></td>
<td>Perfective</td>
<td>&lt;umin&gt; V</td>
<td>&lt;in&gt; V</td>
</tr>
<tr>
<td></td>
<td>Durative</td>
<td>Ca-V &lt;um&gt;</td>
<td>Ca-V-en</td>
</tr>
<tr>
<td>Non-indicative</td>
<td>Atemporal</td>
<td>V</td>
<td>V-u</td>
</tr>
<tr>
<td></td>
<td>Projective</td>
<td>&lt;um&gt; V-a</td>
<td>V-aw</td>
</tr>
</tbody>
</table>

3.2. Correlation with PAN verbal morphology

Note that in Table 7, the verb forms marked by Ca-reduplication are reconstructed as durative; according to Ross (1995) future is extended from durative (expected future, cf. Bybee et al. 1994). However, Wolff (1973: 73) has reconstructed Ca-V-en and Ca-V-an as future patient voice and locative voice forms. If Ca-reduplication alone marks progressive aspect, whereas the meaning of future is rendered through its co-occurrence with the irrealis or projective affixes, then the original function of Ca-reduplication should be marking durative, as proposed by Ross (1995). Examining Table 7 closely, we find that PAN Ca-reduplication did not co-occur with non-indicative verb forms. However, in Pazeh and Puyuma, Ca-reduplication combine with irrealis verb forms to indicate future, indicating a generalization of Ca-reduplication to a wider context.

According Bybee (2003: 153-158), grammaticalization is the process of automatization of frequently occurring sequences of linguistic elements. Repeated words or phrase tend to lose their semantic force and take on a symbolic function inferred from the context they occur. For example, the French negative phrase ne pas was originally composed of a negative element ne and the noun pas 'step' and was used only with motion verb, meaning 'not (go) a step.' Then, pas lost its meaning in the con-

---

24 This table is adapted from Li & Tsuchida (2001: 41), with the sample verb replaced by V.
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struction and took on the meaning of negation from the construction. Following this mechanism of habituation proposed in Bybee (2003), we postulate that Ca-reduplication co-occurred with projective suffixes such as -ay to mark future, and as the original meaning of marking durative aspect got lost through its repeated occurrence with -ay, it took on the meaning of future from the context, and as -ay disappeared in some languages, the function of marking future was assumed by Ca-reduplication alone.

3.3. Linking to reciprocity

Taking durative aspect marking as the original function of Ca-reduplication can help build the link to the function in marking reciprocity or plurality. Moravcsik (1978: 317) argues that the most outstanding single concept recurrently expressed by reduplication in various languages is the concept of increased quantity. Lakoff and Johnson (1980: 128) maintain that all the cases of reduplication in the world languages are instances where MORE OF FORM stands for MORE OF CONTENT.

It is clarified in section 2.5 that the function of Ca-reduplication is in fact to designate plurality. If we take Ca-reduplication as designating an iconic meaning – INCREASE, then we can establish the link between the function in marking reciprocity (or plurality) and durative. Moravcsik (1978: 319) and Katamba (1993) both point out that reduplication of verbs may express either repeated or continued occurrence of an event performed by the same participant(s) or different participants. Following this line of thought, we may propose that for reciprocity or plurality, the meaning is rendered through the projection of INCREASE to the participant. As for durable or progressive aspect, it can be perceived as the projection of INCREASE to the event (Kiyomi 1993).

3.4. Formation of instrumental nouns and verb forms

If Ca-reduplication denotes an iconic meaning – INCREASE, how can we explain its use in the formation of instrumental nouns? As mentioned above, formation of instrumental nouns as well as marking tense/aspect and reciprocity involve the application of Ca-reduplications to verb stems. However, the results are different: for the function of forming instrumental nouns, the result of applying Ca-reduplication to a verb stem is a noun designating instrument; for the function in marking tense/aspect or reciprocity, the application of Ca-reduplication yields verbs. In light of this, the relationship between formation of instrumental nouns and the verbal use of Ca-reduplication seems to be that between verbs and nominalizations.

As shown in (34), it is possible for the same form to manifest both the use of Ca-verb form and of Ca-instrumental nouns.

