

REDUPLICATION IN AMELE

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1. INTRODUCTION

Reduplication, according to Crystal (1985:259), is 'a term in morphology for a process of repetition whereby the form of a prefix/suffix reflects certain phonological characteristics of the root'. Moravcsik (1978) further delimits the notion of reduplication by saying that, formally, reduplication can be the repetition or reiteration of a syntactic, phonological or phonetic string, and this repetition can be n-number of times, whereby the reduplicated form wholly or partially reiterates the base form and that the reduplicated form is semantically linked to the base form in some systematic way. So this definition of Moravcsik's requires that a reduplicated form has a non-reduplicated base form and would exclude instances of reduplication being used to express onomatopoeia, for example. It would also exclude repeated reference to the same referent. Moravcsik discusses the properties of reduplicative constructions across a wide language database and on the basis of these data posits some language universal principles with respect to reduplication processes. Marantz (1982) and Kitagawa (1987) have also proposed different formal models to account for reduplication within the framework of metrical phonology. Reduplication, according to Bolinger and Sears (1981:65), is one of a number of morphological devices available across languages for word formation. Other devices include compounding, derivation, invention, acronymy and conversion.

Reduplication is not an exotic phenomenon and occurs in various forms in Indo-European languages. For example, in Latin and Ancient Greek reduplication is used to express the perfect tense, e.g. (Latin) *fefellī* perfect of *fallō* 'to deceive' and (Greek) *tetypha* perfect of *typtō* 'to smack'. Reduplicated verbs also occurred in Old English when the language was far more inflectional than Modern English (see, for example, Quirk and Wrenn (1989:52-53)). According to Quirk et al. (1985:1579) reduplication is used in Modern English onomatopoeically, (*rat-a-tat*, *tick-tock*, *haha*), to express alternate movement (*seesaw*, *flip-flop*, *ping-pong*) and intensification (*teeny-weeny*, *tip-top*), and to disparage by suggesting instability, nonsense etc. (*higgledy-piggledy*, *hocus-pocus*, *wishy-washy*).

In fact, reduplicative compounds in English have some interesting features. For example, while many of these compounds involve reiterations of the same form, e.g. *bye-bye*, *chin-chin*, *goody-goody*, *so-so*, *wee-wee*, others have either a vowel or consonant change. Where there is a vowel change it involves primarily two pairs, /a/ <-> /i/ and /o/ <-> /u/. With both of these pairings it can be seen that the derivational process has operated both forwards and backwards from the original base form. So for the /a/ <-> /i/ pairing there are forms where the base form is on the right and the

reduplication has been to the left, e.g. *chit-chat*, *dilly-dally*, *mishmash*, *prittle-prattle*, *splish-splash*. On the other hand, there are forms where the reverse has applied, e.g. *dribs and drabs*, *fiddle-faddle*, *snip-snap*, *wiggle-waggle*. The same applies to the /ɒ/ <-> /ɪ/ pairing, e.g. *clip-clop*, *hippity-hoppity*, *niddle-noddle* versus *ding-dong*, *nig-nog*, *ping-pong*. Many reduplicative compounds in English have a consonant change, e.g. *boogie-woogie*, *itsy-bitsy*, *love-dovey*, *namby-pamby*, *pell-mell*, *willy-nilly*. However, it is interesting that, whereas the vowel-change reduplication in English is limited almost entirely to two vowel pairings, the consonant change is dominated by the consonant /h/ as in the following examples: *hab-dabs*, *handy-dandy*, *hanky-panky*, *harum-scarum*, *heebie-jeebies*, *helter-skelter*, *hickery-pickery*, *higgledy-piggledy*, *hirdy-girdy*, *ho-hum*, *hobjob*, *hobnob*, *hocus-pocus*, *hoddy-doddy*, *hodge-podge*, *hogen-mogen*, *hoity-toity*, *hokey-pokey*, *holus-bolus*, *honky-tonk*, *hoot-toot*, *hubble-bubble*, *hubbub*, *huff and puff*, *hugger-mugger*, *humdrum*, *humpty-dumpty*, *hum-strum*, *hurry-scurry*, *boo-hoo*, *yoo-hoo*. In the vowel-change and consonant-change type of reduplication then a language like English selects only a limited range of phonemes from its phoneme inventory for use in this function.

Reduplicative structures occur in many languages and have a range of functions. The main purpose of this article¹ is to describe the reduplicative structures that occur in the Amele language² of Papua New Guinea (PNG). Amele is interesting in that while using more common devices for word formation, such as compounding and derivation, the language also uses reduplication extensively for forming new words and in morphosyntactic processes. All major word classes are subject to reduplication processes and these processes have a range of different structures. For example, there are over 20 different types of reduplicative constructions in the verbs depending on the form-class of the verb and function-meaning of the reduplication.

Another interesting feature about reduplication in Amele is that a number of structures occur which are counterexamples to the formal properties of reduplication predicted so far in the literature by the theoretical linguists. For example, instances occur of both CV and VC reduplication in Amele for the same classes of words, which Moravcsik (1978:307) claims does not occur in natural languages: 'reduplicated phonetic strings I found invariably defined in reference to consonant-vowel sequences and absolute linear position. In other words, all such specifications are of the type: "reduplicate the first C and V of the word" ...and never of the type: "reduplicate the first two segments regardless of whether they are consonants or vowels"'. In Amele this type of reduplication can be handled by two separate reduplication rules. It is also the case that mirror-image reduplication occurs in Amele, which Moravcsik (1978) and Marantz (1982) claim does not occur in natural languages. The evidence for mirror-image reduplication is described in section 3.4. Finally reduplication in Amele is interesting because Amele is a Papuan language and as far as I can tell no data on a Papuan language has been included in any cross-linguistic discussion of reduplication despite the fact that Papuan languages represent about 14% of the world's languages.³

It may be the case that the reduplication that occurs in Amele is somewhat unique to this class of languages. For example, Foley (1986) does not mention reduplication as a typical device in morphological process in his overview of Papuan languages. However, Haiman (1980:124-135) describes CV reduplicative processes that occur in Hua which are similar to those that occur in Amele. Reesink (1987:113-119) describes reduplication of whole words in Usan of the type that occurs in Amele and Davies (1981:171) gives an example of reduplication in Kobon that involves a vowel change similar to the processes in English and which also occurs extensively in Amele. So

reduplication may after all be a common device employed in morphological process in Papuan languages.

This article comprises two basic sections. In section 2 the forms of the various reduplicative structures are described along with the word classes to which each structure belongs. In section 3 the various functions of reduplication in Amele are described along with the rules for each process.

2. FORMS OF REDUPLICATION IN AMELE

Formally Amele has whole and partial reduplication.

2.1 WHOLE REDUPLICATION

In Amele we can differentiate between whole-word and whole-stem reduplication. In whole-word reduplication the whole word, including inflection, is reduplicated, whereas in whole-stem reduplication just the stem is reduplicated and the inflection attaches to the reduplicated stem. Whole-word reduplication applies to all major word classes including the inflected word classes, i.e. possessed nouns and verbs. Whole-stem reduplication, on the other hand, only applies to verbs. The whole verb stem can be reduplicated in different ways with different semantic functions and the verbal inflection attaches to the reduplicated stem. Examples of whole-word reduplication are given in Table 1 and examples of whole-stem reduplication are given in Table 2.

TABLE 1: WHOLE-WORD REDUPLICATION

Nouns (non-possessed)

<i>jo</i>	house	<i>jo-jo</i>	houses
<i>baga?</i>	leaf	<i>baga?-baga?</i>	thin

Possessed Nouns⁴

<i>?otig</i>	brother	<i>?otig-?otig</i>	brothers
<i>?ebinag</i>	sibling of opposite sex	<i>?ebinag-?ebinag</i>	brother and sister

Pronouns

<i>oso</i>	one	<i>oso-oso</i>	anyone
<i>ana</i>	where	<i>ana-ana</i>	wherever

Adjectives

<i>me</i>	good	<i>me-me</i>	very good, many good things
<i>nag</i>	small	<i>nag-nag</i>	very small, many small things

Postpositions

<i>?a</i>	add, with	<i>?a-?a</i>	alike
<i>na</i>	in, at	<i>na-na</i>	in every one, at every place

Verbs⁵

<i>fe?</i>	to see	<i>fe?-fe?</i>	seeing
<i>do?</i>	to know	<i>do?-do?</i>	knowing
<i>fe?eb</i>	he ⁶ looked-DS	<i>fe?eb-fe?eb e?</i>	to look at each other
<i>gbo?ob</i>	he hit-DS	<i>gbo?ob-gbo?ob e?</i>	to hit each other
<i>gbetudo?ob</i>	he cut him-DS	<i>gbetudo?ob-gbetudo?ob e?</i>	to cut each other

TABLE 2: WHOLE-STEM REDUPLICATION

<i>?eel-en</i>	he rejoiced	<i>?eel-?eel-en</i>	as he rejoiced
<i>gudu-en</i>	he ran	<i>gudu-gudu-en</i>	as he ran
<i>budu-ena</i>	it thuds	<i>budu-budu-ena</i>	it is thudding
<i>ho-na</i>	he comes	<i>hu-hu-ena?</i>	he is coming
<i>budu-ena</i>	it thuds	<i>budu-bada-ena</i>	it thuds sporadically
<i>gasu-ena</i>	he searches	<i>gasu-gisi-ena</i>	he searches here and there

As to the question of in which direction the whole-word and whole-stem reduplication operates the evidence would suggest that in both cases this is a left to right operation. In some cases of whole-word reduplication the reduplicated formant can be reduced in some way as in Table 3 for example.

TABLE 3: REDUCED WHOLE-WORD FORMANTS

<i>?eteh</i>	thing	<i>?eteh-teh</i>	things
<i>oso</i>	one	<i>oso-so</i>	anyone

In some cases of whole-stem reduplication there is a vowel change which operates on the rightward reduplicated formant (see Table 2). Both these pieces of evidence would indicate that whole reduplication operates from left to right in Amele. Another indication that the whole-stem reduplication is a type of rightward reduplication is that the position between the verb stem and verb suffixation is also the site for word incorporation as in (1).

- (1) a. *?esul-ade-ig-a.*
 help-3PL.O-3PL-TODP
 They helped them.
- b. *?esul bahi? ade-ig-a.*
 help very 3PL.O-3PL-TODP
 They really helped them.
- c. *?esul gbee ade-l-ein.*
 help not 3PL.O-3PL-TODP
 They did not help them.

