THE INTERACTION OF MORPHOLOGICAL AND PHONOLOGICAL RULES IN TAGALOG: A STUDY IN THE RELATIONSHIP BETWEEN RULE COMPONENTS IN GRAMMAR

by

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ABSTRACT

Reduplication rules in Tagalog seem to function as word formation rules (WFR's), yet they exhibit many properties that we would like to exclude from a constrained notion of WFR. The main conclusion of this thesis is that reduplication rules belong to a subcomponent of the lexicon which until now has been unrecognized.

I argue that what was thought to be a problem with considering reduplication to be word formation is only an apparent one. It appears that reduplication rules are ordered after some phonological rules but before others. This interaction has attracted attention because it throws into question the claim that WFR's can not be interspersed with the rules of other components. In Chapter 2, these ordering relations are illustrated and the rules involved are characterized formally. I claim on the basis of this characterization that all of the rules that precede reduplication are morphological readjustment rules (allomorphy) that apply within the lexicon. Such an argument depends on a well-defined notion of allomorphy. On the other hand, all the rules that follow can be shown to be phonological. So, if anything, the interaction of reduplication in Tagalog reaffirms the existence of a level defined by the break between the lexicon and the phonology.

However, a closer look at reduplication rules in Chapter 3 reveals that they exhibit other properties that would make them exceptional as WFR's:

1. They have to be formulated transformationally.
2. They add material deep inside words although general, affixation rules only add affixes to the outer edges.
3. They are oblivious in some cases to the morphological identity of the material they are copying.
4. In word formations that involve both affixation and reduplication, the reduplication has to apply after affixation. So the WFR has to be split into two sub-parts.

I propose that these exceptional properties disqualify reduplication rules from being WFR's. Reduplication is triggered by WFR's, but they are stated separately and are subject to their own constraints.

The formal properties of this new class of lexical rules are investigated more closely in Chapter 5. In particular, I propose that they are triggered by abstract morphological features that are attached by WFR's and that they do not obey the principle of subjacency. Furthermore, unlike allomorphy rules, reduplication rules apply to the output of the word formation subcomponent of the lexicon from which they are strictly separated.

In order to formulate the reduplication rules in Chapter 5, I motivate a particular morphological analysis of verbs. In doing so, I reach several conclusions, independent of my central thesis, concerning the relationship between inflectional and derivational word formation. First, the distinction between derivation and inflection is one that is observed by lexical processes -- in particular, reduplication rules. Second, that there are two types of inflectional WFR's in Tagalog. Derivational WFR's can apply to the output of the first type. But the second type of inflection defines the final, outer layer of word formation. Finally, our analysis of Tagalog verbs leads us to the conclusion that infixes are attached by WFR's as prefixes. They are inserted into their final resting places by an infix metathesis rule.

Thesis Supervisor: Morris Halle
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From among my other colleagues and friends, I would like to single out Bonnie Wilker Stephens, Laura Knecht, Jonathan Pressler, Mary Louise Kean, John McCarthy and Ellen Woolford to thank for help of all sorts.

Mark Aronoff got me going on this topic, and his work has, as will be evident, been the starting point for what I have done.

As any casual observer knows, I could not have written this thesis without David Duncan. He read it, discussed it with me in detail, typed it, and helped me keep my chin up to the bitter end.

Orthographic Conventions

I would like to mention a couple of conventions I will be following in giving Tagalog examples. /Ng/ will represent /ŋ/. /?/ represents glottal stops; they are never represented in standard orthography. /H/ is never represented in word-final position in standard orthography. But I assume that /?/ and /h/ enjoy the same distribution as other non-syllabics, an assumption that I will justify in Chapter 2. Hence I will represent them in all positions in which they phonologically occur. Length, which is usually not represented in standard orthography either, will be indicated with a macron: $\bar{V}$. I will only be consistent in marking length in the sections where it is relevant.

I will also assume that the presence of English and Spanish loans has introduced certain permanent changes in the phonemic inventory of Tagalog. Originally Tagalog had a three vowel system; /i,u,a/, with /i/ and /u/ lowered to [e] and [o], respectively, in phrase-final position. Many loans, however, show [e] and [o] in non-phrase-final positions, hence I will assume they have been added to the phonemic inventory. Similarly /f/ and /v/, and consonant clusters in syllable-initial and syllable-final positions, have been introduced through loan words.

To My Parents

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CHAPTER 1: Introduction

I. The Organization of the Lexicon

Transformational-generative linguists have sought to restrict the theory of grammar by claiming that rules of grammar are organized into autonomous systems. This claim has been expressed by the division of the grammar into components with the following two restrictions: the rules of each component have their own tight formal characterization, and they are not interspersed with the rules of another component. In the early days of Transformational-generative grammar, linguists working toward restrictive theories of syntax and phonology relegated various processes to the morphological component, in the hopes that some day there would be a theory of morphology. It has only been very recently that they have gotten down to the business of constructing such a theory in any detail.

I think a common criticism of work in morphology in this framework is that much of it is based on studies of English; we are bound to find holes in the theory of morphology worked out so far when we hold it up to the light of a language whose morphological system is much more complicated than, or simply different from, that of English. It is with this in mind that I am studying Tagalog. Like other Philippine languages, it has a rich morphological system, and therefore provides an interesting testing ground for the theory of morphology.

I will very briefly sketch here the theory that I will take as my starting point. I will draw heavily in parts on Mark Aronoff's 1976 monograph, Word Formation in Generative Grammar (from which all references to Aronoff are taken, unless otherwise indicated) because it is one of the first extensive treatments of morphology in the Transformational-generative framework. The seeds of his theory can be found in the Sound Pattern of English (SPE)(Chomsky & Halle, 1968), and other earlier works. But Aronoff attempted to formalize and clarify certain assumptions that had not in earlier work been made explicit.

In the 1968 paper, "Remarks on NomInalizations", Chomsky argued that certain types of word formation which had previously been assumed to be syntactic could not be performed by syntactic rules. In particular, he argued that sentences containing derived nominals (e.g. organization) could not be syntactically derived from sentences containing their base verbs (organize). Briefly, his argument was as follows. He observed (1) that the semantic relations of such pairs were not transparent, (2) that there was not always a derived nominal corresponding to a given verb, nor, conversely, a verb corresponding to a given nominal, and (3) that the structure of the phrases in which these derived nominals occurred paralleled the structure of simple noun phrases, rather than that of the verb phrases in which their verbal counterparts

were found. In each of these cases, the argument against a transformational account of the relationship was based on the assumption that the power of transformations would be unacceptably unconstrained if such conditions could be expressed by transformations.

He proposed instead, that the semantic and distributional generalizations which had in earlier accounts (e.g. Lees 1960) been expressed by transformational rules, be expressed by morphological rules relating the two forms in the lexicon. This proposal expanded drastically the role of the lexcion in the theory of generative grammar. Much of the work in morphology which followed (including the present work) was involved in defining this role.

The semantic idiosyncracies of the noun-verb pairs Chomsky discussed suggest something further about the nature of the relation between them in the lexicon; one could imagine that the lexicon consisted of a list of morphemes, plus rules for concatenating them, and nothing more, if the semantics of derived words were fully compositional. But in the case of +ation nominals, for example, in addition to the predictable derived meanings available (i.e., "the act of X", "the manner of X-ing"), many of the nouns have idiosyncratic meanings--organization can mean "a club, a union, or a society," for example. Since this last meaning is in no way predictable from the meaning of organize plus the meaning of

+ation, we are forced to have an entry in the lexicon for the word organization.

The lexicon must therefore contain a list of all those words which are unpredictable in any way. This includes polymorphemic words that can be derived by fairly productive rules from more basic words. Although it is well known that abstract nominals are derived by suffixing +(at)ion, a Word Formation Rule (WFR) that we might represent as:

1. $[\underset{N\ V}{[\ \text{---}\ ]}\underset{V}{}(+at)+ion\ ]_{N}$

both the abstract nominal organization and the verb organize that it is derived from have to be listed in the lexicon.

Lexical WFR's, then, must operate as redundancy rules analyzing morphologically complex words (detailed proposals have been worked out by Aronoff (1976) and Jackendoff (1975)). However, they may also operate generatively, to create words which are not listed--and whose meanings will be compositional. For example, from modularize, (1) will derive modularization, "the modularizing of; the act of modularizing". So the Word Formation (WF) component contains a list of words, including morphologically complex ones, and a set of WFR's which both relate pairs of listed words and derive new ones. Each application of the (+at)+ion WFR, either in its redundancy or generative capacity, is

represented by the internal bracketing of the word it derives. Both modularization and organization contain labelled brackets around the verb they are derived from (the base).

2. [[modulariz]at-ion] [[organiz]at-ion]
N V V N N V V N

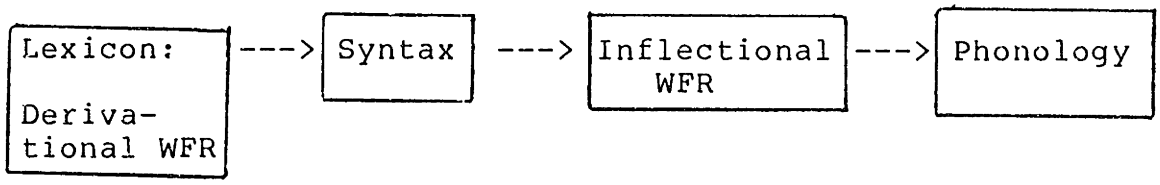
Aronoff (1976) has proposed that only those words that are idiosyncratic in some way are listed. Some words which are already in the language (i.e. are not new coinings) are by this account generated rather than listed (e.g. good-ness). I will refer to this hypothesis as the Partial Listing Hypothesis. (I will use phrases such as "derived from", "output", "input", and "trigger" whether I am talking of the relationship between two listed words or between words that are generatively related to each other. I will distinguish the role of WFR's as generative rules from their role as redundancy rules only where necessary or relevant.)

Though we have seen that lexical WFR's must relate words when the meaning relationship is not totally compositional, it has been assumed that the meaning of one word has to be at least partially a compositional function of the other. Aronoff points out that words such as receive, conceive and deceive do not share any meaning that could be assigned to the morpheme =ceive; it appears to be totally meaningless. So these words must be listed as polymorphemic words with no

internal bracketing, [con=ceive] rather than [con=[ceive]]. The meanings of words tend to drift semantically. A polymorphemic word whose meaning has drifted so far that it is no longer a function of its base ceases to be analyzed as being derived from that base. So transmission meaning "act or fact of transmitting", is derived from transmit by the (at+)ion WFR, and has the structure given in (3a). But although transmission meaning "set of gears in a car" was originally derived from the verb transmit and also had the structure in (3a), it is no longer so analyzed due to the degree to which its meaning has drifted from that of the verb; it now has the structure in (3b).

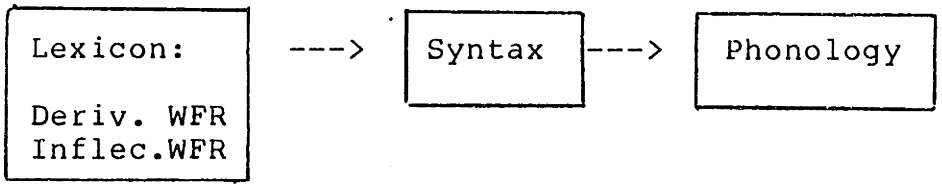
3a. [[trans=mit]-ion] b. [trans=mit+ion]
N V V N N N

Not all WFR's were pushed into the lexicon in Chomsky's paper. Those WF that depended on syntactic information remained in the transformational domain (cf. Siegel (1974)). The view that some WF is performed in the lexicon but some WF applies to strings of words plus syntactic features generated by the syntax provides an expression of the traditional distinction between derivation and inflection. The two types of WF apply at distinct points in the grammar.

4. 

It explains why affixes that are dependent on syntax are semantically transparent, and always occur outside derivational affixes.

But it is clear that some supposed inflected forms must be listed in the lexicon. All forms of the verb to be in English have to be listed, for example, because they are totally idiosyncratic. Lapointe (1978) has worked out a system that would allow the various forms of the English auxiliaries to be spelled out in the lexicon rather than after a syntactic affix-hopping rule. So it is possible, and perhaps necessary, to assume that inflectional WF is not separated by syntax from derivational WF.

5. 

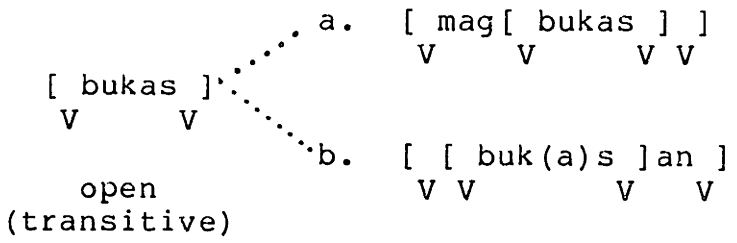
Recent proposals (Bresnan (1978); DeGuzman (1978); Hale (1979)) for relating sentences non-transformationally also throws into question what role syntax plays in determining whether forms constitute a single paradigm or whether they belong to distinct lexical entries.

The distinction between derivation and inflection can still be expressed, even in a picture like (5). Inflectionally related words can be listed as a single paradigm within a single lexical entry, while derivationally related words form separate entries. (Halle 1973) proposed exactly this. Lexical insertion in his system inserts the entire paradigm given in a lexical entry: the appropriate member of the paradigm is chosen following the syntax.) Such a distinction would be in lexical rather than syntactic terms. The syntax would provide no convenient way to make the distinction.

In this thesis I will argue that such a distinction is valid and deserves formal expression in a well-worked-out theory of morphology. With this in mind, it is important to lay out the terminology that we will use to distinguish derivation and inflection. The uninflected stem or lexeme is the most basic member of a word's paradigm. Each lexical entry has its own stem. So stands in English is the inflected, third-person singular, present form of the verb, based on the uninflected stem stand. In English, stems can actually occur in sentences without any overt inflectional markers, but in many languages, stems require inflection to do so. The Tagalog stem bukas, for example, requires either the prefix mag- or the suffix -an (which will be shown in Chapter 4 to be inflectional) before it can occur in a sentence. (I assume, incidentally, that inflectional affixes, like

derivational affixes, are added within brackets.) Still, bukas is the uninflected representative of the word or paradigm.

6.



There are also inflected stems; that is, already inflected words to which further inflected affixes can be added. (7) can be derived from (6a) by adding the further inflectional prefix ?i-.

7. [?i[pag[bukas]]]
V V V V V V

Every stem is minimally composed of a root. However, a root is not a word. In fact, several stems (words) can contain the same root. Withstand and understand both contain the same root stand. The stem of the verb in (8) does not contain a morpheme in addition to its root;

8. She stood there for three hours.

yet it is important to distinguish the root stand from the stem stand. The verbs in (9a-b) are distinct lexical entries

from the verb in (8), as evidenced by their differences in meaning and subcategorization.

9a. She stood the box on its end.

b. She stood his henpecking for years.

Yet they all contain the same root stand, as do understand, and withstand, which can be seen from the fact that they all have the same irregular past tense forms (--)stood. Tagalog also has verbs which are distinct lexical entries which therefore have different stems, but which are based on the same root. For example, in addition to the transitive verb bukas-1, there is an intransitive verb bukas-2. In Tagalog, however, unlike English, two different stems based on the same root take different inflectional affixes in their paradigms.

10. bukas-2 . . . /-um-bukas/ (---> b-um-ukas)
open (intrans.)

The distinction between uninflected stem (or lexeme) and inflected word is an important one to bear in mind as we investigate how WFR's function. Aronoff has proposed as a constraint on the WF component that WFR's can only relate pairs of words (the Word Base Hypothesis). Put in generative terms, rather than redundancy terms, this means that only words can be inputs or outputs to WFR's.

I will only briefly (in Chapter 4) be concerned with the claim that only words can be inputs--that is, that WFR's never form words by concatenating morphemes. I will, however, be making extensive use throughout this thesis (especially in Chapter 3) of the claim that only words can be outputs; that is, that WFR's do not produce intermediate forms that are not complete words. It is quite clear that such a claim cannot be maintained without a clear distinction between uninflected word (or stem) and inflected word. WFR's commonly derive words that are not complete in the sense that they cannot actually occur in sentences. This point cannot be made clearly in English, where words with no overt inflection can show up in sentences. But we will see that in Tagalog the outputs of some WFR's will require overt inflectional markers before they can show up in sentences. Bearing this in mind, the constraint that we will be using is that the output of every WFR must be an uninflected word, associated with its own lexical entry (which includes its paradigm of inflectional markers).

II. Readjustment Rules

The recognition of a class of readjustment rules allows us to simplify and constrain the WF component significantly. Readjustment rules figure greatly into later discussions, so I will spell out here in detail what I take them to be.

According to SPE and other standard accounts, inflectional WF is performed after the syntax by readjustment rules. This is because it is dependent on information such as structural position, and structural features that are only available after lexical insertion or the application of syntactic transformations. A readjustment rule rewrites a word dominated by its lexical node plus any syntactic feature that has been appended to it in the course of the syntactic derivation. Because inflectional WFR's were seen as rules that clean up syntactic surface structures to make them presentable to the phonology, they were called readjustment rules. The term "readjustment" is also used to refer to a whole class of clean-up rules which are not really WF at all (one subclass that will not concern us eliminates extra boundaries that have been inserted by the syntax to ensure that phonological rules will apply to the proper domains). Chomsky and Halle noted in SPE that the outputs of some WFR's are not ready to be acted on by the phonology. For example, the abstract nominal corresponding to the verb receive is not receive+ion, as predicted by rule (1). To handle

discrepancies such as this one, Chomsky and Halle posited an additional class of morphological readjustment rules, which I will call allomorphy rules, to alter the phonological shape of morphemes prior to the phonology. Aronoff adopted this basic notion of allomorphy rule and gave it a formal definition. He proposed that allomorphy rules are distinguished from phonological rules in that they make reference both to a set of morphemes that can serve as their environments and to a set of morphemes that can serve as their targets. The allomorphy rule that accounts for the example at hand changes the morpheme ceive to cept before the morpheme +ion. (Note that this rule applies to all words containing the morpheme ceive, provided they are followed by +ion, e.g. deception, reception.) I will also assume that inflectional WF can feed allomorphy rules. So for example, before the plural ending #s, the final /s/ of house is voiced, as in houses ([z]). This rule is allomorphy by Aronoff's criterion; it does not apply to just any noun ending in /s/. The plural of glass is glasses ([s]), for example. And voicing does not apply before the genitive suffix #s, although genitive #s is homophonous with plural #s. We say "the house's roof" with a [s]. So both the target and the environment of the voicing rule are morphologically restricted.

Aronoff identified a second class of readjustment rules, called truncation rules, which delete entire morphemes and therefore do not resemble phonological rules. Again, like

allomorphy rules, they apply to specific morphemes in the environment of specific morphemes. For example, Aronoff proposes that the noun nominee is derived from the verb nominate; the suffix +ate is truncated before the suffix +ee. (Throughout the rest of this thesis, I will continue to use the term "readjustment" to refer to the class of rules that adjust the output of WFR's--both derivational and inflectional. They are not themselves WFR.)

IIA. Arguments for Separating Allomorphy Rules from the Word Formation Component

Aronoff argues for isolating certain allomorphy from WFR's on the grounds that this would allow us to formulate the WFR's in question in more general terms than would be possible otherwise. The following pairs of words appear to bear the same morphological relationship to each other. The (b) forms are abstract nominals formed by adding +i to the corresponding verbs in (a).

11a. immerse b. immersion

a. subvert b. subversion

a. conceive b. conception

But if we were to incorporate the root allomorphy into the WFR that affixes +ion, we would have to posit three separate

WFR's, each of which adds +ion, and each of which forms an abstract nominal from a verb.

14a. [X] ---> [[X]-ion]
V V N V V N

b. [X=ceive] ---> [[X=cept]-ion]
V V N V V N

c. [X=vert] ---> [[X=verd]-ion]
V V N V V N

On the other hand, if the processes that change vert to verd and ceive to cept are separate from affixation of +ion, the same +ion rule will handle the derivation of all three abstract nominals.

Aronoff makes a similar argument for the existence of truncation rules. The suffix -ee attaches to verbs that require animate objects to form nouns which mean "a person who is understood as the object of the verb," for example employ/employee, pay/payee. However, there are some -ee nominals in which it appears that -ee has been attached to a verb's stem rather than the verb itself, for example nominate/nominee. Nominee bears the same set of relationships to nominate as employee does to employ. This can only be expressed if the same WFR relates the members of both pairs. Aronoff proposed that -ee only attaches to verbs, including those that end in -ate, but that a later truncation rule

deletes -ate before the morpheme -ee.

15. [nomin-ate] ---> [[nomin-ate]-ee] >>>>>
V V N V V N trunc.

nomin-∅-ee

In addition to allowing us to achieve more generality in the formulation of WFR's, separating allomorphy from WFR's enables us to formulate allomorphy processes themselves with more generality. Some allomorphy processes seem to be associated with several WF's. This generality can be expressed only if the allomorphy is separated from the WFR and stated as a single rule that applies in several different morphological environments. Otherwise they will have to be repeated in the formulation of several WFR's. I will demonstrate this point with an allomorphy rule that is triggered by more than one inflectional WFR, and with one that is triggered by more than one derivational rule.

In a 1977 article in Linguistic Inquiry, Halle argues that Vowel Shift is a synchronic rule of English by showing that several rules can be stated more simply if they apply to pre-vowel shift forms. Some of the alternations he uses to argue for vowel shift in this way are interesting for my purposes because they are base-dependent processes which must be considered allomorphy, independent of my claim. If the present tense verbs in (16-18) are represented at some level

as Halle's un-vowel-shifted forms, we can derive their irregular past tense forms with the two simple allomorphy rules (19) and (20). (The underlying vowels are in slash brackets. The segments in parentheses represent the output of vowel shift, diphthongization, and other rules.)

	PRESENT	PAST	PARTICIPLE
16a.	drink /i/	*drank /ae/	%drunk /u/
b.	sing /i/	*sang /ae/	%sung /u/
c.	swim /i/	*swam /ae/	%swum /u/
d.	sit /i/	*sat /ae/	*sat /ae/
e.	lie /ī/(āē-->ay)	*lay /āē/(ey)	*lay /āē/(ey)
f.	choose /ō/(uw)	*chose /ɔ̄/(ow)	*chosen /ɔ̄/(ow)
g.	eat /ē/(iy)	*ate /āē/(ey)	eaten /ē/(iy)
17a.	find /ī/ (āē-->ay)	%found /u/ (ɔ̄ -->aew)	%found /ū/ (ɔ̄-->aew)
b.	bind /ī/	%bound /ū/	%bound /ū/
c.	break /āē/ (ey)	%broke /ɔ̄/ (ow)	%broken /ɔ̄/ (ow)
d.	wear /ae/ (e)	%wore /ɔ/	%worn /ɔ/
e.	dig /i/	%dug /u/	%dug /u/
f.	shrink /i/	%shrunk /u/	%shrunk /u/
18a.	write /ī/ (āē-->ay)	*%wrote /ɔ̄/ (ow)	written /i/
b.	rise /ī/ (āē-->ay)	*%rose /ɔ̄/ (ow)	risen /i/
c.	speak /ē/ (iy)	*%spoke /ɔ̄/ (ow)	*%spoken /ɔ̄/ (ow)

d.	freeze /ē/ (iy)	*%froze /ō/ (ow)	*%frozen /ō/ (ow)
e.	get /e/	*%got /ɔ/	*%gotten /ɔ/

*=(19) has applied %=(20) has applied

19. V ---> $\begin{bmatrix} +\text{low} \\ -\text{high} \end{bmatrix}$

20. V ---> [+back]

The past tense forms in (16) can all be derived by rule (19), those in (17) by rule (20), and those in (18) by both (19) and (20). The same two rules also apply in the participle forms, although for a given verb for the past tense form may or may not trigger the same rule(s) as its participle. So, for example, both the past tense and participial forms of (17c) undergo the backing rule, while in (16c) the past tense form undergoes the lowering rule only while the participial form undergoes the backing rule only. Because each class of verbs chooses a different rule or combination of rules to mark its past tense and participial forms, it is necessary to extract the processes of lowering and backing from the inflectional WFR's themselves. For example, we would not want to formulate a past tense formation rule that simultaneously suffixes -en and backs the verb's vowel to account for the participle broken in (17c). This is because the backing process would have to be repeated in the rule that derives the participle swum in (16c), or the past tense form rose in (18b).

Separating the processes of backing and lowering from the inflectional WFR's themselves also allows us to express the WFR's with more generality. Some of the participles take the suffix -en. If the WFR that derives the participle broken in (17c) both affixes -en and specifies a particular combination of the backing and lowering rules.

So extracting the processes of backing and lowering from the inflectional WFR's allows us to state the processes and the WFR's with more generality. The existence of such arguments is important for Aronoff. Since he claims that WFR's can specify base-dependent processes, there is no reason backing and lowering could not be specified by WFR's rather than by allomorphy rules. On the other hand, I am claiming that even in the absence of such evidence, processes must still be extracted from WF.

There are also allomorphy rules triggered by derivational WFR's that must be stated separately from the WFR's themselves if they are to be stated in as general terms as possible. There is a class of nouns in English which end in a voiceless fricative which is voiced before the plural suffix -s. A few are given in (21). Many verbs derived from these nouns also undergo voicing.

21.

	SINGULAR	PLURAL	VERB
f/v	wife	wives	
	calf	calves	calve
	half	halves	halve
θ/ð	wreath	wreathes	wreathe
	mouth	mouths	mouthe
s/z	house	houses	house

Again, if we assume that the same voicing process is involved in the nouns and the verbs, we would not want to encode it in the WFR that derives the plurals of nouns; if we did, the rule that derives the corresponding verbs would have to echo the voicing process. Furthermore, the affixation of plural -s can be seen as the same rule that applies to derive all regular plurals as long as we disassociate it from voicing. Similarly, voicing should not be stated as part of the verb formation rule. This means that the verbs in (21) are derived by simple zero affixation.

The voicing rule is perhaps more interesting than ablaut in the strong verbs, because a process which I am claiming must be stated separately from WFR's as an allomorphy rule is triggered by both derivational and inflectional environments.

I have argued that the rules of backing, lowering, and voicing in English discussed above ought not to be incorporated into any one WFR, because they apply in several different WFR's. Their generality can be be expressed only if they are extracted from the formulation of any one WFR. I

would like to propose that such rules have to be separated from WFR's, even in the absence of arguments concerning their generality, and that WFR's can only add affixes of constant phonological shape. It follows from this assertion that base dependent rules, that is, rules whose structural changes can only be specified through reference to some phonological property of the base word, cannot be WFR's or parts of WFR's. They must either be phonological rules or allomorphy rules. So phonological changes that commonly mark morphological categories such as ablaut, changes in vowel length, doubling of consonants, must be separated from the WFR's they seem to mark.

IIB. Arguments for Separating Allomorphy from Phonology

If it is given that such processes must be separated from WFR's, why assume that they apply within the lexicon at all? Why not assume rather that they belong to the phonology proper? It is generally accepted that many phonological rules have exceptions. Exceptional words or morphemes that fail to undergo a rule X whose structural description they meet are marked [-rule X]. Kisseberth (1970) and Coates (1970) have discussed cases where a phonological rule has exceptions to its environment as well. They propose that for each phonological rule there is a pair of features, [±target of rule X], and [±environment of rule X].

If it is correct that there are phonological rules which have exceptions to their environments, marked by rule environment features, as well as rules which have exceptions to their focus, it seems that allomorphy rules as defined by Aronoff could be formulated with the notation available as phonological rules. Seen in this way, the so-called allomorphy rules are simply a subclass of the exceptional phonological rules: those whose targest and environments have exceptions. For example, why not formulate the rule that relates permit and permissive (mit~mis) as follows, and assume that mit is the only morpheme in English that is [+Focus: t--->s], and that -ion, -ive and -ory are the only morphemes that are [+Environment: t--->s]?

22. t--->s (minor phonology)

t ---> s / ___ [+syll]

(22) is blocked in e.g. digest-ive because (di)gest is [-Focus: 22]: it is blocked in commit-tal because -al is marked [-Environment: 22]. Aronoff did not explicitly argue against using phonological rule features to formulate allomorphy rules as phonological rules in this way. But it seems that he and others assume that the morphological restrictions on phonological rules are encoded very differently from the morphological restrictions on readjustment rules. Minor phonological rules do not mention

rule features, let alone morphemes. On the other hand, according to Aronoff's definition, morphemes (or some abstract morphological feature) are actually specified in the structural description of readjustment rules.

Taking his definition of allomorphy to an extreme, we might propose that allomorphy rules refer only to morphemes, and not to phonological properties at all. For example, we might assume that each morpheme is assigned a number by which it can be referred to by allomorphy rules (and perhaps WFR's as well).[1]

23. Morpheme [32] ---> /___ $\left\{\begin{array}{l}\text{Morpheme [27]}\\ \text{Morpheme [38]}\\ \text{Morpheme [43]}\end{array}\right\}$

listed elsewhere:

Morph.[32]= -mit- Morph.[28]= -ion
Morph.[38]= -ive Morph.[43]= -ory

Obviously a problem with (23) is that it does not specify a structural change to the right of the arrow. It is not clear that it is possible to do so except in phonological terms. That is, allomorphy rules, like phonological rules, must refer to some phonological segment (or some particular feature of a segment) that is undergoing the change, in order to specify a change in the feature composition of that segment. This point becomes especially dramatic when we consider an allomorphy rule that applies to several morphemes. Take for example

(24), which Aronoff gives (1976: 108) in order to account for the alternation of the stem-final consonants in the sets in (25).

24. d ---> s / ___ $\left\{\begin{matrix}\text{-ive}\\ \text{-ion}\\ \text{-able}\end{matrix}\right\}$

25.

defend		defensive	
comprehend	comprehension	comprehensive	comprehensible
pretend	pretension		
expand	expansion	expansive	
ascend	ascension		

Aronoff notes that all the stems that undergo (24) end in -nd, but that there are stems ending in -nd which do not undergo it, e.g. commendable, unmendable. Thus it is necessary to specify the morphemes that undergo (22) as well as those that trigger it. But a phonological property of the stem, namely that at least it ends in /d/, must also be specified in order to specify the structural change. The formulation of the rule given in (26), whereby morphemes are specified by some abstract notation such as numerical indices, would not express the fact that there is a clear phonological generalization concerning each morpheme that is subject to the rule, and its allomorph.

26.
$$\begin{array}{l} M[17] \text{ ---> fens} \\ M[20] \text{ ---> hens} \\ M[29] \text{ ---> pans} \\ M[41] \text{ ---> dens} \end{array} \quad / \quad \underline{\quad} \quad \left\{\begin{array}{l} M[27] \\ M[38] \\ M[43] \end{array}\right\}$$

Where: M[17]= fend M[27]= -ion
M[20]= hend M[38]= -ive
M[29]= pand M[43]= -ory
M[41]= cend

Similarly, a rule that simply listed the morphemes that underwent the rule would miss the generalization that the same process is taking place in each of the morphemes.

27.
$$\begin{array}{l} \text{fend ---> fens} \\ \text{hend ---> hens} \\ \text{pand ---> pans} \\ \text{cend ---> cens} \end{array} \quad / \quad \underline{\quad} \quad \left\{\begin{array}{l} \text{-ion} \\ \text{-ive} \\ \text{-ory} \end{array}\right\}$$

This solution would be as unsatisfactory as one which posited a separate allomorphy rule for each morpheme. Thus (22), Aronoff's formulation, seems to be the only reasonable one. I only wish to point out that this formulation, in which the focus and the structural change are expressed in phonological terms, is not simply a convenient abbreviation for a formulation in which morphemes are referred to as abstract entities. It is correct to see (22) as a /t/ ---> /s/ rule, and not a <u>mit</u> ---> <u>mis</u> rule. It is correct to think of (24) as a /d/ ---> /s/ rule and not a rule that changes <u>hend</u> to <u>hens</u>, etc. In terms of their targets and their structural

changes, then, allomorphy rules seem very much like phonological rules, and it is not clear to me why rule features are not the appropriate device for distinguishing those morphemes that undergo a particular allomorphy rule from those that do not.

On the other hand, when we consider the nature of the environments of allomorphy rules and the place in the grammar at which they apply, there seems to be real justification for distinguishing allomorphy rules from minor phonological rules.

The environments of allomorphy rules are in no way phonological; it is not only possible, it is necessary to specify their environments in abstract morphological terms.

Even if it were correct that phonological rules can be blocked by rule environment features, such features could not be used to express the morphological conditions in the environment of the voicing rule discussed in Section I. Rule features are not mentioned by phonological rules as triggers; they simply block or allow the application of phonological rules whose S.D.'s are otherwise met. Formulated as a phonological rule which has exceptions to both its target and its environment, the voicing rule would have no environment.

28. Voicing:

$$\begin{bmatrix} +\text{obstruent} \\ +\text{continuant} \end{bmatrix} \text{---> } [+\text{voice}]$$

Nor would the rules of backing and lowering (19-20) have phonological environments when they apply in the past tense forms in verbs.

It seems reasonable to assume that all phonological rules have phonological environments, regardless of whether or not there are morphemes which are exceptional with respect to their environments. On this assumption, (28) cannot be a phonological rule.

Let us assume that the voicing rule, like other morphological rules, can refer directly to its abstract morphological triggers.

29. Voicing:

$$\begin{bmatrix}+\text{obstruent}\\+\text{continuant}\\+\text{Class Q}\end{bmatrix} \text{---> [+voice] / \_\_\_} \begin{Bmatrix}+\text{Plural}\\+\text{Verb}\end{Bmatrix}$$

Class Q = {house, wreath, ...}

A less dramatic example of the non-phonological nature of the environments of allomorphy rules is the /d--->s/ rule discussed above. Unlike the voicing rule, this rule could be said to be triggered by phonologically overt affixes. But the initial vowels of the triggering suffixes (which are in the immediate environment of the segment undergoing the change) do not form a natural phonological class. We might assume then that /d--->s/ does not have a phonological environment. It

refers to the triggering morphemes as abstract entities without specifying any phonological property.

30. $$d \text{ ---> } s \; / \; \_\_\_ \; \left\{ \begin{matrix} M[27] \\ M[38] \\ M[43] \end{matrix} \right\}$$

I would like to propose that morphological readjustment rules never have phonological environments. They can refer to abstract morphological features only. In making such a proposal, I am claiming that there is a clear-cut distinction between all allomorphy rules and all phonological rules (including lexically governed phonological rules). Phonological rules are always formulated with phonological environments. Allomorphy rules never are. Even if this proposal is correct, however, it will not always give us a way to decide whether any given rule is a phonological or an allomorphy rule. It will tell us that a rule whose environment is in no way restricted morphologically is phonological, since its environment must be formulated in phonological terms. And it will tell us that a rule whose environment is completely morphological must be an allomorphy rule. But what of those rules whose environment we could formulate either in phonological or morphological terms? Take the following hypothetical rule, which closely resembles a rule of Tagalog that we will be considering later on. Suppose that stem-initial obstruents are deleted when preceded by the

final /ng/ of a prefix, but that there are a small number of prefixes that do not trigger this obstruent deletion (i.e. there are exceptions to the environment of deletion).

31. /rang-kunot/ ---> rangunot
/kang-kunot/ ---> kangunot
/bang-kunot/ ---> bangunot
/wang-kunot/ ---> wangunot

/nang-kunot/ ---> nangkunot
/lang-kunot/ ---> langkunot
/sang-kunot/ ---> sangkunot

The loss of stem-initial obstruents can be handled with the following phonological rule. But certain prefixes, namely nang, lang, and sang will have to be marked as being exceptions to that rule with the rule environment feature mechanism proposed in Kisseberth (1970) and in Coates (1970) (or something like them).

32. [+obst.] ---> $\emptyset$ / ng +___

But how do we know that obstruent deletion should not instead be formulated as an allomorphy rule with no reference to any phonological aspect of the class of triggering affixes at all? As long as it is necessary to recognize two arbitrary classes of /ng/-final prefixes in order to describe their behavior with respect to obstruent deletion, why not formulate the deletion rule to refer directly and simply to those classes, omitting the phonological condition from the rule altogether?

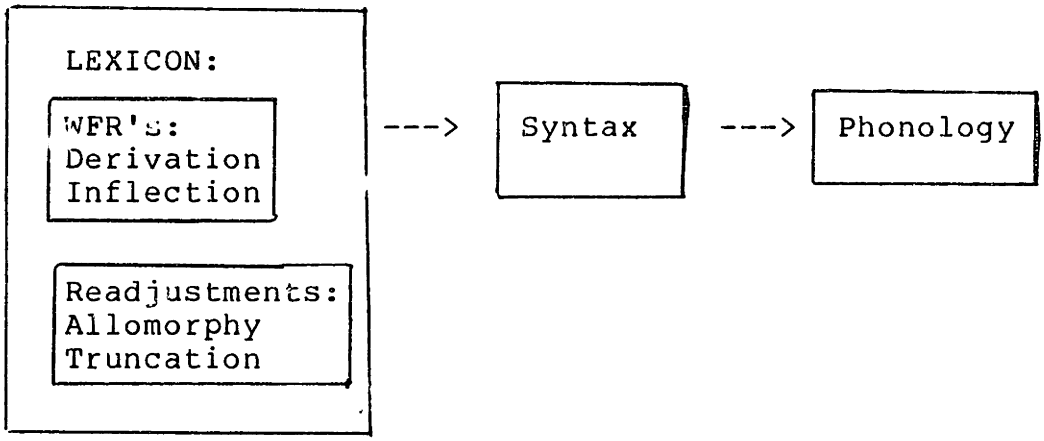
33. [+obst.] ---> $\emptyset$ / [+Class Q]+___

(Notice that under this solution, the fact that all prefixes that trigger obstruent deletion end in /ng/ would have to be expressed by a redundancy rule.) Hopefully, when we know more about allomorphy and phonological rules, we will be able to answer this question.

I am proposing that the property of allomorphy rules that distinguishes them from phonological rules is that their environments are specified in purely morphological terms. Their targets, however, need not differ in nature from those of phonological rules. This definition is weaker than Aronoff's, which requires the target of allomorphy to be restricted as well. In Chapter 2 (Section IC) I will present an argument that the weaker definition is correct. Certain length adjustments have purely morphological environments although their targets have no morphological restrictions.

There is also evidence that allomorphy rules are distinguished dramatically from minor rules by the place in the grammar at which they apply. Since allomorphy rules readjust the output of WFR's, we might suppose that they apply to the output of the WF component at the exit gate of the lexicon.

34.



This picture predicts that allomorphy rules will always precede phonological rules. But it is not clear that its predictions about possible rule interactions are any different from those predictions made by a picture in which allomorphy rules apply at the beginning of the phonology. However, there are some interactions between allomorphy rules and WFR's that I will discuss below, which suggest a model which does differ significantly from one in which allomorphy is grouped with phonology, requiring that it be performed in the lexicon.

There is some limited evidence in English that words are listed in their readjusted forms. Consider the following example. An allomorphy rule changes the morpheme -stroy to -struct before the suffix -ion, as shown by the pair destroy/destruction. One might ask whether the form of the morpheme in the lexical entry for destruction is stroy, as shown in (35b). Under this view, further WFR's can only have access to the unreadjusted form, and the stroy/struct allomorphy rule (>>>) applies productively, prior to the phonology. Another possibility, however, is that the form of

the morpheme in the lexical entry of destruction is struct, as shown in (36b). This would mean that, like the -ion WFR, the stroy/struct rule acts as a redundancy rule which relates two allomorphs, a fact which I've represented by making the rule bi-directional (<<>>). So the relationship between the lexical entries destroy and destruction is expressed by both an allomorphy rule and a WFR. (As I have drawn it in (36a-b), the WFR does not directly relate the listed representations of the words. A slightly different proposal would be that both destroy-ion and destruct-ion are listed in the lexical entry as alternate stems, both being accessible to WF.) Another noun can be formed by prefixing self- to destruction. If it is derived from (35b), its representation is self-destroy-ion. If it derived from (36b), its representation is self-destruct-ion.

35a. [de-stroy]
V V

b. [[de-stroy]ion] >>> struct
N V V N

c. [self[[de-stroy]ion]] >>> struct
N N V V N N

36a. [de-stroy]
V V

b. [[de-struct]ion] <<>> [[de-stroy]ion]
N V V N N V V N

c. [self[[de-struct]ion]]
N N V V N N

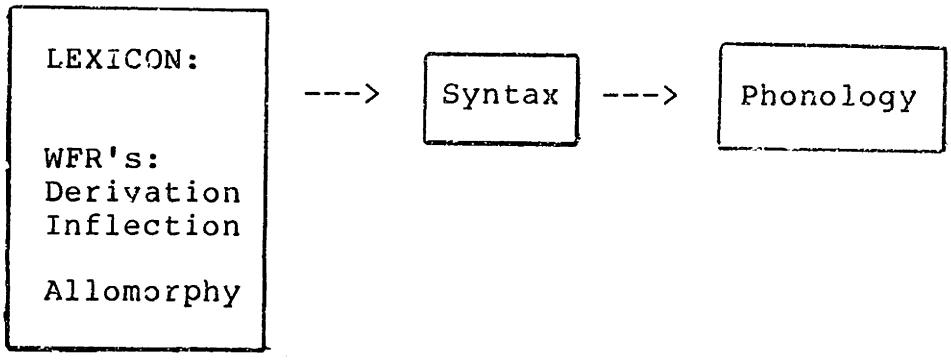
Either (35) or (36) will account for the derivation of destruction and self-destruction. However, the derivation of certain back-formations suggests that the view represented in (36) is correct. WFR's can apply in reverse to derive new words or backforms. For example, at one point in the history of English, there was no verb corresponding to the -ion nominal agression, although this word could have been derived by the -ion abstract nominal WFR. At some later point, though, the verb agress was back-formed using that WFR to analyze it into a verb and suffix. Similarly, the word self-destruct was backformed from self-destruction. The fact that the backform is self-destruct, and not self-destroy, shows that words must be listed in their readjusted froms. It is necessary to assume that self-destruct-ion is listed, because the backform does not contain -ion, which is the trigger of the stroy/struct allomorphy rule. In this respect, allomorphy rules are in sharp contrast to phonological rules. Note that a phonological rule does apply to the morpheme struct; a regular phonological rule palatalizes the /t/ before the high vowel of the suffix. Yet the palatalized

consonant does not show up in the backform. We have /dəstrŬkt/, not /dəstrŬks/.

So allomorphy rules must operate as redundancy rules, working alongside of WFR's to relate pairs of listed forms. Even in their capacity as redundancy rules, allomorphy rules have to work closely and in a particular order. For example, in order to relate destroy to self-destruction, we cannot apply the two WFR's (-ion suffixing and self- prefixing), then apply the allomorphy rule stroy/struct. The picture in (36) shows that the allomorphy rule must be sandwiched in between the two WFR's, applying on the first cycle it can apply on. This is a result of the argument above; there can be no allomorph stroy available on the cycle self-destruction for the back-formation to apply to; hence the allomorphy rule has to have taken place on an earlier cycle.

This interspersal of WFR's and allomorphy rules forces us to revise (34) as follows.

37.



Since we wish to maintain minimally that WFR's are not interspersed with either syntax or phonology, we are now

forced to maintain the same thing about allomorphy rules, since allomorphy rules in some cases will precede WFR's.

I see no reason, incidentally, why allomorphy rules, like WFR's, cannot also apply generatively. For example, if we were to derive a nominal from a newly-coined word trans-ceive, we would expect it to be transception. Again there is an intrinsic ordering relation between the WFR rule and the ceive/cept allomorphy rule. The WFR feeds the allomorphy rule in the generative sense.

III. Issues/Conclusions in Tagalog

Reduplication rules in Tagalog seem to function as WFR's, yet they exhibit many properties that we would like to exclude from a constrained theory of Word Formation. Our main conclusion in this thesis will be that reduplication rules belong to a subcomponent of the lexicon which until now has been unrecognized. This conclusion allows us to maintain a more restrictive characterization of WFR's than would be possible if reduplication rules had to be included among their number.

The first property of reduplication rules in Tagalog that might lead one to suspect their status as WFR's is their order with respect to other rules. It appears that reduplication rules must follow three phonological rules, as well as precede several others, threatening the claim of diagram (37) that WFR's and phonology cannot be interspersed. This problematic ordering has attracted some attention, and has prompted several proposals that greatly weaken the general theory of grammar. I will argue in Chapter 2 that this is only an apparent problem and that the proposed weakening is unwarranted. These rules will be characterized formally, and their interaction with reduplication will be illustrated. I will claim that the rules that precede reduplication rules are all allomorphy rules. This claim requires adopting the weaker definition of allomorphy suggested above: any rule whose

environment is morphologically specified is an allomorphy rule. This weaker definition will be argued for independently (Chapter 2, Section IC). I also claimed above that allomorphy rules are redundancy rules that apply within the lexicon; listed words to which WFR's have access are already readjusted by allomorphy rules. Given this claim, it is not surprising that any WFR, let alone reduplication rules, follow these three allomorphy rules.

On the other hand, all of the rules that follow reduplication are phonological rules, most of which apply at the phrase level. So the interaction of reduplication rules with these rules does not force us to give up the claim that WFR's cannot be interspersed with phonological rules. If anything it supports the particular division of the grammar depicted in (37), since that division explains why reduplication rules have the particular ordering that they do.

However, on closer inspection, reduplication rules exhibit other properties that make them exceptional as WFR's. First, they have to be formulated as transformations that affect strings of segments. It would be desirable--and possible except for the existence of reduplication rules--to restrict the operations available to WFR's to addition of affixes of some specifiable phonological shape, or some constant information. Second, although in general WFR's add affixes to the outer edges of words, reduplication rules add

material deep inside words. Third, in some cases reduplication rules have to be totally insensitive to the morphological identity of the material they copy. We would expect WFR's to be meticulous about specifying the morphological entities that they apply to.

Finally, in certain WFR's that involve both affixation and reduplication, the reduplication has to actually apply after the affixation. So the WFR cannot be written as a single rule that simultaneously affixes and reduplicates. It has to be split into two subrules that are extrinsically ordered. The output of the first one is an intermediate form that does not occur as a word.

Perhaps if we found one of these exceptional properties in isolation we would consider giving up one or another of our assumptions about WFR's. But the fact that they cluster around this one type of rule, reduplication, suggests that we ought to consider changing our conception of that rule instead. Rather than give up these unrelated restrictive claims about the nature and formulation of WFR's, we propose in Chapter 3 that reduplication rules exhibit these properties because they are not WFR's at all. They are a kind of readjustment rule. WFR's attach abstract morphological features that later trigger these special rules.

An additional argument in favor of separating reduplication from WFR's is parallel to an argument that was given above for extracting allomorphy from WFR. Although many WFR's trigger reduplication, if the reduplication processes are extracted from the statement of any one WFR, all cases of reduplication can be handled with one of three rules.

Chapter 5 is an attempt to work out the mechanics of our proposal: how Tagalog reduplication rules and their triggering WFR's are formulated and where they apply.

We reach two somewhat tentative conclusions about triggering WFR's and WFR's in general. WFR's that trigger reduplication rules add the triggering features to the outside of their base words. So it is possible to maintain the claim that WFR's affect words only at their outer edges. Second, if we assume that certain WFR's that do not add affixes also do not add brackets, then the reduplication rules they trigger can be stated more simply. We might generalize from this and propose that no so-called "zero affixation" rules add brackets. (I in fact propose this, and discuss this type of rule in Chapter 4, Section I).

We also make several proposals concerning reduplication rules. Besides exhibiting the exceptional properties described in Chapter 3, these rules also do not obey the principle of Subjacency which was adapted for morphology by Siegel (1977) and Allen (1978). They have to be formulated

with a variable that in some cases allows them to reach inside a word, across several layers of brackets. However, claiming that reduplication rules do not obey Subjacency leaves open the possibility that WFR's do obey that principle.

Finally, there is some limited evidence that reduplication rules are not redundancy rules in the lexicon. They always apply generatively. In this respect they differ from both WFR's and allomorphy rules.

In order to propose the formulation of reduplication given in Chapter 5, we examine the morphological structure of verbs in Chapter 4. In doing so, we reach certain conclusions, independent of our central thesis, concerning the relationship between derivation and inflection, and the interaction between different levels of WFR's. As mentioned above, it is not clear on what formal grounds within the present framework one can make the inflection/derivation distinction--or whether such a distinction should be made. It turns out to be a useful distinction in Tagalog--one that is observed by lexical processes, and which therefore can be made independently of how words work in sentences (i.e. independently of syntax).

There are two types of verbal stems which correspond to the traditional inflected and uninflected stem. a V stem is the uninflected member of its paradigm. WFR's that form new V stems are actually deriving a new word with its own paradigm,

and therefore are derivational. Usually the new V stem has a new meaning and subcategorization, so by traditional standards, we would want to consider WFR's that form them to be derivational. On the other hand, V' WFR's form inflected words. The new V' form has the same meaning and subcategorization as the form it is based on. I will show that there are three processes that observe the distinction between V and V' stems, reinforcing the more traditional, intuitive grounds for the distinction. V' affixes always mark the grammatical relation of the topic of the sentence (a term which will be explained in Chapter 4); they form a word that is complete in the sense that it can occur in a sentence; and they determine where in the verb aspectual reduplication can apply.

If it is correct that the distinction between V and V' corresponds to the distinction between derivation and inflection, then at least derivational WFR's can apply to the output of at least some inflectional WFR's. This is because some V stems can be derived from V' stems. However, there is in addition an outer level of inflection (what I will call ## level inflection) that does not interact with V or V' WFR's. It applies to their output, and defines the end of the derivation of the word.

A final result of Chapter 4 is that Tagalog infixes must be affixed as prefixes by WFR's, and then later metathesized with the first segment to their right. Aspectual reduplication can be formulated simply only if infixes are prefixes at the time it applies. This proposal solves a problem with infixed forms in languages in general. The output of a WFR that inserts infixes would be an improperly bracketed string. We propose, therefore that infixes in all languages are originally attached as prefixes. This infix metathesis rule could belong to the same generative subcomponent of the lexicon as do reduplication rules. This is another case where relegating a process to a different subcomponent of the lexicon makes it possible to maintain a more tightly constrained characterization of the WF component.

CHAPTER 2: Interaction of Reduplication and Phonology

In Section I of this chapter, it will be shown that reduplication rules have to be ordered after the rules of nasal substitution (N.-Subst.), syncope, and various length adjustments, but that they have to be ordered before the rule of flapping, various rules deleting /?/ and /h/, and the rules of vowel lowering and vowel laxing.

