INSIGHTS INTO TAGALOG

Reduplication, Infixation, and Stress from Nonlinear Phonology

by Koleen Matsuda French

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Dedication

This study is dedicated to English speakers working to train Christian leaders in the Philippines who struggle as I did to gain fluency in a language so different from my own. It is my hope that something of what I have learned can help these people whose effectiveness depends so heavily on their ability to communicate clearly in a native Filipino tongue.

Acknowledgments

I have greatly appreciated the excellent suggestions of Bob Mugele, Don Burquest, Jerry Edmondson, and Mary Huttar. I am also grateful to Doug and Phyllis Trick, RBMU coworkers, who fanned my interest in pursuing linguistic research.

RBMU International, with whom I served in the Philippines, gave me permission to take a leave which resulted in this manuscript. My parents, Takashi and Jane Matsuda, have supported me in practical, generous ways.

I owe a special debt of thanks to Nenette Cada, my personal language and culture mentor, who patiently coached my stumbling Tagalog, answered endless questions, and shared my growing passion for hypothesizing rules to account for various phenomena. Were it not for her I am sure I would not be so motivated to be a good speaker and writer of Tagalog.

My husband, Bob, has helped me produce this manuscript in many ways. He thoughtfully took over chores when I was pressed for time, doggedly solved every computer problem I encountered, and drew all final diagrams meticulously.

Finally, I acknowledge my Heavenly Father, in whose perfect plan I have found myself called to work in the Philippines and thus to use every faculty available to communicate to Filipinos in their own tongue.

March 28, 1988

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Abbreviations

[+syl]	[+syllable], i.e., a vowel
[-syl]	[-syllable], i.e., a consonant
(+liq)	optional [+liquid], i.e., laterals and flaps
(+semv)	optional [+semivowel], i.e., /y/ or /w/.

on	onset
ry	rhyme
pk	peak
cd	coda

BRT	Basic Reduplicating Template
BST	Basic Syllable Template
IT1	Inflectional Template 1
IT2	Inflectional Template 2
IT3	Inflectional Template 3
MR	Metathesis Rule For /l y r h ʔ/-Initial Stems

AGT	agent focus
BEN	beneficiary focus
CAU	causative focus
INS	instrument focus
INT	intensive action focus
MUL	multiple agent focus
OBJ	object focus
PAR	participational focus
POT	potentiality focus
REC	reciprocal action focus
SIM	simultaneous action focus

BAS	basic aspect
COM	completive aspect
CON	continuative aspect
PRO	proposed aspect
X	nominal in focus

BV	Basic Verb
M	stem
P	prefix
R	root
S	suffix
σ	syllable

SO	someone
ST	something
[+lo]	[+low]
[+PH]	[+prefix, +high], i.e. /i/ of the prefix /?i-/
WD	word-level
FT	foot-level
SY	syllable-level
AX	Apply X
CX	Copy X
DI	Disyllabic Root: stress pattern of root is imitated
ER1	End Rule 1: first syllable is stressed
ER2	End Rule 2: second syllable is stressed
HS	Heavy Syllable: heavy syllable is stressed
LS	Light Syllable: secondary stress assigned to the antepenultimate syllable of the derived form
PG	Perfect Grid Construction
PU	Penultimate Stress assigned
RS	Reduplicated Syllable receives stress
RSP	Reduplicated Syllable in Prefix receives stress
RSS	Reduplicated Syllable from Root receives stress
TRI	Trisyllabic (second syllable receives stress)
UL	Ultimate Stress assigned

1. The Tagalog Syllable

Tagalog, spoken natively by residents of central Luzon, is the basis for *Pilipino,* the national language of the Philippines. Like other Philippine languages, Tagalog is generally considered to have a relatively simple phonology (Reid 1981:223). Yet reduplication, infixation, and stress phenomena have continued to attract the attention of linguists. In addition to phonological problems involving native vocabulary, large-scale borrowing has complicated an otherwise straightforward analysis of Tagalog syllable types.

The syllable is a crucial unit in rules formalizing reduplication and stress phenomena. Thus before presenting an analysis of reduplication and stress in Tagalog, I present a formalization of the Tagalog syllable. Section 1.1 provides a short review of the development of CV phonology on which this analysis is based. Section 1.2 discusses some ways linguists have treated words borrowed from Spanish and English. Subsequent sections then show how insights from CV phonology can clarify the status of previously ambiguous phonological segments, resulting in the elimination of former epenthesis rules.

1.1 Introduction to CV phonology

A number of convincing arguments (Vennemann 1972; Hooper 1974; Kahn 1976; Selkirk 1978; McCarthy 1979; Kiparsky 1979; Halle and Vergnaud 1979; Leben 1980; etc.) have been proposed for syllable-based phonology. Clements and Keyser (1983) suggest that there are four basic syllable types: CV, V, CVC, and VC, here given in their hierarchical order of derivation. These types are generated by means of two operations acting on the universal syllable archetype, CV. One operation deletes a syllable-initial consonant; the other inserts a syllable-final consonant. Four types of languages are identified according to the possible syllable types derived from these two operations (1983:29):

(1) Type I: CV
Type II: CV, V
Type III: CV, CVC
Type IV: CV, V, CVC, VC

In addition, each language is defined in terms of a "maximum syllable, stated as a single expansion of the general schema C(*)V(*)C(*), where any occurrence of * may be replaced by an integer greater than 1" (1983:30).

Grouping of phonological segments into syllables follows the ONSET FIRST PRINCIPLE first formulated by Kahn (1976) for English.

(2) a. Syllable-initial consonants are maximized to the extent consistent with the syllable structure conditions of the language in question.

b. Subsequently, syllable-final consonants are maximized to the extent consistent with the syllable structure conditions of the language in question.

The ONSET FIRST PRINCIPLE (2) can be restated as a series of rules very similar to those of autosegmental association (Goldsmith 1976a). Syllables are built from the center outwards according to these rules:

(3) a. V-elements are prelinked to σs (σ = syllable).

b. C-elements to the left are adjoined one by one as long as the configuration resulting at each step satisfies all relevant syllable structure conditions.

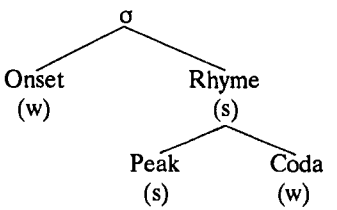
c. Subsequently, C-elements to the right are adjoined in the manner described in (b) above.

All relevant syllable structure conditions (3b) will vary from language to language and will determine how an utterance is syllabified in that language.

According to Selkirk (1982), it is possible to characterize all the syllable types of a language with one syllable template. The template will overgenerate syllable types and, therefore, collocational restrictions are needed to filter out the unacceptable ones. Selkirk uses a binary branching constituent tree to formalize the syllable template. The syllable divides into onset and rhyme, the onset being WEAK (less sonorous) and the rhyme being

STRONO (more sonorous).[1] The rhyme divides further into peak (strong) and coda (weak).

(4)



Having briefly introduced the theoretical concepts of CV phonology, I now turn to an overview of the controversies surrounding Tagalog segments and syllable types.

1.2 Controversies caused by loanwords

While many linguists have described Tagalog segments and syllables, they have not agreed. One reason for this confusion is the abundance of loanwords in Tagalog.

Controversy over segments. As a result of nearly 400 years of Spanish presence in the Philippines, Tagalog is replete with Spanish borrowings. This influx of foreign words has contributed not only to the lexical expansion of Tagalog but also to its inventory of sounds. For example, the vowel system expanded from /i u a/ to /i e a o u/ as a result of Spanish borrowings (Panganiban 1972:xi).

Today, many English borrowings are also considered to be part of vernacular Tagalog. As a result of English borrowings, some linguists such as Ramos (1971:8) and Soberano (1980:21) claim that Tagalog now has the diphthongs /a^y o^y e^y u^y a^w i^w/. Llamzon (1976:40) identifies only five diphthongs, /ay uy iy aw iw/.

Soberano (1980:25) includes /f/ in her chart of Tagalog segments where Ramos (1971:3) and Llamzon (1976:43) do not, since /f/ is the result of Spanish borrowings. Schachter and Otanes (1972:18) include /f/ and /č/ in parentheses to indicate their status as contributions from foreign systems.

The literature also reflects controversy over what constitutes consonant clusters, a decision with direct bearing on identifying syllable types. Ramos

[1]Selkirk credits Pike (1967:387ff) and McCarthy (1977) with the suggestion to incorporate sonority into a strong/weak dichotomy in the binary branching tree. An advantage of labelling according to sonority and not according to STRENGTH (e.g., Hooper 1974, 1976) is that the weak constituents are marginal and the strong constituents are more nuclear; for example, the strongest constituent is the identified as the nucleus of the entire syllable (=peak) (Pike 1947:142).

(1971:8) and Soberano (1980:32) consider /š/ to be the second member of a consonant cluster with /t/ as the only possible initial member. Schachter and Otanes (1972:18) consider /tš/ to be a unit segment, /č/. Ramos, Soberano, and Schachter and Otanes all agree that /y/ and /w/ are the second member of a number of clusters, where the first member can be a stop, nonvelar nasal, or lateral. Llamzon, however, says that "no consonant clusters are to be found in properly Tagalog words" (1976:49) and so has no clusters in his segmental analysis.

Controversy over syllable types. Schachter and Otanes (1972) claim that vowel length—not stress—is contrastive. They represent syllables with long vowels as CV: Soberano, typical of linguists who have followed the lead of Schachter and Otanes, identifies the following syllable types for indigenous Tagalog stems (1980:34):

(5)

CV	{C, :}	in nonfinal position
CV(C)		in final position

Soberano identifies CCVCCC as the maximally complex syllable type if loanwords are included, though "no word in the data exemplifies this structure" (1980:34).

Linguists disagreeing with Schachter and Otanes do not include CVV as a syllable type but do include V and VC. For example, Llamzon (1976:41) is typical of some who imply that V and VC are syllable types by the following underlying representations:

(6)

/a.kó/	'I'	[ʔa.kó]
/ta.ás/	'height'	[ta.ʔás]
/a.sín/	'salt'	[ʔa.sín]

Llamzon does not explicitly list syllable types. By inference from his representations, his syllable types for indigenous words are:

(7) V, VC, CV, CVC

Native speaker perceptions necessitate inclusion of loanwords. Llamzon excludes loanwords on the basis that "these sequences are clearly felt to mark foreign pronunciation" (1976:49). While educated Filipinos can often identify whether a word comes from Spanish or English, loanwords are not seen as non-Tagalog or outside the vernacular. When asked why Spanish loanwords are so prevalent in everyday speech one person stated that Spanish borrowings are not considered foreign by Filipinos but in fact are more conversational than their indigenous Tagalog equivalents, where those exist (Cada n.d.). For example, /ʔestudiyánte/ 'student' (from

Spanish) is by far the preferred choice to /mag-ʔaʔarál/ 'student' (indigenous Tagalog); I have never heard the latter used in informal conversation.

With regard to English borrowings, some Filipinos claim that *Taglish*, the code-switching phenomenon whereby English roots are incorporated within Tagalog morphology and grammar, is a viable variety spoken in Metro Manila and among university-educated Filipinos (Cada n.d.). The fact that Spanish and English words are routinely used, integrated into morphological and grammatical processes, suggests that they are integrated phonologically, as well. Therefore a comprehensive analysis of modern-day Tagalog must include loanwords. In this analysis, *Tagalog* will refer to all Spanish and English borrowings in common use as well as indigenous words.

1.3 The Tagalog syllable and auxiliary templates

Tagalog does not allow syllable-initial clusters of more than two consonants. English borrowings that begin with an /s/-initial onset of three consonants are treated just as /s/-initial words in Spanish are—by epenthesizing a glottal stop and vowel before the /s/ to break up the sCC cluster. In the examples below, the first syllable ends with /s/.

(8) [ʔis.tráyk] 'strike' (from English *strike*)
[ʔis.krú] 'screw' (from English *screw*)
[ʔis.préy] 'spray' (from English *spray*)

Like Schachter and Otanes (1972), I posit that every Tagalog syllable begins with a consonant and every word-final syllable ends with a consonant. One result of this choice is that /ʔ/ and /h/ are represented in all positions—word-initially, medially, and finally. Stems transcribed by Llamzon as vowel-initial become glottal-initial and vowel-final words become /h/-final. For example, Llamzon's /a.kó/, in (6), is now transcribed as /ʔa.kóh/.

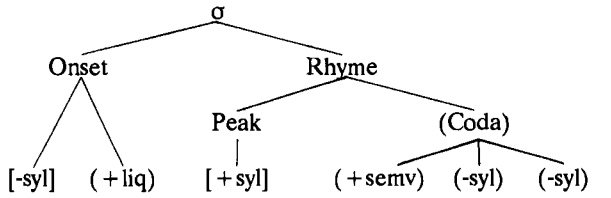
Departing from Schachter and Otanes, I claim that stress, not vowel length, is contrastive. Vowel lengthening is a phonetic consequence of stress, making CVV an unnecessary syllable type. Reduplication and stress phenomena support this choice (see 2.5 and 3.6).

Syllable-final consonant clusters in Tagalog can have three consonants if and only if the first member is /y/ or /w/. With this possibility, Tagalog syllable types are CV, CCV, CVC, CCVC, CVCC, CCVCC, CVCCC, and CCVCCC. Using the notation of Clements and Keyser (1983:30), these translate as follows.

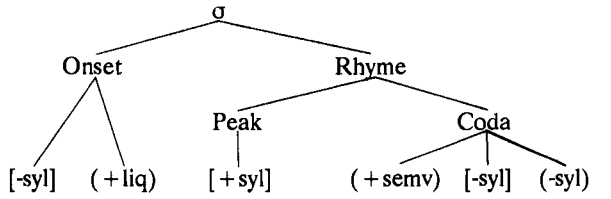
(9) C(2)V
C(2)VC(C)(2) word-finally
C(2)VC(3) (maximum type)

WELL-FORMEDNESS CONDITIONS for the Tagalog syllable can be stated in terms of a basic syllable template, auxiliary templates, and collocational restrictions for complex onsets and codas. First, the TAGALOG BASIC SYLLABLE TEMPLATE (BST), to which all well-formed syllables must conform, is introduced in (10a) and (10b). Features in parentheses indicate that a slot is optionally filled.

(10a) Nonfinal Syllable



(10b) Word-final Syllable



Note that semivowels (/y w/) are always interpreted as consonants and thus are never part of the peak. Reduplication phenomena discussed in section 2.5 shows why this interpretation is necessary.

Like Selkirk's syllable template for English (1982:345), the Tagalog BST overallows syllable types. Conditions for a Tagalog COMPLEX ONSET can be described as follows:

(11) a. If the second member is /r/, the first member is either a stop (excluding the glottal stop), /f/, or /θ/.

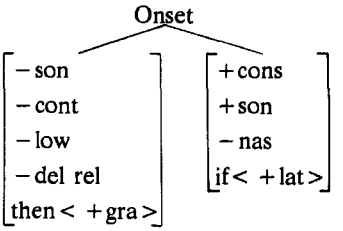
b. If the second member is /l/, the first member is a noncoronal, nonglottal stop, or /f/.

Auxiliary templates similar to that of Selkirk's for English (1982:347) can capture these generalizations.

Angled bracket notation is normally used to "show an interdependency between two optional feature specifications" (Hyman 1975:120). In the case of complex onsets, however, it is the SECOND MEMBER of an onset that delimits what the first member can be. To express this one-way dependency,

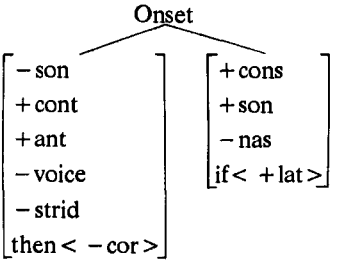
angled bracket notation are modified by establishing an IF-THEN convention instead of the IFF convention between the feature that dictates the concomitant presence of a second feature and that second feature. Thus, [if lat] opposite from [then gra] signals that if the second onset member is [+lat], the first member must be [+grave].

(12) Auxiliary Template 1 (Tagalog)



A second auxiliary template is necessary because of the contributions of segments /f θ v/ to Tagalog from English borrowings. These segments may or may not exist in an individual Filipino's inventory, depending on his exposure to English borrowings.

(13) Auxiliary Template 2 (Taglish)



Collocational restrictions for complex codas are as in (14a) and (14b).

(14a) In a 2-consonant complex coda:

1. Any nonglottal consonant can precede /s/.
2. /l r w y/ can precede any obstruent except glottals and voiced velars, and the dental fricatives.
3. A nasal can be followed by /s/ or assimilates to the pointof articulation of the voiceless stops and /d/.

(14b) In a 3-consonant complex coda:

1. The first member must be a semivowel.

2. The third member must be /t/, /d/, or /s/.
3. The second member must be:
   a. /n/ or /s/ if the third member is /t/.
   b. /n/ if the third member is /d/.
   c. a stop (excluding /ʔ/) or /m n l f v/ if the third member is /s/.

(See Appendix B for examples of well-formed consonant clusters.)

The AUXILIARY TEMPLATES and COLLOCATIONAL RESTRICTIONS stated above generally follow Hooper's UNIVERSAL STRENGTH HIERARCHY (1974:81) and UNIVERSAL CONDITION ON PREFERRED SYLLABLE STRUCTURE (1976:229) with some exceptions.[2] The inclusion of foreign segments makes Selkirk's representation easier to follow.

Now we can state WELL-FORMEDNESS CONDITIONS for Tagalog syllables in a way similar to that of Selkirk for English (1982:347):

(15) A Tagalog syllable is phonologically well-formed if it conforms to the appropriate BASIC SYLLABLE TEMPLATE (10a or 10b), the AUXILIARY TEMPLATES (12, 13), and the COLLOCATIONAL RESTRICTIONS (14a or 14b).

Resyllabification in Tagalog consists of the application of Selkirk's MAXIMAL SYLLABLE ONSET PRINCIPLE (1982:359):

---

[2]Hooper's universal strenth hierarchy (1974:81, 1976:206)

glid	liq	nas	vd cont	vl cont vd stops	vl stops	
1	2	3	4	5	6	strength →

Hooper relates the strength of a segment to its position in an onset or coda via SYLLABLE STRUCTURE CONDITIONS (SSC's) as follows (1974:103, 1976:229):

Universal condition on the form of language-specific SSC's ($ = syllable boundaries): $CmCnCpCq V CrCsCt$

where m > n > p > q
r < s < t
m > t
m > ∅

This condition requires: (1) An obligatory V or [+syll] must make up the nucleus. (2) The strength scale values for various C positions must descend from syllable-initial position inward toward the nucleus. (3) The strength scale values for various C positions must descend from syllable-final position inward toward the nucleus. (4) The syllable-initial C position allows stronger consonants than the syllable-final position.

The auxiliary templates (12, 13) and collocational restrictions (14) roughly follow Hooper's universal condition on preferred syllable structure, but the actual formulation is cumbersome because of the inclusion of foreign segments.

Resyllabification in Tagalog consists of the application of Selkirk's MAXIMAL SYLLABLE ONSET PRINCIPLE (1982:359):

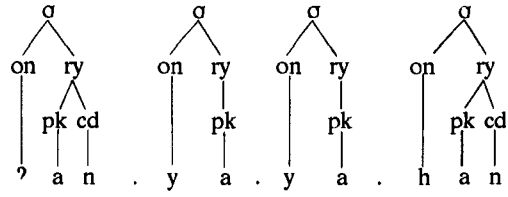
(16) In the resyllabification of an utterance, the onsets of syllables are maximized, in conformance with the BASIC SYLLABLE TEMPLATE.

In addition,

(17) Resyllabification occurs at every step of a derivation.

For example, after the suffixation of /-an/ to /ʔanyáyah/ 'invite' the string is resyllabified. (on = onset; ry = rhyme; pk = peak; cd = coda)

(18) /ʔan.yá.yah/ + /-an/ = /ʔan.ya.yá.han/



Formalizing syllabification and resyllabification is important so that other rules can identify and refer to a particular syllable in a string.

1.4 Former epenthesis rule eliminated

Epenthesis rule needed under former transcription. The glottal stop is not represented orthographically in Tagalog. Perhaps because of this, some linguists like Panganiban consider /ʔ/ an extra consonant (1972:x) because it is contrastive only in word-final position. For example, Panganiban lists the following:

(19) *bahágiʔ* 'division'
bahági 'part (of something)'

báho 'bass (voice, part)'
báhoʔ 'stench, bad oder'

labá 'to launder'
labáʔ 'growth, increase'

bága 'glowing ember'
bágaʔ 'lungs'

Llamzon, like Panganiban, does not represent /ʔ/ word-initially nor /h/ word-finally (1976:49). Under this system, the following transcriptions occur:

(20) /ákin/ 'mine'
/anyáya/ 'invite'
/taás/ 'tall'
/kantá/ 'song'

Observations regarding the phonetic realization of utterances undergoing epenthesis can be summarized as follows:

(21a) A glottal stop is epenthesized before a word-initial vowel. E.g.: /ákin/ = [ʔákin]

(21b) Two contiguous vowels are separated by a glottal stop. E.g.: /taás/ = [taʔás]

(21c) A glottal is inserted before a vowel-initial stem undergoing prefixation. E.g.: /mag-/ + /anyáya/ = [magʔanyáyah]

(21d) /h/ is epenthesized after a vowel-final stem undergoing suffixation. E.g.: /kantá/ + /-an/ = [kantahán]

To account for these phonetic outputs given the representations in (20), one must posit an epenthesis rule as follows. (+ = formative boundary)

(22) /ʔ h/ Epenthesis Rule:

$$\emptyset \rightarrow \begin{matrix} ʔ \\ h \end{matrix} / \begin{Bmatrix} \# \\ C+ \\ V \end{Bmatrix} \_V \quad V\_ \quad +V$$

Similar epenthesis rules are posited for other Philippine languages (e.g., Hayes 1981:38 for Aklan; Allen 1977:283 for Kankanaey).

As an alternative to an epenthetical rule like (22) to explain suffixation like that in (21d), Llamzon proposes allomorphs (1976:113), paraphrased below.

(23) Local: {-(h)an} has allomorphs /-an/ and /-han/, with the presence or absence of a stem-final glottal determining which allomorph is used.

Epenthesis rule eliminated under well-formedness requirements. Ac - cording to the Tagalog SYLLABLE WELL-FORMEDNESS CONDITIONS proposed in (15), all Tagalog syllables must begin with a consonant. Since /ʔ/ and /h/ now enjoy normal distribution, formerly vowel-initial stems are reinter-

preted as underlyingly glottal-initial. Formerly vowel-final stems are reinterpreted as /h/-final. Under well-formedness requirements, the forms of (20) are represented as in (24).

(24) /ʔákin/ 'mine' [ʔákin]
/ʔanyáyah/ 'invite' [ʔanyáyah]
/taʔás/ 'tall' [taʔás]
/kantáh/ 'song' [kantáh]

With the representations proposed above there is no need for any epenthetical rules to produce the phonetic realization after building a word from its constituent parts (i.e., word formation).

(25) /ʔákin/ 'mine' [ʔákin]
/mag-/ + /ʔanyáyah/ = /magʔanyáyah/ 'X invites' [magʔanyáyah]
/taʔás/ 'tall' [taʔás]
/kantáh/ + /-in/ = /kantahín/ 'sings X' [kantahín]

Insights from CV phonology require the full distribution of /ʔ h/ and eliminate the need for any epenthetical rules like (22) or any allomorphs like that of Llamzon's (23). A significant result is that NOW THERE ARE NO PHONOLOGICAL RULES THAT ALTER SYLLABLE SHAPE. Apart from phonological rules of vowel assimilation, all affixation processes in Tagalog now produce their final phonetic forms directly from word formation. A few further examples show how affixation is simplified by the new status of /ʔ h/.

(26) stem: /basáʔ/ 'wet' suffix: /-in/
/basáʔ/ + /-in/ → *basaʔín* 'to wet X' [basaʔín]

stem: /básah/ 'to read' suffix: /-in/
/básah/ + /-in/ → *basáhin* 'so reads X' [basáhin]

stem: /ʔintindíh/ 'understand' affixes: /ma- -an/
/ma-/ + /ʔintindíh/ + /-an/ → *maʔintindihán* 'so understands X' [maʔintindihán]

The claim that /ʔ h/ enjoy full distribution is substantiated by infixation and suffixation phenomena, discussed in section 2.6.

1.5 Vowel syncope and well-formed syllables

Certain stems undergo deletion of their last vowel when suffixed. There is no phonological basis on which to predict which stems will undergo Vowel Syncope. For example, /lakás/ 'strong' and /wakás/ 'end' both have ultimate stress and differ only in their initial consonant, but /lakás/ undergoes Vowel Syncope while /wakás/ does not.

(27) *lakás* 'strong'
laksán 'to make X stronger'
wakás 'end'
wakasán 'to end X'

Stems which end in an open syllable and which undergo VOWEL SYNCOPE (according to traditional underlying representations and current orthographic convention) undergo epenthesis of /h/ before the suffix.

(28) /bilí/ 'to buy' + /-in/ → [bilhín] 'to buy X' (/h/-ins)
→ *bilín* (Vowel Syn)
/dalá/ 'to carry' + /-an/ → [dalhán] 'to carry to X' (/h/-ins)
→ *dalán* (Vowel Syn)
/sará/ 'to close' + /-an/ → [sarhán] 'to close X' (/h/-ins)
→ *sarán* (Vowel Syn)

Although one cannot predict which stems will undergo syncope, the WELL-FORMEDNESS CONDITIONS for Tagalog syllables (15) predict why certain ones will not undergo syncope.[3] The AUXILIARY TEMPLATES (12, 13) constrain syllables such that a syllable-initial cluster is not allowed unless the first consonant is a nonglottal stop and the second is /r/ or /l/. VOWEL SYNCOPE will not occur if the resulting syllable is not well-formed.

(29) *sukláy* 'comb'
suklayín 'to comb X' (and not **suklyin*)

Underlying representations dictated by constraints on the syllable (16) eliminate the need for an epenthetical rule inserting /h/ before the suffix.

(30) Representation of VOWEL SYNCOPE Employing SYLLABLE WELL-FORMEDNESS CONDITIONS

/bilíh/	+	/-in/	→ /bilhín/	'to buy X'	[bilhín]
/daláh/	+	/-an/	→ /dalhán/	'to carry to X'	[dalhán]
/saráh/	+	/-an/	→ /sarhán/	'to close X'	[sarhán]

[3]As a general rule, stems ending in a glottal stop do not undergo VOWEL SYNCOPE, although I know of one exception:

hiŋí? 'petition, request'
-in 'OBJ focus suffix'
hiŋín 'to ask for X'

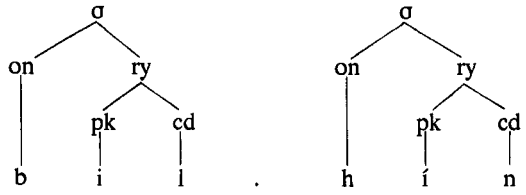
This may be an idiosyncratic word which undergoes the loss of the segments /?i/: /hiŋí?/ + /-in/ → /hiŋí?in/ → /hiŋín/ 'ask for X'

/saráh/ + /-an/ → /sarhán/ 'to close X' [sarhán]

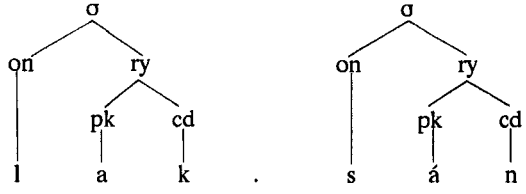
Now phonetic and underlying forms are identical. Resyllabification after VOWEL SYNCOPE follows the Tagalog RESYLLABIFICATION RULE, (17).

(31) Resyllabification After VOWEL SYNCOPE

a. /bilhín/ 'to buy X'



b. /laksán/ 'to strengthen X'



1.6 Predicting the phonology of assimilated loanwords

The Philippines presents a unique situation for the study of the phonology of loanword assimilation. The efforts of the Philippine government to intellectualize the national language has resulted in rapid, large-scale English borrowings. It is likely that loanwords will continue to be assimilated into Tagalog. One Filipino linguist says:

> The acquisition of new and increased vocabulary in Pilipino is in response to the need for denoting new concepts and objects. Pilipino has to continue borrowing English lexical items especially in education, science, technology, business, and politics. (Pascasio 1984:126)

The following subsections will show how the pronunciation and (re)syllabification of any English loanword can now be predicted by the WELL-FORMEDNESS CONDITIONS OF A TAGALOG SYLLABLE (15) along with a set of LOANWORD ASSIMILATION RULES (36, below).

First, we identify a mapping procedure for English vowels to Tagalog vowels (see Appendix B for Tagalog vowel segments). The English vowel system can be represented as follows, based on Smalley (1977:477). (See 34 for diphthongs.)