2.2 PARTIAL REDUPLICATION

Partial reduplication is primarily leftward from the base form although rightward and internal reduplication can also occur. The fact that leftward reduplication is the main type of partial

reduplication is probably due to the fact that regular inflection in Amele is entirely by suffixation. So the leftward reduplication naturally fills the gap left by the absence of prefixation morphology.

2.2.1 PARTIAL LEFTWARD REDUPLICATION

The most common type of leftward reduplication is a copy of the first CV of the base form. This is an active process in the verbs and also applies to one possessed noun and one emphatic word. This type of reduplication is CV based and not syllable based since where the first syllable of a base form is CV+semivowel only the CV is reduplicated. Examples are given in Table 4.

TABLE 4: CV REDUPLICATION

Verbs

<i>bile?</i>	to sit	<i>bi-bilen</i>	as he sat
<i>tawe?</i>	to stand	<i>ta-tawen</i>	as he stood
<i>foio?</i>	to vomit	<i>fo-foion</i>	as he vomited
<i>jaune?</i>	to dress up	<i>ja-jaunen</i>	as he dressed up

Non-verbs

<i>dahig</i>	his ear	<i>da-dahig</i>	ears of everyone
<i>dih</i>	just	<i>di-dih</i>	just now

V and VC leftward reduplication also occurs. VC reduplication applies to verbs and one possessed noun form and V reduplication applies only to verb forms. Examples are given in Table 5.

TABLE 5: V AND VC LEFTWARD REDUPLICATION

V

<i>ilale?</i>	to dodge	<i>i-ilalen</i>	as he dodged
<i>odo?</i>	to do	<i>o-odon</i>	as he did

VC

<i>eben</i>	his hand	<i>eb-eben</i>	hands of everyone
<i>abale?</i>	to search with hands	<i>ab-abale?</i>	to search repeatedly with hands
<i>iloe?</i>	to fall as small drops	<i>il-iloe?</i>	to fall repeatedly as small drops

2.2.2 PARTIAL INTERNAL REDUPLICATION

With internal reduplication the consonant-vowel strings CV, V and VC can all occur as reduplicated strings. Sample forms are given in Table 6.

TABLE 6: INTERNAL REDUPLICATION

CV

<i>ameg</i>	his eyes	<i>ame-meg</i>	the eyes of everyone
<i>aho?</i>	to bring	<i>aho-hon</i>	as he brought
<i>goldo?</i>	to stir	<i>goldo-don</i>	as he stirred

V

<i>abale?</i>	to search with hands	<i>abale-en</i>	as he searched with hands
<i>maniaden</i>	he cooked for them	<i>mania-aden</i>	as he cooked for them

VC

<i>manaden</i>	he cooked them	<i>manad-aden</i>	as he cooked them
<i>?edaden</i>	he got them	<i>?edad-aden</i>	as he got them

2.2.3 PARTIAL RIGHTWARD REDUPLICATION

Partial rightward reduplication is controversial. The first type involves what is analysed as mirror-image reduplication. A CV string becomes a reduplicated VC string with an epenthetic glottal stop inserted. For the moment these forms are illustrated in Table 7 as they occur but in section 3.4 arguments are presented to substantiate the claim that these are indeed instances of mirror-image reduplication. Mirror-image reduplication occurs with some of the locative pronouns and also with some of the postpositions.

TABLE 7: RIGHTWARD CV → VC REDUPLICATION

<i>ene</i>	here	<i>ene-ʔ-en</i>	it is here
<i>ono</i>	there	<i>ono-ʔ-on</i>	it is there
<i>ana</i>	where?	<i>ana-ʔ-an</i>	it is where?

The second type of rightward reduplication is again controversial. It applies to the speech verbs. A quote sentence commonly comprises a speech verb followed by a direct quote followed by a copy of the speech verb. This copy is normally just the verb suffixation, as in (2).

- (2) a. *Ugba mad-ei-a*, "..." *ei-a*.
 3SG say-3SG-TODP 3SG-TODP
 He said, "...".
- b. *Ugba ma-te-i-a*, "..." *te-i-a*.
 3SG say-1SG.O-3SG-TODP 1SG.O-3SG-TODP
 He told me, "...".
- c. *Ugba ma-ade-i-a*, "..." *ade-i-a*.
 3SG say-3PL.O-3SG-TODP 3PL.O-3SG-TODP
 He told them, "...".

This second type of reiteration would fall within the structural definitions of reduplication given above, especially when it applies to just the verb suffixation. The occurrence of intervening material is common in reduplicative constructions but in this case it can consist of a sentence, a string of sentences or a whole discourse. So if we consider this construction to be an instance of reduplication we must assume that a discourse can be embedded within a word. In section 3.10 arguments are presented that quote closure is not in fact a type of reduplication.

3. FUNCTIONS OF REDUPLICATION IN AMELE

Reduplication in Amele can indicate plurality, similarity or likeness, inclusiveness or distribution, intensification, simultaneity, iterativity (either regular or irregular), participial function, reciprocity

and reflexivisation. These functions can be either morphosyntactic or derivational. One could say that the basic semantic function of reduplication in Amele is 'additive', i.e. to indicate an increase in quality or quantity of the notion expressed by the word that is reduplicated. Thus reduplication in Amele is basically iconic – more of the same in form indicates more of the same in meaning. In this sense one could view reduplication as the most basic or primitive form of morphological process. However, while the basic meaning is additive, a range of subcomponents of meaning can be differentiated on the basis of differences of form, word class and whether the function is morphosyntactic or derivational. These functions are described in the following sections.

3.1 PLURALITY

Nouns and adjectives can be reduplicated to indicate plurality. This is a whole-word type of reduplication. Examples are given in Table 8. Where adjectives are reduplicated to indicate plurality the noun modified by the adjective can be present or not. If it is not present then the meaning is 'many things with the quality X'.

TABLE 8: REDUPLICATION INDICATING PLURALITY

Nouns

<i>bolob</i>	trap	<i>bolob-bolob</i>	many traps
<i>?eteh</i>	things	<i>?eteh-?eteh</i>	many things
<i>hamol</i>	room	<i>hamol-hamol</i>	many rooms
<i>jo</i>	house	<i>jo-jo</i>	many houses
<i>jobon</i>	village	<i>jobon-jobon</i>	many villages
<i>maha</i>	land	<i>maha-maha</i>	many lands
<i>gbala</i>	burial hole	<i>gbala-gbala</i>	cemetery
<i>sigin</i>	knife	<i>sigin-sigin</i>	many knives

Adjectives

<i>ben</i>	big	<i>ben-ben</i>	many big things
<i>fil</i>	different	<i>fil-fil</i>	many different things
<i>me</i>	good	<i>me-me</i>	many good things
<i>nag</i>	small	<i>nag-nag</i>	many small things
<i>mel haun</i>	young man	<i>mel haun-haun</i>	many young men
<i>mel sim</i>	young child	<i>mel sim-sim</i>	many young children

It is also the case that many nouns and adjectives are in a frozen reduplicated form, i.e. there is no corresponding unreduplicated form. So these forms do not strictly belong to the reduplicative systems in the language. Nevertheless many plural or mass nouns are in this form. In most cases this is a partial CV or VC reduplication. Both non-possessed and possessed nouns can be in this form. Examples are given in Table 9.

TABLE 9: REDUPLICATED MASS AND PLURAL NOUNS

<i>folo-folo</i>	lungs
<i>ab-ab</i>	a wave of the arm
<i>al-alag</i>	stagnant water

<i>bo-bos</i>	dust
<i>be-beig</i>	roots
<i>?i-?it</i>	barbs
<i>do-do</i>	tail feathers
<i>fu-fu</i>	wind
<i>gi-gi</i>	grass
<i>fi-fiji</i>	a bubbling hot spring
<i>la-la?</i>	rain puddles
<i>li-lih</i>	broom made of coconut spines
<i>mu-mudi?</i>	light rain
<i>ni-nihul</i>	type of wasp
<i>od-od</i>	paths through a garden
<i>g̃ba-g̃bah</i>	type of iguana
<i>su-sul</i>	peelings
<i>to-to?</i>	dew
<i>ud-ud</i>	type of ginger
<i>we-wes</i>	type of ant
<i>bi-bitomi</i>	my buttocks
<i>ge-gehini</i>	my body dirt
<i>go-godomi</i>	my backbone

3.2 REDUPLICATION INDICATING SIMILARITY OR LIKENESS

Both non-possessed and possessed nouns can be reduplicated in a whole-word form to indicate the notion of similarity or likeness. The reduplicated nominal often functions as an adjective or adverb. So although this type of reduplication is formally the same as that indicating plurality its function is different. Reduplication indicating plurality has a morphosyntactic function whereas reduplication indicating similarity has a derivational function. Examples are given in Table 10.

TABLE 10: REDUPLICATION INDICATING SIMILARITY OR LIKENESS

<i>baga?</i>	leaf	<i>baga?-baga?</i>	leaflike, thin
<i>bi?</i>	tail	<i>bi?-bi?</i>	like a tail
		e.g. <i>bi?-bi? nue?</i>	to go backwards, lit. tailwards
<i>boh</i>	plate	<i>boh-boh</i>	like a plate
		e.g. <i>boh-boh le?</i>	to go sleek and shiny like a plate
<i>gel</i>	fence	<i>gel-gel</i>	like a fence
		e.g. <i>dana gel-gel</i>	men surrounding like a fence
<i>gemo</i>	middle	<i>gemo-gemo</i>	through the middle
		e.g. <i>gemo-gemo ?obo?</i>	to walk through the middle
<i>ho</i>	pig	<i>ho-ho</i>	like a pig
		e.g. <i>ho-ho ?obo?</i>	to walk like a pig, i.e. on all fours

<i>leʔis</i>	two	<i>leʔis-leʔis</i>	two by two
		e.g. <i>leʔis-leʔis hoʔ</i>	to come two by two
<i>ʔotig</i>	brother	<i>ʔotig-ʔotig</i>	brothers
		e.g. <i>age ʔotig-ʔotig</i>	they are brothers
<i>ʔebinag</i>	sibling of opposite sex	<i>ʔebinag-ʔebinag</i>	brother and sister
		e.g. <i>age ʔebinag-ʔebinag</i>	they are brothers and sisters

The adjective *ihoc* 'sufficient' can be reduplicated to indicate equivalence, e.g. *age ihoc-ihoc* 'they are equal' and the postposition *ʔa* 'add, with' can be reduplicated to indicate the notion of similarity. In this form it normally functions as a predicative adjective as in (3).

- (3) *Ija na ho hina na ho ale ʔa-ʔa.*
 1SG of pig 2SG of pig 3DU add-add
 My pig and your pig are alike.