In Section II, various implications that these ordering relations might have for the organization of the grammar will be discussed. I will conclude that thy do not force us to allow reduplication rules to be freely interspersed with phonology. The rules that precede reduplication are allomorphy by the definition given in Chapter 1. On the other hand, the rules that follow are clearly phonological. Such a conclusion requires a careful characterization of each rule that interacts with reduplication, which characterization makes up the bulk of this chapter. In Section I, as well as demonstrating the interactions of reduplication with the various rules, I have described in some detail the nature of each of them.

I. Rule Ordering

IA. Nasal Substitution

Nasal Substitution is the process whereby a prefix final /ng/ and a following stem-initial obstruent are replaced by a nasal that is homorganic with the obstruent.

1a. mang-ka?ilangan ---> ma-nga?ilangan
need-ST

b. mang-pulah ---> ma-mulah
turn red

c. mang-dikit ---> ma-nikit
get thoroughly stuck to

(cf. ka?ilangan-in, "need-OT";ma-pulah, "red"; d-um-ikit, "stick to"

What the correct formulation of this rule is will be discussed below.

IA.1 Interaction of N-Substitution with Reduplication

Bloomfield (1933:222) noted that in reduplicated forms that undergo N-substitution, both the original and the copied syllables contain the homorganic nasal. In generative terms this can be handled by ordering the reduplication rule in question after N-substitution. For example, consider (1a-c), reduplicated for durative aspect. A sample derivation is given only for (1a):

2a. /mang-ka?ilangan/

ma -nga?ilangan	1. N-Subst.
ma-ngānga?ilangan	2. RA Reduplication
will need	

b. ma-mūmulah
will turn red

c. ma-nīnikit
will get thoroughly stuck to

If reduplication preceded N-subst., as is expected given the traditional assumptions concerning the relationship of the Word Formation and Phonological Components of grammar, then only the first segment of the copied material would be a nasal, since the corresponding segment in the original would not meet the structural description of N-subst. But forms in which the copied but not the original syllable contains the homorganic nasal are incorrect.

3a. /mang-ka?ilangan/

mang-kāka?ilangan	1. RA Reduplication
*ma-ngāka?ilangan	2. N-subst.

b. *mamūpulah

c. *manīdikit

This ordering relation is not limited to the reduplication rules that mark inflectional categories such as durative aspect. And it is not limited to reduplication rules that add a copy of the form CV (what I call RA). All reduplication

associated with productive WFR's exhibit this ordering, regardless of whether the WFR is inflectional or derivational; regardless of the relationship between the phonological shape of the copied and original material.

The formation of gerunds, for example, (which presumably is inflectional) involves adding an R1 copy to a verbal stem; the initial /m/ of Subject Topic prefixes shows up as /p/. In the derivation of the gerunds corresponding to (1a-c), R1 reduplication must follow N-subst., since again both the original and tne copied syllable contain the homorganic nasal.

4a. /pang-ka?ilangan/

pa -nga?ilangan	1. N-subst.
pa -nganga?ilangan needing	2. R1 Reduplication

b. pa-mumulah
turning red

c. pa-ninikit
getting thoroughly stuck to

The formation of moderative verbs from basic verbs might well be considered to be derivational. This formation involves adding an R2 copy to the verbal stem. If the verb undergoes N-subst., both the copied and original material contain a nasal that is homorganic with the underlying stem-initial obstruent. This can be handled by ordering R2 reduplication after N-subst. Consider the moderative verb corresponding to (1b):

5. /mang-pulah/

ma -mulah	1.	N-subst.
ma -mulahmulah	2.	R2 Reduplication
ma -mulamulah	3.	/h/-deletion
turn a little red		

Again, applying reduplication and substitution in the opposite order gives the wrong results.

6. /mang-pulah/

mang-pulahpulah	1.	R1 Redup.
ma -mulahpulah	2.	N-subst.
ma -mulapulah	3.	/h/-deletion

*mamulapulah

Certain occupational nouns are derived from verbs by adding <u>mang</u>- and an R1 copy to the verbal stem. This is clearly a derivational process since it involves a change in syntactic category. In such formations, R1 reduplication must follow N-subst. since it copies the derived nasal.

7. (um-)[tahi?] ---> [mang[tahi?]]
V V N V V N

ma- nahi?	1.	N-subst.
ma- nanahi?	2.	R1 redup.

t-um-ahi?
sew

seamstress

There is a class of monomorphemic stems which consist of a reduplicated monosyllable. Since such reduplication is not associated with a grammatical or semantic function and has no morphological conditioning, I conclude that it is not morphological. If the reduplication of monosyllables is to be expressed as a rule at all, in fact, this rule must be ordered differently with respect to N-subst. than are productive reduplication rules. N-subst. applies to the following stems; however, the initial consonant of the reduplicated monosyllable is retained in the copy which is not adjacent to the prefix mang-. To account for this, I assume that the dissyllabic stem was already spelled out at the time N-subst. applied.

8a.	tugtug	t-um-ugtog/tugtug-in play a musical in- strument-ST/OT	ma-nunugtog musician (*ma-nunugnog)
b.	kudkud	mag-kudkod/kudkur-in grate-ST/OT	ma-ngungudkod grater (*ma-ngungudngod)
c.	kulkol	k-um-ulkol/kulkul-in dig up-ST/OT	ma-ngungulkol digger (*ma-ngungulngol)
d.	tiktik	t-um-iktik/tiktik-an spy-ST/OT	ma-niniktik (a) spy (*maniniknik)

IA.2 Formal Nature of Nasal Substitution Morphological Restrictions

Examples (9-15) must undergo N-subst., but (16-19) cannot. In these latter cases the final nasal of the prefix has assimilated in place to the following consonant. This rule of regressive nasal assimilation will be discussed in the next section.

9. /mang-putul/

   mamutol
   cut-ST

10. /mang-tahi?/

    manahi?
    sew-ST

11. /mang-sakit/

    manakit
    injure-ST

12. /mang-ka?ilangan/

    manga?ilangan
    need-ST

13. /mang-bilih/

    mamilih
    shop-ST

14. /mang-dikit/

    manikit
    get thorough-stuck to-ST

15. /mang-?anak/

    manganak
    give birth to-ST

16. /mang-basah/

    mambasah
    read-ST

17. /mang-dukut/

    mandukot
    pick pockets-ST

18. /mang-guloh/

    mangguloh
    create dis-order-ST

19. /mang-?atakeh/

    mang?atakeh
    attack-ST

All of the examples above involve the Subject Topic prefix mang-. Therefore, the fact that the verbs in the righthand

column do not undergo N-subst. must be attributed to some property of their stems. A comparison of (13) with (16) and (14) with (17) shows that the property that governs N-subst. is not purely phonological; only certain /b/-initial and /d/-initial stems undergo it. (I know of no cases in which a /g/-initial stem does.) There are some generalizations that can be made concerning what stems are subject to N-subst.: only obstruent-initial stems undergo it, and stems that start with a voiceless obstruent always do. If the same rule applies to all obstruent-initial stems, both voiced (13-14) and voiceless (9-12), it will have to specify some abstract feature to identify those obstruent-initial stems which undergo it. The exceptionless application of N-subst. to voiceless obstruents cannot be expressed as part of the N-subst. rule itself. Yet it seems to be a significant generalization. It should not be costly to specify in the lexicon that a particular /p/-initial stem undergoes N-subst. when it is in the proper environment. One possibility is that there is a redundancy rule that states that all stems with initial voiceless obstruents bear the appropriate diacritic to undergo N-subst. Whether or not a stem with an initial voiced obstruent bears that diacritic will have to be learned along with the other idiosyncratic properties of that stem.

The behavior of /?/-initial stems with respect to N-subst. is problematic. Since stems beginning with liquids, nasals, and glides (including /h/) never undergo N-subst., the

fact that /?/ sometimes does leads us to propose that /?/ is an obstruent. Surprisingly, though, /?/ patterns after the voiced obstruents rather than the voiceless ones, in that some /?/-initial stems are exceptions to N-subst. At this point I have no explanation for this.

Another way to handle /?/ after mang- would be to propose that there are both vowel-initial stems (anak) and /?/-initial stems (?atakeh). /?/ is epenthesized before vowel-initial stems in certain environments, say in word-initial position, but not after mang-. /?/ is not an obstruent (under this account) so N-subst. never applies to it. But this analysis has difficulty accounting for the occurrence of stem-initial /?/ after prefixes other than mang-. The /?/-epenthesis rule applies to a stem such as utang after mag- but not after mang-. Thus it seems that the /?/-epenthesis rule would have to be subject to the same morphological conditions that N-subst. is, a fact which makes this proposal suspect. It is worth mentioning, though, that adopting this proposal would have important consequences for the operation of reduplication rules: When reduplication applied to vowel-initial stems after mang-, it would have to copy the final consonant of the prefix plus the first segment of the stem.

mang-anak

RA

The difficulty of formulating a reduplication rule that copies the final consonant of the prefix just in case there is no stem-initial consonant will be discussed in Chapter 3.

However this issue is handled, it is clear that N-subst. is restricted to a certain class of lexically designated stems. In addition, it only applies with a certain class of prefixes which cannot be identified in strictly phonological terms. It applies in the presence of the verbal ST prefix mang-, the nominal prefix mang- and, under conditions which will be explained below, the instrumental prefix pang-. It does not apply after the remaining prefixes which end in /ng/, namely, the comparative prefix (ka)-sing- and the verbal accidental/result prefix mag-kang-. For example, although a stem-initial voiceless obstruent is always deleted after mang-, no stem-initial consonant, including voiceless obstruents, is ever deleted after mag-kang or (ka)-sing.

20. /ka-sing-talīnuh/	21. /mag-kang-sira?/
kasintalīnoh as intelligent as	magkansira? get damaged (accidently as a result)

These differences in behavior with respect to N-subst. cannot be attributed to some lexical property that distinguishes the stems which occur with each class of prefixes. First, it would be a suspicious state of affairs if among those stems which take mang-, there were none with an initial voiceless

obstruent which were exceptions to N-subst., while all those stems which occur with (ka)-sing or mag-kang are exceptional. Second, there are stems which occur in formations both with mang- and with mag-kang, but undergo N-subst. only after mang-. For example, dikit in (22):

22a. /(um-)dikit/

d-um-ikit
get stuck to-ST

b. /mang-dikit/

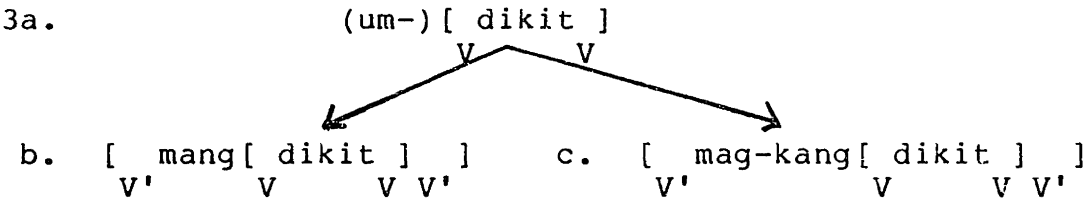
ma-nikit
get thoroughly
stuck to-ST

c. /mag-kang-dikit/

mag-kan-dikit
get stuck to acci-
dently as a result of-ST

So N-subst. must be restricted to apply only in the environment of certain prefixes. This example is relevant to our point regardless of whether we consider diacritics to be properties of morphemes, or of words as claimed by Harris (1977). (22b-c) are both derived from (22a). This can be argued from the fact that both intensive mang- and accidental/result verbs are predictable in all of their properties from the basic -um- verb. Furthermore, almost without exception there is an accidental/result verb only when there is an intransitive -um- verb formed with the same stem in this predictable meaning relationship to the accidental verb. The last point can be handled by deriving all mag-kang- verbs from an -um- verb in the fashion of (23c). So (23b-c)

not only both contain the same morpheme dikit, they both contain the word in (23a) in the sense that they are derived from it.



So it is necessary to conclude that N-subst. is restricted to apply to a certain morphologically specified set of stems in the environment of a morphologically specified set of prefixes. If Aronoff is correct in his definition (see Chapter 1), then N-subst. must be allomorphy.

If N-subst. is allomorphy, its ordering with respect to reduplication does not force us to allow phonological rules to precede morphological rules. But it does mean that allomorphy rules can precede word formation rules. But this must be the case in any event. In Chapter One I argued that allomorphy rules are used as redundancy rules for analyzing already existing words, and that they must be interspersed with WFR's which are also used as redundancy rules to relate already existing words.

Now we will turn to the actual formulation of the rule or rules involved in N-subst. Three alternate proposals will be considered. We will finally adopt an analysis whereby a single rule simultaneously deletes the prefix-final nasal and nasalizes the stem-initial obstruent. This analysis avoids serious problems encountered by the other two.

Regardless of which proposal we choose, it is necessary to posit a regressive nasal assimilation rule. This rule is crucially involved in one of the three proposals, so it is described immediately below.

Formulation of Nasal Substitution

Regressive Nasal Assimilation

There have been two accounts of N-subst. in the literature. One of them involves a rule of regressive nasal assimilation. Such a rule is needed independently for those cases referred to above which do not undergo N-subst.; those cases in which both the final nasal of the prefix and the initial non-syllabic of the stem show up on the surface, (16-19), (20-21), (22c). In such cases, the final /ng/ of the prefix always assimilates in place of articulation to a stem-initial [+consonantal] segment. This rule has no exceptions.

24. Subject Topic marker mang-:

[+cons]	[-cons] (no assimilation)
a. mam-balot wrap up-ST	e. mang-walis hit with a broom-ST
b. man-daya? cheat-ST	f. mang-yarih happen-ST
c. man-lungkot be sad-ST	g. mang-hiram borrow-ST
d. mang-gupit cut hair-ST	h. mang-?atakeh attack-ST

25. Occupational Noun Prefix mang-:

a. mam-babayan citizen	
b. man-durukot pick-pocket	
c. man-lalaro? player	e. mang-hahalal voter
d. mang-gugupit barber	f. mang-?a?awit singer

26. mag-kang verbs of accidental result:

a. mag-kam-pupunit get torn accidentally as a result-ST	c. mag-kang-wawala get lost as a result-ST
b. mag-kan-sisira? get damaged acc. as a result-ST	d. mag-kang-?i?iyak cry involuntarily as a result-ST

27. Comparative Prefix (ka)-sing:

a. (ka-)sim-bago?
as new as

b. (ka-)sin-talinoh
as intelligent as

c. (ka-)sin-luma?
as old as

d. (ka-)sing-gandah
as beautiful as

e. (ka-)sing-hirap
as poor as

f. (ka-)sing-?init
as hot as

28. Instrumental Prefix pang-:

a. pam-basah
for reading

b. pan-luto?
for cooking

c. pang-guhit
for drawing

d. pang-mumog
for gargling

e. pang-nobena
for performing
nobenas

f. pang-nguya?
for chewing

Prefix-final nasals show up as /ng/ before /y,w,?,h/ and nasals (all the examples in the right-hand column). Nasal assimilation does not apply before /y/ and /w/. If it did, we would expect to find /n/ before /y/, and /m/ before /w/. These cases motivate our assumption that all prefix-final nasals are underlyingly /ng/ and that nasal assimilation does not apply before glides.

29. Regressive Nasal Assimilation:

$$[+\text{nasal}] \longrightarrow \begin{bmatrix} \alpha\,\text{coronal} \\ \beta\,\text{back} \end{bmatrix} / \_\_\_ \begin{bmatrix} -\text{nasal} \\ +\text{consonantal} \\ \alpha\,\text{coronal} \\ \beta\,\text{back} \\ \gamma\,\text{labial} \end{bmatrix}$$

Nasal assimilation will not apply before /?/ and /h/ if they are also glides. However if they are not glides, assimilation will apply vacuously before them. We leave this question open for now (see discussion of /?/ above).

So independent of any particular analysis of N-subst., a very general rule of regressive nasal assimilation is needed.[1]

Obstruent Deletion Analysis of N-Substitution

Under one analysis, what we have been referring to as the process of N-subst. is accomplished by a rule that deletes stem-initial obstruents after a prefix-final /ng/.

30. /mang-dikit/

man -dikit	1. Regressive Nasal Assimilation
man - ikit	2. Obstruent Deletion (Allomorphy)

Under this proposal it is obstruent deletion that is subject to the morphological conditions described above, and therefore which, given Aronoff's definition, must be an allomorphy rule.

There are two problems with the Obstruent Deletion analysis. First it requires that a regular phonological rule be ordered before an allomorphy rule. Regressive Nasal Assimilation is crucially ordered before Obstruent Deletion. Furthermore, Reduplication must also be ordered after a phonological rule.

Second, if the Obstruent Deletion solution is correct, all productive reduplication rules must be formulated with an optional boundary between the first consonant and vowel to be copied.

Output of Nasal Substitution-
Input to Reduplication Rules

31. mam-ulah
    RA copy

32. mam-ulah
    R1 copy

33. mam-ulah
    R2 copy

34. man-ahi?
    R1 copy

The boundary must be optional because there is none between the first two segments to be copied in forms that do not

undergo N-subst., for example:

35. man-limbag
R1 copy

It is striking that although reduplication rules do not specify what morpheme the first consonant belongs to, they are very particular about what morpheme the first vowel belongs to. In the following examples the first vowel of the copy always corresponds to the first vowel of the stem, regardless of the linear position in the word of that vowel.

36a. mag-bībigay b. bībigyan

37a. mag-linislinis b. linislinis-in

It is not clear how reduplication rules can specify that the first vowel they copy is the first vowel to the right of the stem boundary/bracket, but be non-committal about what side of the stem boundary the preceding consonant is on. In forms that are not to undergo N-subst., it is the first consonant to the right of the stem boundary. In forms that undergo N-subst., it is the consonant immediately to the left of the boundary.

Obstruent Nasalization Analysis

An account of N-subst. that avoids these two problems is the following. After a certain class of morphologically designated prefixes, the initial obstruent of certain morphologically marked stems is nasalized by one rule. Then the first of two nasals is deleted by a second rule.

38. /mang-dikit/

mang-nikit	1.	Obstruent Nasalization (allomorphy)
ma -nikit	2.	Nasal Deletion

Regressive nasal assimilation applies to /ng/-final prefixes in forms that have not undergone obstruent nasalization (and subsequent nasal deletion).

39. mang-dukut

D.N.A.	1.	Obstruent Nasalization
D.N.A.	2.	Nasal Deletion
man -dukut	3.	Regressive Nasal Assimilation

mandukot
pickpockets

If we accept Aronoff's definition of allomorphy, obstruent nasalization is an allomorphy rule and regressive nasal assimilation is a phonological rule (it has no morphological conditions on it whatsoever). Although there are no crucial ordering arguments, it would be possible to assume that

obstruent nasalization precedes regressive nasal assimilation. The interaction of reduplication with the process of N-subst. that was illustrated above can be handled under this analysis by ordering all reduplication rules after obstruent nasalization.

40. mang-dikit

	mang-nikit	1. Obst. Nas. (allomorphy)
	mang-ninikit	2. RA Reduplication
ma	-ninikit	3. Nasal Deletion
	N.A.	4. Regressive Nas. Assim.

Again, in the derivation given in (40), the only crucial ordering is that between obstruent nasalization and reduplication. However, by ordering the other rules after these two, it is possible to maintain the claim that all morphological rules precede all phonological rules. Also, under this analysis it is possible to assume that reduplication rules always copy segments that belong to the stem.

The nasalization analysis runs into trouble with sequences of nasals which do not arise through application of obstruent nasalization. It predicts that there should be no sequences of nasals on the surface. The first of any two nasals should always be deleted by nasal deletion, regardless of the source of the second nasal. But sequences of nasals do occur on the surface as the (b) examples below show.

41a.	/mahal/	b.	/ka-sing-mahal/
	mahal expensive		(ka)singmahal as expensive as
42a.	/mura/	b.	/ka-sing-mura/
	mura cheap		(ka)singmura as cheap as
43a.	/um-mumug/	b.	/pang-mumug
	mumumog gargle		pangmumog for gargling
44a.	/um-nguya?/	b.	/pang-nguya?/
	ngumuya? chew		pangnguya? for use in chewing

If nasal deletion is an exceptionless phonological rule, then (41b-44b) are unaccounted for. At the point it applies, underlying nasals are indistinguishable from nasals that are introduced by obstruent nasalization. Both should be deleted alike. There is nothing to prevent us from claiming that it is a rule of allomorphy, or a minor phonological rule; but this would mean that the process of N-subst. is carried out by two separate allomorphy rules. And it would be a curious coincidence that all and only those stems with underlying initial nasals are exceptional.

I conclude that there is no rule of nasal deletion, and therefore that the nasalization account of N-subst. is untenable.

Contrary to what has been demonstrated above, several accounts have assumed that N-subst. applies to nasal-initial stems after Subject Topic marker mang- (see, e.g., Bloomfield 1917;213: Schachter and Otanes 1972;290,356: Wilbur 1973;28). The following verbs and their morphological analyses are given by Schachter and Otanes.

45. /mang-manhid/

mamanhid
get numb-ST

46. /mang-mitig/

mamitig
feel numb-ST

47. /mang-nu?ud/

manu?od
watch-ST

48. /mang-nibogho/

manibogho
become jealous-ST

49. /mang-ngaykay/

mangaykay
tremble-ST

50. /mang-nganay/

manganay
give birth to
one's first child

The nasalization proposal of N-subst. which we rejected above would have no trouble deriving these forms from the underlying forms attributed to them by Schachter and Otanes. But why should nasal deletion apply to the final nasal of mang- before an underlying stem nasal, but not to instrumental pang- in the same environment? Or in more general terms, why should N-subst. apply to nasal-initial stems after mang- but not pang-?

51a. /mang-nu?ud/ b. /pang-nu?ud/

manu?od
watch-ST

pangnu?od
for watching

It is not desirable to claim that separate rules are involved in deriving the mang- cases and the pang- cases. With the exception of this problem with nasal-initial stems, the same process of N-subst. seems to be involved for the two cases.

This contradiction leads us to propose that S&O's analysis of the verbs in (45-50) is incorrect. Instead we propose that the ST prefix in these cases is ma-: The rules involved in N-subst. will therefore not apply in these forms. (The (b) forms below are included for the immediately following discussion.)

52a. /ma-manhid/ b. pamamanhid
getting numb

mamanhid
get numb

53a. /ma-mitig/ b. pamimitig
feeling numb

mamitig
feel numb

54a. /ma-nu?ud/ b. panunu?od
watching

manu?od
watch

55a. /ma-nibogho/ b. paninibogho
becoming jealous

manibogho
become jealous

56a. /ma-ngaykay/

mangaykay
tremble

b. pangangaykay
trembling

57a. /ma-nganay/

manganay
give birth to
one's first child

b. panganganay
giving birth to
one's first child

S&O have analyzed (52a-57a) as mang- verbs on the basis of their gerund forms, (the (b) examples). In general, the gerund of a particular verb is predictable from its subject topic form. A gerund is formed from a mang- verb by changing the /m/ of the prefix to /p/ and reduplicating the first CV of the stem. Usually gerund forms of ST ma- verbs are formed by adding pagka- to the verbal stem.

58a. man-ligaw
pay court to

b. panliligaw
paying court to

59a. mang-guloh
create disorder

b. pangguloh
creating disorder

60a. ma-tulog
fall asleep

b. pagkatulog
falling asleep

61a. ma-tunaw
melt

b. pagkatunaw
melting

62a. ma-matay
die

b. pagkamatay
dying

(52-57) follow the pattern for mang- verbs. Compare them

especially with (62), whose stem starts with a nasal. But it is not true that all verbs that take ST prefix ma- form gerunds with pag-ka. At least two verbs whose ST prefix is clearly ma- have gerunds in which the /m/ of the prefix is changed to /p/, and the first CV of the stem is reduplicated.

63a.	ma-ligo? wash-ST	b.	paliligo? washing
64a.	ma-kinig listen-ST	b.	pakikinig listening

Since one cannot maintain that all ST ma- verbs form their gerunds by adding pagka, there is no reason not to assume that the verbs in (52-7) are ma- verbs. But if this is the case, there remain no examples of nasal-initial stems that undergo N-subst. I will conclude that this is correct.

Nasal Substitution Formulated as a Transformational Rule

A possibility which to my knowledge has never been proposed before is that N-subst. is accomplished by a single rule that simultaneously deletes the final /ng/ of a prefix and copies the feature [+nasal] onto the following obstruent of the stem.

65. $$[+\text{nasal}] + [+\text{obstruent}] \quad 1 \quad 2 \quad 3 \quad \text{---} > \quad \emptyset \quad 2 \quad \begin{bmatrix} -\text{obst.} \\ +\text{nasal} \end{bmatrix}$$

66. /mang-dikit/

ma -nikit	1. Nasal Substitution
N.A.	2. Regressive Nas. Assim.

Under this account it is this transformational rule that is restricted morphologically in the ways described in the above sections. If these morphological conditions qualify it as an allomorphy (and I believe they do), then it is necessary to recognize the existence of allomorphy rules that simultaneously affect two morphemes, each in the environment of the other.

The transformational account of N-subst. avoids the problems encountered by the nasalization and the deletion proposals. It is easy enough to handle the fact that nasal-initial stems are never affected by N-subst., which was a major problem for the nasalization proposal. N-subst. is simply formulated to apply only to stem-initial obstruents. (This would correctly exclude stem-initial glides, liquids, and /h/ as well.) Or the restriction might be removed from the N-subst. rule itself and be expressed in a redundancy rule which states that all stems that start with a [-obstruent] segment are exceptions to N-subst. I will not decide between these two possibilities.

Under the transformational account, it is possible to assume that the exceptionless rule of regressive nasal assimilation applies after the rule which must have the double

morphological conditions described. In a derivation where N-subst. has applied, regressive nasal assimilation will be bled. So, if Aronoff is correct in claiming that double morphological conditions on a rule are a necessary and sufficient condition for classifying it as an allomorphy rule (and I will argue that sufficient conditions are even weaker for such classification) N-subst. under this analysis is a rule of allomorphy; the fact that it must precede reduplication is hence not a problem.

Further, in the output of the transformational rule of N-subst., the remaining nasal is the first segment of the stem; thus the first segment copied by reduplication rules is always the first segment of the stem.

Finally, the N-subst. analysis does not have any problems with nasal initial stems. It simply does not apply to them.

Since the transformational proposal avoids all the problems encountered by the other proposals examined here, without so far as I can tell running into comparable problems of its own, I will adopt it. This means that it is necessary to allow allomorphy rules to be formulated transformationally.

IB. Vowel Syncope

Final Interaction with Reduplication

Stem-final vowels are often deleted before the verbal suffixes -in and -an. There are morphological and phonological restrictions on this rule which will be discussed below. For now, it will be sufficient to observe that in some words syncope is obligatory (68), for some it is optional (69), and for some it cannot apply at all (70).

67a.	t-um-ingin	b. *tingin-an tingn-an
	watch-ST	OT
68a.	d-um-umih	b. {dumih-an dumh-an}
	make dirty-ST	OT
69a.	mag-wakas	b. wakas-an *waks-an
	end-ST	OT

If an R2 reduplication rule applies to a verbal stem whose second vowel has been lost through application of syncope, the next syllable (the underlyingly third syllable) is copied. Moderative formation happens to be the only WFR involving R2 reduplication that could apply to syncopated forms, since it is the only one that applies to object-topic verbs in addition to subject topic verbs.

70. tingnan ---> tingnantingnan
look at-OT look at a bit-OT

71. dumhan ---> dumhandumhan
get dirty-OT get a little dirty-OT

In forms that do not undergo syncope, R2 reduplication copies, at most, the first two syllables starting from the beginning of the stem. A consonant that closes the second syllable is copied only if it is the last segment of the stem. So although the consonant following the second vowel is part of the second syllable in both ta?imtim and (mag-)linis, only in the latter stem is it copied (ta?ita?imtim but (mag-)linislinis). This can be handled by enclosing the consonant following the second vowel and a stem boundary in parenthesis.

72. W [Co V Co V (C+) X] Y
stem stem

1 2 3 4 5 --->

1, 2, 3 , 4, 2, 3, 4, 5,
[+long]

R2 never copies a third vowel, whether it is the third syllable of a trisyllabic stem, as in (73), or the suffix following a disyllabic stem that has not undergone syncope, as in (74).

73a.	ta?imtim sincere	b.	ta?ita?imtim somewhat sincere
74a.	linis-in clean	b.	linislinis-in clean a little

The fact that reduplication copies the suffix just in cases where the stem-final vowel has been lost through syncope can be handled by ordering syncope before reduplication. At the point where reduplication applies in (75), the suffix is the second syllable from the beginning of the stem.

75a.	/tingin-an/	b.	/sunud-in/
	tingn -an		sund -in 1. Syncope
	tingnantingnan		sundinsundin 2. R2
	obscure somewhat		obey somewhat

If, as we claim, R2 reduplication applies after syncope, a single statement will account for the number of segments that are copied by R2, both when it applies to forms which have undergone syncope, and when it applies to forms which have not. In fact, with a slight modification, our preliminary statement is adequate to handle all cases. The modifications are underlined in the following: R2 copies at least up to the second vowel from the beginning of the stem, regardless of whether or not that second vowel is part of the stem or part of a suffix that triggers syncope. The consonant following the second vowel is copied if that consonant is the

last segment of a morpheme, regardless of whether or not it is the last segment of a stem or of a suffix that triggers syncope. Although these statements do not represent a change in the number of segments R2 copies, they do attribute a very startling property to R2, namely that it is insensitive to the morpheme membership of the second vowel (and the following consonant) that it copies. So in the rule, the righthand stem bracket must be omitted, and an optional stem boundary precedes the second vowel of the stem.

76. W [CoVCo(+) V (C+) X
stem

1 2 3 4 5 --->

1, 2, 3 [+lg], 4, 2, 3, 4, 5

However, the left end of the structural description of R2 is particular as to what can satisfy its structural description. It cannot simply start copying from the left end of the word. It must locate the left edge of the stem. Compare the linear position of the copied material in (77a-c)

77a. bigyanbigyan

b. magbigaybigay

c. magsipagbigaybigay

This partial insensitivity of R2, which is revealed by its interaction with syncope and the problems it poses for the theory of word formation will be discussed at length in Chapter 4.

IB.2 The Formal Nature of Syncope

Now we will examine the conditions on syncope and try to determine whether there is a formal explanation for its interaction with reduplication. If syncope is a phonological rule, then the theory has to be revised to allow morphological rules, or at least reduplication rules from among them, to follow some phonology. If, like N-substitution, it is an allomorphy rule, then it is sufficient to allow WFR's to follow allomorphy, which we argued in Chapter 1 must be allowed in any event. We suggested that allomorphy rules are redundancy rules that relate allomorphs as they occur in listed words. So as an allomorphy rule, syncope would relate sunud to sund in the listed words s-um-unud and sund-in. WFR's would thus apply to syncopated forms.

The problem of determining what component syncope belongs to will be approached from two angles. First, we will consider whether it is morphologically restricted in any way. It will be shown that syncope has to be restricted to apply only to certain stems. But still it could be either a minor phonological rule or an allomorphy rule. If the suffixes, or

the morphological environments, that trigger syncope also have to be morphologically specified, by Aronoff's strict definition and our weaker one (Chapter 1, p.40), it must be an allomorphy rule. If the environment is purely phonological, then it is a minor phonological rule. Because syncope applies to such a restricted portion of the inventory of roots, one is reluctant to draw any conclusions about the nature of the environment of syncope. This leaves us in a difficult position since the most widely accepted defining property of allomorphy rules (perhaps the only one) is their morphological environment.

Our second consideration in trying to determine whether syncope is allomorphy is its interaction with other processes. There are various other alternations that depend on the application of syncope. If any of these alternations is allomorphy, i.e. if the stems that they adjust are listed in the lexicon in their adjusted forms, then clearly syncope also has to be allomorphy; the listed forms must also be syncopated. If, on the other hand, all of the alternations can be handled by phonological rules, then it is not clear that they shed any light on the nature of syncope. I will argue that at least some of these alternations are allomorphy; hence that some syncopated forms must be listed. In order to handle all syncopated forms with the same rule-- that is, in order to avoid positing a phonological rule that mirrors exactly the necessary allomorphy rule of syncope--I will claim

that all syncopated stems are listed, and that there is a single syncope rule which is a rule of allomorphy.

Morphological Conditions on Stems that Undergo Syncope

Syncope is restricted to apply only to certain lexically marked stems. All of the (b) and (c) examples in (78-83) contain an inflectional suffix. For the stems in (78-81) syncope is obligatory. For the stems in (80-81) it is optional, and it is prohibited from applying in (83).

78.	dalah	a.	magdalah carry-ST	b.	dalhin OT	c. dalhin IOT
79.	bukas	a.	magbukas open-ST	b.	buksan OT	
80.	tingin	a.	tumingin watch-ST	b.	tingnan OT	
81.	dumih	a.	dumumih make dirty-ST	b.	dumhan/dumihan OT	
82.	talikod	a.	tumalikod turn one's back to-ST	b.	talikdan/talikuran OT	
83.	wakas	a.	magwakas end-ST	b.	wakasan (*waksan) OT	

In general, syncope applies only to roots with a light penultimate syllable (i.e. an open syllable with a short

vowel). We will discuss this condition below and decide whether it should be included in the structural description of the rule of syncope. For now we note that among those roots which have light penultimate syllables (78-83), it is not possible to distinguish, in phonological terms, the ones which undergo syncope from the ones which do not. Nor is there any way to distinguish those for which syncope is optional from those for which it is obligatory. Therefore, the set of roots which are subject to syncope must be specified morphologically.

The morphological feature that governs syncope is a property of roots, not stems. We argue in Chapter 4 that there are verbs which have homophonous but distinct stems. The stems can be distinguished on the basis of their meaning and subcategorization, and they take a different array of inflectional affixes to mark their subcategorized nominals as topics (the forms in brackets below). So there are two distinct lexical entries built on the homophonous stems bukas-1 and bukas-2, below. But when two lexical entries are based on homophonous stems, either both of them are subject to syncope, or neither of them are; syncope applies to both stems of the shape bukas, but it does not apply to either of the shape ?abot. It seems reasonable to conclude that these homophonous stems contain the same root, and that syncope is governed by lexically marked roots.

84a. {b(-um-)ukas / pag-buks-an} b. {mag-bukas / buks-an}

open (intrans.) open (trans.)

85a. {mag-?abot / ?i-?abot / ?abut-an} b. {?(-um-)abot / ?abut-in}

pass (to) reach for

Thus either syncope is an allomorphy rule, or it is a minor phonological rule. Consideration of further restrictions on the rule will bear on the choice.

Other Conditions on Syncope

Certain stems that are lexically marked as being subject to syncope undergo it in some word formations, but not in others. This shows that there is an additional restriction on syncope. We will outline two possibilities: that the restriction is phonological, and that it is morphological. Unfortunately, the evidence for choosing one over the other is not very strong.

If one wished to maintain that the only condition on syncope, other than the lexical marking on the roots that undergo it, the most plausible account would be the following. Syncope is blocked, even in roots that are marked to undergo it, when the vowel to be deleted is long.

In general, stems which have long penultimate vowels underlyingly do not undergo syncope. (There are some exceptions to this generalization which are discussed below.) Since stems must be marked in the lexicon as to whether or not they undergo syncope, it is not clear whether this generalization should be expressed in the syncope rule itself, or whether it should be stated in the lexicon as redundant information concerning the lexical entities that are marked as exceptions. We will see in section IC that penultimate length on verbal stems is shifted one syllable to the right before a suffix.

86a.	ʔ-um-ī́big		b.	ʔibī́g-in
	love-ST			OT

We might suppose then that length shift applies before syncope, and that shifted length on the stem-final vowel blocks syncope. There are, however, stems with penultimate length that do undergo syncope.

87.	pūtol	a. {putūlin, putlin}	b.	{putūlan, putlan}
	cut off	DOT		IOT

88.	taban	a. {tabanan, tabnan}	
	hold onto	IOT	

89. tangan a. {tangānan / tangnan}

hold DOT

In order to maintain the claim that syncope is blocked by length, it would be necessary to claim that in the syncopated examples length shift has failed to apply. Notice that for all three stems in (87-9) syncope is optional. In the unsyncopated alternates length shift has applied; there is no form *pūtulin. So in fact, it would be necessary to claim that length shift for these stems is optional, but syncope is obligatory; if length shift did not apply, syncope would have to.

90a. /pūtul-in/	b. /pūtul-in/	
putūl-in	--	1. Length Shift (opt.)
N.A.	pūtl -in	2. Syncope (oblig.)
N.A.	putl -in	3. Closed Syllable Shortening

A real problem for this analysis is that length shift in all other cases is obligatory.

This problem disappears if syncope is in no way dependent on vowel length. This could be expressed in one of two ways. First, verbal length shift could be ordered before syncope, and syncope could be written to delete both long and short vowels.

91. /pūtul-in/

putūl-in	1.	Length Shift
putl -in	2.	Syncope

Second, syncope could be made sensitive to vowel length and ordered before verbal length shift; it would then bleed length shift.

92. /pūtul-in/

pūtl -in	1.	Syncope
N.A.	2.	Length Shift
putl -in	3.	Closed Syllable Shortening

According to either of these two proposals, the fact that syncope may or may not apply in the suffixed forms of (87-89b) is attributed to the fact that syncope is optional for these stems. We know that syncope is optional for some stems in any event. It is then possible to assume that length shift is obligatory.

We cannot choose between these two proposals on the basis of (87-89b): The fact that the penultimate vowel is short in the syncopated alternates does not show that length shift has applied. Closed syllable shortening (which is independently necessary, see Section IC), if ordered after syncope, will shorten the penultimate vowel in any event, as shown in (92). However, there are forms in which syncope feeds the deletion of the stem-medial non-syllabic, thus reopening the

penultimate syllable. For example /h/ is always deleted before a nonsyllabic (see Section ID). In stems with medial /h/, syncope feeds /h/-deletion. The vowel preceding the deletion site of /h/ is long only if it is long in the underlying representation of the stem.

93a.	h-um-ī́hip	~	hī́p-an
	blow-ST		OT
b.	mag-būhos	~	būs-an
	pour-ST		OT
c.	l-um-ihis	~	lis-an
	deviate-ST		OT

This can be handled by assuming that verbal length shift has not removed length from the penult in the OT forms of (93a-b), and that /h/-deletion precedes closed syllable shortening.

94a. /hī́hip-an/	b. /lihis-an/	
hī́h p-an	lih s-an	1. Syncope
N.A.	N.A.	2. Length Shift
hī́ p-an	li s-an	3. /H/-Deletion
N.A.	N.A.	4. Closed Syllable Shortening

If verbal length shift follows syncope, it is not necessary to formulate syncope so that it can delete long vowels. Furthermore, the fact that, in general, verbs with penultimate length do not undergo syncope cannot be expressed by the syncope rule itself, or by the way it interacts with verbal length shift. It will have to be expressed by a redundancy

rule to which stems such as putul are exceptions.

However, there is reason to believe that syncope is blocked by length on the vowel to be deleted. This is further support for the analysis we have chosen, since under this analysis it is possible to formulate syncope to delete only short vowels. In order to present the argument, it is necessary to review three noun formation rules, which we will now do.

In IIA.4, we will discuss several productive WFR's that derive nouns from verbs by adding a suffix to the verbal stem. The arguments given there for deriving the nouns from the verbs are, briefly, that their meanings are predictable from the meaning of the verb, and that they can take the same syntactic complements that the verbs are subcategorized for. (In some cases, the verbal stems which enter into a particular noun WFR can be identified on the basis of the affix they take to mark the subject topic.) Below it is shown that syncope does not apply in these noun formations even when it applies in the verbs they are derived from.

A. Adding -an to a mag- or an -um- verbal stem forms a noun which designates a joint or reciprocal performance of the action of the verb. (Accompanying length adjustments will be commented on below.)

.95a. mag-bigay ST ---> bīgāy-an
bigy-an IOT

give a giving to one another

b. ?-um-upo? ST ---> ?ūpū?-an
{?upu?-an} IOT
{?up-an}

sit a sitting together

c. s-um-akay ST ---> sākāy-an
saky-an IOT

board (a vehicle) a boarding by many

B. Suffixing -an to many verb (and noun) stems forms a noun which designates the place associated with the action of the verb (or with the noun).

96a. b-um-ilih ST ---> bīlīh-an
bilh-in OT
bilh-an IOT

buy a place for buying

b. h-um-iram ST ---> hīrām-an
{hirm-in} OT
{hiram-in}
{hirm-an} IOT
{hiram-an}

borrow a place for borrowing

c. mag-lagay ST ---> lāgāy-an
?i-lagay OT
lagy-an IOT

put a place for putting

C. Adding -<u>in</u> to certain verbal stems forms a noun which designates the object of that verb.

97a.	b-um-ilih bilh-in bilh-an	ST OT IOT	--->	bīlīh-in
	buy			something to buy
b.	g-um-awa? gaw-in gaw-an	ST OT IOT	--->	gāwā?in
	do			something to do

The nouns in the above examples are derived from the verbs, so they contain the uninflected verbal stems that are marked to undergo syncope. Even if diacritics should turn out to be properties of lexical items rather than morphemes (Harris 1976), we would expect the derived nouns to be subject to syncope also. Therefore there must be some condition on syncope other than the morphological restriction on the stems which undergo it, in order to explain why it applies in the verbs but not in the nouns.

If syncope is formulated to delete only short vowels, the difference in behavior of the nouns and the verbs in (95-97) with respect to syncope can be attributed to the difference in the length of the vowel in the final syllable of the stem. The length shifts which accompany the productive noun-formation illustrated in (95) will be discussed in

Section IC. For the purposes of this discussion, the following statements are sufficient. If the related verbal stem is disyllabic and its penultimate vowel is inherently long, both stem vowels are short in the derived noun. If the verbal stem is disyllabic and its penultimate is short, then both stem vowels are long in the derived noun. (Vowels in closed syllables which are thus lengthened are later shortened.) If syncope applies only to short vowels, then it will not apply in (95-97), even though their stems are lexically marked to undergo syncope. This solution requires that the length shifts associated with the productive noun formations be ordered before syncope (although verbal length shift, we claimed, is ordered after syncope).

It appears so far, then, that syncope can be formulated with no morphological restrictions on its environment. It isn't blocked by the noun formation illustrated in (95-7). Rather it is blocked by length that is added in those noun formations.

But it could well be an accident that there are no counterexamples to the proposal that length is sufficient to block syncope. Counterexamples would be cases where a root undergoes syncope in a suffixed verb, but does not undergo syncope in another suffixed form, even though the root vowels are short in both forms. There are many deverbal noun and adjective formations involving suffixes, but for the most part

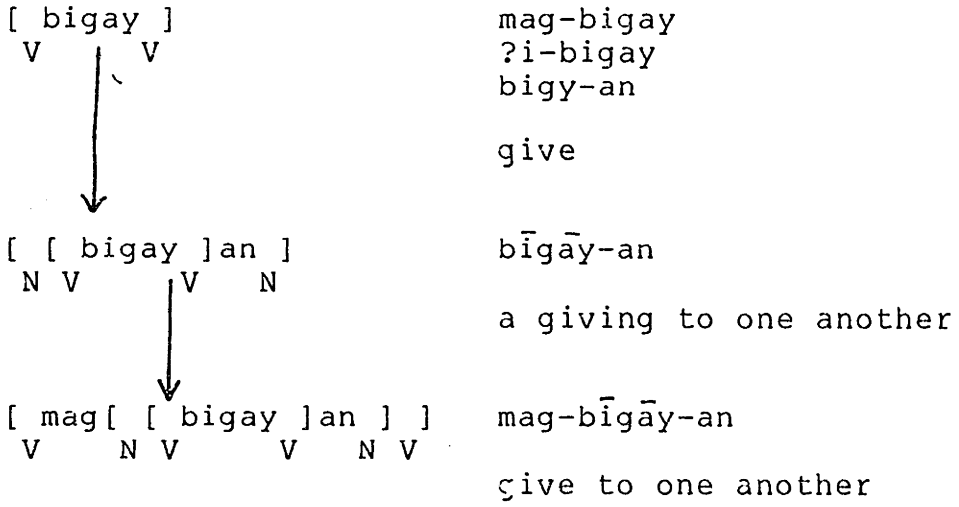
the length pattern of the derived nouns and adjectives is the opposite of the verbs. And, as already mentioned, almost all those verbal stems that are subject to syncope have short vowels; therefore, in the derived nouns and adjectives, the vowels are long. There are also cases where the root vowels in the nouns and adjectives are short, but syncope still does not apply. One might take this to mean that syncope makes reference to the word formation. It applies to the inflected forms of verbs, but it does not apply to these derived nouns and adjectives. Under this view, since syncope has a morphological environment, it is an allomorphy rule. But there is always an explanation to fall back on in order to save the claim that syncope is a phonological rule: we can always say that the roots in these derived nouns and adjectives, which we might expect to undergo syncope, are marked [-syncope]. Still, it is a striking fact--and a totally accidental one by this account--that syncope never applies in these word formations. In fact, to my knowledge it only applies in two morphological environments: in inflected forms of verbs, and in a very small class of unproductive nouns that will be discussed below.

If we wanted to investigate the possibility that the additional restriction on syncope is morphological, two possibilities come to mind. One might propose either that syncope is restricted to apply only to verbs; or that it only applies in certain WFR's (that is, that it is triggered only

by certain WFR's).

The proposal that syncope applies only to verbs is untenable. It does not explain all the cases where syncope fails to apply (and in fact will be shown to be false below). Verbs can be derived from the reciprocal-action nouns in (95) above; syncope does not apply in the derived verb. (Note that the derived verb retains the length pattern of the noun it is derived from.) [2]

98.



So if syncope is allomorphy, it is triggered by particular WFR's, not syntactic category.

The Dependence of Other Allomorphy on Syncope

Syncope applies in one noun formation. At first this seems to support the hypothesis that syncope is blocked by length, since the length in these derived nouns is identical

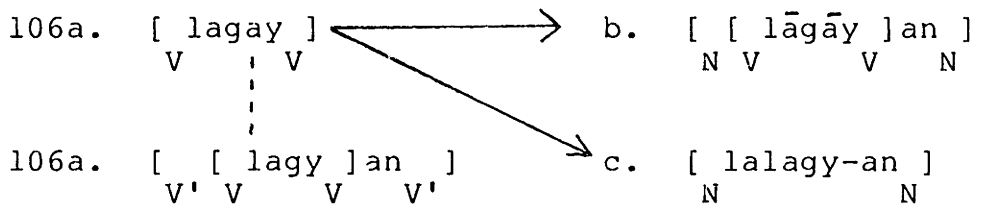
to length in the verbs. However, just those forms that undergo syncope in this formation are also reduplicated. We will argue that this type of reduplication is not productive and is best handled by listing the reduplicated root in the lexicon. But in order to express the dependency of reduplication on syncope, the root must be listed as syncopated.

These nouns appear to contain a nominal or verbal stem plus the suffix -an. We assume that they are not productively derived because their meanings are related to but not predictable from the meanings of the nouns or verbs containing the same root. Their meanings usually involve location associated with the stem, but most of them refer to a very specific object or place as compared with the locative nouns in (96), which can be used in a more general sense. Furthermore, these nouns are morphologically more restricted than the class illustrated by (96) in that they are not as freely constructed. Some of these nouns undergo syncope.

99a.	l-um-āmon ST lamūn-in OT	b.		c.	lalamūnan
	swallow, eat voraciously				throat
100a.	mag-laro? ST luru?in IOT	b.	laru?an	c.	laru?an
	play		playground		toy

101a.	mag-tanim ST {tamn-an } OT {tanim-an}	b.		c.	tatamnan
	plant				plantation
102a.	mag-lagay ST ?i-lagay OT lagy-an IOT	b.	lagayan	c.	lalagyan
	put		a place for putting		container
103a.	l-um-ura? ST ?i-lura? OT lur-an IOT	b.		c.	luluran
	spit				spitoon
104a.	h-um-iga? ST higa?an IOT higan	b.		c.	hihiga?an hihigan
	lie down				bed, couch
105a.	k-um-ā?in ST {ka?īn-in } OT {kān-in } {ka?īn-an IOT} {kān-an }	b.		c.	kakānin
	eat				dining room

It seems clear that nouns such as (99-105c) are no longer productively derived from the corresponding verbs. So they could well have no internal bracketing.



Still, we cannot say that the nouns and the verbs contain different roots without missing a generalization. For every noun which appears to be syncopated (that is, that has a consonant cluster before the suffix -an) there is a verb whose stem exhibits syncope, is homophonous with the noun's root, and bears some semantic relation to the noun. This is not an accident only if the verbs in the (a) examples above and the corresponding (c) nouns share the same morpheme, and it is morphemes that govern the application of syncope. (Note that even under the proposal mentioned immediately above, according to which the roots in the verbs are related to the roots in the nouns by an allomorphy rule, it is an accident that the same roots which are analyzed by the allomorphy rule are also subject to the phonological rule of syncope.) I claim, then, that the (c) nouns in (99-105) contain the same morpheme as the corresponding (a) verbs, and that both the nouns and the verbs undergo the same syncope rule. (Again, this shows that it is not possible to restrict syncope to verbs, as was proposed above.)

But this class of nouns presents a problem for the proposal that syncope is a phonological rule. If a stem that occurs in this formation undergoes syncope, it is reduplicated (some /l/-initial stems that are not subject to syncope are also reduplicated, e.g. (99)). This kind of reduplication is not at all like the productive reduplication rules that we are mainly concerned with. Productive reduplication applies to all words that undergo a particular WFR, not just a phonologically defined subclass of those words. Nor is it a purely phonological rule; it does not apply to verbs that undergo syncope, for example. It seems truly to be triggered by this non-productive noun formation, in which case it is allomorphy. These stems are listed in their reduplicated forms. Yet if we wish to express the dependency of this non-productive reduplication on syncope, they must be listed as syncopated as well as reduplicated. So syncope must also be an allomorphy rule which acts as a redundancy rule, that together with reduplication relates lalagy to lagay.

Many syncopated roots in verbs as well as in the non-productive noun formation above, obligatorily undergo further modifications. For the most part, these modifications have been treated as irregularities. Most reference grammars (Blake 1925, Schachter and Otanes 1972, for example) simply list the syncopated stems with the additional changes.

Some of these modifications, however, can be handled by regular phonological rules. Two of the rules that apply as the result of syncope are exceptionless and can be shown to apply in environments other than those created by syncope. Another class of rules only applies to the output of syncope, but this could well be due to the accidental fact that their environments are not met elsewhere; and they can be formulated in purely phonological terms. A third type of alternation applies only to the output of syncope and only to a certain morphological class of stems, yet appears to be rule-governed. Finally there are modifications which seem to be totally random in the sense that only one stem exhibits them.

This last type will interest us in particular. If the stems that undergo these sporadic modifications simply have to be listed in the lexicon in their modified forms, and if we wish to express the fact that these modifications are dependent on syncope, then the listed stems must also be syncopated.

