

QUANTITY SENSITIVE FOOT REDUPLICATION IN ISBUKUN BUNUN*

Hui-shan Lin

National Taiwan Normal University

ABSTRACT

This paper re-examines the phenomenon of so-called “total reduplication” in Isbukun Bunun and shows that the pattern is inaccurately classified as total reduplication due to the limited number of root types considered. When other root types are considered, it becomes clear that foot reduplication is involved instead, whereby the reduplicant copies the stress foot of the word. As shown, foot reduplication in Isbukun Bunun is quantity sensitive and is different from quantity insensitive foot reduplication, disyllabic reduplication, or full reduplication classified previously for Austronesian languages in and outside Taiwan (Blust 2009, Zeitoun and Wu 2006, Lee 2007). The findings that Isbukun Bunun does not utilize total reduplication and that foot reduplication in this language is quantity sensitive thus suggest the re-examination of total reduplication in other Bunun dialects as well as the inclusion of quantity sensitive foot reduplication in Austronesian languages in and outside Taiwan.

Key words: Isbukun Bunun, total reduplication, foot reduplication, quantity sensitivity, Optimality Theory

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1. INTRODUCTION

Formosan languages, which are Austronesian languages spoken in Taiwan, make extensive use of reduplication as a means of word formation. However, unlike Austronesian languages outside Taiwan (i.e., non-Formosan languages), total reduplication, which copies the entire root, including the word-final coda, is not productively used in Formosan languages due to the tendency of word-final coda-dropping in the language family, which is a trait preserved from Proto-Austronesian languages (Blust 2003:55, Lee 2007:66). Despite its non-productivity, total reduplication is reported to exist in some Formosan languages. Isbukun Bunun is among one of the few Formosan languages that is said to utilize total reduplication (Lee 2007).¹

Isbukun Bunun is the southern dialect of Bunun. Reduplication in Isbukun Bunun is mentioned in Li (1997), L. Huang (1997), Yeh (2000), Zeitoun (2000), T. Lin et al. (2001), Zeitoun and Wu (2006), Istanda (2009), Huang and Shih (2016), and H-s. Lin (2018). In addition to lexicalized reduplication, Ca- reduplication, and CV- reduplication, there is a pattern of reduplication which is always considered as involving a complete copying of the root (e.g., [ma-taɣdum] ‘black’ > [ma-taɣdum~taɣdum] ‘a bit/very black’ [Yeh 2000:361]).² This pattern is referred to as “total reduplication” or “full reduplication” in previous studies³ and is generally considered to convey the meaning of repetition

¹ According to Lee (2007:67), the other Formosan languages that make use of total reduplication include Pazih, Sqliq Atayal, Cʔuliʔ Atayal, and Saisiyat.

² In this paper, the reduplicant is underlined and is separated from the root by ‘~’; the non-reduplicative prefixes and suffixes are separated from the root by ‘-’. Most of the authors of previous studies have made use of a Romanized orthographic system. Data cited from the previous studies are modified using IPA and are transcribed phonetically for the purpose of this paper.

³ According to Istanda (2009) and Zeitoun and Wu (2006:105), total reduplication has a rare sub-pattern in which the whole root is copied without the final coda. Two such examples are reported in the literature ((i) *anak* ‘oneself’ > *ana-anak* ‘one another’ [Istanda 2009:26] and (ii) *amin* ‘all’ > *ami-amin* ‘possess magic power’ [Istanda 2009:34]). The dropping of the final coda in the examples is unlikely to be phonologically governed since words that share a similar structure (e.g., *unul* ‘to have earthquake’ > *unul-unul* ‘to have earthquake frequently’ [Istanda 2009:28]) have the word final coda copied. Such sub-pattern is also rare in my informants’ production. Except for a couple of examples similar

or diminution/augmentation (L. Huang 1997:358, Yeh 2000:361, T. Lin et al 2001:130, Huang and Shih 2016:31-32).

Based on first-hand data of the Isbukun dialect, which is spoken in Taoyuan District, Kaohsiung City, this paper shows that the reduplication process that denotes the meaning of repetition and diminution/augmentation should not be categorized as total reduplication because once new root types (i.e., roots with different syllable numbers and syllable internal make-ups) are considered, it becomes clear that the reduplicant (RED) does not always copy the root in its entirety. The RED, which varies between monosyllabic and disyllabic, can be a copy of part of the root not only when the root is longer than disyllabic (e.g., [ma-ka.li.ŋis] ‘ugly’ > [ma-ka-liŋis-liŋis] ‘a bit ugly’), but also when the root is a disyllable that ends with a heavy syllable (e.g., [maχ.ðjam] ‘slippery’ > [maχ-ðjam-ðjam] ‘a bit slippery’). Despite the fact that previous studies have provided valuable discussions and documentation of the reduplication process, the number of the types of root examined is somewhat limited. Other than monosyllabic roots (e.g., [ma-djav] ‘yellow’ > [ma-djav~djav] ‘a bit/very yellow’ [Yeh 2000:361]), previous studies have mainly focused on disyllabic roots with light syllable endings (e.g., [ma-taxdum] ‘black’ > [ma-taxdum-taxdum] ‘a bit/very black’ [Yeh 2000:361]), which are the most basic root type in the language. Consequently, the RED appears as a complete copying of the root and the pattern is accordingly termed “total reduplication.”

This paper also shows that the variable syllable numbers of the RED (i.e., monosyllabic vs. disyllabic) are not determined by the internal make-up of the root as a whole but by the stress foot. The RED is a copy of the stress foot, which is not always isomorphic to a root. The stressed foot that is copied is a quantity sensitive trochee in Isbukun Bunun, and it varies between a heavy monosyllable to a light-light or a heavy-light disyllable. When the stress foot is monosyllabic, so is the RED. Therefore, so-called “total reduplication” in Isbukun Bunun should be “foot reduplication” instead. Foot reduplication in Isbukun Bunun is different from the foot

to (and including) the two examples mentioned above that are not phonologically governed, there is an example that may be attributed, phonologically, to an OCP effect prohibiting geminates in successive syllables. That is, [mu-sajs] ‘take turns’ > [mu-saj-sajs] ‘take turns several times’.

reduplication categorized in Blust (2009) for Austronesian languages, or the related patterns such as disyllabic reduplication categorized in Zeitoun and Wu (2006), or the full reduplication categorized in Lee (2007) for Formosan languages, all of which simply refer to a disyllabic string without looking into the internal quantitative make-up. Foot reduplication in Isbukun Bunun is quantity sensitive. As a consequence, based on the categorizations made in previous studies, the quantity sensitive foot reduplication in Isbukun Bunun, which varies in syllable numbers, has to be classified into different reduplication patterns (e.g., foot reduplication and monosyllabic reduplication in Blust 2009). The findings of this paper thus suggest the inclusion of *quantity sensitive* foot reduplication in Austronesian languages in and outside Taiwan.