3.3 REDUPLICATION INDICATING INCLUSIVENESS OR DISTRIBUTION

The notion of 'including all' or 'in every place' can be indicated by reduplication. This applies to some of the possessed nouns, the demonstrative and interrogative pronouns and the postpositions *na* 'in, at' and *nu* 'for'. Examples are given in Table 11.

TABLE 11: REDUPLICATION INDICATING INCLUSIVENESS OR DISTRIBUTION

Possessed nouns

<i>ameg</i>	eyes	<i>ame-meg</i>	eyes of everyone
<i>dahig</i>	ears	<i>da-dahig</i>	ears of everyone
<i>eben</i>	hands	<i>eb-eben</i>	hands of everyone

Pronouns

<i>oso</i>	one	<i>oso-oso</i>	anyone
<i>adi</i>	how	<i>adi-adi</i>	however
<i>ai</i>	where	<i>ai-ai</i>	wherever
<i>ana</i>	where	<i>ana-ana</i>	wherever
<i>ʔel</i>	which	<i>ʔel-ʔel</i>	whichever
<i>eeta</i>	what	<i>eeta-eeta</i>	whatever
<i>ganiʔ</i>	how many	<i>ganiʔ-ganiʔ</i>	however many
<i>in</i>	who	<i>in-in</i>	whoever

Postpositions

<i>na</i>	in, at	<i>na-na</i>	in every one, at every place
<i>nu</i>	for	<i>nu-nu</i>	for everyone

It should be noted that this reduplication in the possessed nouns involves structural descriptions (SD) for both CV and VC copying. So inclusiveness (Incl.) in these forms requires either rule [1] or rule [2]. For the same reduplicative function operating on the same word class then both a CV and VC structural description is required. This is therefore a counterexample to Moravcsik's (1978:307)

claim that a specification of the type 'reduplicate the first two segments regardless of whether they are consonants or vowels' does not occur in natural languages.

[1] SD: (V) Incl. + C V ...
1 2 3 4 5

SC: 2 -> 4 5

[2] SD: Incl. + V C ...
1 2 3 4

SC: 1 -> 3 4

3.4 REDUPLICATION INDICATING INTENSIFICATION

The meaning of a word can be intensified by reduplication. This applies primarily to the adjectives but one emphatic word and the postposition *na* 'with (instrument)' can be reduplicated to express this notion. Intensification is also the main function of mirror-image reduplication. Table 12 gives examples of intensified adjectives and the emphatic word.

TABLE 12: REDUPLICATION INDICATING INTENSIFICATION

Adjectives

<i>ben</i>	big	<i>ben-ben</i>	very big
<i>?ebit</i>	slow	<i>?ebit-?ebit</i>	very slow
<i>fil</i>	different	<i>fil-fil</i>	very different
<i>gaid</i>	always	<i>gaid-gaid</i>	for ever and ever
<i>me</i>	good	<i>me-me</i>	very good
<i>nag</i>	small	<i>nag-nag</i>	very small

Emphatic word

<i>dih</i>	just	<i>di-dih</i>	just now
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Postposition

<i>?ebit na</i>	slowly	<i>?ebit na-na</i>	very slowly
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Like the nouns many adjectives have a frozen reduplicated form. These adjectives have the inherent notion of intensification. They cannot be reduplicated by whole-word reduplication, for example, to express intensification. Examples are given in Table 13.

TABLE 13: REDUPLICATED ADJECTIVES

<i>?e-?ela?</i>	(very) long
<i>du-duleh</i>	(very) rough
<i>gi-gi?it</i>	(very) tight
<i>ha-hawan</i>	(absolutely) first
<i>it-itom</i>	(very) righteous
<i>la-lan</i>	(very) crumbly
<i>ne-nel</i>	(very) sloping
<i>so-sog</i>	(very) narrow
<i>tu-tu?</i>	(very) straight

As mentioned above, the primary function of mirror-image reduplication in Amele is to express the notion of intensification (INTENS). Mirror-image reduplication occurs with the postpositions *na* 'possessive' and *nu* 'benefactive' and the demonstrative locative pronouns. The function is to emphasise the statement regarding the possession, benefaction or location. The postpositions can only occur with pronouns when reduplicated in this way, whereas otherwise they can also occur with proper nouns. Examples are given in Table 14.

TABLE 14: MIRROR-IMAGE REDUPLICATION

Postpositions

<i>ija na</i>	my	<i>ija na'in</i>	that is mine
<i>ija nu</i>	for me	<i>ija nu'un</i>	that is for me

Locatives

<i>ene</i>	here	<i>ene'en ~ ene'in</i>	it is here
<i>ono</i>	there	<i>ono'on ~ ono'in</i>	it is there
<i>ana</i>	where?	<i>ana'an ~ ana'in</i>	it is where?

While the semantic function of mirror-image reduplication is basically one of emphasis, it also has the derivational function of turning the pronoun form into a predicative adjective. So, whereas the possessive pronoun form can function either as an attributive or predicative adjective, as in (4), the mirror-image reduplicated form can only function as a predicative adjective, as in (5).

- (4) a. *ija na jo*
1SG of house
my house
- b. *Jo eu ija na.*
house that 1SG of
That house is mine.
- (5) a. **ija na'in jo*
1SG of.INTENS house
- b. *Jo ija na'in.*
house 1SG of.INTENS
That house is (definitely) mine.

Similarly, the demonstrative pronoun can function as either a demonstrative or a predicative adjective, as in (6), but the mirror-image reduplicated form can only function as a predicative adjective and not as a demonstrative, as in (7).

- (6) a. *Jo ono bil-i-a.*
house there sit-3SG-TODP
The house is there.
- b. *Jo ono.*
house there
The house is there.
- (7) a. **Jo ono'on bil-i-a.*
house there.INTENS sit-3SG-TODP
- b. *Jo ono'on.*
house there.INTENS
The house is (over) there.

For the postposition *na* the epenthetic vowel /i/ is inserted in the V position. /i/ occurs frequently in epenthetic processes in Amele and is the default epenthetic vowel in the phonological system⁸. For

the postposition *nu* this is copied as is but in reverse linear sequence. For the locatives either the last CV can be copied in reverse or the epenthetic vowel /i/ can be inserted. There is free fluctuation between these alternatives. This mirror-image reduplication can be accounted for by two rules operating in sequence: the CV reduplication by [3a] and the metathesis with glottal epenthesis by [3b].

$$\begin{array}{llll}
 \text{[3a]} & \text{SD: } n & \begin{bmatrix} u_i \\ V_j \end{bmatrix} & + \text{ INTENS} \\
 & 1 & 2 & \text{[postposition or pronoun]} \\
 & & & 3 \quad 4 \\
 & \text{SC: } 4 \rightarrow 1 & \begin{bmatrix} u_i \\ [V_j] \\ i \end{bmatrix} & \\
 & & 2 &
 \end{array}$$

$$\begin{array}{ll}
 \text{[3b]} & \text{SD: } C \ V + \emptyset \ C \ V \\
 & 1 \ 2 \ 3 \ 4 \ 5 \ 6 \\
 & \text{SC: } 4 \rightarrow ? \ 6 \ 5
 \end{array}$$

The question arises: Is this really mirror-image reduplication or is it just the case that we have a suffix such as *-ʔVn* attaching to these forms? The evidence from the language would suggest that this is really mirror-image reduplication, albeit not what might be expected. Firstly, this suffixation only occurs with these forms, i.e. forms with *nV* preceding. If it was an unreduplicated suffix one would expect to find it attached to other forms phonologically dissimilar. Secondly, Amele only allows vowel change in other reduplicative processes (see section 3.6.2) and not consonant change, so the fact that alternative vowels are allowed in these forms would suggest that it is a reduplication process. Thirdly, other reduplicated forms occur in the language with an inserted linking element, although the element is a vowel in these cases and not a glottal stop. These are all frozen forms with a linking vowel and examples are given in Table 15.

TABLE 15: REDUPLICATIVE FORMS WITH A LINKING VOWEL

<i>beg-a-beg</i>	orphan
<i>ʔeel-a-ʔeel</i>	a swallow
<i>ʔin-a-ʔin</i>	a blue-collared parrot
<i>dab-a-dab</i>	plenty
<i>gab-a-gab</i>	a stretcher
<i>gih-i-gih</i>	heat
<i>jab-a-jab</i>	a share
<i>lug-u-lug</i>	a joist

A fourth argument is that there is a correspondence between forms in other languages of the Gum language family and Amele, which shows that metathesis has taken place in the Amele form.⁹ Where metathesis has taken place there is often a glottal stop inserted. This would be good evidence to suggest that the presence of a glottal stop in the reduplicated forms in Table 14 is indicative that metathesis has taken place. Examples of metathetic correspondence are given in Table 16.

TABLE 16: METATHETIC CORRESPONDENCE BETWEEN AMELE AND OTHER GUM LANGUAGES¹⁰

Amele Form	Form in other Gum languages	
<i>bui?</i>	<i>biw</i>	ripe
<i>le?is</i>	<i>elis</i>	two
<i>esi?</i>	<i>egis</i>	sand
<i>gola?</i>	<i>joga</i>	blood

Finally, Lass (1984:188-190) notes that while metathesis is often involved diachronically in language change, for example /æsk/ in English came originally from /æks/, there are examples of metathesis in morphological process. He cites an example from Papago, where plural formation by reduplication involves a metathetic /h/. This does not produce mirror-image reduplication but it is interesting that the only instance of metathesis in morphological process that Lass cites is the Papago example involving reduplication. Schane (1973) also cites an example of metathesis in morphological process in Hanunoo, where a sequence of glottal stop plus consonant becomes consonant plus glottal stop.

3.5 REDUPLICATION INDICATING SIMULTANEITY

One of the main functions of reduplication in the verbs is to indicate simultaneous action. Amele, like many Papuan languages, has a clause chaining structure whereby clauses can be joined together in a clause chain. In such a structure there are basically two types of verb: a final verb type, which occurs in the clause at the end of the clause chain, and a medial verb type, which occurs in clauses in non-final position. Both verb types can be marked for subject and object agreement but, in addition, final verbs are marked for tense, aspect and mood, whereas medial verbs are marked for two basic categories, viz. same subject following (SS) versus different subject following (DS) and sequential action (SEQ) versus simultaneous action (SIM). SS indicates that the subject of the following verb is the same as that of the marked verb and DS indicates that the subject of the following verb is different from the subject of the marked verb.¹¹ SEQ indicates that the action of the following verb is consecutive to the action of the marked verb and SIM indicates that the action of the marked verb is concurrent with the action of the following verb. (SEQ and SIM are actually distinctions of relative tense.¹²) SS-SEQ is marked morphologically on the verb by *-me* and DS-SEQ is marked by *-?V*, where V is a harmonic vowel. SIM is marked morphologically by reduplication of some part of the verb and this is described in detail below. SS-SIM versus DS-SIM is indicated by the set of subject agreement markers attached to the verb. DS-SIM has a further subdivision of realis modality (R) versus irrealis modality (IR).¹³ DS-SIM-R occurs with final realis verbs marked for categories such as past and present tense and past habitual aspect. DS-SIM-IR occurs with final irrealis verbs marked for categories such as future tense and imperative and contrafactual modality. Table 17 displays illustrative paradigms for the three forms of SIM based on the verb *fe?* 'to see'.