A difficulty that arises in the following discussion is that, for any given rule, very few actual forms are involved. This can be attributed to the fact that syncope is itself lexically restricted ,and thus obviously the number of cases where it can interact with these later rules is much smaller. How do we know whether or not we are dealing with valid

generalizations which, for purely accidental reasons, only make themselves known in a small number of cases? Since some of the rules can be shown to exist independently, the fact that syncope feeds them only in a small number of cases does not throw into question their status as phonological rules. Our conclusions concerning those processes that do not apply in other environments have to be much more tentative.

First we will briefly illustrate those processes that can be handled with phonological rules.

/?/ and /h/-Deletion

Stem-medial /?/ that precedes a stem-final non-syllabic through the application of syncope is deleted, and the preceding vowel is lengthened. Likewise, stem-medial /h/ is deleted in a syncopated stem, but the preceding vowel is not lengthened. (/h/-deletion was mentioned above in connection with length conditions on syncope.)

107a.	k-um-ā?in	b.	/kā?in-in/	
	eat-ST			
			kā? n-in	1. Syncope
			kā n-in	2. /?/-Deletion
			eat-OT	
108a.	ma-gi?ik	b.	{gi?ik-an, gīk-an}	
			thresh-OT	

109a. d-um-ā?an b. dān-an

pass-OT

110a. h-um-ī̄hip b. /hī̄hip-an/

blow-ST {hī̄h p-an / hī p-an} 1. Syncope 2. /h/-Deletion

blow-OT

111a. mag-būhos b. {buhūs-an / būs-an}

pour-ST pour-OT

112a. l-um-ihis b. {lihis-an / lis-an}

deviate-ST deviate-OT

The dependence of /h/-deletion and /?/-deletion on syncope is especially striking in stems which optionally undergo syncope. There are only a few cases where syncope feeds /?/-deletion or /h/-deletion, but there are no exceptions to these rules in this environment. This last fact may not be sufficient to establish that we are dealing with actual rules in the language since so few forms are involved. However, in Section ID, where a more detailed description of these two rules is given, it is shown that they both apply in environments other than those created by syncope, including accross word boundaries.

The interaction of syncope with /?/ and /h/-deletion is compatible either with the claim that syncope is allomorphy, or that it is phonology.

Regressive Nasal Assimilation

In all cases where /n/ precedes a consonant through application of syncope, it assimilates in place to that consonant.

113a.	banig	b.	bangg-in
114a.	dinig	b.	dingg-in
115a.	kinig	b.	kingg-an
116a.	ganap	b.	gamp-an
117a.	linib	b.	limb-an
118a.	?anak	b.	?angk-an

Assimilation of /n/ applies vacuously before coronals and does not apply before /h/ in the two cases I have found. Nor does it assimilate to a following nasal.

119a.	bilin	b.	binl-an
120a.	?asin	b.	?asn-in salt-OT
121a.	dineh	b.	dinh-an
122a.	wanih	b.	wanh-an beg for-OT

123a. tanim b. tamn-in

(See below, Metathesis, for further changes in (119b) and (123b).) In no case does /m/ assimilate to a following stem-final segment in the output of syncope.

124a. kamit b. kamt-an
obtain

125a. damit b. damt-in c. damt-an
to clothe-OT IOT

126a. limah b. limh-in

127a. laman b. lamn-an c. lamn-in
put filling use as filling
in

The behavior of /n/ and /m/ before a consonant in syncopated stems is exactly like their behavior in stems that consist of two identical monosyllables (Section IA). (We have no cases where /ng/ precedes a non-syllabic after syncope, so we cannot compare its behavior in the two environments.) Therefore, it seems that morpheme-internal regressive /n/-assimilation is a general phonological rule, though its environment is rarely met. It therefore can shed no light on the status of syncope.

Progressive Nasal Assimilation

There also seems to be a rule of progressive nasal assimilation that applies in only two stems, causing assimilation of the stem-final nasal to the preceding consonant. In both cases the nasal is /ng/, and the preceding consonant is a coronal obstruent.

128a.	d-um-ating arrive-ST	b.	datn-an IOT
129a.	gising	b.	ma-gisn-an wake up to

The fact that so few roots are involved could be due to the fact that there are no other cases in which /ng/ follows another non-syllabic as the result of syncope.[3]

There are no prefixes that end in a coronal obstruent, so there are no cases where a stem-initial /ng/ might assimilate to a preceding segment. So it is not clear whether progressive nasal assimilation can be considered a general phonological rule or not. It certainly is not an unnatural rule.

Now we turn to alternations which are more difficult to account for with a general rule.

Metathesis

In a good many cases, a stem-medial consonant and a stem-final consonant which come together through application of syncope metathesize. In almost all cases, the first consonant is coronal. Because there seems to be a generalization lurking in so many of the cases, we will discuss the various classes of methathesizing consonants in some detail. We will argue, however, that a sufficiently general metathesis rule cannot be written. It is not clear that any economy is gained by handling the metathesis process in some of these roots with a rule rather than simply listing them in their metathesized forms in the lexicon. We will propose that they are listed in their metathesized forms, but since the metathesis depends on the fact that syncope has also applied, the roots must also be listed as syncopated.

Stem-medial /l/ and /n/ metathesize in all cases. In stems which undergo syncope optionally, they metathesize only if syncope has applied, i.e. if they are adjacent.

130a.	bilin errand	b.	pag-bilin-an be asked to do an errand	=	c.	binl-an
131a.	habilin thing given in trust	b.	kina-hahabilin-an trustee		c.	habinl-an deposit
132a.	pangalan name	b.	pangalan-an call	=	c.	panganl-an
133a.	pangilin abstinence	b.	pangilin-in fast	=	c.	panginl-an

The following stems have final /h/ when they occur at the end of a word. When followed by a suffix, they end in /n/. Syncope is optional in the verbs formed from these, e.g. (b) = (c). (Syncope cannot apply in the noun in (134b), however.) The syncope option has been taken in the (c) examples. /l/ and /n/, which are thereby adjacent, metathesize.

134a. salah — error, sin
b. salan-an — sin against
b'. ka-salan-an — sin
= c. sanl-an

135a. k-um-ilalah — be acquainted with
b. kilalan-in — be acquainted with
c. kilanl-in — be acquainted with

(pagka-kilanl-an) — be used as an advertisement

Our purpose here is to show that the two stems above are subject to this alternation. Furthermore, their final segment is /n/ at the time metathesis applies. This must be the case, since /l/ and /h/ never metathesize.

136a. bilih
b. bilh-in/bilh-an — buy-OT/IOT

137a. dalah
b. dalh-in/dalh-an — carry-OT/IOT

So (134c) and (135c) are additional cases of metathesis of /l/ and /n/. As in (130-33), metathesis only applies in

syncopated forms.

Since there are no exceptions to metathesis of /l/ and /n/ in syncopated forms, there may well be a rule. But this rule is not totally general. It does not apply to a prefix-final nasal followed by an /l/-initial stem; man-ligaw, "pay court to".

There are three stems in which /l/ metathesizes with a following voiced anterior stop which is adjacent to it after application of syncope.

138a.	t-um-alab penetrate-ST	b.	tabl-an OT		
139a.	mag-silid fill-ST	b.	sidl-an OT		
		b'.	sisidl-an container	c'.	sisilir-an container
140a.	mag-sulid spin-ST	b.	sudl-an OT	= c.	sulur-in OT

In the one case where syncope results in /l/ followed by /g/, and in the one case where it results in /l/ followed by a voiceless obstruent, metathesis does not apply.

141a.	palit	b.	palit-an exchange	c.	palt-in exchange

142a.	kalag	b.	kalag-an untie	c.	kalg-an untie

Three stems with medial flap are subject to syncope. Being adjacent to a consonant in the syncopated stems, flap shows up as /d/. In addition, /d/ metathesizes with the following consonant.

143a.	t-um-iris squash (an in- sect between the fingers-ST	b.	tiris-an OT	=	c.	tisd-an
144a.	k-um-urot pinch-ST	b.	kurut-in OT	=	c.	kutd-in
145a.	l-um-irip comprehend-ST	b.	lirip-in OT	=	c.	lipd-in

There are two remaining cases of metathesis.

146a.	mag-ʔatip roof-ST	b.	ʔatip-an OT	=	c.	apt-an
147a.	mag-tanim plant-ST	b.	tanim-an IOT	=	c.	tamn-an

It seems that no single, general metathesis rule can account for the facts illustrated above. It is striking that in most cases where metathesis applies, the first segment is a

coronal. But there are at least two cases in which this is not so.

148a. hibas b. hisb-an
lower

149a. gibik b. gikb-an
come with help

However, there are other /b/-initial clusters that do not metathesize. (150) would clearly have to be an exception to any rule that would account for (148).

150a. ?ibis b. ?ibs-an
get down to

151a. kibit b. kibt-an
nibble

One might also be tempted to say that metathesis was sensitive to some kind of sonority hierarchy, which would explain why metathesis applies in (138-45), but not in the following:

152a. patid b. patd-in
break

153a. putol b. putl-an
cut

154a.	pisil	b.	pisl-in wring
155a.	hatid	b.	hatd-an escort
156a.	masid	b.	masd-an stare at
157a.	?asin	b.	?asn-an salt

But it won't explain:

158a.	pinid	b.	pind-an close
159a.	palit	b.	palt-in exchange
160a.	?alis	b.	?als-an leave

We might posit several metathesis rules but the number of stems each one would apply to is miniscule. (Blust 1971 does in fact propose a metathesis rule that applies to exactly two forms in the language, our (146-7).

Admittedly we don't really know whether a phonological rule has to apply to a certain minimum of cases in order to have the status of a rule. But if it did, then we would have to say that at least some of these stems have metathesized

consonants in one of their listed allomorphs: hibis and hisb. Metathesis, even as an allomorphy rule, is dependent on syncope. Otherwise metathesis would have to relate hibis and hisib in an environment that also triggers syncope. So these stems must also be listed as syncopated, making syncope an allomorphy rule.

Random Alternations

Finally there are modifications that accompany syncope that seem to be sporadic and unlikely as phonological rules.

161a.	halik	b.	hagk-an kiss
162a.	lirip	b.	ligd-an put, place
163a.	tingid	c.	tigd-in resolve

the following two stems are the only ones which lose their final consonant.

164a.	turing	b.	tur-an say
165a.	hintay	b.	hint-in wait for

Note that elsewhere stem-final /y/ does not drop after a

consonant.

166a. bigay b. bigy-an
give

167a. sakay b. saky-an
mount

It seems reasonable to assume that such allomorphs are simply listed in the lexicon. So if syncope feeds them, it too must be allomorphy: syncope certainly does seem to be involved. In all cases, both these and those we have discussed earlier, the stem-final vowel is lost before a suffix. We would miss this generalization if we posited a separate rule of syncope for these cases; we will therefore assume that syncope has deleted the vowel in (161-67).

We have seen that three processes that we would like to consider allomorphy are dependent on syncope: non-productive reduplication in certain nouns; certain cases of irregular metathesis; and sporadic or random modifications. We argued that if allomorphs simply have to be listed already modified by these processes, then they also have to be syncopated.

An alternative proposal is that they are not fed by syncope; stems which exhibit them are simply listed in the lexicon. However, the irregular alternants of such stems always appear before a suffix, exactly the environment of

syncope, and appear to have undergone syncope in that they have lost their final vowel. It would be necessary to posit a morphological syncope rule that recapitulates the living phonological rule of syncope. The fact that this is an untidy state of affairs doesn't necessarily argue against it. If the forms in (161-63) were the only ones that required this morphological remnant of syncope, then we would be content to consider it a quirk. But the fact that it seems to be required by a variety of cases, although few in numbers, suggests that it is incorrect.

IC. Morphological Length Rules

IC.1. Length

Underlying Length in Stems

Before demonstrating the interaction between R2 reduplication and morphological length rules, it is necessary to briefly discuss underlying length in stems and to give examples of various types of length adjustments that might alter underlying stem length in derived words.

Almost without exception, closed syllables do not contain long vowels in native stems, either in derived or non-derived forms. Since all stem-final syllables are closed, they always contain a short vowel. Penultimate syllables, however, may be open or closed. For those stems whose penultimate syllable is open, the length of the penultimate vowel is not predictable from any other phonological properties of the stem. This is clear from the following minimal pairs.

168a.	?āsoh dog	e.	?asoh smoke
b.	lāmang only	f.	lamang advantage
c.	pītoh whistle	g.	pitoh seven
d.	gāling from	h.	galing excellence

Most native stems are disyllabic, but some are trisyllabic or longer. Still, in these longer stems, only the penultimate syllable and no syllable farther to the left can contain a long vowel. Again, the length of the penultimate vowel is an idiosyncratic property of the stem.

169a.	talīnoh intelligence	b.	hiwalay scattered[4]

Length in Derived Words

Underlying length in stems is very often modified in word formation. It seems that these length modifications are governed by particular WFR's rather than by any phonological properties of the derived words for two reasons. First, some WFR's do not involve affixation; they only involve a modification of the underlying length of the stem. Second, there are many WFR's which attach homophonous affixes but which trigger length adjustments. In both types of cases, the canges in length cannot be totally predicted from any

phonological property.

It is convenient to separate WFR's into three classes depending on the relationship of the length pattern of the derived word to that in the stem.

a. the length of the stem is not altered in the derived word

b. all the words derived by the WFR have the same length pattern, regardless of the length patterns of their stems

c. the length pattern in the words derived by the WFR vary depending on the length pattern of the stem.

a. No Change in Length

Usually prefixation is not accompanied by length adjustments in the stem. Prefixing pang- to a noun or verbal stem forms an instrumental stem. The stem retains its length if it has any.

170a. pan-lutoh (mag-lutoh) for cooking

b. pan-lī̃nis (mag-lī̃nis) for cleaning

b. Constant Length Pattern

Below, I will illustrate two WFR's whose outputs always have the same length pattern regardless of the inherent length pattern of the base word's stem. The suffix -an is attached

to nominal stems to form adjectives which mean "covered with X". There are no long vowels in the derived adjective, even if the penultimate vowel of the noun is long.

171. (dugo?) ——> dugu?an
blood covered with blood

172. (pūtik) ——> putikan
mud covered with mud

But when -in attaches to stems (usually nouns) to form adjectives meaning "susceptible to X", all stem vowels are lengthened, regardless of the underlying length of the stem.

173. (himatay) ——> hīmātāyin
fainting given to fainting

174. (bulūtong) ——> būlūtūngin
smallpox susceptible to smallpox

As is the case with all WFR's that cause lengthening, the -in WFR seems to treat closed syllables differently than open syllables; closed syllables never show up lengthened on the surface, for example the first vowel in (175).

175. (?antuk) ---> ?antūkin
sleepiness given to sleepiness

There must in any event be a rule that shortens long vowels in

closed syllables. This rule is fed by syncope, as shown above, e.g. pūtul-in ---> pūtl-in ---> putl-in. It is also fed by R2 reduplication, see below. So it is possible to assume that lengthening rules do not distinguish between open and closed syllables. Any vowel in a closed syllable that is lengthened will be subsequently shortened by closed syllable shortening.[5]

176. [ʔantuk] ---> [[ʔantuk]in]
N N A N N A

ʔāntūk-in	1. Lengthening
ʔantūk-in	2. Closed Syllable Shortening

The fact that these two WF's trigger opposite adjustments cannot be attributed to any phonological difference. (In fact, homophonous affixes trigger very different shifts. For example, compare -an in the formation illustrated by (170-71) with -an in (176-77). The WF itself specifies the length pattern of its output.)

c. Base-Dependent Length

For many WFR's, the length of the derived word is different from but depends on the length of the word it is derived from. For example, in all suffixed verb forms in which the stem has underlying penultimate length, length is

shifted one syllable to the right. If the stem has no long vowels there is no change in the suffixed form, that is, there are no long vowels in the suffixed form either.[6]

177a. s-um-ūlat (write-ST) b. sulāt-an (IOT) c. sulāt-in (OT)

178a. mag-wakas (end-ST) b. wakas-an (OT)

179a. mag-bigay (give-ST) b. bigy-an (IOT)

This type of length shift is not restricted to verbs. It also applies in the noun formation illustrated by (180a-b).

180a. būkid (field) ---> ka-bukīr-an (fields)

b. tāpang (brave) ---> ka-tapāng-an (bravery)

In nouns formed with suffixes that are homophonous with the verbal and nominal suffixes in (177-78), different length adjustments take place. For example, suffixing -an to certain verbal stems forms nouns meaning "reciprocal or joint performance of the verb's action." If the verbal stem is disyllabic and has no long vowels, all of its vowels are long in the derived noun; cf. (182). If the verbal stem is disyllabic and has a long penult, all of the vowels are short

in the derived noun; cf. (181).

181. sūlat ---> sulatan
write a writing to each other

182. bigay ---> bīgāyan
give a giving to each other

Again, short vowels in closed syllables do not show up long on the surface in the derived word.

183. s-um-aksak ---> saksākan
stab-ST stabbing each other

The length adjustments that depend on the length of the stem are not triggered by any phonological environment. Homophonous affixes trigger different, base-dependent processes. Compare (177-78) with (180). Yet we proposed (Chapter 1) that WFR's cannot specify base-dependent processes. This leaves us with the possibility that base-dependent length shifts are allomorphy rules. It does seem that separating base-dependent length shifts from WFR's does allow a more general statement of them. It seems that there is a small number of length shift rules that are triggered in various combinations by many WFR's. However, I will not present the evidence for this in the absence of a formalization of these rules.

If it is correct that base-dependent length shifts are allomorphy rules, then Aronoff's definition of allomorphy is too strong. Aronoff proposed that allomorphy rules specify the morphemes that they apply to, as well as the morphological environment in which they apply. But none of the length adjustment rules have restrictions in their targets. That is, no morpheme is an exception to length shift. Given that a word enters into a particular WFR, it undergoes whatever length adjustments are triggered by that WFR. So I propose that a sufficient condition for a rule to qualify as an allomorphy rule is that it have morphological restrictions on its environment.

IC.2. Interaction: Reduplication and Length

For several reduplication rules, vowel length in the copy is not determined by vowel length (or any other phonological property) of the stem. For example, in the output of RA reduplication rules, the copied material contains a long vowel, regardless of the length of the corresponding vowel in the original material. This must be stated as part of the copying process.

184. mag-tīpon ---> magtītīpon
collect will collect

185. mag-tapos ---> magtātapos
finish will finish

Since RA reduplication always adds length to the copied syllables, in cases such as (184) there can be no argument that reduplication must come either before or after the length shift rule has removed length from the first vowel of the stem in the OT form of the verb (186).

186. titiponin
will collect-OT

Likewise, an R1 copy always contains a short vowel, so it is not clear how the interaction of R1 reduplication rules and rules that adjust underlying stem length would ever be revealed.

Similarly, the second vowel of an R2 copy is long, regardless of the length of the corresponding vowel in the stem, if the following consonant in the stem is not copied. Compare (185a-c).

185a.	salita? talkative	--->	salīsalita? rather talkative	R2=CVCV̄
b.	ma-talīnoh intelligent	--->	matalītalīnoh rather intel-ligent	
c.	ma-sarap tasty	--->	ma-sarapsarap rather tasty	R2=CVCVC

(Moderative adjective formation also removes length from the original stem vowel, which is why there is no length on the

2nd /i/ in the output of (185b).) It was proposed that length is added to the second vowel of R2 in all cases, but that the rule of closed syllable shortening removes this length in case it is contained in a closed syllable. So like R1 and RA reduplication, the final vowel copied by R2 reduplication does not depend on the corresponding vowel of the original stem for its length.

On the other hand, the length of the first vowel of R2 is copied from the corresponding vowel in the original. In forms that are subject to length modifications, R2 copies the length of the stem's first vowel after length has been modified. Consider the formation of moderative verbs and adjectives in which an R2 copy is added to the stem. If the first vowel of the stem is short, the first vowel of R2 is also short.

186. mag-walis ---> mag-waliswalis
sweep sweep a little

Underlying penultimate length is optionally lost. Whether or not the option to remove length is taken, the first vowel in the copy and the original agree in length.

187. mag-linis ---> {mag-lī̄nislī̄nis / mag-linislinis}
clean clean a little

The fact that the two variants in (187) are possible, but

*mag-lī̄nislinis nor mag-linislī̄nis is, shows that R2 reduplication copies the length of the stem's first vowel, and that if the underlying penultimate length is removed at all it must be removed before the application of R2 reduplication.

188. /mag-lī̄nis/

mag-linis	not applied	1.	Length Loss
mag-linislinis	mag-lī̄nislī̄nis	2.	R2

Length loss associated with other WFR's that involve R2 reduplication must also precede reduplication. For example, intensive verbs are formed by prefixing magka and an R2 copy to stems that normally occur with ma and mag-. Underlying length is obligatorily lost. The first vowel in the copy is also short. Nothing new need be added if we assume that length loss precedes R2 reduplication.

189. ma-bā̄sag ---> magka-basagbasag
get broken get thoroughly broken

At least one type of base-dependent length adjustment also has to precede reduplication. As noted above, (examples 177-79), before a verbal suffix, penultimate length is shifted one syllable to the right. Suffixed verbs also show up in the moderative R2 formation in which length is optionally removed (in contrast with the adjective moderative formation above, in which length is obligatorily removed). If the option to

remove length is taken, none of the derived verb's vowels are long, (191a). If the option is not taken, length is shifted in the original material, but neither of the two vowels in the copy is long (191b).

190. lī́nis ... linī́s-in --->
clean OT

191a. linislinis-in
clean a little-OT

b. linislinī́s-in
clean a little-OT

The fact that the first vowel of the copy can never be long shows that verbal length shift precedes R2 reduplication. (Closed syllable shortening removes length.)

192. /lī́nis-in/

linī́s-in	1.	Verbal Length Shift
linī́slinī́s-in	2.	R2
linislinī́s-in	3.	Closed Syllable Shortening

If length loss and verbal length shift in the above examples are phonological rules, then we have yet more cases for which it may be necessary to allow phonological rules to precede a WFR. But we claimed above that the base-dependent length shifts illustrated in (192) and (194) are allomorphy rules. Either the suffixed forms are listed with their stem's length

already adjusted, or length is shifted in the lexicon. Either way, later WFR's will have access to the adjusted forms. So it is not surprising that later WFR's involving reduplication copy the adjusted length.

We have also suggested that if all words derived by a single WFR have the same length pattern, then that length pattern is specified by the WFR itself. This is because length cannot be predicted from any phonological properties of the base or derived word. So there is no phonological explanation for the difference between (171-72) and (173). Likewise, there is no phonological difference between the moderative and the intensive formations illustrated by (188) and (189) that explains the difference in optionality of the length loss rule. If length adjustments are specified as parts of WFR's, then we would expect later WFR's involving reduplication to copy the adjusted length. The fact that R2 reduplication has to be ordered after WFR's that specify length shifts would not be surprising. However, it is still a problem that R2 and length loss are both triggered by the same WFR. In order for length loss to apply first, we must allow two phonological reflexes of the same WFR to be split apart and extrinsically ordered. We saw that certain word formations involving N-subst. and R1 reduplication also required splitting WFR's. This problem will be taken up again in Chapter 3. For now we will be content to observe that the interactions illustrated in (188-89) only show that R2 has to

follow a rule that applies in the lexicon, not during the phonology.

ID. Rules Governing the Deletion of /?/ and /h/

Various rules that account for the distribution of /?/ and /h/ must follow all reduplication rules. Before illustrating this ordering relation, we will describe these rules, and some others that they feed. It will become clear that these rules are totally automatic, and they must apply late. In fact, they can apply across enclitic boundaries, so we might propose that they only apply at the level of the syntactic phrase. This would provide an explanation for their ordering with respect to reduplication. Even if reduplication had to apply later than we originally thought, it would be extremely surprising to find that it had to apply later than automatic, phrase level phonological rules.

ID.1 Optional /?/-Drop

In normally fast speech, a stem-initial glottal stop is deleted after a non-syllabic. The preceding non-syllabic may be either the final segment of a preceding word in the same phrase (when there is no pause between it and the /?/-initial stem) as in (194). Or it may be the final segment of a prefix as in (195). So (193a) is more likely to occur at the beginning of a phrase or in the citation form of the word than is (193b). But though (193b) is typically a phrase-internal pronunciation, when spoken in isolation it is taken to be the same word as (193a), rather than being identified as an

alternate form of (196).

193a. [ʔālay] b. [ālay]
offering

194a. ʔang ʔalay b. ʔang alay
Topic enclitic-offering

195a. mag?alay b. magalay
make an offering

196. [halay]
obscenity

Intervocalic /?/ is often lost in fast speech, both stem-medially and stem-initially after a vowel-final prefix. Usually loss of /?/ is accompanied by changes in the vowels that are thereby made contiguous. These further changes will be discussed below. But absence of a non-syllabic between two vowels is equivalent to the same vowels separated by /?/.

197a. [da?op] b. [daop]
joined

c. dahop
in want

It is likely that the loss of /?/ in (193b) is due to a different rule than is the loss of /?/ in (197b), but for now I'll assume that a single rule is involved in both that affects syllable-initial /?/.

Loss of intervocalic /?/ can also apply across enclitic boundaries. (The final /?/ of the stem luto? is obligatorily deleted in the following example; this will be discussed below.)

198. lalakad {?akoh / akoh}
ST-will walk T-I
I will walk.

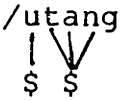
An alternative proposal that immediately comes to mind is the following. /?/ only occurs in syllable-final position in underlying representation. It is optionally epenthesized by syllable-sensitive rules. (This is the position taken by Bloomfield (1917: 134-6) and Llamzon (1970).)

But it is not possible to account for the distribution of stem-initial and stem-medial /?/ solely by a rule that (optionally) inserts /?/ before any syllable that starts with a vowel. Such a rule would account for (197a)=(199) and (200a-b), assuming that they have the syllable structure given below at the time that /?/-epenthesis applies. But it would not account for (200c); assuming that syllabification is not particular about whether or not it is syllabifying material that belongs to distinct morphemes, we would expect that the prefix-final consonant would be syllabified with the initial vowel of the stem, as shown in (200), and therefore that

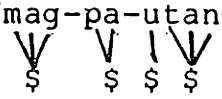
/?/-epenthesis would not apply. But in fact it does.

199. /daop/ ---> [da?op]
joined

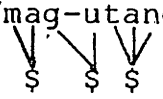
200a. /utang/ ---> [?utang]
debt



b. /mag-pa-utang/ ---> [magpa?utang]
let borrow

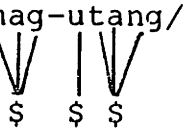


c. /mag-utang/ ---> [mag?utang]
borrow (many things)

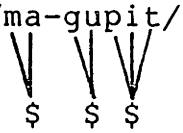


Even in fast speech, when /?/ is omitted, the stem-initial vowel is still not syllabified with the final consonant of the prefix. So in (201b), /g/ is syllabified with the first vowel of the stem. In (201a), /g/ closes the first syllable of the word.

201a. /mag-utang/



b. /ma-gupit/

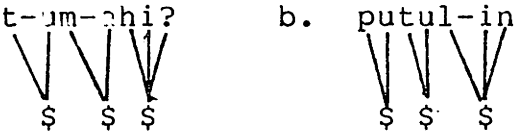


happened to be cut

So the rules of syllabification, which normally syllabify a consonant with a vowel immediately to its right, will have to be complicated not to do so just in case the vowel immediately

to the right is the first segment of a stem. Note that, in general, segments belonging to different morphemes can be syllabified together; for example:

202a. t-um-ʔhi? b. putul-in



The deletion analysis has a simpler solution to offer. /?/-drop could be ordered after the rules of syllabification, so that at the point where these latter apply, all stem-initial /?/ are still present. Later these are optionally dropped, but there is no syllable readjustment this late in the derivation. Given this, the deletion analysis is clearly to be preferred; I will therefore adopt it.

Rules Fed by Optional /?/-Drop

It will be useful to describe two additional rules that can or must apply when the option to drop an intervocalic /?/ has been taken.[7]

Vowel Coalescence

When the two vowels that come together as a result of /?/-drop are identical, they coalesce into a single, long vowel. This is true when the two vowels are contained wthin the same stem, when one is contained in an affix and the other

is contained in a stem, and when they are contained in separate words. This last case arises when the glottal stop that is dropped is the first segment of a word, and the preceding word ends in /?/ or /h/. (Word-final /?/ and /h/ are always deleted in the middle of a phrase, see below.)

	Careful Speech		Casual Speech
203.	/maganda ?ang damit/ The dress (T) is beautiful	——>	/magandāng damit/
204.	/sa?anoh/	——>	/sānoh/
205.	/sa?an/ where	——>	/sān/
206.	/do?on/ there	——>	/dōn/

After the verbal prefix ?i-, /y/ can show up in place of a stem-initial /?/.

207a.	?-um-igib fetch water-ST	b.	?i-?igib
		c.	?i-yigib OT
208a.	mag-(?)akyat climb-ST	b.	?i-?akyat
		c.	?i-yakyat OT
209a.	?-um-uwe? go home-ST	b.	?i-?uwe?
		c.	?i-yuwe? OT

the infix -in- which marks actual aspect in verbs shows up as ni- in prefix position obligatorily before stems beginning with /?/ or /h/, and optionally with stems starting with /l/ or /r/. As a prefix, ni- also allows /y/ to show up instead of /?/.

210a. ?i-ni-?igib b. ?i-ni-yigib
fetched water for

We can handle the (c) examples in (207-9), and (210b) in the following way: first, the option to drop an intervocalic /?/ is taken; then /y/ is inserted.

There is a point in the derivation of (207c) at which two identical vowels are contiguous:

211. /?i-?igib/

?i- igib	1. ?-Deletion
?i-yigib	2. /y/-Insertion
N.A.	3. Vowel Coalescence

As shown, /y/-insertion must precede and bleed vowel coalescence.

The Interaction of Reduplication, Optional /?/-Drop, and Vowel Coalescence

When a /?/-initial stem is reduplicated for durative aspect, there are three possible forms. (213a) is characteristic of formal or deliberate speech; (213c) is characteristic of very fast, informal speech; and (213b) is somewhere in between.

212. mag-?alālah/mag-alālah
worry

213a. mag?ā?alālah b. magā?alālah c. magālālah
will worry

(213a) shows us nothing about the relative order of RA and /?/-deletion, since the latter has not applied at all. In (213b) the /?/ of the copy has been deleted. In (213c) the /?/ of the original has been deleted as well (while the copied and original vowels have coalesced). The fact that there is no form in which the /?/ of the original syllable, but not the /?/ of the copy, has been lost (*mag-?a-alalah), suggests that the deletion of post-consonantal /?/ is separate from the deletion of intervocalic /?/ and that the latter rule applies only in extremely fast speech, while the former applies in moderately fast speech as well. The fact that the original but not the copied syllable in (213b) starts with /?/ can be handled by assuming that the stem-initial /?/ is present at the time reduplication applies. Then post-consonantal /?/-deletion applies (optionally) to delete the /?/ in the copy.

214. /mag-?alālah/

mag-?ā?alālah	1.	RA
mag- ā?alālah	2.	Post-Consonantal /?/-Del.

I assume that (213c) is derived by applying two additional rules to (213b): deletion of intervocalic /?/, and vowel coalescence. These two rules, then, also follow reduplication.

215. /mag-?alalah/

mag-?ā?alālah	1.	RA
mag- ā?alālah	2.	Post-Consonantal /?/-Del.
mag- ā alālah	3.	Intervocalic /?/-Del.
mag- ā lālah	4.	Vowel Coalescence

/y/-insertion also follows RA reduplication, since in reduplicated forms that undergo it, only the copied syllable starts with /y/ instead of /?/. If /y/-insertion preceded reduplication, both the copied and the original material would contain /y/ (so *(216b)).

216a. /?i-?igib/

?i-?ī?igib	1.	RA
?i- ī?igib	2.	/?/-Del.
?i-yī?igib	3.	/y/-Ins.

b. /?i-?igib/

?i- igib	1.	/?/-Del.
?i-yigib	2.	/y/-Ins.
*?i-yīyigib	3.	RA

was fetching water

ID.2 Obligatory Deletion of /?/ and /h/

/?/ and /h/ are both obligatorily deleted before a non-syllabic in all styles of speech. I will assume that they are each deleted by a separate rule because the vowel preceding the deletion site of /?/ but not /h/ is lengthened. Both deletion rules apply at the end of a word before another word in the same phrase. So compare the form of the words in (217a) and (218a) with their form when followed by the enclitic interrogative particle bah.

217a. /ma-hāba?/ It is long
b. /ma-hābā#bah/ Is it long?

218a. /dumih/ It is dirty
b. /dumi#bah/ Is it dirty?

Both rules also apply stem-internally when the application of syncope has brought together a stem-medial /h/ or /?/ with a stem-final non-syllabic.

219a. k-um-ā?in
eat-ST

b. /kā?in-in/

kā? n-in	1.	Syncope
kā n-in	2.	/?/-Del.

OT

A stem which ends in /h/ when spoken in isolation can also be pronounced without /h/. (221a) is taken to be the same word as (221b), distinct from (220).

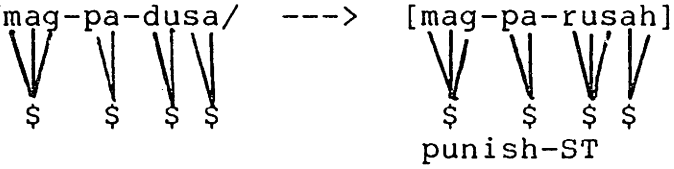
220. [bata?]
child

221a. [bata] b. [batah]
robe

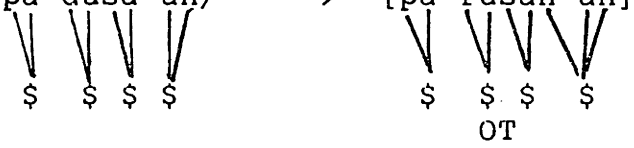
One might propose, then (following Bloomfield (1917) and Llamzon (1970)) that /h/ does not occur in syllable-final position in underlying representation. It is optionally epenthesized in this position. By this account, /h/-epenthesis must be blocked before a non-syllabic as in (218b) and (219b).

But when we consider stems in complex words rather than in isolation, it seems that the distribution of /h/ cannot be stated simply in terms of syllable structure. Those stems which, according to the epenthesis analysis, end in a vowel have an added /h/ before a suffix.

222. /mag-pa-dusa/ ---> [mag-pa-rusah]



223. /pa-dusa-an/ ---> [pa-rusah-an]



If the rule that inserts /h/ in (223) is the same rule that inserts /h/ in (222), this rule could not be formulated to apply to any vowel-final syllable. The /h/ in (223) is syllabified with the following vowel of the suffix.[8]

/h/-epenthesis must be formulated to apply when the right hand vowel is the final vowel of a stem. This formulation, which is necessary to cover the insertion of /h/ before suffixes, will also cover insertion of /h/ at the end of a word, (221b).

224. $\emptyset$ ---> h / V___]
stem

Armed with this formulation, the /h/-epenthesis analysis does not look much different from the analysis in which stem-final /h/ is present in underlying representations of stems. /h/-epenthesis cannot be a syllable-conditioned rule. Furthermore,, it can be ordered before the phonology without any ill-effects. In fact, it has to precede syncope, which we

have argued is an allomorphy rule (see section IB). Otherwise syncope would bleed epenthesis, since a syncopated stem would not end in a vowel.

225.	/bili-an/			/bili-an/		
	bilih-an	1.	/h/-Epen.	bil -an	1.	Syncope
	bilh -an	2.	Syncope	N.A.	2.	/h/-Epen.
	bilhan buy from			*bilan		

This early ordering of /h/-epenthesis would mean that an obligatory rule that deletes /h/ before a non-syllabic is necessary in any event. It will be shown below that R2 reduplication feeds /h/-deletion. Yet R2 follows syncope which in turn follows /h/-epenthesis. So epenthesized /h/ must be deleted.

A remaining problem for the epenthesis analysis is that /h/ at the end of a word is optional but it is obligatory before a suffix.

225a.	{magparusah magparusa}	b.	parusahan *parusaan

this suggests that under the epenthesis analysis, the presence of /h/ in (225a) is unrelated to its presence in (225b). One way to express this would be to account for /h/ in (225a) by an optional (syllable governed) epenthesis rule, but to claim

that /h/ in (225b) is part of the suffix -hin, which is an allomorph of -in. But it would be a strange coincidence that only vowel-final stems, exactly those stems which trigger /h/-epenthesis when in word-final position, take this /h/-initial allomorph. A more appealing proposal along the same lines might be that suffixes begin with /h/, and that /h/ is deleted after a non-syllabic. So the initial /h/ of the suffix would remain only after vowel-final stems.

226a.	/lunas-han/	b.	/pa-dusa-han/	
	lunas- an cure		N.A. punish	1. /h/-Del.

However, in other morphologically or phonologically derived cases of a non-syllabic followed by /h/, /h/ is not deleted.

227a.	/mag-hari?/	b.	/bilih-an/	
	maghari? rule-ST		bilhan buy-IOT	1. Syncope

The deletion proposal has no problems that correspond to those of the epenthesis proposal. A stem-final /h/ is part of the underlying representation of that stem, so the fact that it ultimately may occupy different positions in syllable structure is irrelevant. However, the rule that is responsible for the optionality of /h/ in certain positions can be formulated in terms of syllable structure. /h/ is

optionally deleted when it occurs in syllable-final position.

Interaction of R2 Reduplication with Obligatory /?/- and /h/-Deletion

R2 reduplication feeds and therefore precedes both /?/-deletion and /h/-deletion. If a disyllabic stem that ends in a glottal stop or /h/ is R2 reduplicated, /?/ or /h/ does not show up as the final segment of the copy.

228a.	ma-mulah redden	b.	ma-mulamulah redden a little
229a.	na-hiya? be ashamed	b.	na-hiyahiya? be a little ashamed

R2 reduplication always copies the final segment of a disyllabic stem. (228-29) are not exceptions if we assume that /?/-deletion and /h/-deletion apply to the output of R2 to delete the final segment of R2. This would also explain why the second vowel of R2 is always long when the original stem ends in /?/; the vowel preceding a deleted /?/ is always lengthened. It was argued above that the second vowel of an R2 copy was always long, but is shortened if is contained in a closed syllable. The fact that the vowel in the second syllable of the R2 copy is short in (228b) can be handled by ordering closed syllable shortening before /h/-deletion.

230. /mang-pulah/

ma -mulah	1.	N-Subst.
ma-mulāhmulah	2.	R2
ma-mulahmulah	3.	Closed Syll. Shortening
ma-mula mulah	4.	/h/-Deletion

So R2 reduplication feeds and therfore must precede the obligatory deletion of /?/ and /h/ before non-syllabics. RA precedes the optional deletion of /?/ after a non-syllabic or intervocalically. All three deletion rules are totally automatic. And they can all apply across enclitic boundaries, so they are excluded from being rules of the lexicon. If reduplication rules apply in the lexicon, as previously thought, then the ordering of these rules with respect to reduplication needs no explanation.

IE. Flapping

The voiced dental stop /d/ is often flapped in intervocalic position. Before a stressless vowel, flap is articulated with a single tap against the alveolar ridge. Before stressed vowels it is trilled. I am not prepared to argue for a particular feature composition for flap in Tagalog, but I will represent it orthographically as /r/.

Flapping applies in non-derived environments as well as environments that are morphologically, syntactically and phonologically derived. In order to demonstrate the interaction of flapping and reduplication rules, only flapping of stem-initial and stem-final /d/ as fed by affixation will be shown.

In certain lexically marked stems, initial /d/ becomes /r/ after a vowel-final prefix.

231a.	dāmot stinginess	b.	ma-rāmot stingy
232a.	dineh here	b.	p-um-a-rineh come here

Without exception, stem-final /d/ is flapped before a suffix.

233a.	bū́kid field	b.	ka-bukī́r-an fields
234a.	s-um-unod follow-ST	b.	sunur-an OT
235a.	mag-patā́wad pardon-ST	b.	patawā́r-in OT

IE.1. Interaction of Flapping and Reduplication

RA and R1 reduplication rules both feed flapping. Since both types of reduplication place a CV copy to the left of a stem, when the stem in question starts with /d/, the result is an intervocalic /d/ which (in the case of certain stems) becomes /r/. Consider for example the occupational noun formed from dambong by adding mang- and an R1 copy. After reduplication, the initial /d/ of the stem but not of the copy meets the SD of flapping.

236a.	dambong armed robbery	b.	man-dā́rambong bandit

Likewise, the RA copy that marks durative aspect in verbs triggers flapping of the initial /d/ of a verbal stem. (Flapping is optional for dating.)

237a.	d-um-ating arrived	b.	{d-um-ā́dating d-um-ā́rating} was arriving

238a. d-um-a?ing b. {d-um-ā̄da?ing / d-um-ā̄ra?ing}

239a. d-um-a?an b. {d-um-ā̄da?an / d-um-ā̄ra?an}

240a. d-um-i?in b. {d-um-ī̄di?in / d-um-ī̄ri?in}

Assuming that reduplication rules add copied material immediately to the left of the original material, R2 reduplication must precede the rule of RA aspectual reduplication for the simple reason that in forms that undergo both, the RA copy is to the left of the R2 copy, as shown in (241). If rule ordering is transitive, then R2 reduplication must also precede flapping. Direct evidence that this is the case comes from forms such as (241-42,, where the /d/ which undergoes flapping is introduced by the R2 reduplication rule (R2 copy is underlined).

241. um [dating]
V V

um-datingdating	1.	R2
um-dādatingdating	2.	RA
um-dāratingdating	3.	Flapping
d-um-āratingdating	4.	Infix Metathesis

attends now and then

242. mag-pa-rumatdumat
take a long time to do something

243. ka-ringatdingat
suddenly

244. ka-ragatdagat
worthy

Flapping of stem-final /d/ must also follow R2 reduplication. Again, this ordering is necessary not because R2 feeds flapping, but because there are forms in which either the copy or the original, but not both, contains a flap. In the case of R2 reduplicated stems, however, it is the original stem that contains the flap; the corresponding segment in the copied material does not meet the SD of flapping. Applying flapping before R2 produces the wrong results in these cases as well.

245a. /sunud-in/

sunudsunud-in	1.	R2
sunudsunur-in	2.	Flapping

b. /sunud-in/

sunur-in	1.	Flapping
*sunursunur-in	2.	R2

Below I will discuss the possibility that there is a reverse flapping rule; r--->d/__C. But even such a rule would have to follow R2.

IE.2. The Formal Nature of Flapping

The rules that precede reduplication all have morphologically restricted targets and/or environments, and it has been argued that they are all allomorphy rules. Most of the rules that follow reduplication are automatic, and must apply late during the phonology. One possibility is to handle the interaction between reduplication and phonological rules in Tagalog by allowing reduplication to apply to the output of allomorphy rules, before the phonological component. However, flapping is one of two non-automatic rules that follow reduplication. It is important to decide what kind of rule flapping is before deciding whether it is possible to claim that reduplication rules apply at this independently motivated break in the grammar. We will do this by considering what morphological restrictions there are on the rule, and whether it applies at the phrase level.

Morphological Conditions on Flapping

Flapping of stem-initial /d/ is lexically governed. For some stems it does not apply (246-7); for some it is optional (248-9); and for some it is obligatory (250-1).

246a.	dahon leaf	b.	ma-dahon leafy
247a.	dilim darkness	b.	ma-dilim dark

248a. dāmih	b. {ma-dāmih / ma-rāmih}	c. ka-ramih	
quantity	many	numerousness	
249a. dumih	b. {ma-dumih / ma-rumih}		
dirt	dirty		
250a. dālita?	b. ma-rālita?		
poverty	poor		
251a. dāmot	b. ma-rāmot		
stinginess	stingy		

(248c) and (252b) show that flapping is not restricted to nominal stems, and that it applies after vowel-final prefixes other than ma-.

252a. dingg-in	b. maka-rinig
hear-OT	S'T

If all occurrences of intervocialic /r/ are derived from underlying /d/, a diacritic is needed to distinguish those occurrences of /d/ that alternate with /r/ from those that do not. Whether or not flapping applies cannot be predicted from the prefix. (246-51) all involve the same adjectival prefix ma-. In fact, to my knowledge the class of prefixes that trigger flapping is not morphologically restricted. All vowel-final prefixes trigger flapping in at least some words. If the definition of allomorphy given in Chapter 1 is correct, and by definition allomorphy rules have morphologically

restricted environments, then flapping cannot be allomorphy.

The diacritic governing application of flapping is not a property of morphemes. It seems reasonable to assume that the two following words contain the same root or morpheme damdam. Yet flapping applies only in one of them.

253a. (damdam) feeling b. ma-damdam moving c. ma-ramdam sensitive

So the property [+flapping] is a property not of morphemes, but of lexical entries (similarly to the cases discussed in Harris (1977)).

A stem-final /d/ is always flapped before a suffix. This might lead one to suspect that there are two flapping rules; one that applies to stem-initial /d/ and which is morphologically restricted; and one that applies exceptionlessly to stem-final /d/. There are not stems that both start and end with /d/ to test this hypothesis.

254a. $d \rightarrow r \;/\; V \left\{ \begin{matrix} + \\ \# \end{matrix} \right\} \_\_ V$ b. $d \rightarrow r \;/\; V \_\_ (+) V$

255. /sunud-in/ ---> sunurin

Syntactically Derived Environments for Flapping

For some speakers flapping applies to the initial /d/ of the enclitic particles din ("too,finally,fairly") and daw ("they say" or indirect quotation marker). That is, they show up as rin and raw, respectively, when the word they are cliticized to ends in a vowel. (Flapping must follow the deletion of final /h/ in (255) and (257) below.)

255. /ma-buti#rin/
fairly well

256. /na-tapus#din##?ang#trabāhoh/
We finally finished the job

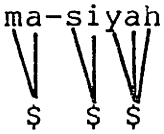
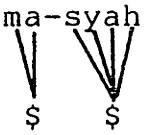
257. /ma-buti#raw##?ang#?ani/
The harvest is good (they say)

258. /sa?an#daw##pūpuntah##sih#huwan/
Where (did he/they say) Juan was going?

Assuming that the flapping of clitic-initial /d/ is handled by the same rule that flaps stem-initial /d/ word-internally, it must be formulated so that it can apply across clitic boundaries. Therefore flapping cannot be allomorphy, since it operates on material generated by the syntax as well as on material that is listed in the lexicon. Its interaction with reduplication rules is what we would expect if reduplication rules apply within the lexicon.

IF. Preglide Vowel Deletion

In fast speech an unstressed high vowel is deleted before a homorganic glide in the next syllable. The consonant preceding the deleted vowel is syllabified with the following syllable even when it is preceded by a vowel, as in (260b).

	careful speech	fast speech
259a.	tiyan	b. tyan
		
	stomach	
260a.	ma-siyah	b. ma-syah
		
	get what is comin g to one	
261a.	tuwid	b. twid
		
	consequence	

Certain stems, including some native ones, always contain a consonant plus glide cluster (although they are spelled with an intervening vowel that is homorganic with the glide).

262a.	(diyan)/dyan	b.	(buwan)/bwan	c.	(huwag)/hwag
	there		month		don't

d. (diyip)/dyip
Jeep

e. (piyanoh)/pyanoh
piano

f. (suwertoh)/swertoh
luck

I assume that these clusters exist in underlying representation and are not the result of the vowel deletion. This is borne out by their behavior in reduplicated forms, as will be shown below.

In very fast speech, and in certain dialects, syllable-initial clusters consisting of a coronal consonant plus /y/ are replaced with the palatalized version of the consonant, whether the cluster exists in underlying representation or is derived by vowel deletion.[9]

263a. siyah b. syah c. šah
he/she/it-T

264a. tiyan b. tyan c. čan
stomach

265a. diyos b. dyos c. ǰos
god

266a. niyah b. nyah c. ñah
he/she/it-Subject

267a. dyip c. ǰip
jeep

All monosyllabic reduplication rules precede pre-glide vowel deletion and palatalization. For example, in (268), which is reduplicated for durative aspect, the original of the copied vowel is subsequently deleted.

268. /ma-siyah/

ma-sīsiyah	1. RA
ma-sīs yah	2. Preglide Vowel Deletion
ma-sīšah	3. Palatalization

Another way to handle (268) might be to say that reduplication follows pre-glide vowel deletion, but that it copies the stem-initial consonant and any following non-syllabic even if it is a glide; a glide between two non-syllabics would then syllabify.

269. /ma-siyah/

ma-syah	1. Preglide Vowel Deletion
ma-sysyah	2. RA
ma-sisyah	3. Glide Syllabification
ma-sisah	4. Palatalization

Under this account, palatalization would still have to follow reduplication, as would vocalization.

A problem is how to account for the length of the vowel that results from vocalization. Given this analysis, it is an accident that when vocalization applies to reduplicated material, the length of the resulting vowel is the same as

vowels copied by that reduplication rule. We noted earlier that RA reduplication adds length to the copied vowel; this is written into RA itself. But some special provision will have to be made to ensure that when vocalization applies to a non-syllabic RA copy (which cannot be long, since there is no such thing in Tagalog), length is added to the resulting vowel. On the other hand, the same vocalization rule, when applying to a glide copied by R1, will have to produce a short vowel, just as vowels that are copied by R1 reduplication are short.

The strongest argument that the vocalization proposal is inadequate is that when reduplication rules apply to stems which start with a consonant-plus-glide cluster, the vowel immediately following the glide is copied. The copy may or may not contain the glide; (270-71) show alternates (a) and (b).

270a.	mag-dy̰idyip	271a.	mag-ty̰ityinelas
b.	mag-dīdyip	b.	mag-tītyinelas
	will take a jeep		will put on slippers

Similar facts for stems that start with consonant-plus-liquid clusters hold. When reduplication applies to such stems, the copied material may or may not contain a liquid cluster.

272a. mag-trā̆trabahoh
b. mag-tā̆trabahoh

will work

This suggests that reduplication rules must be formulated to optionally copy stem-initial clusters, but they always must copy the stem's first vowel. If the first stem vowel in (273) has already been lost at the point at which reduplication applies, then we would expect the next vowel to be copied. This is incorrect.

273. /ma-siyah/

ma-syah	1. Preglide Vowel Deletion
*ma-syasyah	2. RA Reduplication
*ma-sā̆syah	

I assume, then, that the deletion analysis is correct, and furthermore that this rule follows reduplication.

IG. Vowel Lowering

In the last syllable of certain stems, /i/ and /u/% show up as /e/ and /o/, respectively when those stems occur immediately before a break or pause in an intonation phrase. Such a break normally coincides with the end of a major syntactic phrase. The high alternate shows up in non-phrase-final position, whether because the stem is followed by a suffix (274c-278c), or because the word containing the stem does not end the phrase (274b-278b).