The remainder of this paper is organized as follows: section 2 offers a brief background on Isbukun Bunun. Section 3 re-examines so-called “total reduplication” based on fieldwork data of the Isbukun dialect spoken in Taoyuan District, Kaohsiung City and provides some generalizations on the pattern, followed by an analysis within Optimality Theory (Prince and Smolensky 1993/2004, McCarthy and Prince 1993). Section 4 discusses the role that non-reduplicative affixes play in foot reduplication and some implications of the paper for Austronesian languages in and outside Taiwan. Section 5 concludes the paper.

2. BACKGROUND ON ISBUKUN BUNUN

Bunun is a Formosan language spoken in Kaohsiung City, Nantou County, Hualien County, and Taitung County in Taiwan. Bunun has five dialects, the two northern dialects, Takituduh and Takibakha, the central dialects Takbanuaz and Takivatan, and the southern dialect Isbukun (Li 1988, 1997). The discussion of this paper is based on the Isbukun dialect of Bunun spoken in Kaohsiung City.

Isbukun Bunun has three vowels /i, u, a/ and fourteen consonants /p, t, k, ʔ, b, d, v, s, ɣ, ð, m, n, ŋ, l/ (cf. He et al. 1986, Li 1997). Before /i/, /s/ and /t/ are palatalized to [ɕ] and [tɕ], respectively (Li 1997, L. Huang 1997). For example, /siða/ > [ɕiða] ‘take as wife’, /tiaɣav/ > [tɕiaɣav] ‘close one’s eyes’. The roots of the content words in Isbukun Bunun are

typically disyllabic (H.-H. Lin 1996, Li 1997:306). If a content word contains only an underlying vowel, the vowel is lengthened to satisfy word minimality (i.e., a content word must be minimally bimoraic). For example, /bas/ > [ba:s] ‘poisonous’. (Li 1997:307, Zeitoun 2000:45, Huang and Shih 2016). The most basic syllable structure of the language is CV(C) (Li 1997:306). Isbukun Bunun does not allow surface vowel sequences. Underlying vowel sequences are repaired by either gliding or coalescence; gliding occurs when the adjacent vowels are different (e.g., /miaχdi/ > [mjɑχdi] ‘work hard’, /uχna-un/ > [uχnawn] ‘do it over again’; coalescence occurs when the adjacent vowels are identical (e.g., /astala-av/ > [as.ta.la:v]⁴ ‘wait’-) (Huang 2006). Surface glides [w] and [j] exist but are always derived from the underlying vowels /u/ and /i/ (H.-H. Lin 1996).

Stress in Isbukun Bunun most often falls on the penultimate syllable (e.g., [χú.ðas] ‘music’, where the stressed syllable is marked in bold-face here after). But word final syllables containing offglides or post-consonantal onglides are heavy and attract stress (e.g., [uχ.náwn] ‘to do it over again’, [ma.-χan.ejáp] ‘to know’) because these derived glides are moraic and located in the nucleus position; syllable initial onglides, on the other hand, do not attract stress because they are located in the onset position and are consequently nonmoraic (e.g., [bu.χáj.ja] ‘naked’) (H. Huang 2002, 2005). Just as onsets, codas in Isbukun Bunun are also weightless because they do not attract stress (e.g., [ma.lú.daχ] ‘to beat’). The stress pattern in Isbukun Bunun is due to the construction of a quantity sensitive trochaic foot at the right edge of a word, under the assumption that glides are moraic, but codas are not (e.g., [ma.(lú.daχ)] ‘to beat’, [bu.(χáj.ja)] ‘naked’, [uχ.(náwn)] ‘to do it over again’, where the stress foot is placed in brackets) (H. Huang 2005).

⁴ Instead of transcribing the coalesced vowel as a V (i.e., [as.ta.lav]), the coalesced vowels are transcribed as V: to show that the vowels are bimoraic.

3. DATA RE-EXAMINATION AND GENERALIZATIONS

3.1 Limited Number of Types of Root Considered in Previous Studies

This section starts by re-examining data from previous studies. Examples illustrating “total reduplication” are given in (1).⁵ Some observations can be made from the examples. First, though no unified semantic function can be drawn from the data, the pattern of the reduplication generally appears to convey the meaning of repetition in the case of active verbs and diminution/ augmentation in the case of stative verbs. Second, previous studies have not normally marked which part is the RED and which is the base. That is because these data are considered as involving total reduplication and when total reduplication is involved, it is hard to distinguish the base from the RED. Yeh (2000) is an exception, in that in color terms, the RED is considered as a prefix to the root (cf. 1b).⁶

(1)

a. Total reduplication (L. Huang 1997:358)

- | | | | |
|------|----------------------|--------------------------------------|--------|
| i. | [vistu] | [vistu~vistu] | L.H358 |
| | ‘to struggle’ | ‘to struggle again and again’ | |
| ii. | [ʔunul] | [ʔunul~ʔunul] | L.H358 |
| | ‘to have earthquake’ | ‘to have earthquake again and again’ | |
| iii. | [dimal] | [dimal~dimal] | L.H358 |
| | ‘to shine’ | ‘to twinkle’ | |

⁵ Data cited in (1) and hereafter are accompanied by their source. For instance, data from L. Huang are cited as ‘L.Hx’, where ‘x’ is a page number, and data from T. Lin et. al are cited as ‘T.Lx.’ Data from Zeitoun and Wu (2006) are not listed in (1) because they are drawn from Yeh (2000).

⁶ For non-color terms that involve total reduplication, Yeh (2000) does not specify which part is the RED, which the base.

b. Total reduplication (Yeh 2000:361)			
i.	[ma-djav] 'yellow'	[ma- <u>djav</u> ~djav] 'a bit/very yellow'	Y361
ii.	[ma-danχas] 'red'	[ma- <u>danχas</u> ~danχas] 'a bit/very red'	Y361
iii.	[ma-saŋlav] 'green'	[ma- <u>saŋlav</u> ~saŋlav] 'a bit/very green'	Y361
iv.	[ma-lum] 'cloud'	[ma- <u>lum</u> ~lum] 'cloudy'	Y361
v.	[dawlu] 'long'	[dawlu~dawlu] 'turtle'	Y361
c. Total reduplication (T. Lin et al 2001)			
i.	[dawk] 'slow'	[dawk~dawk] 'a bit slow'	T.L132
ii.	[sajs] 'to take turns'	[sajs~sajs] 'to take turns one after another'	T.L132
iii.	[ŋalaχ] 'yell'	[ŋalaχ~ŋalaχ] 'yelling'	T.L131
iv.	[kapa] 'to crawl'	[kapa~kapa] 'to crawl forward'	T.L132
v.	[taχduŋ] 'black'	[taχduŋ~taχduŋ] 'a bit black'	T.L132
vi.	[χajnað] 'to jump'	[χajnað~χajnað] 'to jump and jump'	T.L158
vii.	[lajðu] 'depressed'	[matu-lajðu~lajðu] 'depressed'	T.L178

