PHONOLOGY OF ARALLE-TABULAHAN

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CONTENTS

Sulawesi phonologies (Workpapers in Indonesian Languages and Cultures, vol. 12), edited by René van den Berg, pages 98-149. Ujung Pandang: Summer Institute of Linguistics in cooperation with the Department of Education and Culture, 1991.

LIST OF TABLES

ABBREVIATIONS AND SYMBOLIC CONVENTIONS

A.....absolutive
A.....Aralle
ACT.....actuative
A-T.....Aralle-Tabulahan
ATR.....advanced tongue root
C.....consonant
CMP.....completive
conj.....conjunction
E.....ergative
EMPH.....emphatic
FUT.....future
GPRO.....general pronoun
IC.....intonation contour
INT.....intransitive
LOC.....locative
NCMP.....incompletive
nom.....with nominals
NZR.....nominalizer
PASS.....passive
POS.....possessive
PRT.....particle
PSS.....Proto South Sulawesi
PUS.....Pitu Ulunna Salu
REC.....reciprocal
REF.....referential
s/t.....something
T.....Tabulahan
TAGQ.....tag question
UCT.....uncertainty
UF.....underlying form
V.....vowel

var.....variant
vd.....voiced
vl.....voiceless
YNQ.....yes/no question

1.....first person
2.....second person
3.....third person
s.....singular
d.....dual
p.....plural
n.....inclusive
x.....exclusive
#.....word boundary
−.....morpheme boundary (ex.s)
+.....morpheme boundary (rules)
$.....syllable boundary (rules)
V.V.....syllable boundary (ex.s)

V.....lengthened segment
V́.....stressed syllable
~.....is in variation with
*.....disallowed form

/ /.....(morpho)phonemic script
[ ].....phonetic script
' '.....English gloss
( ).....optional

{.....one of two or more
{.....alternates

1 INTRODUCTION

Aralle-Tabulahan (A-T), an Austronesian language, is a member of the northern South Sulawesi language family. Most of its 7,000 speakers live in the subdistricts of Aralle, Ralle Anak, Tabulahan and Mambi in the northern and western parts of Mambi district in South Sulawesi's Polewali-Mamasa subprovince. Linguistic surveys have variously categorised A-T as: a dialect/dialects of the Pitu Ulunna Salu language (PUS) (Grimes & Grimes 1987); a probably separate language, comprising what may be a single dialect (Friberg 1987); a separate language and member of the proposed Pitu Ulunna Salu subfamily (Strømme 1987). I concur with Strømme's conclusion that A-T is a separate language, sharing enough common features with languages to the south to be considered part of a common subfamily, and sufficiently few similarities with languages to the east to be considered part of the Toraja-Sa'dan subfamily. Strømme lists three dialects for A-T, including Mambi. However since Mambi is as close lexically to PUS as it is to A-T, and on the surface at least appears phonologically closer to PUS than to A-T, I do not consider it a dialect of A-T and have made no attempt at this point to analyse its phonology.

To the best of our knowledge no previous linguistic work has been carried out in the A-T language. Linguistic research is currently being undertaken in the neighbouring PUS language, known locally as Bambam/Bambang. Written work on PUS includes an unpublished manuscript on the phonology of that language (Campbell, this volume). A-T shares a number of common phonological features and processes with PUS, but also differs on a number of points.

The field work on which this study is based was conducted under the UNHAS-SIL cooperative working agreement and mostly in the villages of Salu Leang and Tabulahan in the Tabulahan subdistrict. Accordingly this paper deals principally with the Tabulahan dialect of the language, although the major points of divergence from this as evident in the Aralle dialect have been noted as well. I have based the analysis on the generative approach, but have reserved the right to depart from this where it seemed helpful to do so.

2 SEGMENTALS

2.1 Phones and Phonemes

There is little allophonic variation among A-T consonant phonemes, but most A-T vowel phonemes have more than one phonetic form. The charts in this section present the phones found in A-T and their underlying phonemes.

2.1.1 Phones

Of the 25 phones found in this dialect, 15 are contoids and 10 are vocoids.

Table 1 - Contoids

	bilabial	dental	alveolar	palatal	velar	glottal
stop (vl)	p	t			k	?^
(vd)	b		d			
fricative			s			h
nasal	m		n		ŋ	
lateral			l			
flap			ř			
semivowel				y		

Two glottal stops have been posited. In addition to 'regular' glottal stop [?] which occurs in syllable final position, a second weaker glottal [^], differing only in this respect, is found occurring between identical vowels. Section 2.4.1 discusses its status more fully. (See also section 5.3 Rule 15.)

Table 2 - Vocoids

	front	central	back
high tense	i		u
lax	ɪ		ʊ
mid tense	e		o
lax	ɛ		ɔ
low	æ	a	

2.1.2 Phonemes

From the 25 phones tabulated above, 18 are to be considered phonemes. These 12 consonants and 6 vowels are listed below.

Table 3 - Consonants

	labial	coronal	back
stop (vl)	p	t	k
(vd)	b	d	
fricative		s	h
nasal	m	n	ŋ
lateral		l	
semivowel		y	

It can be seen from Table 3 that the phones [ʔ], [ˆ] and [ř] have not been assigned phoneme status. It will be shown in section 5.1 that /k/ and /d/ are subject to strength changing processes in certain environments (Rules 3 and 4), producing the allophones [ʔ] and [ř] respectively. Section 5.3 also shows the process deriving the phone [ˆ] (Rule 15).

Table 4 - Vowels

	front	back
high	i	u
mid	e	o
low	æ	a

The 10 vocoids presented in Table 2 are thus reduced to six vowel phonemes. Each of the non low vowels has two allophones, one tense (+ ATR) and one lax (− ATR). The processes describing these allophonic changes are found in Section 5.1 (Rules 5 & 6).

2.1.3 Distinctive Features

Table 5 - Consonant Feature Matrix (including allophones)

	p	t	k	b	d	s	h	m	n	ŋ	l	y	ʔ	ř
syllabic	−	−	−	−	−	−	−	−	−	−	−	−	−	−
consonantal	+	+	+	+	+	+	−	+	+	+	+	−	−	+
continuant	−	−	−	−	−	+	+	−	−	−	+	+	−	−
nasal	−	−	−	−	−	−	−	+	+	+	−	−	−	−
anterior	+	+	−	+	+	+	−	+	+	−	+	−	−	+
coronal	−	+	−	−	+	+	−	−	+	−	+	+	−	+
voiced	−	−	−	+	+	−	−	+	+	+	+	+	−	−
flap	−	−	−	−	−	−	−	−	−	−	−	−	−	+

Table 6 - Vowel Feature Matrix (including allophones)

	i	ɪ	u	ʊ	e	ɛ	o	ɔ	æ	a
syllabic	+	+	+	+	+	+	+	+	+	+
high	+	+	+	+	−	−	−	−	−	−
low	−	−	−	−	−	−	−	−	+	+
back	−	−	+	+	−	−	+	+	−	+
ATR	+	−	+	−	+	−	+	−		

2.2 Interpretation

2.2.1 Consonant versus Vowel

When occurring in a syllable peak /i/ is interpreted as a vowel:

(1)	[hí.pe]	/hipe/	'across'
	[í.o]	/io/	'yes'

When occurring in syllable onset or coda position /i/ is interpreted as a consonant:

(2)	[té.ye]	/teye/	'hand'
	[kǽy.yæŋ]	/kæyyæŋ/	'big'
	[yá.liŋ]	/yaliŋ/	'inside'

If the word */teie/ existed, it would be distinguishable from /teye/ on the grounds of stress. Compare *[te.í.e] with [té.ye]. When /i/ occurs in word final position, stress cannot always be the basis of proof that /i/ is either vowel or consonant.

(3)	[má.i]	/mai/	'to here'

In example 3, [mói] would be stressed as shown, whether a one or a two syllable word. It could then be interpreted as either /mai/ or /may/. However, since monosyllabic words are quite infrequent in A-T, an interpretation of vowel is more likely to be correct. I am interpreting all cases of word final /i/ as vowel then, until there is evidence to the contrary.

The other high vowel /u/, is always interpreted as a vowel. It only occurs in syllable peaks.

(4)	[u.há.ti]	/uhati/	'grub'
	[léh.su?]	/lehsuk/	'egg'
	[tá.u]	/tau/	GPRO

2.2.2 Segment versus Sequence

The Tabulahan dialect of A-T displays no affricates/ stop + homorganic fricative combinations other than in a few Indonesian loan words.

Four sets of potentially ambivalent sequences occur in A-T and therefore need to be addressed:

a) nasal + homorganic stop
b) double segments (geminates)
c) glottal stop + other stop
d) vowel clusters

a) Nasal + homorganic stop combinations abound but only word medially and across a syllable boundary. They are interpreted then as sequence; never as prenasalised stop.

(5)	[lám.bu]	/lambu/	'to pound'
	[pan.tú.he]	/pantuhe/	'tube for blowing fire'
	[táŋ.ke]	/taŋke/	'branch'

b) Double consonants often occur at morpheme boundaries and only across syllable boundaries. They are rather less frequent than in many other South Sulawesi languages, generally corresponding to the form [hC]. That is, where cognates in related languages (or dialects viz. Aralle) have a geminate consonant cluster ([CC]), the Tabulahan dialect of A-T frequently has the form [hC]. Thus:

(6)	/bittik/ (Aralle)	=	/bihtik/	(Tabulahan)	'foot'
	/hessæk/ (")	=	/hehsæk/	(")	'mud'.

This sequence of fricative + frictive/stop is itself univalent and grounds to interpret its geminate counterparts as sequence.

c) Glottal stop + other stop is a combination again interpreted as sequence. Besides occurring across syllable boundaries in certain roots,

(7)	[ú?.da]	/ukda/	'no' (Aralle/Mambi),

This combination frequently occurs across morpheme boundaries and is also generated by a morphophonemic process affecting stative verbs (see section 5.3, Rule 21)

(8)		[malumbɛŋ]	/malimbeŋ/	'deep'
	becomes	[mali'?bɛ?]	/malikbek/	'very deep'

d) Vowel clusters generally have reversed counterparts and all vowels occur in combination with at least four of the other vowels. Accordingly I am interpreting all such clusters as sequences, not as diphthongs or long vowels.

2.3 Description of Phonemes

2.3.1 Consonant Phonemes

All A-T consonant phonemes occur in word initial and medial positions. In addition to initial and medial positions, /k/ and /ŋ/ are also found word-finally. In this position /k/ is realised as [ʔ]. As word-initial phonemes the functional load of /y/ and of /ŋ/is extremely low; only a few examples of either exist in this position.

Consonant Phoneme Positions

/p/ Voiceless bilabial plosive, occurs word initially and medially.

(9)	initial	/puha/	[púha]	'already'
	medial	/pepahi/	[pepáhi]	'wind'

/t/ Voiceless dental plosive, occurs word initially and medially.

(10)	initial	/tuho/	[túho]	'to live'
	medial	/mate/	[máte]	'to die'

/k/ Voiceless velar plosive, realised by the following variants:

[ʔ] Voiceless glottal stop, occurs syllable finally in word medial and final positions.

(11)	medial	/sikda/	[síʔda]	'truly'
	final	/dakek/	[dákɛʔ]	'not yet'

[k] Voiceless velar plosive, occurs syllable initially in word initial and medial positions.

(12)	initial	/kaba/	[kába]	'coffee'
	medial	/haka/	[háka]	'ball'

/b/ Voiced bilabial plosive, occurs word initially and medially.

(13)	initial	/bohto/	[bóhto]	'village'
	medial	/kaheba/	[kahéba]	'news'

/d/ Voiced alveolar plosive, realised by the following variants:

[ř] Voiced alveolar flap, optionally occurs in intervocalic position.

(14)		/tadia/	[tadía] ~ [tařía]	'not' (nom)

[d] Voiced alveolar plosive, occurs word initially and medially.

(15)	initial	/dio/	[dío]	'2s'
	medial	/kundaŋ/	[kúndaŋ]	'thunder'

/s/ Voiceless alveolar frictive, occurs word initially and medially.

(16)	initial	/sua/	[súa]	'mouth'
	medial	/dasaŋ/	[dásaŋ]	'house'

/h/ Voiceless glottal fricative, occurs word initially and medially.

(17)	initial	/hapu/	[hápu]	'kitchen'
	medial	/peheŋi/	[pehéŋi]	'yesterday'

/m/ Voiced bilabial nasal, occurs word initially and medially.

(18)	initial	/madondoŋ/	[maɾ̌ɔ́ndɔŋ]	'tomorrow'
	medial	/kamehsa/	[kaméhsa]	'nine'

/n/ Voiced alveolar nasal, occurs word initially and medially.