TABLE 17: SIMULTANEOUS TENSE PARADIGMS

	SS-SIM	DS-SIM-R	DS-SIM-IR
1SG	<i>fi-fi-g</i>	<i>fi-fi-gin</i>	<i>fe-fe-min</i>
2SG	<i>fe-fe-g</i>	<i>fe-fe-gan</i>	<i>fe-fe-m</i>
3SG	<i>fe-fe-i</i>	<i>fe-fe-n</i>	<i>fe-fe-b</i>
1DU	<i>fi-fi</i>	<i>fo-fo-won</i>	<i>fo-fo-hul</i>
2/3DU	<i>fe-fe-si</i>	<i>fe-fe-sin</i>	<i>fe-fe-bil</i>
1PL	<i>fe-fe-b</i>	<i>fo-fo-g̃bon</i>	<i>fo-fo-mun</i>
2/3PL	<i>fe-fe-ig</i>	<i>fe-fe-gin</i>	<i>fe-fe-bil</i>

Initial CV reduplication is the primary means of marking SIM in the verb. There are other means depending on the type of the verb. Examples are given in Table 18. All examples in the table are given in the DS-SIM-R third person singular subject form. Set (a) illustrates verbs that reduplicate the first CV of the verb stem. The forms with initial CV+semivowel only reduplicate the first CV so this reduplication process is CV based rather than syllable based. Set (b) illustrates those verbs that reduplicate the first V of the verb stem. Set (c) illustrates verbs that reduplicate the first V of the verb morphology. Set (d) illustrates verbs that reduplicate an object marker. Any verb that contains an object marker will reduplicate this morpheme. With third person dual and plural it makes a difference as to whether the object is direct or indirect. If the object is direct then the reduplication is VC but if it is indirect the reduplication is V. Set (e) illustrates a few verbs that reduplicate the whole stem to indicate SIM. These verbs operate this way even if there is a reduplication of the object marker. Set (f) illustrates some verbs that reduplicate stem internally. These are forms that were originally two stems but are now fused as one. With respect to this type of reduplication note that in a serial verb construction, which comprises a string of verb stems stripped of most of their verb morphology, it is usually the last verb that reduplicates for simultaneous action.

TABLE 18: FORMS OF SIMULTANEOUS REDUPLICATION

Set (a)

<i>be?</i>	to come up	<i>be-ben</i>	as he came up
<i>bile?</i>	to sit	<i>bi-bilen</i>	as he sat
<i>?afale?</i>	to untie	<i>?a-?afalen</i>	as he untied
<i>faje?</i>	to pay	<i>fa-fajen</i>	as he paid
<i>foio?</i>	to vomit	<i>fo-foion</i>	as he vomited
<i>gele?</i>	to scrape	<i>ge-gelen</i>	as he scraped
<i>ho?</i>	to come	<i>ho-hon</i>	as he came
<i>jag̃be?</i>	to write	<i>ja-jag̃ben</i>	as he wrote
<i>jaune?</i>	to dress up	<i>ja-jaunen</i>	as he dressed up
<i>libe?</i>	to tie	<i>li-liben</i>	as he tied
<i>mude?</i>	to make	<i>mu-muden</i>	as he made
<i>nije?</i>	to lie	<i>ni-nijen</i>	as he lay
<i>nue?</i>	to go	<i>nu-nuen</i>	as he went
<i>g̃batane?</i>	to split	<i>g̃ba-g̃batanen</i>	as he split
<i>siwe?</i>	to share	<i>si-siwen</i>	as he shared
<i>tanawe?</i>	to make peace	<i>ta-tanawen</i>	as he made peace
<i>tawe?</i>	to stand	<i>ta-tawen</i>	as he stood
<i>wege?</i>	to weave	<i>we-wegen</i>	as he weaved

Set (b)

<i>ade?</i> ¹⁴	how?	<i>a-aden</i>	whenever?
<i>ede?</i>	to be like this	<i>e-eden</i>	as it was like this
<i>ilale?</i>	to dodge	<i>i-ilalen</i>	as he dodged
<i>o?</i>	to get	<i>o-on</i>	as he got
<i>odo?</i>	to do	<i>o-odon</i>	as he did

Set (c)

<i>abale?</i>	to search with hands	<i>abale-en</i>	as he searched with his hands
<i>babale?</i>	to cross	<i>babale-en</i>	as he crossed
<i>?ogoge?</i>	to twist	<i>?ogoge-en</i>	as he twisted
<i>deee?</i>	to stare	<i>deee-en</i>	as he stared
<i>eue?</i>	to cry	<i>eue-en</i>	as he cried
<i>fanine?</i>	to flatter	<i>fanine-en</i>	as he flattered
<i>gasue?</i>	to search	<i>gasue-en</i>	as he searched
<i>idade?</i>	to trade	<i>idade-en</i>	as he traded
<i>mecie?</i>	to watch	<i>mecie-en</i>	as he watched
<i>gbelele?</i>	to tremble	<i>gbelele-en</i>	as he trembled
<i>tefa?e?</i>	to jump over	<i>tefa?e-en</i>	as he jumped over
<i>utae?</i>	to call	<i>utae-en</i>	as he called

Set (d)

<i>abuldo?</i>	to struggle	<i>abuldo-don</i>	as he struggled
<i>balado?</i>	to tear	<i>balado-don</i>	as he tore
<i>?aha?do?</i>	to obstruct	<i>?aha?do-don</i>	as he obstructed
<i>dido?</i>	to pull	<i>dido-don</i>	as he pulled
<i>elelando?</i>	to provoke	<i>elelando-don</i>	as he provoked
<i>fagdo?</i>	to stick	<i>fagdo-don</i>	as he stuck
<i>goldo?</i>	to stir	<i>goldo-don</i>	as he stirred
<i>hehdo?</i>	to support	<i>hehdo-don</i>	as he supported
<i>iwesdo?</i>	to sweep	<i>iwesdo-don</i>	as he swept
<i>jabdo?</i>	to pursue	<i>jabdo-don</i>	as he pursued
<i>loldo?</i>	to wander	<i>loldo-don</i>	as he wandered
<i>meledo?</i>	to examine	<i>meledo-don</i>	as he examined
<i>sa?iado?</i>	to prepare	<i>sa?iado-don</i>	as he prepared
<i>wela?do?</i>	to scorch	<i>wela?do-don</i>	as he scorched

Direct object

<i>man-ale?</i>	to cook two	<i>man-al-alen</i>	as he cooked two
<i>man-ade?</i>	to cook them	<i>man-ad-aden</i>	as he cooked them

Indirect object

<i>mani-ale?</i>	to cook for two	<i>mani-a-alen</i>	as he cooked for two
<i>mani-ade?</i>	to cook for them	<i>mani-a-aden</i>	as he cooked for them

Set (e)

<i>ʔeeleʔ</i>	to rejoice	<i>ʔeel-ʔeelen</i>	as he rejoiced
<i>gudueʔ</i>	to run	<i>gudu-guduen</i>	as he ran
<i>ʔuadoʔ</i>	to wave a branch to light it	<i>ʔua-ʔuado-don</i>	as he waved a branch to light it

Set (f)

<i>ahoʔ</i>	to bring	<i>aho-hon</i>	as he brought
<i>agbateʔ</i>	to take a short cut	<i>agbate-ten</i>	as he took a short cut
<i>ʔaʔitoʔ</i>	to spit out	<i>ʔaʔito-ton</i>	as he spat out
<i>ʔaʔoʔ</i>	to wipe	<i>ʔaʔo-ʔon</i>	as he wiped
<i>ʔaʔuteʔ</i>	to unhang	<i>ʔaʔute-ten</i>	as he unhung

Serial verbs

<i>ehi te-ten</i>	as he took and went up
take go.up	
<i>ji fe-fen</i>	as he tasted
eat see	
<i>mani ʔuhado-don</i>	as she cooked well
cook surpass	

Reduplication to indicate simultaneity also needs a rule for both (C)V and VC reiteration, as in [4] and [5].

[4] SD: ...SIM + (C) V ...
 1 2 3 4

SC: 1 -> 3 4

[5] SD: ...SIM + V C ...
 1 2 3 4

SC: 1 -> 3 4

3.6 REDUPLICATION INDICATING ITERATIVITY

There are two types of iterative action that can be marked by reduplication in Amele: regular and irregular iterative. There are both formal and functional differences between these two types. Iterative reduplication differs from simultaneous reduplication in two ways. In simultaneous reduplication the main form is CV reduplication and also there is a particular type of subject agreement morphology associated with this category. In iterative reduplication, on the other hand, the main form is whole-stem reduplication and any type of category, excluding simultaneity, can be marked morphologically on either the medial or final verb.

3.6.1 REGULAR ITERATIVE

The meaning of the regular iterative is a repeated, regular action. In the reduplication process the whole stem is normally reduplicated if the verb does not have an object marker, otherwise the object

marker is reduplicated either in place of or in addition to the reduplication of the verb stem. The evidence presented in section 2.1 would indicate that this reduplication is from left to right. Examples are given in Table 19.