d. Total reduplication (Istanda 2009)			
i.	[χajv] 'to stir'	[χajv~χajv] 'to stir to mix'	I28
ii.	[tawn] 'steam'	[tawn~tawn] 'wheel'	I28
iii.	[suχis] 'to come back'	[suχis~suχis] 'back and forth'	I28
iv.	[baðan] 'to lie'	[baðan~baðan] 'to like to lie'	I29
v.	[ʔajða] 'to exist'	[ʔajða~ʔajða] 'to exist everywhere'	I28
vi.	[tupa] 'to tell'	[tupa~tupa] 'to tell each other'	I28
e. Total reduplication (Huang and Shih 2009)			
i.	[ma-ðawm] 'soft'	[ma-ðawm~ðawm] 'fresh and soft'	H&S31
ii.	[ma-dajŋ] 'big'	[ma-dajŋ~dajŋ] 'very big'	H&S31
iii.	[kan-dapan] 'to step on'	[kan-dapan~dapan] 'to step on several times'	H&S32
iv.	[teistub] 'to chop'	[ma-teistub~teistub] 'to chop and chop'	H&S32
v.	[kawpa] 'only'	[kawpa~kawpa] 'every'	H&S31
vi.	[ma-vajvi] 'different, other'	[ma-vajvi~vajvi] 'various kinds'	H&S31

Importantly, though the examples do involve the total copying of the root as claimed in previous studies, a careful examination of the examples shows that the number of root types is very limited. In terms of syllable number, none of the examples have roots longer than two syllables; the roots are either monosyllabic (i.e., bi, ci, cii, di, dii, ei, eii) or disyllabic (i.e., the other examples). In terms of the syllable-internal make-up of the roots, while all of the monosyllabic roots are bimoraic and heavy (due to root minimality), the disyllabic roots considered always end with a light

syllable; namely, the roots are either formed by a light-light (i.e., ai-iii, bii-iv, ciii-v, diii-iv, eiii-iv), or a heavy-light (i.e., bv, cvi-vii, dv-vi, ev-vi) sequence. No disyllabic roots ending with a heavy syllable have been systematically considered in the previous studies when generalizing the pattern of so-called “total reduplication”. The limited number of types of root considered in the previous studies is understandable given that roots in the language are basically disyllabic and with the syllable structure of CV(C).

The limited types of root examined could mask the true nature of the reduplication process. Blust (2009:417), for instance, points out that suffixal foot reduplication “requires bases of more than two syllables to distinguish it from full reduplication”; without considering longer bases, suffixal foot reduplication is simply indistinguishable from full reduplication.

3.2 New Data and Some Generalizations

This section re-examines the reduplication process by considering other root types. The present paper shows that naming the pattern “total reduplication” is inaccurate once other root types are considered.⁷ Data collected in this study are exemplified in (2)-(4). These examples share a general semantic function, i.e., repetition in the case of active verbs and diminution in the case of stative verbs, and have roots ranging from the monosyllabic, to the disyllabic, and to longer roots.

⁷ The data presented in this paper were collected between 2015 and 2017. A total of 221 items of reduplicated forms involving foot reduplication were collected, among which, 29 items have a monosyllabic root, 10 items have a trisyllabic root, and 182 items have a disyllabic root. Among the 182 disyllabic roots, 107 items are composed of two light syllables, 42 items of heavy penultimate syllables, and 33 items of heavy final syllables. I am grateful to my informants Hanaivaz Takistaulan (顏雲英, female, born in 1950, Taoyuan District, Kaohsiung City), Ciang Ispalidav (顏有利, male, born in 1944, Taoyuan District, Kaohsiung City), and Uvau Baingkinuan (顏洪愛, female, born in 1931, Taoyuan District, Kaohsiung City) for their kind efforts and patience.

(2) Monosyllabic roots (the roots are in italics)

- | | | |
|----|---------------------------------|---|
| a. | [ma- <i>djav</i>]
'yellow' | [ma- <i>djav</i> ~ <i>djav</i>]
'a bit yellow' |
| b. | [ma- <i>εjal</i>]
'be nice' | [ma- <i>εjal</i> ~ <i>εjal</i>]
'a bit nice' |
| c. | [<i>mawn</i>]
'to eat' | [<i>mawn</i> ~ <i>mawn</i>]
'to eat several times' |
| d. | [ma- <i>kwis</i>]
'thin' | [ma- <i>kwis</i> ~ <i>kwis</i>]
'a bit thin' |

(3) Disyllabic roots (the roots are in italics)

- | | | |
|----|---|---|
| a. | [tein- <i>χuða</i>]
'be frightened' | [tein- <i>χuða</i> ~ <i>χuða</i>]
'be frightened several times' |
| b. | [ma- <i>taχduŋ</i>]
'black' | [ma- <i>taχduŋ</i> ~ <i>taχduŋ</i>]
'a bit black' |
| c. | [ma- <i>nusχit</i>]
'sharp' | [ma- <i>nusχit</i> ~ <i>nusχit</i>]
'a bit sharp' |
| d. | [ma- <i>tubu</i>]
'oily and slippery' | [ma- <i>tubu</i> ~ <i>tubu</i>]
'somewhat oily and slippery' |
| e. | [ma- <i>teila</i>]
'to bully' | [ma- <i>teila</i> ~ <i>teila</i>]
'to bully several times' |

- (4) Longer roots⁸ (the roots are in italics)
- | | | |
|----|--|--|
| a. | [ma- <i>kaliŋis</i>]
'ugly' | [ma-ka~ <i>liŋis</i> ~ <i>liŋis</i>]
'a bit ugly' |
| b. | [<i>takunav</i>]
'to throw away' | [ta~ <i>kunav</i> ~ <i>kunav</i>]
'to throw away several times' |
| c. | [<i>nanulu</i>]
'to pay attention' | [ma-na~ <i>nulu</i> ~ <i>nulu</i>]
'to pay attention several times' |
| d. | [<i>uduli</i>]
'to dance' | [u~ <i>duli</i> ~ <i>duli</i>]
'to dance several times' |
| e. | [ma- <i>daδisdis</i>]
'small' | [ma-da~ <i>δisdis</i> ~ <i>δisdis</i>]
'a bit small' |
| f. | [ma- <i>ulajðak</i>]
'to work hard' | [ma-u~ <i>lajðak</i> ~ <i>lajðak</i>]
'to work hard often' |
| g. | [<i>tasipal</i>]
'to go to the opposite (river) bank' | [ta~ <i>sipal</i> ~ <i>sipal</i>]
'to go to the opposite (river) bank several times' |

The examples show that when the root is monosyllabic (2) or disyllabic (3), the RED appears as a total copy of the root; but when the root is longer than disyllabic (4), the RED does not copy the root in its entirety; rather, it copies the rightmost disyllabic string. Though it has not been mentioned in the previous studies that the roots of more than two syllables in Isbukun Bunun do not undergo total reduplication, this finding is not too much of a surprise since it is a common observation of Formosan languages that not more than two syllables are copied in reduplication (Zeitoun and Wu 2006, Lee 2007, Blust 2009). Thus, the reason the RED

⁸ In the present paper, the syllable number of the root form is judged based on the presence or absence of a paradigmatic contrast in the online Isbukun Bunun Dictionary (Jeng et al. 2010) for the root. For instance, the root of the trisyllabic word [acikis] 'small' is considered as [-cikis] in this study since a morphologically related word [ʔutuŋcɨkɨs] 'monkey baby' is available in the online dictionary. The roots in (4) are considered trisyllabic because there is no paradigmatic contrast proving that they are disyllabic. For example, the root of the trisyllabic word [nanulu] 'to pay attention' is considered as trisyllabic because there is no morphologically related word suggesting that [nulu] is the root.

does not copy longer roots in their entirety simply suggests that the RED in Isbukun Bunun cannot exceed two syllables, either.

