An Autosegmental Analysis of Reduplication in Isnag[1]

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0. Introduction

Reduplication is as common as simple affixation in Philippine languages, yet it has received comparatively little attention from linguists. Where it has been dealt with, it has received a wide variety of different treatments. Healey (1960:7) considered reduplication as a simple morphological process. Hohulin and Kenstowicz (1979:247) treated it as a simple morphophonemic process. Allen (1977:280) saw reduplication as a morphological process related to morphophonemics, and Schachter and Otanes (1972:97) considered it as an intermixture of morphological and phonological processes.

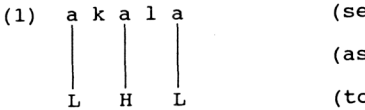
In addition to the problem of disunity among linguists in their view of reduplication, Marantz (1982:435) noted a theoretical problem in the traditional treatment of reduplication; the proposed formalization[2] has been too powerful, i.e., it allows rules that are not instantiated in natural language. He therefore proposed that an assumption be made, namely that reduplication is simply an affixation process. Based on this assumption he proposed a formalism for analyzing reduplication that makes use of the principles of autosegmental phonology.

The purpose of this paper is to demonstrate with Isnag data the validity of the assumption set forth by Marantz (1982:436) and the adequacy of the formalism he proposed. This paper focuses on partial reduplication[3].

1.0 The Autosegmental Theory

The basic assumption of autosegmental theory is that phonological features or units whose relationship "is merely one of simultaneity in time" (Goldsmith 1976:33) can be separated into different levels, also called tiers, and their relationship indicated by association lines. Thus, the word <u>àkálà</u>, where (`) is a low tone and (') is a high tone is represented as in (1):

(1)



(segmental tier)

(association lines)

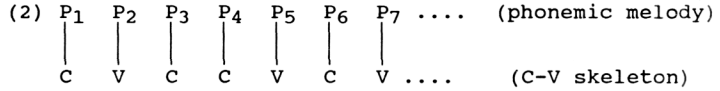
(tone tier)

The units in each tier are segments in their own right, and they exhibit autonomous behavior, hence, the term `autosegmental phonology'.

Autosegmental phonology was originally conceived to deal with problems peculiar to tonal languages. However, in recent years the principles of autosegmental phonology have been successfully applied to a variety of phonological processes, such as vowel harmony (Clements, 1980; Halle and Vergnaud, 1981; McCarthy, 1984) and vowel epenthesis (Ito, 1989). In his analysis of Arabic verbal inflection and derivation, McCarthy (1981) convincingly demonstrated the applicability of autosegmental theory to morphology. It was from this work of McCarthy that Marantz developed his proposed formalism for reduplication.

The formalism requires that words should be represente as C-V (consonant-vowel) skeleta on one tier, associated to phonemic melodies on a separate tier in accordance with the principles of autosegmental theory (Marantz 1982:437), as shown in (2).

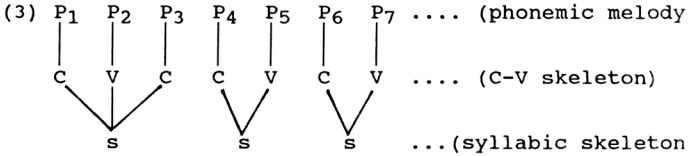
(2)



P= phoneme
C= consonant
V= vowel

The representation in (2) may be expanded into a multitiere representation as in (3).

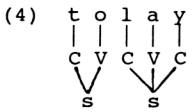
(3)



s= syllable

Thus, the Isnag root <u>tolay</u> `person' may be represented as i (4).

(4)

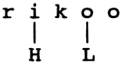


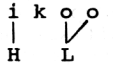
2.0 Operational Principles and Conditions

Autosegmental representations and operations are governed by principles and conditions. Through the development of the theory numerous principles and conditions have been posited. I will discuss here only those directly involved in reduplication, namely, the wellformedness condition, direction of association, and the notion of preassociated features. Where relevant, I will, however, make reference to other principles in the discussion.