TABLE 19: REGULAR ITERATIVE REDUPLICATION

Set (a)

<i>be?</i>	to come up	<i>bi-bi-e?</i>	to come up repeatedly
<i>?ago?</i>	to cut	<i>?agu-?agu-e?</i>	to cut repeatedly
<i>gbo?</i>	to hit	<i>gbu-gbu-e?</i>	to hit repeatedly
<i>ho?</i>	to come	<i>hu-hu-e?</i>	to come repeatedly
<i>le?</i>	to go	<i>li-li-e?</i>	to go repeatedly
<i>o?</i>	to get	<i>u-u-e?</i>	to get repeatedly

Set (b)

<i>budue?</i>	to thud	<i>budu-budu-e?</i>	to thud repeatedly
<i>falee?</i>	to flash	<i>fale-fale-e?</i>	to flash repeatedly
<i>gasue?</i>	to search	<i>gasu-gasu-e?</i>	to search repeatedly
<i>gele?</i>	to scrape	<i>gel-gel-e?</i>	to scrape repeatedly
<i>libe?</i>	to tie	<i>lib-lib-e?</i>	to tie repeatedly
<i>joe?</i>	to hover	<i>jo-jo-e?</i>	to hover repeatedly
<i>gbatane?</i>	to split	<i>gbatan-gbatan-e?</i>	to split repeatedly

Set (c)

<i>balado?</i>	to tear it	<i>bala-(bala-)du-du-e?</i>	to tear it repeatedly
<i>?aha?do?</i>	to obstruct him	<i>?aha?-(?aha?-)du-du-e?</i>	to obstruct him repeatedly
<i>elelando?</i>	to provoke him	<i>elelan-(elelan-)du-du-e?</i>	to provoke him repeatedly
<i>fenundo?</i>	to press it	<i>fenun-(fenun-)du-du-e?</i>	to press it repeatedly
<i>gohudo?</i>	to knock it	<i>gohu-(gohu-)du-du-e?</i>	to knock it repeatedly
<i>iwesdo?</i>	to sweep it	<i>iwes-(iwes-)du-du-e?</i>	to sweep it repeatedly
<i>waldo?</i>	to turn it	<i>wal-(wal-)du-du-e?</i>	to turn it repeatedly

Since this type of reduplication is whole-stem reduplication instead of partial reduplication (as in simultaneous reduplication), the verb stem can be marked as a predicate in certain forms, indicating that it functions as an additional verb. The predicate marker is *-i*. This combines with certain verb stems as given in sets (a) and (c) in Table 19 in a process of vowel coalescence. The forms where this applies are, firstly, those that have a single consonant for the verb stem, as in *b-e?* 'to come up', *gb-o?* 'to hit', *h-o?* 'to come' and *l-e?* 'to go'. In these cases the predicate marker *-i* combines with the infinitive markers *-e?* and *-o?* to produce the vowels *-i* and *-u* respectively. This process of vowel coalescence also applies to the forms that have *-o?* as the final part of the infinitive form, as in *o?* 'to get', *?ago?* 'to cut' and *balado?* 'to tear it'. So in set (a) *be?* + *i* coalesces to *bi* and *ho?* + *i* coalesces to *hu*. The verb morphology then attaches to this reduplicated verb stem. In a similar way in set (c) the predicate marker coalesces with the infinitive form of *balado?* 'to tear it' to produce *baladu-* which then reduplicates. The verb morphology then attaches to this reduplicated verb stem.

It is also possible to express iterativity with a reduplicated serial verb construction. A serial verb construction comprises two or more SS verb stems with reduced morphology in a series. However a serial verb stem is minimally marked with the predicate marker (PRED). With this type of reduplication the verb can be reduplicated many times as in (8).

- (8) *t-i t-i t-i t-i ohis ?al-en*
 go.up-PRED go.up-PRED go.up-PRED go.up-PRED above arrive-3SG.REMP
 up, up, up, up he went and arrived at the top

There is often another verb occurring as the final verb in the serial verb chain. With this type of construction a speaker can usually vary the form, i.e. have a final verb or not and have different final verbs.

- (9) *Agbus-i agbus-i le-Ø-na.*
 unhang-PRED unhang-PRED go-3SG-PRES
 He unhangs repeatedly (lit. he unhangs, unhangs, going).
 (10) *Bagaw-i bagaw-i hele-Ø-na.*
 break-PRED break-PRED throw-3SG-PRES
 He breaks repeatedly (lit. he breaks, breaks, throwing).

A reduplicated iterative verb can be incorporated in the serial verb type of construction, as in (11-13), when an alternate action is described. In this type of construction the verb morphology is attached to the whole serial verb chain rather than to just one reduplicated verb stem.

- (11) *Li-li hu-hu ena.*
 go-go come-come 3SG.PRES
 He goes and comes.
 (12) *Ti-ti ni-ni ena.*
 go.up-go.up come.down-come.down 3SG.PRES
 He goes up and comes down.
 (13) *GBeti li gbeti hu ena.*
 cut go cut come 3SG.PRES
 He cuts backwards and forwards.

Such structures can be very complex as in (14) taken from text.

- (14) *?ebina-g-ul ale laha-luhu-du-du wol-wil-du-du*
 sibling-3SG-PL 3DU stamp-stamp-3SG-3SG turn-turn-3SG-3SG
li-li hu-hu olo-si
 go-go come-come HABP-3DU
 His (two) sisters used to stamp on him all over, turn (their heels) on him all over, this way and that way.

With some verbs only the first VC of the stem is reduplicated to indicate iterative reduplication, as in Table 20.

TABLE 20: VC ITERATIVE REDUPLICATION

<i>abalena</i>	he searches with hands	<i>ab-abalena</i>	he searches repeatedly with hands
<i>eedena</i>	it glows	<i>ed-edena</i>	it glows continuously
<i>iloena</i>	it drips	<i>il-iloena</i>	it drips repeatedly

3.6.2 IRREGULAR ITERATIVE

The meaning of irregular (Irr.) iterative is a repeated action that is irregular in some way, i.e. haphazard, spasmodic, intermittent, etc. This form involves reduplication of the verb stem but with a vowel change. So it is similar to forms in English like *mish-mash*, *wishy-washy*, *flip-flop*, *clip-clop* and *see-saw*. The reduplication process clearly works from left to right since this is the direction the vowel change operates. There are eight types of vowel change possibilities which are determined by phonological factors:

- (i) /u/ -> /a/
- (ii) /u/ -> /i/
- (iii) /a/ -> /u/
- (iv) /i/ -> /u/
- (v) /i/ -> /o/
- (vi) /i/ -> /a/
- (vii) /o/ -> /i/
- (viii) /e/ -> /u/

/i/ and /u/ are each involved in five of the vowel changes and are the dominant vowels in this process. /e/, on the other hand, is only involved in one vowel change and in fact, as described below, only a few examples of this change have been observed. Most verb stems with an /e/ use an alternative strategy than vowel-change reduplication to indicate the same meaning. In Tables 21-31 reduplicated forms that exhibit a vowel change but do not have a corresponding unreduplicated form are also listed.

(i) /u/ -> /a/

Examples of this vowel change are given in Table 21. The conditioning factors here would appear to be that if there are two vowels in the verb stem and the arrangement is /u/ preceded by a [+high] vowel then both vowels become /a/ as in [6]. Examples of this rule are given in set (a) in Table 21.

[6]	V						
SD:	(C)	[+high]	C	u	(C)	+	Irr. iterative ...
	1	2	3	4	5	6	7
SC:	7 ->	1	a	3	a	5	...
		2		4			

However if there is only one /u/ in the stem then the change is unpredictable as in set (b), since there are also stems with only one /u/ vowel which exhibit a different vowel change (as in Table 22 set (b) for example).

TABLE 21: REDUPLICATION WITH /u/ -> /a/ VOWEL CHANGE

Set (a)

<i>budue?</i>	to thud	<i>budu-badae?</i>	to thud sporadically
<i>bugue?</i>	to swell up	<i>bugu-bagae?</i>	to swell and explode sporadically
<i>buhue?</i>	to plop	<i>buhu-bahae?</i>	to plop sporadically
<i>busue?</i>	to fart	<i>busu-basae?</i>	to fart sporadically
<i>fugudo?</i>	to split	<i>fugu-fagado?</i>	to split all over
<i>fulule?</i>	to flap wings	<i>fulu-falae?</i>	to flap wings erratically

<i>guhudo?</i>	to thunder	<i>guhu-gahado?</i>	to thunder in one direction then another
<i>ibuldo?</i>	to stir up	<i>ibul-abaldo?</i>	to stir up in a haphazard manner
<i>ihuldo?</i>	to mix	<i>ihul-ahaldo?</i>	to mix haphazardly
		<i>ihul-ahal</i>	a chaotic mix
<i>jugue?</i>	to bend over	<i>jugu-jagae?</i>	to bend this way and that
<i>lugue?</i>	to wobble	<i>lugu-lagae?</i>	to wobble about all over the place

Set (b)

<i>guhe?</i>	to bump	<i>guhi-gahae?</i>	to bump up and down
<i>guldo?</i>	to pull	<i>gul-galdo?</i>	to pull backwards and forwards
<i>lub</i>	a joist	<i>lub-lab</i>	one who builds in a haphazard manner

(ii) /u/ -> /i/

Examples of this vowel change are given in Table 22. The conditioning factors here would appear to be that if there are two vowels in the verb stem and the arrangement is /u/ preceded by any [-high] vowel except /e/ then both vowels become /i/. If however the preceding vowel is /e/ this vowel does not change.¹⁵ Examples of this process are given in set (a) in Table 22 and the process is formalised in [7].

[7]		V							
SD:	(C)	[-high]i	C	u	(C)	+	Irr.	iterative ...	
	1	2	3	4	5	6	7		
SC:	7 -> 1	$\begin{bmatrix} \text{ei} \\ i \end{bmatrix}$		3	i	5	...		
		2		4					

However if there is only one /u/ in the stem then the change is unpredictable as in set (b), since there are also stems with only one /u/ vowel which exhibit a different vowel change (as in Table 21 set (b) for example).

TABLE 22: REDUPLICATION WITH /u/ -> /i/ VOWEL CHANGE

Set (a)

<i>ahuldo?</i>	to disturb	<i>ahul-ihildo?</i>	to mix up haphazardly
<i>fenundo?</i>	to press	<i>fenun-fenindo?</i>	to press all over the place
<i>gasue?</i>	to search	<i>gasu-gisie?</i>	to search here and there
<i>gohudo?</i>	to knock	<i>gohu-gihido?</i>	to knock sporadically
		<i>bohu-bibie?</i>	the movement of fish in water
		<i>obut-ibit</i>	stripes of alternate colours

Set (b)

<i>but</i>	a tree knoll	<i>but-bit</i>	knobbly surface
------------	--------------	----------------	-----------------

(iii) /a/ -> /u/

Examples of this vowel change are given in Table 23. There would appear to be no conditioning factors on reduplication rule [8], except that it only applies when /a/ is selected as the operative vowel in the stem. In most cases of vowel-change reduplication the operative vowel selected is the final vowel in the verb stem but this is not always the case. For example, in *fale-eʔ* -> *fale-fule-eʔ* the final vowel in the stem is /e/ and not /a/ but the vowel-change operates on /a/ nevertheless.