What is intriguing is that not only do roots longer than two syllables fail to undergo total reduplication, but that the RED also fails in the case of some disyllabic roots, as those illustrated in (5), to copy the root in its entirety.

The RED in (5) copies only the final syllable of the disyllabic roots.

(5) Disyllabic roots that have the final syllable copied (roots are in italics)

- | | | |
|----|---|---|
| a. | [<i>maχ</i> δ <i>jam</i>]
'slippery' | [<i>maχ</i> ~δ <i>jam</i> ~δ <i>jam</i>]
'a bit slippery' |
| b. | [<i>maχ</i> ε <i>jal</i>]
'slippery' | [<i>maχ</i> ~ε <i>jal</i> ~ε <i>jal</i>]
'a bit slippery' |
| c. | [m- <i>unawl</i>]
'to draw water' | [m- <i>u</i> ~ <i>nawl</i> ~ <i>nawl</i>]
'to draw water several times' |
| d. | [ε <i>iswab</i>]
'to yawn' | [ε <i>i</i> ~ <i>swab</i> ~ <i>swab</i>]
'to yawn several times' |

A question that quickly arises is why the entire root of the disyllabic roots in (3) are copied, while only the final syllable of the disyllabic roots in (5) are copied. Reduplication processes that denote different meanings can exhibit different patterns, but the examples in (3) and (5) cannot be considered as different reduplication processes since the two sets of examples display the same (or similar) meanings.

Careful examination of the disyllabic roots in (3) and in (5) shows that the roots have different quantitative make-ups; the roots in the former, but not the latter, end with a heavy syllable. The root-final heavy syllables copied in (5) (as well as in 2) (e.g., 5a [*maχ*δ*jam*] 'slippery' > [*maχ*~δ*jam*~δ*jam*] 'a bit slippery', 2a [*ma-djav*] 'yellow' > [*ma-djav*~δ*jav*] 'a bit yellow') are bimoriac, just as are the two light syllables copied in (3) (as well as in 4) (e.g., 3a [*tɛin-χudɑ*] 'be frightened' > [*tɛin-χudɑ*~δ*udɑ*] 'be frightened several times', 4a [*ma-kaliŋis*] 'ugly' > [*ka*~*liŋis*~*liŋis*] 'a bit ugly'). If, on the other hand, the root-final heavy syllable in (5) were copied together with its preceding syllable, the result

would be a trimoraic RED (e.g., [maχðjam] ‘slippery’ > *[ma_μχðj_μa_μm~maχðjam] ‘a bit slippery’). Since the RED in the examples in (2)-(5), though varying in the number of syllables (i.e., between monosyllabic and disyllabic), is consistent in the number of moras (i.e., always bimoraic), a plausible reason for why the RED in (5) copies solely the final heavy syllable (hence bimoraic), but not the last disyllabic string (hence trimoraic), would be that the maximum size for the RED is bimoraic, not disyllabic.

Nonetheless, this claim fails to make the correct prediction for roots ending with a heavy-light syllable string. The examples in (6) show that when a root ends with a heavy-light syllable string, the RED copies the last two syllables together, resulting in an oversized trimoraic RED (e.g., [ma-ðaj_μku_μ] ‘to curve’ > [ma-ðaj_μj_μku_μ~ðajku] ‘to curve several times’).

(6) The RED is oversized when the root ends with a heavy-light sequence (roots are in italics)

- | | | |
|----|---|--|
| a. | [ma-ðajku]
‘to curve’ | [ma-ðaj _μ ku~ðajku]
‘to curve several times’ |
| b. | [ma-χajðu]
‘sour’ | [ma-χaj _μ ðu~χajðu]
‘a bit sour’ |
| c. | [ma-nawʔað]
‘pretty’ | [ma-nawʔa _μ ð~nawʔað]
‘a bit pretty’ |
| d. | [ma-tawla]
‘stupid’ | [ma-taw _μ la~tawla]
‘a bit stupid’ |
| e. | [tein-tejaxav]
‘to close one’s eyes’ | [tein-tej _μ xav~tejaxav]
‘to close one’s eyes several times’ |
| f. | [matu-εjaxut]
‘to stare’ | [matu-εj _μ xut~εjaxut]
‘to stare several times’ |
| g. | [ma-lawηkav]
‘tall’ | [ma-law _μ ηkav~lawηkav]
‘a bit tall’ |
| h. | [ma-ulajðak]
‘quick in doing things’ | [ma-u-laj _μ ðak~lajðak]
‘quick in doing things often’ |

Since the RED copies from the right edge of the word, when the copying domain reaches the final light syllable, the RED is only monomoraic. But when the copying domain reaches the penultimate

syllable, the RED becomes trimoraic and oversized. Therefore, a plausible analysis would be to claim that the maximal size for the RED is still bimoraic and that the reason the RED is oversized (trimoraic) when the root ends with a heavy-light syllable sequence is to avoid an undersized monomoraic RED. In other words, an oversized RED is formed to prevent an undersized one. In an Optimality Theoretic analysis, this may be predicted by ranking a constraint which requires the RED to be minimally bimoraic (e.g., MIN), above a constraint that requires the RED to be maximally bimoraic (e.g., MAX).

(7) MIN >> MAX

/RED, ma- <i>ḏ</i> aiku/	MIN	MAX
a. ma- <u>ku</u> _μ ~ <i>ḏ</i> ajku	*!	
☞ b. ma- <i>ḏ</i> a _μ <u>j</u> _μ ku _μ ~ <i>ḏ</i> ajku		*

Instead of adhering to the analysis proposed above, which allows the maximum size of the RED to be exceeded in some cases, an alternative analysis is proposed below, whereby the variable syllable numbers of the RED are attributed to the stress pattern of Isbukun Bunun.