(32)

	Front		Central		Back
High	cd.	i			u
	open	ɪ			ʊ
Mid	cd.	e	ə		o
	open	ɛ			ɔ
Low		æ	a		

	i	ɪ	e	ɛ	æ	a	ə	u	ʊ	o	ɔ
High	+	+	−	−	−	−	−	+	+	−	−
Low	−	−	−	−	+	+	+	−	−	+	+
Back	−	−	−	−	−	−	−	+	+	+	+
Round	−	−	−	−	−	+	−	+	+	+	+
Tense	+	−	+	−	−	−	+	+	−	−	+

Now we can map English vowels to Tagalog vowel equivalents according to the following conventions:

(33a)

ENGLISH		TAGALOG
[+hi, −bk]	→	/i/
[+hi, +bk]	→	/u/
[−hi, −lo]	→	/e/
[−hi, +bk]	→	/o/
[+lo, −bk]	→	/a/

Listing the English segments that satisfy the feature conditions on the left, we have:

(33b)

ENGLISH		TAGALOG
/i ɪ/	→	/i/
/u ʊ/	→	/u/
/e ɛ/	→	/e/
/o ɔ/	→	/o/
/a æ ə/	→	/a/

If all English diphthongs are written as an off-glide (y or w) following a vowel, then English diphthongs can be mapped to Tagalog equivalents according to the following:

(34a)

ENGLISH		TAGALOG
/V^{y}/	→	/Vy/
/V^{w}/	→	/Vw/

with two exceptions:

/u^{w}/	→	/ú/
/i^{y}/	→	/í/

The following English diphthongs would map to their Tagalog equivalents as per (34a):

(34b)

ENGLISH		TAGALOG
/a^{y}/ in kite	→	/ay/
/e^{y}/ in hate	→	/ey/
/o^{y}/ in boy	→	/oy/
/a^{w}/ in cow	→	/aw/
/o^{w}/ in boat	→	/ow/
/i^{w}/ in few	→	/iw/
/u^{w}/ in crew	→	/ú/
/i^{y}/ in beat	→	/í/

In order for the Tagalog SYLLABLE WELL-FORMEDNESS CONDITIONS (15) to be met, certain epenthetical processes must occur. Since Tagalog demands consonant-initial syllables and a closed word-final syllable, a glottal stop must be inserted before each word-initial vowel and an /h/ must be added after a word-final vowel. Unacceptable consonant clusters must be separated by vowel epenthesis.

(35)

ENGLISH		TAGALOG
/#V/	→	/ʔV/
/V#/	→	/Vh/
/Cw/	→	/Cuw/
/Cy/	→	/Ciy/
/sC(C)/	→	/ʔisC(C)/

For example, epenthesis would occur as per (35) to derive the following Tagalog words:

ENGLISH			TAGALOG
/o^{w}t/	'oat'	→	/ʔówt/
/kru^{w}/	'crew'	→	/krúh/
/kwɪt/	'quit'	→	/kuwít/
/kyu^{w}t/	'cute'	→	/kiyút/
/ska^{w}t/	'scout'	→	/ʔis.káwt/

The incorporation of English words into Tagalog, whether as roots to be verbalized, or whether as independent formatives, can now be formalized as the following ordered process.

(36) a. Transcribe the English word using offglides y and w to express diphthongs.

b. Assign Tagalog equivalents to English vowels and diphthongs according to rules (33) and (34).

c. Epenthesize English roots according to Loanword Epenthesis Rules, (35).

The following examples show how the LOANWORD ASSIMILATION RULES (36) assign segments and syllabic structure to English borrowings. Resyllabification is done as a test to show that the Tagalog representations resulting from application of (36) are well-formed.

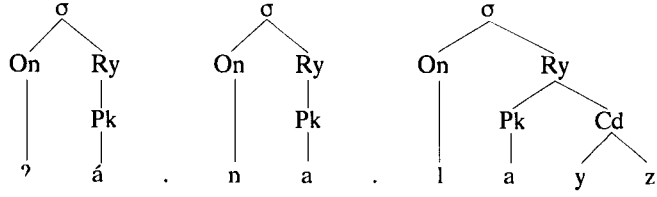
(37) English word: analyze

a. Transcription: /ʔænəla^{y}z/

b. Tagalog segments substituted: /ánalayz/

c. Epenthesis: /ʔánalayz/

Resyllabification: (On = onset; Ry = rhyme; Pk = peak; Cd = coda)



/mag-/ + /ʔánalayz/ → mag-ʔánalayz 'X analyzes'

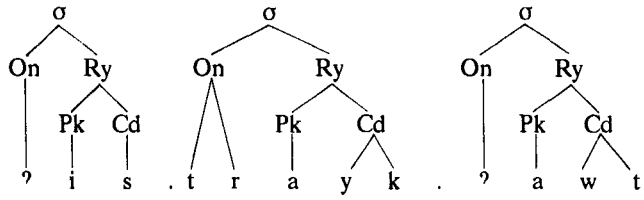
(38) English word: strikeout

a. Transcription: /stra^{y}k# #a^{w}t/ (2 words)

b. Tagalog segments substituted: /stráyk# #áwt/

c. Epenthesis: /ʔistráyk# #ʔáwt/

Resyllabification: /ʔistráyk# #ʔáwt/:

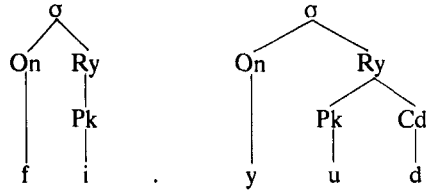


/mag-/ + /ʔistráyk ʔáwt/ → mag-ʔistráyk ʔáwt 'X strikes out'

(39) English word: feud

a. Transcription: /fyúd/
b. Tagalog segments substituted: /fyúd/
c. Epenthesis: /fiyúd/

Resyllabification:



/mag-/ + /fiyúd/ → mag-fiyúd 'X's feud'

1.7 Summary

Language developers in the Philippines wrestle with how to spell English loanwords. Their quandary reflects the linguistic controversy over loanwords, foreign segments, and how the Tagalog syllable should be represented. The choice lies between spelling English words according to Tagalog orthography, considered nearly phonetic, or spelling them as they appear in English. One Filipino linguist says:

> It is obvious that the problem lies mainly in the spelling of borrowed English words. If English *propose* is given affixes and then spelled as *iprinopose*, the question becomes, do we really pronounce it as [i pri no pos] or, as seems to be the case, [i pri no pows]? And if we give it a different affix, do we then spell it as *nagpropos* or, what seems to be more accurate, *nag-propose?* If the purpose is to represent graphemically the pronunciation of such words, then the better way to spell them seems to be *iprinopose, ipablish,* and *iskolarship.* If the purpose, however, is to make borrowed words look native, then *iprinopos, ipablish,* and *iskolarsip* serve the purpose better. (Bautista 1976:86–87)

Given the controversy over Tagalog orthography and incorporation of loanwords, it is no surprise that linguists have analyzed Tagalog segments and consonant clusters inconsistently. Perhaps a key element missing in previous

analyses is that the Tagalog syllable was not formalized; syllabification was not seen as a factor that could help clarify the status of ambiguous segments.

The formalization of Tagalog syllable structure provides a number of theoretical advantages:

1. Syllable types are simplified to a word-initial syllable of C(2)V(C) and a word-final syllable of C(2)V(C)(3). These types unambiguously classify Tagalog as a Type III language according to the typology of Clements and Keyser (1983:29).
2. Several ambiguities regarding segments are resolved:
   a. /ʔ/ and /h/ now enjoy full distribution, thus eliminating former epenthetical rules involving these segments.
   b. The English segments /f v θ ð z š ž/ are included in a description of Tagalog (Appendix B) because they also follow Tagalog syllabification rules. Syllabification is more characteristic of a language than any individual segment, so Filipinos still sound Filipino even when they use foreign segments.
3. Tagalog CV phonology predicts how English loanwords will be assimilated.
4. The syllable can now be referred to as a unit in reduplication and stress phenomena.

2. Autosegmental Reduplication and Infixation in Tagalog

Phenomena such as reduplication and infixation have traditionally been very problematic in a linear (structural) approach. Reduplication phenomena in Tagalog and other Philippine languages have received a variety of analyses. Linguists have tried to formulate solutions to the various ways in which morphological and phonological processes interact in Philippine languages (e.g., Anderson 1974, 1975; Allen 1975, 1977; Wilbur 1973; Carrier 1979). According to Reid (1981:221ff) they do not agree as to the mechanism of processes resulting in vowel syncope and nasalization, or on how phonological rules should be ordered with respect to morphological rules (e.g., Wilbur 1973 vs. Cena 1975 vs. Latta 1976 vs. DeGuzman 1978).

Tagalog is cited as presenting a variety of reduplication processes well-suited to an autosegmental analysis (McCarthy 1981; Marantz 1982). This chapter formalizes some types of reduplication and infixation previously unaccounted for and discusses the interaction of reduplication and infixation in Tagalog. Before reduplication is formulated a brief introduction is given to autosegmental theory (2.1) and to Tagalog verb morphology (2.2).

2.1 Introduction to autosegmental theory

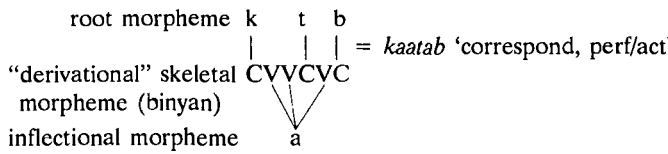
The purpose of autosegmental theory is to "provide a more adequate understanding of the phonetic side of the linguistic representation" (Goldsmith 1976b:23). Autosegmental theory assumes that different phonological features function on different tiers, or levels, and must be associated to produce the final phonetic form of an utterance. The theory is called autosegmental because any feature can be represented as SEGMENTS in a broad sense, existing on separate tiers and exhibiting autonomous behavior.

In its early years autosegmental theory was widely applied to African tonal languages. Tones were treated as if they existed on a separate tier from the segmental tier and then were associated with phonemic segments according to certain rules. In recent years autosegmental theory has been applied to such varied phenomena as vowel harmony (Clements 1980, McCarthy 1984),

pitch-accent (Goldsmith 1974), nasalization (Goldsmith 1976a), vocalism (McCarthy 1981), and reduplication (Marantz 1982). When a feature behaves independently as if it were not anchored to segments, autosegmental theory provides an elegant description.

C-V templates. In McCarthy's analysis of Arabic verbs (1981), he uses C-V TEMPLATES or SKELETONS, linear patterns of consonants and vowels to which consonants from a root are mapped separately from the vowels. The consonants of a root morpheme are on one level; the vowel, considered the inflectional morpheme, is on another level. Each form of an Arabic verb, defined by parameters such as voice, mood, aspect, and *binyan* (conjugation) class, is associated with a unique C-V template. So, for example, the perfective active form of binyan III is associated with the template represented in (40). Association rules are patterned after the Well-Formedness Conditions of autosegmental phonology (Goldsmith 1976a,b). Lines between segments and the C-V template represent the attachment (association, mapping) of segments to their C-V slots.

(40) root: ktb 'to write'



Reduplication as affixation of C-V templates. Marantz (1982) utilizes C-V templates to formalize reduplication as normal affixation, "simply the affixation of a skeleton to a stem" (1982:445). Each C-V skeleton characterizes particular morphological processes and exists in the lexicon, available for word-formation. For most reduplication phenomena in Tagalog, the stem serves as the REDUPLICATING MORPHEME, i.e., provides the phonemic segments which associate to the C-V template.

In Tagalog, some templates have multiple functions and are used by stems from different word classes (e.g., verbs and adjectives). A verb in the lexicon consists of a stem and the C-V templates it associates to in producing an inflected form. In the case where a C-V template is involved in only one morphological process, it is named after that process.

2.2 Tagalog verb morphology

The focus system. The morphology and syntax of Philippine languages are said to be among the most complex in the world (Reid, 1981:223). Tagalog grammar, like other Philippine languages, involves a FOCUS SYSTEM whereby the verbal affix signals a special relationship between the verb and one of the noun phrases in the sentence. This special NP is said to be

IN FOCUS; it is the FOCUSED ITEM or FOCUSED COMPLEMENT of the sentence. The focused item is marked either by a special particle if it is an NP or by a set of pronouns which replace the NP. For a particular sentence, the verbal affix determines the semantic (case) role of the focused item. Usually the FOCUS of a sentence and of the verbal affix is described by the semantic role of the focused item, e.g., AGENT FOCUS, OBJECT FOCUS, BENEFICIARY FOCUS, etc. Three different focus types for one verb stem, /bigáy/ 'give', are shown below. (- = morpheme break; PRO = proposed aspect; 1, 2, 3 = Class 1, 2, 3. Other abbreviations are listed on pages ix–x.)

(41a) *mag-bigáy kah naŋ pérah sah bátah.*
AGT-give-BAS you-1 some-2 money to-3 child
You give (imperative) some money to a/the child.'

Sentence focus: Agent Focused item: *kah* 'you'

(41b) *ʔi-bigáy moh ʔaŋ pérah sah bátah.*
OBJ-give-BAS you-2 the-1 money to-3 child
You give (imperative) the money to a/the child.

Sentence focus: Object Focused item: *pérah* 'money'

(41c) *big(a)y-án moh ʔaŋ bátah naŋ pérah*
give-LOC^PRO you-2 the-1 child some-2 money
You give (imperative) the child some money.

Sentence focus: Location Focused item: *bátah* 'child'

Another factor complicating Tagalog verb morphology is that there is no one-to-one correspondence between a focus type and its affix. One affix can signal more than one focus type. For example, the prefix /ʔi-/ can signal object focus, instrument focus, or beneficiary focus, depending on the stem to which it is attached and the context of the sentence. On the other hand, object focus can be signalled by /ʔi-/, /-in/, /ʔipag-/, /pag- -an/, or /-an/. Simple agent focus can be signalled by the prefixes /mag-/, /maŋ-/, and /ma-/ and by the infix /-um-/. (For further reading on focus affixes and their overlap, see Kess 1975, 1976, 1979.) All of the verbs in (42) are agent-focus (AGT) verbs in which the agent focus is signalled by different aspects. Since stress will be discussed in Chapter 3, its placement in the final derived form will not be commented on here. The concern of this chapter is how phonemic segments are generated in reduplication and infixation. (BAS = basic, the uninflected form used in infinitive and imperative constructions.)

(42)	stem:	*trabáhoh*	'work'
	prefix:	*mag-*	'AGT'
	verb:	*mag-trabáhoh*	'X works' (BAS)
	stem:	*ʔisdáʔ*	'fish'
	prefix:	*maŋ-*	'AGT'
	verb:	*maŋ-ʔisdáʔ*	'X fishes' (BAS)
	stem:	*tákot*	'fear'
	prefix:	*ma-*	'AGT'
	verb:	*ma-tákot*	'X fears' (BAS)
	stem:	*bilíh*	'to buy'
	infix:	*-um-*	'AGT'
	verb:	*b-um-ilíh*	'X buys/X bought' (BAS/COM)

Agent focus is also signalled in portmanteau morphemes used to indicate such focuses as participational (PAR), potential (POT), etc. Portmanteau is represented by a diagonal (/) between glosses.

(43)	stem:	*ʔúsap*	'to converse'
	prefix:	*maki-*	'AGT/PAR'
	verb:	*maki-ʔúsap*	'X requests'
	prefix:	*maki-pag-*	'PAR-AGT'
	verb:	*maki-pag-ʔúsap*	'X talks to (SO)'
	stem:	*sámah*	'to join/go along'
	prefix:	*maka-*	'AGT/POT'
	verb:	*maka-sámah*	'X is able to join/go along'

Prefixes can combine to form the so-called HIGHER AFFIXES, which can signal potential causality, intensive action, potential instrumentality, etc.

(44)	stem:	*ʔáral*	'study'
	prefix:	*maka-pag-pa-*	'POT-AGT-CAU'
	verb:	*maka-pag-pa-ʔáral*	'X is able to put (SO) through school'
	stem:	*ʔáral*	'study'
	prefix:	*magpaka-*	'AGT/INT'
	verb:	*magpaka-ʔáral*	'X studies very hard'

stem:	*ʔáral*	'study'
prefix:	*ma-ʔipag-*	'POT-INS'
verb:	*ma-ʔipag-ʔáral*	'able to use X to study'

Inflectional reduplication. Tagalog verbs exhibit reduplication in their continuative and proposed forms. Certain verbs undergo infixation as well as reduplication in their completive and continuative forms. I have grouped verbs together whose reduplication follows the same pattern. The first division is noninfixed (Type 1) versus infixed (Type 2); each of these two categories is further divided as follows:

Noninfixed (Type 1):

(1) Type 1a: verbs whose monosyllabic prefix begins with /ma/, i.e., agent-focus verbs with monosyllabic prefixes and all nonagent, potential focus verbs.

(2) Type 1b: agent-focus verbs with polysyllabic prefixes.

Infixed (Type 2):

(3) Type 2a: verbs which undergo infixation of /-um-/.

(4) Type 2b: verbs which undergo infixation of /-in-/, i.e., all non-/-um-/ verbs whose prefixes do not begin with /ma/.

Examples of these four verb types follow.

(45) Type 1a: /ma/-Initial Prefixes

stem:	*trabáhoh*	'work'
prefix:	*mag-*	'AGT'
verb:	*mag-trabáhoh*	'X works' (BAS)
	nag-trabáhoh	'X worked' (COM)
	nag-ta-trabáhoh	'X is working' (CON)
	mag-ta-trabáhoh	'X will work' (PRO)
stem:	*ʔisdáʔ*	'fish'
prefix:	*maŋ-*	'AGT'
verb:	*maŋ-ʔisdáʔ*	'X fishes'
	naŋ-ʔisdáʔ	'X fished'
	naŋ-ʔi-ʔisdáʔ	'X is fishing'
	maŋ-ʔi-ʔisdáʔ	'X will fish'
stem:	*bigáy*	'to give'
prefix:	*ma-i-pa-*	'POT-OBJ-CAUS'
verb:	*ma-i-pa-bigáy*	'to be able to cause to give X'
	na-i-pa-bigáy	'was able to cause to give X'

na-i-pa-bi-bigáy	'is able to cause to give X'
ma-i-pa-bi-bigáy	'will be able to cause to give X'

(46) Type 1b: Agent Focus with Polysyllabic Prefixes

stem:	*ʔáwit*	'to sing'
prefix:	*magsi-*	'SIM'
verb:	*magsi-ʔáwit*	'X's sing at the same time'
	nagsi-ʔáwit	'X's sang at the same time'
	nagsi-si-ʔáwit	'X's are singing at the same time'
	magsi-si-ʔáwit	'X's will sing at the same time'
stem:	*ʔáral*	'to study'
prefix:	*mag-paka-*	'AGT-INT'
verb:	*mag-paka-ʔáral*	'X studies very hard'
	nag-paka-ʔáral	'X studied very hard'
	nag-pa-paka-ʔáral	'X is studying very hard'
	mag-pa-paka-ʔáral	'X will study very hard'

(47) Type 2a: Verbs Undergoing /-um-/ Infixation

stem:	*bilíh*	'to buy'
infix:	*-um-*	'AGT'
verb:	*b-um-ilíh*	'X buys' (BAS)
	b-um-ilíh	'X bought' (COM)
	b-um-i-bilíh	'X is buying' (CON)
	bi-bilíh	'X will buy' (PRO)
stem:	*grádwet*	'to graduate'
infix:	*-um-*	'AGT'
verb:	*gr-um-ádwet*	'X graduates'
	gr-um-ádwet	'X graduated'
	g-um-a-grádwet	'X is graduating'
	ga-grádwet	'X will graduate'

(48) Type 2b: Verbs Undergoing /-in-/ Infixation

stem:	*pasalámat*	'act of thanksgiving'
prefix:	*ʔipag-*	'OBJ'
verb:	*ʔipag-pasalámat*	'to give thanks for X'
	ʔip-in-ag-pasalámat	'gave thanks for X'
	ʔip-in-ag-pa-pasalámat	'giving thanks for X'
	ʔipag-pa-pasalámat	'will give thanks for X'

stem:	*ʔupóʔ*	'to sit'
affix:	*pa- -in*	'CAUS- -OBJ'
verb:	*pa-ʔupoʔ-ín*	'to cause X to sit'
	p-in-a-ʔupóʔ	'caused X to sit'
	p-in-a-ʔu-ʔupóʔ	'is causing X to sit'
	pa-ʔu-ʔupoʔ-ín	'will cause X to sit'

The patterns of reduplication and infixation exemplified above are summarized below.

(49) Type 1a: Reduplicates the first consonant and the first vowel of the verb stem.

Type 1b: Always reduplicates the second syllable of the prefix.

Type 2a: BASIC/COMPLETIVE: Infixation of /-um-/ occurs after the first onset. (For Type 2a verbs, the basic and completive forms are identical.)
CONTINUATIVE: The first consonant and first vowel of the stem reduplicates and /-um-/ is infixed after the first consonant.
PROPOSED: The first consonant and first vowel of the stem reduplicates.

Type 2b: COMPLETIVE: /-in-/ is infixed after the first onset unless the first onset is a /ʔ/ and part of a prefix, in which case infixation occurs after the second onset.
CONTINUATIVE: The first consonant and first vowel of the stem reduplicates and /-in-/ is infixed under the same conditions as for completive.
PROPOSED: The first consonant and first vowel of the stem reduplicates.

Except for Type 1b verbs (agent-focus with polysyllabic prefixes), continuative and proposed aspects of all verbs involve reduplication of the verb stem, whether simple (a root) or derived (a root + affix(es))[4]. Type 1b verbs will be discussed in section 2.5. Infixation, only affecting completive and continuative forms of Types 2a and 2b, will be dealt with in section 2.4.

[4]The distinction between STEM versus ROOT is important because Tagalog morphology can derive words from a simple root, complex root, or stem. A STEM "... may be simple (a root) or derived (a root plus affix(es)). The term stem applies to the last layer of morphological structure before the application of a particular affix; thus, an affix may be added to a form that has no affix (simple stem or root) or to a form that has one or more affixes (derived stem)." (Buenaventura-Naylor, 1975:77)

2.3 Tagalog reduplicatlon formulated autosegmentally

The basic reduplicating template (BRT). In formulating reduplication autosegmentally, we must specify a language-specific set of association conditions or rules for mapping segments to the C-V template. The association conditions for Tagalog reduplication are based on Marantz (1982:446–47), summarized and modified in (50).[5]

(50) TEMPLATE ASSOCIATION CONDITIONS

1. Consonants can link only with C-slots; vowels can link only with V-slots.
2. Phonemic segments are linked to template slots one-to-one; there can be no multiple attachments. After association, unattached segments or C-V slots are discarded, i.e., are not realized phonetically.
3. Slots in a C-V skeleton may be preattached to distinctive features (language-specific):
   (a) Individual features can act as a screen, only allowing a segment to associate if that segment has that feature.
   (b) In the case where a preattached bundle of features is a preanchored segment in the C-V template (represented by a segment above the template), no other segment can attach to that slot.
4. Association of segments to the C-V template is either phoneme-driven or skeleton-driven, depending on the particular template.

[5]Association Conditions from Marantz are as follows:
Condition A: Unless overridden by a special proviso, feature complexes containing the feature [-syllabic] can be linked only to C slots in the skeleton, and feature complexes containing the feature [+syllabic] can be linked only to V slots in the skeleton.
Condition B: After as many phonemes as possible are linked to C-V slots one-to-one in accordance with other conditions and principles, extra phonemes and C-V slots are discarded. There is no multiple attachment of phonemes to C-V slots or of C-V slots to phonemes.
Condition C: The slots in a C-V skeleton may be preattached to distinctive features. These features take precedence over the features of any phonemes from a phoneme melody which may link to these slots.
Condition Dii: The association of phonemic melodies and C-V reduplicating affixes is phoneme-driven in the sense that, for each phoneme encountered linking from left to right or from right to left, the association procedure scans along the skeleton to find a C-V slot eligible for association with the phoneme under Condition A.

(a) If phoneme-driven, each segment scans along the C-V skeleton until it finds an appropriate slot under Conditions 1 and 3.

(b) If template-driven, each C-V slot in the template scans along the segmental tier until it finds an appropriate segment to attach to, according to Conditions 1 and 3.

A stem-reduplicating template for Tagalog is shown in (51). This template is fairly ubiquitous among the various reduplication processes in Tagalog and for that reason has been called the BASIC REDUPLICATING TEMPLATE (BRT). The BRT is template-driven (4b of 50).

(51) Tagalog BASIC REDUPLICATING TEMPLATE (BRT)

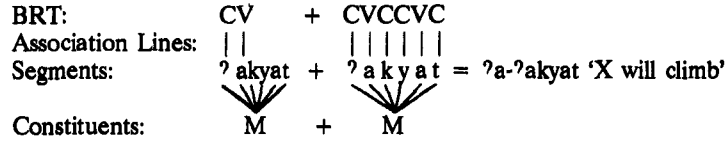
CV + M (where M = stem)

The M of the BRT translates into a series of C-V slots to accommodate the segmental shape of whatever stem is being associated. If the shape of a stem is CVCCVC, as in (52), then the BRT will be realized as CV + CVCCVC.

The stem is the reduplicating morpheme for the BRT. This means that phonemic segments from a stem are mapped to the CV PREFIX, which then attaches to another copy of the same stem as shown below.

(52) Stem (M): ʔakyat 'climb'

BRT: CV + M → CV + CVCCVC



The segments /kyat/ from the first copy of the stem are not phonetically realized because they have no slot on the BRT template to which they can associate.

Proposed forms of Tagalog verbs. Proposed forms of Types 1a, 2a and 2b verbs derive straightforwardly from the stem mapped to the BRT, with prefixes and suffixes of the BASIC form also mapped, unaltered. Infixes do not map; for verbs undergoing /-um-/ infixation, only the stem provides segmental material for association to the template. (P = prefix; M = stem; S = suffix)

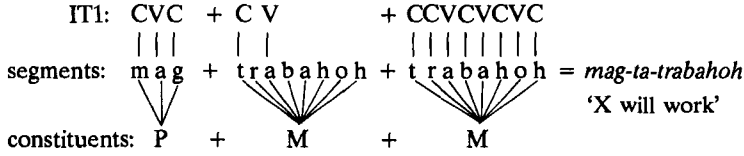
(53) INFLECTIONAL TEMPLATE 1 (IT1)

(P) CV + M (S)

IT1 is just the BRT (51) with provision for a prefix and suffix if they exist in the basic form of the verb. The reference to entire constituents (prefix, stem, suffix) in IT1 means that those constituents will associate unaltered. Just as with M in the BRT above, the P, M, and S in IT1 translate into C-V slots to accommodate the segments provided by the prefix, stem, and suffix. In (54), the P of the template becomes a skeleton comprising CVC to accommodate the segments /mag/ provided by the prefix, /mag-/. Similarly, the M of IT1 becomes CCVCVCVC to accommodate all the segments from /trabáhoh/, the stem. Since there is no suffix in /mag-trabáhoh/ 'X works', no C-V slots are provided in IT1.

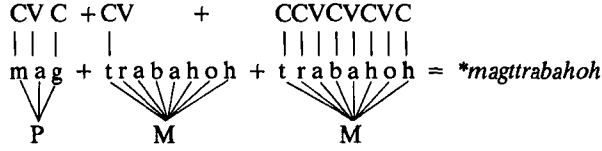
(54) basic form of verb: *mag-trabáhoh* 'X works'

IT1: (P) CV + M (S) → CVC + CV + CCVCVCVC



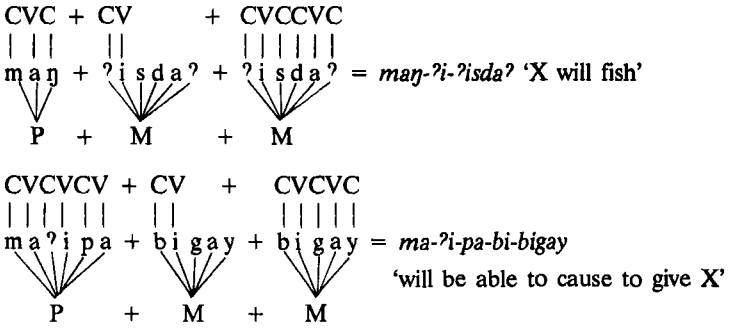
The example above shows clearly why IT1 must be template-driven. A phoneme-driven association means (1) that each segment scans the C-V template for a place to associate, and (2) a particular segment can associate only if the previous segment has already been associated. Such a process applied to reduplication of /trabáhoh/ would result in an incorrect derivation. Under phoneme-driven association, the /r/ in the first /trabáhoh/ cannot find a C-slot in the template and so no succeeding segment can be associated. As a result, only /t/ of the first stem is realized phonetically and /rabahoh/ is discarded.

(55) *IT1 PHONEME-DRIVEN

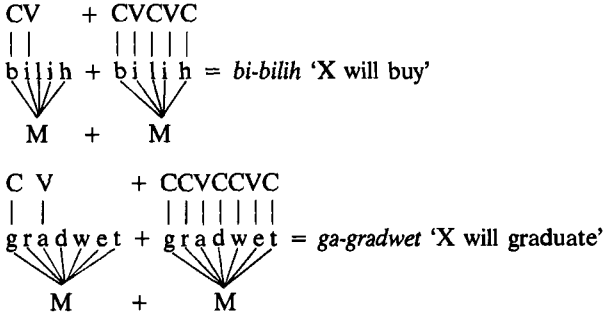


Specifying IT1 as template-driven ensures that the reduplicated syllable strictly consists of the first consonant and the first vowel of the stem, an observation already stated in prose in (49) above. In the case of /trabáhoh/ or any other stem that begins with a consonant cluster, this means that the second consonant will not be phonetically realized, which, in fact, is the realization attested. Other examples of deriving the proposed forms of verbs:

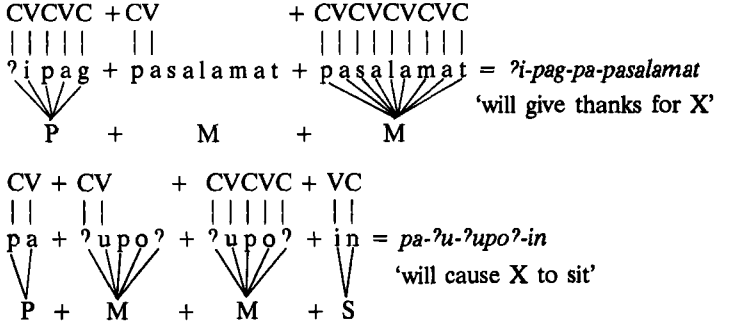
(56) Type 1a: Verbs with /ma(C)-/ prefixes



(57) Type 2a: /-um-/ Verbs



(58) Type 2b: Verbs Undergoing /-in-/ Infixation



Autosegmental theory captures the generalization that all proposed forms of Tagalog verbs except Type 1b exhibit an identical reduplication pattern.