[8]	SD:	(C)	(a)	(C)	a	C	a	(C)	+	Irr. iterative ...
		1	2	3	4	5	6	7	8	9
	SC:	9 -> 1	(u)	3	u	5	u	7	...	
			2		4		6			

TABLE 23: REDUPLICATION WITH /a/ -> /u/ VOWEL CHANGE

<i>baladoʔ</i>	to tear	<i>bala-buludoʔ</i>	to tear and scatter
<i>ʔafdoʔ</i>	to squeeze	<i>ʔaf-ʔufdoʔ</i>	to squeeze all over
<i>ʔaʔaganeʔ</i>	to talk in sleep	<i>ʔaʔagan-ʔuʔuguneʔ</i>	to talk sporadically in sleep
<i>ʔahaʔdoʔ</i>	to obstruct	<i>ʔahaʔ-ʔuhuʔdoʔ</i>	to obstruct in every direction
<i>ʔataʔdoʔ</i>	to break off	<i>ʔat-ʔutdoʔ</i>	to crush, to mash
<i>fagdoʔ</i>	to pierce	<i>fag-fugdoʔ</i>	to stick all over
<i>fahaleʔ</i>	to wander	<i>fahal-fuhuleʔ</i>	to wander all over
<i>faleeʔ</i>	to flash	<i>fale-fuleeʔ</i>	to flash intermittently
<i>hagaleʔ</i>	to wrap around	<i>hagali-huguleʔ</i>	to wrap all around
<i>lahadoʔ</i>	to stamp	<i>laha-luhudoʔ</i>	to stamp all over
<i>gbaleʔ</i>	to look behind	<i>gbal-gbuleʔ</i>	to look behind one way then the other
<i>waldoʔ</i>	to turn around	<i>wal-wuldoʔ</i>	to turn around every which way
		<i>aigul-ugul</i>	type of tree

(iv) /i/ -> /u/

This vowel change is related to (v) and (vi) and examples are given in Table 24. The conditioning factors here would appear to be that if there are two vowels in the verb stem and the arrangement is /i/ preceded by a [-high] vowel then both vowels become /u/ as in [9].

[9]	V
SD:	(C) [-high] C i (C) + Irr. iterative ...
	1 2 3 4 5 6 7
SC:	7 -> 1 u 3 u 5 ...
	2 4

TABLE 24: REDUPLICATION WITH /i/ -> /u/ VOWEL CHANGE

<i>aʔildoʔ</i>	to shout and sing	<i>aʔil-uʔuldoʔ</i>	to shout and sing all over the place
<i>faliʔdoʔ</i>	to turn	<i>faliʔ-fuluʔdoʔ</i>	to revolve
<i>gatiʔdoʔ</i>	to clear vines off a tree	<i>gatiʔ-gutuʔdoʔ</i>	to clear vines in a haphazard manner
<i>lahidoʔ</i>	to shake something	<i>lahi-luhudoʔ</i>	to shake something all over

<i>mani?do?</i>	to bend something	<i>mani?-munu?do?</i>	to bend something backwards and forwards
		<i>amimi-umumue?</i>	to do many different things at the same time
		<i>olib-ulub me?</i>	to put two sets of different things in parallel rows

(v) /i/ -> /o/

This vowel change is related to (iv) and (vi), and examples are given in Table 25. The conditioning factors would appear to be that if there is an /i/ preceded by a [+high] vowel then both vowels become /o/ as formalised in [10].

[10]		V					
SD:	C	[+high]	C	i	(C)	+	Irr. iterative ...
	1	2	3	4	5	6	7
SC:	7 ->	1	o	3	o	5	...
			2		4		

TABLE 25: REDUPLICATION WITH /i/ -> /o/ VOWEL CHANGE

<i>?ifili?do?</i>	to open something out	<i>?ifili?-?ofolo?do?</i>	to open something out all over
<i>filihi?do?</i>	to unravel something	<i>filihi?-foloho?do?</i>	to unravel something all over
<i>gildo?</i>	to move	<i>gili-golodo?</i>	to move from side to side
<i>hildo?</i>	to ripple	<i>hili-holodo?</i>	to ripple all over
<i>wildo?</i>	to stir	<i>wili-wolodo?</i>	to stir in a haphazard manner

(vi) /i/ -> /a/

This vowel change is related to (iv) and (v), and examples are given in Table 26. The conditioning factors would appear to be that if there is an /i/ preceded by a consonant that is both [-back] and [-round]¹⁶ then the /i/ becomes /a/ as formalised in [11].

[11]		C					
SD:		$\begin{bmatrix} \text{-back} \\ \text{-round} \end{bmatrix}$	i	C	+	Irr. iterative ...	
		1	2	3	4	5	
SC:	5 ->	1	a	3	...		
			2				

TABLE 26: REDUPLICATION WITH /i/ -> /a/ VOWEL CHANGE

<i>dido?</i>	to pull	<i>di-dado?</i>	to pull carelessly
<i>lildo?</i>	to be out of square	<i>lil-laldo?</i>	to be out of square all over

(vii) /o/ -> /i/

Examples of this vowel change are given in Table 27. The conditioning factors here would appear to be that if /o/ occurs as the only vowel in the verb stem or is preceded by any other vowel then all vowels change to /i/ as formalised in [12].

[12] SD: (C) (V) C o (C) + Irr. iterative ...
 1 2 3 4 5 6 7

SC: 7 -> 1 (i) 3 i ...
 2 4

TABLE 27: REDUPLICATION WITH /o/ -> /i/ VOWEL CHANGE

<i>ʔogogeʔ</i>	twisted	<i>ʔogog-ʔigigeʔ</i>	twisted all over the place
<i>goldoʔ</i>	to stir	<i>gol-gildoʔ</i>	to stir one way then another
<i>goloʔdoʔ</i>	to peel skin off	<i>goloʔ-giliʔdoʔ</i>	to peel skin off all over
<i>gondoʔ</i>	to turn aside	<i>gon-gindoʔ</i>	to zigzag
		<i>gon-gin</i>	a crooked path, a zigzag
<i>ihoʔdoʔ</i>	to poke	<i>ihoʔ-ihīʔdoʔ</i>	to poke all over
<i>lohdoʔ</i>	to stroke	<i>loh-lihdoʔ</i>	to stroke all over
<i>loldoʔ</i>	to wander	<i>lol-lildoʔ</i>	to wander all over the place
<i>sononeʔ</i>	to glide over the ground	<i>sono-sinieʔ</i>	to glide from side to side
<i>woldoʔ</i>	to turn	<i>wol-wildoʔ</i>	to turn this way and that way

(viii) /e/ -> /u/

The vowel change involving /e/ in reduplication is not as common as the other vowel change processes and only a few examples have been observed to date, as given in Table 28.

TABLE 28: REDUPLICATION WITH /e/ -> /u/ VOWEL CHANGE

<i>beledeʔ</i>	to scrape	<i>bele-buludoʔ</i>	to scrape all over
<i>meʔieʔ</i>	to look	<i>meʔi-mueʔ</i>	to look from side to side

Most stems with /e/ do not use reduplication to express iterativity. They use a distributive morpheme *-ad*, instead, which is homophonous with the third person plural suffix *-ad*. Examples are given in Table 29.

TABLE 29: USE OF THE DISTRIBUTIVE MORPHEME *-ad* WITH /e/-STEM VERBS

<i>beleʔ</i>	to go	<i>beladeʔ</i>	to go everywhere, in all directions
<i>ʔeheʔ</i>	to plant	<i>ʔehadeʔ</i>	to plant everywhere
<i>ʔeseʔ</i>	to scoop up	<i>ʔesadeʔ</i>	to scoop up everything
<i>deeeʔ</i>	to stare	<i>decadeʔ</i>	to stare for a long time
<i>heleʔ</i>	to throw	<i>heladeʔ</i>	to throw all over the place
<i>jeleʔ</i>	to wrap	<i>jeladeʔ</i>	to wrap up completely
<i>meteʔ</i>	to pare	<i>metadeʔ</i>	to pare everything

Some verb stems with vowels other than /e/ also use the distributive morpheme instead of reduplication as illustrated in Table 30. So these forms are marked exceptions to the reduplication rules [6]-[12] above.

TABLE 30: USE OF THE DISTRIBUTIVE MORPHEME *-ad* WITH NON /e/-STEM VERBS

<i>babaleʔ</i>	to cross	<i>babaladeʔ</i>	to cross all over
<i>ʔuseʔ</i>	to rub	<i>ʔusadeʔ</i>	to rub all over
<i>fulusdoʔ</i>	to increase	<i>fulusadeʔ</i>	to increase profusely
<i>gagaleʔ</i>	to scold	<i>gagaladeʔ</i>	to scold all the time
<i>lulueʔ</i>	to grate	<i>luluadeʔ</i>	to grate everything

masue? to proliferate
wale? to search

masuade? to proliferate profusely
walade? to search everywhere

There is also one form that just undergoes a vowel change, /u/ → /e/, to indicate the same distributive meaning but there is no reduplication of the verb stem, as in *gbagbaguldo?* 'to bump into' *gbagbageldo?* 'to bump into many times in an irregular way'.

At first glance the vowel-change reduplication processes in Amele appear to be complex and arbitrary but closer inspection reveals that there is a striking order and symmetry to these processes. To begin with, although Amele has a five vowel system of /a, e, i, o, u/ these processes operate primarily with just four of the vowels, /a, i, o, u/. So the first step in the vowel-change process is to ignore the /e/ vowel and assume a four vowel system defined in terms of the features [HIGH] and [BACK] as in [13]. The vowel change processes then operate within the parameters of [±back] and [±high] and the basic operation can be conceptualised as a change of tongue position from [aback] to [-aback] with [+high] as first choice for the value of tongue height.

[13]

-BACK	+BACK
<i>i</i>	<i>u</i> +HIGH
<i>a</i>	<i>o</i> -HIGH

The eight different vowel-change processes are summarised in Table 31. The operative vowel is marked by * in each case. It should be noted that while the segmental reduplication operates from left to right copying the CV skeleton from the base form to the right of the base form, the vowel-change process operates from the right to the left. So the operative vowel is normally the right-most vowel in the base form and the vowel changes operate leftward from this vowel in the reduplicated formant.