As mentioned, stress in Isbukun Bunun is quantity sensitive and trochaic (H. Huang 2005). Given that the quantity sensitive foot is constructed from the right edge of the word, a word final light syllable can form a left-headed foot with its preceding syllable (i.e., (LL) or (HL), where L stands for a light syllable, H for a heavy syllable, and the stressed syllable is marked in bold-face), but a final heavy syllable can only form a foot by itself (i.e., H) but not with its preceding syllable (e.g., *(LH)). The quantitative make-up of the stress foot is identical to that of the RED. As mentioned, the internal make-up of the RED can be LL, HL, and H, but not LH. Consider (8).

(8) Correlation between the internal make-up of the stress foot and of the RED

<i>Internal make-up of the stress foot</i>	<i>Internal make-up of the RED</i>
(LL)	LL
<u>Disyllabic</u> [tein-(χu ða)] ‘be frightened’	[tein- χu ða~(χu ða)] ‘be frightened several times’
<u>Trisyllabic</u> [na-(nu lu)] ‘to pay attention’	[na~ nu lu~(nu lu)] ‘to pay attention several times’
(HL)	HL
<u>Disyllabic</u> [ma-(χa jðu)] ‘sour’	[ma~ χa jðu~(χa jðu)] ‘a bit sour’
<u>Trisyllabic</u> [ma-u-(la jðak)] ‘quick in doing things’	[ma-u~ la jðak~(la jðak)] ‘quick in doing things often’
(H)	H
<u>Monosyllabic</u> [ma-(kwis)] ‘thin’	[ma~ kwis ~(kwis)] ‘a bit thin’
<u>Disyllabic</u> [maχ(sja l)] ‘slippery’	[maχ~ sja l~(sja l)] ‘a bit slippery’

Careful examination of the examples in (2)-(6), summarized in (8), shows that the RED is always next to and identical to the stress foot. Thus, the RED is a total copy of the stress foot. Given that the stress foot is quantity sensitive and varies between a heavy monosyllable to a light-light or a heavy-light disyllable, the reason why the RED varies between monosyllabic to disyllabic becomes clear. Despite the fact that the RED varies in terms of the syllable number, it always coincides with the quantity sensitive foot.

- (9) Generalization: The RED is a total copy of the stress foot.

The proposed generalization works for the data documented in previous studies as well. The examples documented in previous studies that are claimed to undergo “total reduplication” have roots which fall into either one of two main categories, monosyllabic heavy roots and disyllabic roots ending with light syllables. “Total reduplication” taking place in these two root types is predicted by the current generalization since both a heavy monosyllabic root (i.e., (H)) and a disyllabic root ending with a light syllable (i.e., (LL) and (HL)) form a trochaic foot; therefore, they are copied in their entirety. In addition to the above two typical root types, an example of reduplication taking place on a trisyllabic root is documented in T. Lin et. al (2001), though without discussion. The example is [buχajja] ‘naked’ > [buχajja~χajja] ‘completely naked’ [T.L154], which involves the copying of the rightmost disyllabic sequence of the root. Notice that though the last syllable contains two vocalic segments, the first vocalic segment is not moraic since while a glide in post-consonantal position is moraic, a glide in syllable initial position is not (cf. discussion in section 2). Thus, the last syllable of the trisyllabic root is light and is copied with its preceding syllable, conforming to the generalization of the present paper.⁹

⁹ The example is transcribed as *buhai?ia* ‘naked’ > *buhai?ia~hai?ia* in T. Lin et al. (2001:154), which should be phonetically [buχaj?ja] > bu~χaj?ja~χaj?ja] and be a counterexample to the current generalization since the second high front vocalic segment [j] is preceded by the glottal stop and is therefore moraic. Nonetheless, based on my informants’ production, there is no noticeable glottal stop between the two high front vocalic sounds; and, moreover, the stress falls on the penultimate syllable. Given that the stress falls on the penultimate syllable, the last syllable should be light and the root should be phonetically [buχajja]. The transcription of a glottal stop between the two high front vocalic sounds in T. Lin et al. may be simply to signify that the two vocalic segments are in different syllables. There are other examples in Lin et. al that seem to involve trisyllabic or longer roots. For example, [tuχalav] ‘to beat others to be the first to speak’ > [mapatuχalav~χalav] ‘to beat each other to be the first to speak’ [L170]. The roots in these examples are actually disyllabic and are preceded by prefixes. For example, [tuχalav] ‘to beat others to be the first to speak’, which is considered as a root in T. Lin et al. is preceded by a prefix [tu-] (i.e., [tu-χalav]) since a morphologically related word [χalav] ‘to rob’ is available.

3.3 Optimality Theoretic Analysis

The construction of the trochaic foot from the right edge of word in Isbukun Bunun can be predicted by a set of four undominated constraints in (10). Tableau (11) illustrates how the constraints work together to predict the three possible feet (**LL**), (**H**), and (**HL**) in Isbukun Bunun and (**to**) rule out the impossible (**L**), and (**LH**).

(10) Metrical Constraints

a. WSP (Weight to Stress) (Prince and Smolensky 1993/2004)

Feet internal heavy syllables are stressed.

b. FTBIN:

Feet are binary under moraic or syllabic analysis.

c. TROCHEE (TROC):

Feet are left-headed.

d. RIGHTMOST: Align (Hd-Ft, Right, PrWd, Right) (Kager 1999:167)

The head foot is rightmost in PrWd.

e. DEP- μ -IO

Output moras have input correspondents.

(11) Quantity Sensitive Trochee Construction (The stress syllable is marked in bold-face)

Input form	Output form	TROC	FT-BIN	DEP- μ -IO	RIGHTMOST	WSP
ta $_{\mu}$ ku $_{\mu}$ nav $_{\mu}$						
	a. ta $_{\mu}$ (ku $_{\mu}$ nav$_{\mu}$)	*!				
	b. (ta$_{\mu}$ ku $_{\mu}$ nav $_{\mu}$)		*!			
	c. ta $_{\mu}$ ku $_{\mu}$ (nav$_{\mu}$: $_{\mu\mu}$)			*!		
	d. (ta$_{\mu}$ ku $_{\mu}$)nav $_{\mu}$				*!	
	e. ta $_{\mu}$ (ku$_{\mu}$ nav $_{\mu}$)					
ma $_{\mu}$ χ $_{\mu}$ đi $_{\mu}$ a $_{\mu}$ m	f. (ma $_{\mu}$ χ $_{\mu}$ đj$_{\mu}$a$_{\mu}$m)	*!				
	g. (ma$_{\mu}$χ$_{\mu}$)đj $_{\mu}$ a $_{\mu}$ m		*!		*	
	h. (ma$_{\mu}$χ$_{\mu}$ đj $_{\mu}$ a $_{\mu}$ m)					*!
	i. ma $_{\mu}$ χ $_{\mu}$ (đj$_{\mu}$a$_{\mu}$m)					
ma-χa $_{\mu}$ i $_{\mu}$ đu $_{\mu}$	j. ma-(χa $_{\mu}$ j $_{\mu}$ đu$_{\mu}$)	*!				*
	k. ma-χa $_{\mu}$ j $_{\mu}$ (đu$_{\mu}$)		*!			
	l. ma-χa $_{\mu}$ j $_{\mu}$ (đu$_{\mu}$: $_{\mu\mu}$)			*!		
	m. ma-(χ a$_{\mu}$j$_{\mu}$ đu $_{\mu}$)					