Vowels which bear neither pitch in an intonation melody nor morphologically determined length (see Section IC) are subject to laxing. In non-phrase-final position, therefore, the [-tense] counterparts of /i,u/ (represented /E,U/) actually show up if they are [-long]. Throughout most of this thesis, no distinction is made between tense and lax vowel alternates; I will represent them in the examples in this and the next section (on laxing).

When a single word is given in the following examples, its citation pronunciation is intended, so I have enclosed it in double ## boundaries. I assume that the citation pronunciation of a word constitutes a one-word intonational phrase which is therefore subject to the lowering rule.

274a.	##?i-turo?## point	b.	##?i-turu#moh## you point-OT
c.	##tUru?-an## point-IOT		
275a.	##tulong## help	b.	##t-Um-ulUng#sIlah## they helped-ST
c.	##tUlung-an## help-OT		
276a.	##?alok## offer	b.	##?alUk#moh#moh## your offer
c.	##alUk-in## offer-OT		
277a.	##gabih## ##gabeh## night	b.	##gabi#bah## night?
278a.	##tiket##	b.	{##tikIt#bah## ##tiket#bah##}
	ticket		ticket?
c.	##tIkit-an## give a ticket-IOT		

(a=phrase-final; b=followed by a word in phrase; c=followed by a suffix).

Phrase-final lowering follows R2 reduplication. When an R2 reduplicated word is not the last word before a pause, none of its vowels is subject to lowering and so all the vowels in the R2 copy are identical to the original stem with respect to the feature [+high]. But when the same word is at the end of

its phrase, as in the (b) and (c) examples below, only the vowel that is actually in the phrase-final syllable on the surface has been lowered to mid. The relevant vowels are again underlined.

279a. ##s-Um-UnUdsUnod##
be very obedient

b. ##s-Um-UnUdsUnUd#sIlah##
They were very obedient

c. ##sUnUdsUnUr-in##
be very obedient to

280a. ##məg-ʔāyUsʔāyos##
put in order a little-ST

b. ##məg-ʔāyUsʔāyUs#sIlah##
They put things in order a little

c. ##ʔayUsʔayūs-in##
put in order a little-OT

The fact that the final vowel of the R2 copy in (279a) and (280a) is not identical with the corresponding vowel in the original can be handled by ordering lowering after R2 reduplication. At the point where R2 applies, the second vowel of the stem in all the subcases of (279-80) is high, and height is copied exactly. The SD of lowering, which then applies, is met only by the final vowel of the original stem in (279a) and (280a).

281a. /mag-?āyus/

mag-?āyus?āyus	1.	R2
mag-?āyus?āyos	2.	Lowering
mag-?āyUs?āyos	3.	Laxing

b. /mag-?ayus#sIlah/

mag-?ayus?ayus#sIlah	1.	R2
N.A.	2.	Lowering
mag-?ayUs?ayUs#sIlah	3.	Laxing

c. /?āyus-in/

?ayūs-in	1.	Verbal Length Shift
?ayūs?ayūs-in	2.	R2
?ayus?ayūs-in	3.	Closed Syllable Shortening
N.A.	4.	Lowering
?ayUs?ayūs-in	5.	Laxing

IH. Laxing

Short /i/, /u/, and /a/ become [I], [U] and [ə], respectively, in normal, unemphatic speech.

282a. /bIsītàh/ visitor
b. /pUlāh/ red
c. /ənak/ child
d. /?əlis/ go

Vowels in phrase-final syllables are lengthened, so the vowels that have been lowered to mid as described in the section above are not subject to laxing. However, /e/ and /o/ in foreign loans become [E] and [O].

283a. rEgāloh present
b. bOtīlyāh small bottle

Laxing is a very late phonological rule. It follows all rules that introduce or remove length. First of all it follows all the morphologically conditioned length adjustments discussed above (Section IC). In words where such adjustments take place, it is the derived length that determines whether or not laxing applies. Compare, for example, the ST verb in (284a), whose stem has penultimate length, with its corresponding OT form in (284b), which has undergone verbal length shift.

284a. (Magbūkid kayo ng lupa)
(You-pl.-T cultivate the land)

/məg-būkId.../

b. (Bukīran ninyo ?ang lupa)
(You-pl. cultivate the land-T)

/bUkīr-an.../

Or compare the ST verb (285a) whose stem vowels are both short with the related noun in which both stem vowels have been lengthened.

285a. /##b-Um-IlI#mU##nəng#lupa?##/
buy-ST you-T Obj.-land

Buy land

b. /##bīlīh-ān##/
something to be bought

Laxing is also blocked by compensatory lengthening that accompanies the obligatory deletion of /?/ before another non-syllabic, both when the following non-syllabic is in the same word, and when it is in the following word.

286a. /g-um-i?ik/ b. /gi?ik-an/

	gi?k-an	1.	Syncope
	gī k-an	2.	/?/-Deletion & Lengthening
g-Um-I?Ik	gī k-ən	3.	Laxing
thresh-ST	OT		

and laxing is blocked by length that accompanies vowel coalescence, both word-internally and across word boundaries.

287. (Nasaan na ako?)=(Where am I-T now?)

a. /nā-sa?an#na#?akuh/	b. /na-sa?an#na#?akuh/	
option not taken	...aØa...a Ø a...	1.
N.A.	ā ā	2.
nā-sa?an#na#?akōh	na-san#nakoh	3.
nasə?ən nə?əkoh	nasān nākoh	4.

(1=/?/-Deletion; 2=Vowel Coalescence; 3=Phrase-Final Lowering; 4=Laxing)

Since laxing is blocked by length introduced at the level of syntactic phrases, it must not apply before then.

Laxing must follow another rule that applies on the phrasal level. As has already been mentioned, phrase-final syllables are lengthened. Laxing is blocked by phrase-final lengthening and therefore must follow it. Since the citation forms of words in (282) are one-word phrases, their final vowels have been lengthened by phrase-final lengthening. These final vowels are resistant to laxing. This becomes clearer from a comparison of the pronunciation of the underlined words in (288-90), when they occur at the end of the sentence, (288a-290a), with their pronunciation within a sentence, (288b-290b).

288a. /sI#məriəy##?Umāwīt/
T-Maria-inversion marker sing-ST

It was Maria who sang

b. /?UmāwIt##sI#məriāh/
sang-ST T-Maria

Maria sang

289a. /sI#lUnIngnIng##əy#bābūy/
T-Luningning invers.mrkr. piggy

It is Luningning who is piggy

b. /bābUy##sI#lUnIngnīng/
piggy T-Luningning

Luningning is piggy

290a. /sI#məriəy##məgəndah/
T-Maria-inv.mrkr. beautiful

It is Maria who is beautiful

b. /məgəndə##sI#məriah/
beautiful T-Maria

Maria is beautiful

R2 reduplication precedes obligatory /?/-deletion, and /?/-deletion precedes laxing. If rule ordering is transitive, then R2 reduplication must precede laxing. There is also direct evidence that all reduplication rules precede laxing.

Laxing follows all types of reduplication. Vowels in copied material are dependent on the corresponding vowels in the original material for height and backness specifications.

But their tenseness depends on their length which, as was shown above, needn't agree with the corresponding original vowels. For example, the vowel of an RA copy that marks durative aspect in verbs is always long, and therefore never undergoes laxing even when the corresponding vowel in the verbal stem does.

291a.	/?alis/	b.	/mag-bigay/	
	?ā?alis		mag-bībigay	1. RA
	?ā?əlIs		mag-bībIgəy	2. Laxing
	will go away		will give	
c.	/bulabug/	d.	/mag-regaluh/	
	būbulabug		mag-rēregāluh	1. RA
	būbUlᵊbUg		məg-rērEgālUh	2. Laxing
	will scare away		give a present	

Rl reduplication, which plays a role in the formation of certain occupational nouns, always introduces a short vowel. So the vowel of an Rl copy is always lax, even when the corresponding vowel in the corresponding vowel in the stem is long and therefore tense.

292a.	/mang-?āwit/	b.	/mang-dūkut/	
	mang-?a?āwit		man-dudūkut	1. Rl
	N.A.		man-durūkut	2. Flapping
	məng-?ə?awIt		mən-dUrūkUt	3. Laxing
	singer		pickpocket	

R2 reduplication must precede laxing, again because there are cases in which corresponding vowels in copied and original material do not agree in tenseness. In (293) the second vowel of the stem is long as the result of verbal length shift, but the second vowel of the copy has been shortened by closed syllable shortening. Laxing applies to the second vowel in the copy, but not in the original.

293. /līnis-in/

	liniːs-in	1. Verbal Length Shift
	linīslinīs-in	2. R2
	linislinīs-in	3. Closed Syllable Shortening
	lInIslInīs-In	4. Laxing

clean a little

The reverse state of affairs exists in (294). The vowel in the second syllable of the stem is inherently short. The second vowel of the copy is long on the surface, as is always the case when the stem has three syllables. In such cases the second syllable of the copy is open, and so closed syllable shortening doesn't apply. Laxing applies to the second vowel in the original, but not the copy.

294. /hiwalay/

	hiwāhiwalay	1. R2
	N.A.	2. Closed Syllable Shortening
	hIwāhIwələy	3. Laxing

Laxing is a totally automatic, non-neutralizing rule. It has no exceptions and all surface occurrences of lax vowels are derived from tense counterparts. These two properties alone force us to claim that laxing is a phonological rather than a morphological rule. But we have also given evidence that laxing is excluded from being a morphological rule on the basis of where in the grammar it must apply. It can be blocked by length introduced by rules that apply across domains that encompass major lexical categories plus their clitics (/?/-deletion and vowel coalesc.); and it can be blocked by length introduced at the phrasal level (phrase-final lengthening). Not only is it necessary to allow laxing to apply to these large domains, it is also necessary to prevent it from applying on some smaller domain. So, if reduplication rules apply within the lexicon, it is not surprising that they apply before rules of phrasal phonology. Even if we were to find that reduplication rules do follow some rules of the phonology, their interaction with laxing would allow a possible way to restrict the interaction of reduplication with phonology. It would allow us to say that there is a break in the phonology between the cyclic and/or non-automatic rules, and the phrase-level, automatic phonological rules, at which break reduplication rules can apply.

II. How to Handle the Interaction

IIA. Demonstration that the Interaction between Reduplication and the Phonology Must Be Handled by Ordering

It has been shown that the interaction of reduplication with the rules described in Section I can be handled by ordering reduplication after some of them but before others. We will now show that their interaction must be handled by ordering.

Wilbur (1973) discusses cases in several languages in which it seems that a phonological rule must precede reduplication. She proposes to maintain the claim that all morphological rules precede the phonology by attributing a special type of global power to phonological rules. A phonological rule may behave exceptionally in one of two ways, just in case its structural description is met either by copied material or original material, but not by both. First, it might apply to both, thus applying to a segment that does not meet its structural description; or it might not apply to either. The result of both over- and under-application is maintenance of identify between copied and original material. The main example from Tagalog that Wilbur discusses is the interaction of R1 reduplication with N-Subst. in occupational nouns. I will demonstrate how the interaction of these two rules can be handled as a case of over-application, using the

transformational formulation of N-Subst. that was argued for in section IA. The proposed transformational rule simultaneously deletes the final nasal of a prefix and replaces the initial obstruent of the stem with the homorganic nasal.

295. /mang-tahi?/

ma-nahi? 1. N-Subst.

sew (many things/professionally)

If the form has undergone reduplication, the portion of the N-Subst. rule that changes the stem-initial obstruent to a nasal must over-apply; though the initial obstruent of the original stem no longer meets the S.D. of the rule, the corresponding segment in the copied material does, and so N-Subst. can apply to both.[10]

296. /mang-tahi?/

mang-tatahi?	1.	R1 Reduplication
ma -natahi?	2.	N-Substitution
n		(over-applies)

mananahi?
seamstress

However, for all the power of these devices that Wilbur proposes to add to the theory, they will not handle the relation that we have shown to hold between syncope and

reduplication. When a disyllabic stem undergoes both syncope and R2 reduplication, the underlyingly third syllable is copied. Since R2 copies only two syllables, if it precedes syncope, it will never copy an underlyingly third syllable. Allowing syncope to over-apply as shown in (297b) does not remedy the situation.

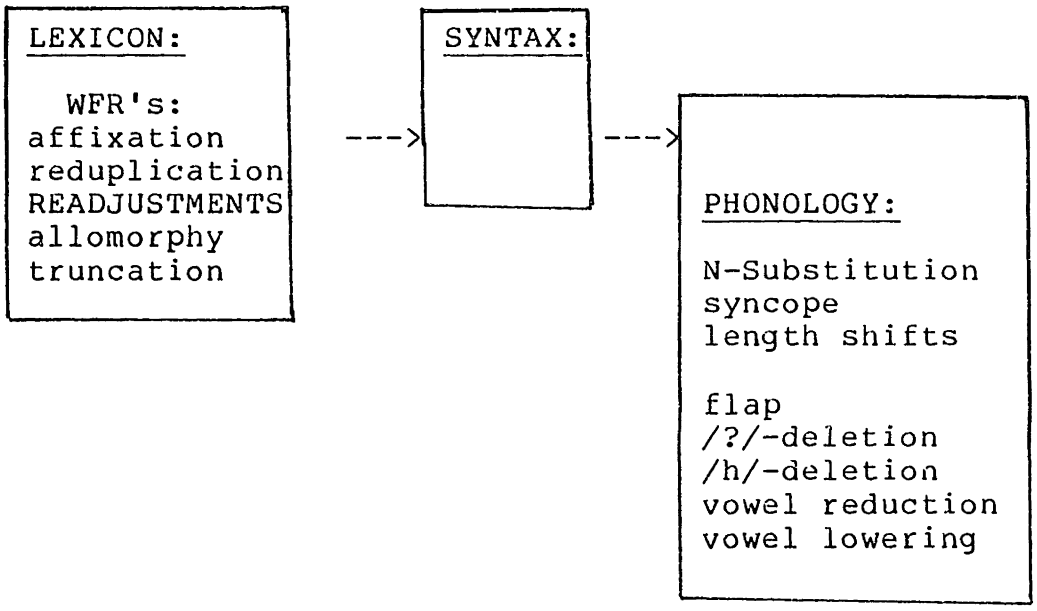
297a. /sunud-in/		b. /sunud-in/	
sund-in	1. Syncope	sunudsunud-in	1. R2
sundinsundin	2. R2	*sunudsundin	2. Syncope
		*sundsundin	(overapplies)

I conclude that the only way to handle the interaction of reduplication with N-Subst., vowel syncope and verbal length shift is to allow reduplication rules to apply after them, as originally proposed.

Implication of the Ordering of Reduplication

If N-Subst., syncope, or the various length shifts discussed in Section I are phonological rules, then the relationship that we have assumed to hold between the different rule components of grammar, illustrated in (298), is incorrect; it is not possible to place reduplication in the leftmost box while N-Subst., syncope, and length shift are in the rightmost box.

298.



(298) represents the claim that the rules of two components interact only insofar as the output of one block of rules is the input to the next. A rule of one component cannot be interspersed with the rules of another. This claim is a restrictive one, since is limits possible rule orderings.

If reduplication in Tagalog forces us to modify the theory to allow WFR's to be interspersed with phonological rules, we will also be forced to modify related assumptions about the lexicon, lexical insertion, and underlying representations. We assume that the words that are listed in the lexicon are complete with respect to the word formation rules; that is, they contain all of their affixes. Furthermore, we assume that these affixes consist of fully specified phonological segments rather than abstract morphemes that are devoid of phonological content, or archisegments. But if reduplication morphemes cannot be spelled out until

after the application of certain phonological rules, reduplicated words cannot be listed in the lexicon.

It might be the case that certain classes of words should be excluded from the lexicon independently of this problem. Two proposals have been made along these lines. The view put forth in Aspects (Chomsky 1965) and SPE (Chomsky and Halle 1968) is that syntactic (inflectional) features such as [+past tense] and [+passive] are generated by the phrase structure rules or added by transformations, and so are spelled out or incorporated after syntax. One might therefore propose that no inflected forms are listed in the lexicon. If all productive reduplication rules in Tagalog were inflectional, this view of inflectional word formation would offer an explanation as to why these WFR's in particular can have this late ordering; inflectional WFR's do not in any event apply in the lexicon. (However, for even this explanation to go through, the claim that inflectional WFR's follow the syntax would have to be modified to allow at least some WFR's to follow some phonological rules as well.)

However, aside from this further difficulty, this line of argument will not work. There are WFR's involving reduplication which are clearly derivational, but which must be ordered after some phonological rules. For example, R1 is involved in the derivation of occupational nouns from verbs.

299a. (mag-)limbag ---> mang-R1-limbag (=man-lilimbag)
publish publisher

b. (-um-)tahe? ---> mang-R1-tahe? (=ma-nanahe?)
sew seamstress

Thus, on the above account, derivationally formed words such as (299a-b), as well as inflected forms, must not be listed in the lexicon. So the division between derivation and inflection does not help us.

Aronoff (1976) proposed that a different class of words should be excluded from the lexicon, namely those whose semantics, syntax, and phonology are all totally predictable from information already listed in other lexical entries. We might look to this claim for an explanation for the ordering of WFR's involving reduplication. If the output of reduplication rules were always totally predictable, then according to Aronoff's Partial Listing Hypothesis (see Chapter 1), their outputs would not be listed in any event. But such an explanation does not seem possible. First of all, it doesn't seem that all reduplicated words are entirely semantically predictable from the words they are derived from. For example the meanings of nouns derived by the mang+R1 occupational noun formation are not always transparent. Perhaps the best characterization of the meaning of the output is the one given by Schachter and Otanes (1972:103): "a

person associated with what the base designates." But in some cases, (e.g. 299'a) the association is a professional one, while in others (e.g. 299'b) it is not. Derivational mang+Rl nouns are perhaps the least semantically predictable of the categories that undergo it. If the semantics of (299'c) were anything like that of (299'a), we might expect it to mean "statesman" or "politician".

299'a.	ma-nananggol lawyer	(tanggol) defend
b.	ma-gingibig lover	(?ibig) love
c.	mam-babayan citizen	(bayan) country
d.	ma-mamahayag reporter	(pahayag) announcement

Furthermore, it seems wrong to claim that no reduplicated words can ever be listed in the lexicon. This would be to claim that reduplicated words are different in a fundamental way from words derived by affixation. They cannot drift semantically or take on the type of idiosyncrasy that would require them to be listed.

So regardless of which class of words one might want to exclude from being listed in the lexicon--inflectionally derived words or predictable words--some reduplicated words in Tagalog should be listed. The fact that reduplication must

follow some phonological rules would be a problem, then, since phonological rules do not apply within the lexicon.

Besides precluding that some or all reduplicated forms cannot be listed in the lexicon, the ordering problem has consequences for lexical insertion. Since some words are not formed until after the application of certain phonological rules, lexical insertion cannot apply until after the application of these phonological rules. Finally, there can be no single level of underlying representation which is the output of the syntactic and readjustment components, and which is the input to the phonology.

Ideally, whatever way we propose to handle the interaction of reduplication with the rules described in Section I will enable us to maintain restrictive claims concerning the interaction of phonological and morphological rules. It is also desirable that it enable us to maintain a level of underlying representation as well as a unified principle for determining when words are listed in the lexicon.

Solutions to the Ordering Problem

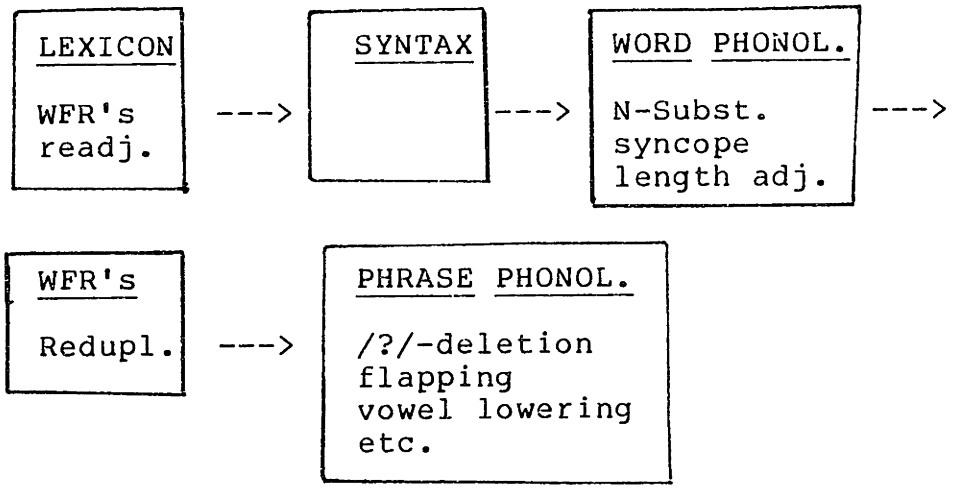
If the facts of Tagalog did force us to abandon the claim concerning the possible interactions between phonological and morphological rules, we might abandon all hope of using rule type to predict rule ordering, and simply propose that

morphological and phonological rules are freely interspersed. This proposal has in fact been made by Steven Anderson in a 1975 article.

The free interspersal theory may, in the end, turn out to be the correct one. But there are two other proposals which differ less radically from the standard claim, which are compatible with the Tagalog facts and still make some predictions as to what kinds of rule orderings we should expect to find in language.

We might propose that WFR's can only apply at specific, independently motivated breaks in the phonology, say between the word-level and the phrase-level phonology. Adopting this proposal would mean claiming that N-subst., vowel syncope, and the various length adjustments that precede reduplication are word-level rules, while /?/-deletion, flapping, etc. are phrase-level rules.

300.



A second possibility is that reduplication rules apply at a break between readjustment rules and phonological rules. Thus reduplication rules could apply within the lexicon. According to this solution, N-Subst., syncope, and length adjustments must be readjustment rules in the lexicon. It does not really require any modification of the theory that is not motivated independently of the way reduplication behaves in Tagalog. It was argued in Chapter 1 that words that are listed in the lexicon are listed in their readjusted forms. So if a WFR involving reduplication applies to a listed word, it is applying to a readjusted word as well.

Proposals such as the two immediately above are meaningful or testable only if we have a hard-and-fast typology of rules already motivated. Otherwise every time we meet a problematic case, where reduplication has an ordering our theory says it shouldn't have, we could simply shove the problematic rule into a new, previously unknown component. Nor, hopefully, are our definitions of the various rule types so vague as to allow us to say that the problematic rule belongs to whatever component we need it to belong to in order to preserve our claim.

There are formal differences between the rules that precede and the rules that follow reduplication, a fact that would be entirely accidental in a free interspersal theory. These differences suggest that the second of our two versions

of the restricted interspersal theory is correct: reduplication applies after allomorphy rules, but before the phonology.

All of the rules that precede reduplication have morphologically restricted environments. They are triggered either by a morpheme or by a WFR. (Evidence that syncope is restricted to apply only in certain word formations is not as firm as we would like it to be. See discussion of individual rules above.) In addition, the targets of syncope and N-Subst. are lexically restricted, so these both qualify as allomorphy rules according to Aronoff's strict definition (environment and target are morphologically restricted). And while none of the length adjustment rules have morphological restrictions on their targets, some of them do have environments that are totally morphological in the sense that there is no phonological material anywhere in the environment that could be triggering the rule.[11] It is the word formation itself that is the environment for these adjustments. If we adopt my weaker definition of allomorphy--those rules whose environments are morphological, regardless of whether or not the targets are restricted--then the length shift rules are allomorphy rules. The alternative--to say that some rules that belong to the phonology proper have no (phonological) environments--seems very undesirable. I will assume, then, that all the rules that precede reduplication are allomorphy rules.

On the other hand, none of the rules that follow reduplication have morphological environments. In fact most of them are totally automatic rules. There are two rules, though, that do have morphological restrictions on their targets; vowel lowering and flapping apply only to certain stems. Vowel lowering is clearly a late phonological rule. It specifically refers to "phrase-final position". The case for flapping is not so clear. But its environment is not morphologically restrictd, which by our definition excludes it from being allomorphy. Furthermore, it applies across clitic boundaries in many dialects, as well as within words.

I conclude that flapping belongs to the phonology proper. Many of the automatic rules are late in the sense that they apply above the word level--across clitic boundaries. For example, phrase-final /h/ and /ʔ/ deletions apply before enclitic particles (see Section ID).

So a restricted interspersal proposal is preferable to a free interspersal proposal, not only because the latter makes predictions about what kinds of rule interactions are possible, but also because it offers an explanation for the particular rule interactions that we find in Tagalog.

If all the rules that precede reduplication are readjustment rules, then one of the problematic properties of reduplicated forms disappears. We argued that words are

listed in their readjusted forms (see Chapter 1). N-subst., syncope, and length adjustment rules in conjunction with WFR's are redundancy rules that relate the already adjusted forms to words they are derived from. So mamulah ("turn red") is listed as /ma-mulah/, and not /mang-pulah/. And the moderative verb formed from it by R2 reduplication can also be listed as /ma-mulahmulah/. Thus it seems that reduplicated forms can be fully spelled out in the lexicon, and inserted into syntactic deep structures. (We will argue in Chapter 5 that reduplicated material is not actually spelled out in the lexical entries for reduplicated words, although it is spelled out prior to lexical insertion.)

Given our conclusion that all the rules that precede reduplication are allomorphy rules, it would not be a difficult problem if any of the rules that have to follow reduplication (say, for example, flapping) were also allomorphy. We would simply have to allow reduplication rules to be interspersed with allomorphy rules. Reduplication would still apply within the lexicon. But given our second conclusion that all the rules that follow are phonological, it is possible to make a more interesting claim: Within the lexicon, reduplication rules are distinguished and strictly segregated from allomorphy rules. We will support this claim in Chapter 3, and again in Chapter 5.

Footnotes to Chapter 2

1. Besides having no lexical exceptions, regressive N-assimilation may apply in syntactically derived environments. In informal speech, the final /ng/ of the topic case marking particle ?ang assimilates in place to the initial non-syllabic of the following word.

a.	b.	c.
am#paruparo?	an#sakay	ang#kuko?
topic#butterfly	topic# passenger	T #fingernail

If so, the obstruent-deletion analysis below is even more suspicious because it would require an allomorphy rule to apply after a rule that applies at the level of syntactic phrases. However, it is perhaps not completely clear that the same rule of regressive assimilation is involved since /ng/ assimilates to /w/ and /y/ and /m/ and /n/ across clitic boundaries but not within a word.

d. an#yõyo?	e. mang-yarih
T#yoyo	ST-happen
f. am#walis	g. mam+walis
T#broom	ST-hit with a broom
h. am#manggah	i. pang-mumog
T#mango	Instrument-gargle (for gargling)

2. The subjacency principle (proposed by Siegel (1977) and Allen (1978) and to be discussed in Chapter 5) can not be what is blocking syncope in (98). The triggering V bracket is not subjacent to the stem to be syncopated. But forms such as the following one show that the trigger and target do not have to be in subjacent cycles in order for syncope to apply. (The morphological structure of this example is motivated in Chapter 4.)

$$[_V\ [_V \text{pag}\ [_V \text{buk}\ \text{s}\ ]_V\ ]_V \text{an}\ ]_V$$

open (in/at) (bukas) open

3. /ng/ does not, however, assimilate to a preceding coronal obstruent inside stems which consist of reduplicated monosyllables: ngitngit ("anger"); ngasngas ("scandal created by gossip"). But since this type of reduplication is not productive, it could be argued that this only shows that regressive nasal assimilation can only apply in derived environments.

4. To talk, as we are, of length which is determined entirely at the word level is somewhat of an abstract. Vowel prominence (length, pitch, or both) is determined by an interaction of length determined at the word level, lengthening by phonological rules (to be discussed (Section ID of this chapter), and various rules that apply at the phrase level, eg. the mapping of intonational contours, the lengthening of phrase-final syllables, etc. I will follow Schachter and Otanes (1972: 41) (and differ from many other accounts) in separating phrasally determined length from other length; furthermore, in assuming that stem final syllable (or any closed syllables for that matter) in native stems are never long. They bear a tone in an intonational melody or are lengthened, only by virtue of their position within the phrase. (The citation forms of words are one-word intonational phrases and so can receive phrasally assigned length or tones.) Throughout this section I will only be talking of length that does not depend on position within the phrase.

5. Closed syllable shortening must not apply in non-derived environments, that is in those foreign loans which have length in closed syllables underlyingly.

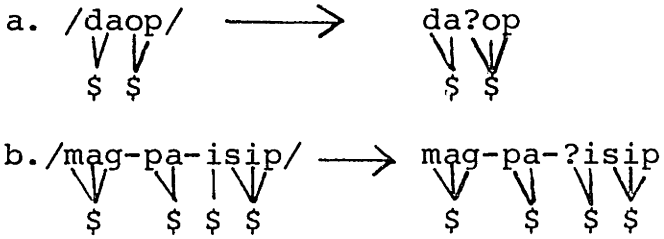
a.	b.	c.
kẽndih	balũn	mag-plãntsah
candy	baloon	iron

6. One way of looking at the verbal length shift would be to say that the derived verb retains the length pattern of the base verb, ie. that the verb has penultimate length in all its inflected forms. It is not clear at this point how to formulate such a proposal.

There are exceptions to verbal length shift. These are cases in which the long penultimate syllable is closed: mag-plãntsah ⟶ plantsah-in ("iron").

7. Other rules fed by /?/ deletion will not be discussed because they do not interact with reduplication.

8. Bloomfield (1917) and Llamzon (1970) both put forward an epenthesis analysis of syllable-initial /?/ as well as an epenthesis analysis of syllable-final /h/. But in terms of syllable structure, the environment of /h/-epenthesis as it applies in (223) is indistinguishable from the application of /?/-epenthesis in (a) and (b) below:



So both /?/-epenthesis and /h/-epenthesis apply in cases where they have the effect of separating two contiguous vowels. In both cases the epenthesized segment is syllabified with the following vowel. What distinguishes whether /?/-epenthesis applies or whether /h/-epenthesis applies is the position of the two vowels withing the stem.

9. Some foreign loans more commonly have the palatalized consonants. These are spelled "ts" or "ch": č̆a ("tea"); č̆an ("Chan"). But in the dialects which lack /č̆/ even on the surface, replace it in these lexical items with /ty/. I will assume that all palatalized consonants are derived, though there are some consonant-/y/ clusters that are present underlyingly.

10. The analysis of N-substitution that Wilbur actually gives is similar to the nasalization proposal above.

/mang-tahi?/	
man- tahi?	1. Regressive nasal assimilat.
man- nahi?	2. Nasalization
ma - nahi?	3. Degemination

Here analysis has the same problem as the nasalization analysis in dealing with nasal initial stems. A problem it shares with the obstruent deletion proposal is that it requires a purely phonological rule (regressive nasal assimilation to be ordered before a morphological one (nasalization). Since they way our transformational rule of N-substitution would have to overapply is the same in all respects to the way Wilbur's nasaization rule would, I use it to consider

her proposal.

11. Or to which a minor rule feature could be appended to for that matter.

CHAPTER 3

Refining our notion of allomorphy rule alone will not completely explain the behavior of reduplication rules in Tagalog. Reduplication rules exhibit other properties that make them exceptional as WFR's. In the following sections I will describe these properties and propose that they justify assigning reduplication to a special subcomponent of the lexicon.

I. Other Exceptional Properties of Reduplication Rules

IA. The Necessity of Formulating Reduplication Rules as Transformations

One property of reduplication rules in other languages, as well as Tagalog, that distinguishes them from other WFR's, is that they do not specify an affix of constant phonological shape. The segmental composition of reduplicative "affixes" depends on the segments of the base word being copied. The number of segments copied and, for R2 reduplication, the length of one of the copied vowels, can also vary depending on the phonological shape of the stem. I will here argue that this particular brand of base-dependency forces us to formulate reduplication rules transformationally.

The number of segments and the length of the vowel in an Rl copy is fairly constant; usually only the first consonant and vowel of the stem are copied. And the vowel is always short, regardless of the corresponding vowel in the base.

1a.	kandīlah "candle"	--->	b.	pag-ka-kandīlah "candle vendor"
2a.	(um)-lākad "(ST)walk"	--->	b.	pag-la-lākad "walking" (gerund)
3a.	(um)-sunod "(ST)obey"	--->	b.	pag-su-sunod "obeying" (gerund)

If the Rl reduplication can refer to the first consonant and vowel of the stems in (1-3) and specify that they are both copied, we can handle the base-dependency of the reduplicated material. Notice that, because the length of the vowel of the copy is independent of the base word and has to be specified as short by the reduplication rule, the CV to be copied cannot be analyzed as a single term in the rule, as shown in (4a). Rather, they must be referred to individually as shown in (4b).

4a. $\underset{\underset{1}{\smile}}{CV}$ ---> 1, 1

4b. $\underset{1}{C}\ \underset{2}{V}$ ---> 1, $\underset{[-long]}{2}$, 1, 1

Similarly, RA reduplication will copy only the first two segments of the word's stem, even if they are only part of a syllable. But unlike R1, the vowel of the RA copy is always long, regardless of the length of the vowel that it copies.

5a. mag-linis "ST-clean"
b. mag-lī-linis "ST-will clean"

6a. t-um-akboh "run-ST"
b. t-um-ā-takboh "will run-ST"

7a. gupit-in "cut-OT"
b. gū-gupit-in "will cut-OT"

8. RA Reduplication (preliminary formulation)

$$C\ V \longrightarrow 1,\ 2\ (+long),\ 1,\ 2$$
$$1\ \ 2$$

The phonological shape of the material added by R2 reduplication rules is dependent on the phonological shape of the stem to be copied in an even more striking way. It has been shown above (Ch. 2, IIB) that R2 always copies the length of the first vowel of the stem. So, in (9a), the first vowel of the copy must be long because the corresponding vowel in the original is long. Similarly, the first vowel in the copy in (9b) must be short.

9a. mag-linis-linis
"ST-clean a little"
(R2=C$\bar{V}$CVC)

b. mag-walis-walis
"ST-sweep a little"
(R2=CVCVC)

Secondly, the number of segments in the R2 copy is entirely dependent on the phonological shape of the original. The entire first syllable is always copied, so the R2 copy contains two consonants between its two vowels when the first syllable of the original is closed as in (10a-b). But R2 contains one consonant between its vowels in cases such as (9a-b).

10a. pantay-pantay
thoroughly
level
(R2=CVCCVC)

b. tingnan-tingn-an
"look at a little-OT"
(R2=CVCC+VC)

Finally, R2 may or may not copy the consonant following the second vowel depending on whether or not that consonant is followed by a morpheme boundary. In (10b) the consonant following the second vowel is suffix-final, and in (9b) the consonant following the second vowel is stem-final. Both are copied. Even where the stem-final consonant is syllabified on the surface with the following vowel, as in (11), it is

copied.

11. lī̆nis-lī̄nis-in
"clean a little-OT"

On the other hand, in trisyllabic stems, R2 copies only up to the vowel of the second syllable, even when it must break up a syllable to do so. The second copied vowel is long if it is in a closed syllable, regardless of whether or not the corresponding vowel in the original is also long.

12a. tahī̄-tahimik "rather quiet"
b. balī̄-baliktad[l] "all topsy-turvy"
c. ma-talī̄-talī̄noh "rather intelligent"
(R2=CVCV̄)

If reduplication rules can refer to the segments that make up the base stem and specify that they are copied, then it is possible to formulate a single, uniform R2 reduplication rule that copies the correct segments and number of segments in each of the cases in (9-12). The fact that the final vowel of the R2 copy may or may not be long need not be specified as a base-dependent property: If R2 reduplication always adds length to the second vowel of the copy, an independently needed rule of closed syllable shortening (see Chapter I, Section IC) will shorten the second vowel in examples (9-10).

So R2 is like RA and R1 in that it specifies a constant length for its final vowel. Consequently, the vowel must be a separate term in the structural description of the rule, in order that the feature [+long] may be added to it in the structural change.

13. [CVCo V (C+) X
stem
1 2 3 4 ---> 1, 2 [+long], 3, 4, 1, 2, 3, 4

In order to accommodate reduplication rules, Aronoff (1976) proposed that all WFR's, even those which add phonologically constant affixes, are formulated as transformations. But, as we shall see, reduplication has several strange properties; instead of proposing a major modification in the lexicon for each one, it would be preferable to find a single solution that explains why all these exceptional properties cluster together.

Furthermore, allowing morphological rules to make use of transformational apparatus greatly increases the power of morphological theory. Even if we are correct that this enrichment is necessary, it would be preferable to predict that it is available only to a certain formally isolable subclass of rules.

IB. Word Internal Modification and Proper Bracketing

Normally we think of words as being built like onions: affixes are added to the outside of a word layer by layer, each within its own set of brackets. So successive WFR's add layers of brackets. And the linear order of successively added prefixes (or suffixes) reflects the order of their affixation.

Tagalog reduplication rules violate this generalization in an extreme way. Of many WFR's involving reduplication we could with very little difficulty say that the WFR adds reduplicated material only in its own brackets; for example in (14) and perhaps even in (15), where a prefix is added as well:

14. [bagu?] ---> [bagu? [bagu?]]
A A A A A A
"new" "rather new"

15. [kandīlah] ---> [mag+ka [kandīlah]]
N N N N N N
"candle" "candle vendor"

There are cases where it appears that reduplication actually has to go inside already attached affixes to do its work. For example, comparative adjectives formed with the prefix ka+sing can be pluralized by R1-reduplicating the stem. The reduplicated syllable has to be inserted inside the already

affixed ka+sing. Given standard assumptions about the bracketing of derived words, it is not clear how the derived word is to be bracketed. If each bracketed string is a word, and the output of every WFR is a fully formed word, then it is not possible to enclose the reduplicated stem in a new set of brackets; *tatalīnoh in the example below is not even a word.

16. [(ka)+sing [talinoh]] --->
A A A A
"as intelligent as (sg.)"

[(ka)+sing [ta [talīnoh]]]
A ? A A ? A
"as intelligent as (pl.)"

IC. Insensitivity to Morpheme Boundaries

Another surprising property of reduplication rules is that while they are quite particular in morphological terms about where they start copying (usually the first vowel of the stem is the first vowel copied), they do not care whether or not the remaining segments that are copied belong to the same morpheme. For example, in (17), where the verb has been derived from an adjective which in turn was derived by prefixing ma+ to the noun dunong, the first syllable copied by R2 belongs to the prefix but the second syllable belongs to the root dunong. So R2 crosses a morpheme boundary.

17. [mag [ma [dunong]]]
V A N N A V

R2

mag-marū-ma-runong
"pretend to be rather wise"

Likewise, when RA reduplication applies to a verb whose stem contains the infix -um-, the first vowel of the infix is copied. Again, for the purposes of the reduplication rule, the infix is analyzed as part of the verb's stem.[2]

18. [nag [um [tirah]]] --->
V V V V V V

nag-t-um-irah --->
RA

nag-tū-t-um-irah
"will keep on living at"

Other cases where reduplication crosses morpheme boundaries are even more striking. For example, when intensive R2 reduplication applies to verbs whose topic marker is a prefix, the stem but not the prefix is reduplicated. The fact that the stem is still reduplicated even when the topic marking affix is a suffix shows that reduplication is indeed locating the stem and not simply starting a certain number of syllables from the left edge of the word.

19. [mag [linis]]
V V V V V
R2

mag-linis-linis
"clean a little (ST)"

20. [[linis] in]
V V V V
R2

linis-linis-in
"clean a little (OT)"

Now in those cases where syncope has eliminated the second syllable of the stem, reduplication copies the topic marking affix.

21. [[sunud] in] ---> sundinsundin
V V V V "obey somewhat"
R2

One can only conclude that reduplication rules must be formulated in such a way that they are sensitive to the distinction between topic marking affix and stem for the purpose of locating the left edge of the string to be copied, but they do not care whether or not the following segments that they copy belong to the stem or not.[3]

22. [[CVCV(C+)
V Stem

ID. Splitting WFR's

Certain WFR's which involve both affixation and reduplication must be split into two subrules because reduplication has to apply after the affixation in question. One example is the formation of occupational nouns from verbs which involves prefixing mang+ and adding an R1 copy to the stem. R1 reduplication must apply after N-substitution because in case N-substitution has applied, reduplication copies the assimilated nasal. Yet mang+ prefixation must precede N-substitution because its final nasal is what triggers N-substitution. Thus the two reflexes of the mang+ occupational noun formation must be split apart, with an allomorphy rule applying between the two subparts. This means that there is an intermediate stage in the derivation of occupational nouns (the asterisked form) when they are not fully formed with respect to the word formation component.

23. (um) [tahi?] --->
V V

*[mang [tahi?]] ---> 1. mang-prefixation
N V V N

ma-nahi? ---> 2. N-substitution

manahi? 3. R1 reduplication

"seamstress"

A second example is the moderative verb formation that involves R2 reduplication and optional loss of penultimate length in the stem (see Chapter 2, Section IC). This length loss has no phonological conditioning. It is totally dependent on the moderate verb formation and so could be considered part of that WFR, rather than a phonological rule. But although length loss and R2 reduplication mark the same word formation, length loss must be separate from R2 reduplication. This is because the penults of the copied and the original material must be identical, a fact that can be handled by ordering reduplication after length loss, as shown in (24). If the option to remove length is taken, the penult of both the original and the copied material must be short. If the length loss option is not taken, both penults must be long. Forms in which the two penults are not identical are ungrammatical.

24a. [mag [līnis]]
V V V V

a. -----	b. mag linis	1. Length Loss
maglīnislīnis	maglinislinis	2. R2 Redup.

{*maglīnislinis / *maglinislīnis}

Finally, there are word formations which involve both affixation and reduplication in which the affixed material itself can be reduplicated and therefore attached before reduplication. For example, causative adjectives are formed by adding na+ka and an RA copy to a noun or verb stem. RA can apply to reduplicate the newly added ka.

25. [ʔantok] --->
N N
"sleepiness"

[na+ka [ʔantok]] ---> 1. Prefixation
A N N A

na kāka ʔantok 2. RA Redup.
"causing sleepiness"

(*naka?antok)

Aronoff (1976) has proposed as a constraint on the WF component that the output of every WFR is a word (lexeme or lexical entry). Such a condition would mean that WFR's simultaneously specify the conditions in the base word, the phonological operation it performs (which is usually affixation), and the change in meaning and syntactic category. The fact that the above word formations involve two phonological operations which have to be stated separately goes against this picture and pushes us to a less desirable one. They suggest that perhaps the outputs of some WFR's are non-words--perhaps with no meaning.

The properties of reduplication rules discussed in this section, when taken together, make it difficult to account for them as WFR's. In the next section, I will give arguments that reduplication rules should in fact be extracted from WFR's, and treated as readjustment rules.

II. Reduplication Rules as Readjustment Rules

I would like to propose that reduplication rules do not conform to our normal conception of WFR's because they are not WFR's; they belong to the class of readjustment rules. WFR's do not have access to transformational apparatus. (Perhaps all base-dependent processes are excluded from WF?) They concatenate constant affixes that could just as well be specified in totally abstract terms--that is, no reference has to be made to phonological information in order to specify what affix a particular WFR attaches.[4] These affixes can only be added to the outside of the base word and the derived word is a properly bracketed string. Readjustment rules are not subject to these restrictions.

Aronoff (1976) proposes two classes of readjustment rules: truncation rules and allomorphy rules, which have been discussed and modified in Chapter 1. What these two classes

have in common is their morphological conditioning; they apply in specific morphological environments. They differ in the type of structural change they can specify. Truncation rules delete an entire morpheme in the environment of another morpheme. Allomorphy rules, on the other hand, usually look very much like phonological rules. Their structural change is specified in terms of segmental features.

IIA. Similarities between Reduplication Rules and Allomorphy Rules

There are several similarities between allomorphy rules and reduplication rules, which suggests perhaps that reduplication rules are allomorphy.

First, allomorphy rules, like reduplication rules, specify base-dependent processes. The phonological shape of their output depends partially on the phonological shape of their input. Consider the allomorphy rule in English, discussed in Chapter 1, that voices final fricatives in the plural of only certain nouns, e.g. calf ---> calves. The segment resulting from the voicing rule when it applies to calf is /v/, but it is /d/ when the input is wreath, and /z/ when the input is house.

Second, both allomorphy rules and reduplication rules must be stated separately from the WFR's that trigger them. I argued in Chapter 1 that this was true of the voicing rule in English because more than one WFR triggers it. Voicing applies not only in the plurals of nouns, but in the verbs derived from those nouns, e.g. to calve. This can be expressed only if we extract the voicing rule from both WFR's.

A similar argument can be made for reduplication rules in Tagalog. For ease of exposition, I said I would talk about three types of reduplication which I defined in terms of the phonological shape of the copy that they added:

R1 = CV

RA = $C\bar{V}$

R2 = $CVCo\bar{V}(C+)$

But we noted that in fact RA, for example, actually shows up in more than one WF. Furthermore, it shows up in both derivationally and inflectionally derived words.

27.	ma-tahimik ---> "become quiet"	ma $t\bar{a}$ tahimik "will become qu." (durative aspect)	(inflection)
28.	?antok ---> "sleepiness" (noun)	na $k\bar{a}$ ka ?antok "causing to become sleepy" (adj.)	(derivation)

So I used the labels "RA", etc., as abbreviations for several

rules. But if reduplication rules are separated from WFR's which create their triggering environments, like all readjustment rules, we can in fact handle all productive reduplication with only three rules. In doing so, we are claiming that a single rule can be triggered by both derivational and inflectional environments.[5]

Tagalog happens to provide a different kind of evidence for splitting a process from tne triggering WFR in this way--a type that English does not provide. Consider the occupational noun formation which derives nouns from verbs by prefixing mang and Rl-reduplicating. We said that this WFR nad to be split in two because N-substitution applies between prefixation and reduplication. This is true regardless of whether all three apply as redundancy rules, (in which case ma-nanahi? ("seamstress") for example, is listed in the lexicon), or whether they apply generatively.

29. /ma+nanahi?/ (listed form)

ma+ nahi?	1. Rl
mang+tahi?	2. N-substitution
tahi?	3. Mang- occupation noun prefixation

(read up)

The fact that the Rl rule has to apply separately from the prefixation of mang- is no longer a problem if Rl is a

readjustment rule. It is no more part of the WFR than N-substitution is. The only thing that examples such as mananahi? would show is that allomorphy rules can apply to each others' output, and, furthermore, that they must be ordered.

IIB. Why Reduplication Should be Distinguished from Allomorphy

In spite of the above similarities between reduplication rules and allomorphy, there are at least two important differences. A serious objection to considering reduplication rules to be allomorphy rules is that although both specify base-dependent processes, only allomorphy rules resemble phonological rules with respect to their structural change. In fact, it is likely that many or most allomorphy rules were phonological rules whose conditions have at some point become morphologized. But reduplication rules cannot be phonological rules that have strayed into the lexicon. There are simply no phonological rules that epenthesize four, five or six segments. In this respect, if reduplication rules are readjustment rules, they line up with truncation rules. Although there are phonological rules that delete single segments, there are none that delete long strings of segments, as a truncation rule does.

Reduplication rules differ from both truncation and allomorphy rules in that they are not conditioned by the idiosyncrasy of particular morphemes. As discussed in Chapter 1, separating allomorphy from Word Formation allows a more general formulation of WFR's as well as of allomorphy. For example, it is possible to derive the following -ion nominals by a single -ion affixation rule if the changes that apply to the morphemes merse, vert, and ceive before -ion are handled by separate rules.

31a. immerse b. immersion

32a. subvert b. subversion

33a. conceive b. conception

Extracting allomorphy from the WFR itself makes it possible to distinguish those properties of derived words that are widely shared from those properties that should be attributed to idiosyncrasy of the component morphemes. The same basic argument can be made for certain truncation rules: If there is a rule that truncates the morpheme ate before the suffix -ee (in English) then the same WFR that derives nouns such as payee and employee from the verbs they contain, pay and employ, will also handle nouns such as nominee.

In contrast, whether or not a particular reduplication rule applies is entirely dependent on a WFR. There are morphological conditions governing what words a WFR can apply to, and these probably refer to classes of morphemes. But if a certain WFR involves reduplication, all of its bases will be reduplicated. There are no cases where only [+native] stems, for example, are reduplicated. So there is a real sense in which reduplication rules are triggered by WFR's. While the application of an allomorphy or truncation rule in a given case is governed by some abstract feature of the morphemes involved, WFR's must actually supply the abstract feature that marks the derived word as subject to reduplication.

I propose, therefore, that there is yet a third class of readjustment rules. The abstract morphological features that govern the application of these new readjustment rules are distinct from the morphological features that govern allomorphy and truncation in two ways: they are supplied by WFR's rather than being inherent properties of morphemes; and they trigger their own kind of phonological operation.

We have already illustrated the sort of phonological change specified by Tagalog reduplication rules, and the transformational apparatus they require. In Chapter 5 we will discuss the morphological conditions on these rules; where in

the word and how they are attached by WFR's; and how the triggered reduplication rules refer to them. In addition we will discuss where in the lexicon they apply--whether they apply as cyclic redundancy rules, alongside the allomorphy and word formation rules, or whether they apply in an isolated block, at some later point in the derivation of words. In order to do this, it is necessary to motivate a morphological analysis of verbs. This is the task of Chapter 4.

Footnotes to Chapter 3

1. The contrast between sunudsunudin and balībaliktad shows that R2 reduplication does not copy syllables. In the former, the consonant following the second vowel is copied even though it is not syllabified with it. In the latter, the following consonant is part of the second syllable, yet it is left behind.

2. In Chapter 4 it is argued that infixes are really prefixes that are later metathesized with the first consonant to their right. To derive nag-tūtumirah from nag-um-tirah, it is necessary to assume that the infix is in its metathesized position before reduplication applies.

3. Below I propose that reduplication is carried out by two rules: a WFR that attaches an abstract feature and a copying rule that is triggered by that feature. In Chapter 5 it is argued that the WFR that attaches the feature that triggers R2 in examples (19)-(21) actually applies to the stems before the topic marking verbal affixes have been added, eg. to sunud rather than sunud-in. So the WFR does not have to distinguish stems from their topic marking affixes at all. But under this analysis, (21) is still surprising. Even if the suffix -in is not present at the time the triggering WFR applies, it certainly must be when the reduplication rule applies. A more detailed discussion of this is in Chapter 5.

4. I do not mean by this to exclude the possibility that there are phonological conditions on the base of certain WFR's of the sort discussed by Siegel (1971).

5. The fact that derivational and inflectional WFR's trigger the same reduplication rules might be taken as an argument for doing inflection in the lexicon.