TABLE 31: SUMMARY OF VOWEL CHANGE PROCESSES

					-BACK	+BACK
(i)	V	* <i>u</i>	->	<i>a</i>	<i>a</i>	
	[+high]	$\begin{bmatrix} +high \\ +back \end{bmatrix}$		$\begin{bmatrix} -high \\ -back \end{bmatrix}$	$\begin{bmatrix} -high \\ -back \end{bmatrix}$	
	... 2	1		... 2	1	
						<i>i</i> <i>u</i> +HIGH <i>a</i> <i>o</i> -HIGH
(ii)	V	* <i>u</i>	->	<i>i</i>	<i>i</i>	
	[-high]	$\begin{bmatrix} +high \\ +back \end{bmatrix}$		$\begin{bmatrix} +high \\ -back \end{bmatrix}$	$\begin{bmatrix} +high \\ -back \end{bmatrix}$	
	... 2	1		... 2	1	
						<i>i</i> <i>u</i> +HIGH <i>a</i> <i>o</i> -HIGH

(iii)	<i>a</i>	<i>*a</i>	->	<i>u</i>	<i>u</i>	-BACK +BACK	
	$\begin{bmatrix} \text{-high} \\ \text{-back} \end{bmatrix}$	$\begin{bmatrix} \text{-high} \\ \text{-back} \end{bmatrix}$		$\begin{bmatrix} \text{+high} \\ \text{+back} \end{bmatrix}$	$\begin{bmatrix} \text{+high} \\ \text{+back} \end{bmatrix}$	<i>i</i>	<i>u</i> +HIGH
	... 2	1		... 2	1	<i>a</i>	<i>o</i> -HIGH
(iv)	<i>V</i>	<i>*i</i>	->	<i>u</i>	<i>u</i>	-BACK +BACK	
	$\begin{bmatrix} \text{-high} \end{bmatrix}$	$\begin{bmatrix} \text{+high} \\ \text{-back} \end{bmatrix}$		$\begin{bmatrix} \text{+high} \\ \text{+back} \end{bmatrix}$	$\begin{bmatrix} \text{+high} \\ \text{+back} \end{bmatrix}$	<i>i</i> → <i>u</i>	+HIGH
	... 2	1		... 2	1	<i>a</i>	<i>o</i> -HIGH
(v)	<i>V</i>	<i>*i</i>	->	<i>o</i>	<i>o</i>	-BACK +BACK	
	$\begin{bmatrix} \text{+high} \end{bmatrix}$	$\begin{bmatrix} \text{+high} \\ \text{-back} \end{bmatrix}$		$\begin{bmatrix} \text{-high} \\ \text{+back} \end{bmatrix}$	$\begin{bmatrix} \text{-high} \\ \text{+back} \end{bmatrix}$	<i>i</i> ↘ <i>o</i>	+HIGH
	... 2	1		... 2	1	<i>a</i>	<i>o</i> -HIGH
(vi)	<i>C</i>	<i>*i</i>	->	<i>C</i>	<i>a</i>	-BACK +BACK	
	$\begin{bmatrix} \text{-high} \\ \text{-round} \end{bmatrix}$	$\begin{bmatrix} \text{+high} \\ \text{-back} \end{bmatrix}$		$\begin{bmatrix} \text{-high} \\ \text{-back} \end{bmatrix}$		<i>i</i> ↓ <i>a</i>	<i>u</i> +HIGH
	... 2	1		... 2	1		<i>o</i> -HIGH
(vii)	<i>V</i>	<i>*o</i>	->	<i>i</i>	<i>i</i>	-BACK +BACK	
		$\begin{bmatrix} \text{-high} \\ \text{+back} \end{bmatrix}$		$\begin{bmatrix} \text{+high} \\ \text{-back} \end{bmatrix}$	$\begin{bmatrix} \text{+high} \\ \text{-back} \end{bmatrix}$	<i>i</i> ← <i>o</i>	+HIGH
	... 2	1		... 2	1	<i>a</i>	-HIGH
(viii)		<i>*e</i>	->	<i>u</i>			

All the processes except (vi) /i/ -> /a/ change the tongue position from [aback] to [-aback]. Six of the processes illustrated in Table 32 form a regular pattern of three mirror-image pairs. The mirror-image pairs are:

- (i) /u/ -> /a/ and (v) /i/ -> /o/
- (ii) /u/ -> /i/ and (iv) /i/ -> /u/
- (iii) /a/ -> /u/ and (vii) /o/ -> /i/

The processes (vi) /i/ → /a/ and (viii) /e/ → /u/ do not pattern with the other six processes and not surprisingly only a few examples of these processes actually occur in the language. (vi) and (viii) are therefore marked exceptions to the general vowel-change pattern and can be ignored for the purposes of defining the basic vowel-change system. From the six regular processes it can be seen that the vowel-change process is basically two stage. The first stage is to select a vowel of opposite value for tongue position. The second stage is to choose the [HIGH] value. [+high] is the first choice as can be seen from (iii) /a/ → /u/ and (vii) /o/ → /i/ and also (ii) /u/ → /i/ and (iv) /i/ → /u/. However, the essence of this process is vowel change so if the operative vowel is preceded by a [+high] vowel then [+high] cannot be selected since it may not produce a vowel change in the preceding vowel. Therefore [-high] must be selected in these circumstances.

The six regular processes of vowel-change reduplication can therefore be reduced to the rule schema [14] where * marks the operative vowel. For tongue position, [BACK], [αback] → [-αback]. With regard to tongue height, [HIGH], the situation is slightly more complex in that two instances of [+high], as in (i) and (v), cancel out to produce a [-high] vowel, whereas other combinations of values of [HIGH] always produce a [+high] vowel, this being the default choice. Vowels preceding the changed vowel in the reduplicated formant then harmonise with the changed vowel.¹⁷

- [14] 1. Assume a four-vowel system:

-BACK	+BACK	
<i>i</i>	<i>u</i>	+HIGH
<i>a</i>	<i>o</i>	-HIGH

(if the operative vowel is /e/ assume to /a/)

- 2.
- | | | | |
|-----|---------|----------------|----------------|
| V | *V | V _i | V _i |
| | [αback] | -> | [-αback] |
| ... | 2 | 1 | ... 2 1 |
| (if | C | *i | then [-back]) |

$\begin{bmatrix} \text{-high} \\ \text{-round} \end{bmatrix}$	$\begin{bmatrix} \text{+high} \\ \text{-back} \end{bmatrix}$
---	--

... 2 1

3. if then

V	*V	V _i	V _i
[+high]	[+high]	->	[-high]
...	2	1	... 2 1

else

V _i	V _i
->	[+high]
...	2 1

3.7 REDUPLICATION WITH PARTICIPIAL FUNCTION

The infinitive form of the verb comprises the verb stem followed by a suffix which can be either *-e?* or *-o?* depending on the class of the verb. Categorisation by infinitive marker is arbitrary and there is no phonological conditioning. Most verbs belong to the first class, which includes *bel-e?* 'to go', *buj-e?* 'to defecate', *ʔob-e?* 'to walk', *f-e?* 'to see', *hagal-e?* 'to entangle', *m-e?* 'to put', *od-e?* 'to do'. The second class includes *ʔag-o?* 'to cut', *ʔob-o?* 'to walk', *god-o?* 'to beat', *h-o?* 'to come', *od-o?* 'to do', *ḡb-o?* 'to hit'. In fact some verbs belong to both classes, such as *ʔobe?* ~ *ʔobo?* and *ode?* ~ *odo?* for example. The infinitive (INF) form of the verb can occur in several constructions including the purpose construction, as in (15).

- (15) *Ija j-e? nu h-ug-a.*
 1SG eat-INF for come-1SG-TODP
 I came to eat.

The infinitive form of the verb also has a reduplicated form. In this form it has an adjectival function similar to the participial *-en* and *-ing* forms in English. This function is illustrated by (16-18).

- (16) *Welu eu man j-e?-j-e? bil-i-a.*
 mango that bird eat-INF-eat-INF sit-3SG-TODP
 Those mango are bird-eaten.
- (17) *Man qee f-e?-f-e? q-it-i je-i-a.*
 snake not see-INF-see-INF hit-1SG.O-PRED eat-3SG-TODP
 Not seeing the snake (it) bit me.
- (18) *Saen ʔal m-igi-an qee d-o?-d-o? nu-i-na.*
 time dead become-3SG-FUT not know-INF-know-INF go-3SG-PRES
 He goes not knowing when he will die.

3.8 REDUPLICATION INDICATING RECIPROCITY

A reciprocal action can be indicated by a reduplication process. The structure of this form is similar to that of the serial verbs described in sections 3.5 and 3.6 except that, whereas in the serial verb construction the subjects of all the verbs in the series are the same, the serial verbs in the reciprocal construction have different subjects. The reduplicated verb can only occur as a different subject third person singular form. This reduplicated DS verb then has verb morphology attached to it which agrees in person and number with the reciprocal group as a whole, either dual or plural, as in (19).

- (19) *Age ḡbo-ʔo-b ḡbo-ʔo-b eig-a.*
 3PL hit-DS-3SG hit-DS-3SG 3PL-TODP
 They hit each other.

The reduplicated reciprocal verb can also be part of a serial verb construction as in (20, 21).

- (20) *Ale meen ḡbel-i ḡbo-ʔo-b ḡbo-ʔo-b esi-a.*
 3DU stone throw-PRED hit-DS-3SG hit-DS-3SG 3DU-TODP
 They (2) threw stones at each other.

- (21) Age *ʔeta eh-i le-ʔe-b eh-i le-ʔe-b eig-a.*
 3PL yam take-PRED go-DS-3SG take-PRED go-DS-3SG 3PL-TODP
 They took yams to each other.

If the reciprocal verb has an object marker it makes a difference if the object is direct or indirect as to how the verb reduplicates. When the verb has direct object reference the whole verb is reduplicated, as in (22, 23), but when the verb has indirect object reference just the verb morphology is reduplicated, as in (24, 25).

- (22) Age *ḡbet-udo-ʔo-b ḡbet-udo-ʔo-b eig-a.*
 3PL cut-3SG.O-DS-3SG cut-3SG.O-DS-3SG 3PL-TODP
 They cut each other.
- (23) Age *od-udo-ʔo-b od-udo-ʔo-b i-me-ig asal-eig-a.*
 3PL do-3SG.O-DS-3SG do-3SG.O-DS-3SG PRED-SS-3PL laugh-3PL-TODP
 They made each other laugh.
- (24) Age *jaʔas ḡbet-i do-ʔo-b do-ʔo-b eig-a.*
 3PL tobacco cut-PRED 3SG.O-DS-3SG 3SG.O-DS-3SG 3PL-TODP
 They cut tobacco for each other.
- (25) Ale *na ho u do-ʔo-b do-ʔo-b esi-a.*
 3DU of pig get-PRED 3SG.O-DS-3SG 3SG.O-DS-3SG 3DU-TODP
 They (2) killed each other's pig on each other.

It should be noted that reciprocity can be indicated in the verb by other means than a reduplication process. For example, each verb with an object marker has an alternative reduced reduplicated form, as illustrated in Table 32. This form is analysed as having the reduplicated form *doʔob-doʔob* reduced to *dod*.