(19)	initial	/næik/	[næi?]	'young girl'
	medial	/kenek/	[kénɛ?]	'rain'

/ŋ/ Voiced velar nasal, occurs word initially, medially and finally.

(20)	initial	/ŋaŋŋak/	[ŋáŋŋa?]	'bridle'
	medial	/seŋak/	[séŋa?]	'different'
	final	/puduŋ/	[púɾ̌uŋ]	'nose'

/l/ Voiced alveolar lateral, occurs word initially and medially.

(21)	initial	/lalaŋ/	[lálaŋ/	'road'
	medial	/ile/	[íle]	'snake'

/y/ Voiced palatal semivowel, occurs word initially and medially.

(22)	initial	/yaho/	[yáho]	'up'
	medial	/teye/	[téye]	'hand'

2.3.2 Vowel Phonemes

All six A-T vowel phonemes occur in both stressed and unstressed open syllables and both stressed and unstressed closed syllables as the following examples show.

Vowel Phoneme Positions

/i/ Voiced high front unrounded vowel phoneme, realised by the following variants:

[ɪ] Voiced high open front unrounded vocoid, occurs in closed syllables before anterior consonants.

(23)	/dinne/	[dɪnne]	'here'

[i] Voiced high close front unrounded vocoid, occurs in open syllables and syllables closed by back consonants.

(24)	open	/hipe/	[hípe]	'across'
	closed	/bihti?/	[bíhti?]	'leg'

/e/ Voiced mid front unrounded vowel phoneme, realised by the following variants:

[ɛ] Voiced mid open front unrounded vocoid, occurs in closed syllables.

(25)	/betek/	[bétɛ?]	'to go across'

[e] Voiced mid close front unrounded vocoid, occurs in open syllables.

(26)	/behiŋ/	[béhiŋ]	'edge'

/æ/ Voiced low front unrounded vowel phoneme, occurs in open and closed syllables.

(27)	open	/bælæbæk/	[bælǽbæ?]	'woven bamboo'
	closed	/tæmpæk/	[tǽmpæ?]	'youngest'

/u/ Voiced high back rounded vowel phoneme, realised by the following variants:

[ʊ́] Voiced high open back rounded vocoid, occurs in closed syllables before anterior consonants.

(28)	/sumbana/	[sumbána]	'before'

[u] Voiced high close back rounded vocoid, occurs in open syllables and syllables closed by back consonants.

(29)	open	/supu/	[súpu]	'only'
	closed	/uhpak/	[úhpa?]	'four'

/o/ Voiced mid back rounded vowel phoneme, realised by the following variants:

[ɔ] Voiced mid open back rounded vocoid, occurs in closed syllables.

(30)	/saohkok/	[saɔ́hkɔ?]	'small'

[o] Voiced mid close back rounded vocoid, occurs in open syllables.

(31)	/pano/	[páno]	'go level'

/a/ Voiced low back unrounded vowel phoneme, occurs in open and closed syllables.

(32)	open	/aha/	[áha]	'there is/are'
	closed	/ampok/	[ámpɔ?]	'but'

2.4 Contrast of Phonemes

2.4.1 Contrast of Consonant Phonemes

Two possible conclusions can be reached in analysing the phones [k], [ʔ] and [^].

Firstly, [ʔ] appears word finally and medially before other contoids and so complements [^] which only occurs intervocalically. It would seem then that they are allophones of the one phoneme. Pairs can be found to illustrate contrast between [k] and /ʔ/ intervocalically, leading to the conclusion that they are separate phonemes.

(33)	/k/,/ʔ/	/haka/	[háka]	'ball'
		/haʔa/	[há^a]	'top plate (of house frame)'
		/dakaŋ/	[dákaŋ]	'basket (man's)'
		/daʔa/	[dá^a]	'don't!'

However [ʔ] also occurs intervocalically at morpheme boundaries.

(34)	/pa-elaʔ-i/	[paélaʔi]	'go carefully!'
	/maʔ-oto/	[maʔóto]	'to go by car'

Alternatively if we examine [^] in context we find it not only occurs intervocalically, but also always between identical vowels.

(35)	[ɪndó^o]	'that'
	[ɪndé^e]	'this'
	[maní^i]	'soon'

There are no geminate vowels in A-T, so it would not be unreasonable to posit an epenthetical process by which [^] is inserted to break up the vowel cluster present in the underlying structure of words such as [há^a]. This being the case, we are left without intervocalic contrast between pairs like /haka/ and /háa/. [k] occurs word initially and intervocalically (ie always syllable-initially); [ʔ] occurs only syllable finally. Since the environment governs the selection of either one or the other and does so completely predictably, we can conclude that [ʔ] and [k] are allophones of a single phoneme, which we will call /k/.

I have adopted this second analysis as being the more reasonable and elegant, because the glottals are completely predictable and the net result is one less phoneme. There remain only four other pairs of consonants close enough to need contrasting.

(36) - Consonant Contrasts

/p/,/b/	/pahe/	[páhe]	'rice (plant)'
	/bahi/	[báhi]	'pig'
/t/,/d/	/tontoŋ/	[tɔ́ntɔŋ]	'to remain'
	/tondoŋ/	[tɔ́ndɔŋ]	'top'
/k/,/h/	/kenek/	[kénɛʔ]	'rain'
	/henek/	[hénɛʔ]	'sago glue'
/n/,/ŋ/	/naoa/	[náoa]	'he said'
	/ŋaoo/	[ŋáo^o]	'you're lying!'

2.4.2 Contrast of Vowel Phonemes

(37) - Vowel Contrasts

/i/,/e/	/kalumpini/	[kalumpíni]	'sideburns'
	/kalumpeni/	[kalumpéni]	'swift (bird)'
/e/,/æ/	/heŋkæŋ/	[héŋkæŋ]	'to laugh-cry'
	/hæŋkæŋ/	[hǽŋkæŋ]	'twig'
/æ/,/a/	/lempæŋ/	[lémpæŋ]	'to stop and visit'
	/lempaŋ/	[lémpaŋ]	'to overflow a cup'
/a/,/o/	/lekbak/	[lɛ́ʔbaʔ]	'to leave'
	/lekbok/	[lɛ́ʔbɔʔ]	'sea'
/o/,/u/	/poaŋ/	[póaŋ]	'tree'
	/puaŋ/	[púaŋ]	'lord'

3 SUPRASEGMENTAL FEATURES

3.1 Stress

Stress in A-T is regular and predictable. Apart from three conditions which place stress on other syllables, stress in this language always falls on the penultimate.[1]

(38)	[táma]	'to enter'
	[patáma]	'to cause to enter'
	[kupatáma]	'I cause to enter'
	[lakupatáma]	'I will cause to enter'

Rule 1 - Stress placement

$$S \rightarrow [+stress] \; / \; \_\_ \; \begin{bmatrix} S \\ [-stress] \end{bmatrix} \; \# \; \text{word}$$

The three conditions overriding this general pattern are:

a) distal vocative stress placement
b) enclitics
c) certain off-glides

a) Vocatives will follow one of two patterns. When addressing someone at close range, stress placement on the name or term of address is on the penultimate syllable in accordance with the general pattern of the language. But if the addressee is at some distance from the speaker the stress placement is altered such that stress now falls on the final syllable. With this there is usually an increase in volume or force of delivery commensurate with the distance involved.

(39)	close range	[o sɔ́ʔyaŋ]	'Oh Sofian'
	distance	[sɔʔyáŋ]	'Sofian' (called)

This process can be handled by the following rule:

Rule 2 - Distal Vocative Stress Placement

$$S \rightarrow [+stress] \; / \; \_\_ \;] \; \# \; \text{distal vocative word}$$

Rule 2 needs to precede Rule 1 in rule ordering, so that the the final syllable of a distal vocative will already be stressed and therefore not undergo Stress Placement.

b) As stress placement is measured from the right end of the word, prefixes and proclitics can have no bearing on it. Suffixes and enclitics on the other hand do affect the positioning of stress. Any suffix attached to a root in A-T will cause the stress on that root to shift to the right so that it remains on the penultimate syllable.

(40)	[dásaŋ]	'house'
	[dasáŋku]	'my house'

With suffixes then, stress remains on the penultimate syllable.

Enclitics, however, by definition cannot be stressed and neither do they cause the stress to shift from its position on a root or stem. They merely 'lean' on the tail end of a word and in so doing add extra syllables to the right of the stressed syllable. Thus with one enclitic attached stress will be on the antepenultimate

syllable; with two it will be found on the preantepenultimate syllable. Both frequently occur.

(41) [mařɔ́ndɔŋ] + [-kɛ?] -> [mařɔ́ndɔŋkɛ?]
'tomorrow' (NCMP) 'tomorrow' (NCMP)

[uŋkɔ́hti?] + [-řa] + [-ka] -> [uŋkɔ́hti?řaka]
'you pick' (UCT) (YNQ) 'Did you pick?'

c) Certain vowel sequences, notably those beginning with /a/ can in rapid speech skew the expected stress pattern. Where stress should occur on the second vowel of the sequence, it is sometimes thus left-shifted one place. A closer examination of the same word at a slower speed reveals that in fact stress does fall on the second of the sequence as expected.

(42) [maí?di] ~ [mái?di] 'many'
[saɔ́hkɔ́?] ~ [sáɔhkɔ?] 'small'
[paéla?i] ~ [páela?i] 'go carefully'

3.2 Vowel Length

Consonantal length has been handled at the segmental level, above. We have seen that lengthened consonants are phonemically determined and are interpretated as geminate sequences.

A-T has no phonemically lengthened vowels. However vowel length is present phonetically to a predictable pattern. In stressed open syllables there is a slight lengthening of the syllable nucleus, not present in other syllables.[2]

(43) [í.si] /isi/ 'tooth'
[íhsi] /ihsi/ 'to fill'

3.3 Intonation

Speakers of surrounding languages sometimes refer to the speech of their Tabulahan neighbours as being like Chinese or like 'bird talk'. A-T is certainly not a tonal language; neither is its intonation system radically different from those of neighbouring languages. There are however some interesting differences.

3.3.1 Sentence Level

The major difference so far encountered is with content questions at the sentence level. Where PUS for example has a rise in intonation at the last stressed syllable of the sentence with both yes/no and content questions, A-T content questions would generally have a sharp fall followed by a rise to the initial level.

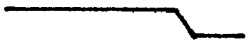
For most sentence types the intonation is level until a nucleus at the last stressed syllable. Here the pitch level changes either up or down and either remains at that level until the end, or changes again on the following syllable.

Below is a list of sentence level intonation patterns frequently encountered. This is neither an exhaustive list, nor are the intonation patterns described

completely definitive. Rather these are patterns we have observed, which are subject to a certain amount of variation due to subtle meaning differences.

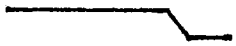
Statements typically have a level intonation falling at the nucleus and remaining at the lower pitch level until the end. The fall often seems to be equivalent to a fall of a major third in music.

IC1



(44) [maŋsihuaŋ dúlle]
'We are frying corn.'

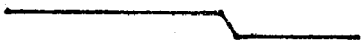
IC1



[lá?bi sambúlaŋ]
'More than a month.'

This is also the pattern for hortatives, though the fall is not necessarily so pronounced.

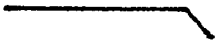
IC1



(45) [máimo ánna móhkoiŋke]
'Come let's sit down.'

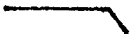
Imperatives are also signalled by a falling intonation, but the nucleus is the last syllable.

IC2



(46) [lémpæŋkaŋko]
'Stop and visit!'

IC2



[ɛmpéi^i]
'Wait!'

Vocatives can have one of two intonation patterns. Close range is identical with the pattern for hortative intonation.

IC1

(47) [o máma? óndɔŋ]
'O, Ondong's mother...'

When people are being called, that is the range is somewhat further, the intonation pattern for vocatives is shurply rising on the last syllable which is also stressed and lengthened, then falling slightly as it trails off.

IC3 

(48) [púa? handé:]
'Uncle of Hande...'

Yes/no questions rise at the last stressed syllable, sometimes remaining high for the rest of the sentence,

1C4 

(49) [laolalánaŋřaka]
'Are you going to weave a herringbone pattern?'

but more commonly falling for the remaining syllables.

1C5 

(50) [lamasáeo di yáho]
'Will you be up there long?'

1C5 

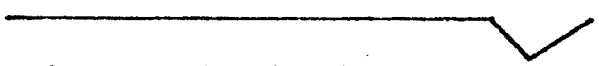
[áha pakulímmu]
'Have you any medicine?'

Content questions can follow this latter pattern also.

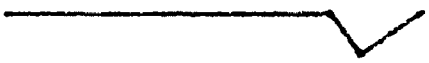
IC5 

(51) [umbanóa uŋsá?diŋ]
'How do you feel?'