TROCHEE requires feet to be left-headed and, therefore, functions to rule out iambic feet (e.g., a, f, j). FTBIN requires feet to be either disyllabic or bimoraic, and rules out monomoraic (e.g., g, k) or trimoraic (e.g., b) feet. DEP- μ -IO is a faithfulness constraint that penalizes output moras that have no input correspondents. It helps to rule out output candidates in which an underlying light syllable is lengthened to satisfy FTBIN (e.g., c, l). RIGHTMOST resembles the EDMOST constraint in Prince and Smolensky (1993) and penalizes any stress foot that is not rightmost in a word (e.g., d, g). Finally, WSP is a constraint enforcing quantity sensitivity. It ensures that the stress falls on the heavy syllable of a foot. For simplicity, the constraints in (10) that function to predict the quantity sensitive trochaic foot at the word final position will be united into a cover constraint FT-FORM.

To predict the RED size, additional constraints in (12) are proposed. Assuming that the RED is a prefix to the stress foot, which is captured by the ANCHDFT-L constraint, two more constraints are crucial for the

prediction of the RED size, BR-ANCHOR-L and MAX-BR. (Following McCarthy and Prince (1994), the base is considered to be the part to which the RED is attached, for reduplicative prefixes, it is the part following the RED, and for reduplicative suffixes, the part before the RED.) Tableau (13) illustrates how the RED is predicted to be an exact copy of the stress foot.

(12) RED Size Constraints

a. BR-ANCHORHEADFOOT-L (ANCHHDFT-L) = ANCHOR(RED, L, FOOT_{HEAD}, L):

The left edge of the reduplicant has a correspondent in the left edge of the main stress foot. (Alderete and MacMillan 2015:32)

b. BR-ANCHOR-L

The left peripheral element in the reduplicant has a correspondent in the left peripheral element in the base. (Alderete and MacMillan 2015:41)

c. MAX-BR

Every segment in the base has a correspondent in the RED.

(13) RED size

Unreduplicate Form	Reduplicated Form	FT-FORM	ANCHHDFT-L	BR-ANCH-L	MAX-BR	*SEG
RED, takunav	a. <u>takunav</u> ~(takunav)	*!				14
	b. taku~ta(kunav)		*!			11
	c. kunav~ta(kunav)			*!		12
	d. ta~ <u>ku</u> ~(kunav)				**	9
	e. ta~ <u>kunav</u> ~(kunav)					12
RED, maχðjam	f. <u>maχðjam</u> ~(maχð jam)	*!				14
	g. maχðjam~maχ(ðjam)		*!			14
	h. <u>ðjam</u> ~maχ(ðjam)			*!		11
	i. maχ~ <u>ði</u> ~(ðjam)				**	9
	j. maχ~ <u>ðjam</u> ~(ðjam)					11
RED, ma-χajðu	k. ma- <u>χaj</u> ~ðu~(ðu)	*!				9
	l. ma-χaj~ <u>ðu</u> :~(ðu :)	*!				9
	m. ma- <u>χaj</u> ~(χajðu)				**	10
	n. ma- <u>χajðu</u> ~(χajðu)					12

The ANCHHDFT constraint makes sure that the reduplicant will copy from the left edge of the stress foot. The MAX-BR constraint, which crucially dominates *SEG that penalizes copying, ensures that the RED will be a complete copy of the base, which is the stress foot. Finally, the BR-ANCHOR-L constraint functions to ensure that the RED will be adjacent to the base.

Though the analysis proposed above considers the RED as a prefix to the stress foot, this paper intends no theoretical claim regarding which copy is the RED and which is the base, as both analyses are equally plausible. In Austronesian languages in and outside Taiwan, different scholars make different claims with respect to the issue. On the one hand, Blust (2009:416) points out that foot reduplication in Austronesian languages tends to be suffixal and that prefixal foot reduplication is rare. On the other hand, Lee (2007) proposes that full reduplication in

Formosan languages is better considered as prefixal. A crucial reason for Lee to make such a claim is related to the tendency of the dropping of the final consonant in Formosan languages (e.g., Tanan Rukai: [toθiŋit] ‘be respected’ > [toθiŋiθiŋit] ‘respect’); according to Lee (2007:104), a suffixal (rightward) analysis will unnaturally segment the final consonant from the rest of the base (i.e., [toθiŋi-θiŋi-t]), while a prefixal (leftward) analysis will prevent such a problem (i.e., [to-θiŋi-θiŋit]). But, for Lee’s proposal to work, the uncopied part in the word initial position has to be assumed as a historical prefix (i.e., [to] in [to-θiŋi-θiŋit]), which does not participate in reduplication.

Foot reduplication in Isbukun Bunun can be considered either as prefixal or suffixal. It can be considered as suffixal because the problem of the base final consonant raised in Lee (2007) does not exist in Isbukun Bunun since the word final coda is always copied except for a few rare cases mentioned in footnote 3. It is equally plausible to consider foot reduplication as prefixal because no assumption of an historical prefix is needed for the prefixal analysis to work in Isbukun Bunun. The RED simply prefixes to the stress foot, which is quite common universally (Broselow and McCarthy 1983, Alderete and MacMillan 2015).

If the RED is a suffix, given that it is located at the right edge of the word, it will form the stress foot. Two crucial constraints will be needed in such an analysis, ALIGNFTHD-RED and BR-ANCHOR-R. ALIGNHDFT-RED ensures that the RED forms the stress foot, which due to RIGHTMOST in the cover constraint of FT-FORM, will occur at the right edge of the word. The domination of FT-FORM over MAX-BR, which encourages copying, ensures that the RED can only be as big as a trochaic foot can be. BR-ANCHOR-R, on the other hand, ensures that the RED will be adjacent to the base and copy from the right edge of the base. Tableau (15) illustrates how suffixal foot reduplication is predicted.