Continuative and compietive aspect of type 1a verbs. As shown above, the proposed form of Type 1a verbs is derived from rri (53) with the

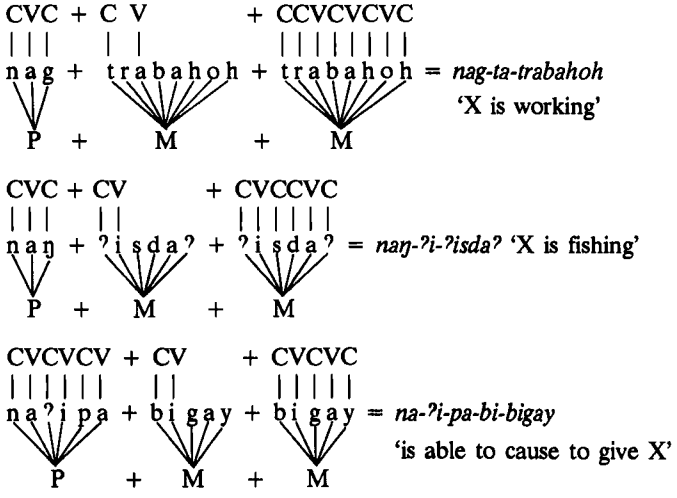
prefix of the basic form mapped unaltered. In a similar way, the continuative form of Type 1a verbs can be derived from the completive form if one first posits a rule to derive the completive prefix from the basic prefix as follows:

(59) /m/ → /n/ /# _[+com]

Thus, for example, *mag-trabáhoh* → *nag-trabáhoh* 'X worked'

Now we can associate the completive prefix of any Type 1a verb, /na(CV)(CVC)(CVC)-/ and the verb stem to IT1 to derive continuative aspect, as illustrated in (60).

(60) IT1: (P) CV R (S)



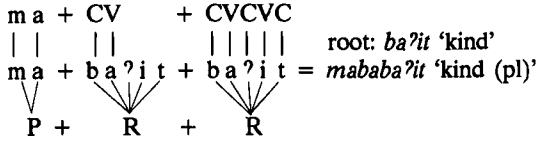
Plural adjectives: more use of the BRT. One type of adjective is formed from an adjective root by prefixing the root with /ma-/. Adjectives used with plural nominals can be easily derived from a template that is just the BRT prefixed with /ma-/. The reduplicating morpheme is the adjective root. Association is template-driven.

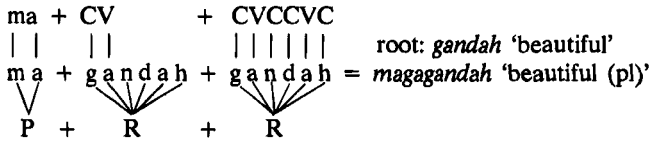
(61) PLURAL ADJECTIVE TEMPLATE

ma + CV + R

For example:

(62)





The BRT must be employed in deriving plural adjectives because only the first consonant and first vowel of the root are phonetically realized, just as with the stems of verbs for proposed tense/aspect.

2.4 Infixation and reduplication

Infixation alone. As mentioned above, the completive form of Type 2a and 2b verbs involves only infixation. In an autosegmental approach, infixation becomes a simple matter of anchoring the segments of the infix to a C-V template. The completive form of Type 2a and 2b verbs in Tagalog presents a classic example of how a C-V template can reduce infixation to a process that is easily understood and produced.

Above, the proposed form of Type 2a and 2b verbs was produced by mapping the verb stem and any prefix or suffix present in the basic form to INFLECTIONAL TEMPLATE 1 (53). The only forms now left to be derived are the completive and continuative forms (note that for /-um-/ verbs, basic and completive forms are identical). As per Condition 3b of the TEMPLATE ASSOCIATION CONDITIONS (50), the relevant infix is anchored to the C-V template. (Anchored material appears above the template to distinguish it from segmental material being associated.) The final phonetic form is produced directly from word-formation, a distinct advantage of the autosegmental approach.

The BASIC/COMPLETIVE /-UM-/ VERB TEMPLATE is phoneme-driven (Condition 4a of 50), unlike the BRT (51) and ITI (53). No /-um-/ verb ever involves prefixes or suffixes, so segmental material is associated to the template from the verb stem alone.

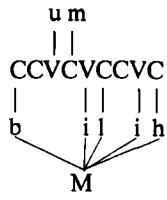
(63) BASIC/COMPLETIVE /-UM-/ VERB TEMPLATE

Anchored infix: u m

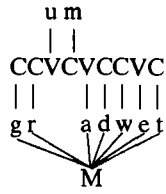
Template: CCVCV(CCVC)$_{n-1}$

Conditions: (a) Association is phoneme-driven.
(b) n = no. of syllables in the stem.

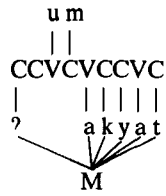
(64)



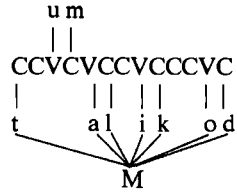
= *b-um-ilih* 'X buys/bought'



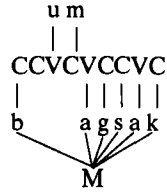
= *gr-um-adwet* 'X graduates/graduated'



= *ʔ-um-akyat* 'X climbs/climbed'



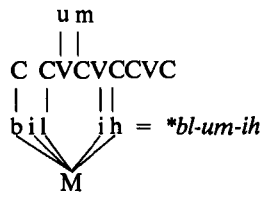
= *t-um-alikod* 'X turns/turned his back to'



= *b-um-agsak* 'X fails/failed'

Comparing the first two examples of (64), we see why the BAS/COM /-um-/ Verb Template must be specified as phoneme-driven. Every segment of a stem mapped to this template is realized phonetically, with /um/ being infixed after the first ONSET, whether it is a single C or a consonant cluster. If association were template-driven, an incorrect derivation would result for /bilíh/ 'buy':

(65)



Type 2a verbs, those which undergo infixation of /-in-/, comprise all verbs which do not have an /ma/-initial prefix and are not infixed with /-um-/. Some typical paradigms are listed in (66).

(66)

stem:	*pasalámat*	'act of thanksgiving'
affix:	*ʔipag-*	'OBJ'
verb:	*ʔipag-pasalámat*	'to give thanks for X' (BAS)
	ʔip-in-ag-pasalámat	'gave thanks for X' (COM)
	ʔip-in-ag-pa-pasalámat	'giving thanks for X' (CON)
	ʔipag-pa-pasalámat	'will give thanks for X' (PRO)
stem:	*ʔíbig*	'love'
affix:	*-in*	'OBJ'
verb:	*ʔibíg-in*	'to love X'
	ʔ-in-íbig	'loved X'
	ʔ-in-i-ʔíbig	'loves X'
	ʔi-ʔibíg-in	'will love X'
stem:	*bigáy*	'give'
prefix:	ʔi-	'OBJ'
verb:	*ʔi-bigáy*	'give X'
	ʔi-b-in-i-gáy	'(SO) gave X'
	ʔi-b-in-i-bigáy	'(SO) is giving X'
	ʔi-bi-bigáy	'(SO) will give X'
stem:	*bilíh*	'to buy'
affix:	*-in*	'OBJ'
verb:	*bilh-ín*	'to buy X'
	b-in-ilíh	'(SO) bought X'
	b-in-i-bilíh	'(SO) is buying X'
	bi-bilh-ín	'(SO) will buy X'
stem:	*ʔáral*	'to study'
affix:	*pag- -an*	'OBJ'
verb:	*pag-ʔarál-an*	'to study X'
	p-in-ag-ʔarál-an	'studied X'

p-in-ag-ʔa-ʔarál-an	'is studying X'
pag-ʔa-ʔarál-an	'will study X'

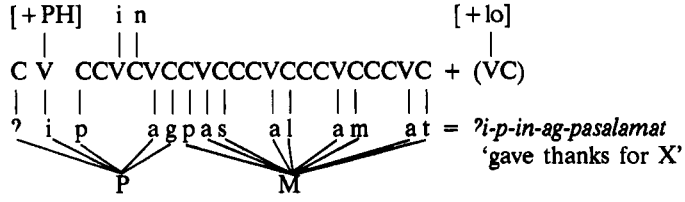
In the completive forms of the verbs of (66), /-in-/ is infixed after the first consonant unless /ʔi/ occurs as all or part of the prefix, in which case the infix bypasses /ʔ/ and attaches after the next consonant. This rule can be incorporated into the C-V template by preattaching the features [+prefix, +high] to the first V, abbreviated [+PH]. As per Condition 3a of the Association Conditions (50), these features [+PH] specify that only /i/ that is part of a prefix can attach to this slot. If the initial /i/ is part of the stem and not a part of the prefix, as in the second example of (66), it must scan along the C-V template to find the next available V-slot.

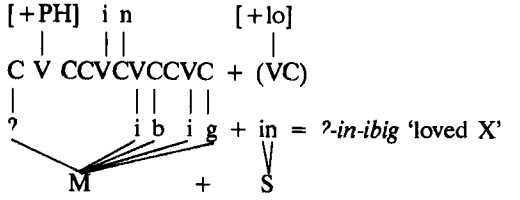
Note that the suffix /-in/ never appears in completive or continuative forms, although the suffix /-an/ always appears. (Compare completive and continuative forms of 66b and 66d versus 66e.) To incorporate this difference into a C-V template, we must first consider the template to be composed of two pieces. The first piece gets its segmental material from (prefix)+stem; the second piece gets its segments from the suffix (if one exists). The feature [+low] can be preattached to the first V of the suffix template to ensure that /-an/ maps but /-in/ does not. That a C-V template does not respect morpheme boundaries is not new; Marantz observes that "well-attested reduplication rules do copy sequences of consonants and vowels from a morpheme which form no constituent of the morpheme" (1982:438). As long as we specify where each skeletal piece gets its segmental material, there is no confusion.

The completive form of /-in-/ infixed verbs can be derived from the template below. Association is phoneme-driven. Segmental material is associated in two pieces: (P)stem + (S).

(67) COMPLETIVE TEMPLATE FOR /-IN-/ INFIXATION

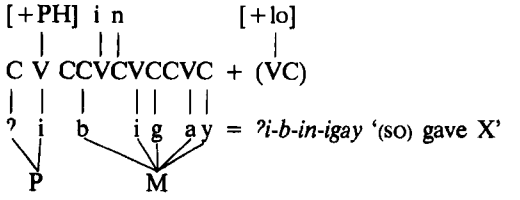
Conditions: (a) Association is phoneme-driven
(b) n = no. of syllables in the stem

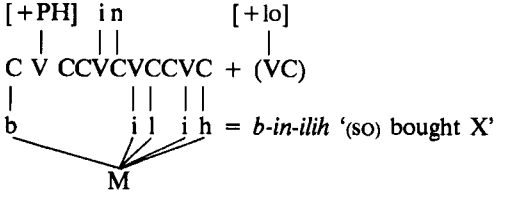


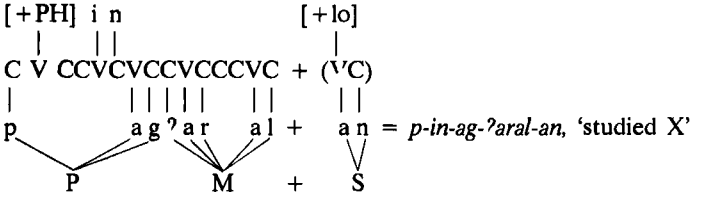


Note how the first /i/ of the stem /ʔibig/ cannot associate to the V-slot with preattached [+prefix, +high] and so scans until it finds the third V of the template. Similarly, the /i/ of the suffix cannot associate because of the preattached [+lo].

(68)







Verbs undergoing infixation of /-um-/ and /-in-/ share an important common feature that allows two templates to be collapsed into one. Infixation has been presented as association of a noninfixed form to a C-V template with the infix preattached. The completive forms of verbs infixed with /-um-/ and /-in-/ can be derived from the same template if certain conditions are specified.

Note that the BASIC/COMPLETIVE TEMPLATE FOR /-UM-/ VERBS (63) can be considered a simplified version of the INFLECTIONAL TEMPLATE FOR /-IN-/ INFIXATION (67) if the segments /um/ replace the segments /in/ in the latter.

(69) [+PH] u m [+lo]
| | | |
C V CCVCV(CCVC)$_{n-1}$ + (VC)

Since /-um-/ verbs never involve prefixes or suffixes, the first consonant and first vowel with [+P] feature attached and the final (VC) are superfluous, and the formula of (69) reduces to (63).

(70) [+P] u m [+lo] um
| | | | | |
C V CCVCV(CCVC)$_{n-1}$ + (VC) → CCVCV(CCVC)$_{n-1}$

To capture the generalization that the completive aspect of all infixed Tagalog verbs can derive from the same template, however, (63) and (67) can be combined, using asterisks (*) to denote an anchored feature—in this case, either /um/ or /in/—depending on which infixation process is involved.

(71) INFLECTIONAL TEMPLATE 2 (IT2): COMPLETIVE INFIXED

[+PH] * * [+lo]
| | | |
C V CCVCV(CCVC)$_{n-1}$ + (VC)

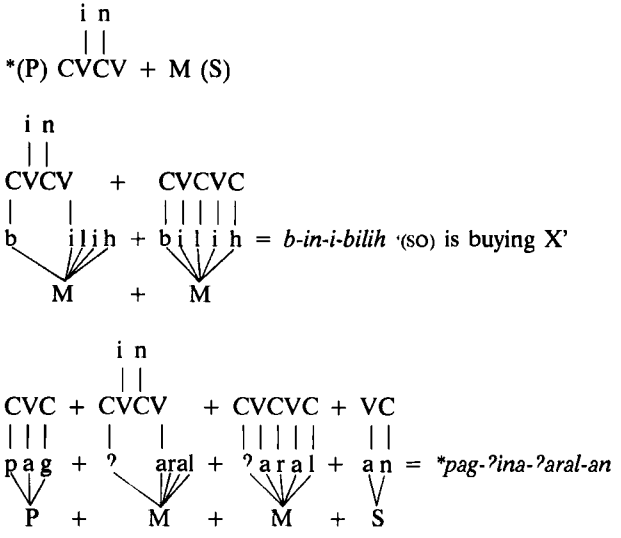
Conditions: (a) Association is phoneme-driven
(b) n = no. of syllables in the stem
(c) * * = /um/ or /in/ depending on the infixation to be derived.

Infixation and reduplication. The continuative form of infixed verbs (Type 2a and 2b) involve both infixation and reduplication, raising the question of how these two processes interact. Consider two continuative /-in-/ verbs:

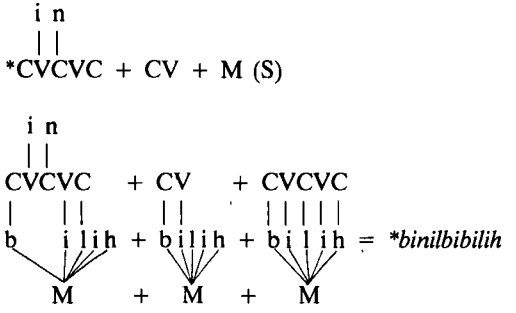
(72)	stem:	*bilíh*	'to buy'
	affix:	*-in*	'OBJ'
	verb:	*bilh-ín*	'to buy X'
		b-in-i-bilíh	'(SO) is buying X'
	stem:	*ʔáral*	'to study'
	affix:	*pag- -an*	'OBJ'
	verb:	*pag-ʔarál-an*	'to study X'
		p-in-ag-ʔa-ʔarál-an	'is studying X'

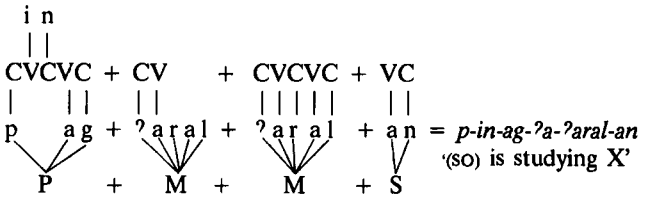
Verbs infixed with /-in-/ present a special problem because /-in-/ occurs within the reduplicated syllable of the stem in the first example of (72) but within the (nonreduplicated) prefix in the second example. To show that the reduplication in these examples is of the same type is problematic if one tries to derive both forms from only one C-V template. If we try, we get incorrect results for one or the other.

(73a) *TRIAL 1 /-IN-/ CONTINUATIVE TEMPLATE:



(73b) *TRIAL 2 /-IN-/ CONTINUATIVE TEMPLATE:





Reduplication before infixation. In analyzing Tagalog reduplication, Carrier (1979) does not make use of C-V templates associated autosegmentally, but instead formulates reduplication as transformational rules. Reduplication rules are considered "a kind of readjustment rule" (Carrier 1979:48) and not word-formation rules. Instead, they "belong to a subcomponent of the lexicon which until now has been unrecognized" (Carrier 1979:2). Carrier further claims that reduplication must apply after affixation and other allomorphy or word-formation rules, but before phonological rules. Realizing that a word-formation rule "cannot be written as a single rule that simultaneously affixes and reduplicates" (1979:48), Carrier separates affixation/infixation from reduplication.

Carrier recognizes the problem noted above (2.4) with respect to rule ordering between reduplication and infixation. She says: "Aspectual reduplication can be formulated simply only if infixes are prefixes at the time it applies" (1979:52). To preserve a simple formulation of reduplication as a transformation and to properly derive infixed verbs, Carrier considers /-in-/ and /-um-/ to actually be prefixes. She claims that infixes in all languages are originally attached as prefixes and then moved to their proper place via a metathesis rule (1979:52). No empirical evidence or reaction of native speakers known to this author validates this claim, whereas there appears to be empirical evidence validating the psychological reality of infixes (4.3).

The proposed and continuative forms of infixed verbs are very similar. We have seen how the proposed form of infixed verbs is derived from INFLECTIONAL TEMPLATE 1 (57, 58). Now I suggest that the continuative form is produced by mapping segmental material first through INFLECTIONAL TEMPLATE 1 and then through INFLECTIONAL TEMPLATE 2 (69). If the input to INFLECTIONAL TEMPLATE 2 is the proposed form, the continuative form will be the output. I thus propose that reduplication precedes infixation in Tagalog verb inflection.

With this proposal, inflection for continuative Tagalog verbs which undergo infixation can now be formalized as in (74).

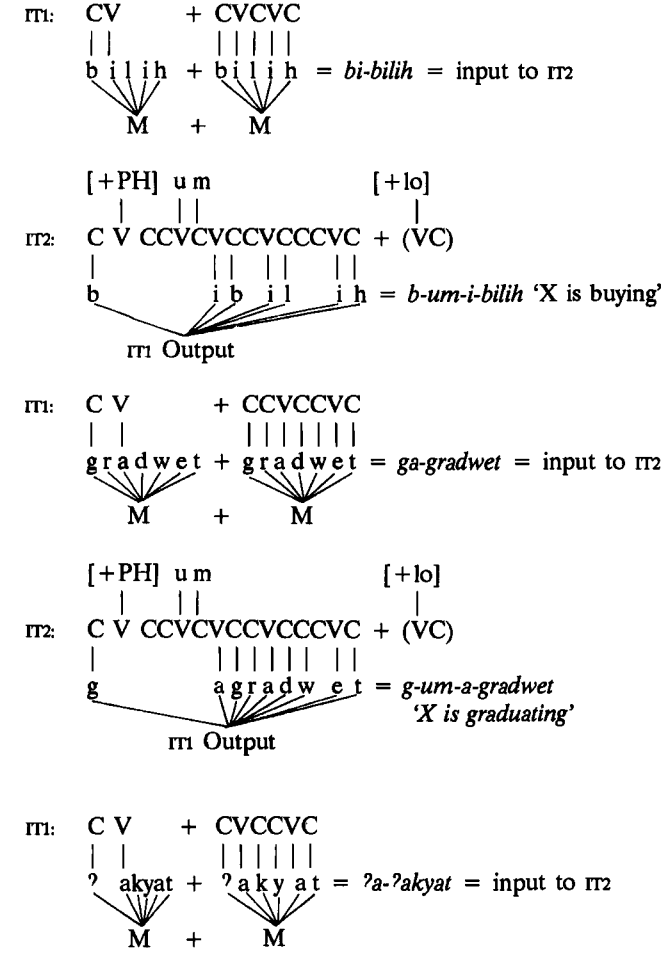
(74) Continuative Infixed Tagalog Verb Formation:

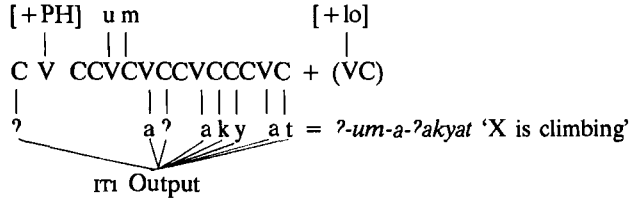
(a) Map segments of the stem to INFLECTIONAL TEMPLATE 1.

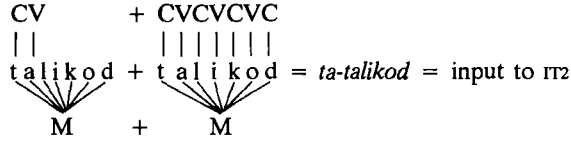
(b) Map the output of IT1 to INFLECTIONAL TEMPLATE 2.

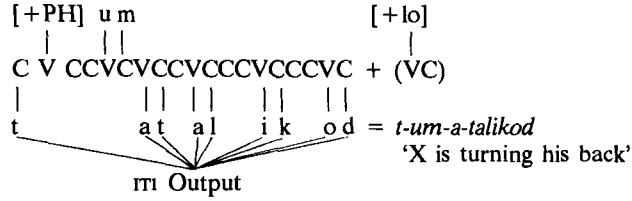
Below are examples of how /-um-/ and /-in-/ verbs are derived by taking the output of IT1 and mapping it to IT2. Reduplication and infixation are separated as processes and, through an autosegmental approach, receive a simple analysis impossible in a structural approach and superior to transformational rules.

(75) Examples of Continuative /-um-/ Verb Formation:

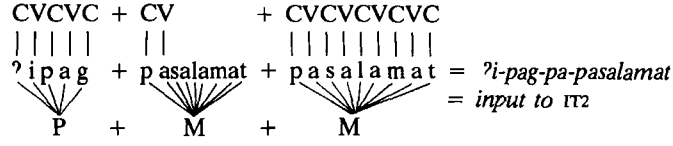


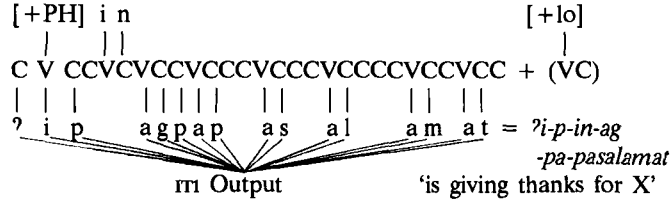


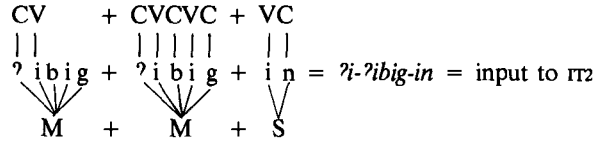


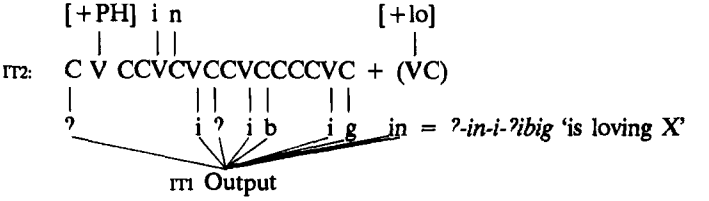


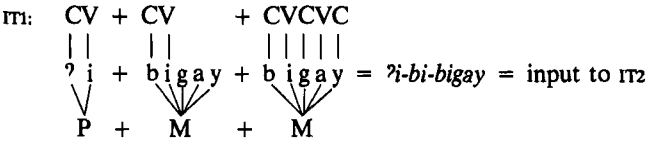
(76) Examples of Continuative /-in-/ Verb Formation:

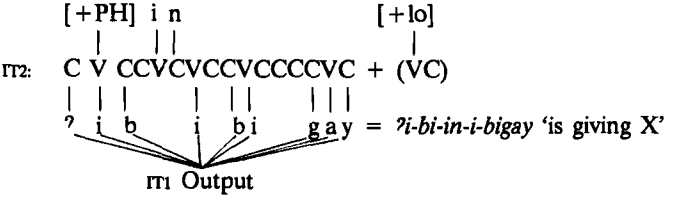


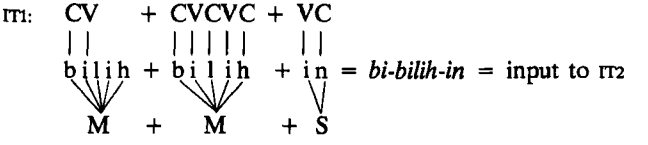


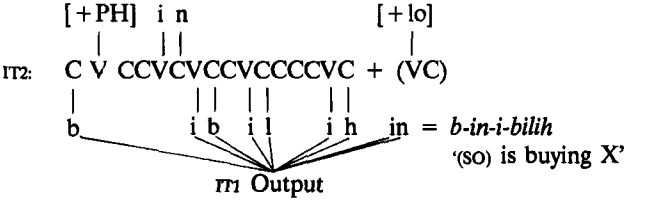


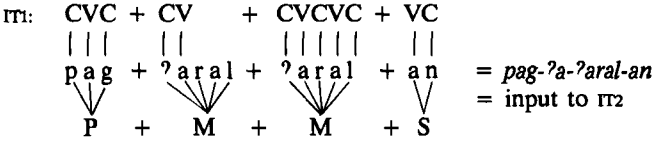

[+PH] i n
[+lo]
IT2: C V CCVCVCCVCCCCVC + (VC)
? i ? i b i g in = ?-in-i-?ibig 'is loving X'
IT1 Output

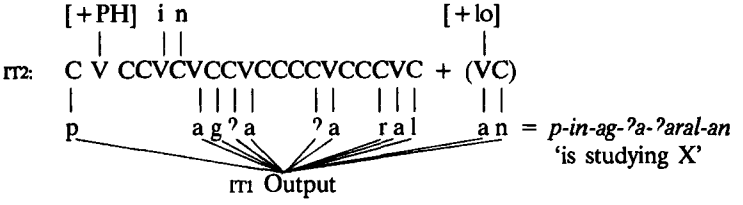

IT1: CV + CV + CVCVC
? i + b i g a y + b i g a y = ?i-bi-bigay = input to IT2
P + M + M


[+PH] i n
[+lo]
IT2: C V CCVCVCCVCCCCVC + (VC)
? i b i bi gay = ?i-bi-in-i-bigay 'is giving X'
IT1 Output


IT1: CV + CVCVC + VC
b i l i h + b i l i h + i n = bi-bilih-in = input to IT2
M + M + S

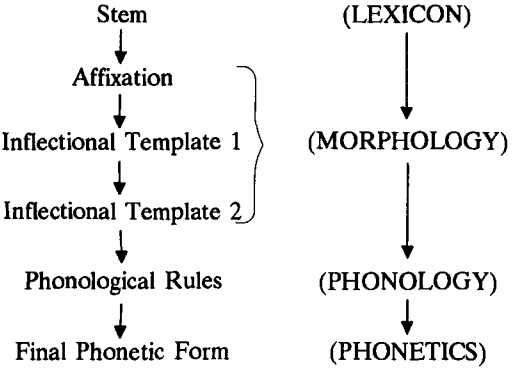

[+PH] i n
[+lo]
IT2: C V CCVCVCCVCCCCVC + (VC)
b i b i l i h in = b-in-i-bilih
'(SO) is buying X'
IT1 Output


IT1: CVC + CV + CVCVC + VC
p a g + ? a r a l + ? a r a l + a n = pag-?a-?aral-an
= input to IT2
P + M + M + S



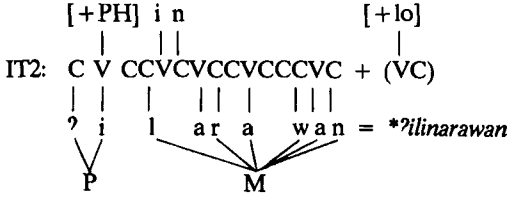
As autosegmental processes, reduplication and infixation are part of the morphological component. Within the morphological component, derivational affixation (i.e., prefixation and suffixation only) occurs first, followed by reduplication, followed by infixation. Infixation in Tagalog is an inflectional process; affixation is derivational. It is not surprising that these two processes occur at different steps, though infixes are usually considered a type of affix. Building a continuative infixed verb can thus be diagrammed as follows:

(77) Tagalog Continuative Infixed Verb Formation Schema



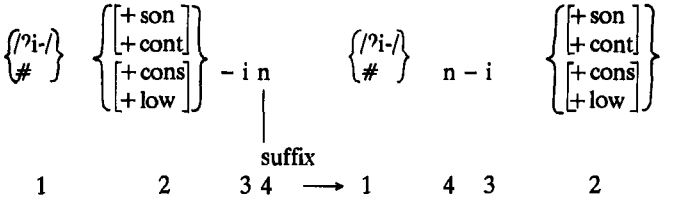
/l y r h ?/-initial stems. There is an apparent problem with IT2 for verb stems which begin with an /l y r h ?/. Consider the stem /laráwan/ 'picture'. The completive form of the verb /?i-laráwan/ 'to describe X' is /?i-ni-laráwan/ 'described X'. /?i-laráwan/ mapped to IT2 produces an incorrect form:

(78)



Rather than abandon RT2 or resort to a special template for stems beginning with /l y r h ʔ/, we can posit a phonological rule whereby a metathesis occurs between the initial segment and the first /n/ in forms generated after reduplication.