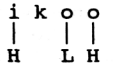
2.1 The Wellformedness Condition

The inter-tier segmental relationship in the autosegmental representation is monitored by the wellformedness condition which specifies the manner of the association of the inter-tier segments. In general terms, the wellformedness condition states that segments on one tier must be associated to segments on the other tier, and no association lines may cross each other (Goldsmith, 1976:36). Thus example 5a below is not wellformed since one tone-bearing segment is not associated. Example 5b, on the other hand, is wellformed since all tone bearing segments are associated with the segments on the tone tier.

(5) a.


b.


c.


d.


Similarly, 5c is not wellformed since two association lines cross each other. Example 5d is wellformed, however, since all tone-bearing segments are associated to the segments on the tone tier with no lines crossing each other.

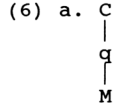
2.2 Direction of Association

Association of inter-tier segments is not random. For a given construction it either proceeds from left-to-right or right-to-left starting from the leftmost or the rightmost segment. Further, it is either melody driven or skeleton driven; specifically, in reduplication, it is either phoneme driven or C-V skeleton driven. This is discussed further in section 3.1.

2.3 Preassociated Elements

Autosegmental representation allows for a situation in which a unit which is not part of the material directly involved in the process is preassociated in the template. Thus, in his analysis of Arabic verb morphology, McCarthy (1981:388) proposed 6a and 6b as templates for "derivational

classes" IV and V. The q and t have their own morphological status and are not part of the root involved in the morphological process.

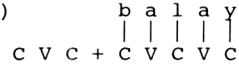
(6) a.


b.


The preassociated unit is like a formulaic constant; it persists through the process involving different roots from the same "derivational class". Note that the wellformedness condition requires that association of the stem consonants begin with the second C position in such patterns because the first C position is already occupied.

3.0 Marantz Formalism

The diversity of treatments that reduplication has received is a result of varying assumptions on what reduplication is. As mentioned earlier, Marantz claims that making the assumption that reduplication is a normal affixation process will provide the best account (1982:436ff). Reduplication differs, however, from the common type of affixation in that the affixed material, which is also a morpheme in its own right, is limited to a C-V skeleton, which depends on the base to which it is attached for its phonemic shape. This, then, calls for a mechanism by which the C-V affix derives its phonemic shape from the base. Marantz proposed that the phonemic melody of the stem is copied over the reduplicating C-V affix on the same tier as the melody, as in (7a) where the diminutive morpheme CVC is prefixed to the Isnag root balay `house' to obtain the form balbalay `play house.'

(7a)


At this point in the reduplication process, the operational principles of autosegmental theory apply, resulting in the association in (7b).

(7b)


Reduplication can either be prefixing as in tultolay the plural form of tolay `person' in Isnag, or suffixing as

in tagbibi, the intensified form of tagbi small' in Kalagan[4].

In the next section I will summarize the basic approach to reduplication under the assumptions just mentioned above.

3.1 The Basic Approach

There are two basic steps in the reduplication process: affixation and derivation of the correct phonemic shape of the reduplicated word.

Step I. Affixation

The appropriate C-V affix or the reduplicating template is attached to the skeleton of the base as in (8). I use the `+' sign in this step to indicate the affixation.

(8)
```
          b a l a y
          | | | | |
C V C + C V C V C
```

Appropriate templates are selected from among the reduplicating templates for different morphological functions, e.g., pluralization, diminutivization, comparative degree, moderateness, etc.

Step II. Derivation of Final Phonemic Shape

The second step deals with the post-affixation operations. It consists of a series of ordered steps governed by principles and conditions of autosegmental theory. The C-V affix and the skeleton of the stem are separated by a hyphen to indicate post affixation processes. The following are the steps in the derivation of the final phonemic shape of the reduplicated words.