However the general pattern for content questions is usually a fall equivalent to a perfect fourth in music (but may be anywhere between a major third and a perfect fifth), at the last stressed syllable followed by a rise to the previous pitch level for the remaining syllables.

IC6 

(52) [i píhhaŋ lamáo bóu dái ? di maŋkása?]
'When are you going to Ujung Pandang again?'

IC6 

[saŋŋáka taúmmu mepáhe]
'How many people do you have harvesting rice?'

Tag questions follow statement intonation, but with a sharp rise on the final syllable.

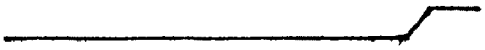
IC7 

(53) [dáko?kɛ? máne kukutúi tóuo dío né]
'Later I'll delouse you too ok?'

IC7 

[dáun duŋkú?i indó^o né]
'Don't you go near that, will you?'

Request intonation is typically a rise on the last stressed syllable maintained to the end of the sentence. This is the same pattern as for some yes/no questions (IC4). Requests are in fact a subset of yes/no questions. While expecting a positive answer, there is always the possibility that the request will be denied.

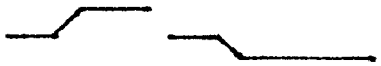
IC4 

(54) [lamálařaka uŋálli^iŋkæ? uháse]
'Can you buy me an axe?'

The Either/Or construction is signalled by a rise on the stressed syllable of the 'either' and a fall for the stressed and following syllables of the 'or'.

IC8 

(55) [uŋsábi?řaka báhtu? uŋkóhti?řaka]
'Did they sickle-cut or did they pick?'

IC8 

[dinóařaka mařóndɔŋřaka]
'either today or tomorrow'

Surprise/contraexpectation intonation consists of a sharp rise on the last stressed syllable falling slightly for subsequent syllables.

IC9 

(56) [o makórɔŋ lólo keařahámmu]
'Oh, is your horse continually sick?!'

IC9 

[kulámbi? ɪndóku namesamésa]
'I found my mother by herself!

3.3.2 Higher Level

Discourse level intonation can be defined in terms of three levels: P1, P2 and P3. These are separated and also distinguished by pauses the length of which increases with an increase in level. The first, P1, is marked by a slight falling intonation on the final syllable and a slight pause. The second, P2, is signaled by a

rise after the last stressed syllable and a short pause. A longer pause and a sharply falling intonation on the last stressed syllable marks P3.

The following textual excerpt illustrates these three levels, using \, \\, \\\ to indicate the close of P1, P2 and P3 respectively.

(57)

[ɪndéˆe téřɔŋ\\dikámbi?\\alloállo\\disáŋkɛ?\\
this buffalo tended daily tied

dipatáma di kandánna kebéŋiˆi\\\pihsanánna\tállu pahiamánna dikámbi?
made to enter at corral at night then three years tended

\\ɪndéˆe téřɔŋ kǽyæmmi\\\dialámiŋ téřɔŋ lakɪnna púa? lénɔŋ
this buffalo already big fetched buffalo male uncle Lenong

ánna dipandalúiˆi\\i yáho di tanéte béhtɛŋ\\\pihsanánna\púha
and mated it up on mount Behteng then already

mopandálu\\kehæhtæŋ póle? diáto téřɔŋ\\\]
mated pregnant indeed that buffalo

This buffalo\\ was tended\\ daily\\ tied\\and fenced in at night\\\Then\after three years of being cared for\\it was fully grown\\\Lenong's uncle's male buffalo was brought to mate with it\\up on mount Behteng\\\Then\having mated\\the buffalo was pregnant indeed\\\

4 DISTRIBUTION

In this section we shall look at the distribution of consonants and vowels within phonological words; how they pattern and restrictions to further patterning. In order to examine these patterns of distribution, it is neccesary firstly to understand the components that constitute the phonological word, namely syllables.

4.1 The Syllable

Syllables in A-T are simple in structure, consisting obligatorily of a vowel nucleus, which may be preceded by a single consonant as a syllable onset and may be followed by a single consonant as a coda. There are then, four possible syllable types in A-T: two open, V and CV; and two closed, VC and CVC.

Divisions between syllables are also of four possible configurations, since there are two open syllable types and two closed. Any syllable may be preceded by an open syllable: (C)V.V(C) or (C)V.CV(C) or by a closed syllable: (C)VC.V(C) or (C)VC.CV(C). In practice the third of these configurations is rare, intervocalic consonants generally being interpreted as fitting a V.CV pattern in accordance with the 'maximise onset principle' of CV-phonology, leading to resyllabification. VC.V syllable divisions do occur, but only where C = [ʔ]. In such a case no resyllabification takes place.

It follows that there are sixteen potential permutations of two syllables, illustrated in (58). Of these, four could be predicted to be unlikely to occur, (i), j), m) and n)), in that they contain the combination C.V, which would be usually interpreted as CV occuring within a syllable. That any of these do occur is due only to the fact that [ʔ] occurs syllable finally, but never syllable initially. Words such as those illustrated in m) and n) can therefore be formed with one of the glottal-final morphemes prefixed to vowel-initial roots. Some of the following examples then are polymorphemic, while others are single morphemes.

The two permutations not illustrated below are unlikely to occur. If either should, we could predict the contoid [ʔ] to constitute the first of the two consonant positions. Any other consonant, including the allophone [k], would resyllabify to maximise onset. Morpheme final /ŋ/ would generate an accrescent [ŋ] in this position for the same reason.

(58)

a)	V.V	/o.a/	[ó.a]	'to say'
b)	V.VC	/li.u.-æk/	[lí.u.æʔ]	'very' (1sA)
c)	V.CV	/u.he/	[ú.he]	'rattan'
d)	V.CVC	/a.saŋ/	[á.saŋ]	'all'
e)	CV.V	/da.i/	[dá.i]	'no'
f)	CV.VC	/be.ak/	[bé.aʔ]	'rice' (unhulled)
g)	CV.CV	/ha.he/	[há.he]	'to sleep'
h)	CV.CVC	/ke.nek/	[ké.nɛʔ]	'rain'
i)	*VC.V			
j)	*VC.VC			
k)	VC.CV	/an.na/	[án.na]	'and'
l)	VC.CVC	/am.pok/	[ám.pɔʔ]	'but'
m)	CVC.V	/mak-.o.to/	[maʔ.ó.to]	'to go by car'
n)	CVC.VC	/mak-.al.lo/	[maʔ.ál.lo]	'to go to church'
o)	CVC.CV	/tam.po/	[tám.po]	'ground'
p)	CVC.CVC	/lem.pæŋ/	[lɛm.pæŋ]	'to stop and visit'

The above list of syllable permutations also shows that both consonant clusters (k), l), o), p)) and vowel clusters (a), b), e), f)) occur, but only across syllable boundaries.

Words may be any length from one syllable to at least eight syllables, the larger words usually composed of several morphemes.

(59)

/ta/	[tá]	name particle
/ne/	[né]	TAGQ
/yak/	[yáʔ]	'then' (conj)

/ka.si.po.ba.hi.ne.aŋ.na/ [kasipobahineánna]
(ka-si-po-bahine-aŋ-na) 'their marriage'
NZR REC ACT female NZR 3POS

Single syllable words occur infrequently in A-T. Those there are cannot stand alone. Some are contractions, products of rapid speech.

(60) [káʔ] <-- [á.kaʔ] 'because'

4.1.1 Syllable distribution in monomorphemes

Within a single morpheme permissible permutations of syllables are more limited than in polymorphemic words. The sequences C.V, and (C)V.V.V(C) are unacceptable within the monomorphemic word, while able to occur in polymorphemic words; and the sequence #V.V is not found in monomorphemic words of more than two syllables.

With monomorphemes of up to three syllables only 44 of the 84 permutations are thus acceptable. Table 7 shows the acceptable syllabic types with examples for single morpheme words of up to three syllables. The five acceptable syllable patterns not exemplified may exist but present data has yet to yield examples. It is unlikely that there are constraints against the unillustrated patterns. V.CVC., for example, though not yet illustrated in a three syllable monomorpheme, occurs in disyllabic examples.

All four possible monosyllabic types exist but as already mentioned, occur infrequently. Disyllabic roots form the majority of monomorphemic words, though roots with three syllables also frequently occur. Roots containing more than three syllables are rarer, but still are greater in number than monosyllabic words.

Table 7 - Syllable Types in Monomorphemic Words

1	V	/i/	[í]	TAGQ
	VC	/aŋ/	[áŋ]	REL
	CV	/to/	[tó]	'person'
	CVC	/yak/	[yá?]	'then' (conj)
2	V.V	/io/	[ío]	'yes'
	V.VC	/aik/	[ái?]	'girl' (endearment)
	V.CV	/upe/	[úpe]	'taro'
	V.CVC	/eheŋ/	[éhɛŋ]	'ladder'
	VC.CV	/ambe/	[ámbe]	'father'
	VC.CVC	/uhpak/	[úhpa?]	'four'
	CV.V	/noa/	[nóa]	'like'
	CV.VC	/beaŋ/	[béaŋ]	'goitre'
	CV.CV	/lopi/	[lópi]	'boat'
	CV.CVC	/kenek/	[kénɛ?]	'rain'
	CVC.CV	/sikda/	[sí?da]	'truly'
	CVC.CVC	/lembæŋ/	[lémbæŋ]	'valley'
3	CV.V	/uhai/	[uhái]	'water'
	V.CV.VC	/aneaŋ/	[anéaŋ]	'outside'
	V.CV.CV	/uhani/	[uháni]	'bee'
	V.CV.CVC	/uhakak/	[uháka?]	'root'
	V.CVC.CV			
	V.CVC.CVC			
	VC.CV.V	/umbai/	[ʊmbái]	'maybe'
	VC.CV.VC	/umbaik/	[ʊmbái?]	'maybe'(var)
	VC.CV.CV	/andana/	[andána]	'than'
	VC.CV.CVC	/ambataŋ/	[ambátaŋ]	'bridge'
	VC.CVC.CV	/iŋkanna/	[iŋkánna]	'all'

VC.CVC.CVC			
CV.V.CV	/muane/	[muáne]	'man'
CV.V.CVC	/kuæhæŋ/	[kuæhæŋ]	'monitor lizard'
CV.VC.CV	/maikdi/	[maiʔdi]	'many'
CV.VC.CVC	/saohkok/	[saɔ́hkɔʔ]	'small'
CV.CV.V	/maloe/	[maló͡e]	'afternoon'
CV.CV.VC	/hohiaŋ/	[hohíaŋ]	'durian'
CV.CV.CV	/pepahi/	[pepáhi]	'wind'
CV.CV.CVC	/buhotek/	[buhótɛʔ]	'fly'
CV.CVC.CV	/tahakde/	[taháʔde]	'rice drying rack'
CV.CVC.CVC	/madondoŋ/	[mařɔ́ndɔŋ]	'tomorrow'
CVC.CV.V	/hombia/	[hɔmbía]	'sago'
CVC.CV.VC			
CVC.CV.CV	/lahsuna/	[lahsúna]	'onion'
CVC.CV.CV	/hæmpækæŋ/	[hæmpǽkæŋ]	'rice cutter'
CVC.CVC.CV			
CVC.CVC.CVC	/timbuhhuk/	[tɪmbúhhʊʔ]	'jealous'

4.2 Consonants

The twelve consonants, /p, t, k, b, d, s, h, m, n, ŋ, l, y/, can all occupy the onset position in a syllable. This has already been demonstrated in 2.3.1 above. However, only seven can occupy the coda of a syllable: /k, h, m, n, ŋ, l, y/ and of these only /k/([ʔ]) and /ŋ/ occur word finally before morphophonemic change rules have been applied.

Of course none of these seven syllable-final consonants can precede all twelve of the possible syllable-initial consonants in a cluster, neither within the morheme nor across a morpheme boundary. We would not expect to find */ŋp/ for example. But some can cooccur with four or five of the list of syllable-initial consonants within the morpheme and with eight or more between morphemes. For clarity I have represented these consonant clusters in matrix form.

4.2.1 Consonant clusters within the morpheme

Table 8 - Consonant Clusters Occurring Intramorphemically

		2nd Consonant											
		p	t	k	b	d	s	h	m	n	ŋ	l	y
1st Consonant	k				kb	kd						kl	
	h	hp	ht	hk			hs	hh					
	m	mp			mb				mm				
	n		nt			nd	ns			nn			
	ŋ			ŋk							ŋŋ		
	l											ll	
	y												yy

In the initial position of a consonant cluster the phonetic realisation of the phoneme /k/ is [ʔ]. The voiced stops and /l/ all have the capacity to be

preglottalised. It can be seen from Table 8 that the nasals combine with their homorganic stops to produce the five clusters: /mp, mb, nt, nd, ŋk/. In addition /s/ can be preceded by the nasal /n/. Several other consonants can be preceded by /h/. The remaining clusters are geminates.