(79) METATHESIS RULE for /l y r h ʔ/ -initial stems (MR)

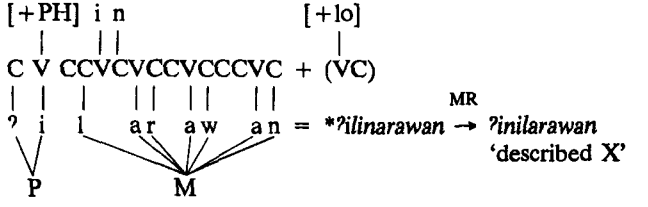


That is, /l y r h ʔ/ and /n/ metathesize when they occur with an /i/ between them as the result of /-in-/ infixation either after the prefix /ʔi-/ or word-initially.

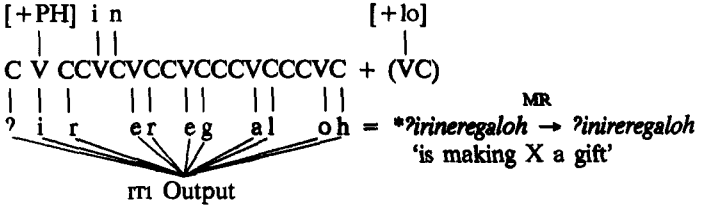
This metathesis rule applies after passage through RT2 (71) which occurs in producing both the completive and continuative forms.

(80) Application of METATHESIS RULE (MR)

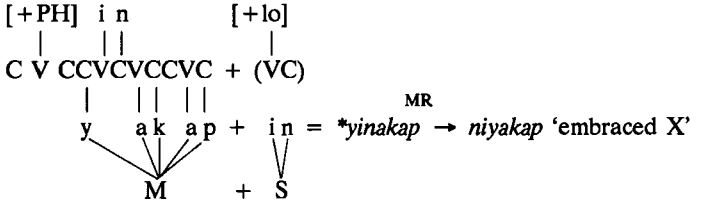
stem: *laráwan* 'picture
prefix: *ʔi-* 'OBJ'
verb: *ʔi-laráwan* 'to describe X'



Output from RT1: *ʔi-re-regáloh* 'will make X a gift'
Mapping to RT2:



stem: *yákap* 'embrace'
suffix: *-in* 'OBJ'
verb: *yakápin* 'embraces X'



Now stems beginning with /l y r h ʔ/ can also utilize RT1 and RT2 and present no exception.

2.5 Agent focus with polysyllabic prefixes

Agent-focus verbs with polysyllabic prefixes were exempted from the discussion of reduplication in 2.2 because the reduplicating morpheme in these cases is not the verb stem, but is part of the complex prefix. Allen (1977) reports that Kankanaey, another Philippine language, exhibits a parallel pair of reduplication types.

> In reduplication involving a prefixed or infixed root, only the root is reduplicated; the affix is not affected. Stem reduplication, on the other hand, seems to be more phonologically motivated (although it does carry lexical content), inasmuch as it crosses morpheme boundaries, affecting both affix and root. (1977:281)

In Tagalog agent-focus verbs with complex prefixes, it is the second syllable of the prefix that reduplicates; the verb stem is not involved in reduplication at all. The inflection from basic to past tense is the same for all agent-focus verbs, aas indicated in (59), namely, /m/ → /n/ iff # _ [+com], so we will only concern ourselves here with formulating the reduplication from basic to proposed aspect. Two paradigms will suffice for examples. (81)

(81a) Paradigm: /ʔúsap/

stem:	*ʔúsap*	'to converse'
refix:	*maki-pag-*	'PAR-AGT'
bas:	*maki-pag-ʔúsap*	'X talks to (SO)' (BAS)
pro:	*maki-ki-pag-ʔúsap*	'X will talk to (SO)' (PRO)
prefix:	*maki-*	'AGT'
bas:	*maki-ʔúsap*	'X requests'
pro:	*maki-ki-ʔúsap*	'X will request'

(81b) Paradigm:	/trabáhoh/	
stem:	*trabáhoh*	'work'
prefix:	*mag-pa*	'AGT-CAU'
bas:	*mag-pa-trabáhoh*	'X causes (SO) to work'
pro:	*mag-pa-pa-trabáhoh*	'X will cause (SO) to work'
prefix:	*maka-*	'AGT+POT'
bas:	*maka-pag-trabáhoh*	'X able to work'
pro:	*maka-ka-pag-trabáhoh*	'X will be able to work'
prefix:	*mag-paka-*	'AGT-INT'
bas:	*mag-paka-trabáhoh*	'X works very hard'
pro:	*mag-pa-paka-trabáhoh*	'X will work very hard'
prefix:	*magsi-pag-*	'MUL-AGT'
bas:	*magsi-pag-trabáhoh*	'X's work together'
pro:	*magsi-si-pag-trabáhoh*	'X's will work together

The question of what constitutes the reduplicating morpheme at first appears to depend on how one parses the morphemes in a complex prefix. As will be seen below, an autosegmental solution based on a syllable template avoids the controversy of prefix-parsing and still captures the generalization that for all agent-focus verbs (mono- and polysyllabic), it is the second syllable that reduplicates, regardless of which morpheme contains that syllable.

The one-syllable, one-morpheme solution. Carrier (1979) formulates word formation as the cyclical process utilized in lexical phonology (Mohanan 1982:4). In this interpretation words are built by cyclically adding affixes to stems in an onion-like fashion, from the innermost brackets outward. Carrier (1979:295ff) thus represents verbs in Tagalog as a series of bracketed formatives with the verbal stem occupying the innermost set of brackets:

(82) [ma[ka[kita?]]]
V' V V V V V'
Derivation: *kita?* → *kakita?* → *makakita?* 'X sees'

A V' affix is distinguished from other stems or affixes in two ways: (1) it is a TOPIC-MARKING AFFIX (Carrier 1979:211), signaling the focus of a verb, and (2) the V' stem is a complete word that occurs in sentences. Carrier formulates reduplication as an adjustment transformation triggered by the presence of V' to the left of the reduplicating morpheme, as follows: starting with the innermost bracket, the verbal stem, one successively adds

(83) [ma[ka[kita?]]]
V' V V V V V'

stem: *kita?* 'see' →
kakita? →
makakita? →
maka-ka-kita? 'X will see'

Carrier also discusses the problem of agent-focus verbs with polysyllabic prefixes. She recognizes that the reduplication of verbs prefixed with /maka-/ is different from that of verbs prefixed with /ma-/ (1979:310). In order for the form /maka-ka-kita?/ to be derived from a formulation like (83) there must be a V' to the left of the reduplicated syllable /ka/. This bracketing convention forces Carrier to consider each syllable to be a separate morpheme; i.e., the prefix /maka-/ is actually the bimorphemic /ma-ka-/. The evidence she presents (1979:299) is that /ma-ka-/ and /ma-/ are part of the same paradigm of agent and object focus, respectively, for POT focus.

(84)

ma-ka-kita?	*ma-kita?*
'see, AGT-POT'	'see, OBJ+POT'
ma-ka-rinig	*ma-rinig*
'hear, AGT-POT'	'hear, OBJ+POT'

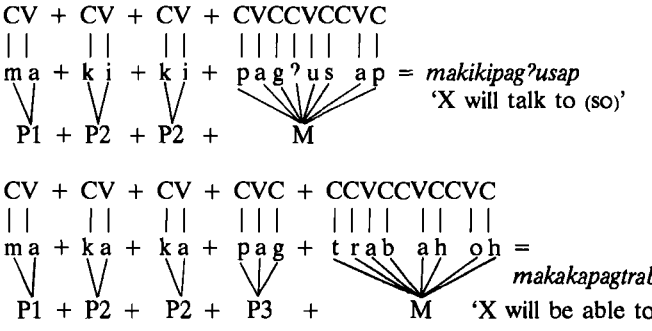
She argues by extension from this paradigm that in all other polysyllabic prefixes, each syllable represents one morpheme. Prefixes such as /mag-si-/ 'AGT^MUL' and /ma-ki-/ 'AGT^PAR' are two examples. While the evidence Carrier presents may be a basis for saying that /maka-/ is actually /ma-ka-/, the evidence for prefixes like /mag-si-/ and /ma-ki-/ being bimorphemic is much less convincing. Unlike /ka-/, /si-/, and /ki-/ never appear separately from /ma-/ as a clearly identifiable single morpheme combining with other morphemes to produce a complex prefix. Even in arguing for the bimorphemic /ma-ka-/, Carrier's case is weakened by the overlap between affixes and focuses discussed in 2.1. /ma-/ is a classic example of one affix which signals several meanings, as shown below.

(85)

ma-	'AGT'
ma-túlog	'X sleeps'
ma-?upó?	'X sits'
ma-	'OBJ^POT'
ma-kíta?	'able to see X'
ma-diníg	'able to hear X'

The problem of polysyllabic prefixes is certainly a simple case for a C-V template if, as Carrier claims, each syllable in the prefix is a separate morpheme. The second morpheme in the agglutinating string of prefixes is the reduplicating morpheme and the template looks very much like Inflectional Template 1 (53). (P1 = first prefix morpheme, P2 = second prefix morpheme, etc.) The template would be phoneme-driven.

(86) P1 + CV + P2 (P3) (P4) M



The simplicity of this one-syllable, one-morpheme solution is highly appealing. But the assumption that all prefixes in Tagalog can be broken down into monosyllabic formatives is very questionable. Convenience is not a valid reason to adopt the above solution.

A syllable-counting template. AGT-focus verbs with monosyllabic prefixes have already been accounted for in Inflectional Template 1 (53). It is worth noting here, however, that all agent-focus verbs share a common feature: in the final string produced (the word), it is the second syllable of the string which reduplicates. Consider the proposed forms of the following verbs.

(87)	*mag-ta-trabáhoh*	'X will work'
	maka-ka-pag-trabáhoh	'X will be able to work'
	mag-pa-pa-trabáhoh	'X will cause (so) to work'
	maka-ka-pag-pa-trabáhoh	'X will be able to cause (so) to work'
	mag-pa-paka-trabáhoh	'X will work very hard'
	mag-ʔuʔúsap	'X's will converse'
	maka-ka-pag-ʔúsap	'X's will be able to converse'
	maki-ki-pag-ʔúsap	'X will be able to talk to (so)'
	maki-ki-ʔúsap	'X will be able to request'

The reduplication pattern for deriving proposed and continuative aspect of all agent-focus verbs in Tagalog can be stated in prose:

(88) Proposed tense in agent-focus verbs is derived from the basic form by reduplicating the second syllable. Continuative tense is derived from the completive tense by reduplicating the second syllable.

This rule seems simple enough, assuming one can identify the second syllable of a word. This is the rule taught to students learning Tagalog as a second language (Trick and Trick 1985).

Any good solution should capture the generalization in (88). Two possibilities will be considered, both of which assume that the template incorporates information about the number of syllables in the basic form of the verb.

Reduplicating morpheme: the basic verb. First, the entire verb (basic form) will be considered to be the reduplicating morpheme. As per Condition D(i) of Marantz (1981:447) (see footnote 5), association proceeds from left to right if it is a prefix and from right to left if it is a suffix. We can propose that the first part of the C-V skeleton is a prefix (left-to-right association) and the second part a suffix (right-to-left association).

Note that because we have formally defined the Tagalog syllable and the process of syllabification (Chapter 1), we can refer to the syllable σ as a unit in a template.

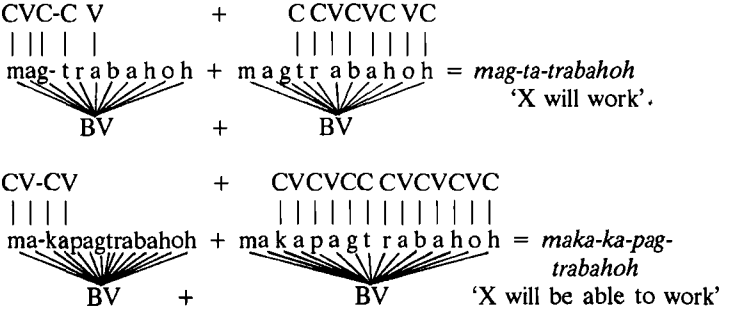
(89) PREFIX-SUFFIX BIDIRECTIONAL AGENT-FOCUS TEMPLATE

σ-CV + σ_{n-1}

Conditions: (a) n = no. of syllables in basic verb.
(b) Association is template-driven.

Each σ converts to the exact CV shape of the syllable being associated to it. Association to the PREFIX-SUFFIX BIDIRECTIONAL TEMPLATE above would proceed as follows, where BV = basic verb.

(90)



The biggest flaw in this analysis is that Tagalog makes extensive use of stems as the reduplicating morpheme. With the solution above, we must believe there is a reality to an entire verb serving as the reduplicating morpheme, an idiosyncratic pattern that has no parallel in any other reduplication pattern in the language.

Reduplicating morpheme: the second syllable. The final possibility we will consider involves a modified syllable template whereby the second syllable of the basic verb is marked for reduplication regardless of whether that syllable is part of the prefix or part of the stem. The syllable template only defines the C-V shape of the second syllable, which must be strictly composed of one consonant and one vowel, CV. Association is template-driven.

(91) INFLECTIONAL TEMPLATE 3 (IT3): AGENT-FOCUS SYLLABLE TEMPLATE

$\sigma_1 + CV + \sigma_2 + \ldots + (\sigma)_{n-2}$

Conditions: (a) n = no. of syllables in the basic verb

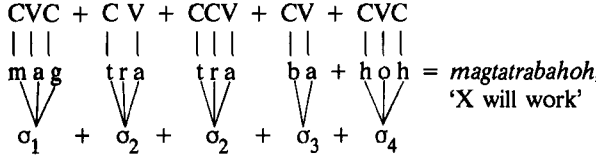
(b) Association is template-driven.

Again, the syllable template in (91) becomes a C-V template by having each syllable convert to the exact shape of the syllables being mapped from the segmental level. The purpose of expressing IT3 as a syllable template is to identify the second syllable of a string as the reduplicating morpheme, which maps to CV. That is, the second syllable of a string will only reduplicate its first consonant and first vowel, regardless of its actual shape, while every other syllable maps unaltered.

(92) IT3: $\sigma_1 + CV + \sigma_2 + \ldots + (\sigma)_{n-2}$

For the verb /mag.tra.ba.hoh/,

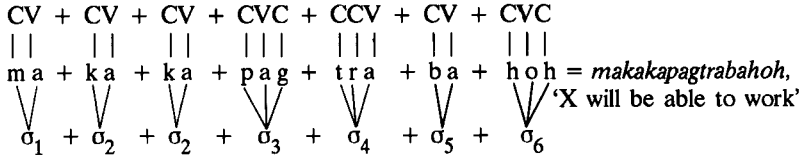
IT3 → CVC + CV + CCV + CV + CVC



magtatrabahoh, 'X will work'

For the verb /ma.ka.pag.tra.ba.hoh/:

IT3 → CV + CV + CV + CVC + CCV + CV + CVC



This analysis has the advantage of reflecting the generalization in (88) while avoiding the controversy of how to divide prefixes into formatives.

Other uses of syllable templates. Some adjectives are derived by reduplicating the first two syllables of a simple root and prefixing the new stem with /ka-/.

(93)	root:	*taŋgap*	'to receive'
	adj:	*ka-taŋgap-taŋgap*	'acceptable'
	root:	*wilih*	'interested'
	adj:	*ka-wilih-wilih*	'interesting'
	root:	*panabik*	'excitement'
	adj:	*ka-pana-panabik*	'exciting'
	root:	*rimarim*	'loathe'
	adj:	*ka-rima-rimarim*	'loathsome'

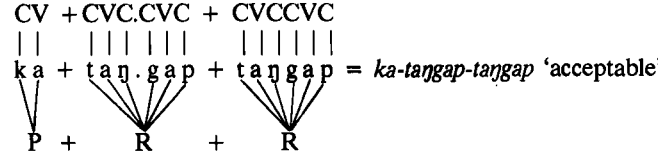
These adjectives can easily be derived with a syllable template where the first two syllables of the root are copied.

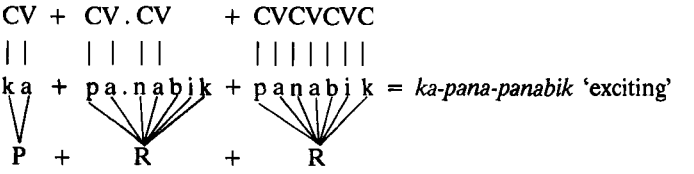
(94) /ka-/ ADJECTIVE TEMPLATE

ka + $\sigma_1\sigma_2$ + R, template-driven

Unlike IT3 above, the /ka-/ ADJECTIVE TEMPLATE maps syllables unaltered. The adjective root is the reduplicating morpheme, providing syllables (in segmental form) to be associated to the template. Note that it makes no sense to consider the /ka-/ ADJECTIVE TEMPLATE to be phoneme-driven since the syllable is the smallest prosodic unit of this template.

(95) ka + $\sigma_1\sigma_2$ + R → CV + CVC.CVC + CVCCVC





The case of /maka-/: archaic versus modern forms. Agent-focus potential verbs have two possible reduplicated forms, as shown in (96).[6]

(96)

Formal/Archaic	Conversational/Modern
maka-ki-kita?	*maka-ka-kita?*
maka-pag-ta-trabahoh	*maka-ka-pag-trabahoh*

To retain the convention that a V' triggers reduplication, Carrier derives these alternate forms by proposing that "an optional boundary adjustment allows /ma-ka-/ to be analyzed as one morpheme" (1979:302). The equivalent of (82) for the formal/archaic forms would be as in (97) (Carrier 1979:301).

(97) [ma-ka[kita?]]
V' V V V'

Derivation: *kita?* →
maka-kita? →
maka-ki-kita? 'X will see (archaic)'

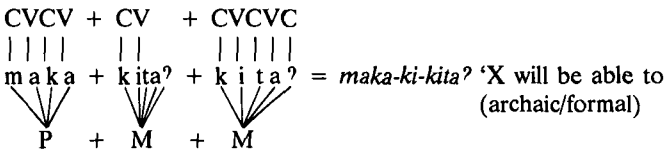
The use of C-V templates avoids the difficulty of having to explain why the potential prefix has a structure /maka-/ in one form and /ma-ka-/ in another. Rather, we can generate the dual forms in (96) by having verbs map to either INFLECTIONAL TEMPLATE 1 (53) or INFLECTIONAL TEMPLATE 3 (91). If a verb maps to IT1, the verb stem will reduplicate. If a verb maps to IT3, the second syllable of the basic verb form will reduplicate.

[6]According to one individual, the Philippine Institute of National Language considers reduplication of the root to be the FORMALLY CORRECT form of potential agent-focus paradigms, i.e., verbs prefixed with /maka-/ (Ventura, n.d.). A typical paradigm would look like:

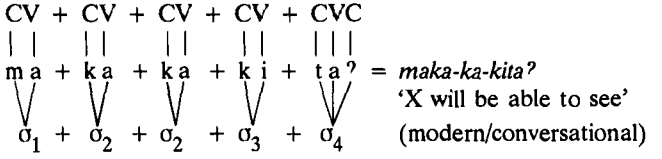
maka-kíta?	'X able to see' (BAS)
naka-kíta?	'X was able to see' (COM)
naka-ki-kíta?	'X is able to see' (CON)
maka-ki-kíta?	'X will be able to see' (PRO)

But the modern, conversational form of such verbs always involves reduplication of the second syllable, /ka/. The more formal form above is associated with an archaic style.

(98) ITI: (P) CV + M (S)



IT3: σ_1 + CV + σ_2 + ... + $(\sigma)_{n-2}$

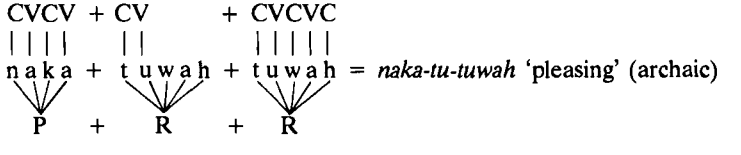


The parallel case of /naka-/ adjectives: archaic vs. modern. Adjectives prefixed with /naka-/ also exist in modern and archaic forms.

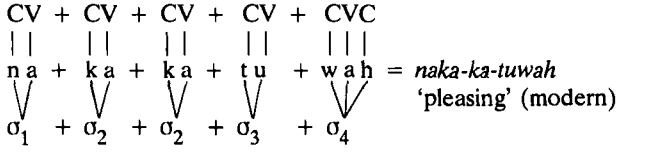
(99)	ROOT	ARCHAIC	MODERN	GLOSS
	tuwáh	*naka-tu-tuwáh*	*naka-ka-tuwáh*	'pleasing'
	?inís	*naka-?i-?inís*	*naka-ka-?inís*	'irritating'
	táwah	*naka-ta-tawáh*	*naka-ka-tawáh*	'funny'

If the prefix /naka-/ plus adjective root is mapped to IT1, the formal form is obtained; if mapped to IT3, the modern form is obtained. Since adjectives are always derived from a root, the M (stem) in IT1 and IT3 can be replaced by R (root), remembering that a root is a simple stem (see foonote 4).

(100) IT1: (P) CV + M (S) → (P) CV + R + S



IT3: σ_1 + CV + σ_2 + ... + $(\sigma)_{n-2}$



Summary of Tagalog inflectional reduplication

An autosegmental formulation of reduplication and infixation captures the relationships between the four tense-aspects (basic, completive, continuative, proposed). One can generate all four tense-aspects by associating certain forms with certain C-V templates. These formulas are summarized below.

(101) Table 1: Tagalog Inflectional Reduplication, Formulaic

VERB TYPE	FORMULA	RESULTING FORM
Type 1a: /ma/-initial prefix	BAS + IT1	Proposed
	COM + IT1	Continuative
Type 1b: AGT with poly-syllabic prefix	BAS + IT1	Proposed (formal)
	COM + IT1	Continuative (formal)
	BAS + IT3	Proposed (modern)
	COM + IT3	Continuative (modern)
Type 2a: /-um-/-infixed	BAS + IT1	Proposed
	STEM + IT2	Basic/Completive
	PRO + IT2	Continuative
Type 2b: /-in-/ infixed	BAS + IT1	Proposed
	BAS + IT2	Completive
	PRO + IT2	Continuative

An alternate summary of this same information shows how each template IT1, IT2, and IT3, are used with various verb types to produce various inflections of that type. (for = formal; mod = modern)

(102) Table 2: Tagalog Inflectional Reduplication

	IT1		IT3	
	+Bas	+Com	+Bas	+Com
Type 1a:	PRO	CON	—	—
Type 1b:	PRO (for)	CON (for)	PRO (mod)	CON (mod)

	IT1	IT2	
	+Bas	+Bas	+Pro
Type 2a:	PRO	BAS/COM	CON
Type 2b:	PRO	COM	CON

Thus in three templates, the inflectional processes of all Tagalog verbs can be described, including that of archaic forms.

2.6 Other ambiguities resolved by template reduplication

Reduplication derived from C-V templates has the added advantage of resolving several ambiguities regarding syllable structure and the status of certain segments.

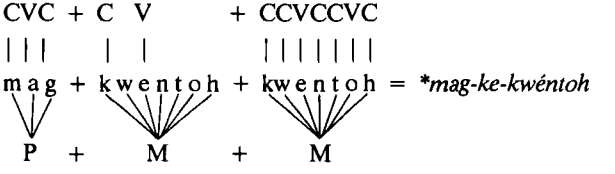
Semivowels do not form complex onsets. There has been some disagreement in the literature as to which consonant clusters are allowable as onsets. Part of the controversy may be a result of alternate spellings in Tagalog for syllables with a semivowel as a potential second member of a consonant cluster. Note that these examples are borrowings from Spanish; no indigenous roots exhibit these patterns.

(103) *espirituwal/espiritwal* 'spiritual' (Sp. *espiritual*)
eskuwela/eskwela 'school' (Sp. *escuela*)

Ramos (1971) and Soberano (1980) list /y/ and /w/ as second members of a consonant cluster onset, with stops as the only possible first member. But in Chapter 1, the Tagalog syllable was formalized in such a way as to disallow the semivowels /y w/ in this position. Reduplication phenomena suggest that this analysis is correct.

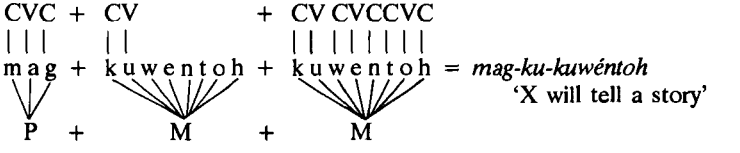
For example, /mag-kuwéntoh/ 'X tells a story' would be transcribed as /mag-kwéntoh/ if /kw/ were a permissible onset. In such a case, reduplication would occur, according to INFLECTIONAL TEMPLATE NO. 1 (53), as in (104). Note that /w/ as a consonant must be bypassed by a V-slot in the template since consonants can link only with C-slots and vowels can link only with V-slots according to Condition 1 of the ASSOCIATION CONDITIONS (50).

(104) ITI: (P) + CV + M, template-driven



In fact, /kuwéntoh/ is the most viable underlying representation.

(105)



A similar argument can be made for /y/ as the second member of a cluster. Consider /ma-tiyák/ 'able to be sure of X'. If this were transcribed as /matyak/, an ungrammatical form is obtained in reduplication.

(106) CV + C V + CCVC

m a + t y a k + t y a k = **ma-ta-tyak*

P + M + M

The correct reduplication is:

(107) CV + CV + CVCVC

m a + t i y a k + t i y a k = *ma-ti-tiyak*

'will be able to be sure of X'

P + M + M

Linguists may have initially considered the possibility of /y w/ as second members of a consonant cluster because of the phonetic realization. In normal or fast speech, any consonant followed by /iy/ can become palatalized and any consonant followed by /uw/ labialized. /kuwéntoh/, for example, can be phonetically transcribed as [kwéntoh] or [k^{w}wéntoh]; /tiyák/ can be [tyák] or [t^{y}ák]. But insights from autosegmental reduplication provide strong evidence that underlying forms do not allow /y w/ to form consonant cluster onsets.

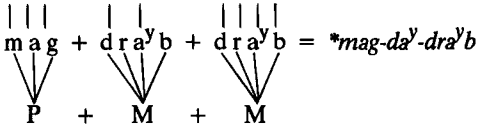
Semivowels do not form complex peaks. In 1.3, the BASIC SYLLABLE TEMPLATE (10) was introduced. There it was claimed that /y w/ are always unambiguously members of the syllable coda, never functioning as part of the syllable peak to form a complex peak. Reduplication phenomena of verbs based on English roots show why this is true.

Consider the underlying representations for two verbs based on English roots.

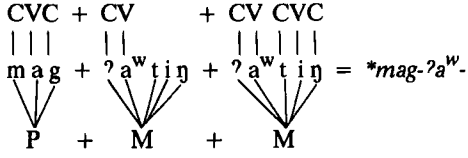
(108)	*mag-dráyb*	'X drives'	[magdráyb]
	mag-da-dráyb	'X will drive'	[màgdadráyb]
	mag-ʔáwtiŋ	'X goes on an outing'	[magʔáwtiŋ]
	mag-ʔa-ʔáwtiŋ	'X will go on an outing'	[magʔàʔáwtiŋ]

If the verbs /mag-drayb/ and /mag-ʔawtiŋ/ are transcribed such that /y w/ form part of a complex peak, as in /mag-dra^{y}b/ and /mag-ʔa^{w}tiŋ/, incorrect reduplicated forms are obtained (109).

(109) CVC + C V + CCV C

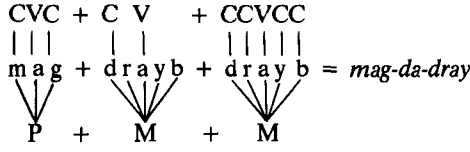


CVC + CV + CV CVC

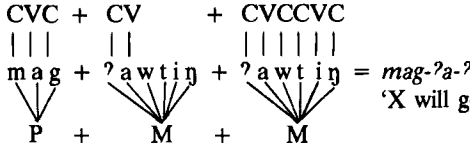


/y w/ must always be represented as consonants and as members of the coda:

(110) CVC + C V + CCVCC



CVC + CV + CVCCVC



/č/ and /ǰ/ are unit segments. Linguists have also disagreed over the status of segments such as /č/ and /ǰ/, results of Spanish borrowings. Ramos (1971:8) and Soberano (1980:32) claim that /š/ appears as the second member of a consonant cluster onset, with /t/ as the only possible initial member. Reduplication phenomena suggest, however, that /tš/ and /dž/ are considered one sound by native speakers (/č/ and /ǰ/, respectively).