1. Copy the phonemic melody over the C-V affix as in (9).

(9).
```
b a l a y        b a l a y
                 | | | | |
C V C      -     C V C V C
```

2. Make the association between the copied phonemic melody of the stem and the C-V skeleton. The association process is governed by the following principles:

Principle 1.

The association is either phoneme driven or skeleton driven. It is phoneme driven when the association proceeds from the phonemic melody tier, i.e., a phoneme scans through the C-V tier until it finds the appropriate slot it can fill; [-syll] fills the C-slots, and [+syll] fills the V-slots. An unassociatable phoneme will terminate the association process.

The association is skeleton driven if a slot, C or V on the skeletal tier, scans through the phonemes on the melody tier until it finds the appropriate phoneme that can fill it. C positions are associated with [-syll] segments, and V

are associated with [+syll] segments. An unassociatable slot will terminate the association process.

The reduplication for continuative aspect illustrates the difference between phoneme driven and skeleton driven association. The reduplicating template is CVCV, and it is phoneme driven as in (10a). If we make the association skeleton driven as in (10b) we get the wrong form.

(10a) tuqbit `to touch'

```
                    t u q b i t
                    | | | | | |
C V C V  +          C V C C V C  ---->

t u q b i t           t u q b i t
| | |                 | | | | | |
C V C V             + C V C C V C

= tuqtuqbit  `to continuously touch X'
```

(10b)

```
                    t u q b i t
                    | | | | | |
C V C V   +         C V C C V C ---->

t u q b i t           t u q b i t
| | |   |           | | | | | |
C V C   V           + C V C C V C
```

= *tuqituqbit

Principle 2

The direction of association is either left-to-right or right-to-left. The unmarked direction of association is left-to-right for prefixes and right-to-left for suffixes.

Principle 3

Multiple association is not allowed, i.e., Wellformedness Condition does not allow multiple association. Each phoneme and each skeletal tier slot is associated only once unless a separate rule requires it, e.g., obligatory spreading rule discussed in section 4.1.

Principle 4

Association lines may not cross (wellformedness condition). Thus (10) will be represented as in (11):

(11)
```
b a l a y     b a l a y
| | |         | | | | |
C V C     -   C V C V C
```

3. Copy consecutively all the associated phonemes. These will comprise the final form of the reduplicated word. Preassociated features or segments take precedence, overriding any opposing features or segments that would otherwise be assoicated. Unassociated segments are discarded. From (11) we get balbalay `a small house'. This will be illustrated in 4.1 under the comparative degree affix.

4.0 The Isnag Data

In this section I will look at the different types of reduplication used for different morphological functions in Isnag. The specific morphological functions considered here are: plural, moderateness, comparative degree, diminutive, continuative aspect, multiple reciprocity, and repeated action. I will also look specifically at the apparent overapplication of one rule in diminutivization.

4.1 Reduplicating Templates

Templates are fixed forms of the C-V skeletal affix. There are four basic reduplicating templates for the morphological functions mentioned above: CVC, CVCV, CV, and CCV. Each type may have multiple morphological functions depending upon any preassociated features and the word class of the stem to which they are attached.

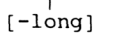
The CVC Template

The CVC template always has preassociated features when used for the following morphological functions: plural, moderateness,comparative degree and diminutive. The direction of association involving this template is left-to-right and it is either skeleton driven or phoneme drive.

Plurals

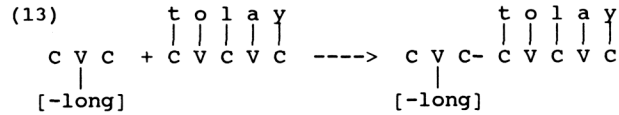
The plural forms of some nouns are derived by affixing the reduplicating template shown in (12).

(12)

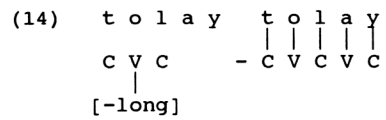


Note that [-long] is preassociated to the V slot. Thus, the plural for tolay^{5} `person' is derived as follows.