(14) *RED Size Constraints—RED as a suffix*

a. ALIGNFTHD-RED

Align the left/right edge of the RED with the left/right edge of the head foot.

b. BR-ANCHOR-R

The right peripheral element in the reduplicant has a correspondent in the right peripheral element in the base. (Alderete and MacMillan 2015:41)

(15) RED as a suffix

Unreduplicated Form	Reduplicated Form	FT-FORM	ALIGNHDFT-RED	BR-ANCH-R	MAX-BR
RED, takunav	a. takunav~(takunav)	*!			
	b. takunav~ ta(kunav)		*!		
	c. takunav~(taku)			*!	***
	☞ d. takunav~(kunav)				*
RED, maχðiam	e. maχðjam~(maχðjam)	*!			
	f. maχðjam~ maχ(ðjam)		*!		
	g. maχðjam~(maχði)			*!	**
	☞ h. maχðjam~(ðjam)				***
RED, ma-χajðu	i. ma-χajðu~(ðu)	*!			***
	j. ma-χajðu~ χ(ajðu)		*!		
	k. ma-χajðu~(χai)			*!	**
	☞ l. ma-χajðu~(χajðu)				

4. DISCUSSION

4.1. Non-reduplicative Affixes and Foot Reduplication

This paper has shown that foot reduplication in Isbukun Bunun involves the copying of the stress foot. The generalization has been based on simplex words, i.e., words without non-reduplicative infixes or suffixes. It is known that non-reduplicative affixes may behave differently from root segments in reduplication and tend to be skipped (cf. Tseng 2003, H.-

s. Lin 2010). For example, in the Formosan language of Pazih, while the RED denoting intensification normally copies a continuous disyllabic string from the base without the final coda (e.g., [ʔasikis ‘painful’ > [ʔasikis-siki-s ‘very painful’), the disyllabic string copied is no longer continuous when the infix [-in-] is present in the base (e.g., [lamik ‘cold’ > [l<in>ami-lami-k ‘extremely cold’). In Isbukun Bunun, a preliminary study as to how non-reduplicative affixes participate in foot reduplication shows that these affixes tend to be copied, as long as they appear within the stress foot.

Focus suffixes (e.g., /-an/ (locative focus marker), /-un/ (patient focus marker)) always form a stress foot with segments from the root. Though not every word ending with focus suffixes can undergo foot reduplication (e.g., [hawŋun] ‘scold’ > [hawŋun~hawŋun] ‘to scold several times’, but [hawŋun-un] ‘be scolded’ > *[haw-ŋunun~ŋunun], *[hawŋun~hawŋunun]), when foot reduplication does take place, with a couple of exceptions (e.g., [ʔamin] ‘all’ > [is-ʔami~ʔamin-an], *[is-ʔa~minan~minan] ‘to possess strong witch power’), the focus suffixes are copied with the root segments within the stress foot, as illustrated in (16).

(16) Suffixes copied in foot reduplication (stressed foot in boldface)

- | | | |
|----|---|--|
| a. | [kalat-un]
‘be beaten’ | [ka~ <u>latun</u> ~ latun]
‘be beaten several times’ |
| b. | [asbaj-un]
‘be scared away’ | [as~ <u>bajun</u> ~ bajun]
‘be scared away several times’ |
| c. | [savaj-an]
‘be defeated’ | [sa~ <u>vajan</u> ~ vajan]
‘be despised’ |
| d. | [kawn-un]
‘be eaten’ | [<u>kawnun</u> ~ kawnun]
‘food to be eaten’ |
| e. | [hudan-an]
‘rain’ | [hu~ <u>danan</u> ~ danan]
‘rain several times’ |

For prefixes, due to the fact that roots in Isbukun Bunun are always bimoraic, prefixes are often outside the stress foot, except when the prefix, which is often bare-consonantal, is attached to a bimoraic vowel-initial root that is not followed by a suffix (e.g., [m-a_μda_μs] ‘to take someone

somewhere’). When a prefix is within the stress foot, it is copied with the root segments within the stress foot, as illustrated in (17).

(17) Prefixes copied in foot reduplication (stressed foot in boldface)¹⁰

- | | | |
|----|-----------------------------|----------------------------------|
| a. | [m-adas] | [<u>ma</u> das~ ma das] |
| | ‘to take someone somewhere’ | ‘to take someone to walk around’ |
| b. | [m-uχna] | [<u>mu</u> χna~ mu χna] |
| | ‘to do it over again’ | ‘to do it over several times’ |
| c. | [k-uskun] | [kuskun~ kuskun] |
| | ‘to eat together’ | ‘to eat together often’ |
| d. | [m-atmuð] | [matmuð~ matmuð] |
| | ‘full’ | ‘several are full’ |
| f. | [m-asχut] | [masχut~ masχut] |
| | ‘tight’ | ‘a bit tight’ |

Similarly, the infix /-in-/ ‘past tense’, which is inserted after the root-initial consonant, is copied in foot reduplication as long as it appears within the stressed foot.

(18) Infix copied in foot reduplication (stressed foot in boldface)

- | | | |
|----|----------------------|----------------------------------|
| a. | k<in> ulut | ki~ <u>ni</u> lut~ nulut |
| | ‘sawed’ (‘sawn’ (?)) | ‘some are sawed before’ |
| b. | ε<in> iða | ei~ <u>ni</u> ða~ niða |
| | ‘selected’ | ‘several things selected’ |
| c. | χ<in> alup | χi~ <u>ni</u> alup~ nalup |
| | ‘hunted’ | ‘hunted several times’ |

¹⁰ Based on the online Isbukun Bunun Dictionary (Jeng et al. 2010) and comments from a reviewer, the underlying forms of [kuskun], [matmuð], and [masχut] should be /ku-uskun/, /ma-utmuð/, and /ma-usχut/, respectively. The surface forms, [kuskun], [matmuð], and [masχut], suggest that coalescence has taken place, with a merging of the root-initial and the prefix-final vowels in these examples. The reduplicated forms [kuskun~kuskun], [matmuð~matmuð], and [masχut~masχut] show that the prefix, which stands within the stress foot at the surface representation, is reduplicated together with its following root.

4.2 Some Implications

This paper has shown that foot reduplication in Isbukun Bunun has been inaccurately classified as “total reduplication” in previous studies due to the fact such studies have mainly focused on the canonical root types and have not systematically considered the roots that are longer than two syllables or multisyllabic roots that end with heavy syllables. When such root types are considered, it becomes clear that the reduplication process does not always involve the complete copying of the root. In other words, Isbukun Bunun does not utilize total reduplication, which is uncommon among the Formosan languages. As total reduplication does not exist in Isbukun Bunun, it is of interest to know whether total reduplication exists in the other Bunun dialects.

Studies of reduplication in other Bunun dialects are not as common as reduplication in Isbukun Bunun. Other than Isbukun Bunun, studies of reduplication in Takibakha and Takivatan Bunun are available, the former is mentioned in Lee (2007), Hsu (2007), Manqoqo (2010, 2011), and Jiang (2012) and the latter in De Busser (2009). Takibakha Bunun, according to Hsu (2007) and Manqoqo (2010, 2011), is also claimed to incorporate total reduplication. However, just as in the case of the previous studies on Isbukun Bunun, all of the relevant data documented in these studies have either monosyllabic roots or disyllabic roots ending with light syllables, as exemplified in (19).