Below are alternate representations of roots with [tš] and [dž] as onsets. By reasoning similar to that presented above, these two sounds are seen to be unit segments.

(111) CLUSTER	UNIT	GLOSS
mag-tšuper	*mag-čuper*	'X drives'
mag-džip	*mag-ǰip*	'X takes a jeep'

Mapping the cluster representations to INFLECTIONAL TEMPLATE 1 produces incorrect results.

(112) CVC + C V + CCVCVC
m a g + t š u p e r + t š u p e r = **mag-tu-tšuper*
P + M + M

CVC + C V + CCVC
m a g + d ž i p + d ž i p = **mag-di-džip*
P + M + M

Whereas correct results are obtained by representing /tš/ and /dž/ as unit segments /č/ and /j/.

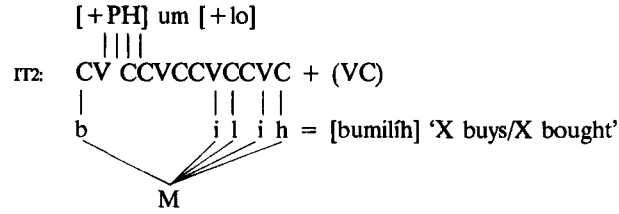
(113) CVC + CV + CVCVC
m a g + č u p e r + č u p e r = *mag-ču-čuper* 'X will drive'
P + M + M

CVC + CV + CVC
m a g + j i p + j i p = *mag-ji-jip* 'X will take a jeep'
P + M + M

/ʔ h/ should enjoy full distribution. In 1.4, it was shown that epenthesis rules involving /ʔ h/ are eliminated because /ʔ h/ now enjoy full distribution in underlying representations. Infixation phenomena verifies that /ʔ/ is underlyingly present in formerly vowel-initial roots.

Consider the infixation of a glottal-initial root such as /ʔakyát/ 'climb' associated to π2 to derive the basic/completive form. The initial glottal in /ʔakyát/ behaves just like all other consonantal segments in this position, associating in the same way as /b/ in /bilíh/ 'buy'.

(114) π2: [+PH] u m [+lo]
CV CCVCCVCCVC + (VC)
ʔ a k y a t = [ʔumakyát] 'X climbs/X climbed'
M



After resyllabification according to the TAGALOG RESYLLABIFICATION RULE (16), [ʔumakyát] is [ʔu.mak.yát]. If the underlying form of /ʔakyát/ were */akyát/, without an initial glottal, /-um-/ would attach as if it were a prefix, and we would expect the /ʔ h/ EPENTHESIS RULE (22) to mark the prefix-root boundary as *[ʔum-ʔakyat] just as it marks the prefix-root boundary of [mag-ʔáral] 'X studies' if /ʔáral/ is represented as vowel-initial, */áral/. But /-um-/ always attaches as an infix inserted after the first onset. Infixation thus verifies that an initial /ʔ/ is present in roots formerly represented as vowel-initial.

Because /ʔ/ and /h/ form a natural class, one would expect that the unambiguous full distribution of /ʔ/ points to the full distribution of /h/. Suffixation also verifies the existence of the underlying final /h/ at the end of formerly vowel-final roots. For example, when /-in/ 'OBJ' is suffixed to /básah/ 'read' and /basáʔ/ 'wet', resyllabification operates identically and the final consonant becomes the onset of the last syllable:

(115) /básah/ + /-in/ = [ba.sá.hin] 'read X'
/basáʔ/ + /-in/ = [ba.sa.ʔín] 'wet X'

The full distribution of /ʔ h/ is thus verified by infixation and suffixation phenomena.

CVV is not a necessary syllable type. In 1.2, the Tagalog syllable types proposed by Schachter and Otanes (1972) were introduced (5). In 1.3, it was suggested that CVV (or CV: of Schachter and Otanes) is not a necessary syllable type. Marantz (1982) and Clements (1985) are two who try to retain lengthened vowels in their analysis of Tagalog reduplication. Marantz does this by employing the feature [+long] in his C-V template and admits this is a problem, given the controversial status of [+/-long] as a feature (1982:451–52; see also 3.6). Clements manages to retain CVV in his template for Tagalog but then must make affixation of the reduplicated morpheme to its stem a completely separate step, complicating the machinery of reduplication by introducing an externally-ordered set of rules for transferring segments to a template (see footnote 11).

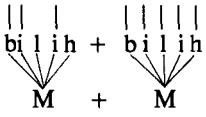
Within the constraints established thus far for reduplication, I examine the results of CVV as a valid syllable type. Instead of using the feature [+long],

I use CVV in a reduplicating template. Consider the association of two verbs to rr1 (53) for proposed verbs with CVV as the reduplicating morpheme.

(116) rr1 With CVV: (P) + CVV + M + (S)

If a verb happens to have the same segment in its first two syllable peaks, like /bilih/ 'buy', reduplication occurs properly.

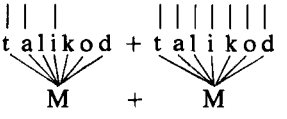
(117) CV V + CVCVC



= *biibilih* 'X will buy'

[biibilíh] is a valid phonetic transcription since all reduplicated syllables receive an extra prominence. In Chapter 3, I discuss why I consider this extra prominence to be secondary stress, with the phonetic consequence being vowel lengthening. But with CVV as the reduplicating morpheme, the incorrect result is obtained if the first two syllable peaks happen to be different.

(118) CV V + CVCVCVC



= **taitalikod*

If we are to avoid the controversial feature [+long] and not further complicate the machinery of reduplication, CVV is not a viable syllable type because either (1) two V's would have to link with only one vowel segment, a violation of the one-to-one association requirement of our Association Conditions (50b); or (2) only words which happened to have the same vowels in its first two syllable peaks would reduplicate properly.

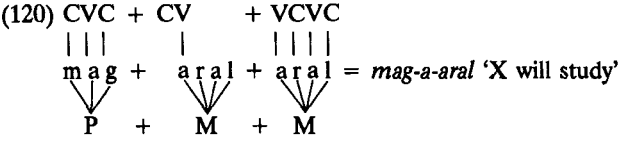
The syllable onset is obligatory. It has already been noted (2.6) that autosegmental reduplication verifies restrictions placed on syllable onsets in Chapter 1. It is also of interest that the Tagalog syllable with an obligatory onset makes association to the C-V templates a more straightforward process.

Without the insight from syllable phonology that all Tagalog syllables underlyingly are consonant-initial, autosegmental reduplication is formulated with a very awkward association process. Consider the traditional underlying forms of (119).

(119) stem: aral 'to study'
prefix: *mag-* 'AGT'

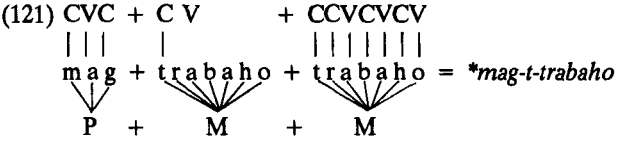
verb:	*mag-aral*	'X studies'
	mag-a-aral	'X will study'
stem:	*trabaho*	'work'
prefix:	*mag-*	'AGT'
verb:	*mag-trabaho*	'X works'
	mag-tatrabaho	'X will work'

If we associate /aral/ to RT1, the association must be phoneme-driven to ensure that only the initial vowel of /áral/ is reduplicated.

(120)


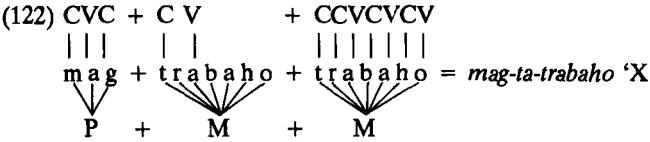
= *mag-a-aral* 'X will study'

But phoneme-driven association produces an incorrect form for /trabaho/.

(121)


= **mag-t-trabaho*

Rather, we must specify association of stems like /trabaho/ to be skeleton-driven in order to ensure that /ta/ is mapped, but not /r/.

(122)


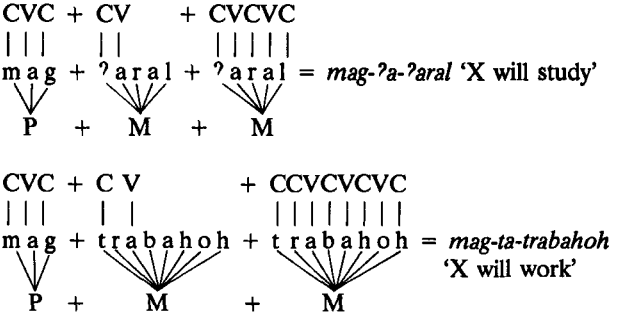
= *mag-ta-trabaho* 'X will work'

Combining the association patterns for data transcribed as in (119) means that an awkward association rule must be invoked:

(123) *Association of segments to the BRT is phoneme-driven until the first segment is associated; after that, association is skeleton-driven.

With the requirement that all Tagalog syllables begin with at least one consonant, the underlying representations of the roots above are /ʔáral/ 'study' and /trabáhoh/ 'work'. The process of association to the BASIC REDUPLICATING TEMPLATE is now simply skeleton-driven, typical of other reduplicating processes, such as that of Arabic (McCarthy, 1981).

(124)



Other association processes in Tagalog are either phoneme-driven or skeleton-driven, but not both. CV phonology thus provides the basis for a simpler autosegmental approach to reduplication phenomena.

2.7 Summary

An autosegmental approach to reduplication is superior to previous transformational accounts on grounds of restrictiveness. "The use of transformational rules allows the linguist to state virtually any imaginable type of reduplication rule, including many that have never been recorded and which should be excluded in any reasonable universal theory of reduplication processes" (Clements 1985:4).

The use of C-V skeleta reduces inflectional reduplication in Tagalog to three patterns (INFLECTIONAL TEMPLATES 1, 2, 3) and generates archaic as well as modern forms. Tagalog utilizes both C-V templates and syllable templates in reduplication processes. Reduplication appears to be limited to a maximum of two syllables, which appears in diminution of adjectives and verbs.

Infixation is also easily formulated using autosegmental C-V templates. In Tagalog, an interesting result of the combination of infixation and reduplication for certain inflectional processes is that reduplication precedes infixation.

The autosegmental formulation of reduplication and the choice of underlying representations are interdependent processes. Insights from an autosegmental analysis of reduplication also show that:

1. /y w/ are unambiguous consonants. They never form complex onsets or peaks.
2. /č ǰ/ are unit segments.
3. /ʔ h/ should enjoy full distribution in all positions.
4. CVV is not a necessary syllable type.
5. The syllable types proposed in Chapter 1 are verified.

[blank]

3. Tagalog Stress

3.1 Primary stress

Stress, like many other aspects of Tagalog phonology, has been interpreted in a variety of ways. Schachter and Otanes (1972:16) and others following their lead (e.g., Soberano 1980:36) claim that vowel length is contrastive in Tagalog. Their analysis may be called the LENGTH HYPOTHESIS. In their interpretation "all syllables that include significantly long vowels are stressed" (Schachter and Otanes 1972:55). The lengthened syllable is phonetically characterized by "relative pitch and length prominence in nonfinal syllable position or by relative pitch prominence in syllable-final position" (Soberano 1980:34).

In Chapter 1 it was suggested that CVV is not a viable Tagalog syllable type. In 2.6 CVV is shown to be an unallowed type on the basis of reduplication phenomena. Schachter and Otanes recognize that contrastive stress is a valid alternative to their analysis (1972:16). Thus we propose the STRESS HYPOTHESIS: primary stress is contrastive in Tagalog. Both primary and secondary stress result in phonetic vowel lengthening on a nonfinal syllable. Contrastive stress is demonstrated in the following minimal pairs.

(125)	*púno?*	'trunk of a tree'
	punó?	'full'
	básoh	'drinking glass'
	basóh	'target practice'
	búkas	'tomorrow'
	bukás	'open'
	tásah	'cup'
	tasáh	'having the point sharpened'
	arálan	'place for studying'
	aralán	'apprentice'

A difference in the main stress of a stem can also lexically indicate a difference in word class, similar to English (pérmit versus permít). Each member of the following pairs is a separate entry in the lexicon.

(126)	*búhay*	'life (noun), live (verb stem)'
	buháy	'alive (adjective)'
	tápos	'finish (verb stem)'
	tapós	'finished (adjective)'
	túlog	'sleep (noun, verb stem)'
	tulóg	'asleep (adjective)'

The main stress of a Tagalog stem is either ultimate or penultimate. Other linguists have noted that stress (or vowel length) "shifts one syllable to the right" when a verbal stem undergoes suffixation (Schachter and Otanes 1972:17, Ramos 1971:11, Carrier 1979:89). Describing stress shift in this way, however, fails to capture the important generalization that word-level stress is maintained in all the inflectional and focus paradigms associated with one stem.

For example, the penultimate stress of the stem /ʔáral/ 'study' is maintained in all the paradigms of (127) regardless of the number of syllables or affixes added.

(127)	stem:	*ʔáral*	'study'
	prefix:	*mag-*	'AGT'
	verb:	*mag-ʔáral*	'X studies (BAS)'
		nag-ʔáral	'X studied (COM)'
		nag-ʔa-ʔáral	'X is studying (CON)'
		mag-ʔa-ʔáral	'X will study (PRO)'
	affixes:	*pag- -an*	'OBJ'
	verb:	*pag-ʔarál-an*	'SO studies X'
		pinag-ʔarál-an	'SO studied X'
		pinag-ʔa-ʔarál-an	'SO is studying X'
		pag-ʔa-ʔarál-an	'SO will study X'
	affixes:	*papag- -in*	'CAU, OBJ'
	verb:	*papag-ʔarál-in*	'X is put through school'
		p-in-apag-ʔáral	'X was put through school'
		p-in-a-papag-ʔáral	'X is being put through school'
		pa-pa-pag-ʔarál-in	'X will be put through school'

Similarly the ultimate stress of /ʔupóʔ/ ('sit') is maintained in the derivatives in (128)[7].

(128)			
	stem:	*ʔupóʔ*	'sit'
	affix:	*-um-*	'AGT'
	verb:	*ʔ-um-upóʔ*	'X sits/X sat'
		ʔ-um-u-upóʔ	'X is sitting'
		ʔ-u-ʔupóʔ	'X will sit'
	prefix:	*magpa-*	'CAU'
	verb:	*magpa-ʔupóʔ*	'X causes (SO) to sit'
		nagpa-ʔupóʔ	'X caused (SO) to sit'
		nag-pa-pa-ʔupóʔ	'X is causing (SO) to sit'
		mag-pa-pa-ʔupóʔ	'X will cause (SO) to sit'
	suffix:	*-an*	'LOC'
	verb:	*ʔupoʔ-án*	'(SO) sits on X'
		ʔ-in-upoʔ-án	'(SO) sat on X'
		ʔ-in-u-ʔupoʔ-án	'(SO) is sitting on X'
		ʔu-ʔupoʔ-án	'(SO) will sit on X'

[7]Some may claim that an exception to this pattern exists in cases such as the verb built from /bigáyan/ ('reciprocal tolerance' or 'giving way to each other'). The verbal paradigm for /bigáyan/ is:

mag-bigáyan	'X's tolerate each other'
nag-bigáyan	'X's tolerated each other'
nag-bi-bigáyan	'X's are tolerating each other'
mag-bi-bigáyan	'X's will tolerate each other'

/bigáyan/ and /bigáy/ come from the same root, /bigáy/ 'give'. But they are separate lexical entries because they are separate STEMS. A lexical entry is a stem; hence the importance of distinguishing between stems which are simply roots and stems which are derived from roots (Buenaventura-Naylor 1975:77). /bigáyan/ is a derived stem; /bigáy/, as a root, is a simple stem. Similarly, /sakáyan/ 'many climbing aboard' is a separate entry from /sakáy/ 'to ride' and so maintains its penultimate stress in the verbal paradigm.

mag-sakáyan	'X's climbing aboard'
nag-sakáyan	'X's climbed aboard'
nag-sa-sakáyan	'X's are climbing aboard'
mag-sa-sakáyan	'X's will climb aboard'

Note that neither /bigáyan/ nor /sakáyan/ undergo vowel syncope because they are separate stems in the lexicon. /an/ in these cases is not a suffix attached in word-formation but is part of the stem.

affixes:	*pa- -in*	'CAU, OBJ'
verb:	*pa-ʔupoʔ-ín*	'(SO) causes X to sit'
	p-in-a-ʔupoʔ	'(SO) caused X to sit'
	p-in-a-ʔu-ʔupoʔ	'(SO) is causing X to sit'
	pa-ʔu-ʔupoʔ-ín	'(SO) will cause X to sit'

Such patterns as these suggest that primary stress in Tagalog is not tied to individual segments. Main stress in this sense can be said to be autosegmental. One way to state this generalization is that

(129) All the derivatives of a particular verb stem formed by affixation and inflection maintain the word-level stress position of the stem.

Since the Tagalog syllable has been formalized (Chapter 1) we can posit an association rule assigning main stress as a phonological rule, applying after the last resyllabification has occurred (i.e., after word-formation and any rule, such as VOWEL SYNCOPE, which affects the syllable structure of the word).

(130) Word-level stress (ultima or penultima) of the verb stem is copied onto the corresponding syllable (ultima or penultima) after the last resyllabification.

In 3.3 this prose statement is incorporated into a general stress assignment procedure that also assigns secondary stress.

3.2 Metrical theory: predicting secondary stress

Tagalog secondary stress mostly ignored. Historically linguists have made only vague statements about secondary stress in Tagalog. For example:

> A word having more than two syllables may have other accents besides the one on the ultima or penultima. (Soberano 1980:34–35)

> The succession of syllables with their varied lengths determined according to accentual prominence is further marked by the junctural signs which occur internally as well as finally at the end of utterance-wholes. The result is a delivery which gives the impression of staccato rhythm. (Llamzon 1976:56)

Schachter and Otanes (1972) do not discuss secondary stress. Panganiban (1972) is one of the very few who even mark secondary stress (he marks it as primary), often doing so to disambiguate homophonous affixes. For example, Panganiban explicitly marks stress in the paradigm in (131) as an example of how "differences in stresses . . . produce semantic distinctions in Pilipino expression" (1972:xiii).

(131)	*kaʔibígan*	'friend'
	kaʔibigán	'desire, inclination, preference'

ká?ibigán	'mutual consent'
ka?íbigan	'sweetheart, boyfriend, girlfriend'

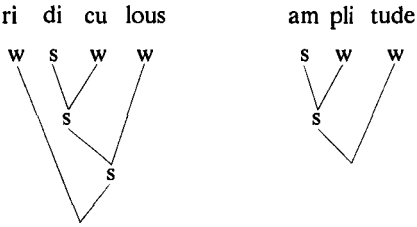
Secondary stress in Tagalog provides a good testing ground for the claim of metrical theory that linguistic rhythm aspires to the rhythm of music. This analysis is based primarily on Prince (1983). A brief introduction will first be given to metrical theory and to Prince's modifications before formalizing Tagalog stress assignment rules.

Introduction to metrical phonology. Liberman and Prince (1977) are credited with the first thorough development of metrical theory. Rather than representing stress as a property of single vowels, they propose that stress is a relative prominence of syllables. By means of a binary branching tree structure, each syllable is labeled as a strong (s) or weak (w) node relative to the adjacent syllable, depending on which has the stronger stress.

(132)

For utterances of more than two syllables, nonterminal constituents are specified for relative strength

(133)



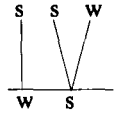
A syllable dominated only by s nodes carries primary stress, such as *di* in *ridiculous* and *am* in *amplitude* above. Other syllables dominated by s nodes carry secondary stress, the relative strength of which is determined by their number and degree of embedding.

Under the s/w tree system outlined above, words like *bandanna* and *banana* have identical structures although most people perceive *ban* in *bandanna* to have a greater prominence than *ba* in *banana*. To account for this difference, Prince (1976) and Selkirk (1980) added the notion of METRICAL FEET. A foot consists of two or three syllables, only one of which can be strong. The difference between *bandanna* and *banana* lies in their foot construction: *ban* forms a separate foot from *danna* in *bandanna* where the entire word *banana*

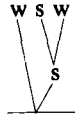
is one foot. As a graphic aid to recognizing where feet occur, a point that attaches to a horizontal line represents a foot. The horizontal line marks the division between feet and the tree structure below, called a WORD TREE. *Bandanna* and *banana* are thus represented as follows.

(134) (Data from Hayes 1981:6)

bandanna



banana

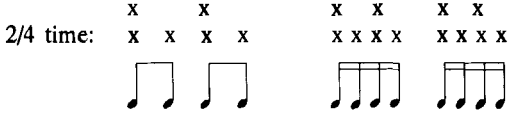


With the advent of metrical feet as a prosodic unit, *bandanna* and *banana* can be distinguished from one another. As a separate foot, *ban* in *bandanna* has more prominence than *ba* in *banana*. Foot construction rules are language-specific.

Metrical theory eliminates the feature [+stress] completely from phonological theory. Stress is established not as a local feature but as a pattern of relative prominence. The stress rules of a particular language can be formulated by restricting the formation of metrical feet and trees.

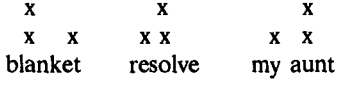
Relating directly to the grid. In its original formulation, metrical theory was intended to be a mapping process between surface structures and a metrical grid. The grid is metrical because it aspires to the 'perfect grid' of music where, in 2/4 time for example, alternating pulses are intrinsically stronger.

(135)



The linguistic grid is a more direct representation of relative stress prominence. Each syllable receives a stress, represented by an x above it. The stronger syllable receives another x to denote relative prominence. Thus (132) is represented as:

(136)



Binary s/w trees were originally intended as an intermediate step between surface structure and the grid (Prince 1983:19). Studies using s/w trees helped clarify the importance of prosodic levels such as the syllable, foot,

and word. Such prosodic categories can also be incorporated into grid representation and in fact are needed in order to directly show the prominence of secondary stress. (133) and (134) are shown below with grid representation at prosodic levels.

(137)

WD			x				x				
FT			x		x		x		x		
SY	x		x	x	x		x		x	x	
	ri		di	cu	lous		am		pli	tude	
WD				x					x		
FT	x			x					x		
SY	x			x		x		x	x	x	
	ban			dan		na		ba		na	na

Prince (1983) pursues a simplification of metrical theory by abandoning the S/W TREES and expressing stress rules as X-ASSIGNMENT RULES, which relate surface structures directly to the grid. The grid system is easier to use than s/w trees. Secondary stresses are interpreted as foot-level stresses and primary stress as word-level. Unlike the s/w trees, secondary or ternary stress is no longer determined by a vague calculation of the weight of embedded s nodes, but instead is read directly off the grid[8]. The higher the x column over a particular syllable, the stronger the relative stress. The grid system shows clearly how "the main burden of lexical stress theory is to map words onto the perfect grid" (Prince 1983:48).

The following subsections summarize two principles discussed by Prince (1983) which are relevant to Tagalog stress rules.

Perfect grid construction (PG). If we assume that linguistic rhythm aspires to the 'perfect grid' of music (Prince 1983:21), the PERFECT GRID CONSTRUCTION (PG) assigns secondary stress (an x at the foot level) so that alternating syllables receive prominence. PG does not apply if it would produce a CLASH, i.e., two contiguous syllables that carry foot-level stress. The direction in which PG applies is designated as right-to-left or left-to-right.

As an example, consider a hypothetical word with primary stress on its first syllable (138). PG assigns secondary stress by placing x's on the foot level of alternating syllables. In this case, we will designate PG as applying from left to right.

[8]In the literature perused I did not find any explicit means of equating the amount of embedding with a particular prosodic prominence.

(138) Application Of PG To Hypothetical Word

WD	x						x					
FT	x						x		x		x	
SY	x	x	x	x	x	PG	x	x	x	x	x	
	ba	ba	ba	ba	ba	→	ba	ba	ba	ba	ba	

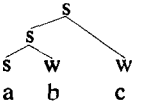
If constraints exist which preassign foot-level stresses, PG may not apply if a clash would result.

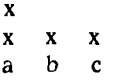
(139)

WD	x						x					
FT	x			x			x		x	x		
SY	x	x	x	x	x	PG	x	x	x	x	x	
	ba	ba	ba	ba	ba	–/→	*ba	ba	ba	ba	ba	

The End Rule (ER). The END RULE is equivalent to a rule that uniformly labels adjacent tree constituents as weak/strong or strong/weak. If, for example, we have a consistent pattern of strong/weak nodes in a right-branching tree (140), then the result is that the leftmost element, 'a', is the strongest.

(140) (a) Tree Structure (b) Equivalent Grid Structure





The END RULE directly relates surface structures to the grid by assigning the first or last element of a constituent a stronger grid position by means of an extra x. The END RULE (Prince 1983:25) can be stated as in (141).

(141) In a constituent C, the leftmost/rightmost terminal in C is associated to a stronger grid position than any other terminal in C.

3.3 Predicting secondary stress in Tagalog verbs

Establishing the rules. The stresses of a Tagalog verb are organized around two parts: the prefix and the rest of the word. Stress needs to be assigned to a prefix separately from the rest of the word because stress in polysyllabic prefixes behaves independently from stress in the stem (+suffix). In (142), the stress remains on the /ma/ of /màka-/ 'AGT+POT' regardless of the stress position in the stem.

(142)

stem:	*sámah*	'to join'
prefix:	*màka-*	'AGT+POT'
verb:	*màka-sámah*	'X is able to join'

stem:	*bilíh*	'to buy'
prefix:	*màka-*	'AGT+POT'
verb:	*màka-bilíh*	'X is able to buy'

Stress on an inflected prefix (reduplicated or infixed) seeks to retain the stress position of the uninflected (basic form) prefix just as the entire word maintains the primary stress of the verbal stem. This preservation of prefix-level stress is parallel to (129), which was stated for primary stress.

(143) An inflected prefix seeks to maintain prominence on the same syllable of prominence in its basic form.

For example, if an uninflected prefix has penultimate stress, that stress will shift to the right when the prefix undergoes reduplication (144a) so that penultimate prominence is retained relative to the entire prefix. If a prefix is both inflected and reduplicated, adding two extra syllables, the stress will shift two syllables to the right (144b). (For ease of reading, only the boundary between the prefix and verbal stem will be signalled by a hyphen.)

(144a)	stem:	*ʔúsap*	'request/converse'
	prefix:	*màki-*	'AGT+PAR'
	verb:	*màki-ʔúsap*	'X requests' [màkiʔúsap]
		makíki-ʔúsap	'X will request' [makìkiʔúsap]

(144b)	affixes:	*pàki- -an*	'LOC'	
	verb:	*pàki-ʔusáp-an*	'makes a request of X'	[pàkiʔusápan]
		pinàki-ʔusápan	'made a request of X'	[pinàkiʔusápan]
		pinakíki-ʔusápan	'is making a request of X'	[pinakìkiʔusápan]
		pakíki-ʔusápan	'will make a request of X'	[pakìkiʔusápan]

With grid theory, the assignment of both primary and secondary stress in Tagalog verbs can be formalized. First, some definitions and abbreviations are listed:

(145) (a) AX = ASSIGN X. All syllables of a word are assigned an "x" at the syllable level.

(b) ER = END RULE. The first syllable of a prefix receives foot-level stress (ER1) with two exceptions:

(i) If the prefix begins with /ʔi/, the second syllable receives foot-level stress (ER2).

(ii) If the prefix has a heavy syllable (CVC), secondary stress will be assigned to that syllable. (HS)[9]

[9]Prince (1983:58) assigns foot-level stress to heavy syllables in cases where the heavy syllable attracts stress.

(c) CX = COPY X. The foot-level stress of the basic form prefix is copied onto the same syllable of the inflected prefix (antepenultima, penultima, or ultima) to preserve prefix-level stress unless a clash results.

(d) RS = REDUPLICATED SYLLABLE.

(i) In the stem(+suffix), the syllable that RESULTS from reduplication receives foot-level stress. (RSS = REDUPLICATED SYLLABLE, STEM)

(ii) When reduplication occurs in the prefix, the syllable that undergoes reduplication receives word-level prominence. (RSP = REDUPLICATED SYLLABLE, PREFIX)

Now Tagalog stress assignment can be formalized as a series of ordered rules for mapping surface structures to a metrical grid. Note that for verbs, stress is assigned first to the stem (+suffix) and then to the prefix if it exists.

(146) (a) stem (+suffix)

(i) The syllables of a verb are mapped from right to left to the grid pattern of the stem. Syllables with no grid "x" assigned to them are assigned an "x" at syllable level. (AX)

(ii) A syllable which results from reduplication receives foot-level stress. (RSS)

(b) prefix

(i) Uninflected (basic form) Prefix: ER1, ER2, or HS applies according to conditions stated above (145b).

(ii) CX applies according to conditions stated above (145c).

(iii) RSP assigns word-level stress.

Three examples of how primary stress is assigned in the stem (+suffix) are presented in (147). The remaining derivations will not include this step since secondary stress assignment is more interesting.