Affixation

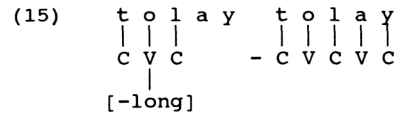
(13)


Stem Copying

(14)


Association

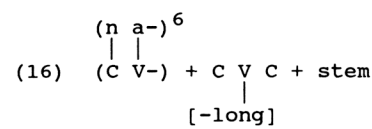
Direction: Skeleton driven or phoneme driven, left-to-right

(15)


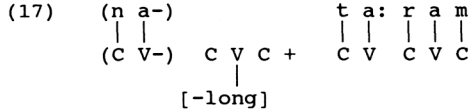
= tultolay 'people'

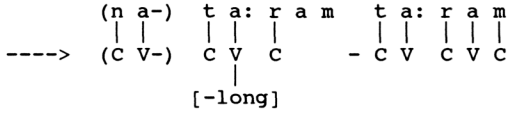
Moderateness (Adjective Stems

Adjectives signalling moderateness of quality are formed by prefixing a common adjective prefix <u>na-</u> and the CVC reduplicating template shown in (16). Only adjectives that take the modifier prefix <u>na-</u> may be inflected for moderateness.

(16)


Thus, the derivation of <u>natarta:ram</u> `moderately/somewhat handsome' from the root <u>ta:ram</u> `handsome' is as follows:

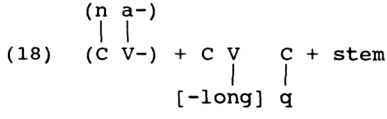
(17)




= natarta:ram

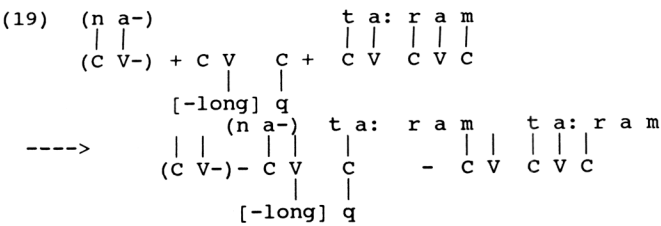
Comparative Degree

Adjectives, whether they take the na- prefix or not, may be inflected for comparative degree by prefixing the reduplicating template shown in (18) to the stem. This template differs from templates (12) and (16) in that it has two preattached features. The na- prefix is optional depending upon the class of adjective stem.



q = glottal stop

The derivation of the comparative degree of nata:ram `handsome' is as follows:



=nataqta:ram `more handsome than X'

Note that the pre-associated glottal stop overrides the r which is asociated from the stem.

Diminutives

Diminutive forms signal a quality reduced below that which is usually expected. Although most commonly used with nouns, it is also used in some verbs signalling an action realized as less than its normal fullness, and consequently

the quantity of the thing involved, usually the goal, is also less than normal.

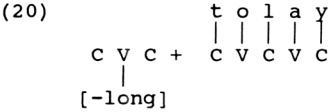
The derivation of diminutives presents an interesting problem of apparent overapplication of the shortening rule (represented autosegmentally as the preattached feature [-long] in the reduplicating prefix). The [-long] feature is found not only in the reduplicated prefix but also in the stem; the diminutive form for tolay `person' is tultulay `a very small person'.

There are three possible solutions to the problem. The first one is that before reduplication, a shortening rule is applied to the stem. This would not require the shortening rule to apply to the stem during the reduplication process. However, there are two obvious problems with this solution: (a) there is no motivation for the rule to apply, and (b) it precedes the morphological process of reduplication, under the assumption that reduplication is normal affixation. In normal affixation, phonological rules apply after the morphological proces

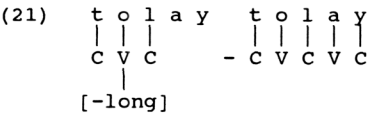
The second solution is to put the form tulay in the lexicon and treat it as an allomorph of tolay. However, this solution will make the lexicon proliferated with meaningless forms.