CHAPTER 4

The Morphological Structure of Verbs

One of the purposes of this chapter is to lay out the behavior of RA reduplication as it applies to mark aspect in verbs, so we can formulate the RA rule in Chapter 5. RA reduplication makes a distinction between two types of verbal stems: those which allow RA reduplication to apply, which will be called V' stems; and those which do not allow RA reduplication to apply, which will be called V stems.

The distinction between V' and V stems is one that figures into other morphological and syntactic processes as well. V' stems are complete words in the sense that they can occur in sentences. They contain an affix, called a V', topic-marking (TM) affix, which signals the grammatical relation of the topic of the sentence. V stems are incomplete. They require a TM affix before they can occur in a sentence. Finally, the difference between V and V' in most cases clearly follows the traditional distinction between derivation and inflection: V stems are uninflected words or lexemes. Furthermore, the derivation of a new V stem usually involves meaning and/or subcategorization changes which we would expect of a derivational WFR.

If it is correct that V affixes are derivational, but V' affixes are inflectional, a further observation can be derived from the investigation presented in this chapter; derivational and certain inflectional WFR's can apply to each others' outputs. As expected, an inflectional (V') affix can be added to an uninflected (V) stem. But an uninflected stem can be derived from an inflected stem as well (although it will require a V' TM affix before it can actually occur in a sentence).

Finally it will be shown that there is a terminal or double-word boundary layer of inflectional WFR's that do not interact either with the V or the V' WFR's. These final WFR's do make reference to the internal structure of verbs as determined by the V and V' levels, and so must follow them.

I. The Basic Members of Verbal Paradigms

IA. Preliminaries

Before examining the morphological structure of verbs and their representation in the lexicon, we must show how they function in sentences.

All main clauses contain at least a predicate and a nominal complement. (There are a few exceptions involving act-of-nature and weather verbs, which do not take nominal

complements.) One nominal complement is marked as the topic of the sentence: it is the focus of the speaker/hearer's attention. If the sentence has only one nominal complement, that complement is the topic. The topic is introduced by the proclitic particle ?ang if it is a common noun, and the particle si if it is a proper name.[1] The predicate is usually information about the topic which is new to the listener: It can be a nominal, as in (1), an adjective, as in (2), or a verb, as in (3). (The topic is marked "T" in the glosses.)

1. Titser si Juan
   teacher T-Jonn

   John-T is a teacher

2. Takot ?ang bata?
   frightened T-child

   The child-T is frightened

3. S-in-amah-an ng ?anak ?ang lalaki?
   Accompany S-child T-man

   The child tagged along with the man-T

(Word order is in general free, but I will be giving all examples with the verb initial and the topic-marked complement final.)

I will only be concerned with certain morphological properties of predicate verbs which are not shared by nominal and adjectival predicates and which must be specified in the lexical entries of verbs.

Verbs are often subcategorized for more than one noun phrase complement. For example, in (4a) nag-lagay requires a complement introduced by the proclitic case-marking particle ng and a complement introduced by the case-marking particle sa (kay if the noun is a proper name) in addition to the topic, baba?e. I will call ng-complements direct object (DO) complements, and sa (kay) complements indirect object (IO) complements.[2]

4a. nag-lagay ng tubig sa baso ng baba?e
put DO-water IO-vase T-woman

The woman (T) put (some) water in the vase.

Corresponding to (4a) are related sentences in which the DO (4b) or the IO (4c) are marked as the topic. Baba?e, which was preceded by the topic-marking particle in (4a), takes the case-marking particle ng in (4b-c). (Before a proper name this case-marking particle is si.) I will call this ng-complement the subject (S) complement.

4b. ?i-l-in-agay ng baba?e sa baso ng tubig
put S-woman IO-vase T-water

The woman put the water (T) in the vase

4c. L-in-agy-an ng baba?e ng tubig ng baso
put S-woman DO-water T-vase

The woman put the water in the vase (T)

(4a-c) differ as well with respect to the morphological shape of the verb. In (4a), the prefix nag- marks the verb to take the subject complement baba?e as topic. In (4b) the suffix -in marks the verb to take the Direct Object complement as topic, and in (4c) the suffix -an marks the verb to take the Indirect Object complement as topic. In general, a choice of topic from among the nominal complements is reflected by a change in affixation in the verb. Except for the change in topic, (4a-c) have the same meaning.

At this point it might be helpful to distinguish the notion subcategorized complement from the notion topic. By subcategorized complement I mean one which is required by a particular verb in order for a sentence containing that verb to be well-formed; in (5a), for example, fish and Mother are subcategorized, while for Nena is not:

5a. Mother broiled some fish (for Nena)

b. Mag?ī?ihaw ng ?isda? (para kay Nena) ?ang Nanay
will broil-ST DO-fish Benef.-Nena T-mother

Mother (T) will broil some fish for Nena

c. ?ī?ihawin ni Nanay (para kay Nena) ?ang ?isda?
wll.brl.-OT S-mother Benef.-Nena T-fish

d. ?i-pāpag-?ihaw ni Nanay ng ?isda? si Nena
wll.brl.-Ben.T S-mother DO-fish T-Nena

e. ?ikingulat ko
OT-surprise S-I

?ang [pag?i?ihaw ng Nanay ng ?isda? (para kay Nena)]
T-[broiling S-mother DO-fish Ben.-Nena]

I was surprised at [mother's setting aside the fish (for Nena)]-T

Topic, on the other hand, is a marking on <u>any</u> nominal complement, subcategorized or not. Any of <u>Mother</u>, <u>fish</u> or <u>(for) Nena</u> can be the topic of the Tagalog equivalent of (5a) (cf. (b-d), respectively). Topic marking may be thought of as an overlay on the constellation of nominal complements in a sentence, sitting on one of them and replacing its case-marking with topic marking. It is a requirement on <u>sentence</u> well-formedness in Tagalog, regardless of the particular verb (in fact, regardless of whether or not there <u>is</u> a verb in the sentence, cf. (1-3) above). This last point is illustrated by the case of gerunds derived from verbs, which still require their sub-categorized complements to be

well-formed, but do not take a topic (cf. (5e)).[3]

So far we have seen one verb that subcategorizes three complements. The following are examples of verbs that take one and two complements. In the latter case there are two related sentences, since either complement can be topic. As was the case with lagay, the change in topic and the correlated change in verbal morphology do not entail a change in meaning, number of subcategorized complements or semantic relations of those complements.

6. nag-ʔāʔantok ng ʔāsoh
ST-sleep T-dog

The dog is getting sleepy

7a. nag-bukas ng pinto? ʔang bāta?
ST-open O-door T-child

The child (T) opened the door

b. b-in-uks-an ng bāta? ʔang pinto?
open-OT S-child T-door

8a. nag-māmatyag sa ʔāsoh ʔang bāta?
ST-observe IO-dog T-child
cautiously

The child (T) is cautiously observing the dog

b. māmatyag-an ng bāta? ʔang ʔāsoh
ob.caut.-OT S-child T-dog

Note that for at least some cases it will not be enough to specify in the lexical entry of the verb the number of nominal complements it must take. Comparing (7a) and (8a), we see that although both verbs take two complements, mag-bukas takes an object introduced by ng, but mag-matyag takes an object introduced by sa. So a verb must be subcategorized as taking a certain case frame.

The semantic relations borne by each nominal in a verb's subcategorizational case-frame must also be specified in its lexical entry, as part of its meaning, because there is no one-one correspondence between case-marking and semantic relations. In (9) below, t-um-anggap takes the same number of complements with the same case-markings as nag-lagay (cf. (4a-c) above). Yet the semantic functions are not the same. The subject (the noun that takes ng when it is not the topic) of nag-lagay ("put") is an agent, but the subject of t-um-anggap ("receive") is a goal, just as in their English counterparts. Furthermore, the subject of nag-lagay is the source of the motion, while it is the indirect object of t-um-anggap (i.e. the noun marked with sa) that is the source of the motion.

8a. t-um-anggap ng sulat sa Ben si Juan
ST-receive DO-letter IO-Ben T-Juan

Juan (T) received a letter from Ben.

b. t-in-anggap ni Juan sa Ben ?ang sulat
DOT-receive S-Juan IO-Ben T-letter

Juan received a letter (T) from Ben

c. t-in-anggap-an ni Juan ng sulat ?ang Ben
IOT-receive S-Juan DO-leter T-Ben

Juan received a letter from Ben (T)

In general, for each subcategorized nominal that a verb takes, there is a construction in which that nominal is topic, and the verb contains an affix which marks its grammatical relation. The verb takes a distinct affix to mark each of its nominal complements as topic. So the number of forms a verb has is related to the number of subcategorized NP's it takes. In a small number of cases a verb lacks a form corresponding to one of its complements, but in general the number of topic forms and the number of complements a verb takes are equal.[4] A verb certainly cannot have more topic forms than complements. For example, a verb will have an object topic form only if it takes an object complement.

Verbal affixes form classes according to whether they form subject-topic, direct object-topic, or indirect object-topic verbs:

Subject Topic	Dir.Obj.Top.	Ind.Obj.Top.
-um-	?i-	-in
mag-	-in	-an
mang-	-an	
ma-	(ma-)	
maka-		

A verb can only pick one affix from each class. But which affix it picks from each class cannot be predicted on the basis of its subcategorization. The following verbs are all intransitive, yet each takes a different subject topic affix.

Intransitive

l-um-akad	"walk" ST
mag-tagalog	"speak Tagalog" ST
mang-?isda?	"go fishing" ST
ma-basag	"break" ST
maka-ra?an	"be over" ST

The same point holds for the following three sets of verbs. The members of each set have the same subcategorization, but each takes a different subject topic marker.

Transitive

a. Subject + Direct Object

ST	OT	
l-um-unas		"cure"
mag-bukas	buks-an	"open"
mang-?anak	?i-pang-?anak	"give birth to"
ma-ligoh	?i-pa-ligoh	"bathe with"
maka-kita	ma-kita	"see"

b. Subject + Indirect Object

ST	IOT	
p-um-asok	pasuk-in	enter
mag-masid	masd-an	look at
mang-pangino?on	pangino?on	serve
ma-hiya?	hiya?-an	lie down on

c. Subj. + Dir.Obj. + Ind.Obj.

ST	DOT	IOT	
b-um-ilih	bilh-in	bilh-an	buy
mag-?alok	?i-alok	?aluk-in	offer
mang-?ako?	?i-pang-?ako?	pang-?aku?-an	promise

I have included the indirect object and/or direct object topic forms of each verb to show that their affixes also cannot be predicted on the basis of subcategorization.

Nor, for a given verb, can the form of one topic marker be predicted on the basis of the form of another topic marker plus the verb's subcategorization frame. For example, the following three verbs are all subcategorized for a direct object and a subject, and all take the prefix mag- to mark subject topic. Yet each takes a different object topic affix.

9a.	mag-bukas ST	buks-an OT	"open"
b.	mag-kula ST	?i-kula OT	"bleach"
c.	mag-kudkod ST	kudkur-in OT	"grate"

Although it is usually possible to make each of a verb's subcategorized nominals into a topic, there are some verbs which have one or more complements that cannot be topic. For some such cases it is easy to imagine that the particular nominal complements in question cannot be topics because of their meanings. For example there are two classes of verbs which take complements that designate measurements. Perhaps there are semantic reasons that measurement phrases cannot be topics. (The following examples are from Schachter & Otanes, pp.384-396.)

10. ng-complement can't be topic:

a. s-um-ukat "measure"
b. t-um-imbang "weigh"

c. S-um-ūsukat ng tatlong ?ektarya ?ang lupa?
ST-measures DO-three hectares T-land

The land (T) measures three hectares

11. sa-complement can't be topic:

a. b-um-aba? "be lower than"
b. d-um-amih "be greater than"

c. s-um-obra? "be greater than"
d. t-um-a?as "be higher than"

e. Hindi bābaba sa sampang piso ?ang halaga niya
not will IO-ten peso T-value-its
be lower

Its value (T) will not be less than 10 pesos

There are other cases where there is no apparent semantic

reason that a particular nominal cannot be topic. For example, the subject complement of the following verbs cannot be the topic.

11. ng/ni (Subj.) phrase can't be topic:

a. ?agar-in
do w/out delay

b. ?araw?araw-in
do every day

c. datn-in
find upon arrival

d. ?isa?isah-in
sort through one by one

e. ?a?agar-in ko ?ang kampahya
will do w.o. S-I T-campaign
delay

I will undertake the campaign (T) immediately

However, very often the verbs involved can be characterized semantically or morphologically. For example, the verbs in the following class share their stems with ma- adjectives and all have a causative meaning.

12. ng/ni phrases cannot be topic:

a. bagal-an (<---ma-bagal)
"make slow "slow"

b. pa?it-an (<---ma-pa?it)
"make bitter" "bitter"

c. tamis-an (<---ma-tamis)
"make sweet" "sweet"

d. tapang-an (<---ma-tapang)
"make strong" "strong"

e. Bagal-an mo ?ang lakad mo
make slow-OT you-S T-walking-your

Make your walking (T) slow (i.e. "walk slowly!")

I will assume then that some verbs are defective in that they lack a topic form corresponding to one of their subcategorized nominals. Any one of the topic forms can be missing. Although there may be semantic and morphological generalizations governing which verbs are defective in this way, the fact that a verb stem is defective is information that must be given in the lexicon.

From the observations made so far, the lexicon must specify for each verbal stem the nominal arguments it requires in terms of a case frame, the array of affixes it takes, its meaning and the semantic relations borne by its complements. There may be, however, some generalizations, either universal or specific to Tagalog, concerning the relationship between the morphological, semantic, or subcategorization features of verbs which may make some of this information redundant in a

cases.[5]

IB. Derivation vs. Inflection: the Distinction between V and V'

Traditional Criteria

It seems clear that the various topic forms of verbs such as the following are morphologically related:

10a. mag-lagay b. lagy-in c. lagy-an

They share the same root, lagay, and take the same number of nominals in the same semantic relations. It seems reasonable to suppose that the sentences they occur in, for example (4a-c) above, have the same semantic representations with identical nominal argument structures, which we might represent as the following: (I assume that surface case marking is directly related either to deep Grammatical Relations, or to Logical Relations.)

11. lagay: "put" subject, d.object, ind.object

baba?e	tubig	baso
"woman"	"water"	"vase"

We will now ask how, exactly, the relationship between such sets of corresponding verbs is expressed in the lexicon and in their morphological structure.

One possibility is that they are listed together in a single lexical entry as the inflectional paradigm for that entry. So in the verbs given above, mag-, -in, and -an are inflectional affixes, and lagay is the uninflected stem or "lexeme", that represents the lexical entry. This way of looking at things certainly explains why these three verbs all have the same argument structure and meaning, and why the semantic relations of their complements are identical; semantics and subcategorization are specified once and for all for the entire lexical entry.

Certainly until the last few years most Transformational-Generative linguists would have automatically assumed that the verbs in (4a-c) are different inflected forms of the same word. The sentences themselves would have been derived from a single deep structure by a syntactic rule, since there are predictible relationships between the meanings, subcategorizations and selectional restrictions on their verbs. And since, in the model of the grammar set out in SPE and Aspects, inflectional WFR's applied after the syntax to perform all syntax-dependent Word Formations, the verbal morphology related to changes in the grammatical relation of the topic in (4a-c) would have had to have been

inflectional.

But several recent proposals (e.g. Starosta 197 7, DeGuzman 1978 for Tagalog in particular; Bresnan 1978, Hale 1979 more generally) in syntax and morphology would eliminate the possibility of using syntax to distinguish derivation from inflection. Each of these has involved non-transformational ways of generating the grammatical sentences of a language while still expressing relationships between them. For example, following the system worked out by Bresnan (197-) for English, (4a-c) could be directly generated. Each of their verbs would be listed separately with its own meaning and subcategorization. The predictability of the relationships between their subcategorization frames and the logical relations of their subcategorized terms is expressed by a lexical rule. Or, following a system like that of Hale (1979), strings consisting of a predicate and nominal complements could be freely generated. The job of determining whether the strings of words are well-formed sentences of Tagalog would be left up to conditions and rules of semantic interpretation. A representation of the nominal arguments that a verb must take would be given in the lexical entry of that verb. If the semantic interpretation rules leave any of these argument positions unsatisfied, the sentence is ill-formed. Or if any elements in the string are uninterpretable, the sentence is ill-formed. Under either of these proposals, syntax is no longer wedged between

derivational and inflectional morphology. In fact, both derivation and inflection could be seen as creatures of the lexicon.

Working from the lexicon end of things, Lieber (work in progress at M.I.T.) has produced some arguments, based on the interaction of morphological rules, that at least some inflection has to be performed in the lexicon. And LaPointe (197-) has worked out a detailed account for handling the morphology of the English auxiliary system within the lexicon.

If we accept any of these proposals, it is not clear how the distinction between derivational and inflectional Word Formation is to be formally expressed--or whether it should be expressed at all. Derivational WFR's and inflectional WFR's can both relate words listed in the lexicon. But is there any evidence that some related words should be listed in the same paradigm while others are listed as distinct entries? I should note that the two proposals do not necessarily deny that there is such a distinction--or even that the rules that either generate or interpret syntax observe such a distinction. It is possible, for example, that semantic interpretation would have access only to a certain "depth" of morphology. That is, it might only be sensitive to affixes which in traditional terms would have been called inflectional or syntax-dependent. In what follows, I will attempt to show that the distinction between derivation and inflection is one

that exists formally within the lexicon: if I am correct, syntax need not play the formal role of distinguishing the two.

In trying to establish some formal bases that might lie behind the intuition that such a distinction exists, we would probably start with the assumption that verbs can belong to the same paradigm only if they share the same argument structure. They must also have the same meaning with the exception of certain types of purely compositional meaning changes such as plurality and tense, which presumably have been admitted into the paradigm because they mark all or almost all members of a syntactic category. Corresponding topic forms such as those in (4a-c) meet this minimal requirement and so might belong to the same paradigm.

However, it is not clear that, just because two words have the same argument structure and identical meanings, they necessarily belong to the same paradigm; the different topic forms of a verb might be distinct lexical items related by derivational WFR's which state the regularities between their meanings and argument structures.

I would like to propose that the corresponding Topic-marked forms of verbs are in fact members of the same listed paradigm. In the course of the rest of this chapter I will show that the Topic Marking affixes must be distinguished as a class from another class of verbal affixes (to be

introduced later in this chapter) because they behave differently in sentences, and they undergo reduplication differently. It is the distinction between these two classes that I will take to be the distinction between inflection and derivation.

The Word Base Hypothesis

The morphological structure of all the verbs discussed so far, and in fact of most verbs, suggests that we are correct in claiming that corresponding topic forms constitute a single paradigm. For such verbs, the subject topic, direct object topic and/or indirect object topic forms are equal in morphological complexity. For example, the forms in (12a-c) all consist of the same verbal stem plus one affix: There is no evidence that one is the basic form from which the other two are derived (in contrast, for example, to the active-passive verb pairs in English). Furthermore, if we accept Aronoff's Word Base Hypothesis (Chapter 1, Section I),, (12a-c) cannot be derived by a productive derivational WFR from a morpheme (non-word) lagay. So it seems correct to assume that lagay is the uninflected word or lexeme to which the inflectional endings are added. This I will represent by enclosing lagay in brackets labelled "V", and the topic marking affixes in brackets labelled "V'", because only those verbs with topic marking affixes can actually occur in sentences.

12a. [mag[lagay]]
V' V V V'

b. [[lagay]in]
V' V V V'

c. [[lagay]an]
V' V V V'

However, for a very small class of verbs, the object and/or indirect object forms seem to be built on the corresponding ST form:

13.	Root	SubjectT	ObjectT	Ind.Obj.T
a.	?it "refuse to give"	mag-ka?it	?i-pag-ka?it	pag-ka?it-an
b.	ligo? "bathe with"	ma-ligo?	?i-pa-ligo?	
c.	?ako? "promise"	mang-?aku?	?i-pang-?aku?	pang-?aku?-an

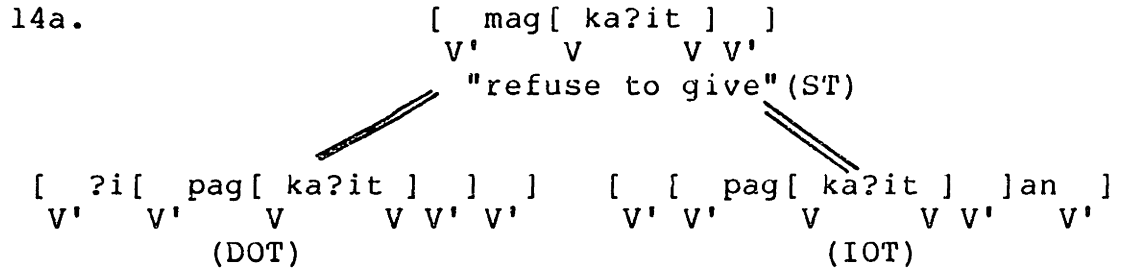
(13a-c) are representative of this small class of verbs in that pag shows up only in the OT or IOT forms of those verbs whose ST prefix is mag-; pa in verbs whose ST prefix is ma-; and pang in verbs whose ST prefix is mang-. There are not ST verbs with mang- which take ?ipag in their object topic forms. This distribution of pa, pag, and pang can be accounted for simply if we assume that in these verbs the topic marking affixes are added not to the root, but to a stem based on the ST form of the paradigm. (The alternation of the initial /m/ of the ST prefix with /p/ will have to be explained.) Besides

explaining the distribution of pa, pag and pang, the above treatment saves us from having to enlarge the class of object topic markers to include ?ipa, ?ipag, ?ipang, pag...an, etc. The same IOT marker, for example, is involved in (12) and in (13a).

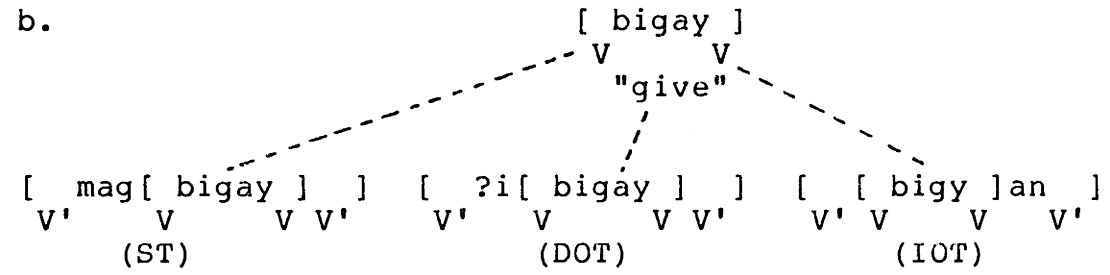
A second way to handle the various topic forms of verbs in (13) as members of a single paradigm would be to say that mag, mang, and ma are actually composed of two separate affixes--an inflectional ST prefix m- and a stem-extending prefix pag-, pa-, or pang-, which forms the stem for all topic forms in (13). I will call this the m+pag analysis, and I will call the earlier analysis the m/p analysis. For simplicity of exposition I will present arguments for the m/p analysis, and against the m+pag analysis, after further discussion of the verbal morphology. But I will assume in this discussion the m/p analysis.

The Word Base Hypothesis does not force us to claim that these few Object Topic verb forms belong to the same paradigm as the Subject Topic verb forms they are based on. Since mag-ka?it itself is a complete word in the sense that it actually can occur in a sentence, it would be possible to claim that ?i-pag-ka?it is a separate lexical entry. A derivational rule would then relate the two: (solid lines represent derivational WFR's; dotted lines, inflectional WFR's).

14a.



b.



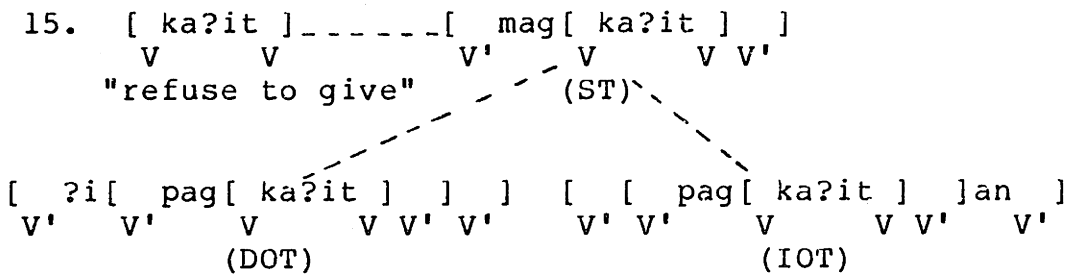
This would mean that some corresponding ST and OT verbs form a single paradigm (14b) and others do not (14a). It would also mean that derivational pairs identical in meaning and subcategorization, differing only in focus, would exist. This is the relationship we have characterized as inflectional, and I would like to assume that inflectional relationships are always intra-paradigmatic, as they must be in any case in (14b).

I will therefore propose that the corresponding ST, DOT, and IOT verbs in (13a-c) are members of a single paradigm, and allow for the following possibility: Paradigms are not always derived by adding simple inflectional endings to an uninflected V-stem; rather, some inflected forms are derived from a member of the paradigm other than the V-stem. So, for these few verbs, the inflected ST form is also the stem for

the formation of the DOT and IOT forms. The difference between the verbs bigay and ka?it, then, is that in the former all inflectional affixes are added to the uninflected V-stem.

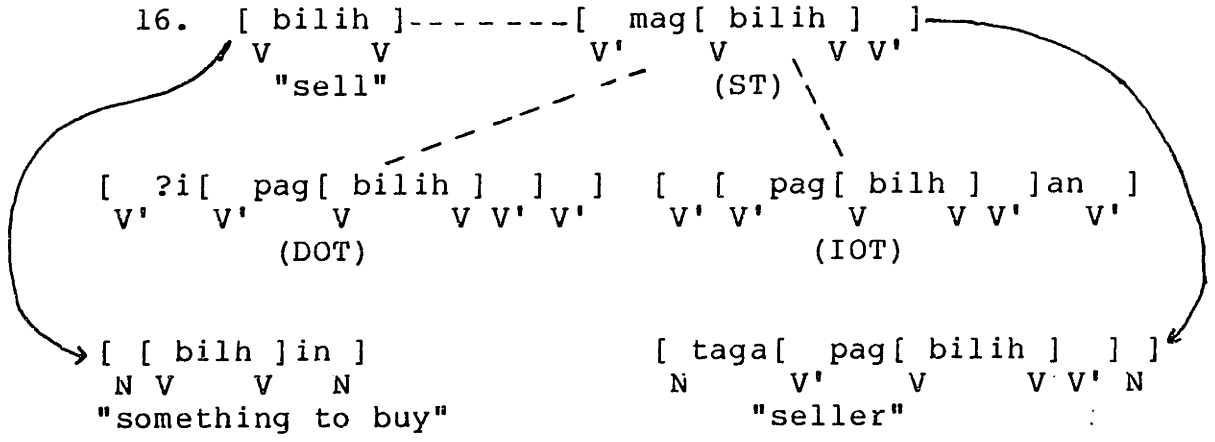
In the OT and IOT forms of ka?it, the inflectional OT markers are added to a stem that already contains an inflectional ST marker. In fact, since the inflected stem to which the object affixes are added is the ST form, a form which can itself occur in sentences, it also is labelled "V'".

15.

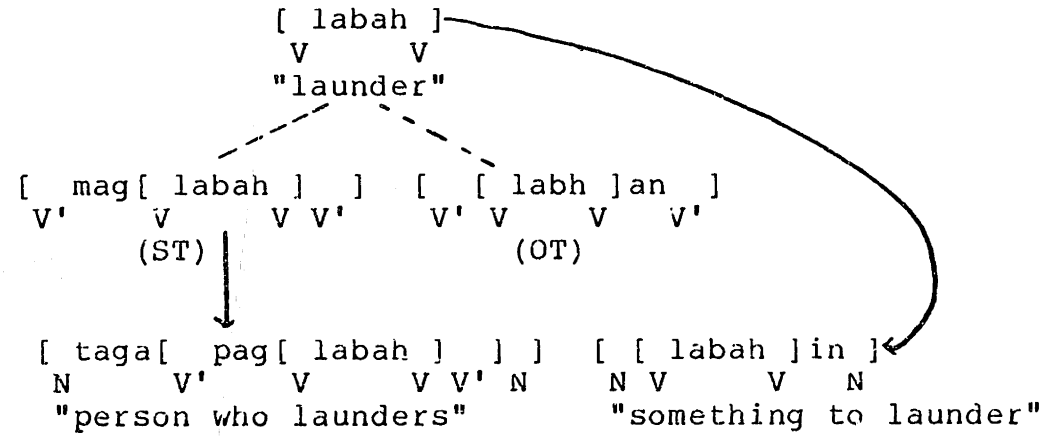


This analysis requires a rule to handle the /m/~/p/ alternation in the ST prefixes mang-, mag-, and ma-. Since the alternation is sensitive to the presence of OT suffixes which are not contiguous to the alternating prefixes (e.g. OT form in (15)), this rule will have to be an allomorphy rule. The analysis also requires us to make some provision for the fact that verbs formed from ST stems no longer mark the subject as topic; the newly added affix determines the topic of the new verb.

It is necessary in any event to assume that both the uninflected V stem (lexeme) and the inflected, ST V' stem are accessible to further WFR's. Some derivational WFR's that apply to verbs choose the V stem while others choose the V' stem. There really is no way to predict which stem a particular WFR will choose. For example, adding the suffix -<u>in</u> to simple V stems, even of those verbs whose object topic forms are based on the subject topic stem (e.g. <u>mag-bilih</u> below), produces a noun meaning the object of the action designated by the verb. On the other hand, the <u>taga-</u> noun formation rule applies to the ST V' stem, regardless of whether or not the object topic forms are also derived from the ST stem.



17.



Below I will discuss the possibility that all m-initial ST prefixes are actually derived from a subject topic prefix m- plus a p-initial stem-forming prefix: m+pag-, m+pang-, etc. Under that analysis, it is not a V' to which further affixes are attached.

However, regardless of whether the m/p allomorphy rule analysis or the m+pag analysis of ST prefixes is correct, the verbal paradigm must contain a stem other than the simple root stem, to which other topic marking affixes as well as derivational affixes can be added. Only if this is true can we assume that the ST forms of the verbs in (13a-c) form a single paradigm with their corresponding OT forms.

RA Reduplication

So far we have seen that V' stems behave differently from V stems in two respects: they are complete words that can occur in sentences, and they contain affixes that mark the

logical relation of the topic of the sentence. A third difference is that RA reduplication marking aspect in verbs can only apply to V'. This point will be made more dramatically in Section IIB, where we discuss the derivation of new V stems--which cannot undergo RA reduplication. But the same point can be made for the basic members of the verbal paradigm as well.

All verbs can undergo aspectual RA reduplication. The meaning associated with RA reduplication is dependent on another aspectual category, [±actual aspect]. The rules that spell out the feature [±actual] and the way that actual aspect determines the interpretation of RA reduplication will be discussed in detail in Section III of this chapter, and again in Chapter 5. For the present discussion, the following description will suffice. A [-actual] verb is one whose action has not begun; a [+actual] verb is one whose action has begun. In verbs with nasal-initial ST prefixes, the initial shows up as /m/ in the [-actual] form, and as /n/ in the [+actual] form. In verbs with OT -<u>in</u>, -<u>an</u>, or <u>?i</u>-, [+actual] is marked by the infix -<u>in</u>. In a [+actual] verb, RA reduplication marks the action as either ongoing, or not complete at a single point in time. In a [-actual] verb, RA red. marks the action as future.

18. [+actual, +RA] nag-bībigay, ST-is/was giving

[-actual, +RA] mag-bībigay, ST-will give

In verbs that consist of a single TM affix plus a V stem, RA will copy the first CV of the V stem (adding length to the copied V), regardless of whether the TM affix is a suffix or a prefix. The TM affix itself cannot be copied.

19a. [mag[bigay]]
V' V V V'

mag-bībigay (*māmagbigay)
ST-will give

b. [?i[bigay]]
V' V V V'

?i-bībigay (*?i?i-bigay)
DOT-will give

c. [[bigy]an]
V' V V V'

bībigy-an
will give-IOT

Verbs whose ST affix is the infix -um- appear at first to be problematic. -Um- shows up between the first consonant and vowel of the stem (s-um-amah). Yet RA still copies the V stem. The additional fact that in such reduplicated forms the infix shows up inside the reduplicated material and not inside

the original material suggests that infixes are not inserted inside the V stem until after RA has applied. But all topic marking affixes are present before aspect reduplication applies, because they determine where aspect reduplication applies, not to mention what part of the word actually gets copied. Therefore, I propose that infixes are first added as prefixes. If this is the case, the same RA reduplication rule will handle verbs whose topic marking affixes are prefixes, suffixes, and infixes. Later, infixes are metathesized with the first consonant to their right:

20. [um[samah]] --->
V' V V V'

um-sāsamah ---> s-um-asāmah
was-ST-accompanying

Now consider the RA reduplicated forms of those verbs whose object topic forms are based on complex V' stems, for example:

21a. [mag[bilih]]
V' V V V'

mag-bibilih
*mamag-bilih
ST-will sell

b. [?i[pag[bilih]]]
V' V' V V V' V'

?i-papag-bilih
?i-pag-bibilih
DOT-will sell

c. [[pag[bilih]]an]
V' V' V V V' V'

pāpag-bilh-an
pag-bībilh-an
will sell-IOT

RA reduplication applies to magbilih exactly as it does to mag-bigay. In both cases the V stem to which mag- is attached is reduplicated, but mag- itself cannot be. But (21b-c) has alternate reduplicated forms. This can be accounted for by an RA reduplication rule that locates a V' set of brackets and reduplicates the stem in the next inner set of brackets. Since ?i- and mag- are both topic marking affixes which form verbs that are inflectionally complete, they are both added with V' brackets and therefore RA can analyze the verb in two ways:

[?i[pag[bilih]]]
V' V' V V V' V'
1
2

(In spite of these alternate analyses, RA can only apply once in a single verb. This problem is discussed in Chapter 5.)

The contrast between (21b-c) suggests that RA does not locate the syllable to be copied by simply counting syllables from the left edge of the word. To write a linear formulation

that would not copy mag- in (21a) and ?i- in (21b), we would have to specify that the leftmost prefix cannot be copied:

22. (CVCo+) CV X
RA

But this would incorrectly block RA from copying the first CV of pag- in (21c). I conclude that reduplication must locate a set of V' brackets and copy the first CV that is not part of a TM affix introduced in that bracket.

The fact that RA reduplication knows when the leftmost TM affix in a V' bracket is uniquely contained in that V' will be discussed at length in Chapter 5. For now we will write the rule with a parenthesized TM affix immediately to the right of the triggering V' bracket and stipulate that no brackets can intervene between them. Furthermore it is necessary to assume that the two expansions of the rule are disjunctively ordered. If there is a TM affix immediately dominated by the V' analyzed by the rule, as in a verb like mag-bilih, it must be analyzed as the parenthesized TM affix.

23. Aspectual RA Reduplication
(preliminary formulation)

[(TM) CV
V'
copy

We still have not accounted for a very small class of perception verbs that take the prefix ma-ka in their ST forms, and ma- in their DOT forms.

24a.	ma-ka-kita? (ST)	b.	ma-kita? (DOT)	"see"
25a.	ma-ka-rinig (ST)	b.	ma-rinig (DOT)	"hear"
26a.	ma-ka-halata? (ST)	b.	ma-halata? (DOT)	"notice"

We would like to claim that the corresponding ST and DOT forms belong to the same paradigm, since in other cases, e.g. (12,19), corresponding ST and DOT forms are paradigmatically related. If this is the case, it would appear that the inventory of ST markers has to be extended to include maka: However, the way these verbs behave with respect to reduplication suggests that maka consists of the same ST prefix ma- that occurs in, e.g., ma-basag, plus ka. For each verb there are two alternate reduplicated forms. Either ka- or the V stem can be reduplicated:

27a.	ma-kāka-kita?	b.	ma-ka-kīkita?	"will see"

The preliminary formulation of RA in (23) can account for (27a), since it does not care whether the CV that is copied is contained in the next inner set of brackets. We have already seen that RA is somewhat indifferent to the morphological status of the material that it copies. In a verb such as (21b), RA can copy either material contained in V brackets or V' brackets: And there are some verbs in which the copied CV is separated by two sets of brackets from the triggering V' brackets; in the following example, furthermore, the extra bracket is a N bracket:

28. [mag[[bigay]an]] ---> mag-bībigay-an
V' N V V N V' "will give to one another"

So we might just as well assume that (23) is correct and the presence of a bracket between V' and the CV to be copied is irrelevant.

In order to handle (27b), we propose an adjustment rule that erases the boundary, allowing na+ka to be analyzed as the parenthesized morpheme in the RA rule. This rule does no more than describe the facts, but I know of no more explanatory proposal at this point. There are also more morphologically complex verbs, to be discussed in Section IIC, which also seem to allow RA to skip over an extra morpheme in exactly the same way; they will shed more light on this adjustment

One point is clear from the examples we have looked at so far: only by assuming that each inflectional TM affix is added within its own set of brackets are we able to state simply what part of the verb is reduplicated for durative aspect.

Proposed Tagalog-Specific Criterion for Distinguishing Derivation and Inflection

The members of most verbs' paradigms are built on the same V stem by adding different V' inflectional TM affixes (e.g mag-bigay, ?i-bigay, bigy-an). But there are verbs which, though they apparently differ only with respect to their TM affix, do not meet the minimal requirement for belonging to the same paradigm: they have different meanings and argument structures. For example:

29a.	mag-bukas buks-an	b. b-um-ukas
	open (trans.)	open (intrans.)
30a.	mag-?abot ?i-abot ?abut-an	b. ?-um-abot ?abut-in
	hand to	reach for

31a.	t-um-aga?	b.	ma-naga
	cut		slash (intent to destroy)
32a.	k-um-uhah	b.	ma-nguhah
	take		gather (multiple objects)
33a.	d-um-ikit	b.	ma-nikit
	stick to		get thoroughly stuck to (intensive or repeated activity)

The (a) and (b) members of each pair in (29-30) differ in subcategorization. Not only do the (a) examples require one more grammatical complement than the corresponding (b) examples, there is also a shift in the grammatical relation borne by corresponding semantic arguments. For example, the subject of b-um-ukas corresponds semantically to the direct object of mag-bukas ("The door opened" vs. "He opened the door"). In addition, many such pairs also differ in some element of meaning, as (30a-b) do.

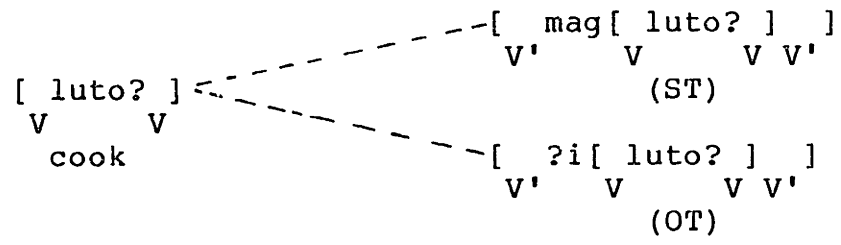
The corresponding (a) and (b) verbs in (31-3) differ not in subcategorization, but in meaning. I assume that either one of these differences is sufficient grounds for recognizing these verbs, built on the same root, as distinct lexical entries. A lexeme, and all its inflected forms share a single meaning and subcategorization. Although the (a) and (b) verbs have homophonous stems, they are listed as separate lexical

entries.

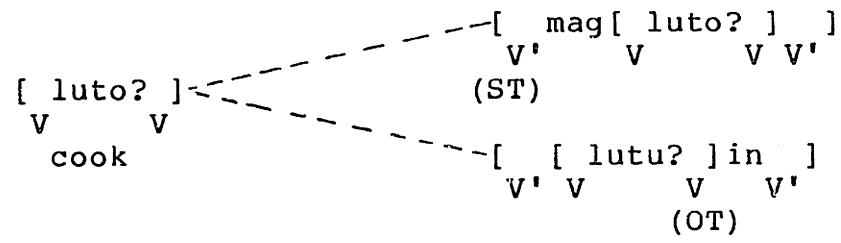
However the status of these verbs as separate lexical entries is reflected morphologically. In all of the examples in (29-33), homophonous but distinct V stems take different affixes to mark the same topic. So bukas in (29a) takes mag- to mark subject topic while bukas in (29b) takes -um-. This is in contrast to the situation in English where there is no overtly marked morphological difference between the transitive verb "open" and the intransitive verb "open". I would like to propose that this is an additional criterion, specific to Tagalog, which can disqualify two verbs from belonging to the same paradigm; a single topic relation cannot be represented more than once in a verb's paradigm. In fact I propose further that this last criterion alone is sufficient to distinguish separate lexical entries. (This is roughly the position taken by Schachter & Otanes; (1972:293-4).)

There are one or two verbs which appear to share the same stem, have identical meanings and subcategorizations, but which take different affixes to mark a single topic function. By the above criterion, there must be two verbs with homophonous stems:

34a.



b.



Even if the corresponding (a) and (b) verbs in (29-33) belong to distinct lexical entries, it seems clear that they are related in some way. The question is, how?

It seems reasonable to relate them with a fairly productive WFR. This WFR applies to a V stem of mag- and -um- verbs and forms derived stems which take mang-. The meaning change is always one of the three given in parentheses after the verbs in (31-3).

On the other hand, it is not so clear that we should relate verb pairs such as those in (29-30), which differ in subcategorization, by a productive rule. There are some generalizations that can be made concerning their relatedness, but they are not hard and fast. There are obvious semantic similarities in the action designated by the corresponding verbs. But the exact semantic differences that a given pair

will exhibit is not predictable. There are also generalizations that can be made concerning the differences in subcategorization that we find. The subject of the verb that takes fewer complements (the (b) cases in (29-30)) corresponds semantically to an object of the corresponding verb which has an additional complement. Derivational WFR's certainly must be able to express this sort of relationship between subcategorization frames. A clearly productive derivational WFR that forms causative verbs (which will be discussed in Section IIB) must state that the subject of the basic, non-causative verb corresponds to an object of the causative verb. But the causative WFR, unlike whatever WFR we would need to relate the (a-b) verbs in (29-30), is very precise about which object of the derived verb the base verb's subject corresponds to.

There is even some degree of regularity governing the choice of TM in verb pairs such as those in (29-30). Regularly the verb with one fewer complements takes -<u>um</u>- in its ST form. The corresponding verb takes <u>mag</u>-. But which object topic markers the <u>mag</u>- verb takes is not predictable. (What OT markers productively derived causative verbs take, in contrast, is entirely statable by a rule.)

So, if a rule is involved in relating the (a-b) verbs in (29-30), it is not a productive one. Some verbs that have homophonous stems but different TM affixes are separate

lexical entries related by a productive derivational rule: Others may not be synchronically related by a productive WFR. If this is correct, then one member of such a pair is not morphologically more basic than the other.

Zero Affixation

Since mang- that occurs in the derived intensive verbs in (31-33) is an inflectional prefix, the intensive WFR, which is derivational, relates two homophonous uninflected stems. If every WFR adds a new bracket, even those that do not add affixes, there would have to be an empty set of brackets around the derived stem.

35a. [kuhah] (get)
V V
[+um]
↓
b. [[kuhah]] (gather)
V V V V
[+mang]

However, since pairs such as the two verbs based on the root bukas (i.e. the transitive and intransitive verbs "to open") are not related by a productive WFR, neither one is contained in an empty set of brackets.

36a. [bukas] (open-transitive)
V V
[+mag]
[-an]

b. [bukas] (open-intransitive)
V V
[+um]

I would like to propose, however, that WFR's can derive one word from anothe without adding brackets. Or, put another way, WFR's can relate two lexical entries and even express that one is more basic, without the use of nested bracketing. The fact that (mang+)kuhah and (um+)kuhah are productively related is expressed by the following rule. (We give the meaning change, but of course any syntactic or phonological changes would be specified in a complete rule as well.)

37. [ ] ---> [ ]
V V V V
+um +mang

Meaning Change: intensively, repeatedly

(I will assume that WFR's can also refer to abstract features governing the TM affixes of the base and the derived words as shown in (37). This assumption will be justified in Section IIB.)

There are also WFR's that change syntactic category that do not involve affixation. For example, the only difference between certain adjectives and the nouns or verbs they are derived from in that the adjectives lack penultimate length.

38a.	bū̄hay life	b.	buhay living
39a.	gā̄lit anger	b.	galit angry
40a.	hī̄loh dizziness	b.	hiloh dizzy

The WFR relating the (a) and (b) forms would look something like (41).

41. $\begin{bmatrix} N \\ N \end{bmatrix} \longrightarrow \begin{bmatrix} A \\ A \end{bmatrix}$ $\begin{bmatrix} +\text{Length} \\ \text{Loss} \end{bmatrix}$

Meaning Change: having or exhibiting the quality designated by the base

An additional example is the derivation of nouns from uninflected verb stems in which the derived noun designates an object of the verb. There is no phonological difference between the noun and the verb stem.

42a.	(um)bilih buy	b.	bilih thing bought
43a.	(um)sulat write	b.	sulat thing written

44. $[_{V}\ \ ]_{V}$ ---> $[_{N}\ \ ]_{N}$

Meaning Change: Object of X

In Chapter 5, it will be shown that R1 reduplication can be formulated simply only if we are correct in claiming that WFR's which do not add affixes do not add empty brackets either, which we take as support for this proposal.

II. Verbs Derived from the Basic Members of the Paradigm

In section I of this chapter, we started with the assumption that all members of a verbal paradigm share the same meaning and subcategorization. The paradigm consists of an uninflected or V stem plus various inflected or V' forms, each of which can mark one of the subcategorized nominals as topic of a sentence. This will be referred to as the basic paradigm. Most inflected V' members of the basic paradigm are formed by adding one of an array of TM, V' affixes to the uninflected V stem. But a very few inflected OT forms are formed from an inflected V' ST form. So it was proposed that it is possible to derive one inflected member of a paradigm from another inflected member. It was also proposed that the entire basic paradigm is listed in the lexical entry for the verb, because the array of TM affixes that a V stem takes to mark each of its subcategorized nominals as topic is largely

unpredictable: Furthermore, some paradigms are unpredictably defective. We also proposed that a given grammatical relation is represented only once in a verb's paradigm. This led us to recognize the existence of homo-morphemic but distinct V-stems, each of which has to be listed as a separate lexical entry with its own paradigm. The distinction between distinct but homo-morphemic stems is also usually marked by a difference in meaning and subcategorization.

In this section we will consider verbs that are derived productively from members of basic verbal paradigms. Most, but not all of them are formed on the inflected ST stem. In Section IIA, verbs which are inflectionally derived from a basic form of a verb are discussed. They are considered to be inflectionally derived because they preserve the meaning and subcategorization of the verb they are based on. And, like those few OT verbs that are based on ST stems, they are formed by stacking an additional V' affix onto a V', ST stem. They do not have to be listed as part of the basic paradigm, it is claimed, because they are entirely predictable.

In section IIB we will consider verbs which are derivationally derived. They are formed not simply by stacking V' affixes onto a basic form; rather their derivation involves the formation of a new V stem (usually by affixation or reduplication). The derived V stem belongs to a new entry and requires its own array of paradigmatic TM

affixes. The new V stem differs in meaning and/or subcategorization from the basic verb it is derived from. Because derivational V-formation rules in some cases apply to the inflected ST form of their base verb's paradigm, it is necessary to allow derivational WFR's to apply to at least some inflected forms.

As will become clear, both inflectionally and derivationally derived verbs make use of the same small inventory of TM V' affixes as the members of basic paradigms. As in the basic forms, in the derived verbs, these TM affixes "complete" a verb, so it can occur in a sentence, they determine the relation of the topic of the sentence to the verb, and they trigger RA reduplication.

IIA. Inflectionally Derived Verbs: Thematic Topic Verbs

Thematic Complements

There are nominal complements of verbs which do not conform to the description of subcategorized nominals I gave in IA. For example, the phrases introduced by the prepositions para sa, dahil sa, and tungkol sa in the (a) sentences below.

45a. B-um-ībilih ?ako ng buyo (para sa lola koh)
ST-will buy T-I DO-betel leaf Benef.-grandmother-my

I (T) will buy some betel leaf
(for my grandmother)

b. ?i-bībilih ko ng buyo ?ang lolah ko
Ben.T S-I DO-btl.lf T-grandm.-my

I will buy some betel leaf for my grandmother (T)

46a. Mag-?ū?usap siya (tungkol sa giyera)
ST-will talk T-he Referential-war

He (T) will talk (about the war)

b. Pāpag-?usap-an niya ?ang giyera
Refer.T S-he T-war

He will talk about the war (T)

These complements are like the grammatical complements already discussed in that they can be the topic of the sentence with certain specifiable changes in the verb, as the (b) examples show. However, unlike the grammatical complements, these do not have to be mentioned in the lexical entry of any verb.

As has been already pointed out, there is no one-one correspondence between the grammatical relations of the nominal complements of a verb, as represented by their case marking, and their semantic relations. For example, the subject (the complement introduced by ng/ni-) of k-um-uhah ("get") is an agent, while the subject of t-um-anggap ("receive") is not. The lexical entry for each verb must

mediate between the grammatical relation of each complement as represented in its case-marking and its thematic relation in semantic representation. In contrast, tungkol, para, and dahil are lexical entities with their own meanings. Together with the following case marking particle sa (kay) they behave very much like prepositions in English.

para sa "on behalf of/for"	Benefactive Phrase
dahil sa "on account of"	Reason Phrase
tunggol sa "on the subject of/about"	Referential Phrase

Their meaning and therefore the semantic relation of the entire phrases they introduce does not vary depending on the meaning of the co-occurring verb; the same is true when they are topics. The lexical entries need not supply any information abut their role in semantic representation. Since such complements are semantically transparent, I will call them thematic complements in contrast with grammatical complements, which are introduced by semantically empty case marking particles.

A verb's lexical entry must specify what grammatical complements it requires, allows, or excludes. On the other hand, thematic complements could be treated simply as optional phrases, not specifically mentioned in the lexical entry of any verb. Sentences which are unacceptable because of the presence of a thematic complement are best considered

semantically deviant rather than a violation of the verb's subcategorization frame. For example, benefactive phrases can occur with most verbs, but the following sentence is strange in Tagalog, as is the corresponding sentence in English.

46. ?T-um-andah si Maria para kay Juan
ST-grew old T-Maria Benef.-Juan

?Maria grew old for Juan

(46) can be assigned an interpretation because the para sa phrase carries its own meaning. But the interpretation is strange. Only volitional actions can be done as a favor to or on behalf of other people. People don't have control over growing old. But certainly we do not want to encode this knowledge about the world in the lexical entry of t-um-andah masked as subcategorization features.