Consonant Gemination

Gemination of consonants is widespread among the languages of South Sulawesi. In the Tabulahan dialect of A-T gemination also occurs, but is limited to sonorants. Table 8 shows that each of the sonorants, /m,n,ŋ,l,y/ are found to geminate.

Obstruents in Tabulahan never pattern as geminates,[3] but follow alternative clustering arrangements, depending on voice. The voiced stops, do not geminate, as they would in certain dialects of Bugis for example, (Sirk 1983:30), but can be preglottalised. This is consistent with many South Sulawesi languages, particularly those closely related to Torajan. PUS acts in the same way (Campbell, this volume).

It is with voiceless obstruents that Tabulahan stands apart from its close linguistic relatives. Where other languages, including the Aralle dialect of A-T, generally allow voiceless stops and fricatives to geminate (CC), the cognate equivalents in Tabulahan pattern hC. Thus:

(61)

Toraja	PUS	Aralle	Tabulahan	
appaʔ	appaʔ	uppaʔ	uhpaʔ	'four'
-	tappaʔ	tappaʔ	tahpaʔ	'exact'
patti	patti	patti	pahti	'box'
biʔtiʔ	bitti?	bitti?	bihtiʔ	'foot'
teʔteʔ	tette?	tette?	tehteʔ	'hour'
baʔta	batta	batta	bahta	'cut'
pikkiriʔ	pikki?	pikki	pihkiʔ	'think'
masakkaʔ	mæsække	masakke	masahkeʔ	'cold (water)'
malassu	malussu	malussu	maluhsu	'hot'
assalaʔ	assa	?	ahsalaʔ	'provided that'
lossoʔ	hossæʔ	hessæʔ	hehsæʔ	'mud'
issi	issi	issi	ihsi	'flesh'

There are exceptions to the typical hC pattern. Certain words in related languages featuring geminate voiceless obstruents have cognates in Tabulahan which pattern NC, C being the obstruent and N being a homorganic nasal.

(62)

Toraja	PUS	Tabulahan	
rakkaʔ	-	hæŋkæʔ	'finger'
Makki	Makki	Maŋki	'Kalumpang people/language'
dassi	dassi	dansi	'bird/kind of bird'
issoŋ	issæ	inseŋ	'rice mortar'
issan	issam	insaŋ	'know'

(63) Consonant clusters within the morpheme

/kb/	/lakbok/	[lá?bo?]	'large machete'
/kd/	/sikda/	[sí?da]	'true'
/kl/	/laklaŋ/	[lá?laŋ]	'umbrella'
/hp/	/uhpak/	[úhpa?]	'four'
/ht/	/bohto/	[bóhto]	'village'
/hk/	/tihku/	[tíhku]	'beak'
/hs/	/masuhsa/	[masúhsa]	'difficult'
/hh/	/tahhik/	[táhhi?]	'straight on'
/mp/	/ampok/	[ámpɔ?]	'but'
/mb/	/lambik/	[lámbi?]	'to reach'
/mm/	/mammik/	[mámmi?]	'delicious'
/nt/	/mintuk/	[míntu?]	'all'
/nd/	/indee/	[ɪndé^e]	'this'
/ns/	/insaŋ/	[ínsaŋ]	'to know'
/nn/	/ponna/	[pónna]	'if'
/ŋk/	/saŋkek/	[sáŋkɛ?]	'to tie'
/ŋŋ/	/laŋŋenak/	[laŋŋéna?]	'earlier'
/ll/	/tollo/	[tóllo]	'to spill'

Summary of Consonant Distribution Within Morphemes

Table 9 - Distributional Properties of Consonants Within Morphemes

	p	t	k	b	d	s	h	m	n	ŋ	l	y
initially	+	+	+	+	+	+	+	+	+	+	+	+
medially single	+	+	+	+	+	+	+	+	+	+	+	+
medially geminate	−	−	−	−	−	−	−	+	+	+	+	+
medially after h	+	+	+	−	−	+	+	−	−	−	−	−
medially after /k/ ([?])	−	−	−	+	+	−	−	−	−	−	+	−
medially after nasal	+	+	+	+	+	+	−	−	−	−	−	−
finally	−	−	+	−	−	−	−	−	−	+	−	−

It can be seen from the above table that medial gemination and the medial prelocation of /h/ are in complementary distribution, occurring with sonorants and voiceless obstruents respectively. A small liberty has been taken with the above table in a bid to make this point. /h/ does in fact occur as a medial geminate, but this amounts to the same thing as /h/ occurring medially after /h/. Rather than include the redundancy caused by this overlap, geminate /h/ has been marked minus. The redundancy of nasals following nasals (which amounts to the same thing as nasals in geminite clusters) has similarly been handled by marking them minus in the table.

4.2.2 Consonant clusters across morpheme breaks

Between morphemes only two consonants can appear in the first position of a consonant cluster. /h/, prolific intramorphemically, does not occur morpheme finally and so only appears as a second consonant candidate in the following table.

Table 10 - Consonant Clusters Occurring Intermorphemically

		2nd Consonant										
		p	t	k	b	d	s	h	m	n	ŋ	l
1st Consonant	/k/ [ʔ]	ʔp	ʔt	ʔk	ʔb	ʔd	ʔs	ʔh	ʔm	ʔn		ʔl
	/ [m]	mp			mb				mm			
	/ [n]		nt			nd	ns			nn		
	/ŋ/\ [ŋ]			ŋk			ŋs	ŋh			ŋŋ	
	\ [l]											ll

The principal differences between Tables 8 and 10 lie with /k/([ʔ]) and /ŋ/. As shown in 2.3.1, only these two consonants occur word-finally. /m,n,l/, which are so manifested as surface forms after morphophonemic change rules have been applied, have /ŋ/ as their underlying form when appearing morpheme finally, (see 5.2 Rules 7 & 8).

Table 10 shows two apparent anomalies. Firstly, it seems /ŋ/ is the only consonant not able to be preceded by a glottal stop across a morpheme boundary. This is no doubt due to the extremely low frequency of /ŋ/-initial roots. Secondly, each of the consonants except /s/ is able to be preceded by only one of the variants of the morphophoneme /ŋ/. /ns/ is in free variation with /ŋs/ across a morpheme boundary.

(64) Consonant clusters across morpheme boundaries

/kp/	[ʔp]	/uhpak-pulo/	[uhpaʔpúlo]	'forty'
/kt/	[ʔt]	/mak-tulak/	[maʔtúlaʔ]	'to speak'
/kk/	[ʔk]	/pak-kamase/	[paʔkamáse]	'grace'
/ks/	[ʔs]	/pak-sikola/	[paʔsikóla]	'pupil'
/kh/	[ʔh]	/mak-hupa-tau/	[maʔhupatáu]	'human being'
/km/	[ʔm]	/lekbak-mi/	[léʔbaʔmi]	'already gone'
/kn/	[ʔn]	/bææk-na/	[bæ^æʔna]	'his head'
/kl/	[ʔl]	/pak-lele/	[paʔléle]	'climber'
/ŋp/	[mp]	/maŋ-pa-dende/	[mamparéndeˈ]	'to shift s.t.'
/ŋb/	[mb]	/uŋ-babe/	[ʊmbábe]	'you are doing'
/ŋm/	[mm]	/sehuŋ-mu/	[sehúmmu]	'your spoon'
/ŋt/	[nt]	/meŋ-timbak/	[mɛntímbaʔ]	'to answer'
/ŋd/	[nd]	/meŋ-dahi/	[mɛndáhi]	'to become'
/ŋs/	[ns]	/uŋ-sakdiŋ/	[ʊnsáʔdiŋ]	'you feel'
	[ŋs]		[uŋsáʔdiŋ]	
/ŋn/	[nn]	/dasaŋ-na/	[dasánna]	'his house'
/ŋk/	[ŋk]	/meŋ-kæhæŋ/	[meŋkæhæŋ]	'to work'
/ŋh/	[ŋh]	/uŋ-hæŋæŋ-i/	[uŋhæŋæŋi]	'you add to'
/ŋN/	[ŋŋ]	/maŋ-alli/	[maŋŋálli]	'to buy'
/ŋl/	[ll]	/uŋ-lelleŋ/	[ullélleŋ]	'you fell (trees)'

4.3 Vowel Distribution

4.3.1 Vowel clusters within morphemes

Table 11 - Vowel Clusters Occurring Intramorphemically

		2nd Vowel					
		i	e	æ	u	o	a
1st Vowel	i	ii			iu	io	ia
	e	ei				eo	ea
	æ	æi		ææ			
	u	ui		uæ		uo	ua
	o	oi	oe		ou	oo	oa
	a	ai	ae		au	ao	aa

The table shows several gaps at least some of which are probably due to insufficient data at hand. Several of the gaps pertaining to the vowel /æ/ could be systematic, /æ/ only clustering with itself and with high vowels. This still would leave two nonsystematic æ cluster gaps: iæ and æu. The table also shows four apparent intramorphemic geminate vowels. While it is true that these exist as underlying forms, an epenthetic weak glottal separates them in their surface form. (See Rule 15). Sequences of three or more vowels do not occur within the morpheme.

(65) Vowel clusters within the morpheme

/ii/	/biik/	[bí^i?]	'bottom'
/iu/	/liu/	[líu]	(intensifier)
/io/	/dio/	[dío]	'2s'
/ia/	/sia/	[sía]	'salt'
/ei/	/neik/	[néi?]	(comparative)
/eo/	/maksaleo/	[ma?saléo]	'to wander'
/ea/	/beak/	[béa?]	'rice (unhulled)'
/æi/	/sæmpæik/	[sæmpæi?]	'a short time'
/ææ/	/bææk/	[bæ^æ?]	'head'
/ui/	/dui/	[dúi]	'thorn'
/uæ/	/tuæk/	[túæ?]	'palm wine'
/uo/	/suo/	[súo]	'to comission'
/ua/	/sua/	[súa]	'mouth'
/oi/	/hoik/	[hói?]	'below'
/oe/	/kaloek/	[kalóɛ?]	'parrot'
/ou/	/bou/	[bóu]	'again'
/oo/	/koo/	[kó^o]	'I'
/oa/	/dinoa/	[dinóa]	'now'
/ai/	/dai/	[dái]	'no, not'
/ae/	/masae/	[masáe]	'a long time'
/au/	/nauŋ/	[náuŋ]	'to descend'
/ao/	/tambao/	[tambáo]	'stork'
/aa/	/haa/	[há^a]	'top plate (house)'

Table 12 - Vowel Clusters Occurring Intermorphemically

		2nd Vowel					
		i	e	æ	u	o	a
1st Vowel	i	ii	ie	iæ	iu	io	ia
	e	ei	ee	eæ	eu	eo	ea
	æ						
	u	ui	ue	uæ	uu	uo	ua
	o	oi	oe	oæ	ou	oo	oa
	a	ai	ae	aæ	au	ao	aa

The most notable feature of vowel distribution across morpheme boundaries is the absence of /æ/-initial clusters. /æ/ is the least common of the vowel phonemes, having a limited distribution. Although it occurs in the initial position of the enclitic /æk/ [-æʔ] '1sA', and initially in some roots such as /æŋkæk/ [æŋkæʔ] 'take up', it never occurs finally in roots nor finally in prefixes. Consequently though it occurs following any of the other vowel phonemes across a morpheme boundary, it is never found as the first member of a vowel cluster in such a position. That said, it must also be noted that the phonetic realisation of the cluster /aæ/ is [ææ] in accordance with a process of assimilation (see 5.2 Rule 9).