TABLE 32: RECIPROCAL VERBS WITHOUT REDUPLICATION

<i>ababdoʔ</i>	to wave	<i>ababdodeʔ</i>	to wave at each other
<i>beluhdoʔ</i>	to lick	<i>beluhdodeʔ</i>	to lick each other
<i>ʔesuldoʔ</i>	to help	<i>ʔesuldodeʔ</i>	to help each other
<i>dodoldoʔ</i>	to approach	<i>dodoldodeʔ</i>	to approach each other
<i>elelandoʔ</i>	to provoke	<i>elelandodeʔ</i>	to provoke each other
<i>fanindoʔ</i>	to flatter	<i>fanindodeʔ</i>	to flatter each other
<i>gihaʔdoʔ</i>	to squeeze	<i>gihaʔdodeʔ</i>	to squeeze each other
<i>hehdoʔ</i>	to support	<i>hehdodeʔ</i>	to support each other
<i>ihondoʔ</i>	to imitate	<i>ihondodeʔ</i>	to imitate each other
<i>jabdoʔ</i>	to chase	<i>jabdodeʔ</i>	to chase each other
<i>leledoʔ</i>	to betray	<i>leledodeʔ</i>	to betray each other
<i>maleldoʔ</i>	to examine	<i>maleldodeʔ</i>	to examine each other
<i>nesildoʔ</i>	to choose	<i>nesildodeʔ</i>	to choose each other
<i>ḡbududoʔ</i>	to touch	<i>ḡbududodeʔ</i>	to touch each other
<i>soadoʔ</i>	to care for	<i>soadodeʔ</i>	to care for each other
<i>talildoʔ</i>	to circle	<i>talildodeʔ</i>	to circle each other
<i>wogoldoʔ</i>	to spear	<i>wogoldodeʔ</i>	to spear each other

There are also three verbs that have an irregular reciprocal form, as illustrated in Table 33. In this case the reduplicated suffix *-dadaneʔ* is added to the verb stem and for these verbs this is the only

reduplicated form. The meaning of these forms is slightly different to the meaning of the regular reciprocal forms. The *-dadane?* form indicates an unequal involvement of the recipricators, viz. that one of the recipricators is responsible for initiating the action of the verb.

TABLE 33: IRREGULAR RECIPROCAL VERBS

<i>dido?</i>	to pull	<i>di-dadane?</i>	to pull each other
<i>fee?</i>	to disobey	<i>fee-dadane?</i>	to argue with each other
<i>gulu?do?</i>	to meet	<i>gulu?-dadane?</i>	to meet each other

3.9 REDUPLICATION INDICATING REFLEXIVISATION

There are two principal ways of indicating a reflexive action in Amele. A reflexive action can be indicated where the object agreement marked on the verb is coreferential with the same entity as indicated by the subject agreement, as in (26).

- (26) *Ija gb-it-ig-a.*
 1SG hit-1SG.O-1SG-TODP
 I hit myself.

Another means is by use of a pronoun marked with the reflexive adjective or postposition *do-do?*, which is a reduplicated form. This reflexive form can only occur following a personal pronoun so it could be equally well analysed as either an adjective or a postposition. *do-do?* only occurs in this form, however. There is no unreduplicated form **do?* so this item is not part of the reduplicative processes in the language. It can have a reflexive function as in (27a) and it is interesting to note that it cannot co-occur with the object marker type of reflexivisation, as in (27b). It can also have an emphatic function similar to reflexive pronouns in English as in (28).

- (27) a. *Ija ija do-do? gb-ug-a.*
 1SG 1SG self hit-1SG-TODP
 I hit myself.
- b. **Ija ija do-do? gb-it-ig-a.*
 1SG 1SG self hit-1SG.O-1SG-TODP
- (28) *Ija do-do? nu-ig-en.*
 1SG self go-1SG-FUT
 I myself will go.

3.10 REDUPLICATION INDICATING QUOTE CLOSURE

As described in section 2.2.3 discontinuous reiteration occurs with speech verbs. The whole verb, or more commonly the verbal suffixation of the speech verb, is copied after the direct quote, as in (29, 30). As stated above this type of reiteration falls within the structural description of reduplication. It is a repetition of a morphosyntactic string which can be a whole or partial reiteration of the base form. But, unlike the other types of reduplication in Amele, the reduplicated form is not semantically linked to the base form in any systematic way. It is purely a structural device for bracketing off the quote and should not therefore be considered as a type of reduplication.

- (29) *Age mad-eig-a, "Ege due bele-gb-an", (mad)-eig-a.*
 3PL say-3PL-TODP 1PL dance go-1PL-FUT (say)-3PL-TODP
 They said, "We will go to the dance", they said.
- (30) *Age ma-t-eig-a, "Ege due bele-gb-an", (ma)-t-eig-a.*
 3PL say-1SG.O-3PL-TODP 1PL dance go-1PL-FUT (say)-1SG.O-3PL-TODP
 They told me, "We will go to the dance", they told me.

4. SUMMARY AND CONCLUSION

This article is basically a description of the various reduplication systems that occur in the Papuan language, Amele. The description is in itself interesting in that Amele has a rich variety of forms and functions of reduplication and this would appear to be somewhat unusual for a Papuan language since reduplication is normally associated with Austronesian languages in PNG.

The forms of reduplication include whole-word, whole-stem, partial leftward, partial internal and partial rightward reduplication. These forms can occur with all the major word classes of noun, verb, adjective, pronoun and postposition. The functions include expressions of plurality, similarity or likeness, inclusiveness or distribution, intensification, simultaneity, iterativity, participial function, reciprocity and reflexivisation. The reduplication processes in Amele can have either a morphosyntactic function such as to indicate plurality in nouns and adjectives or to mark categories on the verb such as simultaneity, iterativity or reciprocity, or they can have a derivational function such as to derive adjectives and adverbs from nouns, verbs or postpositions and, in the case of mirror-image reduplication, to derive predicative adjectives from pronouns. It was also argued that, whereas the phenomenon of quote closure falls within the structural description of reduplication, on the basis of semantic criteria it must be excluded as a proper instance of reduplication.

The most interesting aspect of reduplication in Amele, however, is that there are some types that, according to the current linguistic literature, do not occur in the world's languages, viz. reduplication that could be construed as 'reduplicate the first two phonemes regardless of whether they are C or V' and mirror-image reduplication. In conclusion this description of a language which makes extensive use of reduplication in morphological process adds to the database of linguistic knowledge with particular reference to the linguistic phenomenon known as 'reduplication' and helps further in the formal delimitation of Language itself.

NOTES

1. This article is a slightly revised version of a paper first presented at the 1989 Conference of the Linguistic Society of Papua New Guinea. The following abbreviations are those which are not introduced in the text: D(ifferent)S(ubject), FUT(ure tense), HAB(itual)P(ast tense), O(bject), PRES(ent tense), REM(ote)P(ast), S(tructural)C(hange) - in the rules, S(tructural)D(escription) - in the rules, TOD(ay's)P(ast tense), 1 (first person), 2 (second person), 3 (third person) S(in)G(ular), DU(al), PL(ural).
2. Amele has approximately 6000 speakers and is the largest language group belonging to the Gum language family. The other Gum languages are Sihan, Gumalu, Isebe, Bau and Panim. The Gum language family belongs to the Mabusio Stock, Madang-Adelbert Range sub-phylum (Z'graggen 1975). The grammar of Amele is extensively described in Roberts (1987).

3. This percentage is based on the latest Ethnologue (Grimes 1988) which cites some 6000 distinct extant languages in the world, over 860 of which are in PNG.
4. Possessed nouns are mainly kinship and body-part terms. They can be inflected for first, second and third person and singular, dual and plural number of the possessor and, in the case of the kinship terms, also for singular and plural number of the possessed. A paradigm for *ʔotig* 'brother' is given below.

	Singular possessor	Dual possessor	Plural possessor
1	<i>ʔot-i</i> <i>ʔot-i-el</i>	<i>ʔot-ile</i> <i>ʔot-ile-il</i>	<i>ʔot-ige</i> <i>ʔot-ige-il</i> Plural possessed
2	<i>ʔot-in</i> <i>ʔot-in-el</i>	<i>ʔot-ola</i> <i>ʔot-ola-il</i>	<i>ʔot-oga</i> <i>ʔot-oga-il</i> Plural possessed
3	<i>ʔot-ig</i> <i>ʔot-ug-ul</i>	<i>ʔot-ola</i> <i>ʔot-ola-il</i>	<i>ʔot-oga</i> <i>ʔot-oga-il</i> Plural possessed

5. Verbs can be inflected for various past, present and future tenses, sequential and simultaneous relative tense, contrafactual and injunctive mood, past habitual aspect, negation, person and number subject, direct and indirect object agreement, and also as to whether the subject of the following verb is same or different. Verbs in Amele can also undergo word incorporation.
6. For convenience, third person forms are translated 'he' except where the context specifically requires 'she' or 'it'.
7. See section 3.6.1 for an explanation of how *ho-* reduplicates to *hu-hu-* in these iterative forms.
8. See Roberts (1987) for a full description of Amele phonology including vowel epenthesis and vowel harmony.
9. For more information on metathesis in Amele and its significance in determining dialect isoglosses see Roberts (forthcoming).
10. The non-Amele forms are taken from Z'graggen (1980).
11. I present arguments in Roberts (1988a, 1988b) that the switch-reference system in Amele in fact tracks the pragmatic category of theme/topic rather than the syntactic category of subject. But since the subject is usually also the topic of the clause this description of SS and DS will suffice for the purposes of this article.
12. In Comrie's terms (Comrie 1985) SEQ is E *before* R, i.e. the event, E, described by the marked verb occurs before the event, R, described by the following verb and SIM is *Esimul* R, i.e. the event, E, described by the marked verb occurs simultaneously with the event, R, described by the following verb.
13. See Roberts (1990) for further explication of realis vs. irrealis modality in the DS-SIM verb.
14. *adeʔ* is the infinitive form of the interrogative verb. It has various meanings depending upon the function of the verb being questioned, e.g. *eu ad-eʔ* 'that question-INF 'what/how is that?', *ad-i h-og-aʔ* question-PRED come-2SG-TODP 'how did you come?', *aad-eb h-ugi-anʔ* question-SIM.IR.3SG come-3SG-FUT 'whenever will he come?'

15. Amele has a five vowel system /a, e, i, o, u/, but consistently the /e/ vowel is not involved in reduplication processes.
16. See Roberts (1987) for an explication of the use of the cover feature [ROUND] as applicable to both consonants and vowels in Amele.
17. Vowel harmony also operates in morphological processes in the possessed nouns and verbs in Amele. See Roberts (1987) for further discussion.

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