Finally, the meaning of the verb and the semantic relations of its subcategorized complements is not altered by the presence of a thematic complement. This is why we could simply put the thematic complements in parentheses in (45-6); the meaning of a sentence which we get by adding a thematic complement is a compositional function of the basic sentence plus the meaning of the thematic phrase. In contrast, grammatical complements cannot be freely added. For example, the following two sentences differ not only with respect to the number of complements, but pinto, which is the subject in

(48a), is the direct object in (48b), although its semantic role in both is essentially the same.

48a. B-um-ukas ?ang pinto
ST-open T-door

The door (T) opened

b. Nag-bukas ng pinto ?ang bata?
ST-open DO-door T-child

The child (T) opened the door

The addition of a grammatical complement also requires a change of ST -um- to mag-, which according to our criterion means that two distinct lexical entries are involved. On the other hand, the addition of a thematic complement in the (a) sentences of (45-6) does not require any change in the verbal affixes.

I conclude that thematic complements do not have to be mentioned at all in the lexical entries of verbs. Likewise, a verb's meaning and subcategorization, and the array of TM affixes it chooses to form its basic paradigm can all be stated independently of thematic complements that may co-occur with it.

Another type of complement I would like to include in the class of thematic complements is the locative phrase.

49a. Nangīngisda siya (sa ?ilog)
ST-fishes T-he Loc-river

He (T) fishes on the river

b. Pangīngisda?an niya ?ang ?ilog
Loc.T-fishes S-he T-river

Because locative phrases are introduced by sa which is homophonous with the IO case marking particle, it is necessary to show that they are distinct. One difference is semantic. Locative phrases always express the location of the action ("in", "on", or "at"). Indirect object complements introduced by sa can be the "source" away from which the action of the verb is moving (as with the verb k-um-uhah, "take from"); or it can be the goal toward which the action is going (mag-lagay, "put").

It might still be possible to say that indirect objects can have an array of semantic functions, location being one of that array. But there are other properties of locative sa-phrases that justify not only distinguishing them from indirect ojbect sa-phrases, but treating them as thematic (non-subcategorized) complements. Schachter and Otanes (p.450) point out that in some cases, what we are calling indirect objects are very close to locatives in meaning. For example, the sa-complement in (50) has two interpretations, one as a locative phrase and the other as an IO phrase. But even the IO reading is roughly locational. However, as

Schachter and Otanes point out, there are two sentences whose topics correspond to the sa-phrase in (50); each has a morphologically distinct verb, and each has only a single reading of the two for (50). It will be shown below that only the verb in (51b) patterns after other locative topic verbs, and in fact after thematic topic verbs in general; we'll assume here that the reading of its topic is the locative reading.

50. S-um-ulat siya sa mesa
ST-wrote T-he {IO / Loc}-table

He (T) wrote {on / at} the table

51a. S-in-ulat-an niya ?ang mesa
IOT-wrote S-he T-table

He wrote on the table (T)

b. P-in-agsulat-an niya ?ang mesa
Loc.T-wrote S-he T-table

He wrote at the table (T)

Finally, like other thematic complements, locative phrases can be treated for the most part as optional sentential elements. So although locative sa and IO sa/kay are homophonous, they mark categories that are distinct for the purposes of the semantic projection rules. It is clear in any event that the grammatical status of nominals must be represented in some more abstract form than the actual surface case marking

particles. Abstract grammatical features are spelled out differently depending on whether the noun they mark is a proper name, common noun, or pronoun.

The Morphological Structure of Thematic Topic Verbs

The semantic transparency of thematic complements is paralleled by the morphological predictability of thematic topic verbs. Recall that the affix that a given verbal stem takes to mark its topic as being subject, direct object, or indirect object is unpredictable, to a large extent. Furthermore, the stem to which the TM affixes are added is not always predictible. For most verbs, the members of the paradigm are formed by adding a TM affix to the same V stem. But for a few, e.g. (16), the OT markers are added to the ST, V' stem. There is no way to predict which verbs pattern after (16). And certain verbs have defective paradigms in that they lack a form which would allow one of their subcategorized nominals to be the topic.

In contrast, the thematic topic form of the verb never has to be listed. First of all, there is always always a single affix associated with each type of thematic complement. For example, the benefactive topic form of a verb always takes the prefix ?i-. Secondly, given the basic ST form of a verb, it is always predictable what stem the thematic topic affix is attached to. Finally, there are no morphological exceptions

to thematic topic formation rules. I assume that the rules for forming thematic topic verbs apply to all verbs. Some verbs never actually occur in one or another of the thematic topic forms, but this can be handled the same way that deviant sentences with thematic complements were handled. The resulting sentence is deviant, although the verb is morphologically well-formed. So it is not necessary to add any information to the lexical entry of any verb to account for the existence (or non-existence) and form of thematic topic verbs. And it is not necessary to list the thematic topic forms themselves since they are predictible in all their properties.

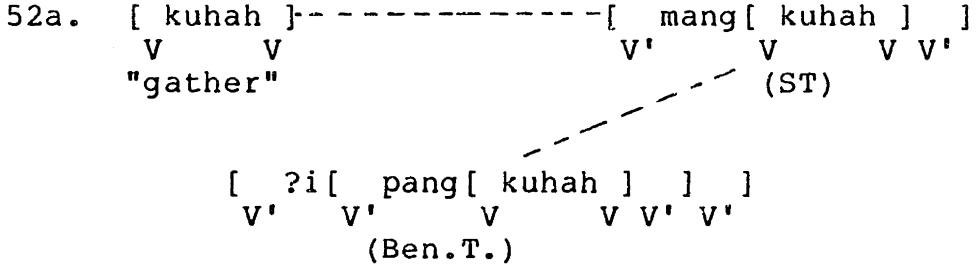
I will briefly illustrate the formation of benefactive topic (BT), locative topic (LT), and referential topic (RT) verbs to show that they are semantically, syntactically, and morphologically predictable from the basic verbal paradigms that must be given in the lexicon. This illustration will also allow me to propose that although such forms are not listed in the verbal paradigms, they are derived from a member of the listed verbal paradigm by an inflectional WFR. The fact that a thematic topic verb has the same meaning and subcategorization as the verb it is derived from leaves open the possibility that they <u>are</u> inflectionally derived. Furthermore, our morphological criterion for distinguishing inflection and derivation based on the distinction between V and V', also supports this possibility. The affixes that form

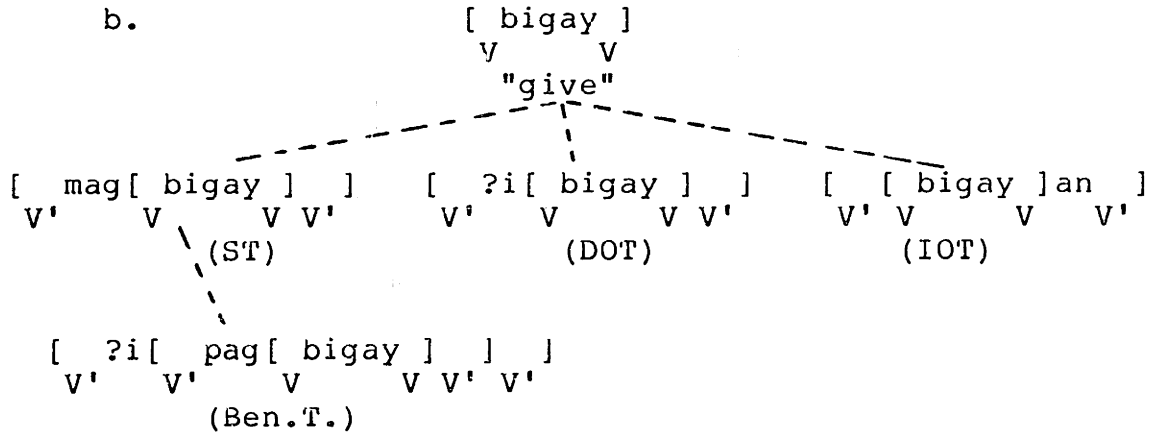
thematic topic verbs are homophonous with the V', TM affixes that occur in the OT forms of basic verbal paradigms. There is every reason to believe that the same affixes are involved in both cases. They certainly behave like V' TM affixes. Most thematic topic verbs are formed by adding one of these affixes to the V' ST form of the basic paradigm. The affixes added to form a thematic topic verb over-rides the topic-marking function of the embedded ST prefix, just as the OT affix over-rides the ST prefix in those few cases where the OT form is based on the ST stem. The affixes that form thematic topic verbs also trigger RA reduplication. Assuming then that they are TM V' affixes, the derivation of thematic topic verbs does not involve the formation of a new V stem.

Benefactive Topic Verbs

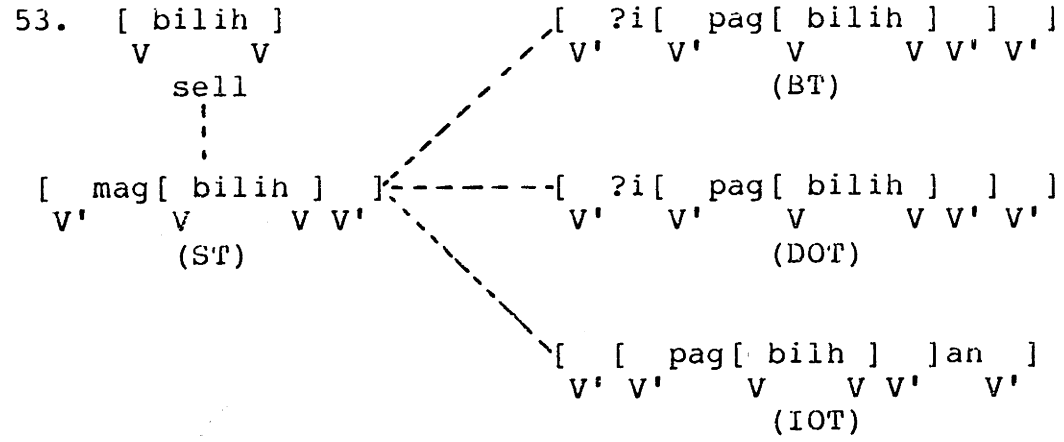
Benefactive Topic verbs are formed by adding ?i- to the ST stem forms of those verbs which take mag- or mang-:

52a.





Benefactive ?i- is homophonous with the direct object topic prefix ?i-. (In fact it is entirely possible that it is the same morpheme.) But while only the DOT of certain verbs takes ?i-, all BT verbs do. For some verbs, then, both the OT and the BT take the same affix ?i-. However, for most of these, the OT is based on the V stem while the BT is based on the ST stem. In a few cases, though, in which the OT form of a verb is derived from the ST stem, the OT and BT forms are identical.



RA reduplication applies the same way to BT verbs as it does to those OT verbs which are structurally parallel--that is, either the RA rule chooses the V' bracket which contains the BT prefix ?i-, in which case the first CV of the prefix pag- is copied:

```
[  ?i[  pag[ CV...   ]  ]  ]
 V'   V'    V       V V' V' (BT)
```

or it chooses the V bracket which contains the ST prefix pag-:

```
[  ?i[  pag[ CV...   ]  ]  ]
 V'   V'    V       V V' V' (BT)
```

The BT form of verbs which take -um- in their ST forms do not appear to be derived from the ST -um- stem. If we want to claim that the BT prefix ?i- is always attached to a ST, then it is necessary to posit an -um- truncation rule.

54.
```
[  ?i[  um[ kuhah ]  ]  ]
 V'   V'   V      V V' V' (BT)
          |
          ↓
[  ?i[  [ kuhah ]  ]  ]
 V'   V' V     V V' V' (BT)
```

For now we could just as well assume that the BT form is based on the V stem of -um- verbs, although it is based on the ST V' stem for all other verbs.

55. [?i[kuhah]]
V' V V V'

The behavior of RA reduplication cannot help to decide between (54-5). Whichever we choose, RA will apply correctly to copy the first CV of kuhah: ?i-kukuhah. The way RA would apply under the -um-truncation analysis perhaps deserves special comment. RA would have two alternate analyses:

56a. [?i[[sulat]]]
V' V' V V V' V'

b. [?i[[sulat]]]
V' V' V V V' V'

One might think that the (a) analysis would be ruled out by some general condition on analyzability: however, precisely this factoring is necessary in the class of denominal verbs exemplified in (57).

57. (mag)-bigay ---> bigay-an --->
"give (ST)" "a giving to one another"

mag-bigay-an ---> mag-bibigay-an
"give to one another" "will give to one another"

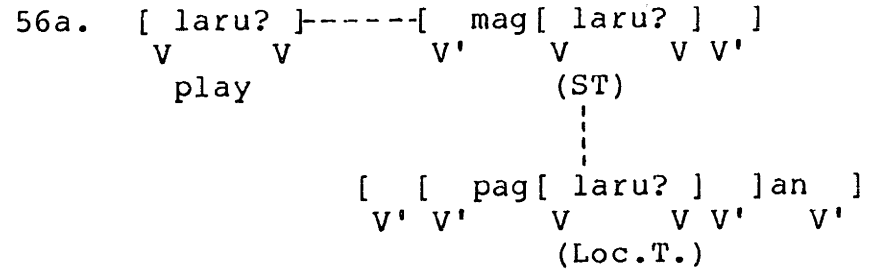
[mag[[bigay]an]]
V' N V V N V'

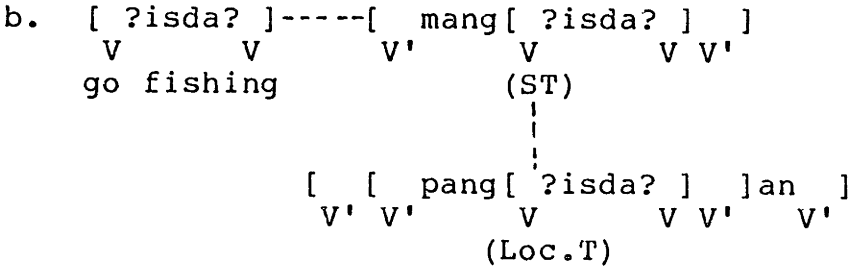
So it seems clear that there is no clear way to choose between (54) and (55). But regardless of which is correct, the form of the Ben.T. verb is always predictable given the ST form, and therefore need not be listed.

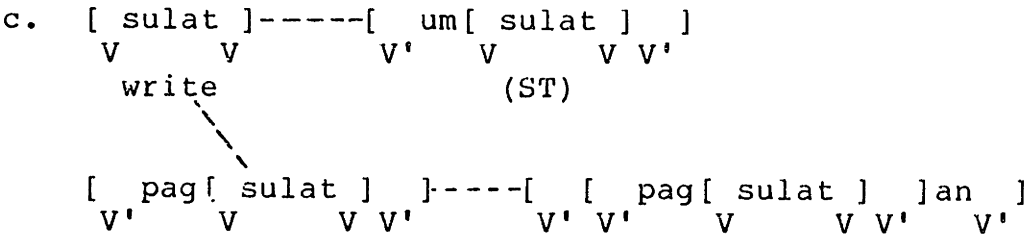
Locative Topic

Locative topic verbs can also be predicted from the ST forms of basic verbs. The suffix -an is added directly to the ST stems of mag- and mang- verbs. However, unlike Ben.T., Loc.T. verbs corresponding to -um- verbs are not composed of the root stem plus -an. Instead, a new stem is formed with pag-. But notice, pag- also shows up in the gerund form of -um- verbs (s-um-ulat--->pag-sulat: "write-ST"--->"writing"). So we can assume that -um- verbs do contain a pag- stem within their paradigms from which gerunds and locative topic verbs are derived.[6] This saves us from complicating the locative topic formation, cf.

56a.

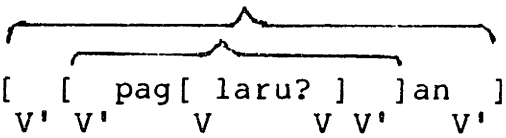


b. 

c. 

Notice the Loc.T.-forming suffix is also homophonous with (or identical to) the -an which forms the DOT and IOT forms of verbs. Again, except in a handful of cases, the locative topic of a verb is different from the OT form which is also formed with -an, because one is formed on the ST stem while the other is formed on the root stem.

RA reduplication applies to Loc.T. verbs exactly as it applies to basic verbs with complex stems. Either it copies the stem of the ST verb (the root stem) or the stem of the locative verb (the ST stem):

57. 

Especially interesting are the Loc.T. forms of verbs

corresponding to -um- verbs. The pag does indeed form a V' stem, because either the pag stem or the root stem can be reduplicated:

58. um-verb: [[pag[sulat]]an]
V' V' V V V' V'

pāpagsulatan pagsūsulatan

Referential Topic Verbs

Referential topic verbs can only be derived from certain verbs of communication that take the ST prefix mag-. Like Loc.T. and Ben.T. verbs, they are formed by adding a TM affix that occurs in basic OT forms, an, to the ST V' stem. And, as expected, RA can analyze either of the two V' brackets, giving two alternate forms:

59. [mag[taloh]]-----[[pag[taluh]]an]
V' V V V' V' V' V V V' V'
argue about-ST Ref.T.

pāpag-taluh-an pag-tātaluh-an
will argue about-Ref.T.

60. [mag[?usap]]-----[[pag[?usap]]an]
V' V V V' V' V' V V V' V'
talk about-ST Ref.T.

pāpag-?usap-an pag-?ū?usap-an
will talk about-Ref.T.

61. [mag[pulong]]----[[pag[pulong]]an]
V' V V V' V' V' V V V' V'
have a meeting about Ref.T.

pāpag-pulong-an pag-pūpulong-an
will have a meeting about-Ref.T.

IIB. Derivationally Derived Verbs

In section IB (p.246) it was claimed that a given verb cannot take two distinct TM affixes to mark the same grammatical relation as topic. So k-um-uhah ("get") and ma-nguhah ("gather") must be distinct lexical entries even though they are related by a productive WFR and their stems consist of the same morpheme (kuhah).

There are also derivationally related verbs whose V stems are not homophonous. Derived V stems can be formed from basic V stems by affixation, reduplication, or both. For example, causative V stems are formed from basic V stems by prefixing pa-. Moderative V stems are formed from basic V stems by R2 reduplicating them. As was the case with the pairs discussed above, the moderative and basic verbs differ in meaning. The causative and non-causative verbs differ in subcategorization as well. So preliminary syntactic and semantic considerations lead us to suspect that the WFR's involved are derivational.

62a. [bigay] ---> [pa[bigay]]
V V V V V V
give let/cause to give

b. [linis] ---> [linislinis]
V V V V
clean clean a little

Once again, the fact that such verbs are distinct lexical entries is overtly represented in their morphology. But unlike the verbs with homophonous stems above, it needn't be reflected by a difference in choice of TM affixes. Notice the basic verb bigay takes ST prefix mag-, and so does the causative verb derived from it: mag-bigay and mag-pa-bigay. A moderative verb formed by R2 reduplication always takes the same TM affixes as the verb it is derived from: mag-linis and mag-linislinis. The difference is their V stems. I propose that verbs with distinct V stems must be distinct lexical entries: A verbal paradigm is based on only one V stem.

In some cases, what I proposed are co-members of a single paradigm are built on different stems. For example, the OT forms of mag-bilih are based on the ST V' stem while the ST form itself is based on the V stem (cf. (53)). So the above principle does not exclude the various topic forms of mag-bilih from belonging to a single paradigm, it should be restated more precisely: two verbs can belong to the same paradigm only if their outermost V stems are identical. The outermost, and only, V stem in the verbs in (53) is bilih.

The "outermost" condition ensures that (63a) and (63b) below do not belong to the same paradigm. Both contain the same stem lagay and can be related by a series of derivational and inflectional WFR's. But the outermost V stem of (b) is pa-pag-lagay.

63a. [mag[lagay]]
V' V V V'
place-ST

b. [[pa[pag[lagy]]]in]
V' V V' V V V' V V'
cause to place-(Causee Topic)

The sections below cover some of the class of verb formation rules that involve the derivation of a new V stem. Two points we have already made will be reinforced or generalized:

1. Like the rules for forming the thematic topic verbs above, many of the rules for forming new V stems apply to the ST forms of basic verbs, showing that derivational as well as inflectional WFR's can apply to at least some inflected members of a verbal paradigm.

2. The validity of the distinction that we have made between V and V' will become clearer. Derived V stems, like nonderived V stems, are incomplete in that they require TM affixes before they can occur in sentences. So [bigay] ("give") and [pa[bigay]] ("cause to give") have the same

syntactic status. Derived and nonderived V stems also have the same status (as opposed to V' stems) with respect to certain morphological processes. First, some derived V stems have their own complete paradigms. That is, they have a topic form corresponding to each of their subcategorized nominals. Other derived V stems do, however, have defective paradigms. But in this respect they are no different from nonderived V stems (see p.222). Secondly, derived V stems do not allow RA reduplication; RA can only apply to these derived verbs after their TM affixes have been added.

Two new observations will be made concerning the role of abstract morphological features in derivational WFR's. It appears, first, that a V stem must carry abstract features specifying what TM affixes it takes, and that in the derivation of a new V stem from a basic V stem, the features governing the array of TM affixes can be passed on to the newly derived word.[7] And second, although the process of reduplication must be sharply distinguished from affixation, there are WFR's that only add features that trigger later reduplication rules, which are like affixation rules in that their output is a new V stem.

Derived V Stems

Magsi Plural Verbs

Plural verbs can be formed by prefixing magsi to the ST V' forms of mag- and mang- verbs, and to the stem of -um- verbs. Magsi affixation applies to derived as well as basic mag- and mang- verbs. The magsi verb has the same meaning as the base verb, except that it indicates that its subject is plural. (Number agreement between subject and verb is optional, however.)

64. k-um-antah ---> magsi-kantah
sing-ST sing (pl.)-ST

(magsīsi-kantah)
will sing (pl.)-ST

65. mag-?aral ---> magsi-pag-?aral
study-ST study (pl.)-ST

magsīsi-pag-?aral
magsi-pag-?ā?aral
will study (pl.)-ST

66. mang-?isda? ---> magsi-pang-?isda?
go fishing-ST go fish.(pl.)-ST

magsīsi-pang-?isda?
magsi-pang-?ī?isda?
will go fishing (pl.)-ST

The derived form is marked ST: I suggest that the TM is the familiar ST prefix mag-, and that -si- is a V stem-forming prefix. In this way the inventory of TM's need not be enlarged to include a new ST form magsi. Further evidence comes from the way aspect reduplication applies to magsi, as illustrated in parentheses in (64-6) above. In magsi verbs

formed from -um- verbs, only si can be reduplicated. This is totally in line with the behavior of RA in verbs considered earlier, if si forms a new V stem and mag- is contained in its own set of V' brackets. RA will not copy the first CV of the base verb's stem kantah, any more than it will copy the second syllable of the stem of a morphologically simple verb such as mag-hiwalay:

67. [mag[si[kantah]]] [mag[hiwalay]]
V' V V V V V' V' V V V'

mag-sīsi-kantah
*mag-si-kākantah

mag-hīhiwalay
*mag-hiwāwalay

Magsi verbs based on pag- and pang- stems have alternate durative forms. In one of the alternates, aspect marking has chosen the innermost V', that is, the V' enclosing the base verb's ST form, and reduplicated the next inner stem, as in the (a) examples below. In the other durative form, si is reduplicated. pag- and pang- cannot be reduplicated, although there is no general prohibition against reduplicating them. In verbs such as Ben.T. verbs which are formed by adding only a TM marker to the ST stem, the ST prefix can be reduplicated: ?i-papag-?aral ("will study for"). The difference is that in (68), si and not pag/pang- is the beginning of the next inner stem from the outermost V'.

68. [mag[si[pag[?aral]]]]
V' V V' V V V' V V'

a. magsi-pag-?ā?aral
b. magsīsi-pag-?aral

c. *magsi-pāpag-?aral

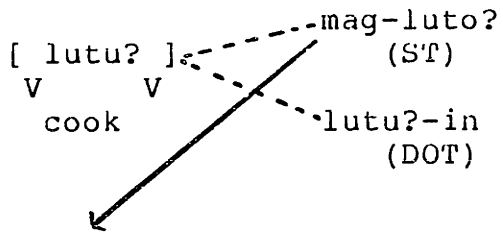
69. [mag[si[pa[ngisda?]]]]
V' V V' V V V' V V'

a. magsi-pa-ngīnigsda?
b. magsīsi-pa-ngisda?

c. *magsi-pāpa-ngisda?

It was proposed above that only derivational WFR's derive new V stems. So the derived si plural verbs are distinct lexical items; they in turn take their own paradigmatic TM affix mag-. This means it is necessary to allow derivational WFR's to have access to inflected V' stems and that the internal structure of verbs can zigzag between V and V'.

70.

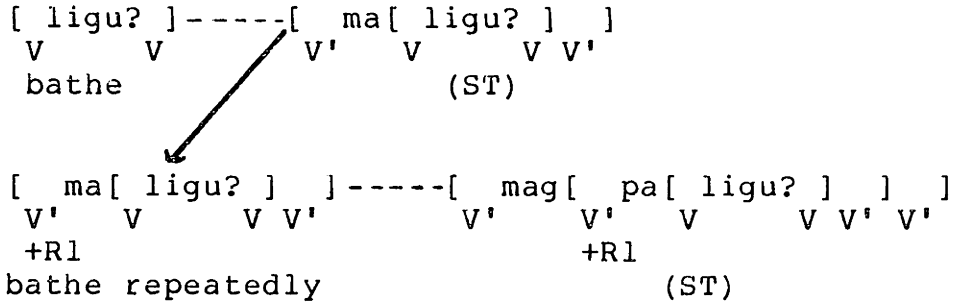


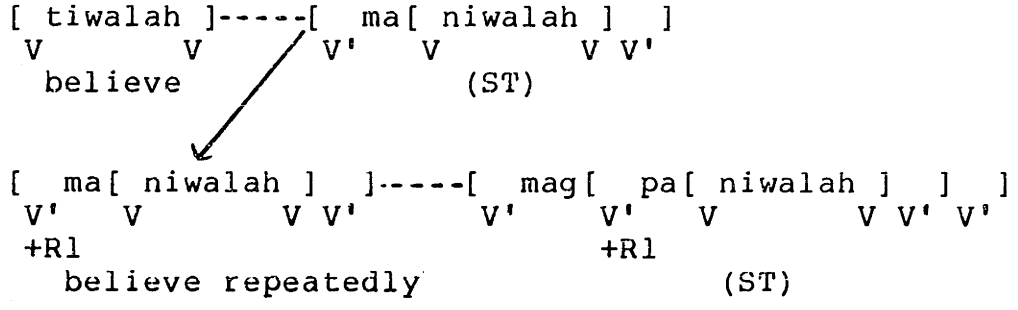
[si[pag[lutu?]]]-----[mag[si[pag[luto?]]]]
V V' V V V' V V' V V V' V V'
(ST)

It is perhaps surprising that the new V stem formed with *si* takes only a ST prefix. Although it takes the same object complements as the verb is is derived from, it does not have OT forms. So, for example, there is no plural form corresponding to *lutu?-in* (the DOT). But this situation is not unheard of. There are basic verbs which are defective in that they lack a topic form corresponding to one or more of their nominal complements (see p.222). Like these basic verbs, *si* plural stems have defective paradigms.

Intensive Mag- Rl Verbs

Verbs designating repeated or intensive activity can be derived from the ST forms of many *ma-* and *mang-* verbs by Rl reduplicating their stems. The new intensive V stem takes ST prefix *mag-*.

71.


72.


In verbs whose ST stems take -um- or mag-, it appears that the intensive WFR applies directly to the V stem.

73a.	?-um-iyak cry	b.	mag-?i?iyak cry repeatedly
74a.	mag-lakbay travel	b.	mag-lalakbay travel repeatedly

I have claimed that if two words are related but do not belong to the same lexical entry, this is reflected in their morphological structures: if their V stems are homophonous, or perhaps homo-morphemic, they take different arrays of TM affixes; otherwise they have distinct V stems. I have assumed on the basis of their meanings that the intensive verbs do not belong to the same paradigm as the verbs they are derived from. But it is perhaps not clear that there is morphological evidence for this in the case of the R1 intensives derived from mag- verbs. Before the application of R1 reduplication, the base and the derived verbs have homophonous stems, and they both take mag- to mark ST. We must assume ,then, that in spite of the fact that reduplication is very different from affixation, the assignment of abstract features that trigger reduplication can form new V stems: $[_{V}$ lakbay $]_{V}$ and $[_{V}$ lakbay $]_{V}$ are distinct stems.[8]

+mag

+mag
+R1

These derived R1 intensive verbs have OT forms in their paradigms as well. These are based, not on the derived V stem, but on the derived ST V' stem. This makes their paradigms parallel to those of the few basic verbs such as mag-ka?it whose OT forms are also based on the ST stem. It is interesting, however, that each derived intensive verb takes exactly the same OT markers as the basic, non-intensive verb does.

75a.	g-um-upit (ST) gupit-in (DOT)	--->	b.	nag-gugupit (ST) pag-gugupit-in (DOT)
	cut			cut repeatedly
76a.	mag-bukas (ST) buks-an (DOT)	--->	b.	mag-bubukas (ST) pag-bubuks-an (DOT)
	open			open repeatedly
77a.	t-um-awag (ST) ?i-tawag (DOT)	--->	b.	mag-tatawag (ST) ?i-pag-tatawag (DOT)
	call			call repeatedly

So it is necessary to assume that the derived R1 stem must carry with it, in the form of abstract morphological features, a specification of the OT affixes that the basic non-intensive verb takes.

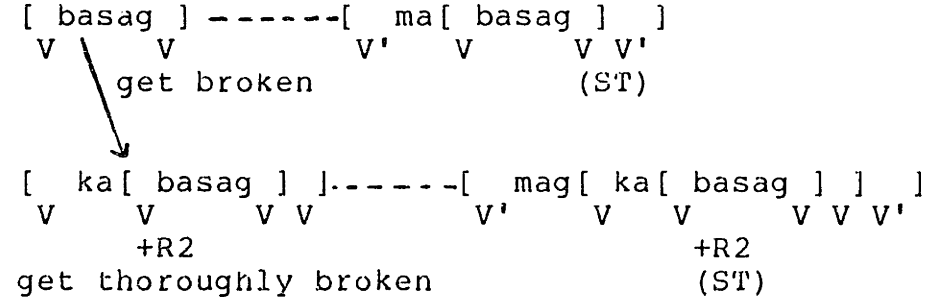
Although these intensive verbs take exactly the same TM affixes (with the exception of ST) as the verbs they are derived from, the fact that they belong to distinct lexical

entries is overtly manifested; their V stems are subject to R1 reduplication and therefore are distinguished from the V stems they are derived from in concrete phonological terms.

WFR's that Trigger R2 Reduplication

There are several derivational WFR's which derive new V stems by adding a prefix and a feature that triggers R2 reduplication. V stem-forming ka- is added in the intensive formation illustrated by (78-80); V stem-forming paka- is added in a second intensive formation illustrated in (81-3). In both formations, the derived stem takes ST prefix mag-. (The derivation is represented in (78) and (81) only; (79-80) and (82-3) are inflected forms of the basic and derived verbs.)

78.



79. ma-sira? ---> mag-ka-sirāsira?
get damaged-ST — get thoroughly damaged-ST

80. mag-hiwalay ---> mag-ka-hiwāhiwalay
get separated-ST — get completely separated-ST

81. [gutom]-----[ma[gutom]]
V V V' V V V'
become hungry (ST)
↓
[paka[gutom]]-----[mag[paka[gutom]]]
V V V V V' V V V V V'
+R2 +R2
(try to) become (ST)
extremely hungry

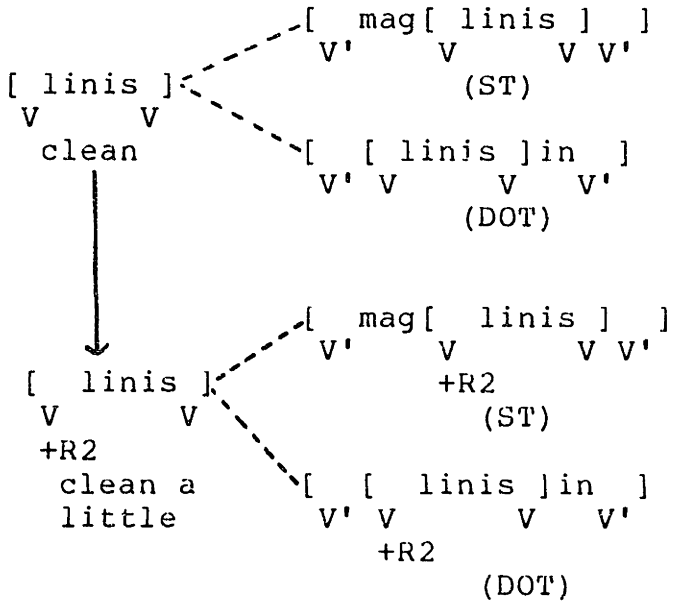
82. b(-um-)a?it ---> mag-paka-ba?itba?it
become good-ST try to become extremely good-ST

83. y(-um-)aman ---> mag-paka-yamanyaman
become wealthy-ST try to become extremely wealthy-ST

Although there is no change in subcategorization involved in either of these two WFR's, the meaning changes are those we might expect of a derivational rather than an inflectional WFR. Our criterion that verbs based on different V stems constitute distinct lexical entries forces this conclusion in any event.

Moderative verbs are formed only by adding the feature [+R2] to the V stem of the base verb. As in the case of Mag-R1 intensive verb formation discussed above, this WFR derives a new lexical entry, but it does not involve affixation. So features that trigger reduplication rules, like affixes, can distinguish V stems. The new moderative stem has its own lexical entry and paradigm.

84.



An R2 moderative verb always takes exactly the same array of TM markers as the verb it is derived from: thus compare the TM affixes in the derived R2 verbs in (84) with those in (85-6).

85.	d-um-aloh (ST) daluh-an (DOT)	d-um-aludaloh (ST) daludaluh-an (DOT)
	attend	attend now and then
86.	mag-?urong (ST) ?i-?urong (DOT)	mag-?urung?urong (ST) ?i-?urung?urong (DOT)
	move back	move back a bit

This fact does not force us to derive each inflected moderative verb from the corresponding inflected form of the basic verb, e.g. linislinis-an <--- linis-an; we will, however, consider this possibility in Chapter 5, in connection

with another problem. We have already seen that the intensive Mag- R1 verbs discussed above take exactly the same OT markers as their base verb does (although in those verbs the OT marker is added to the derived stem). So it is necessary to assume that derivational WFR's can carry over some or all inflectional TM features from the base word to the derived word. (Causative verbs, discussed below, provide more evidence that this must be so.)

Causative Verbs

Causative verbs can be derived from almost all basic verbs. A causative verb takes the same object complements with the same case marking as the basic, non-causative verb it is derived from. But there are two predictable ways in which its subcategorization differs from that of its non-causative base. Its subject (ng/si case marking) is the person who causes or allows the action, and does not correspond to any of the basic verb's complements. Secondly, the complement that corresponds to the subject of the base verb--the causee of the causative verb--is an object of the causative verb. Its case marking depends on what other objects there are. If the base verb (and therefore the causative verb) takes a direct object, the causee is case-marked as an indirect object (sa/kay). Otherwise (if the base verb is intransitive or takes only an indirect object) the causee is marked as a direct object (ng). (By identifying the causee complement in semantic terms we do

not mean to abandon our position that the semantic relations borne by verbal complements is interpreted through their grammatical case markings. It is simply a convenient way to refer to a nominal argument whose grammatical relation depends on what other grammatical relations it co-occurs with.)

87a. Nag-walis ng bakuran ?ang katulong
ST-sweep DO-yard T-maid

The maid swept the yard

b. Nag-pa-walis ng bakuran sa katulong ?ang lalaki?
ST-have sweep DO-yard IO-maid T-man

The man had the maid sweep the yard

88a. P-um-unta sa tindahan ?ang bata?
ST-go IO-store T-child

The child went to the store

b. Nag-pa-punta siya ng bata? sa tindah-an
ST-cause/let go T-he DO-child IO-store

He let the child go to the store

ST causative verbs always consist of magpa- plus the V stem of the corresponding non-causative verb. As with the mag-si- plural verbs above (p.274), we might ask whether they are derived by adding an inflectional V' affix which happens to be bi-syllabic, as follows:

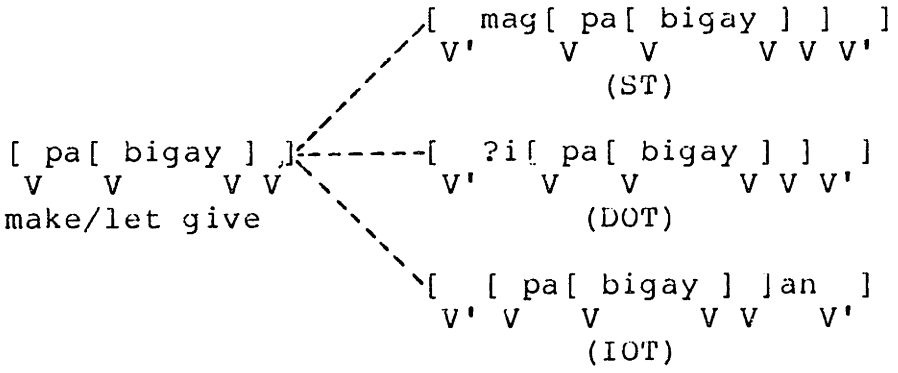
89. [magpa[bigay]]
V' V V V'

or whether they are formed by first deriving a new causative V stem to which V' topic marking affixes must be added:

90. [mag[pa[bigay]]]
V' V V V V V'

Again it seems that the second solution is the correct one. First of all, the posited causative stems have their own paradigms. They show up with the familiar array of topic marking affixes that we find with basic monomorphemic V stems: Besides taking mag- to mark the ST, the causative verb pa-bigay takes ?i- to mark the DOT and -an to mark IOT.

91.



Even stronger reason for assuming that the affixes that occur in causative verbs are the same affixes that occur in the base verb is that if the base verb forms its OT with the suffix -an, the new causative verb will also take -an to mark the OT (e.g. bigyan~ pabigyan). The alternative, to say that the discontinuous affix pa...an contains a string tht is only

accidently homophonous with the OT suffix -an, is dissatisfying.

So first a causative stem is formed by prefixing pa- to the V stem of a non-causative verb, and then the familiar topic marking affixes are added to it. In section IB, I proposed that if a WFR forms a new V stem--that is, a stem which is incomplete, and requires TM affixes before it can show up in a sentence-- that WFR must be derivational. By this criterion, pa- causative stems must be V stems which are related derivationally to the V stems of their non-causative counterparts. The pa- stem is the V stem of a new paradigm; it is not inflectionally related to the non-causative verb. This conclusion is forced on us in any event, given the other criteria we proposed to determine whether two words are derivationally or inflectionally related. Even when two verbs have homophonous V stems, they are distinct lexical items if they have different meanings and/or subcategorization. Causative verbs differ from their non-causative counterparts in both these ways (though the meaning change could fall within the range of inflectionalized meaning changes, perhaps).

Additional evidence that causative pa- stems have the same status as monomorphemic V stems comes from the way they are treated by further WFR's. For example, instrumental stems are formed by adding pang- to V stems of mag- verbs; this WFR

never applies to V' stems. If the verb is causative, pang- is added to the pa- stem.

92a. mag-bigay ---> pambigay
give-ST for use in giving

b. mag-pa-punas ---> pampapunas
have/let for use in causing
wipe s.t. to be wiped

In the formation of gerunds, the initial /m/ of ST prefixes becomes /p/, and the first CV of the V stem is reduplicated: In the gerund form of causative verbs, it is the causative morpheme pa- that is reduplicated as the first CV of the V stem.

93a. mag-bigay ---> pag-bibigay
giving

b. mag-pa-bigay ---> pag-papabigay
causing/allowing to
give

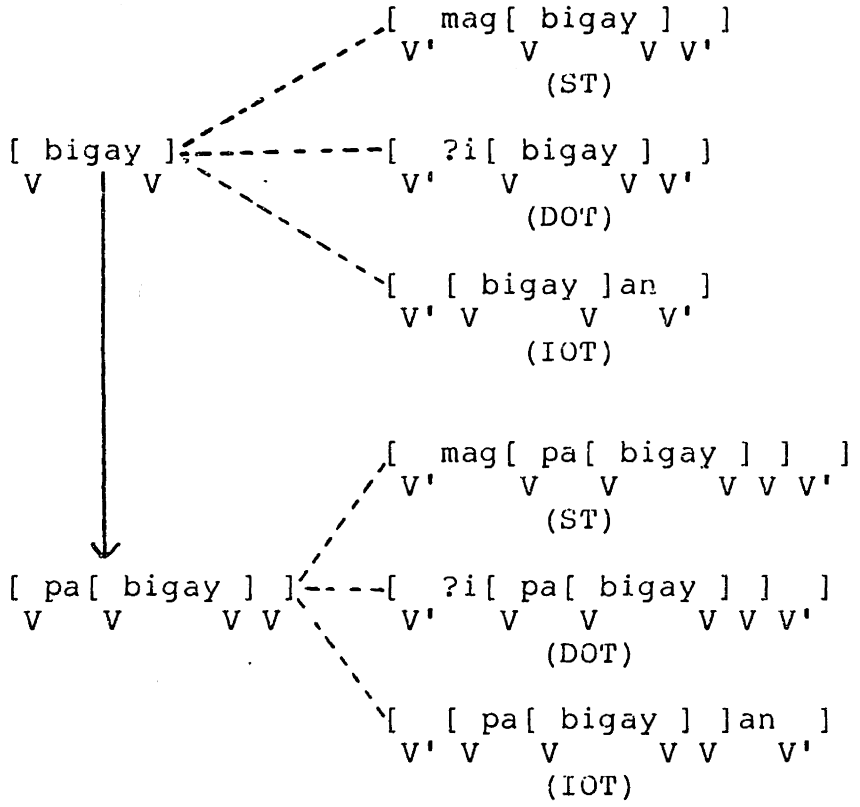
Finally, in the durative aspect, pa- must be reduplicated (recall that durative reduplication looks for the first CV in from a V' morpheme). The first CV of the base verb's V stem cannot be reduplicated, arguing that pa- is not a V' affix.[9]

94. mag-papabigay (*mag-pa-bibigay)
was causing to give

If the pa- stem is itself a V stem, this is in line with what we already know about aspect reduplication.

So I conclude that causative verbs are derivationally related to non-causative verbs. A new V stem or lexeme is formed from a basic lexeme by prefixing pa- to its V stem. (It just happens to be one of those derivational WFR's that chooses the V stem rather than the V' stem of the base verb.)

95.



According to (95), the causative WFR relates only the V stem of the non-causative verb and the V stem of the causative verb. There is no direct relationship between their various inflected forms. This seems correct. It is obvious that a

causative verb with a topic marking prefix cannot be derived from a non-causative verb with its topic marking prefix. For example, ?i-pa-bigay cannot be derived by adding pa- to ?i-bigay; it would require inserting an affix inside already affixed material. In the case of causative verbs with suffixed topic markers, the linear order of the morphemes does not tell us whether (96a) or (96b) is correct:

96a. [[pa[bigay]]an]
V' V V V V V'

b. [pa[[bigay]an]]
V V' V V V' V

Still, it is necessary to assume that pa- is affixed before the OT suffix--that (96a) is correct--because the new pa- stem must at least partially dictate what topic marking affixes the causative verb takes. Pa-bigay happens to take the same array of TM markers as bigay, but this is not always the case. All pa- stems take mag- to form the ST verb, even when their base verbs take ST -um-.

97. [sulat]- - - - - - - - -[um[sulat]]
V V V' V V V'
write (ST)
↓
[pa[sulat]]------[mag[pa[sulat]]]
V V V V V' V V V V V'
let/cause to write (ST)

Further, all causative stems take -an to form IOT topics,

regardless of whether their base verbs take -in or -an. For example:

98. [?akyat]----------[[?akyat]in]
V V V' V V V'
climb (IOT)
↓
[pa[?akyat]]-----[[pa[?akyat]]an]
V V V V V' V V V V V'
let climb (IOT)

Finally, causative verbs must have partial autonomy in choosing their DOT affixes. If the basic non-causative verb takes -an in its DOT form, the corresponding causative verb will also take -an. Otherwise, it will take ?i-, regardless of whether its base counterpart takes ?i- or -in.

99a.	buks-an open-DOT	pa-buks-an cause to open-DOT
b.	?i-handa prepare-DOT	?i-pa-handa cause to prepare-DOT
c.	kudkur-in grate-DOT	?i-pa-kudkod cause to grate-DOT

(The effect of these conditions on the choice of DOT and IOT marking affixes is that the suffix -in is never used to mark any of the object complements that it shares with the basic, non-causative verb as topic. Another way to state which OT markers the causative stem takes might be to say that they take the same OT markers as their basic counterpart to mark

shared direct or indirect object as topic, unless the basic verb takes -in. Then the causative verb takes ?i- to form DOT and -an to form IOT.)

So even though the causative OT forms are not derived by attaching pa- directly to the corresponding OT forms of the basic non-causative verbs, the derived pa- stem must carry with it, in the form of abstract morphological features, a specification of the OT affixes that the non-causative verb takes.

Causee Topic

In order to derive all members of the paradigm of a causative verb, it is not enough to derive a single new causative V stem from the basic, non-causative V stem, to which TM V affixes are added. The form of the verb that marks the causee--the nominal that corresponds to the subject of the basic, non-causative verb--as topic, is based on a second causative stem which is formed by adding pa- to the ST V' stem of the basic verb. This second causative stem takes the TM suffix -in.

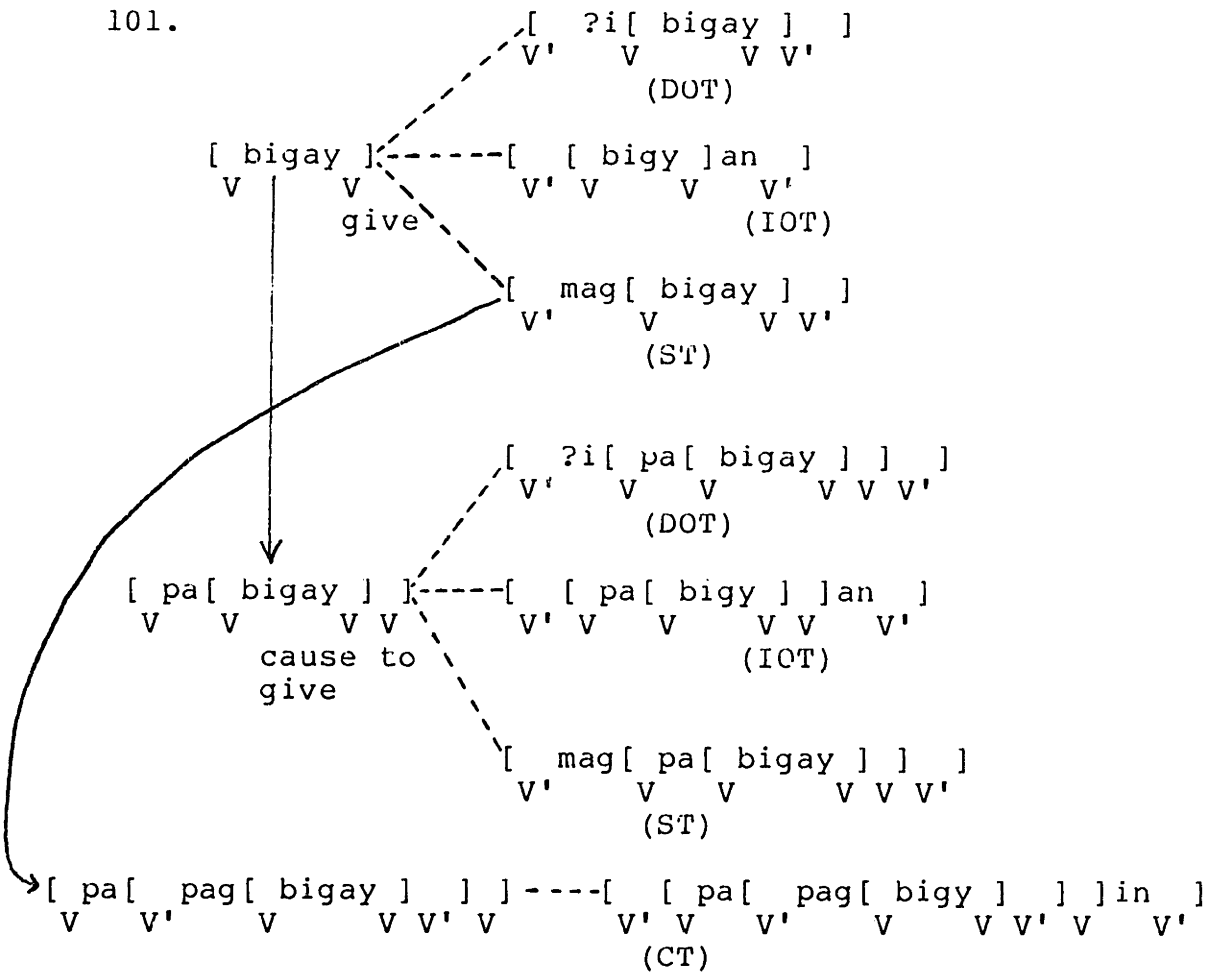
100. P-in-a-pag-walis-in ng bakur-an ng lalaki?
have/let sweep-CT DO-yard S-man

?ang katulong
T-maid

The man had the maid sweep the yard.
(the first occurrence of -in- marks actual aspect)

If the Causee Topic (CT) form is part of the paradigm that includes the ST, OT, and IOT forms of the causative verb, then we must allow the derivational WFR that prefixes <u>pa-</u> to apply to two base verb stems to derive two derived causative stems. That is, in some cases where two words are related by a derivational WFR, it is necessary to assume that the rule actually simultaneously relates two pairs of stems from the base paradigm.

101.



IIC. A Problem for the Inflection/Derivation Distinction

Adding maka- to most verbs forms a ST verb with two alternate meaning changes: either the subject of the verb was able to perform the action or he performed it involuntarily. Otherwise there is no change in meaning from the base verb; and the two verbs have identical argument structures.

102a. G-um-amit siya ng manggang hilaw
ST-used T-he DO-mango green

He (T) used a green mango

Naka-gamit siya ng manggang hilaw
managed/hap- T-he DO-mango green
pened to use

He (T) happened/managed to use a green mango

Maka- attaches to the ST V' stems of mag- and mang- verbs but, as usual, -um- does not show up in the derived verb.

103a.	mag-?abot hand to-ST	maka-pag-?abot be able to hand to-ST
b.	mang-guloh cause trouble	maka-pang-guloh manage to cause trouble
c.	g-um-amit use-ST	maka-gamit manage to use-ST

The meaning change introduced by maka- is one that might be characteristic of either an inflectional or derivational WFR. But if maka- consists of the ST prefix ma- plus the V

stem-forming prefix ka-, then these derived verbs do not belong to the same paradigm as the verbs they are derived from, according to our classification based on V and V'.