(66) Vowel clusters across morpheme boundaries

a)	/ii/	/uŋ-alli-iŋ-k-æk/	[uŋŋálli^iŋkæʔ]	'you buy for me'
b)	/iæ/	/di-æŋkæk/	[diæŋkæʔ]	'taken up'
c)	/iu/	/si-ulu/	[siúlu]	'sibling'
d)	/io/	/di-oa/	[dióa]	'say' (PASS)
e)	/ia/	/di-ala/	[diála]	'fetch' (PASS)
f)	/ei/	/sule-i/	[suléi]	'come' (LOC)
g)	/ee/	/inde-e/	[ɪndé^e]	'this' (EMPH)
h)	/eæ/	/sule-æk/	[súleæʔ]	'I come'
i)	/eu/	/me-uhe/	[meúhe]	'to cut rattan'
j)	/eo/	/ke-olloŋ/	[keólloŋ]	'pillow-owning'
k)	/ea/	/onge-aŋ/	[ɔŋéaŋ]	'place'
l)	/ui/	/mu-insang/	[muínsaŋ]	'you know'
m)	/ue/	/ku-empei/	[kuɛmpéi]	'I wait for s.t.'
n)	/uæ/	/supu-æk/	[súpuæʔ]	'only I'
o)	/uo/	/mu-ola/	[muóla]	'you go'
p)	/ua/	/ku-ala/	[kuála]	'I fetch'
q)	/oi/	/pa-tuho-iŋ/	[patúhoɪŋ]	'to shepherd'
r)	/oe/	/to-ek/	[tóeʔ]	'also' (3sA)
s)	/oa&e/	/mohko-æk/	[móhkoæʔ]	'I sit'
t)	/ou/	/mo-ulaŋ/	[moúlaŋ]	'to trap'
u)	/oo/	/indo-o/	[ɪndó^o]	'that' EMPH
v)	/oa/	/-ko-ak/	[-koaʔ]	2pA (2sA+p)
w)	/ai/	/pe-puha-i/	[pepuhái]	'finish it!'
x)	/ae/	/pa-elak-i/	[paéla?i]	'go carefully!'

y)	/aæ/	/uŋ-ala-æk/	[ʊŋŋálæ^æʔ]	'I fetch'
z)	/au/	/la-uŋ-babe/	[laumbábe]	'you will make'
α)	/ao/	/na-oa/	[naóa]	'he said'
β)	/aa/	/ma-aka/	[ma^áka]	'to be something'

Sequences of three vowels may occur across a morpheme boundary as in (66α) above.

5 PHONOLOGICAL PROCESSES

The phonological processes occurring in A-T can be grouped into two main types: 1) Allophonic and 2) Morphophonemic. The first of these deals with strength-changing (weakening) processes. The second type, morphophonemic, can be subdivided into assimilation processes and syllable structure processes. Of course, there is interplay between these groups and rule ordering will not be restricted to keep within such boundaries, but it may be helpful to look at processes according to type where possible.

5.1 Weakening Processes

Six phonemes each have more than one allophone. The two consonants /k/ and /d/, and the nonlow vowels /i/, /u/, /e/ and /o/ are all subject to weakening processes which bring about their allophonic variants.

5.1.1 In syllable-final position /k/ has the form [ʔ].

Rule 3 - k-Weakening

$$\begin{bmatrix} C \\ -\text{continuant} \\ -\text{nasal} \\ -\text{anterior} \end{bmatrix} \rightarrow [-\text{consonantal}] \; / \; \underline{\quad} \; \$$$

The above rule shows the weakening of /k/ in syllable final position, that is not only before other consonants or word finally, but also before any morpheme break. This means that /k/ will be manifest as [ʔ] even if in an intervocalic position, provided that a morpheme break occurs following the [ʔ].

(67)			
	/bahtuk/	[báhtuʔ]	'or'
	/lakbi/	[láʔbi]	'more'
	/pak-kamase/	[paʔkamáse]	'grace'
	/tuŋkak-i/	[túŋkaʔi]	'open it'

In this final example we see that no resyllabification takes place when a vowel initial enclitic (or suffix) is attached; the [ʔ] remains. This is in contrast to Indonesian.

(68)				
	Indonesian:	baik	[báiʔ]	'good'
	BUT	mem-per-baik-i	[məmpərbáiki]	'repair'

5.1.2 The consonant phoneme /d/ is subject to the following rule when occurring intervocalically.

Rule 4 - d-Continuantisation

$$\begin{bmatrix} C \\ -\text{continuant} \\ -\text{nasal} \\ +\text{anterior} \\ +\text{coronal} \\ +\text{voice} \end{bmatrix} \rightarrow \begin{bmatrix} C \\ +\text{continuant} \\ -\text{lateral} \end{bmatrix} / \; V \_\_ V$$

According to this rule, /d/ becomes the continuant [ř] in the specified position. While this rule holds true for most speakers of the Tabulahan dialect, there are some who seldom apply it to their speech and others who never do, retaining the [d] form in all positions.

(69)	/madondoŋ/	[mařɔ́ndɔŋ]	~	[madɔ́ndɔŋ]	'tomorrow'
	/sadiŋ/	[sářiŋ]	~	[sádiŋ]	'rat'
	/kodik/	[kóři?]	~	[kódi?]	'I'
	/dedua/	[deřúa]	~	[dedúa]	'two'

5.1.3 Non-low vowels are laxed in certain positions.

Because the environments in which this process occurs are different with vowels of different height, two rules are necessary.

Rule 5 - Mid Vowel Laxing

$$\begin{bmatrix} V \\ -\text{low} \\ -\text{high} \end{bmatrix} \rightarrow [-\text{tense}] / \_\_\_ C \$$$

This rule states that mid vowels, /e/ and /o/ become laxed ([ɛ], [ɔ]) in closed syllables.

(70)	/maŋ-empe/	[maŋŋémpe]	'to watchguard'
	/pahenta/	[pahénta]	'command'
	/meŋeŋ/	[méŋɛŋ]	'already (verb)-ing'
	/lekbak/	[lé?ba?]	'to leave'
	/lehsuk/	[léhsu?]	'egg'
(71)	/sompok/	[sɔ́mpɔ?]	'rise in level'
	/bondek/	[bɔ́ndɛ?]	'coast'
	/tedoŋ/	[téřɔŋ]	'water buffalo'
	/elok/	[élɔ?]	'to desire'
	/bohto/	[bɔ́hto]	'village'

Similarly the high vowels, /i/ and /u/ sometimes undergo laxing, but here the environment is a little narrower.

Rule 6 - High Vowel Laxing

$$\begin{bmatrix} V \\ +high \end{bmatrix} \text{ --> } [-tense] \text{ / } \_\_\_ \begin{bmatrix} C \\ +anterior \end{bmatrix} \$$$

High vowels are laxed then, when occurring in syllables closed by non-back consonants.

(72)	/i/	/timbak/	[tímba?]	'to answer'
		/dille/	[dílle]	'corn'
	but	/sikda/	[sí?da]	'true'
		/tihku/	[tíhku]	'beak'
(73)	/u/	/umba/	[úmba]	'where?'
		/unnuŋ/	[únnuŋ]	'six'
	but	/lehsuk/	[léhsu?]	'egg'
		/masuhsa/	[masúhsa]	'difficult'

5.2 Assimilation Processes

5.2.1 Three assimilation processes occur.

Two have limited application, but the first, nasal assimilation, is ubiquitous in usage; occurring wherever heterorganic nasals and stops, or nasals and nasals juxtapose, whether across a morpheme boundary or a word boundary within phonological levels P1 and P2.

Rule 7 - Nasal Assimilation

$$[+nasal] \text{ --> } \begin{bmatrix} \alpha \text{ anterior} \\ \beta \text{ coronal} \end{bmatrix} / \_\_\_ \begin{bmatrix} - \text{ syllabic} \\ \alpha \text{ anterior} \\ \beta \text{ coronal} \end{bmatrix}$$

According to this rule any nasal assimilates to the place of articulation of a following consonant. This applies within words and across word boundaries within P1 and P2 levels.

(74)	/maŋ-pa-dende/	-->	[mampaŕénde]	'to shift s/t'
	/uŋ-babe/	-->	[ʊmbábe]	'you make'
	/enuk-aŋ-mu	-->	[enu?ámmu]	'your cup'
	/dasaŋ-ta/	-->	[dasánta]	'our house'
	/saŋ-dahpa/	-->	[sandáhpa]	'one armspan'
	/puduŋ-na/	-->	[puŕúnna]	'his nose'

/aŋ doŋ-bali uhanaŋ ma-luak-na/
--> [an dɔmbáli uhánam maluá?na]
'which is two armlengths wide'

Principally the following consonant is either a stop or a nasal. /y/ is never in a position to initiate this process, since the few cases where /y/ occurs morpheme initially are conjunctions and adverbs which take no affixation. /h/ is already of the same anterior and coronal specification as the preceding nasal (/ŋ/) and so leaves the surface form the same as the underlying. /s/ initiates the process generally, but sometimes optionally ignores the rule, remaining as the sequence /ŋ-s/.

(75)	/uŋ-sakdiŋ/	-->	[uŋsáʔdiŋ]	~ [únsáʔdiŋ]	'you feel'
	/maŋ-sihu/	-->	[maŋsíhu]	~ [mansíhu]	'to roast'
	/aŋ handaŋ/	-->	[aŋ hándaŋ]	'the most...'	

5.2.2 Although /l/ following a nasal could also generate this rule, the surface form [nl] is never realised.

This is because /l/ is also the condition for the subsequent continuantisation rule (8). Nasal Continuantisation, like Nasal Assimilation, occurs across word boundaries as well as morpheme boundaries within levels P1 and P2.

Rule 8 - Nasal Continuantisation

[+nasal] -->[l]/ ___ /l/

(76)	/uŋ-lelleŋ/	-->	[ʊlléllɛŋ]	'to fell'
	/aŋ lehsuk/	-->	[al léhsuʔ]	'ago'

5.2.3 The third assimilation process involves the phoneme /æ/.

As has already been noted, /æ/ does not readily cluster with other vowels to the same extent that the five others do. Even apart from this tendency to avoid juxtaposition with other vowels, /æ/ tends to be found in syllables adjacent to other /æ/-peak syllables within roots. The combinations /a/(C)(C)/æ/ or /æ/(C)(C)/a/ never occur within a morpheme. There is then neutralised contrast between /a/ and /æ/.

(77)	/bælæbæk/	[bælǽbæʔ]	'woven bamboo'
	/læmmæk/	[lǽmmæʔ]	'to hide'
	/bætæŋ/	[bǽtæŋ]	'stalk'

When two morphemes meet, the first having /a/ as its final syllable peak; the second having /æ/ as its first syllable peak, vowel assimilation occurs.

Rule 9 - Vowel Assimilation

$$\begin{bmatrix} V \\ +low \end{bmatrix} \text{ --> [-back] / ___ (C)(C) } \begin{bmatrix} V \\ +low \\ -back \end{bmatrix}\Bigg]_{word}$$

This vowel assimilation occurs progressively, that is /a/ becomes [æ] whenever /a/ and /æ/ are in adjacent syllables with /æ/ to the right of /a/.

(78) /ma-kalimpunaŋ-æk/ --> [makalɪmpúnæŋŋæʔ] 'I am dizzy'
/ma-kætiŋ/ --> [mækǽtiŋ] 'itchy'

The reverse situation, where /æ/ is to the left of /a/, produces no such vowel assimilation.

(79) /hæmpækæŋ-na/ --> [hæmpækǽnna] 'his rice-picker'
/peŋ-kæhæŋ-aŋ/ --> [pɛŋkæhǽŋŋaŋ] 'work'

Vowel assimilation can be applied once only to a word. The resultant syllable, once the rule has been applied, cannot then be the condition for a subsequent reapplication.

(80) /la-uŋ-ala-æk/ --> [lauŋŋálæ^æʔ] 'I will fetch'
not *[lauŋŋælæ^æʔ]

5.3 Syllable Structure Processes

We have looked at weakening processes and also at assimilation processes. We now turn to the group of processes effecting changes in syllable structure.

5.3.1 The first process, that of nasal insertion, occurs in two somewhat similar environments: before the possessive suffix with a) high vowel-final noun roots and b) certain /a/-final noun roots. The second of these is not predictable from a purely synchronic study so two rules are necessary to adequately present the full picture.

Rule 10 - Nasal Insertion:high vowels

$$\emptyset \text{ --> [+nasal] } / \left[\overset{V}{\text{+high}}\right]\_\_\_ + \ ]$$

possessive suffix

According to this rule, the high vowels /i/ and /u/ must be followed by a nasal [N] when morpheme-final before a possessive suffix. This rule must precede Nasal Assimilation, in order that the inserted nasal can assimilate to the point of articulation of the ensuing consonant.

(81)	underlying form	/lopi-ku/	/hapu-mu/
	Nasal Insertion	lopiN-ku	hapuN-mu
	Nasal Assimilation	lopiŋ-ku	hapum-mu
	High Vowel Laxing	-	hapʊm-mu
	Stress Placement	lopíŋ-ku	hapúm-mu
	surface form	[lopíŋku]	[hapúmmu]
		'my boat'	'your kitchen'

Nasal insertion also occurs with some noun roots ending in /a/. According to Sirk (1988) a number of South Sulawesi languages have both a possessive suffix[4] set without the nasal and one with. Though they are used differently in certain languages, particularly Makassarese, the general trend (Toraja Sa'dan, Mamasa, Duri, Mandar and various Bugis dialects) is for the nasal-included set to follow nouns ending in high vowels or /a/; and for the nasal-discluded set to follow nouns

ending in consonants, mid vowels (which derive from Proto-South Sulawesi (PSS) laryngeal- and semivowel-final roots) and /a/.