(34) Saisiyat
    a. yao 'am mari' ka ha-hiwa: ha-hiwa: ka 'ayam
       1SG.NOM will take ACC Ca-saw Ca-saw ACC meat
       'I will take a knife to cut the meat.'
There are two *ha-hiwa:* in (34a) – the first one is a derived instrumental noun, whose nominal status can be revealed by its compatibility with the accusative marker *ka,* and as shown in (34b) the position can be filled in by a non-derived lexical noun; as for the second *ha-hiwa:* the fact that it is followed by an accusative case-marked noun phrase demonstrates that it still retains the verbal property of transitivity. In light of this, the relationship between the function of Ca-reduplication in verb formation and instrumental noun formation boils down to the controversy on voice affixes being verbal or nominal deriving in Austronesian languages (Starosta, Pawley, and Reid 1982, henceforth SPR 1982). It is well-known that in Formosan and Philippine languages voice affixes are also used to form nominalizations (Ross 1995). The following Paiwan examples from Ferrell (1982: 17 & 106, cited in Ross 1995: 752) are frequently cited to illustrate the dual functions of the voice affixes.

Table 8: Focus and Nominalization in Paiwan (Ferrell 1982:17 & 106)

<table>
<thead>
<tr>
<th>Verb form</th>
<th>Nominalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>k-em-an</td>
<td>AV neutral  'eater', 'someone who eats'</td>
</tr>
<tr>
<td>kan-en</td>
<td>PV neutral  'food', 'something to be eaten'</td>
</tr>
<tr>
<td>k-in-an</td>
<td>PV perfective 'consumed food', 'something eaten'</td>
</tr>
<tr>
<td>kan-an</td>
<td>LV neutral  'place where one eats'</td>
</tr>
<tr>
<td>si-kan</td>
<td>IV neutral  'eating utensil', 'something to eat with'</td>
</tr>
</tbody>
</table>

According to Pawley and Reid (1980), these nominalizations are derived from their “passive” verb forms, whereas SPR (1982) and Ross (1995) argue for the opposite direction, i.e. non-actor voice constructions as developed from nominalizations based on the fact that the same markers are also used to derive nouns and that the actor in a non-actor voice construction is marked by genitive case markers. In the literature, the discussion focuses on the neutral voice affixes, i.e. *-um-, -en, -an* as well as *si-,* which are supposed to carry no tense or aspectual information. The fact that in Mayrinax Atayal and Saisiyat, Ca-reduplication co-occurs with patient voice or locative voice marker but does not co-occur with instrumental voice marker seems to indicate that, like the patient voice perfective marker *-in-,* it has a portmanteau function in instrumental voice constructions, i.e. it designates both instrumental voice and future tense. Thus, apart from the well acknowledged perfective marker *-in-,* durative or progressive forms marked by Ca-reduplication are also involved in the nominal versus verbal controversy. We are not going to commit ourselves in the discussion of this issue, which deserves another paper. However, judging from the fact that verbal use of Ca-reduplication to mark progressive is more iconic, the direction of change seems more likely to be from the verbal use.
4. Conclusion

In this paper, we have given an overview of the functions exhibited by Ca-reduplication in Formosan languages. An important finding is that the function of Ca-reduplication to form verbs in a special tense or aspect is not less pervasive than the functions of forming instrumental nouns or numerals for counting humans in the named Formosan languages. Trying to clarify the function of Ca-reduplication in verb, we come to the finding that Ca-reduplication, like the perfective infix -in-, also exhibits a portmanteau function and belongs to a part of the PAN verbal morphology. Noticing the fact that the function of forming instrumental nouns and the function to form special verb forms are both Ca-reduplication applying to verbs, we come to the observation that the relationship between the two boil down to the controversy between nominal versus verbal deriving of the focus affixes in Austronesian linguistics. Though our conclusion appears to diverge from what is maintained in Blust (1998) that the function of Ca-reduplication to form instrumental nouns is neither related to its verbal uses nor the same as the nominalization properties of PAN instrumental voice *Si-, the implication is the same: the importance of Ca-reduplication should be highlighted when trying to settle down the nominal-verbal controversy of voice affixes in Austronesian languages.

5. Acknowledgements

This study was supported by the project Classification and Dispersal of Austronesians: Anthropological, Archaeological, Genetic and Linguistic Studies Relating to Taiwan (NSC 95-2627-H-001-001). I would like to thank the project coordinator, Prof. Paul Jen-Kuei Li and all the participants, especially Henry Yung-li Chang for their comments on an earlier version of this paper. I am also grateful to all the participants in the Graz Reduplication Conference 2007 for their comments.

6. References