104. [basah]--------[mag[basah]]
V V V' V V V'
read (ST)
↙
[ka[basah]]---[ma[ka[pag[basah]]]]
V V V V V' V V' V V V' V V'
manage to read (ST)

There are also OT and thematic topic forms of ability/involuntary action verbs.

105a. Gāgamit-in niya ?ang manggang hilaw
will use-DOT S-he T-mango green

He will use the green mango (T)

b. Ma-gāgamit niya ?ang manggang hilaw
will manage to use S-he T-mango. green

He will manage to use the green mango (T)

They are unlike any of the derived verbs discussed so far in two respects. First, they are not formed on the V stem, or on the V' stem, either of the basic verb or of the derived ability verb. That is, they are not based on any of the forms in (106).

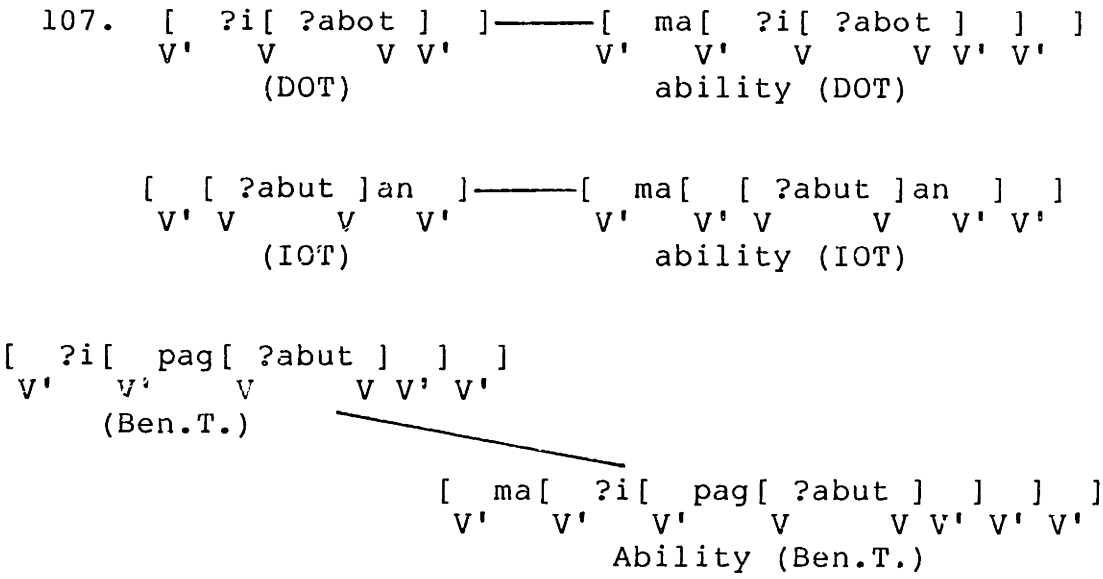
106. [?abut]-------[mag[?abut]]
V V V' V V V'
hand to (ST)

[ka[pag[?abut]]]---[ma[ka[pag[?abut]]]]
V V' V V V' V V' V V V' V V V'
be able to hand to

Instead they are formed by adding ma- directly to the OT or thematic topic V' forms of the base verb.[10] IOT suffix -in is subsequently truncated, however). Except for the rules for

marking verbal aspect (which I will argue apply at a later level of affixation), ma- is the only WFR that applies to a V' stem other than a ST V' stem.

107.



Although this makes ma- unusual, it is not a problem. Since ST forms are accessible to further WFR, why shouldn't OT forms also be?

A second way that ma- ability verbs are surprising is that the topic marking function of the base verb is transferred to the new ma- verb. For example, -an marks a different nominal function as topic in each of the (a) verbs below. This TM function is carried over exactly in the corresponding ma- verb.

108a. [[talup]an] b. [ma[[talup]an]]

V' V V V' V' V' V V V' V'
peel-DOT be able/manage to peel-DOT

109a. [[?abut]an] b. [ma[[?abut]an]]

V' V V V' V' V' V V V' V'
pass to-IOT manage to pass to-IOT

110a. [[pag[laru?]]an]
V' V' V V V' V'
play in-Loc.T.

b. [ma[[pag[laru?]]an]]
V' V' V' V V V' V' V'
be able/manage to play in-Loc.T.

In contrast, in all cases where a TM marker is added to a ST V' stem, the new TM affix determines the topic of the new verb, e.g.:

111. [mag[laru?]] [[pag[laru?]]an]
V' V V V' V' V' V V V' V'

This does not necessarily preclude classifying ma- with the TM affixes. The prefixes -um-, mag-, and mang- always form ST verbs and therefore might bear the feature [±ST]. But ?i-, -in, and -an can mark a variety of functions, grammatical or thematic. For example, -an can mark DOT, IOT, or Loc.T. For a verb that belongs to the basic (listed) paradigm, the verb's subcategorization frame will specify where -an forms an IOT or a DOT verb. The Loc.T. WFR specifies that its output

is [±Locative].

112. Locative Topic Formation

```
[      ] ---> [   [      ]  ]
 V'  V'         V'  V'  V' V'
 +ST            +Loc.T.
```

So, as morphemes, -in, -an, and ?i- do not bear features that correspond to thematic or grammatical relations. However, since they never form ST verbs, they are marked [-ST]. So within the inventory of TM affixes there is only a two-way division, defined by [±ST].

Given a system in which TM features, except for [±ST], are derived rather than inherent features of TM affixes, then we can offer a proposal as to how ma- verbs take over the TM marking of their base verbs. Suppose that ma-, like other OT affixes, is unspecified for any TM feature except [±ST]. Furthermore, the ma- formation rule, unlike the locative topic rule above, does not specify a TM function in its output; then we postulate that any V' that is unspecified for OT TM features takes on the TM features of its base V

113.

```
[          ] ---> [ ma[
 V'      V'         V'   V'
 -ST                     -ST
 ∝DOT                    ∝DOT
 ℘LOC                    ℘LOC
```

Ability ma- does behave like the other TM affixes in that it

completes a word, and it allows RA reduplication on the following syllable.

114. ma-?i-pag-?abut $\left\{\begin{array}{l}\text{ma-?ī?i-pag-?abut}\\ \text{ma-?i-pāpag-?abut}\\ \text{ma-?i-pag-?ā?abut}\end{array}\right\}$

will be able to hand to-Ben.T.

It is possible to assume, then, as I will, that ma- is an inflectional TM affix, perhaps the same morpheme that shows up in certain DOT verbs, e.g. ma-kita? ("see"-DOT).

Under the analysis given so far of ST ma-ka as consisting of ST ma- plus V stem -ka, the relationship between ma-ka and ma- is a problem for our claim that different V stems belong to different lexical entries. From the point of view of meaning and subcategorization, it seems that ma- and maka- verbs ought to belong to the same paradigm. However, they are based on different V stems. There is a parallel in a very small class of basic verbs. These verbs take maka in their ST forms, and ma- in their OT forms. Again, it seems desirable to consider the corresponding ST and OT forms to belong to the same paradigm.

115a.	ma-ka-kita? see-ST	ma-kita? OT
b.	ma-ka-rinig hear-ST	ma-rinig OT
c.	ma-ka-halata? notice-ST	ma-halata? OT

I will propose therefore that ability ma-ka is the same bimorphemic ST marker that occurs in basic verbs in (115), and that ST ma-ka and OT ma- ability verbs are inflectionally related.

There is a complication in the way RA applies to ma-ka ability verbs, which does not, however, warrant modifying either our analysis of ma-ka or of RA reduplication. In maka- verbs derived from mag- and mang- stems, either ka- or the syllable following the ST prefix pag/pang (<--mag/mang) is reduplicated. The syllable following ka-, the base verb's ST prefix cannot be. All this is what we would expect given our claim that only V' affixes trigger RA.

116. ma-kāka-pag-basah
ma-ka-pag-bābasah
*ma-ka-pāpag-basah

will happen/manage to read

However, in maka verbs derived from -um- verbs, either ka- or the syllable following ka- can be reduplicated.

117. ma-kāka-gamit
ma-ka-gāga mit

will be able to use

One way to maintain our claim that only V' brackets trigger RA (the second case in (117) is ostensibly triggered by ka-)

would be to say that after ka- has been added to the V' stem, -um- is truncated, but its V' brackets are left behind:

118. [ma[ka[um[gamit]]]] --->
V' V V' V V V' V V'

[ma[ka[[gamit]]]]
V' V V' V V V' V V'

Presumably, under this analysis the plural prefix si- would be added to the V stem of -um- verbs, since the syllable following si cannot be reduplicated: compare (117-18) with (119).

119. [mag[si[gamit]]]
V' V V V V V'

*mag-si-gagamit

But Recall that the basic ma-ka verbs just referred to in (115) also allow RA to copy the CV following ka- (p.242). In such cases it is not possible to appeal to an inner set of V' brackets as triggering RA on the inner V stem, since ma-ka is attached to the simple V stem.

120. [ma-ka[kita?]]
V' V V V'

ma-kāka-kita?
ma-ka-kīkita?
will see

I proposed for these verbs that an optional boundary adjustment allows ma-ka to be analyzed as one morpheme. this same adjustment would handle the cases with ability ma-ka as well. The difference between (116) and (117) shows that this adjustment cannot apply when ma-ka is attached to a V' stem.

The M+P Analysis of Nasal-Initial Prefixes

We have been assuming that further affixes can be added to the V' forms of verbs with ST markers ma-, ma-ka, mag-, and mang-. This arises in three types of situation: in the basic paradigms of those few verbs like (121a) whose OT forms are based on the ST form; in inflectionally derived thematic topic verbs such as (121c).

121a. [mag[ka?it]] . . . [?i[mag[ka?it]]]
V' V V V' V' V' V V V' V'
refuse to give-ST DOT

b. [mag[luto?]] . . . [?i[mag[luto?]]]
V' V V V' V' V' V V V' V'
cook-ST BT

c. [ma[ngisda?]] --->
V' V V V'
go fishing-ST

[mag[si[ma[ngisda?]]]]
V' V V' V V V V' V V'
go fishing (pl.)-ST

This account requires an allomorphy rule that changes /m/ to /p/ (for which reason it was called the m/p analysis). Also,

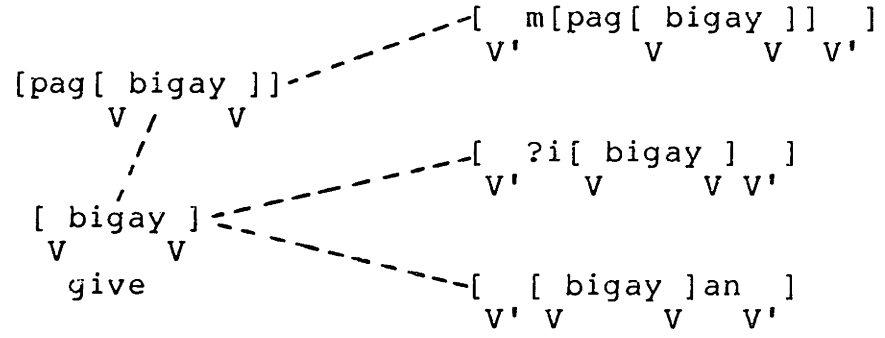
it requires some mechanism or convention whereby the ST prefix is over-ridden by the newly added TM affix.

Another possibility (also proposed and adopted by DeGuzman, 1978), is that mag, ma, ma-ka and mang are each actually composed of two separate affixes--an inflectional ST prefix m- and a /p/-initial prefix that forms a secondary stem from the primary root or stem. This will be called the m+p analysis. Like the primary stem, the secondary stem still requires an inflectional affix before it can actually occur in a sentence (the brackets around the secondary stem will not be labelled for now).

This solution would require a rule that changes m+p to m, but such a process could perhaps be handled by Nasal Substitution.

So in the paradigms of most verbs, the ST form is based on the secondary stem, while the OT forms are derived from the primary stem.

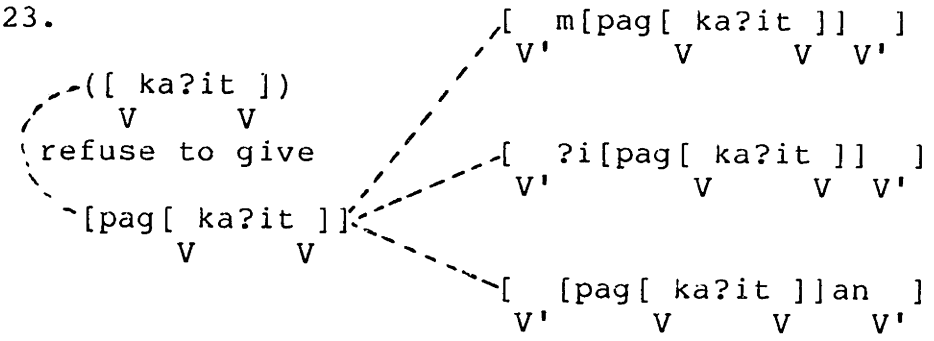
122.



However, for a very small class, the OT forms are also based

on the secondary stem.

123.



Throughout this chapter we have been motivating a two-way division among verbal affixes depending on three properties. V' affixes differ from V prefixes in that they complete the verb, marke the topic of the sentence, and trigger reduplication. the m+p analysis is of great interest to us because, if it is correct, then these three characteristics would not identify two neat classes of affixes. Rather, it would be necessary to conclude that the class of TM affixes is not identical to the class of affixes that trigger reduplication.[11] First, consider the m+p account of RA reduplication. According to the m+p analysis, the ST form of the verb (pag-)bilih ("sell") is morphologically parallel to the OT forms. All three are built on the secondary stem. But although pag can be reduplicated in the OT forms, it cannot in mag-bilih.

123. [m[pag[bilih]]]
V' V V V'
sell-ST

a. *māmag-bilih
b. mag-bībilih

124. [?i[pag[bilih]]] a. ?i-pāpagbilih
V' V V V' b. ?i-pag-bibilih
sell-OT

125. [[pag[bilih]]an] a. pāpag-bilh-an
V' V V V' b. pag-bibilh-an

So /m+p/ would have to become /m/ before reduplication applies. In addition, there would have to be a convention whereby empty brackets are erased. If the brackets that contain ST m- remain, they would presumably incorrectly trigger reduplication (parallel to (125)). An additional complication is that the ST marking function will have to somehow be transferred to the next inner bracket, and its morpheme.

126. [m[pag[bilih]]] ---> [[mag[bilih]]] --->
+ST N-Sub. +ST Pruning

[mag[bilih]]
+ST

At the time that RA applies, then, the prefix that forms the secondary stem appears to be identical in shape with the ST prefix under the m/p analysis. However it is necessary to attribute to the secondary stem-forming prefixes pag-, pa-, and pang- the power to trigger reduplication in forms such as (124) and (125). But according to the m+p analysis, pag is not a TM affix, and it does not form a verb that is ready to appear in sentences.

Pag is like the TM affixes in that it triggers reduplication. It is like pluralizing si or causative pa in that it does not mark the topic of the sentence.

One argument in favor of the m+pag analysis is that it does not require an allomorphy rule to change /m/ to /p/. If the N-Subst. rule needed elsewhere can change /m-p/ to /m/, then the m+pag analysis requires one less rule than the m/p analysis.

There are two other reasons that the m+pag analysis is appealing, although neither of them is really strong enough to make it obvious that it is the correct analysis. First, it claims that there are only two ST inflectional affixes, -um- and m-, whose phonological similarity suggests they were identical at some point in the history of Tagalog. Those verbs which have a stem with a p-initial extension always takes m- to form the ST form.[12] Perhaps it should be noted, however, that although the set of TM affixes is reduced (m- and -um- instead of mang-, mag-, ma- and -um-), the overall verbal system is not simplified. pa-, pang- and pag- stems must still be listed in the paradigms.

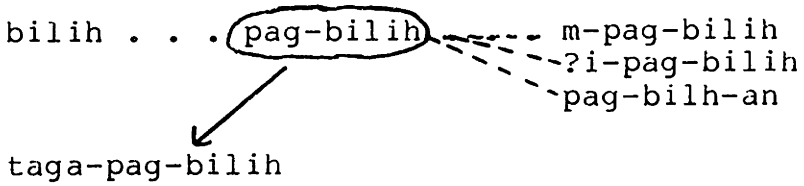
The m+p analysis also allows a fairly simple statement of many inflectional and derivational WFR's including the taga- WFR above, that apply to verbs. Many of them take the pag, etc., stems of mag, etc., verbs, but they take the simple root stem of -um- verbs.

127a. b-um-ilih
buy-ST

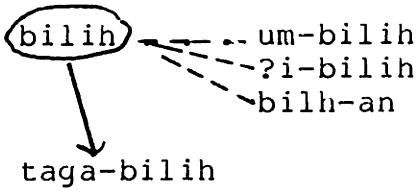
b. taga-bilih
buyer

Under the m+pag analysis, a single statement will do for all verbs. Taga- is prefixed to that stem in the verbal paradigm to which the ST affix is added. This is the secondary root of those verbs that have them, and the primary root of those that have only one.

128.



129.



Under the m/p analysis it is necessary to complicate the derivation of such nouns in one of two ways. One possibility is that the taga- prefixation rule (and many other WFR's) applies to different members of the paradigm for different verbs. Taga- would be prefixed directly to the V' ST forms of mag and mang verbs, but to the V stem of -um- verbs. Or we could posit a simple taga- prefixation rule that applies to the ST V' form in all forms, by additionally positing a truncation rule that deletes -um- (this truncation rule would be triggered in many Word Formations; -um- almost never shows

up inside complex words, even in formations where pag/pang stems do).

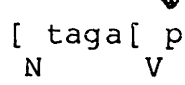
130. [mag[bilih]] ---> [taga[pag[bilih]]]
V' V V V' N V' V V V' N

131. [um[bilih]] ---> [taga[um[bilih]]]
V' V V V' N V' V V V' N
↓
ø

The m+pag analysis might seem at first to offer the attractive possibility that inflection always falls outside of derivation. Like other TM inflectional affixes ?i-, -an, -in and -um-, m- is never inside a derivational affix. In the following deverbal nouns, taga- has been added to the secondary stem, not to a ST form. The m/p analysis claims that taga is prefixed to the ST form, but that the ST marking function is obliterated or over-ridden. [10]

132. [pag[bilih]] ---> [taga[pag[bilih]]]
+RA N V V V V N
.
.
.
[m[pag
V
+TM
+RA

133. [pa[ngisda?]] . . . [m[pa[ngisda?]]]
V V V V +TM V V V V V
+RA +RA



[taga[pa[ngisda?]]]
N V V V V N

But it is not clear that even under the m+p analysis it is possible to maintain the claim that TM affixes are always outside of derivation.

It is not true that a ST marker cannot show up inside derivation, as the following intensive formation shows.

134. [um[tirah]] ---> pag[um[tirah]]
V V V V V V V V

t-um-irah
dwell in/at-ST

nag-t-um-irah
dwell repeatedly at-ST

So the m+p analysis seems to do no better than m/p at preserving the generalization that inflection is always outside of derivation. Furthermore, it is totally an accident that an /m/-initial prefix never shows up inside another TM affix the way -<u>um</u>- does.

An additional problems concerns ability/involuntary action verbs. We claimed (p.300) that ability/involuntary <u>ma-ka</u> and abil./invol. <u>ma</u>- were paradigmatically related. But <u>ma</u>- attaches to verb forms that are inflected with OT markers, while according to the m+p analysis, <u>ma-ka</u> attaches not to a TM form but to a secondary stem. Consider:

135.	maka[pag[lalakad]] be able to walk intensively	ma[?i[pag[luluto?]]] be able to look for

So the formation of ma-ka and ma- verbs is not parallel even though they belong to the same paradigm. Again, it is purely an accident that ma-ka does not attach to the ST form: *maka-mag-lalakad. (According to the m/p analysis, both maka and ma- attach to TM forms.)(Notice, furthermore, that if the analysis given in Section II is incorrect, and maka/ma- verbs are derivationally rather than inflectionally derived, then it would be impossible, even under the m+p analysis, to maintain the claim that all derivation is inside inflection. And it would be an accident that m- never shows up inside derivational affixes while ?i-, -an and -in do.)

Since at this point the m+pag analysis does not seem to be a more explanatory thatn the m/p analysis, I will not adopt it. I will assume that all and only TM affixes trigger reduplication.

III. Terminal or ## inflection

In section I it was claimed that basic verbal paradigms contain two kinds of forms, V and V'. V stems are the basic uninflected form from which the rest of a lexical entry's entire paradigm is built by adding V' TM affixes to it. In the case of a very small class of words, some inflected V'

members of the paradigm are derived from another V' member (usually the ST form(which in turn is built on the V stem.

In section II we outlined several WFR's that apply to the members of basic paradigms. Inflectional WFR's add a V' TM affix to a member of the basic paradigm: [V' [V V] V'] ---> [V' [V' [V .... They do not form a new V stem. Derivational WFR's do involve the derivation of a new V stem which has its own lexical entry: [V' [V V] V'] ---> [V [V' [V V] V'] V]. We found that derivational as well as inflectional WFR's apply to inflected forms of the basic paradigm (for the most part, the ST form). But each new V stem requires an inflectional V' affix before it can occur in sentences. This means that the internal bracketing of some words zigzags back and forth between V and V': [V' mag[V si[V' pag[V luto? V] V'] V] V']. So there can be no strict segregation of derivational WFR and at least V' inflection. These two subcomponents of the WF component keep cycling in on each other. Assuming that allomorphy works right alongside the WFR's, applying cyclically wherever its environment is met, we might propose that different lexical rule types are free to interact with each other.

In this section it will be shown that there is an outer layer of inflectional WF that truly marks the end of the derivation of the word, which we will call the ## level. The WFR's that apply at this level only take V' forms as their

input. And no derivational or V' inflectional WFR's can apply to the output of ## inflectional WFR's. ## inflection does not trigger any of the same allomorphy rules that derivational or V' inflectional WFR's trigger, so we can tentatively propose that a subcomponent comprised of ## WFR's applies to the output of the subcomponent containing V and V' WFR's and allomorphy.

IIIA. -Ang- Plural Verbs

The plural infix -ang- must be treated as a word-final or terminal inflectional affix. This infix is optionally attached to ST prefixes mag-, ma-, and maka-, and their actual counterparts nag-, na-, and naka-. Given our analysis of infixes as prefixes that our metathesized with the first consonant to their right (p.239), -ang- must be prefixed to the ST forms. That is, affixation of -ang- follows affixation of these TM prefixes.

136. ang[ma[ka[pag[linis]]]] ---> m-ang-a-ka-pag-linis
V' V V' V V V' V V'

manage to clean (pl)-ST

137. ang[ma[?i[sulat]]] ---> m-ang-a?isulat
V' V' V V V' V'

manage to write (pl)-DOT

138. ang[mag[linis]] ---> m-ang-aglinis
V' V V V'

clean (pl)-ST

139. ang[mag[si[pag[linis]]]] ---> m-ang-agsi-paglinis
V' V V' V V V' V V'

clean (pl)-ST

(plurality is marked by derivational si as well as by -ang-)

-Ang- can be inserted into these prefixes only when they are the outermost TM affixes; it is not possible to add a further TM affix to a verb which is already inflected for plurality:

140a. ang[mag[linis]] b. [maka[ang[mag[linis]]]]

m-ang-ag-linis *maka-m-ang-ag-linis

This is in contrast with the si-plural formation discussed in Section IIB.

141a. [mag[si[pag[linis]]]] b. maka-pag-si-pag-linis

clean (pl)-ST be able to clean (pl)-ST

This can be handled simply if -ang- is added at the word final cycle after all V and V' WF.

-Ang- differs from TM affixes in two other ways, which justifies assigning it to a different class of WF. These differences in themselves do not argue conclusively that -ang- affixation has to follow V and V' affixation, although this ordering provides an explanation for them.

For example, unlike prefixing a TM affix such as ?i- or -an, prefixing -ang- to a ST form such as mag-linis does not cause the /p/-initial allomorph to show up.

142. ?i[mag-bilih] ---> ?ipagbilih
V' V'

143. [mag-bilih]an ---> pagbilhan
V' V'

144. ang[mag-bilih] ---> m-ang-agbilih
V' V'

One way to handle this would be to claim that allomorphy does not apply at the ## level.

There are two additional differences between plural -ang- and TM affixes. -Ang- does not interfere with the way RA reduplication applies. The same material in a verb is copied when -ang- is present as when it is not present.

145a. {m-ang-akaka-bigay / m-ang-aka-bibigay} b. {ma-kaka-pag-bigay / ma-ka-pag-bibigay}

will be able to give (Sing.)
(Pl.)-ST

And, finally, -ang- differs from the TM affixes in that it does not alter the topic of the verb. However, unlike new V stem-forming affixes, e.g. causative pa-, their affixation does not require any further affixes in order for the word to

appear in a sentence.

IIIB. Actual Aspect

All verbs can be marked so as to designate an action which has begun (actual) as opposed to an action which has not begun (non-actual). Non-actual forms are (morphologically) basic. The actual forms are derived from them either by adding an affix or by modifying a consonant of the topic-marking prefix in the basic, non-actual form. Therefore, on some level, actual verbs have a plus value and non-actual verbs have a minus value for a single feature [± Actual].

Although all verbs are inflectable for actual aspect, there are two actual spell-out rules. These actual spell-out rules must apply after all rules that add topic marking affixes. First of all, the choice of spell-out rule is determined by the TM affix that was added last in the derivation of the verb. Furthermore, actual aspect always affects the outer edge of the word: either it adds an affix or modifies a consonant outside all the TM affixes. I propose therefore that the actual spell-out rules apply at a second level of inflectional WF that is ordered after all V and V' WFR's. Although V and V' WFR's can apply to each others' outputs, they cannot apply to the output of ## WFR's. So TM affixes cannot be added to verbs that have been marked for

actual aspect.

Verbs with One V' Affix: /m/-Initial Prefixes

Every verb whose TM prefix begins with a nasal marks the [±actual] distinction as follows. The initial nasal shows up as /m/ in the non-actual form, and /n/ in the actual form. Below are shown basic verbs that take /m/-initial ST and OT prefixes. In combination with RA reduplication, actual marking provides four possible aspectual forms. The way aspectual reduplication applies and the semantics associated with it will be discussed later. Except for examples (146) and (151), reduplicated forms will be avoided in the discussion of actual aspect. We note, however, that the unreduplicated, non-actual form, which we translate as the imperative form, is identical in form with the basic verb form with no aspectual inflection, that functions as an infinitive in embedded sentences.

	-Actual		+Actual
146a.	mag-bukas open-ST	b.	nag-bukas has/had opened-ST
c.	mag-bū̃bukas will open-ST		nag-bū̃bukas is/was opening-ST
147a.	man-ligaw pay court to-ST	b.	nan-ligaw paid court to-ST
148a.	ma-ligo? bathe!-ST	b.	na-ligo? bathed-ST

149a.	ma-ka-kita? see!-ST	b.	na-ka-kita? saw-ST
150a.	ma-kita? see!-DOT	b.	na-kita? saw-DOT

Verbs whose topic marking affix is ?i-, -in, or -an take the infix -in- in addition to the topic marking affix to mark the actual aspect. ?i- is optionally truncated. OT suffix -in is obligatorily truncated.

	-Actual		+Actual
151a.	?i-sulat write!-DOT	b.	(?i-)s-in-ulat has/had written-DOT
c.	?i-sūsulat will write-DOT	d.	(?i-)s-in-ūsulat is/was writing-DOT
152a.	sulat-an write!-IOT	b.	s-in-ulat-an wrote-IOT
153a.	buks-an open!-DOT	b.	b-in-uks-an opened-DOT
154a.	pasuk-in enter-IOT	b.	p-in-asok has/had entered-IOT
c.	pāpasuk-in will enter-IOT	d.	p-in-āpasok is/was entering-IOT

It was proposed in Section IIB that the ST infix -um- is first added as a prefix. Later it is metathesized after the first consonant to its right. We will assume that actual -in- is also attached as a prefix and later repositioned by a

phonological rule. The output of Actual Spell-out is:

155a. [?i[-in-sulat]] (=151b)

b. [[-in-sulat]an] (=152b)

c. [[-in-bukas]an] (=153b)

There is no Actual Spell-out for -um- verbs.

	-Actual		+Actual
156.	s-um-agot answer!-ST	b.	s-um-agot has/had answered-ST

We assume, however, that this aspectual category exists for -um- verbs for consistency's sake, since the various aspectual forms of -um- verbs correspond semantically to other TM verbs.

For those few basic OT verbs that are derived by adding an OT marker (?i-, -in or -an) directly to the corresponding ST verb, actual aspect marking is governed by the outermost, OT affix. For example, although the ST verbs mark the [+actual] distinction by the m/n alternation, OT verbs derived from them take the infix -in-.

	-Actual		+Actual
157.	[mag[ti?is]] V' V V V' endure-ST		
	a. mag-ti?is	b.	nag-ti?is

158.
```
[  [  mag[ ti?is ]  ]an  ]
 V' V'    V     V V'   V'
          OT
```

a. pag-ti?is-an b. p-in-ag-ti?is-an

159.
```
[  mang[ ?anak ]  ]
 V'     V     V V'
 give birth to-ST
```

a. ma-nganak b. na-nganak

160.
```
[  ?i[  mang[ ?anak ]  ]  ]
 V'   V'     V     V V' V'
          OT
```

a. ?i-pa-nganak b. ?i-p-in-a-nganak

161.
```
[  ma[ ligu? ]  ]
 V'   V     V V'
 bathe with-ST
```

a. ma-ligo? b. na-ligo?

162.
```
[  ?i[  ma[ ligu? ]  ]  ]
 V'   V'   V     V V' V'
          OT
```

a. ?i-pa-ligo? b. ?i-p-in-a-ligo?

163.
```
[  ma[ no?od ]  ]
 V'   V     V V'
   notice-ST
```

a. ma-no?od b. na-no?od

164.
```
[  [  ma[ no?od ]  ]in  ]
 V' V'   V     V V'   V'
          OT
```

a. pa-no?or-in b. p-in-a-no?od

If we assume that the actual aspect marking is determined by the last added topic marking affix, no new statements are

needed to handle (158, 160, 162, 164). ?i-, -an and -in require the infix -in- in the actual aspect just as they do in verbs in which they are the sole topic-marking affix, (151-54). In (164) the OT suffix -in is deleted in the actual forms, just as it was in the actual forms of (154).

The same point can be made with morphologically complex verbs involving both V and V' affixes. The outermost V' affix determines the choice and position of actual spell-out.

165. [?i[pag[luto?]]] ---> ?i-p-in-ag-luto?
V' V' V V V' V'
Ben.T.

166. [[pag[lutu?]]an] ---> p-in-ag-lutu?-an
V' V' V V V' V'
Loc.T.

167. [mag[si[pag[luto?]]]] --->
V' V V' V V V' V V'
Plural

nag-si-pag-luto?

168. [maka[pag[si[pag[luto?]]]]] --->
V' V' V V' V V V' V V' V'
Ability

naka-pag-si-pag-luto?

Since the choice of actual spell-out rule is determined by the last added affix, that choice must be made after all TM affixes have been added.

One might want to propose that all verbs take the same actual marker. The fact that the actual marker looks different in verbs with /m/-initial prefixes and all other TM affixes would be handled by certain allomorphy rules. Let us say arbitrarily for the purposes of this discussion that the actual marker is /-n-/ and that /i/ is epenthesized where it must show up as /-in-/. So the underlying representations of nag-bilih and ?i-s-in-ulat would be:

169a. (m-)n-pag-bilih ---> nag-bilih

b. (?i-)n-sulat ---> ?i-s-in-ulat

If such an analysis is correct, it would not be necessary to wait until the final word level to determine what the appropriate form of the actual marker is; there would only be one form. However, it would still be necessary to assume that this uniform affix is added at the end of the derivation to ensure that it does not wind up deep within the word as in (170).

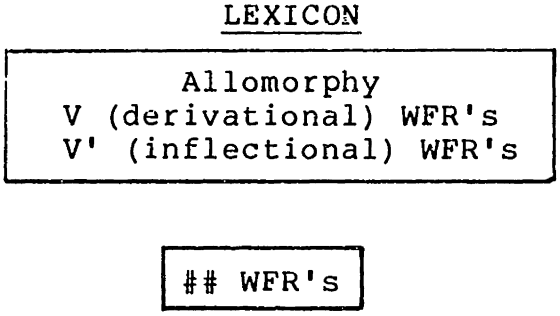
170. [?i[pag[linis]]] --->
V' V' V V V' V'

[?i[p-in-ag[linis]]] --->
V' V' V V V' V'

*[ma[?i[p-in-ag[linis]]]]
V' V' V' V V V' V' V'

Conclusion

It is necessary to recognize three types of verbal WFR which interact with each other in very specific ways. V and V' WFR's can apply to each other's outputs, a fact which can be expressed by relegating them to the same subcomponent of the WF component. But neither V nor V' WFR's can apply to the output of ## WFR's. None of the ## WFR's trigger the particular allomorphy that was discussed in Chapter 2. So we might include allomorphy in with the V and V' WFR's in the following diagram (I do not intend the order in which I have listed rule types to represent any particular order they must apply in).



In Chapter 5 it will be argued that the WFR that assigns the feature [+RA] to mark aspect is also a ## level rule. Reduplication rules, then, must be able to follow ## WF.

Footnotes to Chapter 4

1. Personal and deictic pronouns have special, suppletive case marked forms.

2. I will assume that grammatical relations are expressed by case-marking particles. The relationship between grammatical and semantic relations is mediated by the lexical entry.

3. By "subcategorized nominal" I will mean any nominal complement of the verb introduced by one of the grammatical case-marking particles (ng/ni; ng; or sa/kay). Such complements must be mentioned in lexical entries because they are dependent on the verb for their semantic relations. However, some subcategorized nominals are not absolutely required by the verb. For example, ng pahayag below is optional.

a. B-um-ābasah ?ang tagasuri?
ST-read T inspector
The inspector is reading.

b. B-um-ābasah ng pahayagan ?ang tagasuri?
DO-announcement
The inspector is reading an announcement.

Presence or absence of optional compements does not alter the meaning of the verb , its other subcategorized nominals, or the verb's affix. This is in contrast with other pairs which differ with respect to the number of complements that cooccur with them, as we will see below. So I will assume that the same verb basah occurs in both the (a) and (b) sentences above, but that it optionally subcategorizes a DO complement. In case the DO argument slot is not filled by a nominal in a particular sentence, an indefinite object reading is assigned.

Definite pronouns are also freely omitted, giving another sort of case in which a subcategorized nominal has no surface realization.

4. It will be shown below that a verb has topic forms corresponding to complements that are not subcategorized, as well. There verbs are totally predictible and do not have to be listed in the verb's basic paradigm. So we should modify our statement to say that the number of forms contained in a verb's basic or listed paradigm will not be

greater than the number of its subcategorized nominals.

5. There does seem to be one interesting interdependence between the DO and IOT affixes a given verb will choose. -in and -an both can function as an OT or an IOT affix, depending on the verb. But a given verb cannot take -in in both its IOT and DOT forms. Likewise, a single verb can not take -an in both its DOT and IOT forms. The constraint is not simply that a verb can not use the same affix for two different topic forms. When the IOT form takes -in, the DOT form must take ?i-. It cannot take -an although the result would not be homophonous DOT and IOT forms. -an then always forms the topic form of the verb that corresponds to the subcategorized nominal that is lowest on the logical/grammatical hierarchy. The result is, given a verb's subcategorization plus the array of TM affixes that it can occur with, it is always possible to predict which affix will be related to which subcategorized nominal.

There are also some generalization that can be made concerning the particular array of affixes that some verbs take and either their meanings or the semantic relations of their subcategorized nominals. Blake (1925: 248-273) and Romos (1974) cite examples. For example, Ramos points out that when a verb's directional (IO in our terms) is semantically the goal of the action, it takes mag- in its agentive (ST in our terms) and ?i- in its objective topic form. For example:

a. mag-bigay(ST)/ ?i-bigay (DOT) "give"
b. mag-?abot(ST)/?i-?abot (DOT) "hand to"
c. mag-?akyat(ST)/?i-akyat (DOT) "carry up to"

When the verb's directional complement (IO) is the source of the action, it takes -um- in its agentive topic (ST) form and -in in its objective form. For example: k-um-uhah/kun-in ("get"); d-um-ukot/dukut-in ("draw out of").

6. Perhaps this is an argument in favor of analyzing /m/-initial ST prefixes as being composed of a ST prefix m- plus a /p/-initial stem extender, eg. m-pag- → mag-. Our present analysis requires that one inflect form within the paradigm of -um- verbs never shows up. The m-pag analysis will be discussed below, but we do not adopt it.

7. If a stem carries features corresponding to the TM affixes it takes, it is perhaps not necessary to list its entire paradigm with all the TM markers spelled out, as we have been doing. If correct, this would change the way we

describe the interaction of reduplication with allomorphy. Reduplication rules would have to apply after the spell-out of TM affixes since they copy allomorphy triggered by he TM affixes.

8. Not that it is necessary that a derivation WFR is marked by a phonological change of some sort (eg. nurse to nurse, in English). But as we remarked earlier, Tagalog is rather explicit about whether a new lexical entry has been derived.

9. However, if the TM affix added to the causative stem is not mag- , then either pa- or the following CV- of the non-causative stem can be reduplicated.

a. [?i [pa [bigay]]]
V' V V V V V'

{?i-pāpa-bigay
?i-pa-bībigay}
will let/have give (DOT)

b. [[pa [bigay]] an]
V' V V V V V'

{pāpa-bigy-an
pa-bībigy-an}
will let/have give (IOT)

This is similar to the way RA applies to ma-ka- verbs above. But the solution we proposed for the ma-ka- verbs -- an optional boundary deletion rule allows ma-ka to be analyzed as one morpheme by RA -- does not seem appropriate for these causative verbs; pa- and -an are not contiguous so they could not be analyzed as the same morpheme. So perhaps it would be better to formulate such readjustments in terms of bracketing rather than boundaries.

10. If ma- ability prefix is derivational, contrary to what we are proposing, then these verbs show that derivation can apply to the output of inflection. (And the m-pag- analysis of the ST prefixes could not be argued to be superior to the m/p analysis on the grounds that it would allow us to claim that all derivation is inside inflection.

11. If the above reservations are valid, and ma- really is not a TM affix, then our claim that all and only TM

affixes trigger reduplication is incorrect.

12. m- and -um- could not be collapsed synchronically even though we claimed earlier in this chapter that -um- is also affixed as a prefix. here are /p/-initial stems that take -um- in which the rule that takes /m/ to /p/ must not apply, for example pitas: (um-pitas) p-um-itas ("pick"). Yet N-substitution applies to pitas after mang-: ma-mitas ("pick up a number of things"). Collapsing -um- and m- then would make it seem unlikely that it is the N-substitution rule that changes m-pag- to mag-. Either we need a separate allomorphy rule to handle m-pag (which would mean giving up the main argument in favor of the m-pag analysis) or we have to give up collapsing -um- and m-. The latter seems necessary in any event because future is spelled out differently in -um- and m- verbs (Section III.)

CHAPTER 5

I. The Formulation of Reduplication Rules

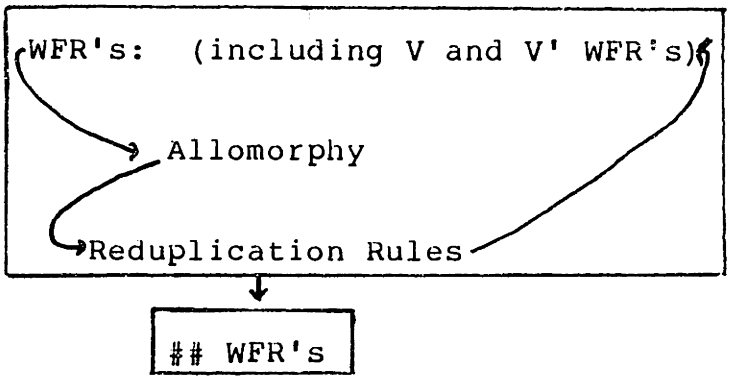
It was argued in Chapter 3 that reduplication rules must be stated separately from the WFR's that trigger them as a special type of readjustment rule. One of the arguments for separating out reduplication rules from WFR's is parallel to an argument for separating out another type of readjustment rule, namely allomorphy rules. Both allomorphy rules and reduplication rules can be triggered by several WFR's, a fact which can be expressed only by extracting them from the formulation of any one WFR. We have pointed out two differences between reduplication rules and allomorphy rules (Chapter 3). But we might ask whether as co-members of the class of readjustment rules, they occupy the same place in the lexicon and interact with WFR's in the same way.

In Chapter 1 it was proposed that words listed in the lexicon are listed with the appropriate component allomorphs. For example, conception is listed as con=cept+ion, not con=ceive+ion. In order to maintain this, it is necessary for allomorphy rules to work alongside WFR's as redundancy rules that relate pairs of listed words. To relate the two listed words con=ceive and con=cept+ion, an allomorphy rule first

expresses that -ceive and -cept- are two context-dependent realizations of the same morpheme. Then the -ion WFR relates [N[Vcon=ceiveV]-ionN] and [Vcon=ceiveV], expressing which is more basic, the predictable meaning differences between them, and so on. The -ion WFR can be formulated with the most generality only if the allomorphy rule that relates -ceive and -cept- applies first. That is, the same -ion WFR will relate other -ion nominals to the verbs they are derived from in pairs, where different allomorphy is involved (e.g. subvert-subversion) or if no allomorphy is involved (e.g. confess-confession). In relating morphologically complex words to successively less complex words, this "cycle" of allomorphy rule(s) followed by word formation rules must be repeated to get from the most complex to the simplest nested word; thus allomorphy rules apply sandwiched in between WFR's. An allomorphy rule will apply at the level of the word where its triggering WFR applies.

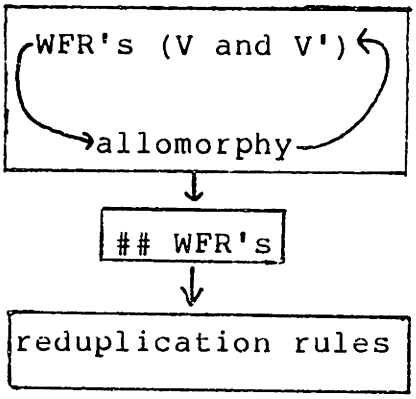
In this chapter, we will be concerned with where reduplication rules fit into this picture. Do they apply cyclically, right alongside their triggering WFR's?

1.



Or are they strictly segregated from all other morphological rules? We could assume that the features added by WFR's trigger reduplication rules at some much later point (perhaps even after the ## level WFR's).

2.



This question can be rephrased in terms of the lexical representation of reduplicated words. Are reduplicated words listed in their reduplicated forms or are they listed with the abstract feature that triggers reduplication. For example, consider the occupational noun formation rule that involves R1 reduplication plus affixation of the prefix mang- which triggers N-Substitution. Since N-Subst. is an allomorphy rule, occupation nouns are listed with readjusted nasals. But is the R1 copy also spelled out? That is, is the lexical representation of mananahe? ("seamstress", from (um)tahe?, "sew") (3a) or (3b)?

3a. [ma[nanahe?]]
N V V N

b. [ma[nahe?]]
N V V N
+R1

If (3b) is correct, then R1 does not apply as a redundancy rule. In the case of most WFR's that trigger reduplication, it is not possible to decide between the possibilities. It would be possible to assume either that they are triggered right alongside their triggering WFR's, or that they apply in an isolated box (always generatively) at the end of the lexicon.

But we will show that there is some evidence from at least one word formation (moderative formation that triggers R2 reduplication), that the reduplication rule has to interact with allomorphy in a way that forces us to order it at some much later point than the WFR that triggers it. The way different reduplication rules interact with each other in the intensive recent perfective formation also suggests that reduplication rules must apply at a point later than their triggering WFR's. From this somewhat limited evidence, we will (tentatively) propose that reduplicated words are never listed in the lexicon in their reduplicated forms; rather they are listed with abstract features which trigger r uplication rules prior to the phonology.

In addition to considering where in the lexicon reduplication rules apply, we will consider how they are to be formulated. The structural changes specified by reduplication rules and the necessity of specifying those structural changes transformationally have been discussed in Chapter 3. And in

fact we have claimed that there are only three reduplication rules in Tagalog, and that they can be identified by their structural changes, i.e. by the shape of the copy that they add; CV, CV, or CVCV(C). Now we will consider a more morphological aspect of their formulation: how they locate the left edge of the material they are to copy. We will propose that all three mention an abstract reduplication feature and a bracket relative to which they specify the material to be copied. We will propose, again somewhat tentatively, that all three require a variable between the triggering feature and bracket, since they have a choice as to what bracket is to be analyzed, one at the outside of the word, or one further in.

4. [+R] X [CV
↑
start copying

We will argue that the variables in reduplication rules are not constrained by Subjacency. The triggering feature and the bracket need not be in subjacent cycles. We will propose, however, that WFR's can only add triggering features to the outsides of words--just as they can only add affixes to the outsides of words.

We have claimed that the derivation of reduplicated words always involves two rules: A WFR adds an abstract feature that triggers a reduplication rule. It is necessary to

separate the questions of where in the lexicon reduplication rules apply and how they are formulated, from the question of where their triggering WFR's apply.

If a particular type of reduplication (say RA, R1 or R2) seems to behave the same in all the word formations it occurs in, we would like to extract this behavior from the various WFR's and state it as part of the reduplication rule. In fact, the discovery of such shared characteristics would support our claim that there is a small inventory of reduplication rules triggered by a variety of WFR's. In some cases our decision to attribute a particular property to reduplication rules rather than to their triggering WFR's is motivated by restrictiveness considerations. For example, we might propose that it is the reduplication rules that reach deep inside a word to find the material that gets copied--not the WFR.

This leaves open the desirable possibility that WFR's can refer to elements that are ony a limited distance into the word they are operating on. Reduplication rules form a very small class of morphological rules that are not restricted in this way, but we have already seen (Chapter 3) that reduplication rules are free of other restrictions on WFR's. Still we must emphasize that the conclusions reached in this chapter are only tentative ones.

IA. Cyclic vs. Word Level Assignment of [+RA]

Besides being inflectable for [±Actual Aspect] (Chapter 4, Section III), all verbs can be inflected for certain aspectual categories that are marked by RA reduplication. The semantics of the aspectual category or categories will be discussed below. For now we will refer to this category vaguely as [±Aspect 2]. For convenience, we will refer to any instance of RA reduplication that is triggered by the feature [+Aspect 2] as aspectual RA reduplication. However, as will be shown below, RA is triggered by other WFR's as well.

We have already informally described aspectual RA in Sections I and II of Chapter 4, in order to motivate the internal structure of verbs and the distinction between V and V'. Here two more explicit proposals will be considered: that the aspectual WFR adds the feature [+RA] at ## level; and that the aspectual WFR that adds the feature [+RA] applies cyclically, before the ## level. We will claim that the first proposal is correct, although the evidence for it is indirect.

The fact that the rule that assigns the triggering RA feature is a ## level WFR does not necessarily mean that the RA reduplication rule itself has to be formulated with a ## in its S.D. Its environment will not be met until the ## level because the triggering feature is not present until that point. However, it does have implications for the formulation

of the reduplication rule itself. If it applies at the ## level, RA cannot obey Subjacency.

Recall from Chapter 4 that a statement of what RA reduplication is cannot be specified in purely linear terms. The leftmost CV in (5) cannot be RA reduplicated, while in (6) and (7) it can:

5. [mag[bigay]] ---> { magbībigay / *māmagbigay }
   V' V V V'
   give-ST will give

6. [[bigy]an] ---> bībigyan
   V' V V V'
   give-IOT

7. [[pag[bigy]]an] ---> { pāpagbigyan / pagbībigyan }
   V' V' V V V' V'
   give-Loc.T.

What gets RA reduplicated can be described only by referring to the morphological structure of the verbs. Given a V' bracket, the leftmost CV that is not part of the TM affix introduced in that bracket (i.e. the TM affix immediately dominated by that bracket) is reduplicated. So the underlined CV in (8) is copied; no brackets can intervene between the parenthesized TM and the left bracket.

8. [(TM) <u>CV</u>
   V'

One of the rules involved in RA reduplication--either the WFR that attaches the feature [+RA], or the RA reduplication rule itself-- must have access to the morphological structure of verbs. If we assume that the WFR appends the feature [+RA] to the triggering V' bracket, then the RA reduplication rule will have to be able to identify whether or not the first CV after V' is immediately dominated by V'. Thus we would need something like the following pair of rules to handle aspectual RA reduplication.

9a. +RA Attachment (WFR):

```
[     --->  [
 V'          V'
             +Aspect 2
             +RA
```

b. RA Reduplication

```
[    (TM) C V X
 V'
 +RA
└──────┘
   1      2 3 4  --->  1, 2,   3   , 2, 3, 4
                                +long
```

Condition: no brackets intervene between [and (TM)
V'

I will assume that something like the proposal represented by (9) is correct. I tentatively propose that WFR's can add morphological features such as [+RA] only to the outside of a word--just as they can only attach affixes to the outside. Therefore, it must be the reduplication rule itself that

reaches across a TM affix immediately dominated by V' to copy the first CV.

Another possibility, which I will not adopt, is that the WFR adds the feature to the CV that eventually gets copied; under this account, sensitivity to the morphological structure of verbs must be a property of the WFR itself.

10a. [+RA] Attachment (WFR):

$$[_{V'}\ (TM)\ CV\ X \quad \text{---}> \quad [_{V'}\ (TM)\ \begin{matrix} C \\ +\text{Aspect } 2 \\ +\text{RA} \end{matrix}\ V\ X$$

b. RA Reduplication:

$$\begin{matrix} C \\ +\text{RA} \end{matrix}\ V\ X$$

$$1\ \ 2\ \ 3 \text{ ---}> 1,\ \begin{matrix} 2 \\ +\text{long} \end{matrix},\ 1,\ 2,\ 3$$

Recall also from Chapter 4 that in verbs that contain more than one set of V' brackets, RA reduplication has alternate analyses.

11. $[_{V'}\ ma[_{V'}\ ?i[_{V'}\ pag[_{V}\ linis\ ]\ ]\ ]\ ]$

{a. ma?ī?ipaglinis
b. ma?ipāpaglinis
c. ma?ipaglīlinis}

will manage to clean for

12. [mag[si[pag[linis]]]]
V' V V' V V V' V V'

{a. magsīsipaglinis
b. magsipaglīlinis}

will clean (plural)

Any account of aspectual RA reduplication must allow these alternate reduplicated forms, yet not allow RA to apply more than once in a given verb: *ma?ī?ipaglīlinis, *ma?ipāpaglīlinis, etc. We will be considering a cyclic and a noncyclic account of RA assignment, showing how each accounts for the multiple possibilities for the application of RA.