(147) STEM: WD x STRESS: Penultimate
FT x
SY x x
ʔ a r a l

(a) prefix: mag- 'AGT'
verb: mag-ʔáral 'X studies'

Mapping (from right to left) the syllables of the entire verb /mag-ʔaral/ to the penultimate stress pattern of /ʔáral/ allows the main stress position of the stem to be maintained:

```
WD    x
FT    x
SY    x  x
   |  |  |
 mag-ʔa.r a l
```

Apply X (AX) ensures that each syllable has an 'x' at syllable level:

```
WD       x
FT       x
SY    x  x  x
      |  |  |
    mag-ʔ a.r a l
```

(b) affixes: pag- -an 'OBJ'
verb: pag-ʔarál-an '(SO) studies X'

```
WD          x                    x
FT          x                    x
SY          x x        x    x x x
       |  |  | |   AX   |    | | |
     pag-ʔa.ra.lan  →  pag-ʔa.ra.lan
```

(c) suffix: -in 'OBJ'
verb: ʔarálin '(SO) studies X'

```
WD     x                  x
FT     x                  x
SY     x  x          x    x   x
    |  |  |   AX     |    |   |
  ʔa.r a l i n  →  ʔa.r a.l i n
```

Note how the primary stress has shifted to /ra/ in (b) and (c) in order to preserve word-level penultimate stress.

In the following subsections, examples will be presented to illustrate how the stress assignment rules (146) are applied. Because the assignment rules are ordered, the application of HS, ER1, or ER2 as the first step of prefix stress assignment will have the greatest effect on prefix stress patterns. For Type 1a verbs, whose prefix begins with /ma/, only the basic and proposed forms are derived since stress assignment for basic and proposed are exactly paralleled by assignment for completive and continuative.

Heavy syllable (HS). No Tagalog complex prefix has more than one heavy syllable. A heavy syllable in an uninflected prefix always attracts secondary stress. Its prominence is only overshadowed when word-level

stress is assigned to a syllable which undergoes reduplication in the inflected form (as in 149b).

(148a) Basic: [màg?áral] 'X studies'

```
WD      x                   x
FT      x           x       x
SY  x   x  x   HS   x       x  x
    m a g - ? a r a l  →  m a g - ? a r a l = [màg?áral]
```

(148b) Proposed: [mag?à?áral] 'X will study'

```
WD          x                       x
FT          x                   x   x
SY  x   x   x  x   RSS   x       x   x  x
    m a g - ? a ? a r a l  →  m a g - ? a ? a r a l = [mag?à?áral]
```

Note that HS cannot apply because a clash would result:

```
WD          x                       x
FT        x  x                  x     x  x
SY  x     x  x  x    HS         x     x  x  x
    m a g - ? a ? a r a l  -/→  *m a g - ? a ? a r a l = *[màg?à?áral]
```

(149a) Basic: [makapàg?áral] 'X able to study'

```
WD              x                       x
FT              x                   x   x
SY  x  x  x     x  x  HS   x  x  x      x  x
    m a k a p a g - ? a r a l → m a k a p a g - ? a r a l = [makapàg?áral]
```

(149b) Proposed: [makákapàg?áral] 'X will be able to study'

```
WD          x                   x           x       x
FT          x               x   x           x   x   x
SY  x x x x   x x  CX  x x x x   x x RSP   x x x x     x x
    makakapag-?aral → makakapag-?aral → makakapag-?aral
                                        [makákapàg?áral]
```

Although the main stress of the prefix in /makakapag-?áral/ above now falls on the first /ka/ because of the application of RSP, this does not violate the preservation of prominence position in the uninflected prefix (143). Note that /pag/ still carries prominence, though its prominence is overshadowed by the higher prominence of /ka/.

The assignment of word-level stress to a prefix syllable which undergoes reduplication as in /makákapàg-/ above fits best with phonetic data. There is still a clear secondary stress on the /pag/ of /makákapàg-/ but the stress on the first /ka/ is also clearly stronger. The beauty of metrical grid theory is

that the relative prominences of these syllables within the prefix constituent is read directly off the grid after stress assignment rules have applied.

(150a) Basic: [màgpakaˀáral] 'X studies intensely'

```
WD          x           x
FT          x       x   x
SY   x  xx  xx HS   x  xx xx
     magpaka-ˀaral → magpaka-ˀaral = [màgpakaˀáral]
```

(150b) Proposed: [magpápakaˀáral] 'X will study intensely'

```
WD              x               x           x    x
FT              x         x     x           x    x
SY   x  x x x  x x CX  x  x  x x  x x RSP x  x x x  x x
     magpapaka-ˀaral → magpapaka-ˀaral → magpapaka-ˀaral
                                          [magpápakaˀáral]
```

In /magpapaka-ˀáral/ above, CX appears redundant since RSP would assign word-level prominence to the first /pa/ even if CX had not applied. It is important to follow the ordered rules established, however, because of the cases where RSP does not apply to the same syllable as CX (as in 149b).

(151a) Basic: [makapàgpaˀáral] 'X able to send so to school'

```
WD              x                 x
FT              x            x    x
SY   x x x  x  x x   HS   x x x  x  x x
     makapagpa-ˀaral  →  makapagpa-ˀaral = [makapàgpaˀáral]
```

(151b) Proposed: [makákapàgpaˀáral] 'X will be able to send so to school'

```
WD                x               x         x        x
FT                x          x    x         x    x   x
SY   x x x  x  x  x x CX x x x  x  x  x x RSP x x x x  x  x x
     makakapagpa-ˀaral → makakapagpa-ˀaral → makakapagpa-ˀaral
                                              [makákapàgpaˀáral]
```

(152a) Basic: [pàgˀarálan] 'studies X'

```
WD        x           x
FT        x       x   x
SY   x   x x x  HS  x   x x x
     pag-ˀaralan  →  pag-ˀaralan = [pàgˀarálan]
```

(152b) Completive: [pinàg?arálan] 'studied X'

```
WD          x                   x
FT          x             x     x
SY  x x   x x x   CX    x x   x x x
    pinag-?aralan  →  pinag-?aralan = [pinàg?arálan]
```

(152c) Continuative: [pinag?à?arálan] 'is studying X'

```
WD          x                     x
FT          x                   x   x
SY  x x   x x x x   RSS    x x   x x x x
    pinag-?a?aralan  →  pinag-?a?aralan = [pinag?à?arálan]
```

Note how CX cannot apply because a clash would result:

```
WD            x                   x                     x
FT            x               x   x             x   x   x
SY  x x   x x x x RSS x x   x x x x  CX   x x   x x x x
    pinag-?a?aralan → pinag-?a?aralan → *pinag-?a?aralan
                                        *[pinàg?à?arálan]
```

(152d) Proposed: [pag?à?arálan] 'will study X'

```
WD          x                   x
FT          x               x   x
SY  x   x x x x   RSS    x   x x x x
    pag-?a?aralan  →  pag-?a?aralan = [pag?à?arálan]
```

Because COPY X cannot apply in the continuative form above, /pinag-?a?arálan/ (152c), a nonbinary alternation of stress results. This seems to reflect phonetic reality; the speakers I interviewed could not identify a stronger stress between /pi/ and /nag/ in the prefix /pinag-/ in the continuative form. One speaker claimed there was no stress on either of the two syllables, a perception reflected in the current derivation since CX is blocked.

(153a) Basic: [pàgtiwalá?an] 'trusts X'

```
WD          x                   x
FT          x             x     x
SY  x   x x x x   HS    x   x x x x
    pag-tiwala?an  →  pag-tiwala?an = [pàgtiwalá?an]
```

(153b) Completive: [pinàgtiwalá?an] 'trusted X'

```
WD            x                   x
FT            x               x   x
SY  x x   x x x x   CX    x x   x x x x
    pinag-tiwala?an  →  pinag-tiwala?an = [pinàgtiwalá?an]
```

(153c) Continuative: [pinagtìtiwalá?an] 'is trusting X'

```
WD          x                   x
FT          x               x   x
SY  x x  xx xx x  RSS   x x  xx x x x
   pinag-titiwala?an  →  pinag-titiwala?an = [pinagtìtiwalá?an]
```

Copy X is blocked because a clash would result:

```
WD          x                   x
FT      x   x               x x   x
SY  x x  xx x x x  CX    x x  xx xx x
   pinag-titiwala?an  →  *pinag-titiwala?an  *[pinàg-tìtiwalá?an]
```

(153d) Proposed: [pagtìtiwalá?an] 'will trust X'

```
WD          x                   x
FT          x               x   x
SY  x  xx x x  RSS    x  xx x x  x
   pag-titiwala?an  →  pag-titiwala?an = [pagtìtiwalá?an]
```

(154a) Basic: [papàg?arálin] 'puts X through school'

```
WD          x                   x
FT          x               x   x
SY  x x  x x x  ER2   x x  x x x
   papag-?aralin  →  papag-?aralin = [papàg?arálin]
```

(154b) Completive: [pinapàg?áral] 'put X through school'

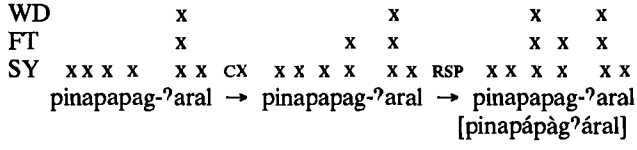
```
WD          x                   x
FT          x               x   x
SY  x x x  x x  CX    x x x  x x
   pinapag-?aral  →  pinapag-?aral = [pinapàg?áral]
```

(154c) Continuative: Two forms are possible.

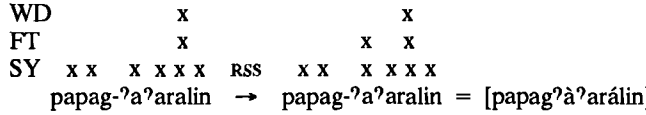
[pinapag?à?áral] 'is putting X through school'
Reduplication occurs through RT1; this is considered the 'formally correct' form.

```
WD          x                   x
FT          x               x   x
SY  x x x  x x x  RSS   xx x  x x x
   pinapag-?a?aral  →  pinapag-?a?aral = [pinapag?à?áral]
```

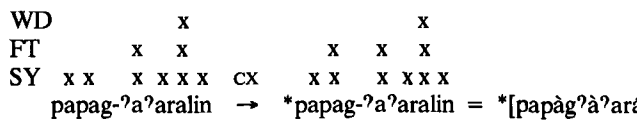
[pinapápàg?áral] 'is putting X through school'
Reduplication occurs through RT3; this form is a sort of "accepted careless speech" (Cada n.d.)



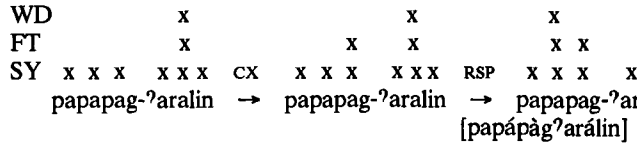
(154d) Proposed: Two forms are possible.
[papag?à?arálin] 'will put X through school' ('formally correct')



Note that Copy X cannot apply because a clash results:



[papápàg?arálin] 'will put X through school'



Reduplication formulated autosegmentally explains why two forms are obtained for the continuative and proposed forms of /papag-?arálin/ 'puts X through school'. The stress assignment rules proposed, only applying on the final output from morphological rules (which include inflectional rules via template association), correctly assigns stress to all variants.

A common conversational form of causative verbs such as /papag-?arál-in/ above drops the syllable /pag/ since the causative prefix /pa-/ along with the object-focus suffix /-in/ are sufficient to signal the focus being used. The basic form of this conversational abbreviation is /pa-?arálin/ 'puts X through school'. Stress assignment for inflections are shown below in (155).

Application of End Rule 1 (ER1). The following examples illustrate how, in the absence of a heavy syllable, the first syllable of the prefix (whether mono- or polysyllabic) receives secondary stress as per END RULE 1 (145b(i)).

(155a) Basic: [pà?arálin] 'puts X through school'

```
WD      x              x
FT      x          x   x
SY  x  x x x  ERI   x  x x x
    pa-?aralin  →  pa-?aralin = [pà?arálin]
```

(155b) Completive: [pina?áral] 'put X through school'

```
WD      x              x
FT      x            x  x
SY  x x  x x  CX    x x  x x
    pina-?aral  →  pina-?aral = [pinà?áral]
```

(155c) Continuative: [pina?à?áral] 'is putting X through school'

```
WD       x               x
FT       x              x x
SY  x x x x x  RSS   x x x x x
    pina?a?aral  →  pina?a?aral = [pina?à?áral]
```

(155d) Proposed: [pa?à?arálin] 'will put X through school'

```
WD       x               x
FT       x             x  x
SY  x x x x x  RSS   x x x x x
    pa?a?aralin  →  pa?a?aralin = [pa?à?arálin]
```

(156a) Basic: [pàki?usápan] 'make a request of X'

```
WD       x               x
FT       x           x   x
SY  x x x x  x  ERI  x x x x x
    paki?usapan  →  paki?usapan = [pàki?usápan]
```

(156b) Completive: [pinàki?usápan] 'made a request of X'

```
WD        x                x
FT        x            x   x
SY  x x x x x x  CX  x x x x x x
    pinaki?usapan  →  pinaki?usapan = [pinàki?usápan]
```

(156c) Continuative: [pinakíki?usápan] 'is making a request of X'

```
WD          x                x                x   x
FT          x            x   x                x   x
SY  x x x x x x x x  CX  x x x x x x x x  RSP  x x x x x x  x
    pinakiki?usapan  →  pinakiki?usapan  →  pinakiki?usapan
                                            [pinàki?usápan]
```

(156d) Proposed: [pakíkiˀusápan] 'will make a request of X'

```
WD          x                 x                x     x
FT          x             x   x                x     x
SY  x x x x x x   CX   x x x x x x       x x x x x x
      pakikiˀusapan  →  pakikiˀusapan  →  pakikiˀusapan
                                          [pakíkiˀusápan]
```

Application of End Rule 2 (ER2). The examples below show how stress is assigned when END RULE 2 (ER2) operates instead of HS or ER1 as per 146b(i).

(157a) Basic: [ˀipàkiˀúsap] 'requests X'

```
WD        x              x
FT        x           x  x
SY  x x x  x x   ER2  x x x  x x
     ˀipaki-ˀusap  →  ˀipaki-ˀusap  =  [ˀipàkiˀúsap]
```

(157b) Completive: [ˀipinàkiˀúsap] 'requested x'

```
WD          x              x
FT          x           x  x
SY  x x x x  x x   CX   x x x x  x x
     ˀipinaki-ˀusap  →  ˀipinaki-ˀusap  =  [ˀipinàkiˀúsap]
```

(157c) Continuative: [ˀipinakìkiˀúsap] 'is requesting X'

```
WD           x                  x                  x  x
FT           x               x  x                  x  x
SY  x x x x x  x x   CX   x x x x x  x x   RSP   x x x x x  x  x
     ˀipinakiki-ˀusap  →  ˀipinakiki-ˀusap  →  ˀipinakiki-ˀusap
                                               [ˀipinakíkiˀúsap]
```

(157d) Proposed: [ˀipakíkiˀúsap] 'will request X'

```
WD          x              x              x  x
FT          x           x  x              x  x
SY  x x x x  x x   CX   x x x x  x x   RSP   x x x x  x x
     ˀipakiki-ˀusap  →  ˀipakiki-ˀusap  →  ˀipakiki-ˀusap
                                           [ˀipakíkiˀúsap]
```

(158a) Basic: [ˀikàluŋkót] 'sad because of X'

```
WD        x            x
FT        x        x   x
SY  x x  x  x   ER2  x x  x   x
     ˀika-luŋkot  →  ˀika-luŋkot  =  [ˀikàluŋkót]
```

(158b) Completive: [ʔikinàluŋkót] 'was sad because of X'

```
WD          x                 x
FT          x           x     x
SY  x x x x x   x  CX   x x x x x   x
    ʔikina-luŋkot  →  ʔikina-luŋkot = [ʔikinàluŋkót]
```

(158c) Continuative: [ʔikinalùluŋkót] 'is sad because of X'

```
WD          x                 x
FT          x               x x
SY  x x x x x   x   RS   x x x x x   x
    ʔikina-luluŋkot  →  ʔikina-luluŋkot = [ʔikinalùluŋkót]
```

Copy X is blocked because a clash would result:

```
WD          x                   x
FT        x   x             x x   x
SY  x x x x x   x   CX    x x x x x   x
    ʔikina-luluŋkot  →  *ʔikina-luluŋkot = *[ʔikinàlùluŋkót]
```

(158d) Proposed: [ʔikalùluŋkót] 'will be sad because of X'

```
WD          x                 x
FT          x             x   x
SY  x x x x   x   RS    x x x x   x
    ʔika-luluŋkot  →  ʔika-luluŋkot = [ʔikalùluŋkót]
```

The continuative and proposed forms above (158c, d) have no syllable with clear prominence. Again, this should not be considered a violation of (143) since the prefix 'seeks' to maintain the stress of its uninflected form—unless cx is blocked by clash considerations.

3.4 Stress in derived nouns: predictable but not autosegmental

One difficulty for students of Tagalog is learning how to stress derived nouns of the form /ka-/ + stem + /-an/. Unlike verbs, these derived nouns do not exhibit autosegmental stress in the sense that they do not always retain the primary stress position of the stem. There is a predictable pattern, however, and grid theory provides an easy way to assign stress. Consider the derived nouns below (STR = stressed syllable in the stem; Pen = penultimate syllable; Ult = ultimate syllable).

(159)

STEM		STR	DERIVED NOUN	
báyad	'to pay'	Pen	[kabayarán]	'payment'
kúlaŋ	'to lack'	Pen	[kakulaŋán]	'lack/failing'
dápat	'should'	Pen	[karapatán]	'right/privilege'
dánas	'to experience'	Pen	[karanasán]	'experience'

sábih	'say'	Pen	[kasabihán]	'saying/proverb'
ʔáraw	'day'	Pen	[kaʔarawán]	'birthday'
tiyák	'sure'	Ult	[katìyákan]	'assurance'
lagáy	'to place'	Ult	[kalàgáyan]	'situation'
galák	'rejoice'	Ult	[kagàlákan]	'joy'
tuwáʔ	'to delight'	Ult	[katùwáʔan]	'delight'
sundóʔ	'agree'	Ult	[kàsundúʔan]	'agreement'
gandáh	'beautiful'	Ult	[kàgandáhan]	'beauty'
babáʔe	'woman'	Pen	[kabàbaʔíhan]	'ladies' group'
lalákih	'man'	Pen	[kalàlakíhan]	'men's group'
hináhon	'sincere'	Pen	[kahìnahúnan]	'sincerity'

Two stress patterns emerge for the derived nouns above:

(1) Ultimate primary stress (UL) on the derived noun. Condition: The penultimate syllable of a bisyllabic stem is stressed.

(2) Penultimate primary stress (PU) on the derived noun. Condition: The ultimate syllable of a bisyllabic stem or penultimate syllable of a trisyllabic stem is stressed.

When the derived noun has ultimate stress, the stress shifts from its original position to the last syllable of the new word. When the derived noun has penultimate stress, the stress stays anchored to the syllable it is found on the bisyllabic stem and shifts one syllable to the right in a trisyllabic stem. Derived nouns do not exhibit autosegmental stress.

Secondary stress occurs on nouns derived from ultimate-stressed bisyllabic stems of the form CVCVC and on nouns derived from trisyllabic stems. On nouns derived from bisyllabic CVCVC stems, secondary stress is phonetically realized as a slightly longer vowel and falls on the first syllable of the stem. On nouns from trisyllabic stems, secondary stress is predicted by the PERFECT GRID CONSTRUCTION mapping from right to left.

These observations can be stated as stress assignment rules:

(160) Tagalog Stress Assignment Rules: /ka- -an/ Nouns

(a) Primary stress is mapped from the stem to the derived noun as follows:

STEM	STRESS	STRESS IN DERIVED NOUN
Bisyllabic	penultimate	Ultimate (UL)
Bisyllabic	ultimate	Penultimate (PU)
Trisyllabic	penultimate	Penultimate (PU)

(b) Secondary stress falls on the antepenultimate syllable if the stem is of the form CVCVC (LS = light syllable). If the stem is trisyllabic, secondary stress is assigned according to the PERFECT GRID CONSTRUCTION (PG) mapping from right to left.

Examples of stress assignments follow.

(161a) WD x x
FT x x
SY x x UL x x x x
bayad → kabayaran = [kabayarán] 'payment'

(161b) WD x x x
FT x x x x
SY x x PU x x x x LS x x x x
tiyak → katiyakan → katiyakan = [katìyákan] 'assurance'

(161c) WD x x x
FT x x x x
SY x x PU x x x x PG x x x x
sundo? → kasundu?an → kasundu?an = [kàsundú?an] 'agreement'

(161d) WD x x x
FT x x x x
SY x x x PU x x xx x PG x x x x x
baba?e → kababa?ihan → kababa?ihan = [kabàba?íhan] 'ladies' group'

3.5 Adjectives

In section 2.3 the BASIC REDUPLICATING TEMPLATE (51) was employed to show how plural adjectives are generated. Unlike verbs, plural adjectives do not exhibit extra prominence on their reduplicated syllables. Reduplication in plural adjectives appears to simply add an extra syllable to the word without affecting the main stress and without inducing a secondary stress. Plural adjectives simply maintain the primary stress of the adjective root.

(162)	root:	*ba?ít*	'kind'	[ba?ít]
	adj:	*maba?ít*	'kind'	[maba?ít]
	plural adj:	*mababa?ít*	'kind (pl)'	[mababa?ít]
	root:	*láyoh*	'far'	[láyoh]
	adj:	*maláyoh*	'far'	[maláyoh]
	plural adj:	*malaláyoh*	'far (pl)'	[malaláyoh]

root:	*talínoh*	'intelligent'	[talínoh]
adj:	*matalínoh*	'intelligent'	[matalínoh]
plural adj:	*matatalínoh*	'intelligent (pl)'	[matatalínoh]

In contrast to plural adjectives, stress in derived adjectives behaves exactly like that in verbs. This is not surprising since verbs and adjectives fill the same slot in the comment-topic construction typical of Tagalog. In fact, adjectives prefixed with /nakaka-/ 'adjectivizer' look identical in form to agent-focus potential verbs inflected for continuative aspect. In the example below, /nakaka-lákad/ 'X is able to walk' is classified as a verb because it is the continuative form of /maka-lákad/ 'X able to walk'. But /nakaka-ʔinís/ is considered an adjective because it does not derive from a verbal form and cannot be inflected for tense-aspect.

(163) *nakaka-lákad* *siyáh*
AGT/POT-walk(CON) s/he
'S/he is able to walk.'

nakaka-ʔinís *siyáh*
ADJ-irritate s/he
'S/he is irritating.'

Stress in adjective prefixes behaves the same as stress in verbal prefixes—independently from stress in the root. As in verbal stems a syllable reduplicated from the adjective root receives foot-level (secondary) stress.

(164) Tagalog Stress Assignment Rules: Adjectives

(a) The root retains its main stress.[10]

(b) A reduplicated syllable receives foot-level stress (RS). A two-syllable reduplication imitates the stress pattern of the root if the root is disyllabic (DI); if the root is trisyllabic, the second syllable receives foot-level stress (TRI).

(c) Polysyllabic prefixes receive secondary stress on theinitial syllable (ER1). Monosyllabic prefixes do not receive a secondary stress.

[10]The only exception I know of to the preservation of root stress in a derived adjective is the adjectivization of /táwaʔ/ 'laugh'. The penultimate stress of /táwaʔ/ is maintained in all verbal derivatives but when /nakaka-/ or /ka-/ is prefixed, the stress of the root changes to ultimate.

/nakaka-/ + /táwaʔ/ = [nakákatawáʔ] 'funny'
/ka-/ + /táwaʔ/ + /táwaʔ/ = [katawá-tawáʔ] 'ridiculously funny'

(d) A prefix with a reduplicated syllable shifts its secondary stress to the right to preserve the stress position of the unreduplicated prefix formative (CX).

Examples follow.

(165a) *napaka-ba?ít* [nàpakaba?ít] 'very kind'
root: *ba?ít* 'kind'

WD			x						x		
FT			x			x			x		
SY	x	x	x	x	x	ERI	x	x	x	x	x
	napaka-ba?it			→			napaka-ba?it			=	[nàpakaba?ít]

(165b) *napaka-?ínit* [nàpaka?ínit] 'very hot'
root: *?ínit* 'hot'

WD			x					x		
FT			x			x		x		
SY	x	x	x	x	x	ERI	x	x	x	x
	napaka-?init			→			napaka-?init		=	[nàpaka?ínit]

(165c) *napaka-talínoh* [nàpakatalínoh] 'very intelligent'
root: *talínoh* 'intelligent'

WD			x						x			
FT			x			x			x			
SY	x	x	x	x	x	ERI	x	x	x	x	x	x
	napaka-talinoh				→		napaka-talinoh			=	[nàpakatalínoh]	

(166a) *nakaka-tuwá?* [nakàkatuwá?] 'pleasing'
root: *tuwá?* 'pleasing'
prefix root: *naka-*

WD			x					x		
FT			x			x		x		
SY	x	x	x	x	CX	x	x	x	x	x
	nakaka-tuwa?			→		nakaka-tuwa?			=	[nakàkatuwá?]

Since /nakaka-/ derives as a mapping of /naka-/ [nàka] to INFLECTIONAL TEMPLATE 3 (section 2.4), CX applies here; /nakaka-/ [nakàka] retains the penultimate stress of the uninflected [nàka].

(166b) *nakaka-híloh* [nakàkahíloh] 'dizzying'
root: *híloh* 'dizziness, vertigo'

WD		x				x			
FT		x			x	x			
SY	x	x	x	x	CX	x	x	x	x
	nakakahiloh			→		nakakahiloh		=	[nakàkahíloh]

(166c) *nakaka-kilití?* [nakàkakilití?] 'ticklish'
root: *kilití?* 'tickle'

```
WD          x                   x
FT          x          x        x
SY  x x x  xxx   CX    x x x  xxx
    nakaka-kiliti?  →  nakaka-kiliti?  [nakàkakilití?]
```

(167a) *ka-pana-panabík* [kapanàpanabík] 'exciting'
root: *panabík* 'excitement'

```
WD              x                       x
FT              x               x       x
SY  x  x x  x x x   TRI   x x x  x x x
    ka-pana-panabik  →  ka-pana-panabik = [kapanàpanabík]
```

(167b) *ka-lugód-lugód* [kalugódlugód] 'delightful'
root: *lugód* 'delight'

```
WD            x               x     x
FT            x               x     x
SY  x x  x  x x   DI    x x  x   x x
    ka-lugod-lugod  →  ka-lugod-lugod = [kalugódlugód]
```

(167c) *ka-wíli-wílih* [kawíliwílih] 'interesting'
root: *wílih* 'interest'

```
WD          x             x    x
FT          x             x    x
SY  x  xx   xx   DI   x   xx   x x
    ka-wilih-wilih  →  ka-wilih-wilih = [kawíliwílih]
```

(168a) Adjective: *mabútih* 'good'
prefix: *pinaka-* 'superlative'
Superlative: /pinaka-mabútih/ 'best' [pìnakamabútih]

```
WD          x                   x
FT          x          x        x
SY  x x x   x x x  ER1  x x x   x x x
    pinaka-mabutih  →  pinaka-mabutih = [pìnakamabútih]
```

(168b) Adjective: *maba?ít* 'kind'
prefix: *pinaka-* 'superlative'
Superlative: /pinaka-maba?ít/ 'kindest' [pìnakamaba?ít]

```
WD            x                   x
FT            x         x         x
SY  x x x   x x x  ER1   x x x   x x x
    pinaka-maba?it  →  pinaka-maba?it = [pìnakamaba?ít]
```

(168c) Adjective: *matalínoh* 'intelligent'
prefix: *pinaka-* 'superlative'
Superlative: /pinaka-matalínoh/ 'most intelligent' [pìnakamatalínoh]

WD		x			x
FT		x		x	x
SY	x x x	x x x x	ERI	x x x	x x x x
	pinaka-matalinoh		→	pinaka-matalinoh	= [pìnakamatalínoh]

Diminutive adjectives involve reduplication of two syllables and exhibit a unique pattern of stress assignment. Consider some diminutive adjectives:

(169)	ROOT		DIMINUTIVE	ADJECTIVE
	taŋkád	'tall'	[mataŋkàdtaŋkád]	'rather tall'
	gandáh	'beautiful'	[magàndagandáh]	'rather beautiful'
	ba?ít	'kind'	[maba?ìtba?ít]	'rather kind'
	?ínit	'hot'	[ma?inìt?inít]	'rather hot'
	dámih	'many'	[maramìramí]	'rather many'
	bérdeh	'green'	[mabèrdeberdéh]	'rather greenish'
	préskoh	'cool'	[mapréskopreskóh]	'rather cool'
	símpleh	'simple'	[sìmplesimpléh]	'rather simple'
	kásyah	'well-fitting'	[kàsyakasyáh]	'rather well-fitting'
	talínoh	'intelligent'	[matalìtalinóh]	'rather intelligent'
	liwánag	'clear, light'	[maliwàliwanág]	'rather clear/light'

In diminutive adjectives, the presence or absence of an initial heavy syllable, (C)CVC, appears to affect the secondary stress in the first copy of the root. Stress patterns in (169) can be summarized in (170).