The factor determining whether an /a/-final root takes an inserted nasal before the suffix (the nasal-included possessive set) goes back to pre-PSS forms. Those whose reflexes are used without the nasal 'derive from earlier forms ending in -aq' (Sirk 1988:293), that is, they once were consonant final and like present consonant final forms take no inserted nasal.

The historical linguist then can predict which forms currently ending in /a/ will undergo a nasal insertion process before the possessive suffixes, and which forms will not. Any synchronic study such as this present one requires that /a/-final noun roots undergoing this process (approximately one third of all /a/-final noun roots) be so marked in the lexicon.

Rule 11 - Nasal Insertion:a

$$\emptyset \rightarrow [+\text{nasal}] \;/\; a \_\_\_ + \Big]_{\text{possessive suffix}}$$

Again this rule must be ordered before Nasal Assimilation.

(82)

	[+nasal ins]	[-nasal ins]
underlying form	/pahiama-na/	/sua-na/
Nasal Insertion	pahiamaN-na	-
Nasal Assimilation	pahiaman-na	-
Stress Placement	pahiamán-na	suá-na
surface form	[pahiamánna]	[suána]
	'his years (of age)'	'his mouth'

5.3.2 Whenever a morpheme final /ŋ/ immediately precedes a vowel within a word, it undergoes gemination. This happens not only with the verbal prefixes and numerical prefixes ending in /ŋ/, but also where /ŋ/-final roots meet vowel-initial enclitics for example. As this creates closed syllables ending in a back consonant it must be ordered before Mid Vowel Laxing, though not necessarily before High Vowel Laxing, which requires the syllable to be closed by an anterior consonant.

Rule 12 - ŋ-Gemination

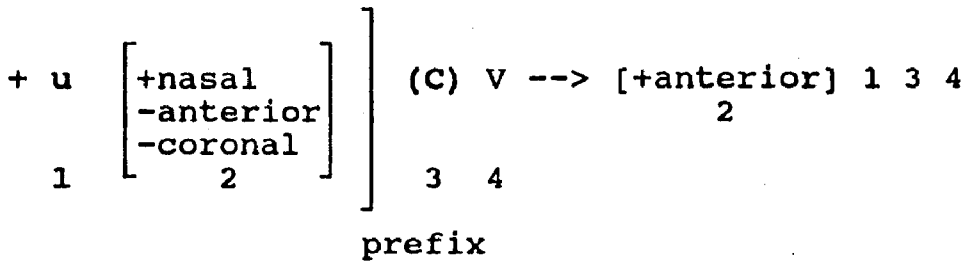
$$\underset{1}{(C)}\ \underset{2}{V}\ \begin{bmatrix} +\text{nasal} \\ -\text{anterior} \\ -\text{coronal} \end{bmatrix}_{3}\ +\ \underset{4}{V} \rightarrow 1\ 2\ 3\ 3\ 4$$

(83)

/doŋ-atuk/ -->	[dɔŋŋátu?]	'two hundred'
/saŋ-aka/ -->	[saŋŋáka]	'how many'
/uŋ-alli/ -->	[uŋŋálli]	'to buy'
/paŋ-elok-na/ -->	[paŋŋelɔ́?na]	'his will'
/maŋ-empe/ -->	[maŋŋémpe]	'to guard'
/maŋ-ka-diŋiŋ-æk/ -->	[maŋkadíŋiŋŋæ?]	'I am shivery'
/lempæŋ-aŋ/ -->	[lɛmpǽŋŋaŋ]	'we visit'

5.3.3 The prefix /uŋ-/ is the form used to mark both actor focus and second person ergative. Besides undergoing ŋ-Gemination, /uŋ-/ is subject to two other syllable structure changing processes. The first of these optionally occurs.

Rule 13 - uŋ-Labialisation & Metathesis



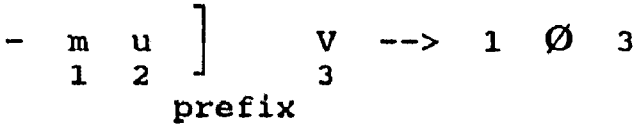
This rule describes two simultaneous processes. The nasal /ŋ/ is labialised to become [m], while at the same time this nasal metathesises with the preceding vowel /u/. The form [mu-] is the result. However, Rule 13 is optionally applied. Some speakers will use both forms with the same verb root in succeeding clauses.

In general, the basic form uŋ- is the one of preference. mu- is arguably a simpler underlying form to work from. Section 5.4.1 discusses an alternative analysis based on this.

(84)	/uŋ-kalehai/	-->	[mukalehái]	~ [uŋkalehai]	'remember'
	/uŋ-hasuŋ/	-->	[muhásuŋ]	~ [uŋhásuŋ]	'poison'
	/uŋ-insaŋ/	-->	[muínsaŋ]	~ [uŋŋínsaŋ]	'to know'
	/uŋ-ala/	-->	[muála]	~ [uŋŋála]	'to fetch'
	/uŋ-tipu/	-->	[mutípu]	~ [ʊntípu]	'to cheat'

5.3.4 There is a very small closed class of vowel-initial verb roots consisting of the verbs 'to eat', 'to drink' and 'to sit'.[5] Rule 14 is applied to members of this class in order to delete /u/ from the prefix mu-. Rule 13 feeds Rule 14 and needs to come first in rule ordering.

Rule 14 - u-Deletion



(85)	underlying form	/uŋ-ande/	/uŋ-enuk/
	uŋ-Labialsn.& Metathesis	mu-ande	mu-enuk
	u-Deletion	m-ande	m-enuk
	Stress Placement	m-ánde	m-énuk
	surface form	[mánde]	[ménu?]
		'eat'	'drink'

Remembering that Rule 13 is optionally applied, should the speaker not apply it with any member of this closed class of verbs, then Rule 14 would also not apply. In this case the following forms would be generated.

(86)	underlying form	/uŋ-ande/	/uŋ-enuk/
	uŋ-Labialsn. & Metathesis	not applied	not applied
	Nasal Gemination	uŋ-ŋ-ande	uŋ-ŋ-enuk
	Stress Placement	uŋ-ŋ-ánde	uŋ-ŋ-énuk
	surface form	[uŋŋánde] 'eat'	[uŋŋénuʔ] 'drink'

A minor rule such as this requires that the members of the class to which it applies be so marked in the lexicon.

5.3.5 A-T does not allow geminate vowels to exist in any surface representation. But since there are a number of geminate vowels in underlying form, there is a process to deal with these.

Rule 15 - Glottal Epenthesis

$$C\ (V)\ \begin{bmatrix} V \\ \alpha\ \text{high} \\ \beta\ \text{low} \\ \gamma\ \text{back} \end{bmatrix}\ \begin{bmatrix} V \\ \alpha\ \text{high} \\ \beta\ \text{low} \\ \gamma\ \text{back} \end{bmatrix}\ \text{--> } 1\ 2\ 3\ \hat{}\ 4$$

1 2 3 4

Whenever two identical vowels are juxtaposed within a word a weak glottal is inserted between them to break the gemination. This occurs both within the morpheme and where identical vowels meet intermorphemically.

(87)	/bææk/	-->	[bæ^æʔ]	'head'
	/koo/	-->	[kó^o]	'I'
	/ma- aka/ STV what	-->	[ma^áka]	'to be something'
	/di- paha -i -iŋ/ PASS shelf LOC BEN	-->	[dipahái^iŋ]	'made into shelves'

5.3.6 The need for Glottal Epenthesis further arises with the implementation of another process, vowel repetition. A-T has several deictics which can be made emphatic by employing an 'echo vowel'.

Rule 16 - Vowel Repetition

```
C  V  ]  #  -->        1 2 2 3
1  2  ]  3
```

emphatic deictic

The above rule generates an identical vowel to 'echo' the root-final vowel of the deictic. This gemination must be broken up by Glottal Epenthesis, therefore rule ordering needs to place Vowel Repetition before Glottal Epenthesis.

(88)	underlying form	/diato/	/inde/
	Vowel Repetition	diatoo	indee
	Glottal Epenthesis	diato^o	inde^e
	Stress Placement	diató^o	indé^e
	surface form	[diató^o]	[ɪndé^e]
		'the'(EMPH)	'this'(EMPH)

5.3.7 The aspectual enclitics /-mi/ (completive) and /-kek/ (incompletive) undergo certain reduction processes when contiguous to vowels. A minimum of three rules is required to deal with these reduction processes. It is perhaps simpler to handle the two clitics separately as follows than to describe rules that simultaneously affect them both. For an alternative handling of these reduction processes see section 5.4.2.

In two similar environments the completive aspect enclitic /-mi/ undergoes vowel deletion.

Rule 17 - Vowel Deletion:CMP-mi

$$mi \rightarrow m \;/\; \begin{pmatrix} V + \\ \end{pmatrix} \_\_\_ \; + \; V$$

completive aspect enclitic

Rule 17 states that whenever the completive aspect enclitic /-mi/ is found contiguous to a vowel within a word the /i/ is deleted.

(89) a) /ma- toho -mi haŋkak -na/ --> *matóhom háŋka?na
STV strong CMP finger 3POS 'his finger is already strong'

b) /lekbak -mi -æk/ --> [lé?ba?mæ?] 'I left'
leave CMP 1sA

(89a) is marked * because as it stands it is not an acceptable surface form in A-T. A subsequent rule is necessary to bring this about.

Rule 18 Nasal Velarisation

[+nasal] --> [-anterior] / ___ #

Nasal velarisation causes any nasal found in word final position to become the velar nasal [ŋ]. The relevant processes for (89a) are as follows:

underlying form	/ma-toho-mi/
Vowel Deletion:CMP-mi	ma-toho-m
Nasal Velarisation	ma-toho-ŋ
Mid Vowel Laxing	ma-tohɔ-ŋ
Stress Placement	ma-tóhɔ-ŋ
surface form	[matóhɔŋ]
	'already strong'

The incompletive aspect enclitic [-ke?] also undergoes reduction in one of the two environments effecting similar changes in completive [-mi]. Here the last two phones are deleted, leaving only [k] to carry the meaning.

Rule 19 Elision:NCMP-kek

$$kek \rightarrow k \; / \; \_\_\_ \;] \; + \; V$$

incompletive aspect enclitic

Like /-mi/, /-kek/ reduces to a single consonant before a vowel initial enclitic. Unlike /-mi/ no change is made following a vowel final stem.

(90) /tahhik -kek -ang/ --> [táhhi?kaŋ] 'we are going on'
continue NCMP 1xA

/bea -kek -æk/ --> [béakæ?] 'give me'
give NCMP 1sA

/mesa -kek/ --> [mésakɛ?] 'one more'
one NCMP

The above three rules are illustrated below with the stative verb, boho 'full (of food)'.

underlying form	/boho-mi tau/ full CMP GPRO	/boho-mi -æk/ full CMP 1sA	/boho-kek -æk/ full NCMP 1sA
Vowel Del:CMP-mi	boho-m tau	boho-m-æk	-
Elision:NCMP-kek	-	-	boho-k-æk
Nasal Velarisation	boho-ŋ tau	-	-
Nasal Assimilation	boho-n tau	-	-
k-Weakening	-	boho-m-æ?	boho-k-æ?
Mid Vowel Laxing	bohɔ-n tau	-	-
Stress Placement	bóhɔ-n táu	bóho-m-æ?	bóho-k-æ?
surface form	[bóhɔn táu]	[bóhomæ?]	[bóhokæ?]
	'we're full already'	'I'm full already'	'I'm still full'

5.3.8 A-T allows stative verbs to undergo a syllable structure changing process with a resultant meaning of 'intensified state'. There are three variant rules to express this process.

Rule 20 Stative Intensification:h

```
V (h) [    C     ] V (C) #  -->  1 h 3 4 ? #
      [-sonorant]
1  2  [    3     ] 4  5
```

When a stative verb has an obstruent as the onset of its ultimate syllable and is preceded by a vowel or h, it may be intensified according to Rule 20.

(91)	[manípi?]	'thin'	-->	[maníhpi?]	'extremely thin'
	[mařóta?]	'nice'	-->	[mařɔ́hta?]	'extremely nice'
	[mamáta]	'unripe'	-->	[mamáhta?]	'extremely unripe'
	[maléke]	'pretty'	-->	[maléhkɛ?]	'extremely pretty'
	[másiŋ]	'salty'	-->	[máhsi?]	'extremely salty'
	[manæhæŋ]	'clever'	-->	[manæhhæ?]	'extremely clever'

This and the following two rules need to be ordered before Mid Vowel Laxing as they each cause syllables to be closed with non anterior consonants.