One way to handle the alternate reduplicated forms in verbs such as (11-12) would be to say that the aspectual WFR that assigns the feature [+RA] is an optional cyclic rule that gets a chance to apply each time a V' verb is created. We will use the formulation of RA given in (9a). So, for example, the derivation of (11c) would be as follows.

13. [mag[linis]]--------[mag[linis]]
V' V V V' Asp.2 V' V V V'
+Asp2
+RA

[?i[pag[linis]]]
V' V' V V V' V'
+BT +Asp2
+RA

```
                    |
                    |
                    |
[  ma[  ?i[   pag[ linis ]  ]  ]  ]
 V'   V'   V'     V     V V' V' V'
     +BT   +Asp2
           +RA
```

{a. mag-lī́linis (ST)
b. ?i-pag-lī́linis (Ben.T.)
c. ma-?i-pag-lī́linis (Ability Vb.)}

But the derivation of (11a) is the following:

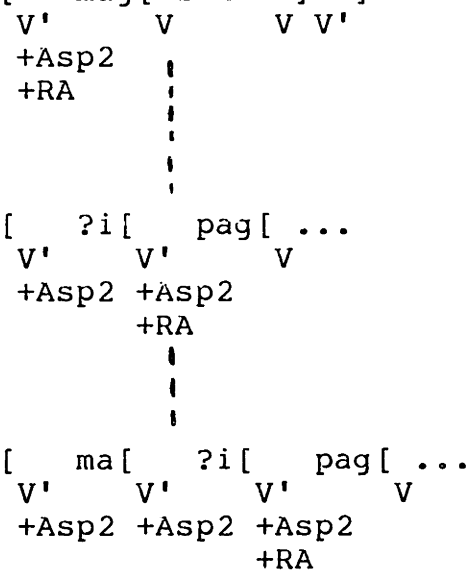
14.
```
[  mag[ linis ]  ]
 V'    V   |  V V'
            |
            |
            |
[  ?i[  pag[ linis ]  ]  ]
 V'   V'   |  V     V V' V'
           |
           |
           |
[  ma[  ?i[  pag[ linis ]  ]  ]  ]
 V'   V'   |V'    V     V V' V' V'
           |
           |
           |
[   ma[  ?i[  pag[ linis ]  ]  ]  ]
 V'    V'   V'    V     V V' V' V'
 +Asp2
 +RA
```

(For the purposes of this discussion we could assume either that RA is immediately triggered--as soon as the feature [+RA] is attached--or that it applies at some later point.)

The cyclic proposal will not over-apply if it is formulated to apply only to verbs that are [-Aspect 2], and if any verb derived from a verb that has been marked [+Aspect 2] takes on that feature.

For example, if aspect marking applies on the innermost V' in the verb in (11), then the feature [+Aspect 2] is spread to any verb derived from it, e.g. (11b). But this feature blocks the application of the Aspectual WFR that assigns the feature [+RA]. Therefore RA reduplication will not apply in the new V' cycle. Likewise, spreading of the feature [+Aspect 2] will block application of the WFR that assigns [+RA] on the outermost V' cycle.

15.



Given a cyclic analysis of RA marking, it seems that a spreading convention should be necessary in any event, since aspect is a property of the whole verb, even when RA reduplication applies on an inner V', as in (11c).[!]

A second possibility is that, like the feature [±Actual Aspect], the feature [±Actual Aspect 2] is attached at the ## level.

16a. +RA Attachment (WFR):

```
##[  ...   --->  ##+RA[  ...
    V'                   V'
```

b. RA Reduplication

```
##+RA X [  (TM) C V Y
          V'
          1      2 3 4 --->  1, 2,   3   , 2, 3, 4
                                    +long
```

The feature [+RA] would then not be assigned until that level either. So (11a-c) would all have the same representation prior to the application of reduplication.

17.

```
##+RA[  ma[  ?i[  pag[ linis ]  ]  ]  ]##
       V'   V'   V'    V     V V' V' V'
```

X=Ø in the derivation of (11a)
="[ma" in the derivation of (11b)
V'
="[ma[?i" in the derivation of (11c)
V' V'

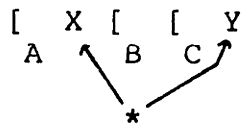
Under this account, the fact that RA reduplication applies only once in a given verb is a result of the fact that the rule applies at ## level, and thus only has one chance to apply.

IA.1 RA and Subjacency

One reason for preferring the cyclic analysis of [+RA] attachment is that, unlike the ## level analysis, it does not force us to posit any rules that violate subjacency. Much more research needs to be done before we know whether it is possible to claim that all morphological rules obey such a principle, but in advance of such research, it would be desirable to constrain morphological rules in this way.

Siegel (1977) and Allen (1978) have adapted the Subjacency condition proposed by Chomsky (1973) for syntax as a condition on the operation of WFR's. The following modified morphological version is from Siegel (1977: 20).

18. No WFR can involve X and Y, where X is an affix, unless Y is uniquely contained in the cycle adjacent to X.



Siegel illustrates how this condition constrains a negative condition on a WFR. She notes that the prefix un# in English does not attach to a base that already contains the prefix dis-, such as those given in (19a-d). However, this condition does not apply in those cases where un# and dis- are not in subjacent cycles.

19a. *[un[dis[honest]]]
A A A A A A

b. *[un[dis[courteous]]]

c. *[un[disjoint]]

d. *[un[discrete]]

e. [un[[distinguished]ed]]
A A V V A A

f. [un[[discover]able]]

Now consider how the rules required by the cyclic and the non-cyclic analyses of aspectual RA reduplication behave with respect to Subjacency. Under both analyses (or at least the particular versions we have proposed of them) [+RA] marking applies to the outermost edge of the word, and so does not violate Subjacency. Under the cyclic analysis, the RA copying rule also obeys Subjacency. It refers to a V' and the TM marker that it immediately dominates. Notice that the CV that gets copied is not always subjacent to the triggering V' bracket as the following nominal verb shows.

20. [mag[[bigay]an]] ---> mag-bĭbigay-an
V' N V V N V'
+RA

will give to one another

(from bigayan, "a giving to one another")

But this does not mean that RA reduplication violates Subjacency. RA does not have to analyze a morpheme in a

non-subjacent cycle. From the point of view of RA, bigay-an is an unanalyzable string of segments. However, under the ## proposal, in order to derive a verb of the form of (11c), we must assume that RA reduplication does not obey Subjacency. The trigger [+RA] and the V' bracket are not contained in subjacent brackets.

21. ##+RA [ma[?i[pag[linis ...
+Asp2 V' V' V' V

I will argue that the ## analysis of aspectual RA reduplication is correct; first because semantic considerations suggest that the feature [+Aspect 2] is a feature at the ## level; and second because the interaction of RA reduplication with infix-metathesis can be handled only if RA applies at the ## level.

The behavior of RA as triggered by WFR's other than aspect marking will be illustrated in order to show that RA must be formulated with a variable, contrary to the claims of a cyclic analysis.

IA.2. The Semantics of Aspect 2

One reason for assuming that RA is triggered by ## level inflectional features is that these features are dependent on another ## feature. Together with the feature [±Actual] (see Chapter 4, Section 3), the option to RA reduplicate gives four

possible aspectual forms.

22a. [-Actual, -RA]

mag-bukas
open!-ST

b. [-Actual, +RA]

mag-bubukas
will open-ST

c. [+Actual, -RA]

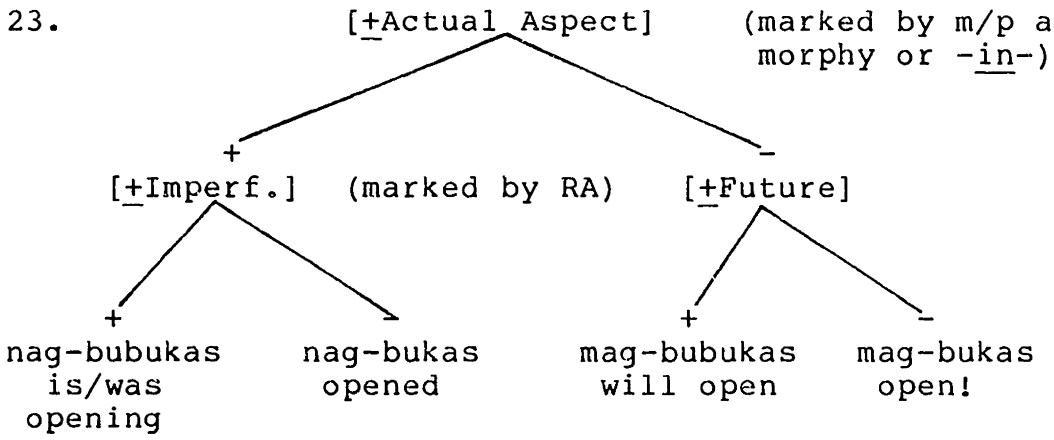
nag-bukas
(had) opened-ST

d. [+Actual, +RA]

nag-bubukas
was/is opening-ST

RA reduplication does not seem to have a constant meaning associated with it. Its meaning depends on the verb's specification for [±Actual]. In a [+Actual] verb, RA reduplication marks the action as one that was or is not complete at a single point in time, a category we will call [±Imperfective]. In a [-Actual] verb, RA reduplication distinguishes between a future ([+RA]) and an imperative ([-RA]). So it seems that in addition to [±Actual Aspect], there is not just one additional aspectual category (what we've been calling [Aspect 2]), but two: [±Imperfective], [±Future]. However, a given verb form can be inflected only for one or the other. Which one the verb is inflected for depends on whether the verb is [+Actual] or [-Actual]. Both [+Imperf.] and [+Future] trigger the RA reduplication rule.

23.



The interpretation of RA is dependent on the verb's specification for [±Actual], even though the actual marker and the reduplicated syllable (both underlined in (23a-b)) are widely separated.

24a. [+Actual, +Imperf.]

naka-pag-sīsi-pag-luto?
is/was able to cook-ST

b. [-Actual, +Imperf.]

maka-pag-sīsi-pag-luto?
will be able to cook-ST

We argued above that [±Actual] is a feature at the ## level of the verb. So if the decision to inflect a verb for either [±Imperf.] or [±Future] cannot be made without reference to [±Actual], they too must be ## level features.

Under a cyclic analysis, on the other hand, the WFR that assigns the features [+RA] and [+Aspect 2] does not specify any semantic or inflectional changes in its output. Instead, the feature [±Aspect] has to be interpreted after the word has

been completed, in the presence of other aspectual features. This is a radical departure from the concept of what a WFR does.

I have no way of evaluating this system of interpretive morphology, except to note that I know of no other cases where such a system is required. However, I do think that the assymmetry in the aspectual system does make this analysis suspicious; the category [±Aspect 2] in this system has a very different morphological status from the category [±Actual]. I would expect all features having to do with tense and aspect to be features at the same level in a word.

IA.3. Interaction of RA Reduplication and Infix Metathesis

In order to account for the way RA reduplication applies to verbs with ST infix -um-, I proposed that infixes are prefixes at the time reduplication applies. They are later metathesized with any following consonant. Infix metathesis must follow reduplication because infixes are inserted into reduplicated material.

25. ##[um[sigaw]]##
V' V V V'

um-sɪ̄sigaw	1. RA
s-um-ɪ̄sigaw	2. Infix Metathesis

will shout

Certain ST -um- verbs can be stems for derived intensive verbs

that take ST prefix nag-. -um- still is inserted into its V stem.

26. [nag[um[sigaw]]]
V' V' V V V' V'

nag-s-um-igaw
shout repeatedly

In order to derive the future or the imperfective of these intensive verbs, RA reduplication and infix metathesis must apply in the opposite order from the order they applied in to form the future of the basic verb in (25). The first consonant of the V stem and the vowel of the infix are copied.

27. ##[mag[um[sigaw]]]##

...s-um-igaw	1. Infix Metathesis
mag-sū s-um-igaw	2. RA Reduplication

will shout repeatedly

The ordering paradox disappears if we assume, first that RA reduplication is extrinsically ordered before infix-metathesis, but that it cannot apply until the ## level; and second, that metathesis is cyclic. In (27), the environment of infix metathesis will be met on the inner V' before the ## level. In (26), the environments of both are met on the same cycle (i.e. the outermost cycle), so RA applies first.

If RA applied cyclically and therefore preceded infix-metathesis in (27), it would yield the ungrammatical *mag-s-um-īsigaw.

Again, from the evidence we have so far it is not clear whether RA doesn't apply until the ## level because it is formulated with ## or because it is triggered by a feature complex [+Future,+Imperfective] that is introduced at the ## level. However, the interaction of RA with infix-metathesis strengthens our claim that RA applies at the ## level, and therefore must not obey Subjacency.

IA.4. Other Environments for RA

We will now look at two other WFR's that trigger RA and show that RA operates similarly in these environments to the way it operates to mark durative aspect. This supports our claim that a single RA reduplication rule is triggered by a variety of morphological environments, and also that the RA reduplication rule must be formulated with a variable.

Causative adjectives can be formed by adding na-ka plus an RA copy to certain nouns and verbal stems.[2] RA has a choice as to what part of the derived word it copies. The alternatives available to it are identical to those which are available in the marking of durative aspect in verbs. If the base word is a noun, na-ka is added directly to the noun stem. Either ka or the first CV of the noun stem is RA reduplicated.

If the base word is a verb which takes either -um- or mag- in its ST form, na-ka is again added directly to the verb stem, and again either ka or the first CV of the V stem is RA reduplicated. If the base word is a verb which takes mang- in its ST form, na-ka is added to the ST V' stem. Either ka or the first CV of the V stem is reduplicated.

28. ?antok ---> {a. na-kāka-?antok / b. na-ka-?ā?antok}
sleepiness — causing sleepiness

29. (mag) bihag ---> {a. na-kāka-bihag / b. na-ka-bībihag}
capture(-ST) — captivating

30. (um) tawa? ---> {a. na-kāka-tawa? / b. na-ka-tātawa?}
laugh(-ST) — laughable

31. (mang) li?it---> {a. na-kāka-pan-li?it / b. na-ka-pan-līli?it}
feel small(-ST) — cause to feel small

Notice that the options that are available to RA in these na-ka adjectives are identical to the options available to aspectual RA in ability/involuntary action verbs formed with ma-ka (Chapter 4, Section II). If ma-ka is attached to a V stem, either ka or the V stem can be reduplicated (32a,b). If, on the other hand, ma-ka is attached to a V' stem, either ka or the V stem--not the V' stem--can be reduplicated (*33c).

32. [ma-ka[bilih]] ---> {a. ma-kāka-bilih
V' V V V' {b. ma-ka-bībilih}

manage to buy will manage to buy

33. [ma-ka[pag[bilih]]] ---> {a. ma-kāka-pag-bilih
V' V' V V V' V' b. ma-ka-pag-bībilih
c. *ma-ka-pāpag-bilih}

manage to sell

will manage to sell

The behavior of RA in forms such as (32b) was a problem given our formulation of RA; only the first CV after the TM affix should be reduplicatable, in which case we should only be able to reduplicate ka. In many verbs which have derived V stems, RA behaves as this formulation predicts. So we can only reduplicate si in the durative form of the following verb.

34. [mag[si[bilih]]]
V' V V V V V'

a. mag-sīsi-bilih
b. *mag-si-bībilih

will buy (pl.)

So we must say something special about V stems formed with ka. We proposed in Chapter 4 that, unlike mag-si, both morphemes in ma-ka are introduced in the same V' bracket. There is an optional boundary adjustment that deletes the boundary between them, allowing ma-ka to be analyzed as a single morpheme.

Even if this suggestion should turn out to be inadequate, whatever we propose to handle the ma-ka verbs will automatically handle the na-ka adjectives. In fact, the parallelism between the way RA behaves in the verbs and the adjectives strongly suggests that they should be handled in exactly the same way. Note, however, that the formulation of the RA reduplication rule (15) will have to be generalized to analyze left X' bracket rather than simply left V' bracket, since RA must be triggered by A' brackets as well as V' brackets.

The fact that RA has alternate ways of applying in na-ka adjectives cannot be handled by cyclic assignment of the feature [+RA] in the manner proposed above for a cyclic analysis of aspectual RA reduplication. The feature [+RA] and the prefix na-ka must be added simultaneously since they are part of the same WFR. It wouldn't make any sense to add [+RA] prior to the application of the na-ka adjective formation. Doing this would mean allowing [+RA] to be freely assigned without any morphological or semantic consequences at the point of its assignment, only to be interpreted later in the derivation of the word. Unlike aspectual RA, the interpretation attributed to RA in these na-ka adjectives has nothing to do with aspect.

So to account for alternates such as (35a-b), RA reduplication must be formulated with a variable that allows it to analyze either the A' bracket it is attached to (35a) or the V' bracket of the basic verb (35b).

35. [pang[li?it]] ---> [na-ka[pang[li?it]]]
V' V V V' A' V' V V V' A'
+RA
(a) (b)

In deriving nakapanlīli?it, RA does not violate Subjacency, since the bracket to which the feature [+RA] is attached is subjacent to the V' bracket. In fact, there are no na-ka adjectives that are more complex than (32), so there can be no cases that violate Subjacency.

But such forms are important because they show that the fact that there are alternate RA reduplicated forms has to be attributed to a variable in the RA rule itself. They cannot be handled by allowing the triggering WFR to apply on alternate cycles. The ## level proposal requires that RA be formulated with a variable in any event. The cyclic analysis did not.

RA is also involved in the formation of recent perfective verbs which designate actions that have just been completed, and intensive recent perfective verbs which designate extremely recent actions that will be discussed in a later

section.

Recent perfective verbs are derived from the ST forms of basic verbs by prefixing ka and RA reduplicating stems of basic verbs. For verbs which take ma-, ma-ka-, or -um- in their ST forms, ka- is added directly to the V stem, which is RA reduplicated. For verbs which take ST prefix mang-, RA may copy either the first CV of the ST prefix or the first CV of the V stem. For verbs whose ST prefix is mag-, ka- can be prefixed either to the ST V' stem, in which case RA behaves as it does for the mang- verbs, or it can be prefixed to the V stem, in which case RA patterns after the other recent perfective verbs based on V stems.

36. [um[ka?in]] ---> ka-kāka?in
V' V V V'
have/had just eaten

37. [ma[basag]] ---> ka-bābasag
V' V V V'
have/had just broken

38. [ma-ka[kita?]] ---> ka-kīkita?
V' V V V'
have/had just seen

39. [mang[kuhah]] ---> {ka-pāpa-nguhah / ka-pa-ngūnguhah}
V' V V V'
have/had just gathered

40. [mag[luto?]] ---> {{ka-pāpag-luto? / ka-pag-luluto?} / ka-lūluto?}
V' V V V'
have/had just cooked

Unlike ability verbs and causative adjective formed with ka, the homophonous recent perfective ka cannot be reduplicated. But an additional difference--that recent perfective ka is the only affix in its bracket--will explain this. It will be analyzed as the parenthesized morpheme in (41a). This will also explain why the ST prefix pang- can be reduplicated in the recent perfective verb, but not in either the causative adjectives or the ability verbs. Only in the recent perfective is the ST prefix analyzable as the leftmost CV excluding an affix immediately dominated by X'. (In the following examples, triggering brackets are circled. CV sequences that can be copied are underlined.)

41a. [V' ka[V' pang[V kuhah]]] (Rec.Perf.)
V V V' V'

just gathered

b. [V' ma[V ka[V' pang[V kuhah]]]] (Ability)
V V V' V V'

manage to gather

c. [A' na[A ka[V' pang[V li?it]]]] (Adj.)
V V' A V'

causing to feel small

But once we attribute this difference in morphological structure to the recent perfective verbs, we can see that RA behaves identically to the way it behaves to mark aspect in verbs, and to form na-ka adjectives.

Again, the feature [+RA] must be attached simultaneously with ka, since both are part of the recent perfective WF. [+RA] could not be attached on the earlier V' cycle in order to derive ka-pag-luluto? in (40), as shown in (42).

42a. [mag[luto?]] ---> b. [mag[luto?]] --->
V' V V V' V' V V V'
+RA

c. [ka[pag[luto?]]]
V' V' V V V' V'
+RA

Though (42b) exists, RA is interpreted in it as [+Future]; in (42c), however, RA is interpreted in combination with ka- as recent perfective. So if (42b) is an intermediate step in the derivation of (42c), i.e. if [+RA] is attached cyclically, then we must allow WFR's to add features whose semantic function is undetermined. Recent perfective, it must be claimed, is defined by two widely separated WFR's, +RA-attachment and ka-prefixation. I submit that this is undesirable.

I conclude that the feature [+RA] must be attached to the V' bracket that introduces ka, as shown in (43). But this means that for recent perfective verbs, the RA reduplication rule must be formulated with a variable so that it can analyze either the

outer or the inner V' bracket in applying to (43b).

43a. [mag[luto?]] --->
V' V V V'

b. [ka[pag[luto?]]]
V' V' V V V' V'
+RA

We normally assume that a given affix is attached earlier in the morphological derivation of a word than any of the affixes that occur in more outer layers of the word. For example, pag- is attached earlier than ?i- or ma- in ma-?i-pag-linis. But because the RA rule under the analysis we have adopted contains a variable, the linear position of the RA copy is no clue as to when in the derivation of the word it was attached.

IB. The Formulation of R1 Reduplication

R1 is involved in a variety of WFR's. It forms plurals of certain nouns and adjectives, it forms gerunds, and it functions in clearly derivational WFR's to derive nouns and verbs.

R1 shares a characteristic with RA that was not pointed out in the preceding section. What part of the word is reduplicated depends on whether or not reduplication is accompanied by affixation. If R1 is the sole phonological

reflex of the WFR, it will reduplicate the stem of the base word. For example, the gerund forms of mag- and mang- verbs are formed on the ST stems by Rl reduplication alone. The stem of the ST stem is reduplicated. Plural adjectives are formed from ma- adjectives by Rl reduplicating their stems.

44a. [mag[bilih]] ---> b. [pag[bilih]]
V' V V V' V' V V V'
+Rl

magbilih
sell

pagbibilih
selling

45a. [ma[talīnoh]] ---> b. [ma[talīnoh]]
A A A A
+Rl

matalīnoh
intelligent

matatalīnoh
(plural)

The formation of perfective gerunds involves the addition of the complex of affixes pag-ka, and optionally Rl reduplication. If the option to reduplicate is taken, ka is reduplicated.

46a. [ma[nakot]] --->
V' V V V'

manakot
frighten

b. [pag[ka[pa[nakot]]]]
N' N V' V V V' N N'
+Rl

pag(ka)kanakot
having frightened

47a. [mag[si[tulong]]] --->
V' V V V V V'

magsitulong
help (plural)

b. [pag[ka[pag[si[tulong]]]]]
N' N V' V V V V V' N N'
+R1

pag(ka)kapagsitulong
having helped (pl)

Assuming the derived bracketed structures given for the (b) examples,what R1 applies to can be stated very simply: it always applies to the stem of the new word.

48. R1 Reduplication

[(M) C V X
+R1

1 2 3 4 ---> 1, 2, 3 , 2, 3, 4
-long

But adopting these particular derived bracketed structures involves accepting two other assumptions. First, in WFR's that involve both affixation and reduplication such as (46b) and (47b), affixation applies first; R1 must refer to the new bracket introduced with the new affix in order to reduplicate its stem. (We have already shown (Chapter 3) in any event that reduplication rules must apply later than the attachment of affixes in the same WFR, since reduplication copies allomorphy triggered by the co-occurring affixes.) Second,

WFR's that add the feature [+R1] but no affixes do not add brackets as shown in (44-45).

Regardless of whether or not the WFR that triggers R1 adds an affix (and therefore adds a new bracket), its output has the feature [+R1] on its outermost bracket. The R1 reduplication rule itself does not care whether the bracket to which the trigger is attached has been newly added or not.

It seem that, unlike the RA reduplication rule, R1 does not have a variable in it, since in the cases we have considered so far, R1 does not have alternate analyses. We will demonstrate one formation where R1 does have alternate analyses, however.

IC. The Formulation of R2 Reduplication

R2 reduplication is triggered by verb WFR's, many of which form
intensives or moderatives of the base word. R2 may or may not be accompanied by affixation as a comparison of (49-50) with (51-52)
shows.

49a.	(ma-)hiya? be ashamed	b.	(ma-)hiyāhiya? be a little ashamed
50a.	(um-)lakad walk	b.	(mag-)lakadlakad do a little walking

* * * * *

51a.	(mag-)sugat have wounds	b.	(mag-)ka-sugatsugat be thoroughly covered with wounds
52a.	(ma-)tahimik become quiet	b.	(mag-)paka-tahĭtahimik try to become extremely quiet

But unlike R1, what R2 copies does not seem to depend on whether or not an affix is also added. It seems to always copy the V stem of the base verb, a fact which might suggest that the feature [+R2] is always attached to the V stem of the base verb. In some cases, e.g. (54), this means that [+R2] is added to an inner bracket.

53. [hiya?] ---> [hiya?]
V V V V
+R2

be ashamed be somewhat ashamed

54. [sugat] ---> [ka[sugat]]
V V V V V V
+R2

And furthermore, R2 reduplication simply starts copying at the leftmost segment after the trigger [+R2]. I would like to claim, however, that [+R2] is always appended to the new V stem, as in (55).

55. [sugat] ---> [ka[sugat]]
V V V V V V
+R2

Furthermore, the formation of R2 reduplication is something like the formation of RA and R1, except in that it starts from a V bracket rather than a V' bracket.

56. R2 Reduplication

[(M) C V Co V (C+) X
V
+R2

1 2 3 4 5 ---> 1, 2, 3 , 4, 2, 3, 4, 5
+long

In a form such as (53), there is no morpheme intervening between the bracket and the left edge of the copied material, while in (55), ka- is analyzed by the parenthesized morpheme in (56).

Support for our claim that the feature [+R2] can be appended outside the material to be reduplicated will be given below, in our discussion of intensive recent perfective verbs. There it will be shown that R2 has two alternate analyses. In one of them R2 actually reaches in to find an inner V bracket. This also shows that R2, like RA and R1, should be formulated with a variable.

II. The Place of Reduplication Rules in the Lexicon

IIA. Cyclic vs. ## Level Attachment of Reduplication Features

In a good many word formations, R1 and R2 do not have alternate applications. When further WFR's apply to words that are already marked to undergo reduplication, the position of the reduplicated material does not change from the base word to the newly derived word. For example:

57a. ?-um-urung ---> b. ?-um-urung?urong --->
go backwards go backwards a little

c. magsi-?urong?urong
go backwards a little (pl.)

58a. mag-hanap ---> b. mag-hanaphanap --->
search search a little

c. magsi-pag-hanaphanap
search a little (pl.)

59a. ma-tahɪmik ---> b. mag-paka-tahĪtahimik --->
become quiet try to become very quiet

c. magsi-pag-paka-tahĪtahimik
try to become very quiet (pl.)

60a. mag-?usap ---> b. mag-?usap?usap --->
converse converse with one another (>2 people)

c. maka-pag-?usap?usap
be able to converse w/one another (>2)

61a. ?-um-iyak ---> b. mag-?i?iyak
cry cry repeatedly

c. magsi-pag-?i?iyak
cry repeatedly (pl.)

The difference between aspectual RA reduplication that often does have alternate analyses, and R1 and R2 in (57-61) where there is only one possible analysis, should at least partially be attributed to a difference in the triggering WFR's, rather than to the copying rules themselves. If the WFR's that attach [+R1] and [+R2] in (57-61) apply before ## level, even if further WFR's can apply to their outputs, the position of [+R1] and [+R2] will not be altered. They will still be appended to an inner bracket where they will trigger reduplication: a reduplication feature cannot trigger reduplication on material outside the bracket that it is a feature of.

62. [?iyak] ---> [mag[?iyak]] --->
V V V' V V V'
+R1

[mag[si[mag[?iyak]]]]
V' V V' V V V' V V'
+R1

On the other hand, if the aspectual [+RA] feature is appended at the ## level, then at the time it triggers reduplication, the base verb may be composed of a complex layering of affixes, all of which are available to be

reduplicated. So an important difference between aspectual RA reduplication and R1 and R2 reduplications in (57-61) is that their triggering WFR's apply at different points, and therefore add triggering features at different depths within the word.

Since for those cases where a WFR involves both affixation and either R1 or R2 reduplication the feature and the affix are assigned simultaneously, the linear position of the affix also marks the point in the derivation relative to other affixation rules where the reduplication feature was added. Looking at things this way, if [+Imperfective] and [+Future] aspect were marked by an affix in combination with RA, our claim that these aspectual features are ## level WFR's would predict that the affix involved would always be at the outer edge of the word.

There are two formations that suggest that R1 and R2 must both be formulated with a variable between the triggering feature and the bracket mentioned by the rule. The fact that they normally do not have alternate analyses is accidental; the triggering WFR's only apply to words which are morphologically fairly simple. The internal structure of the base word simply doesn't provide possible alternate analyses.

Comparative adjectives formed with <u>(ka)sing</u> can enter into the R1 plural formation, as illustrated by (63).

63. (ka-)sin-talinoh ---> (ka-)sin-tatalinoh
as intelligent as plural

An adjective of equality can be formed from the (ka)sing adjective as well:

64. (ka-)sin-talinoh ---> mag-(ka-)sin-talinoh

These equality adjectives can be pluralized by the R1 pluralization rule; but in this case, R1 can either reduplicate ka (the stem of the new adjective) or the first CV of talinoh (the stem of the base adjective).

65a. mag-kaka-sin-talinoh

b. mag-(ka-)sin-tatalinoh

What this suggests is that [+R1] is attached to the outer A' bracket, and that RA reduplication is formulated with a variable so that it can analyze either of the two A brackets further in.

66. [mag[ka-sin[talinoh]]]
A' A A A A A'
+R1

There is also one WFR where R2 has alternate analyses: the intensive recent perfective verb formation. Again, I take this to argue for formulating R2 reduplication with a variable. The formation will be illustrated below.

IIB. The Interaction of Reduplication with Allomorphy

We will now ask whether reduplicated forms can be listed in the lexicon, or whether reduplication must always be triggered generatively. Consideration of most word formations involving reduplication does not tell us whether or not the reduplicated material has to actually be spelled out. However, we will argue that, given the analysis of verbs outlined in Chapter 4, and certain assumptions about the relationship between a word and its paradigm, R2 reduplication triggered by the moderative verb formation rule should not be spelled out in the lexicon. The moderative verbs should be listed with the abstract feature [+R2] rather, which triggers R2 reduplication after later WFR's.

Although there is no such evidence for other reduplication rules, we will tentatively propose that all reduplication rules work in this way, and in this respect differ from allomorphy.

Allomorphy rules apply as redundancy rules that relate readjusted morphemes in listed forms. Reduplication rules apply generatively, after all other morphological rules have

applied.

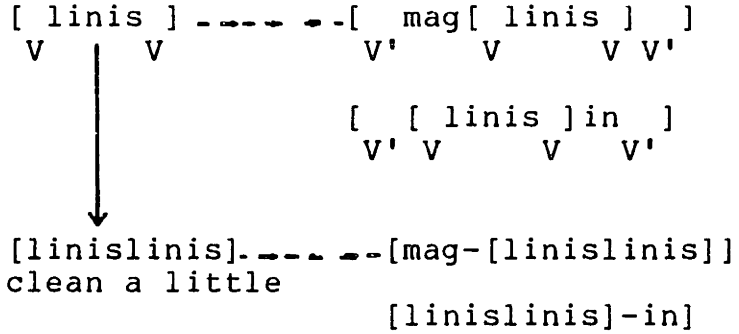
Moderative verbs can be derived from most basic verbs by R2 reduplicating their stems. A moderative reduplicated stem takes all the same topic marking affixes that the corresponding unreduplicated stem takes.

67.

mag-linis		mag-linislinis
clean-ST		clean up a little-ST
	--->	
linis-in		linislinis-in
OT		OT

In Chapter 4 (Section I) I argued that the topic marking affixes are inflectional. So the entry for the verb in (67) consists of the uninflected stem [V linis V] plus its inflected, topic marked forms. We can account for the moderative verb's paradigm simply by triggering R2 reduplication of the base verb's V stem.

68.

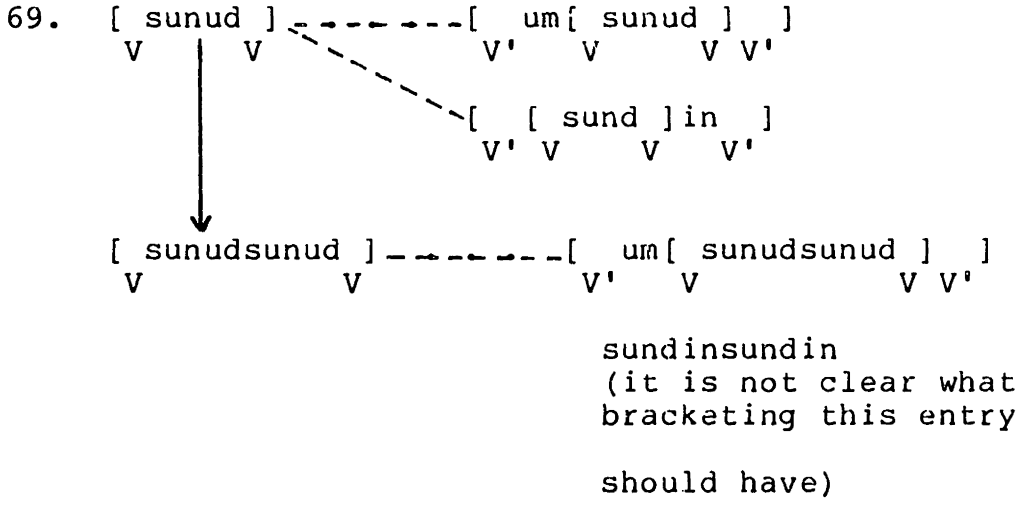


It cannot be argued that linislinis is not a distinct lexical entry from linis simply because both take the same TM affixes.

We have seen other cases where a derivationally derived verb carries over some inflectional features of the base verb it is derived from (e.g. pa- causative verbs, Chapter 4 Section II).

But some of the paradigmatic topic marking affixes condition allomorphy that determines the phonological shape of the R2 copy as well as the original material. For example, consider the verb sunud. If listed words are listed in their readjusted forms, the object topic form of sunud is represented; sund-in. Syncope, acting as a redundancy rule, relates it to the morphemes sunud and -in. But it will not be able to relate the derived, reduplicated stem (sunudsunod) with its inflected object topic form (sundinsundin). It will instead relate it to the non-existent form *sundinsunud-in.

69.

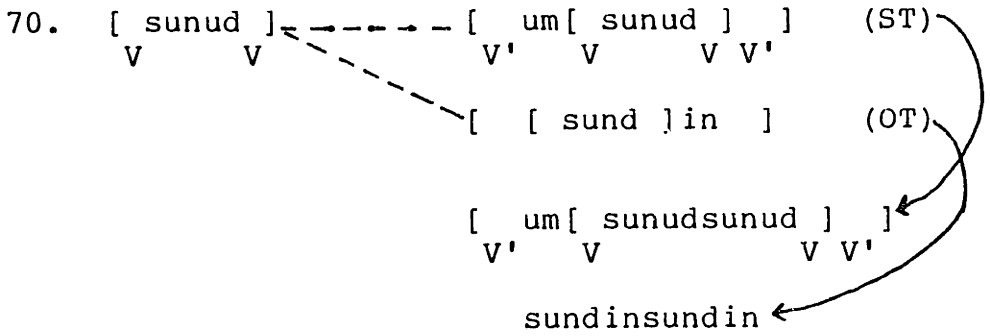


sundinsundin
(it is not clear what
bracketing this entry

should have)

It does not change the problem to assume that the inflected topic marked forms are not listed in the lexicon, but are generated by WFR's. If the derivatinal R2 reduplication rule applies first to derive the new lexeme sunudsunud from sunud, then adding the inflectional suffix -in will trigger syncope (again generatively). But syncope will only apply to the original material, giving *sunudsund-in.

A way around this problem might be to say that the (derivational) moderative verb formation, and the reduplication it triggers, apply to the inflected verb forms. Each member of the paradigm of the moderative verb would have to be derived directly from the corresponding member of the basic verb, as in (70):



This analysis goes against our normal conception of derivational WFR's: When two lexical items are related, we normally need not assume that there is a direct relationship between particular members of their inflectional paradigms. It is enough to assume that the lexemes (words minus

inflection) are related.

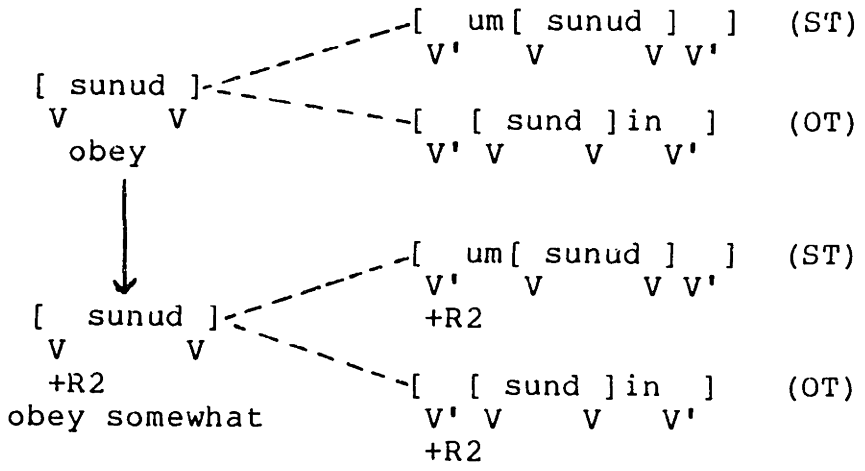
But there is at least one case already discussed where it is necessary to assume such a direct relationship, allowing a WFR to relate two members of a derived word's paradigm to two members of the base word's paradigm. Causative V stems to which TM affixes are attached are formed by prefixing pa- to a base verb's V stem. This follows from our conception of derivational WFR as applying only to relate two lexemes. But one member of the paradigm, the causee topic form, is based on the subject topic V' stem of the basic verb. A single rule of pa- prefixation is involved, but we must say that it simultaneously applies to two members of the basic paradigm to derive the V stems of the causative paradigm. (See p.292 for examples.)

Also, it isn't uncommon for the ST inflected form to serve as the base for further WFR's (see Chapter 4). But in all such cases, the ST affix loses its force as a topic marker. Likewise, in the causee topic stem in (67), the ST prefix pag- has lost its inflectional power. But in the moderative formation, the topic markers retain their topic marking function.

I would like to propose, then, that the moderative formation rule applies only to the V stem, adding an abstract feature [+R2]. The new moderative stem, marked with this feature, takes its own paradigm of TM affixes. [+R2] triggers

reduplication at some point in the derivation of the topic marked words after the allomorphy triggered by the TM affixes has applied.

71.



IIC. The Interaction of Reduplication Rules

We would like to tentatively propose that all reduplication rules are segregated from all other morphological rules, applying generatively at the very end of the morphology. It seems, at first, that this claim forces us to give up an explanation for the way the various reduplication rules are ordered with respect to each other. However, we will argue that the way RA and R2 interact in intensive recent perfective forms of verbs shows the inadequacy of this explanation in any event. First we consider the way the various reduplication rules interact; then we take up how RA and R2 interact in the intensive recent

perfective formation.

There are many cases where two reduplication rules apply to the same word but they do not interact in any way. For example, R2 can apply to ma- adjectives to form moderative adjectives. Verbs of pretension are formed by adding mag- to any ma- adjective, including moderative, R2 reduplicated adjectives. These derived verbs, like all verbs, can be inflected for aspect by RA reduplicating.

72a. ma-runong (---> mag-ma-runong ---> mag-mama-runong)
wise — pretend to be wise — will pretend to be wise

b. ma-rununggdunong
rather wise

c. mag-ma-rununggdunong
pretend to be rather wise

d. mag-māma-rununggdunong
will pretend to be rather wise

A form such as (72d) has undergone both RA and R2. But each rule applies exactly as it would have if the other reduplication rule had not applied as well: RA copies the syllable following mag- in both (72d) and the corresponding non-moderative form in (72a) (mag-mama-runong); R2 copies dunong in both (72c) and (72d).

In other cases, different reduplication rules analyze and copy the same part of a base word. For example, (73b) and (73c) are both derived from (73a), one by RA reduplicating and the other by R1 reduplicating the stem hiya?. In fact, since ma-hiya? has only one V' bracket, RA does not have alternate applications.

73a. ma-hiya?
be ashamed

b. ma-hiyāhiya?
be somewhat ashamed

c. ma-hīhiya?
will be ashamed

Furthermore, they both place their reduplicative "affix" in the same position in the word. We know that both reduplication rules apply leftward, because each specifies some constant vowel in the material it adds. For example, the vowel added by RA is always long regardless of the length of the original vowel (the second stem vowels in (74a-b)).

74a. mag-līlinis b. mag-wāwakas

In words that are R2 reduplicated, the first vowel of the original and copy are always identical, but if the base stem is trisyllabic, the second vowel of the copy is long, regardless of the length of the second vowel to its right (its corresponding original).

75a. hiwāhiwalay b. ma-talītalīnoh

So R2 and RA, triggered by totally independent WFR's, alter the same part of the base word ma-hiya?; they actually start copying at the same segment and place a copy adjacent to it. It is quite common for a verb to undergo both R2 and RA, as for example in a moderative verb taking durative aspect. It is obviously impossible for both R2 and RA to be adjacent to the original stem. In fact, R2 must apply first, followed by RA, which copies material copied by R2.

76. ma-hiya? ---> ma-hiyāhiya? ---> ma-hīhiyāhiya?
R2 RA
R2 RA R2

The RA and R2 reduplication rules must apply in the same order as the WFR's that trigger them. As already noted, the moderative WFR can apply early in the morphological derivation. But the durative feature which triggers RA is added at the terminal level of inflection. Now, if all reduplication rules are triggered by abstract features, and they all apply in a block just prior to lexical insertion as we have suggested immediately above, the fact that the relative order of RA and R2 mirrors the order of the WFR's that trigger them is an accident. They could just as well be ordered the opposite way. On the other hand, if reduplication rules apply immediately after their triggering WFR's, then the

copying rules do not have to be ordered extrinsically with respect to one another. R2 applies first because the triggering moderative WFR applies before the ## level where aspectual RA reduplication is triggered.

However, there is one formation in which the order of RA and R2 reduplication does not mirror the order of application of their triggering WFR's. This formation suggests that RA must be extrinsically ordered after R2.

Recall that recent perfective verbs are formed by affixing ka and the feature [+RA] to the V stems of -um-, ma-, and maka verbs, and to the ST V' stems of mag- and mang- verbs. The feature [+RA] can always trigger reduplication on the stem to which ka- is attached. But in those forms based on a ST stem, reduplication can also start copying at the stem of the inner V'.

77. [ka[pag[trabãhoh]]]
V' V' V V V' V'
+RA

a. ka-pãpag-trabãhoh
have just worked

b. ka-pag-trãtrabãhoh
(same)

There is also an intensive recent perfective which is exactly like the recent perfective, except that it also triggers R2 reduplication. R2 always applies before RA in the sense described above (see ex.76). The R2 copy is always to the

right of the RA copy. In those forms based on the V stem, R2 like RA copies the stem of ka-.

78a. [um[bāsah]]
V' V V V'
b-um-āsah
read

b. [ka[bāsah]]
V' V V V'
+RA
ka-bābāsah
have just read

c. [ka[bāsah]]
V' V V V'
+RA
+R2
ka-bābāsabāsah
just this minute
have read

But for those forms in which ka- has been prefixed to a V' mag- stem, R2 must always copy the V stem of the base V', even though RA has alternate analyses. R2 can only apply to bāsah below.

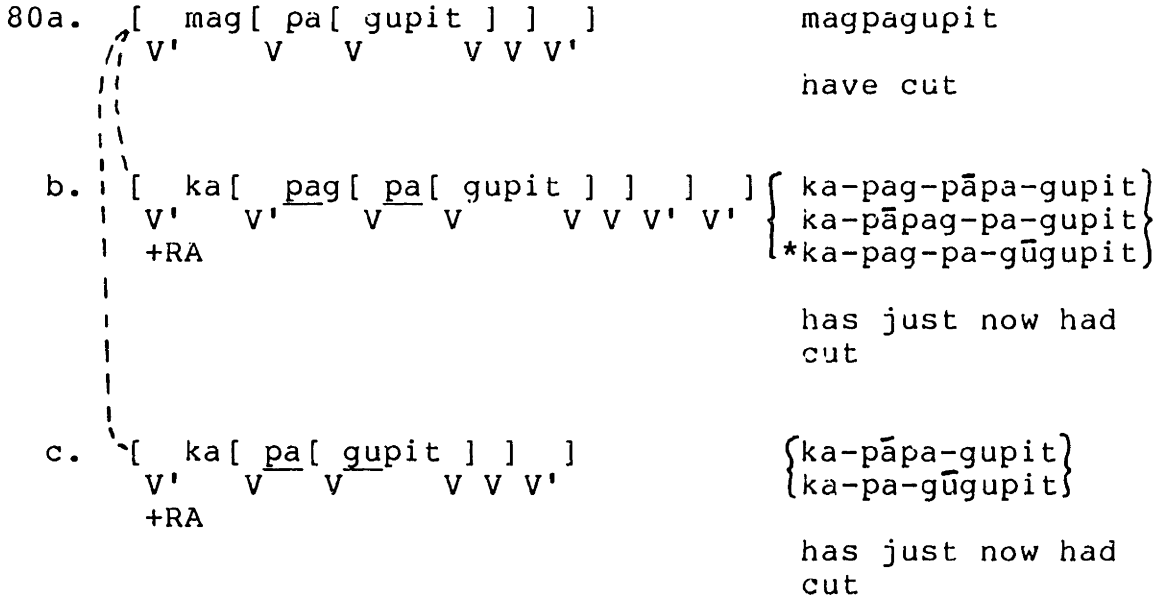
79a. [mag[bāsah]]
V' V V V'
mag-basah
read intensively

b. [ka[pag[bāsah]]]
V' V' V V V' V'
+RA
{ka-pa bābāsah
ka-pāpag-bāsah}
have just read
(intensively)

c. [ka[pag[bāsah]]]
V' V' V V V' V'
+RA
+R2
{ka-pāpag-bāsabāsah
ka-pag-bā-bāsabāsah}
have just this moment
read intensively

However, in recent perfective forms derived from causative

verbs, R2 reduplication does have alternate analyses. Either it can start copying at the pa- V stem of the causative verb, or it can start at the V stem to which pa- is attached. First notice that there are two possible causative stems to which ka- can be attached in both the recent perfective and the intensive recent perfective forms. Either it can be attached to the ST V' stem of the causative verb (as in (80b)) or to the V stem of the causative verb (as in (80c)). (We will simply assume that both members of the causative verb's paradigm are accessible to this WFR.) In the recent perfective RA can copy the V stem after pa- only in the form where the ST prefix is not present (80c).[4]



Similarly, in the intensive recent perfective, RA cannot copy the inner V stem (to which causative pa- has been attached), if pag- is present. On the other hand, R2 can always copy

either of the two V stems, i.e. it can copy either gupit or pa-gu.

81a. [ka[pag[pa[gupit]]]]
V' V' V V V V V' V'
+RA
+R2
{*ka-pag-pa-gū-gupitgupit
ka-pag-pāpa-gupitgupit
ka-pag-pā-pagūpagupit}

b. [ka[pa[gupit]]]
V' V V V V V'
+RA
+R2
{ka-pāpa-gupitgupit
ka-pā-pagūpagupit}

The fact that R2 has alternate analyses suggests that it is formulated to copy a V stem (as opposed to a V' stem) but that there is a variable between the trigger and the V stem that is copied.

82. R2 Reduplication

[X [C V Co V (C+) Y
+R2 V

1 2 3 4 5 ---> 1, 2, 3 , 4, 5
+long

RA must follow R2 because, as in other formations, the RA copy is to the left of the R2 copy. But also, what stem RA copies depends on which analysis R2 has chosen. If R2 has chosen to copy the causative V stem, RA cannot copy the inner V stem.

83. *[ka[pa[gupit]]]
V' V V V V V'
+RA
+R2

{*ka-pagū-pagū-gupit
*ka-pagū-gu-pagupit}

The fact that RA must follow R2 in these forms is interesting for our purposes, because there is no reason to assume that [+R2] is added before [+Ra]. In fact, if anything, it seems reasonable to derive the intensive recent perfective forms from their recent perfective counterparts (since these latter are morphologically and semantically more basic).

84a. [pa[gupit]] --->
V V V V

b. [ka[pa[gupit]]] --->
V' V V V V V'
+RA

c. [ka[pa[gupit]]]
V' V V V V V'
+RA
+R2

We will assume, then, that the relative order of RA and R2 cannot be predicted from the order in which their triggering features were attached. RA must be ordered extrinsically before R2. The fact that reduplication rules can apply in the opposite order from the WFR's that attach their triggering features provides yet another argument that

reduplication should be separated from the WFR's that trigger them. In generative terms, it argues further that they do not apply immediately after they are attached. The implication for lexical representations is that reduplicated material is not spelled out in the lexical entry of a word. The word is, rather, listed with the abstract triggering feature.

Footnotes to Chapter 5

1. It does not seem that we can invoke a general semantic condition that would ensure that RA does not apply twice. Plurality may be marked twice, by -ang and si-.

a. mag-kantah	b. mag-si-kantah	c. m-ang-ag-si-kantah
sing	(plural) sing	pl-pl-sing

m-ang-ag-si-kantah
(plural) sing

So the prohibition is at least partially morphological.

2. Schachter and Otanes (p. 228) point out that although these adjectives are often homophonous with the imperfective forms of ma-ka- verbs of ability, they are distinct from verbs. For those na-ka- adjectives that are not derived from verbs, for example nakāka?antok ("inducing sleepiness"), there are no corresponding verbs they could be derived from: ?antok ("sleep") but *maka?antok. For many that are derived from verbs, the meaning of the adjective is quite different from the verb it is derived from. So in contrast to naka-bibihag ("cativating"), makabihag means "succeed in captur ing." Finally, the verbs, but not the adjectives, can be inflected for the various aspectural categories. It is likely, however, that these adjectives were derived from verbs historically.

3. The complication is not particular to the recent perfective formation. Presence of mag- also determines whether RA copies the CV after pa- in the regular aspectual forms of causative verbs: ?i-pa-bibigay but *mag-pa-bibigay. (See footnote 9, Chapter 4.)

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