(19) Reduplication in Takibakha Bunun

a.	ma-haiv 'fast'	ma-haiv~haiv 'faster'	Hsu 2007
b.	amin 'all'	amin~amin 'things'	Manqoqo 2011:109
c.	dusa 'two'	dusa~dusa 'each two'	Manqoqo 2011:111
d.	lingku 'roll'	lingku~lingku 'roll and roll'	Manqoqo 2010
e.	kuis 'thin'	kuis~kuis 'a bit thin'	Manqoqo 2010
f.	kon-un 'eat'	konun~konun 'food'	Manqoqo 2010

For Takivatan Bunun, though De Busser (2009) refers to the examples in (20) as root/ stem reduplication rather than total reduplication, all of the examples have complete RED~Base matching, except for (20f), which has the final coda optionally deleted. All of the examples which De Busser shows to involve root/stem reduplication also have either monosyllabic roots or disyllabic roots ending with light syllables.

(20) Reduplication in Takivatan Bunun (De Busser 2009)

a.	saipuk 'help'	<u>saipuk</u> ~saipuk 'help continuously'	De Busser 2009:399
b.	maq 'what'	<u>maq</u> ~maq 'whatever'	De Busser 2009:401
c.	simaq 'who'	<u>simaq</u> ~simaq 'whoever'	De Busser 2009:401
d.	ʔisaq 'where'	<u>ʔisaq</u> ~ʔisaq 'wherever'	De Busser 2009:402
e.	m-adas 'take sb. somewhere'	<u>madas</u> ~madas 'take sb. wherever one goes'	De Busser 2009:402
f.	(a)das-un 'be taken along'	<u>dasu(n)</u> ~dasun 'be taken along wherever that person goes'	De Busser 2009:409

Since previous studies of Takibakha and Takivatan Bunun have the similar problem of only considering a limited number of types of root as in the studies on Isbukun Bunun, the finding of this paper that total reduplication does not exist in Isbukun Bunun thus suggests that so-called “total (or root/stem) reduplication” in Takibakha and Takivatan Bunun should be re-examined as well by including other root types, especially roots longer than two syllables and multisyllabic roots ending with heavy syllables. After all, the limited number of the types of root considered in these studies could have masked the true nature of the reduplication process as well.

Furthermore, in the analysis proposed, it is important to consider the quantitative make-up of the foot. Foot reduplication in Isbukun Bunun does not involve the simple copying of two syllables from the base since the RED can be a monosyllable as well, as long as it is heavy. The quantitative make-up of the prosodic unit has often been ignored in previous classifications of the reduplication patterns in Austronesian languages in and outside Taiwan, apart from when the RED is monosyllabic. For example, Blust (2009) categorizes the reduplication patterns in Austronesian languages into seven main types, (1) full reduplication (which copies the complete base morpheme, with or without affixation/coda/last vowel), (2) foot reduplication (which copies CVCV-), (3) CVC- reduplication (also called heavy syllable reduplication), (4) CV- reduplication, (5) Ca- reduplication, (6) infixal reduplication, and (7) suffixal syllable reduplication.¹¹ Zeitoun and Wu (2006) categorize the reduplication patterns in Formosan languages into two main types, partial reduplication and disyllabic reduplication, the former copies a light or a heavy syllable or just the first consonant of a syllable and the latter copies two syllables, with or without the coda. Lee (2007) also categorizes reduplication patterns in Formosan languages into two types, partial

¹¹ According to Blust (2009), full reduplication can be further categorized into full reduplication plus affixation, full reduplication minus the coda, full reduplication minus the last vowel, full reduplication with vocalic or consonantal change, or both, and full reduplication with four consecutive identical syllables; foot reduplication can be further categorized into prefixal foot reduplication and suffixal foot reduplication; and CV- reduplication can be further categorized into CV- reduplication and CV- reduplication plus affixation.

reduplication and full reduplication, the former copies a light or a heavy syllable or a consonant plus a fixed segment and the latter copies two syllables without the coda. Thus, foot reduplication in Blust (2009), disyllabic reduplication in Zeitoun and Wu (2006), and full reduplication in Lee (2007) are all simply considered as the copying of two syllables, without reference to the internal make-up of the syllables. As a consequence, the reduplication process discussed in this paper, which varies between a disyllabic light-light or heavy-light string to a heavy monosyllabic string will have to fall into two different patterns (or two alloduples),¹² foot reduplication and heavy syllable reduplication in Blust (2009), disyllabic reduplication and partial reduplication in Zeitoun and Wu (2006), or full reduplication and partial reduplication in Lee (2007). On the other hand, in the analysis proposed in this paper, the reduplication process can be classified as just one pattern, which is that of quantity sensitive foot reduplication.

5. CONCLUSION

This paper has examined foot reduplication in Isbukun Bunun which denotes the meaning of repetition in the case of active verbs and attenuation in the case of stative verbs. Previous studies have inaccurately classified the pattern of the reduplication as “total reduplication” because of the limited types of root considered. Once other root types, especially roots longer than disyllabic and multisyllabic roots with final heavy syllables are considered, it becomes clear that the RED is not a complete copy of the root, but of the stress foot, which is a quantity sensitive trochee. The quantitative make-up of the stress foot explains why the RED varies between monosyllabic and disyllabic. Since this pattern of reduplication copies the stress foot which is not always isomorphic to the root, Isbukun Bunun should not be considered as incorporating total reduplication as assumed in previous studies.

¹² The term “alloduple” is from Spaelti (1997). Alloduples are surface forms that show similar functions and are in complementary distribution. They share the same underlying structure and can be considered as involving the same reduplication process.

Foot reduplication in Isbukun Bunun, which is quantity sensitive, is different from foot reduplication classified in Blust (2009) for Austronesian languages, or disyllabic reduplication classified in Zeitoun and Wu (2006), or full reduplication classified in Lee (2007) for Formosan languages as the RED in the patterns in these studies all involve the copying of a quantity insensitive disyllabic string.

The findings of this paper have two implications. First, they suggest that so-called “total reduplication” claimed to exist in other Bunun dialects needs re-examination, since considering only a limited number of types of root is a common problem in studies on reduplication in Bunun dialects. Second, they also suggest the inclusion of quantity sensitive foot reduplication in Austronesian languages in and outside Taiwan, since without such a pattern, a single reduplication process will have to be classified into two patterns based on the existing classifications.

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Hui-shan Lin
Department of English
National Taiwan Normal University
hslin@ntnu.edu.tw

郡社布農語的「音步重疊」形式

林蕙珊
國立臺灣師範大學

先前有關郡社布農語重疊詞的研究多認為郡社布農語有所謂的「完全重疊」形式 (total/full reduplication)，複製的範疇為完整的詞根。本文重新檢視該重疊形式，指出該重疊形式不應稱為「完全重疊」，因為該重疊形式有時並非複製完整的詞根。文獻之所以將該重疊形式誤認為「完全重疊」，乃因考量的詞根類型過於侷限所致。考量不同詞根類型後，可發現該重疊形式乃是有系統的複製位於詞尾的重音音步，即：音拍敏感型的揚抑格音步 (quantity sensitive trochaic foot)，因此應稱為「音步重疊」(foot reduplication)。

關鍵字：郡社布農語、完全重疊、音步重疊、音拍敏感型的揚抑格音步、優選理論