Rule 21 Stative Intensification:?

```
   ( [    (C)    ]    C     )
   ( [+sonorant]             )
V  (                         )   V (C) --> 1 ? 3 4 ?
   (           [    C     ] )
   (           [+sonorant] ) )
1  (     2      [    3     ] )   4  5
```

Rule 21 applies to statives with either a sonorant as the onset of the ultimate syllable and/or a sonorant as the coda of the penultimate syllable.

(92)	[manóno]	'hungry'	-->	[manɔ́?nɔ?]	'starving'
	[masíli]	'shy'	-->	[masí?li?]	'extremely shy'
	[mabáŋi]	'dry'	-->	[mabá?ŋí?]	'extremely dry'
	[makámbaŋ]	'thick'	-->	[maká?ba?]	'extremely thick'
	[malɔ́ntiŋ]	'fat'	-->	[malɔ́?ti?]	'extremely fat'
	[kæyyæŋ]	'large'	-->	[kæ?yæ?]	'huge'

The third stative intensification rule applies to statives without an onset to their ultimate syllable. As these are less frequent than CV(C)# in stative verbs this rule is less productive than the previous two.

Rule 22 Stative Intensification:ŋ

```
V V --> 1 ? ŋ 2 ?

1 2
```

(93)	[makaháo]	'far'	-->	[makahá?ŋɔ?]	'far far away'
	[mahóa]	'laden'	-->	[mahɔ́?ŋa?]	'overly laden'

When the relevant intensification rule has been applied to a stative verb a new stress rule can be optionally applied also.

Rule 23 Stative Intensification Stress Placement

$$V \rightarrow [+stress] \; / \; (C)\ V\ (C)\ (C)\_\_\_(C)\Big]\ \#$$
$$[+stress]$$
$$\text{intensified stative}$$

According to this rule any intensified stative verb may receive equal stress on the final two syllables.

(94)	[maléke]	-->	[maléhké?] ~ [maléhke?]	'extremely pretty'
	[masíli]	-->	[masí?lí?] ~ [masí?li?]	'extremely shy'
	[mahóa]	-->	[mahɔ́?ŋá?] ~ [mahɔ́?ŋa?]	'overly laden'

5.4 Alternative Analyses

5.4.1 The prefix uŋ-/mu-

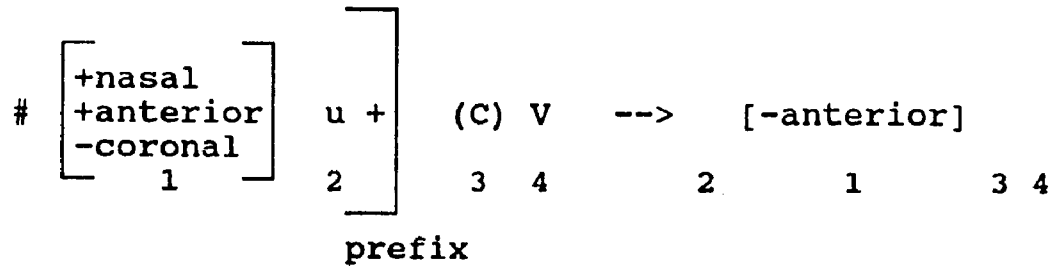
A-T most commonly uses the form [uŋ-] to mark actor focus on the verb. It is also the form most commonly used for the second person ergative prefix. However for either of these functions, the form [mu-] may be substituted. The underlying form for these verbal prefixes is debatable.

Neighbouring PUS also has two forms to mark actor focus: [um-] before consonant initial roots and [mu-] before vowel initial roots (Campbell, this volume:27). The [mu-] form is also used optionally before consonant initial roots. In his phonological analysis Campbell uses [um-] as the basic form for actor focus, possibly to avoid confusion with the 2sE prefix [mu-].

The formal distinction maintained in PUS between actor focus prefix and 2sE prefix cannot readily be made in A-T. Either form is used for either purpose. It is likely that the original underlying form for 2sE was [mu-] since the (ergative marking) pronominal prefix set is essentially the same as the possessive suffix set which has the form [-mu] to mark 2sPOS. This does not necessarily mean of course that the actor focus morpheme should have the same UF as the 2sE/POS morpheme, nor should it necessarily have a different one. It may be that 2sE/POS had mu- as its original UF while actor focus was originally signalled by uŋ-. The present use of either for both showing that the system is undergoing change.

From the perspective of natural phonology it is possibly a little simpler to posit [mu-] as the underlying form for either. The nasal velarisation part of the rule is an independently motivated process in A-T, whereas nasal labialisation is ad hoc in this case.

Rule 13A mu-Velarisation and Metathesis[6]



According to this rule, whenever the form mu- is prefixed to a word, metathesis occurs (um-) concurrent with a change in the place of articulation of the nasal such that it becomes [ŋ]. An accompanying note is needed to indicate that this rule applies optionally.

(95) a)	/mu-kalehai/	-->	[uŋkaléhái]	~	[mukaléhái]	'remember'
b)	/mu-insaŋ/	-->	[uŋŋínsaŋ]	~	[muínsaŋ]	'know'
c)	/mu-hiŋi/	-->	[uŋhíŋi]	~	[muhíŋi]	'hear'
d)	/mu-tipu/	-->	[ʊntípu]	~	[mutípu]	'cheat'

Example b) shows that this rule would need to be ordered before ŋ-Gemination. Example d) shows the need to order this rule before both nasal assimilation and high vowel laxing.

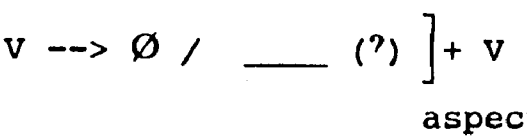
Assuming mu- as the UF, Rule 14 which reduced mu- to m- with a small closed class of verbs could be applied directly, with no ordering restrictions.

Though it would appear a little simpler to have mu- as the UF for the actor focus and 2sE morphemes than uŋ-, the latter requires the same number of rules and less ordering restrictions. It remains then that either is a plausible UF to work from. Until there are firm reasons to change we will persist in using uŋ- as the UF for both 2sE and actor focus, which is the more commonly used surface form.

5.4.2 The aspectual enclitics

Changes relating to the aspectual enclitic /-mi/ (completive) and to /-kek/ (incompletive) in section 5.3 (Rules 17-19) were handled separately. Here an attempt is made to combine the processes into more general rules. The first of these deals with the placement of vowel initial enclitics after either /-mi/ or /-kek/. For /-mi/ the process is a simple one step vowel deletion.

Rule 17A - Vowel Deletion



According to this rule the completive aspect clitic /-mi/ reduces to [-m] and the incompletive aspect clitic /-kek/ reduces to [-kʔ] before a vowel within a word. The completive clitic requires no further changes.

(96) /lekbak -mi -aŋ/ --> [lé?ba?maŋ] 'we left'
leave CMP 1xA

/ke- hæhtæŋ -mi -æk/ --> [kɛhǽhtæmmæ?]
POS pregnant CMP 1sA 'I was pregnant'

When completive /-mi/ neither precedes nor follows a vowel, no such deletion occurs.

(97) /lekbak -mi sola -mu/ --> [lé?ba?mi solámu]
leave CMP friend 2sPOS 'your friend has gone'

/la- ku- pa- tahhik -mi -tek/ --> [lakupatáhhi?mitɛ?]
FUT 1sE CAUS continue CMP Dprx 'I must keep going'

The incompletive enclitic /-kek/ requires a further rule to reduce it to the form /-k/.

Rule 19A - Glottal Deletion

? --> Ø / C ___

Glottal stop only occurs syllable finally and so must be deleted whenever immediately following another consonant within a word. The rule, Glottal Deletion, is fed by Vowel Deletion and needs to be ordered after both Vowel Deletion and k-Weakening.

(98)	underlying form	/sule-kek-aŋ/	/bea-kek-æk/
	k-Weakening	sule-ke?-aŋ	bea-ke?-æ?
	Vowel Deletion	sule-k?-aŋ	bea-k?-æ?
	Glottal Deletion	sule-k-aŋ	bea-k-æ?
	Stress Placement	súle-k-aŋ	béa-k-æ?
	surface form	[súlekaŋ]	[béakæ?]
		'we are coming'	'give me'

Rule 19 deleted both the vowel and the glottal stop of incompletive -ke? in a single step. Rule 19A only deletes the glottal as the vowel has already been deleted under the more general vowel deletion rule 17A.

There is another situation in which completive /-mi/ is reduced in form. Following a vowel final root the i of /-mi/ is deleted.

Rule 17B - i-Deletion

i --> Ø / V +m ___ +

(99)	/boho-mi-æk/	-->	[bóhomæ?]	'I am full'
	/boho-mi tau/	-->	boho-m tau	'we are full'

If this reduced form is followed by a subsequent enclitic, no further rules are necessary; the surface form is duly generated. However, if the completive clitic marks the end of the word, the reduced form cannot stand without further modification.

Rule 18 - Nasal Velarisation

```
[+nasal]  -->  [-anterior]  /___#
```

Nasal Velarisation has to follow i-Deletion but must precede Nasal Assimilation which can occur across word boundaries.

(100)	underlying form	/boho-mi tau/	/boho-mi-æk/
	i-Deletion	boho-m tau	boho-m-æk
	Nasal Velarisation	boho-ŋ tau	-
	Nasal Assimilation	boho-n tau	-
	Stress Placement	bóho-n táu	bóho-m-æk
	surface form	[bóhɔn táu]	[bóhomæʔ]
		'we are full'	'I am full'

The above analysis generates the various surface forms of the aspectual enclitics, but requires four rules to do so. The earlier analysis, requiring only three rules is therefore the more economic.

5.5 Rule Ordering

As we have looked at the various rules which generate surface forms from their underlying layers, it has become apparent that many of them need to be ordered to bring about the correct surface manifestation. For several no such ordering is necessary; they work independantly to effect a change unrelated to other changes. The following table represents rules from sections 5.1-3 and also the two stress placement rules, showing those that must be ordered (with the sequential notation a-b-c). The remainder are listed arbitrarily. Table 14 represents the rules from section 5.4 and any other rules from earlier sections that need to be ordered with them under alternate analyses.

Table 13 - Rule Order

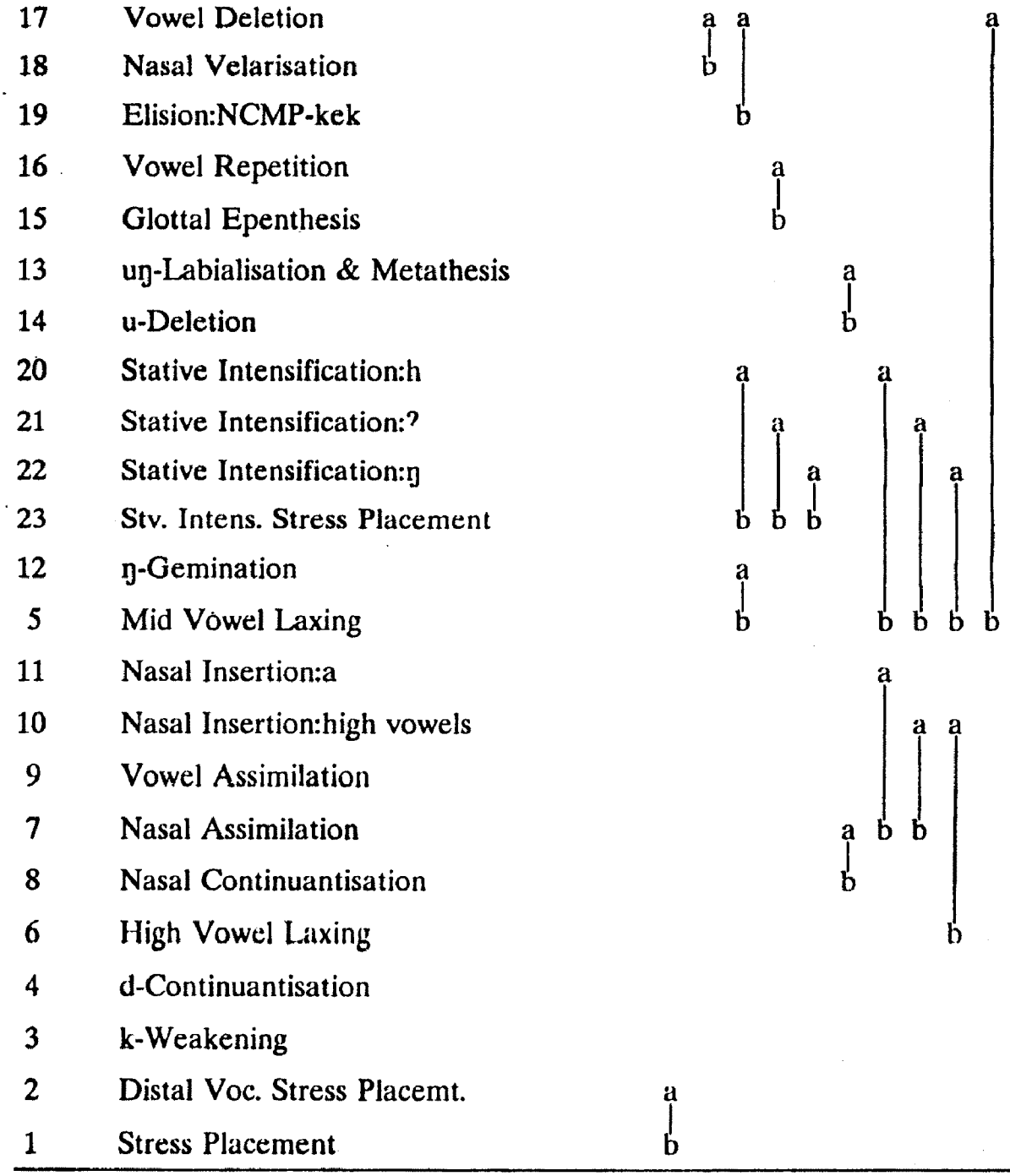


Table 14 - Rule Order (Alternative Analysis)