(170) The first occurrence of the root will have penultimate secondary stress if the first syllable of the root is heavy, (C)CVC. Otherwise, stress will always occur on the ultimate syllable of each root constituent.

3.6 Secondary stress disambiguates homophonous words

Tagalog does not only exhibit contrastive primary stress; in many cases, the placement of a secondary stress disambiguates two homophonous words with identical primary stress. Consider the pairs below.

(171)	stem:	*sákah*	'to farm'	
		mag-sasákah	'farmer'	[màgsasákah]
		mag-sasákah	'will farm'	[magsàsákah]

stem:	*nákaw*	'to rob'	
	mag-nanákaw	'robber'	[màgnanákaw]
	mag-nanákaw	'will rob'	[magnànákaw]
stem:	*pások*	'enter'	
	pasúk-an	'doorway'	[pàsúkan]
	pasúk-an	'(SO) places (ST) inside X'	[pasúkan]
stem:	*ká?in*	'eat'	
	ka?ín-an	'eats off of X'	[ka?ínan]
	ka?ín-an	'feast (noun)'	[kà?ínan]
stem:	*?íbig*	'love'	
	ka-?ibig-án	'desire, preference'	[ka?ibigán]
	ka-?ibig-án	'mutual consent'	[kà?ibigán]

For the first two pairs of (171), the presence of the two forms can be explained by stipulating that for the nonverb form, RSR does not apply to add prominence to the reduplicated syllable. In the absence of prominence on the reduplicated syllable, the HEAVY SYLLABLE (HS) rule will give secondary stress to the prefix, accounting for the noun forms. The derivation of /magsasákah/ 'farmer' and /magsasákah/ 'will farm' is shown below.

(172) stem: *sákah* 'to farm'
verb: *magsasákah* 'will farm' [magsàsákah]

WD			x						x	
FT			x					x	x	
SY	x	x	x	x	RSR		x	x	x	x
	mag-sasakah				→		mag-sasakah = [magsàsákah]			

stem: *sákah* 'to farm'
noun: *magsasákah* 'farmer' [màgsasákah]

WD			x						x	
FT			x					x	x	
SY	x	x	x	x	HS		x	x	x	x
	mag-sasakah				→		mag-sasakah = [màgsasákah]			

Thus the difference between the verb and noun forms is the difference between RSR applying or not applying; if it applies, HS is blocked and the verb form is obtained. If RSR does not apply, HS applies and the noun form is obtained.

The difference between the second two pairs of noun and verb forms of (171) can be explained by making optional the application of LS (160b), the rule that assigns secondary stress to a light antepenultimate syllable preced-

ing the stressed syllable after a bisyllabic stem has undergone suffixation of /-an/. If LS applies, the noun is obtained; if it does not, the verb is obtained.

(173a) stem: *pások* 'enter'
noun: *pàsúkan* 'doorway' [pàsúkan]

```
WD  x              x
FT  x            x x
SY  x x  x  LS   x x  x
    pasuk-an  →  pasuk-an = [pàsúkan]
```

(173b) stem: *pások* 'enter'
verb: *pasúkan* 'places (ST) inside of X' [pasúkan]

Segments of the verb /pasukan/ are mapped from right to left to the grid of the stem, /pások/, as per 146a(i). Then AX applies.

```
WD x          x              x
FT x          x              x
SY x x        x  x         x  x  x
   | |        |  |   AX    |  |  |
   pasok → pasuk-an  →  pasuk-an = [pasúkan]
```

The difference between the final pair of nouns in (171) may be thought of as the result of the application or nonapplication of END RULE 1 (ER1), which places secondary stress on the first syllable of the prefix. Since the prefix is monosyllabic (/ka-/), the absence of ER1 means that /ka-/ joins the rest of the word to obliterate the separation between prefix and stem (+suffix) exhibited in verbs. If ER1 applies, we obtain [kàibigán] 'mutual consent'. If it does not apply, we obtain a word with only primary stress, [kaibigán] 'desire/preference'.

3.7 Tagalog stress patterns and grid theory

Single prominence per constituent. One of the more unique features of stress assignment in Tagalog is the fairly strict separation of stress patterns between a prefix and the rest of the word. This feature, along with the consistent assignment of extra prominence to reduplicated syllables, results in a nonbinary alternation of stress. The PERFECT GRID CONSTRUCTION (PG) apparently has no application in verbs and limited application in other forms.

An historical explanation for the independence of prefix stress may lie in the possibility that prefixes originally occurred as independent formatives. Even today, Tagalog speakers may use a few prefixes as independent words in special contexts. For example, /pinaka-/ 'most' and /napaka-/ 'very' can occur in conversation.

(174a) *siláh ʔaŋ pínakah*
they the-1 most
'They are the ultimate.'

(174b) Speaker A: *maʔínit ŋayón*
hot today
'It's hot today.'

Speaker B: *nápakah*
very
'Very (hot).'

If prefixes were originally independent formatives, they had word-level stress. As the language evolved, apparently prefixes lost their former status and today generally only appear attached to a stem. Their formerly word-level stress has evolved into secondary stress except when a reduplicated syllable occurs. Metrical theory provides the keen insight that word-level and foot-level stresses are relative terms to each other; in Tagalog, these are also relative to the constituent they belong to. The syllable with word-level stress in a prefix may be phonetically slightly less intense than the syllable with primary stress in the stem (+suffix). But prefix word-level stress is perceptibly stronger than prefix secondary stress (if it exists). By allowing a prefix to exhibit both word and foot-level stress, we have the means to distinguish between two prominence levels within one constituent, understanding that prefix word-level stress and stem (+suffix) word-level stress may not be equivalently intense, phonetically.

Another interesting feature of Tagalog stress, perhaps partly resulting from the independence of prefix stress, is that each constituent of a Tagalog word seeks to establish one syllable of major prominence. For the stem (+suffix), that prominence is word-level (primary); for the prefix, it is foot-level (secondary) in the basic form and word-level in the inflected form involving reduplication. This tendency is especially evident in words whose stems contain four or more syllables. Without this tendency, one would expect a wider application of the PERFECT GRID CONSTRUCTION (145) with the result that a word like /pasalamátan/ 'give thanks to X' would have a clear secondary stress:

(175a) Basic: [pasalamátan] 'give thanks to X'

WD		x						x		
FT		x					x	x		
SY	x	x	x	x	x	PG	x	x	x	x	x
	pasalamatan					→	*pasalamatan			= *[pasàlamátan]

(175b) Completive: [pinasalamátan] 'give thanks to X'

```
WD        x                    x
FT        x              x  x  x
SY x x x x x  x    PG     x x x x x  x
   pinasalamatan  –/→  *pinasalamatan = *[pìnasàlamátan]
```

If /pasalamátan/ and /pinasalamátan/ have secondary stress, it is so slight as to be ambiguous even to several native speakers interviewed. The safer conclusion to draw at this point is that Tagalog has a language-specific tendency to confer clear prominence to only one syllable per constituent. Tagalog verbs thus exhibit metrical feet of considerable length, along the lines of Hayes' 'unbounded foot' (1981:56).

Special prominence of the reduplicated syllable. The special prominence of reduplicated syllables in Tagalog has been discussed by Carrier (1979), Marantz (1982), and Clements (1985). Marantz (1982), basing his analysis on Carrier (1979), formulates reduplication with a template where [+long] is preattached to the second vowel. This [+long] feature accounts for the vowel lengthening accompanying a reduplicated syllable. A Carrier-style derivation, translated into a C-V skeleton by McCarthy (1981) and Marantz (1982), is shown below. Association must be specified as phoneme-driven (Marantz 1982:451) to obtain the correct form.

(176) R2 TYPE REDUPLICATION (Marantz 1982)

```
                [+long]
                   |
R2 TEMPLATE: CVCC  V  + Stem
```

Example: stem: *talínoh* 'intelligent'

```
          [+long]
             |
R2: CVCC  V    + CVC VCVC
    | | |  |      | | | | | |
ma+t a l  inoh + t a l i n o h = [matali:talínoh]
                                 'rather intelligent'
```

Marantz admits that the feature [+long] is a problem (1982:451–52):

> Many linguists have argued against the existence of [+/– long] as a distinctive feature . . . . Because the linking of phonemes to C-V slots in reduplication is "phoneme-driven," as specified in Condition D, we cannot give the Tagalog reduplicating prefix . . . the skeleton CVCCVV, avoiding the [+long] feature.

Clements (1985:15) formalizes Carrier's R2-type reduplication utilizing CVV in skeletal association[11]. If one insists on interpreting secondary stress as vowel length, then one must adopt an analysis like Marantz' or Clements'. We suggest that a CVV or [+long] attached to a skeletal V is not a persuasive interpretation for three reasons: (1) CVV has been shown to be an unrequired syllable type (2.6); (2) native speakers do not consider the reduplicated syllable to carry the same stress as the primary stress of the stem; (3) in fast speech, the secondary stress on reduplicated syllables (vowel length according to Marantz, et al.) is suppressed. Phonetic data suggest that the reduplicated syllable in the stem (+suffix) does, in fact, carry secondary stress since only the primary stress of the stem (+suffix) retains clear prominence in fast speech. The assignment of extra prominence to reduplicated syllables is easily incorporated in a metrical theory of stress and avoids the problems of [+long] as a distinctive feature and CVV as a questionable syllable type.

The reasonableness of End Rule 2. At first glance, END RULE 2 (145bi), which assigns foot-level stress to the second syllable of prefixes beginning with /ʔi-/ 'OBJ', may appear suspicious. END RULE 2 is a reasonable variant of the END RULE however, if we consider the prefix /ʔi-/ to be dispensable in the minds of native speakers.

In fast speech the prefix /ʔi-/ is often dropped.

---

[11]Clements proposes the following steps in his expanded theory of reduplication, separating the step of association of segments to a C-V template from the sequencing of affix to base.

(1) affixation: adjoin a reduplicative affix in parallel to the CV tier of the base.

(2) reduplication:

(a) Associate Cs to Cs and Vs to Vs on the adjacent CV tiers;

(b) Transfer the melody of the base to the associated portion of the affix;

(c) Sequence the affix skeleton to the base skeleton, as a prefix, infix or suffix.

Applying these steps to Tagalog reduplication and retaining CVV as a syllable type yields:

(1) Affixation:

reduplicative affix: CVCCVV
base: CVCVVCVC
segments: tali noh

(2a) Association:

CVCCVV
CVC VVCVC
tal i noh

(2b) Transfer:

tal i
CVCCVV
CVC VVCVC
tal i noh

(2c) Sequencing:

CVCCVV + CVC VVCVC
tal i tal i noh
= [tali:tali:noh]

(177)

	fast speech	
/ʔipinag-pasalámat/	→	[pinàg-pasalámat] 'gave thanks for X'
	fast speech	
/ʔi-bigáy/	→	[bigáy] 'gives X'
	fast speech	
/ʔipag-línis/	→	[pag-línis] 'use X to clean'

There may well be a phonetic argument for why the prefix /ʔi-/ is dispensable. /ʔi-/ is the only prefix of the form /ʔV/. /i/ is considered the weakest or minimal vowel according to Hooper's strength scale (1972b:141). Across languages, /i/ tends to be the vowel that is epenthesized or deleted. In Brazilian Portuguese, for example, /i/ is epenthesized to avoid certain syllable-final obstruents (Hooper 1972:142) just as /ʔi/ is epenthesized in Tagalog to break up /s/-initial consonant clusters in loanwords (8).

There may also be a morphological argument for why /ʔi-/ is dispensable. When /ʔi-/ is deleted, the Type 2b inflectional patterns (49) make it possible to still identify the verb as object focus. The other object-focus affixes are phonetically stronger (e.g., /-ʔin/, /-an/, /pag- -an/, /ʔipag-/). Since the only function of the prefix /ʔi-/ is to signal object focus (no other phonological rules depend on its presence) and since its absence creates no ambiguity regarding the focus type, /ʔi-/ may be considered redundant; in this sense it is the unmarked focus.

END RULE 2 can thus be viewed as a concession to the native perception that /ʔi-/ is dispensable. With this insight, END RULE 1 is preserved in spirit in END RULE 2 as a rule strengthening the leftmost indispensable syllable.

3.8 Summary

Nongrid metrical theory applied to Aklan. Grid theory offers a significant advantage over metrical theory employing tree structures. Hayes (1981) provides a good basis for comparing the advantages of grid theory to tree construction.

Hayes uses tree structures to analyze stress in Aklan, a Philippine language similar to Tagalog. Like Tagalog, Aklan exhibits the autosegmental property of maintaining the primary stress position of the stem in all words derived from that stem. Hayes formalizes this observation by invoking the feature [+Penultimate Stress] ([+PS]) in a foot construction rule:

(178)

$$\begin{array}{lcl} R & \rightarrow & R \;/\; \_\# \\ [+PS] & & | \\ & & F \end{array}$$

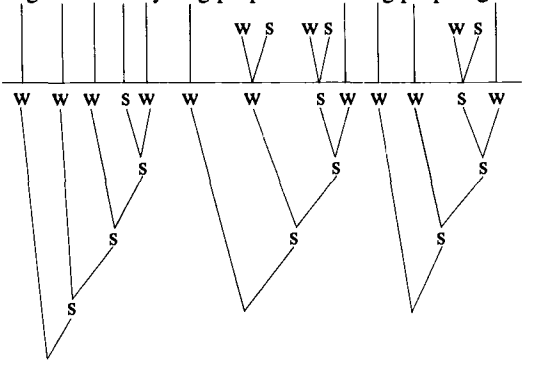
That is, form a nonbranching foot over a syllable rhyme marked [+PS] when it is word-final. This feature "percolates to the segments of the suffix in the derived form" (1981:27) to ensure that a derivative of a stem with penultimate stress will also have penultimate stress. The two notions of feature percolation (along the lines of Chomsky and Halle 1968:377–8) and foot construction before realizing actual stresses complicate Hayes' analysis.

Like Tagalog, Aklan exhibits independent stress patterns in its prefixes. By not capturing this generalization, Hayes has to invoke a DESTRESSING RULE (1981:23), a roundabout expression of clash avoidance, for certain derivations.

(179) Remove a nonbranching foot on an initial syllable whenever the following syllable is metrically strong.

For example, his assignment of metrical feet predicts stress assignment as in (180).

(180) nàg-ka-ka-sákay nàg-pa-pà-maníla nàg-pa-pa-lígus



But actual Aklan data exhibit the same kind of preservation of prefix-level stress as Tagalog.

(181)

basic prefix: [màgka] /nagkaka-sákay/	Stress of prefix: penultimate [nagkàkasákay] 'X became co-passengers' Stress of inflected prefix: penultimate
basic prefix: [màgpa] /nagpapa-maníla/	Stress of prefix: penultimate [nagpàpamaníla] 'X caused (SO) to go to Manila' Stress of inflected prefix: penultimate

basic prefix: [màgpa]	Stress of prefix: penultimate
/nagpapa-lígus/	[nagpàpalígus]
	'X caused (so) to take a bath'
	Stress of inflected prefix: penultimate

To account for these data, Hayes invokes a rule that assigns an 'exceptional metrical foot' to a prefix syllable. Then he destresses the adjacent syllable as per (171). The phonetic material is generated at the cost of unwieldy theoretical machinery and the loss of an interesting generalization common among Philippine and other Austronesian languages.

Grid theory is simpler. Metrical grid theory greatly simplifies stress assignment rules in Tagalog. Stress rules are now rules assigning prominences to syllables on a grid from which primary and secondary stresses can be directly read.

The most unique feature of Tagalog stress is that the juncture at the prefix serves as a strict constituent boundary whereby stress in the prefix is assigned separately from stress in the stem (+suffix). Stress is autosegmental in that the position of the most prominent syllable of the basic form in each word-level constituent is retained regardless of infixation and reduplication of syllables that may occur.

[blank]

4. Baligtad Tagalog: Evidence for Autosegments

At least by 1931 linguists were describing word games and the ways they clarify linguistic structures (e.g., Chao 1931, Conklin 1956, 1959, Haas 1957, Hombert 1973). Linguists like Hombert (1986) and Campbell (1986) have explored word games as verification of structures which are "psychologically real" (Chomsky and Halle 1968:viii). For example, Hombert cites data from word games in Bakwiri and Thai as empirical evidence for tone being a suprasegmental and segmental, respectively, in the minds of speakers of these languages (1986:175).

This chapter discusses a word game in Tagalog and evaluates the resulting evidence for the psychological reality of infixation and stress as autosegments. (Data are rewritten according to guidelines for underlying forms established in Chapters 1 and 2.)

4.1 Baligtad Tagalog

Baligtad 'inside-out, upside-down, backward, inverted' is a game of speech disguise popular among Filipino adolescents and unmarried teenagers (Conklin 1956:139). A BALIGTAD WORD is "a Tagalog particle, full word, or phrase occurring as a single unit in any of the modified shapes typical of baligtad speech" (Conklin 1956:136). Words can be formed from four types of structural rearrangement (182–185) and three types of infixation (186–188); there are four additional combinations of these plus suffixation and reduplication (189–192). Conklin's data, divided into slightly modified categories, are reproduced below. Where deemed helpful, syllable breaks of the original Tagalog are indicated in the baligtad Tagalog with a period. Artificial infixes are separated from original segments by hyphens.

(182) R1: Reversal of Stem Segments (reading backwards)

salámat	'thanks'	→ *tamálas*
mag-simbá?	'X attends mass'	→ *mag-?abmís*

(183) R2: Metathesis of Segments (bisyllabic words only)

dítoh	'here'	→	*dótih*
gábih	'taro'	→	*bágih*

(184) R3: Rearrangement of Syllables

ʔitóh	'this'	→	*tóʔih*
páŋit	'ugly'	→	*ŋitpáh*
kapatíd	'sibling'	→	*tidpakáh*

walá? náŋ ʔúlam 'there is no food now' → *láwah náŋ lamʔúh*[12]
none now food

busóg káh náh báh 'Are you full now?' → *sugbúh banakáh*
full you now (?)

(Note how /káh náh báh/ is treated as one phonological word in baligtad word formation, i.e., /kanabáh/)

(185) R4: Transposition of 3rd Syllable to 1st Position

magandáh	'beautiful'	→ *damagán*
kamátis	'tomato'	→ *tiskamáh*

(186) I1: Partial Infixation (i.e., only affects the first syllable)

a.	tinápay	'bread'	→ *t-um-ínapáy*
b.	náh báh	'already?'	→ *n-um-áh b-ab'-ah*

(187) I2: Complete Infixation (i.e., affects each syllable)

sí.lo?	'snare, trap'	→ *s-ig-í.l-og-ó?*
sa.lá.mat pó?	'thank you'	→ *s-ag-á.l-ag-á.m-ag-át.p-og-ó?*
ʔit.lóg	'egg'	→ *ʔ-um-út.l-om-óg*
gá.liŋ	'coming from'	→ *g-um-á.l-im-íŋ*

(188) I3: Compound Infixation (i.e., infix is longer than -VC-)

a.	*hin.dí?*	'negative'	→ *h-um-ín.d-im-í-pi-?*
	pún.tah	'goes'	→ *p-um-ún.t-am-á-pa-h*
b.	*hindí?*	'negative'	→ *h-igíd-in d-igíd-i?*
	taŋháli?	'noon'	→ *t-agád-aŋ h-agád-ah l-igíd-i?*
c.	*báh*	'?'	→ *b-umámamá-h*

(189) R3I2: Syllable Reversal + Complete Infixation

a.	*hin.dí?*	'negative'	→ *d-im-íh-in-ín*
	sag.lít	'moment'	→ *l-um-ít.s-am-ág*

[12]Conklin's transcription here actually puts the stress of *láwah* on the ultimate syllable, [lawáh]. I believe this is a typographical error, however, because he transcribes the identical rearrangement pattern (R3) in two other places as [láwah] (1956:138,139).

b. *sa.ʔán* 'where' → *ʔ-um-án.s-am-áh*

(190) R3I2S: Syllable Reversal + Complete Infixation + /-n/ Suffixation
do.ʔón 'there' → *ʔ-um-ón.d-om-ó-n*

(191) R3I3: Syllable Reversal + Compound Infixation

hin.dí?	'negative'	→	*dih-ípindíp-in*
lag.pák	'fall'	→	*pak.l-ápandáp-ag*
ʔa.kóh	'I'	→	*ko.ʔá-pandápan*
wal.á?	'none'	→	*la.wá-pandápan*

(192) RDI2: Reduplication + Complete Infixation
náh 'now' → *n-um-áh n-um-áh*

The following sentences of baligtad speech are also provided by Conklin (1956:138). The type of rearrangement which each word undergoes is noted above the original Tagalog. (U = unchanged word)

(193) I2 I2 I3 I2
Bákit ʔikáw luŋkót ŋayón → *b-um-á.k-im-ít ʔ-um-í.k-am-áw*
why you sad now *l-um-úŋ.k-omóp-ot ŋ-um-á.y-om-ón*
'Why are you sad now?'

(194) I2 I2 I2 U I1 I1 U I3 I2
huwág ʔikáw ʔíŋay, ʔát daratíŋ mamayá? ʔáŋ ʔiyóŋ ʔináh
don't you noisy and will-arrive later the your mother
'Don't be noisy, and later your mother will arrive.'

→ *h-um-ú.w-am-ág ʔ-um-í.k-am-áw ʔ-um-í.ŋ-am-áy, ʔát d-um-á.ratíŋ m-um-á.ma.yá? ʔáŋ ʔ-um-í.y-omóp-oŋ ʔ-um-í.n-am-áh*

(195) R3I3 R3I3 R4 I2
Hindí? siyáh marúnoŋ s(um)ayáw →
neg s/he know to-dance
'S/he does not know how to dance.'

dih-ípindíp-in ya.s-ípindíp-i-n noŋmarúh s-um-á.y-am-áw

(196) R3I2 I2 R4 I2
Hindí? siyáh marúnoŋ s(um)ayáw →
neg s/he know to-dance
'S/he does not know how to dance.'

d-im-íh-in-ín s-um-í.y-am-áh noŋmarúh s-agá.y-ag-áw

R3 U R3 R4

(197) *walá? náh siyáhŋ kuwáltah → lá.wah nah ya.síŋ tá.ku.wal*
none now s/he -L- money
'S/he has no more money.'

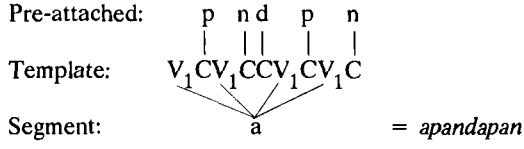
4.2 Infixed baligtad formulated autosegmentally

Just as infixed forms of normal Tagalog can easily be formulated using C-V templates (2.3), each of the seven types of infixed baligtad can be associated with a particular generative template.

/ʔ/ and /h/ are subject to deletion and epenthesis via a phonological rule after syllable metathesis, applicable in R3I2, R3I3, and RDI2 below as in (198).

(198) /ʔ h/ → Ø / _.(C)V where . = syllable break
Ø → /h/ _#

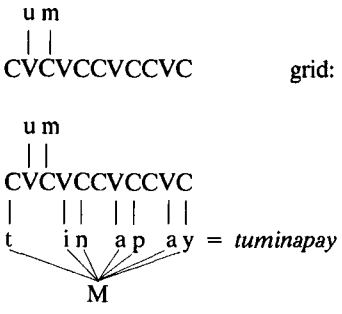
As before, infixes are represented by anchored segments appearing above the C-V template. The templates are associated according to conventional autosegmental rules (Goldsmith 1976a). Association is template-driven so that vowel-spreading will occur as it does in McCarthy's template-driven description of Arabic (2.1). A series of subscripted V-slots (i.e., V1) will associate to the same vowel, as follows:



Each word in a baligtad template is also associated with a grid pattern for stress, either ultimate or penultimate. Syllables from the output of a baligtad template are mapped onto the appropriate grid pattern and receive either penultimate or ultimate stress. Then the PERFECT GRID CONSTRUCTION (PG) applies within a word from right to left, assigning secondary (foot-level) stress to alternating syllables from the rightmost stressed syllable.

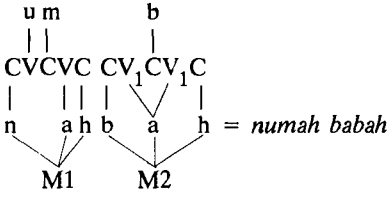
Each infixed baligtad type is shown below with its C-V template and an example of how the phonemic segments are generated. Stress assignment is only shown for the first baligtad type since the process is straightforward and not of central concern.

(199a) I1 TEMPLATE: Partial Infixation



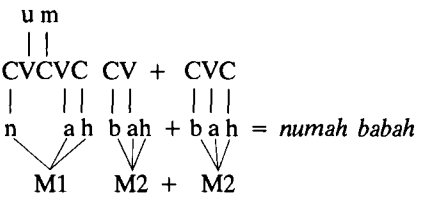
(199b) u m b

CVCVC CV_1CV_1C grid: ultimate

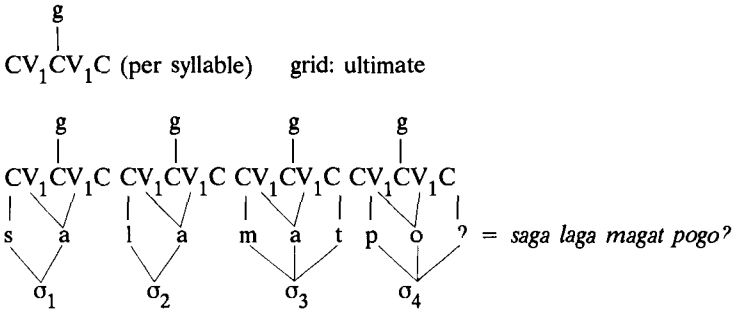


Alternatively, type I1b can be seen as I1a + reduplication of the second word according to the BASIC REDUPLICATING TEMPLATE (51), with the second syllable as the reduplicating morpheme. In this interpretation, segments are generated as in (199c).

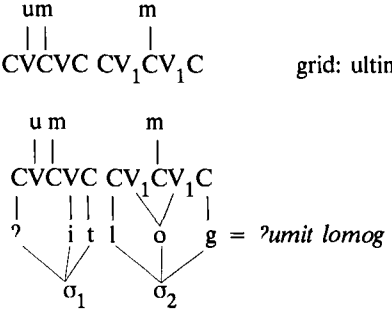
(199c)



(200a) 12 TEMPLATE: Complete Infixation

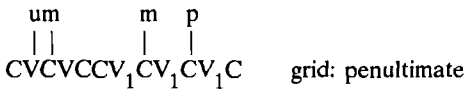


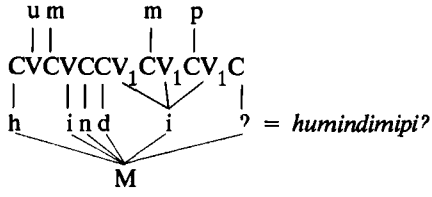
(200b)



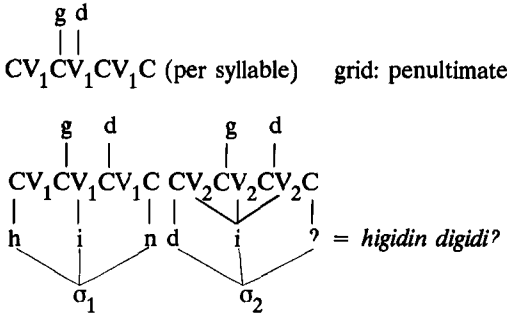
In the 12 baliktad above, each syllable in the original Tagalog becomes a bisyllabic baliktad word. /salámat po?/ 'thank you' becomes [sagá lagá magát pogó?] and /?itlóg/ 'egg' becomes [?umít lomóg], an interesting result in light of the fact that almost all indigenous stems are bisyllabic.

(201a) 13 TEMPLATE: Compound Infixation (3 types)

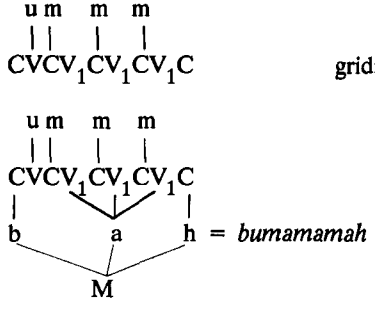




(201b)



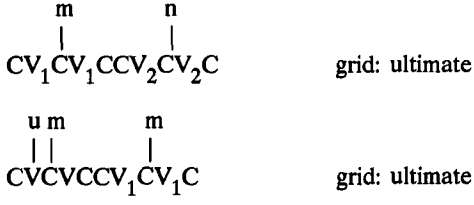
(201c)



(202) R3I2 TEMPLATE: Syllable Reversal + Complete Infixation

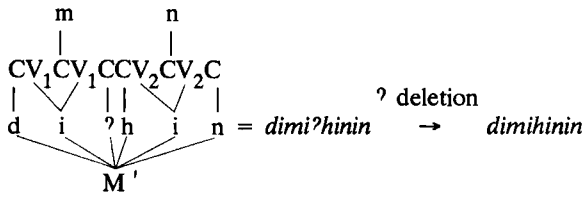
i. Syllable Reversal: $\sigma_1\sigma_2 \rightarrow \sigma_2\sigma_1$ (This step generates the segments to map to step ii.)

ii. Infixation: two templates are available.



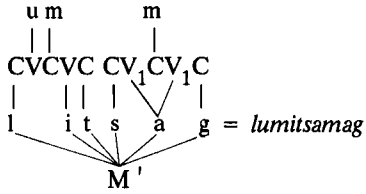
(202a) i. *hindí?* 'neg' → *di?hin* = M '

ii.