A more viable solution involves the use of a 'spreading rule' which allows a feature or a segment to double to an homogeneous segment (Goldsmith 1990:29). This rule has to apply before the final copying of the associated phonemes to obtain the final form of the reduplicated word, but after affixation where the domain of phonological rules begins. Figures (20) to (22) show how the second solution works in the derivation of the diminutive tultulay `a very small person'.

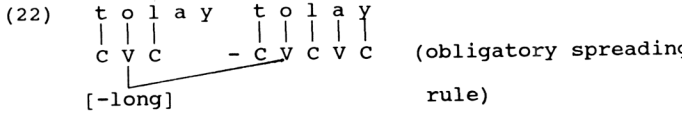
(20)



(21)



(22)

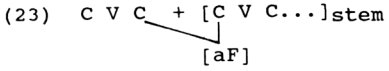


(obligatory spreading rule)

= tultulay

In some nouns, another spreading rule is necessary to derive the correct phonemic shape of the plurals. For example, the plural of the word bala:sang `an unmarried woman' is babbala:sang, rather than balbala:sang `an adolescent girl'. This class of nouns requires a variant template, shown in (23) analogous to an allomorph of the same prefix morpheme. The variation lies only on the preattached feature.

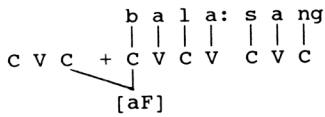
(23)



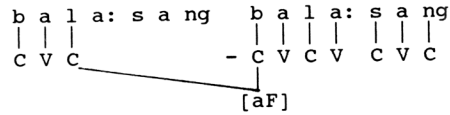
[aF]= all features

The derivation of the plurals for this class of nouns is shown in (24)-(26).

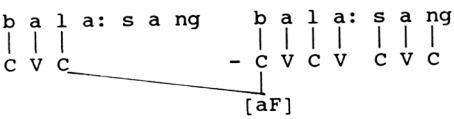
(24)



(25)



(26)



= babbala:sang `unmarried women'

The CVCV Template

The CVCV reduplicating template is an inflectional affix for continuative aspect. It does not have any preassociated features. The inter-tier association is phoneme driven and left-to-right. An unassociatable phoneme, in a phoneme driven association, will terminate the association process and all unassociated segments will be discarded. The following are illustrations.

(27) tuqbit `to touch'

```
                t u q b i t
                | | | | | |
C V C V  + C V C C V C

      t u q b i t     t u q b i t
      | | |         | | | | | |
----> C V C V   -   C V C C V C
```

= tuqtuqbit `to continuously touch X '

(28) putad 'to cut'

```
                p u t a d       p u t a d    p u t a d
                | | | | |       | | | |      | | | | |
C V C V +  C V C V C----> C V C V   - C V C V C
```

= putaputad `to continuously cut X'

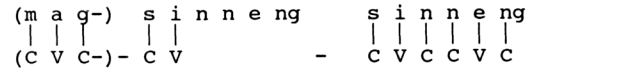
The CV Template

The CV template is used in conjunction with the mag- prefix to inflect verbs for multiple reciprocity, i.e., many participants doing the same action one to another. The prefix mag- signals that the participant role of the marked noun phrase is agent. The reduplication occurs only after the infixation of -inn-, the affix for simple reciprocity, i.e., only two participants doing the same action to each other. The infix is inserted after the first consonant. The association is skeleton driven and proceeds left-to-right. The following are examples:

(29) seng `to help'

Infixation: -inn- + seng = sinneng
Reduplication:

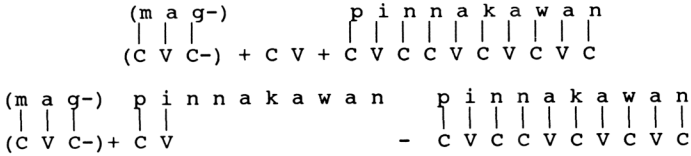
```
(m a g-)          s i n n e ng
 | | |            | | | | | |
(C V C-)+ C V +   C V C C V C
```



= (mag)sisinneng `to help one another'

(30) pakawan `to forgive'

Infixation: -inn- + pakawan
= pinnakawan
Reduplication:

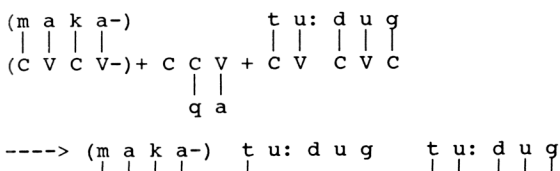


= (mag-)pipinnakawan `to forgive one another'

The CCV Template

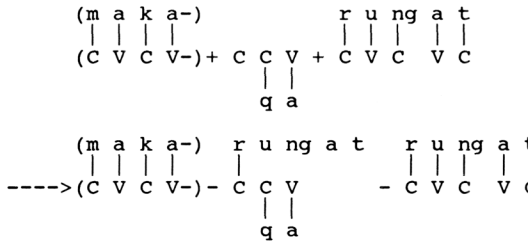
This template is used in conjunction with the prefix maka- `agent focus, abilitative' to inflect verbs for repeated action. This differs from the continuative aspect in that repeated action is done intermittently. The template has two preattached features. The association is skeleton driven and it proceeds from left-to-right. The following are illustrations:

(31) tu:dug `to sleep'



= makatqatu:dug `always sleeping'

(32) rungat `to be angry'



= makarqarungat `always angry'

5.0 Conclusion

The Isnag data demonstrates in three significant points the adequacy of the autosegmental approach in analyzing reduplication: (a) it avoids the intermixing of levels, e.g., the C-V skeletal and the phonemic level, in representing the reduplicating affix, i.e., it avoided such forms as Cqa or CVq. (b) it provides a more economical solution to some reduplication problems. Specifically, in handling the continuative aspect we need only one template. In the traditional approach we would have needed two formulas, one to handle roots with CVCV and another to handle roots with CVCCVC syllable patterns; and (c) it provides a viable mechanism for handling the apparent overapplication of some phonological rules, specifically the shortening rule in the diminutivization of nouns and some verbs (section 4.1), which would have been solved in the traditional approach with either a two-stage solution, e.g., the first vowel of the root is shortened before reduplication, or with one rule applying simultaneously on two noncontiguous identical segments, or an unnecessary cyclical application of one phonological rule. Furthermore, it avoided generating forms not instantiated in the language.

To the extent that the analysis of the Isnag data is successful in handling the above three problems, it demonstrates that the affixational theory of reduplication proposed by Marantz (1982) is adequate and elegant in handling reduplication in Isnag.

Notes

1. The Isnag language belongs to the Austronesian (Malayo-Polynesian) language family. Both Dyen (1965:31) and Walton (1979) assign Isnag to the northern Cordilleran group in the northern Philippines. The language is spoken by approximately 27,000 people in the province of Kalinga-Apayao.

2. I refer the reader to Marantz (1982:435) where he specifically cites Munro and Benson's formation rule for Luiseno adjective reduplication and Carrier's (1979:353) transformational notation for Tagalog reduplication rule, and shows how their suggested formalism for reduplication can generate rules that are not instantiated in natural languages.
3. In complete reduplication the reduplicating affix borrows both its C-V skeleton and phonemic melody from the base.
4. Kalagan is a language spoken in the Davao area, southern Philippines. The data was provided by Erika Erkmann.
5. In Isnag o is always long. When shortened it is raised to u.
6. na- is a modifier prefix attached to a class of adjectives. The parenthesis indicates that the process is not related to reduplication.

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