(202b) i. *saglít* 'moment' → *litsag* = M '

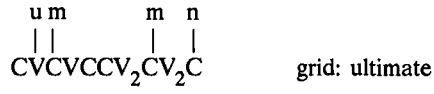
ii.



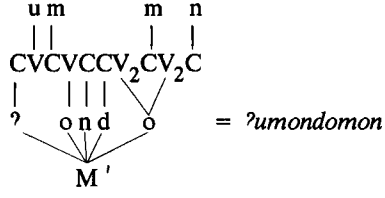
(203) R3I2S TEMPLATE: Syllable Reversal + Complete Infixation + /n/-Suffixation

i. $\sigma_1\sigma_2 \rightarrow \sigma_2\sigma_1$

ii.



do?ón 'there' → *?ondo* = M '



For R3I3 rearrangement, I posit a phonological rule that applies after passage through the R3I3 template to ensure that the default coda of the last syllable is /n/ if no segment is provided for that slot. This /n/-Epenthesis Rule will occur instead of /h/-epenthesis (198). That is, the last syllable of a word undergoing R3I3 rearrangement will end either (1) with a consonant provided from the segmental tier or (2) with /n/.

(204) $\emptyset \rightarrow$ n / V _# (R3I3 rearrangement)

That is, in a baligtad word that has undergone R3I3 rearrangement, an /n/ is epenthesized word-finally if there is no word-final consonant.

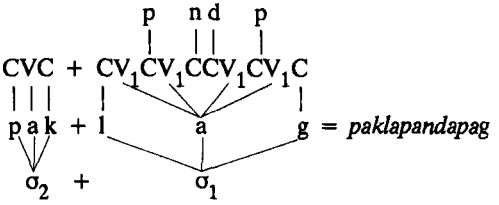
(205) R3I3 TEMPLATE: Syllable Reversal + Compound Infixation

i. $\sigma_1\sigma_2 \rightarrow \sigma_2\sigma_1$

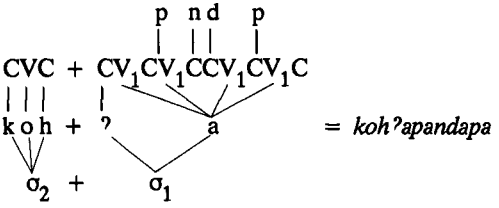
ii. σ_2 + $CV_1CV_1CCV_1CV_1C$ (p, n d, p) grid: penultimate

(Segments to be mapped are from σ_1.)

(205a) *lagpák* 'fall' → *pak.lag*



(205b) *ʔakóh* 'I' → *kohʔa*



h-del. n-epen.

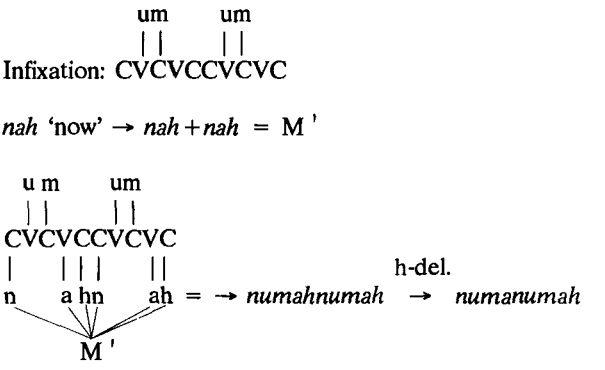
kohʔapandapa → *koʔapandapa* → *koʔapandapan*

Note that R3I3 baligtad provides an interesting example of phonetic pressure to have an unambiguously closed syllable word-finally since the word-final [h] provided by the /ʔ h/ EPENTHESIS RULE (198) is hard to hear.

(206) RDI2 TEMPLATE: Reduplication + Complete Infixation

i. Reduplication: S1 → S1+S1

ii.



4.3 Infixes as autosegments

The argument for infixes as autosegments is presented in two steps: (1) infixes are conceptually separate formatives, as demonstrated by the relationship between full and abbreviated forms in normal Tagalog; (2) the process of decoding a baligtad message suggests that infixes are manipulated on a psychologically autosegmental level of their own.

Normal Tagalog abbreviations. In normal speech, commands (basic form) and repeated completive /-um-/ verbs are regularly abbreviated to the stem. Young children also use uninflected stems more than fully infixed forms. In the examples below, /t-um-ayó?/ 'stand' is abbreviated to the noninfixed stem, /tayó?/ and /t-um-áwah/ 'laugh' is abbreviated to the stem, /táwah/. (-L- = linker).

(207) Full form: *tumayó? kah náh*
stand you now
'You stand now.'

Abbreviated form: *tayó? kah náh*

Full form: *tumáwah siyáh naŋ tumáwah*
laughed s/he -L- laughed
'S/he laughed and laughed.'

Abbreviated form: *táwah siyáh naŋ táwah*

When certain verbs infixed with /-in-/ are inflected for past tense, abbreviation to the stem is also common. In the example below, the prefix and infix of the full form /ʔibinigáy/ 'gave X' are dropped, resulting in an abbreviation to the stem, /bigáy/ 'give'.

(208) Full form: *ʔanóh ʔaŋ ʔibinigáy moh*
what the-1 OBJ-give(COM) you-2
'What did you give?'
Abbreviated form: *ʔanóh ʔaŋ bigáy moh*

The popularity of abbreviated forms in conversational Tagalog and the acquisition of stems before inflected forms among young children suggests that infixes are conceptually separate from stems. At this point, data from normal Tagalog only verifies the separateness of infixes without demonstrating their autosegmental nature in word-formation. We now examine the decoding process apparently employed in baligtad speech for such evidence.

Decoding infixed baligtad speech. Infixation is the statistically dominant baligtad strategy. Out of eleven baligtad types (182–192), seven involve infixation (64%). In the five full baligtad sentences provided (193–197), a total of twenty-two words are rearranged. Of these, seventeen exhibit infixation (77%).

To decode a baligtad message, a person presumably extracts the artificial infixes, leaving a skeleton of original Tagalog. This process is a reversal of infixation formulated as mapping a Tagalog stem to a skeleton with an anchored infix.

A person can only decode a baligtad message if he knows how the message was originally encoded, i.e., if he knows how infixation and vowel spreading occur in that particular baligtad type. Decoding an infixed baligtad message can be formulated as two steps: (1) extracting the artificial infix; (2) collapsing vowels resulting from vowel spreading.

(209) baligtad utterance: *sagálagámagát pogó?*

(1) Infixed /g/ extracted:

	g		g		g		g	
sa	ala		ama		at	po	o?	

(2) Vowel collapsing: $V_1V_1 \rightarrow V_1$
saálaámaát poó? → *salámat pó?* 'thank you'

Vowel spreading, absent in normal infixed Tagalog, allows a variety of baligtad words to derive from one general template. Vowel spreading with artificial baligtad infixes suggests that a matching process must occur in a speaker's mind between a baligtad pattern and normal Tagalog. Assuming this matching process is analogous to infixation in normal Tagalog, baligtad offers some evidence for infixes as autosegments.

4.4 Autosegmental stress: inconclusive evidence

As discussed in 3.1, a Tagalog verb in all its focus forms and inflections maintains the main stress (ultimate or penultimate) of the verb stem. Stress

is a property of an entire constituent and in this sense may be called autosegmental. There is some question, however, as to whether main stress is psychologically autosegmental.

Data from baligtad speech does not conclusively support stress as an autosegment. In infixed baligtad, main stress results from the grid pattern (ultimate or penultimate) associated with that type (199–203, 205, 206); the stress of the original Tagalog is ignored. The examples in (210) show how stress in infixed baligtad is a feature of the rearrangement type, independent of stress in the original Tagalog.

(210)

TYPE	STEM STRESS	STEM	BALIGTAD WORD	BALIGTAD STRESS
I2	penultimate	*sílo?*	*sigí logó?*	ultimate
	ultimate	*?itlóg*	*?umít lomóg*	ultimate
I3	penultimate	*púntah*	*pumùntamápah*	penultimate
	ultimate	*hindí?*	*humìndimípi?*	penultimate

The only data from baligtad Tagalog which does not exhibit consistent word-level stress is found in R3 (184) and R4 (185), where the syllable is the unit undergoing rearrangement. All the data from R3 and R4 are listed in (211). (STR SYL = shape of the stressed syllable in the original Tagalog)

(211) a. Bisyllabic words

TAGALOG	STR SYL	BALIGTAD	STRESS IN BALIGTAD
?itóh	CVh	*tó?ih*	penultima (syllable level)
walá?	CV?	*láwah*	penultima (syllable level)
páŋit	CV	*ŋitpáh*	ultima (syllable level)
?úlam	CV	*lam?úh*	ultima (syllable level)
busóg	CVC	*sugbúh*	ultima (word level)

b. Trisyllabic words

TAGALOG	STR SYL	BALIGTAD	STRESS
kamátis	CV	*tiskamáh*	ultima (syllable level)
kanabáh	CVh	*banakáh*	ultima (word level)
magandáh	CVh	*damagán*	ultima (word level)
kapatíd	CVC	*tidpakáh*	ultima (word level)

Efforts to correlate the patterns observed above with a heavy syllable offer no insight. However, one can make a rule which correctly generates the limited data here, though the motivation for the rule is questionable.

(212) In baligtad involving syllable rearrangement, stress can be predicted as follows: A bisyllabic word ending with a stressed syllable of the form CV[+cons, +low] (i.e., the coda is /? h/) retains stress at the syllable level. Otherwise, stress is on the ultima.

This rule would have to be confirmed by more data before being confidently stated. The fact that word-level stress is maintained in all baligtad forms except R3 and R4 and even for these types appears to be maintained in a predictable environment suggests that stress in Tagalog has certain autosegmental properties. Using baligtad to claim solid verification of the psychological reality of stress as an autosegment would, be premature at this point.

4.5 Verifying other structures

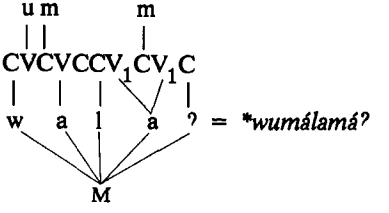
Syllable patterns. All baligtad words observed confirm the expected syllable pattern of Tagalog, where syllable breaks occur according to the Tagalog RESYLLABIFICATION RULE (16). Of special interest is the verification of the semivowel /y/ as an unambiguous consonant. The rearrangements of /siyáh/ in (195–197) are as follows:

(213) 1. *siyáh* → *ya.s-ípindíp-i-n* (195)
2. *siyáh* → *s-um-í.y-am-áh* (196)
3. *siyáh* → *ya.sí(h)* (197)

In each case, the syllable structure verified is a CVCVC, /siyáh/, and not */sia/ (CVV) or */si^{a}/ (CV^{V}). Particularly in (195) and (197), where syllable metathesis occurs as the first step of the rearrangement, /y/ emerges as an unambiguous consonant. The strong case for /y/ as consonant also serves the case of /w/ as unambiguous consonant. As proposed in Chapter 1, the CVV or CV: syllable type of Schachter and Otanes (1972) is not necessary for Tagalog. /y/ and /w/, unambiguous consonants, always fill the coda slot of a syllable and never are part of the peak.

Segment metathesis. One baligtad form which reveals an unallowable phoneme sequence suggests that metathesis is also psychologically valid. The sequence **wu* is not allowed when /walá?/ 'none' undergoes I2b rearrangement.

(214) I2b Rearrangement of /walá?/ 'none'



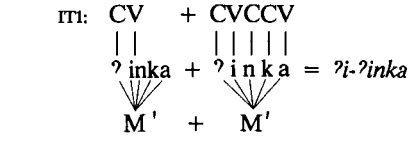
metathesis of /w/ and /m/

**wumálamá?* → *muwálamá?*

This metathesis parallels that of /l y r h ʔ/ and /n/ which occurs when /l y r h ʔ/-initial stems are infixed with /-in-/ (2.3) and offers evidence for the psychological reality of the METATHESIS RULE (78) proposed.

C-V template reduplication. Conklin mentions data which suggest that the C-V templates proposed in Chapter 2 reflect the mental processes involved in reduplication. Conklin notes (1956:138): /ka-ká?in/ 'X will eat' → /ʔi-ʔinka/.

The formation of this baligtad word begins with reversing the syllables of the stem /ká?in/ to obtain the baligtad stem, /ʔínka/. Then the new stem, /ʔínka/ (*M* '), is mapped to IT1:



4.6 Summary

Baligtad Tagalog offers convincing evidence for infixes holding a psychologically real level of their own. This evidence consists of (1) the popularity of infixation as a baligtad strategy; and (2) the phenomenon of vowel-spreading, suggesting a decoding process whereby a speaker separates artificial infixes and collapses repeated vowels to decipher the masked Tagalog message.

Less conclusive is baligtad evidence for stress as an autosegment. Stress in normal and baligtad Tagalog exhibits certain autosegmental properties. baligtad involving rearrangement of syllables, however, offers stress patterns which, while predictable, do not convincingly verify stress as an autosegment.

The syllable structure proposed in Chapter 1 and a metathesis rule to deal with /l y r h ʔ/-initial stems infixed with /-in-/ are consistent with baligtad data. The inflectional C-V templates proposed to handle reduplication work consistently with baligtad data.

New forms of baligtad may be used to further test for the reality of other linguistic structures. One could teach the following game combinations (not listed by Conklin) to examine the effects of segmental rearrangement and infixation on stress.

(215) R1I1 Complete Segment Reversal + Partial Infixation
R2I3 Vowel Metathesis + Compound Infixation

The hypothesis to be tested is that these new baligtad forms will maintain word-level stress dictated by the infixation template just as other infixed baligtad patterns maintain a word-level stress typical of the baligtad type. So, for example, expected results would be as in (216) and (217).

(216) R111: Complete Segment Reversal + Partial Infixation

TAGALOG			EXPECTED BALIGTAD
	R1		
salámat 'thanks'	→	*tamálas*	
	I1		
	→		[t-um-àmalás]
	R1		
mag-simbá?	→	*mag-ʔabmís*	
'X attends mass'			
	I1		
	→		[mag-ʔ-um-abmís]

(217) R2I3: Vowel Metathesis + Compound Infixation

TAGALOG				EXPECTED BALIGTAD
	R2		I3	
dítoh 'here'	→	*dótih*	→	[d-um-ò-t-imíp-ih]
	R2		I3	
gábih 'taro'	→	*bágih*	→	[b-umà-g-imíp-ih]

Another experiment could help verify the claim made here that infixes hold a psychologically real level of their own. A list of various baligtad words could be presented to native speakers unfamiliar with the game. The assignment would be to decode the secret language and explain how the real Tagalog was discovered. In this way, one might get native speakers themselves to articulate knowledge of their rules and underlying forms, just as Campbell suggests (1986:164).

[blank]

5. Conclusions and Problems for Further Research

5.1 CV phonology

Tagalog is like any language in that its various phonological processes involve a network of interdependent linguistic structures and systems. CV phonology, autosegmental reduplication, and metrical grid theory all combine to provide insights into reduplication, infixation, and stress phenomena, some of which are unaddressed or unaccounted for in the literature.

Basing the formalization of the Tagalog syllable on the notion of templates and collocational restrictions holds the advantage of including Spanish and English loanwords in a comprehensive view of modern-day Tagalog. Even in remote parts of the Philippines it is impossible to listen to Tagalog speakers without hearing a number of loanwords generously peppered throughout the dialogue. Avoiding the use of loanwords in conversational Tagalog not only sounds "bookish"; among some Filipinos, an emotional distance is created because they commonly use loanwords in expressing personal thoughts and feelings (Cada n.d.).

Syllabification rules predict how new English loanwords will be assimilated. Knowing the rules for loanword assimilation is a distinct advantage for an English speaker studying Tagalog who wants to "sound Filipino" when incorporating English borrowings.

There is no doubt a grammar, as well as a phonology, of loanwords. It should be possible to predict on the basis of factors such as the phonology and transitivity of an English root whether the agent-focus Taglish word will be prefixed with /mag-/ or infixed with /-um-/ and whether the object focus will be prefixed with /ʔi-/ or suffixed with /-in/. For example, a Tagalog speaker studying at a university will always say /mag-ʔanalayz/ 'X analyzes' but never */ʔ-um-analyz/ and /ʔi-analayz/ '(so) analyzes X' but never */ʔanalayz-in/. Further research incorporating CV phonology and morphological insights could well characterize a grammar of loanwords in Tagalog.

5.2 Autosegmental reduplication

Formalizing the Tagalog syllable lays the foundation for infixation and reduplication formulated autosegmentally. Infixation is reduced to a simple matter of infix segments anchored to a C-V template. All inflectional reduplication in Tagalog is accounted for in three templates. These templates generate archaic and modern forms not only for verbs, but for certain adjectives, as well. Using C-V templates to formulate reduplication captures similarities between the four inflected forms (basic, completive, continuative, and proposed), as well as between archaic and modern forms still present in the language.

Autosegmental reduplication employing C-V or syllable (σ)-copying templates accounts for nearly all reduplication types attested in Tagalog. There is one kind of Tagalog reduplication, however, which presents a problem because it appears as if the reduplicating morpheme is sometimes based on a C-V skeleton and sometimes on a σ skeleton. For example:

(218)	root:	*baʔít*	'kind'	prefix: *ma-* 'adjectivizer'
		ma-baʔít	'kind'	
		ma-baʔit-baʔít	'rather kind'	
	root:	*baluktót*	'crooked'	
		baluktót	'crooked'	
		balu-baluktót	'very crooked'	

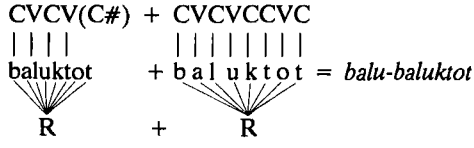
In the first example of (218), the first two syllables—CVCVC—reduplicates. In the second example, only the onset and peak of the second syllable are included in the reduplication: the shape of the reduplicated portion is CVCV. If we specify the C-V skeleton to be CVCVC + R we can generate the first but not the second. If we specify the template as CVCV + R we can generate the second but not the first. If we specify the template as σσ + R we can generate the first but not the second, since the second syllable of /baluk.tot/ is /luk/ and the result would be ***/baluk-baluktót/.*

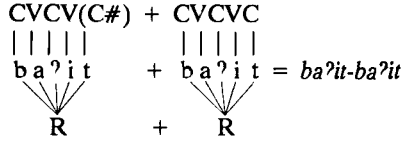
The difference between the two examples is that the stem of the first is bisyllabic whereas the stem of the second is trisyllabic. In *baʔít,* the final consonant of the second syllable is also stem-final and so is copied. In *ḅaluktót,* the final consonant of the second syllable is not stem-final and so is not copied; only the onset and peak are copied. (According to Cada (n.d.) a form of this rule is taught to Filipino schoolchildren.)

Marantz' solution to this problem is to say that "the reduplicating affix has two allomorphs" (1982:440). When the stem is CV(C)CVC#, a stem-based skeletal affix is attached to the stem; otherwise, the C-V skeletal affix, CVCCV, attaches.

We can combine Marantz' suggestion of allomorphs into one template by making the final slot of the skeletal affix an optional stem-final consonant. A segment only associates to this slot if it is stem-final.

(219) CVCV(C#) + R → CVCV(C#) + CVCVCCVC





The solution in (219) is not optimal because we have to impose a special condition (stem-final) on the final C of the reduplicating prefix.

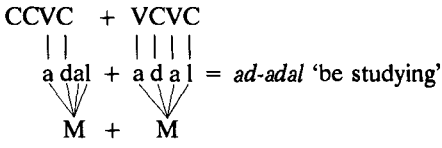
Such adjectives in Tagalog raise the question: if the reduplicating affix appears to be based on a unit between the segment and the syllable, or on constituents of the syllable (e.g., onset and peak), how can such prosodic units be incorporated into a template?

McCarthy and Prince suggest that template theory should only include units such as the PROSODIC WORD, FOOT, SYLLABLE, LIGHT SYLLABLE (monomoraic), HEAVY SYLLABLE (bimoraic), and CORE SYLLABLE, with C-V templates eliminated completely (1986:7). They show how analysis of the progressive form in Ilokano (another Philippine language) is simplified in their theory.

(220)	/basa/	ag-BAS-basa	'be reading'
	/adal/	ag-AD-adal	'be studying'
	/takder/	ag-TAK-takder	'be standing'
	/trabaho/	ag-TRAB-trabaho	'be working'

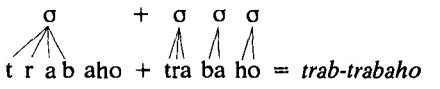
In the Ilokano data of (220), the reduplicated portion is one closed syllable. In traditional C-V template theory, the template must be designated as CCVC + M (phoneme-driven) to accommodate the first four segments of /trabaho/ 'work'. But with this C-V template (as others), some C-V slots (e.g., the first CC) will be superfluous for stems such as /adal/ 'study':

(221) For the stem /adal/: CCVC + M → CCVC + VCVC



McCarthy and Prince advocate a simpler formulation: a syllable template with one syllable prefixed to the stem syllables. The first syllable has all the stem segments available to it for association. Since no other σ competes for association in this first constituent, this first σ always receives a coda.

(222)



Syllabification in the stem is limited by the ONSET FIRST PRINCIPLE (2); hence /traba.ho/. But the prefix in this case is /trab/.

The unique feature of adjective reduplication in Tagalog is that the prosodic unit of reduplication CHANGES depending on whether the stem is bi- or trisyllabic. For bisyllabic stems, the unit is the foot, or two maximal syllables. For trisyllabic stems, the unit is the foot minus final coda, or a maximal syllable plus a light syllable. Even with the insight of McCarthy and Prince into Ilokano progressive reduplication, Tagalog adjective reduplication remains a problem.

5.3 Stress via metrical grid theory

The contribution of grid theory to an analysis of Tagalog is that secondary stress patterns, previously unaccounted for and hardly mentioned in the literature surveyed, are now seen to follow certain general principles of stress assignment. Because of Tagalog's richly productive morphology, a verb can consist of many syllables; hence the importance of knowing how secondary stress is predicted. In addition, understanding the rules governing the presence or absence of secondary stress helps one to recognize the derivational difference between contrastive pairs like [kà?ínan] 'feast' and [ka?ínan] 'table'; [pàsúkan] 'doorway' and [pasúkan] 'place ST inside of X'; [magsàsákah] 'will farm' and [màgsasákah] 'farmer'.

As in English, certain alternate forms have come into general acceptance which do not follow the stress assignment rules proposed. Some acceptable variants to the rules proposed in Chapter 3 are listed in (223).

(223)	PREDICTED BY RULES	ACCEPTED VARIANTS	
	[kapayàpa?án]	[kapàyapá?an]	'peace'
	[màgsasákah]	[màgsasakáh]	'farmer'
	[matalìtalinóh]	[matalìtalínoh]	'rather intelligent'

Although alternate forms such as those in (223) exist, the forms predicted by the rules are also considered correct. The alternate forms of certain words must be memorized as must any exceptions to a rule.

5.4 Empirical testing to bring us back to earth

A theory with great elegance and generative power has questionable worth if its constructs do not reflect an underlying reality. Word games such as baligtad are one way of examining empirical evidence for supporting or arguing against the reality of proposed linguistic structures and systems. The discussion of baligtad Tagalog and resulting implications in Chapter 4 is only a beginning and perhaps understates the importance of empirical testing. To the extent that theoretical constructs and systems are not yet validated by empirical evidence, I believe one must hold lightly to a particular theoretical framework or formulation.

In spite of the various theoretical advantages offered by CV, autosegmental, and metrical grid theory, one wonders whether the structures assumed or proposed are truly faithful to the actual mental processes of a native speaker. In closing, I quote a reminder that linguists must critically test their formulations for underlying reality if they are honestly pursuing a faithful representation of language:

> There is really no limit to the imaginative, elegant, and intellectually satisfying hypotheses they [linguists] can dream up to account for observed linguistic behavior. Unfortunately, the systems they seek to understand, human language and speech, which have a physical and psychological reality, are limited. . . . The problem, then, is to constrain the range of hypotheses we entertain in the same way that the real world is constrained. Only information from the real world can provide this check on our hypotheses. Without such negative feedback from empirical tests, our hypotheses are liable to run out of control. (Ohala 1974:269)

[blank]

APPENDIX A:

Tagalog Phonemic Segments

The chart below for Tagalog, excluding parenthesized segments, is identical to that of many linguists (e.g., Ramos 1971, Llamzon 1976) except for the inclusion of /č ǰ/. Schachter includes /č f/ in parentheses, indicating their status as foreign borrowings (1972:18). Panganiban (1972) spells Spanish borrowings with /č ǰ/ as *ts* and *dy*. (See Section 2.6 arguing for /č/ and /ǰ/ as unit segments.)

Segments in parentheses may or may not exist in a particular speaker's inventory, depending on his exposure to English. Panganiban (1972:xii) lists /f v š ž/ as sounds used by many speakers but does not include them in his dictionary.

(222) Tagalog Consonants

		Labial	Dental	Alveol	Palatal	Velar	Glottal
Stops	vl	p		t	č	k	ʔ
	vd	b		d	ǰ	g	
Nasals		m		n		ŋ	
Fricatives	vl	(f)	(θ)	s	(š)		h
	vd	(v)	(ð)	(z)	(ž)		
Lateral					l		
Liq Flap					r		
Semi-Vowels		w			y		

(223) Tagalog Vowels

	Front	Central	Back
High	i		u
Mid	e		o
Low		a	

[blank]

APPENDIX B:

Consonant Clusters

Listed below are examples of loanwords either in common use or viable loanwords which exhibit the consonant cluster patterns delimited by the AUXILIARY ONSET TEMPLATES (12, 13) and CODA COLLOCATIONAL RESTRICTIONS (14). Clusters not allowed are marked by a dash, —.

(224) Initial Consonant Clusters In Tagalog

	-r		-l	
p-	/príto/	'fried'	/pláto/	'plate'
b-	/bráso/	'arm'	/blúsa/	'blouse'
t-	/trápo/	'rag'	—	
d-	/dráma/	'drama'	—	
k-	/krús/	'cross'	/kláse/	'class'
g-	/grába/	'gravel'	/glóbo/	'globe'
f-	/fríz/	'freeze'	/fláyt/	'flight'
θ-	/θrí/	'three'	—	

(225) 2-Consonant Codas In Tagalog

	-p	-t	-d	-k	-s
p-	—	—	—	—	/líps/ 'lips'
t-	—	—	—	—	/báts/ 'bats'
k-	—	—	—	—	/bíks/ 'vicks'
m-	/límp/ 'limp'	—	—	—	/híms/ 'hymns'
n-	—	/hínt/ 'hint'	/ʔénd/ 'end'	/wínk/ 'wink'	/léns/ 'lens'
(f)-	—	—	—	—	/páfs/ 'puffs'
(v)-	—	—	—	—	/náyvs/ 'knives'

	-p	-t	-k	-b	-d
l-	/pálp/ 'pulp'	/pélt/ 'felt' '	/mílk/ milk'	/bálb/ 'bulb'	/ʔóld/ 'old folks'
r-	/hárp/ 'harp'	/tárt/ 'tart'	/párk/ 'park'	/kúrb/ 'curb'	/rékord/ 'record'
w-	/kówp/ 'cope'	/iskáwt/ 'scout'	/ʔówk/ 'oak'	/ʔistówb/ 'stove'	/kráwd/ 'crowd'
y-	/ʔistráyp/ 'stripe'	/háyt/ 'height'	/máyk/ 'microphone'	/dráyb/ 'drive'	/réyd/ 'raid'

	-m	-n	-s	(-f)	(-v)
l-	/pílm/ 'film'	/kíln/ 'kiln'	/píls/ 'pills'	/ʔélf/ 'elf'	/délv/ 'delve'
r-	/dórm/ 'dorm'	/módern/ 'modern'	/nárs/ 'nurse'	/túrf/ 'turf'	/kúrv/ 'curve'
w-	/ʔówm/ 'ohm'	/bráwn/ 'brown'	/bláws/ 'blouse'	/ʔówf/ 'oaf'	/grówv/ 'grove'
y-	/táym/ 'time'	/fáyn/ 'fine'	/béys/ 'base'	/láyf/ 'life'	/dáyv/ 'dive'

(226) 3-Consonant Codas In Tagalog

	-nt	-st	-nd	-ps	-ts	-ks
y-	/péynt/ 'paint'	/péyst/ 'paste'	/gráynd/ 'grind'	/páyps/ 'pipes'	/káyts/ 'kites'	/léyks/ 'lakes'
w-	/káwnt/ 'count'	/tówst/ 'toast'	/ráwnd/ 'round'	/rówps/ 'ropes'	/ráwts/ 'routes'	/jówks/ 'jokes'

	-bs	-ds	-ms	-ns	-ls
y-	/háybs/ 'hives'	/réyds/ 'raids'	/cáyms/ 'chimes'	/láyns/ 'lines'	/ʔáyls/ 'aisles'
w-	/rówbs/ 'robes'	/kówds/ 'codes'	/kówms/ 'combs'	/lówns/ 'loans'	/ʔáwls/ 'owls'

	-(fs)		-(vs)	
y-	/fáyfs/	'fifes'	/láyvs/	'lives'
w-	/ʔówfs/	'oafs'	/lówvs/	'loaves'

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