17B	i-Deletion	a
18	Nasal Velarisation	|
13A	mu-Velarisation and Metathesis	b a
7	Nasal Assimilation	| | a a
12	ŋ-Gemination	c b | |
6	High Vowel Laxing	b |
3	k-Weakening	b
17A	Vowel Deletion	a
19A	Glottal Deletion	| a
		b b

6 FREE VARIATION

Speakers of A-T distinguish the speech of Aralle and that of Tabulahan as being significantly different from each other to be separate, while remaining similar enough to be considered dialects. Within these dialectal areas, slight differences are reported between villages' usage. From my observation these differences are more commonly speaker specific than village specific. Intervillage communication and relocation between villages due to marriage for example are sufficiently strong and frequent to minimise these as areal differences, while they remain in speakers' idiolects.

We have already seen that /d/ is manifest as the phone [ř] intervocalically. In the main this is true, but in each of the Tabulahan dialect-speaking villages there are individual speakers who will invariably use [d] even intervocalically. This then is a speaker-specific variation.

(101)	/ma-duŋku/	[mařúŋku]	~	[madúŋku]	'close'
	/adahaŋ/	[ařáhaŋ]	~	[adáhaŋ]	'horse'
	/pedoka/	[peřóka]	~	[pedóka]	'gift'

The low vowels /æ/ and /a/ have been shown to contrast meaning (2.3.2). Sometimes however there will be free variation between these sounds. This is again speaker-specific variation.

(102)	[kæyyæŋ]	~	[káyyaŋ]	'large'
	[tæhhi?]	~	[táhhi?]	'straight on'

There exist then variations between speakers. Aside from these there are sometimes variations in the speech of an individual.

Such a free variation exists between stops and nasals in word-initial position occurring in several words where the second consonant of the word is /n/.

(103)	[pónna]	~	[mónna]	'if'	
	[póni]	~	[móni]	'sound'	
	[dɪnne]	~	[nínne]	'here'	(general)
	[dóne]	~	[nóne]	'here'	(adjacent)
	[dóno]	~	[nóno]	'there'	(opposite)

The same individual may use either of these forms at any time.

The same speaker may fluctuate in usage between the uŋ prefix and its metathesised counterpart mu-. He is far more likely to use uŋ- at any given time however. (See (84), (95))

7 FEATURES OF FAST SPEECH

It is considered refined among speakers of this language to speak slowly. People from Aralle as well as Tabulahan have related that Tabulahan is the preferred dialect inasmuch as it is generally spoken slowly and carefully. Nevertheless there are times when any speaker delivers a faster than usual string of speech. When this occurs, there may well be features not found in slower, more controlled utterances.

It has already been noted in 3.1, that certain vowel sequences, notably those beginning with /a/ can in skew the expected stress pattern, and particularly so in rapid speech.

Fast speech can often cause elision of segments. The consonant /d/ in fast utterances is frequently left off the morphemes di (general preposition) and di- (passive).

(106)	/la- di- aka/ FUT PASS what	-->	[laiáka]	'What will it be?'
	/di hipe/	-->	[ihípe]	'across (the valley)'
	/di- pa- tama di loko/ PASS CAUS enter GP barn	-->	[ipatámai lóko]	'put in the barn'

Similarly the first segment in the morpheme la- (future) can be lost to rapid speech elision.

(107)	/la-l-um- ao- mi -aŋ/ FUT INT go CMP 1xA	-->	[amáomaŋ]	'We are already going to leave.'

(107) also illustrates the frequent reduction of the intransitive infix -um-. The first two segments of the infixed verb are sometimes omitted leaving modified roots invariably beginning with /m/.

Nouns with an UF featuring geminate vowels and word final /k/ frequently lose the last vowel when suffixed with one of the possessives. This is especially so in fast speech.

(108)	/bææk-ku/	-->	[bǽʔku]	'my head'
	/biik-na/	-->	[bíʔna]	'its bottom'

8 ADAPTATION OF LOAN WORDS

Speakers of A-T, like speakers of all languages, have allowed new words to be accepted into general usage and to a greater or lesser degree to be adapted to suit A-T phonology. Some words having more recently entered the language than others may not be as fully adapted, given the same sequences of sounds.

I first became aware of sound adaptations being made in the language through hearing the difference in what people told me their names were from what they used in calling each other. Names originating outside the language area can be viewed as a kind of loan word and show patterns that are likely to emerge when new sounds are introduced to the language.

(109)	Hardy	[háʔdi]	Simson	[sínsɔŋ]
	Herby	[ɛ́ʔbi]	Johnson	[ɔ́nsɔŋ]
	Arnie	[áʔni]	Yordan	[yɔ́ʔdaŋ]
	Elias	[líaʔ]	Sofian	[sɔ́ʔyaŋ]
	Silas	[sílaʔ]	Arlene	[áʔliŋ]

From the above examples, we can summarise frequent changes made in loan words:

a) word-final nasals become [ŋ]
b) word-final s (and likely other non-nasal consonants) becomes [ʔ]
c) r in word-medial consonant clusters becomes [ʔ]
d) assimilation of nasals to point of articulation of following consonants

Some of these observations are indeed features of loan word adaptation. d) is harder to test as combinations of heterorganic nasal plus other consonant are rare in Indonesian.

8.1 Replacement of Foreign Sounds

The Indonesian consonants /g/, /j/ and /c/ are not part of the phonology of the Tabulahan dialect of A-T. Usually loan words containing these are modified to /k/, /d/ and /t/ respectively.

1. g --> k

(110)	tuan guru	[tuaŋkúhu]	'teacher'
	minggu	[míŋku]	'week'
	gergaji	[kařakáji]	'saw'

2. j --> d

(111)	puji	[púdi]	'praise'
	janji	[dándi]	'to make agreement'
	gaji	[kádi]	'salary'

3. c --> t

(112)	celana	[talána]	'trousers'
	baca	[báta]	'to read'
	cangkir	[táŋki?]	'cup'

Similarly the Indonesian vowel /ə/ has no equivalent in A-T and is adapted to /a/ in most cases and to /i/ between /s/ and /k/.

4. e[ə] --> a

(113)	celana	[tálana]	'trousers'
	selamat	[saláma?]	'safe'
	ketam	[káhtaŋ]	'plane'

5. e[ə] --> i

(114)	sekolah	[sikóla]	'school'
	sekop	[sikópaŋ]	'spade'
	sekrup	[sikúru?]	'screw'

[r], though it occurs in A-T, is not a phoneme. Often in loan words Indonesian /r/ becomes A-T /h/. More frequently though it is retained as [r].

6. r --> h

(115)	surat	[súha?]	'letter, book'
	tuan guru	[tuaŋkúhu]	'teacher'

7. r --> r

(116)	kursi	[kuřúsi]	'chair'
	gergaji	[kařakáji]	'saw'
	umur	[umúřu?]	'age'

8.2 Treatment of Word Final Consonants

Word final consonants are dealt with in one of four ways:

1. Anterior nasals are replaced with /ŋ/.
2. Other word final consonants are generally replaced by /k/ which is weakened to [ʔ] in this position.
3. The final vowel may be repeated followed by glottal stop.
4. /aŋ/ may be added to the end of the word.

1.		N#	-->	ŋ#
	(117)	ketam	[káhtaŋ]	'plane'
		senin	[séniŋ]	'Monday'
2.		C#	-->	ʔ#
	(118)	kasur	[kásuʔ]	'mattress'
		pahat	[pá^aʔ]	'chisel'
		minyak	[mínnæʔ]	'oil'
3.		VC#	-->	VCVʔ#
	(119)	umur	[umúruʔ]	'age'
		tanggal	[taŋgálaʔ]	'date'
		sandal	[sandálaʔ]	'sandal'
4.		C#	-->	Caŋ#
	(120)	sekop	[sikópaŋ]	'spade'

8.3 Breaking of Clusters

Illegal consonant clusters are handled by a vowel epenthesis process.

Loan Rule - Vowel Epenthesis

```
V C C      -->      1 2 1 3

1 2 3
```

VCC --> VCVC

(121)	kursi	[kuřúsi]	'chair'
	surga	[suřúga]	'heaven'
	gergaji	[kařakáji]	'saw'
	sekrup	[sikúruʔ]	'screw'

The last example shows the epenthesis working from right to left. This is most likely because the Indonesian vowel /ə/ has no place in A-T phonology and presumably the breaking of a consonant cluster precedes replacement of illegal vowels.

8.4 Consonant Gemination

One final process warrants mentioning in connection with loan word adaptation. Sometimes in South Sulawesi languages a medial consonant is geminated in borrowed words. A-T has been shown to exhibit geminate sonorants, while voiceless obstruents pattern: hC. As expected the same pattern occurs with loan words in the event that such a process takes place.

C --> hC / CC (cf Toraja)

(122)	kapal	[kahpála?]	'vessel'	(kappala)
	ketam	[káhtáŋ]	'plane'	(gattaŋ)
	Kamis	[kámmi?]	'Thursday'	

Despite all these adaptation processes, there remain borrowed words that have not been adapted and others only partially so, retaining features of the donor language. For example gergaji --> [kařakáji] 'saw', has retained [j], reflecting the time of borrowing, while gaji --> [kádi] 'salary' has been fully adapted to A-T phonological patterning.

9 ARALLE DIALECT - PRINCIPAL DIFFERENCES

In the short time we have been able to spend in the Aralle dialect area thus far[7], certain patterns of phonological divergence from the dialect spoken in Tabulahan have emerged. Their treatment here will be cursory; the small amount of data available is sufficient for only some of the principal differences to be mentioned.

9.1 Segmentals

Aralle has the additional phonemes /g/ and /j/, occurring root-initially and medially.

(123)

A.		T.		
/gaŋgu/	[gáŋgu]	/aliali/	[aliáli]	'to bother'
/lago/	[lágo]	/salalaŋ/	[salálaŋ]	'spouse of in-law'

At times /g/ corresponds with /k/ in Tabulahan, especially so in the case of loan words, which need not be adapted in this respect in Aralle.

(124)

A.		T.		
/logo/	[lógo]	/lokok/	[lókɔ?]	'a game for children'
/miŋgu/	[míŋgu]	/miŋku/	[míŋku]	'week'

Like /g/, the Aralle phoneme /j/ has a low functional load. It is only found word medially and corresponds to /y/ in Tabulahan in many cases.

(125)

A.		T		
/maŋ-baja/	[mambája]	/maŋ-baya/	[mambáya]	'to weed'
/tuju/	[túju]	/tuyu/	[túyu]	'a reed'
/kaju/	[káju]	/kayu/	[káyu]	'wood'

Another consonant correspondence, though not as consistent as either /g/-/k/ or /j/-/y/, is /b/-/h/. In certain cognate word pairs, /b/ in Aralle is equivalent to /h/ in Tabulahan.

(126)

A.		T.		
/bala/	[bála]	/hala/	[hála]	'fence'
/baa/	[bá^a]	/haa/	[há^a]	'top plate' (house)

We saw that intervocalically Tabulahan /d/ becomes [ř], though not with 100% of the population. In Aralle, this does not occur. /d/ remains [d] in all positions, [ř] only occurring in a handful of loan words.

9.2 Suprasegmental Features

Stress patterning is the same in both Aralle and Tabulahan and for the main part so is intonation. My subjective impression, backed by reports from Aralle speakers, is that intonation contours in Aralle are somewhat flatter. That is, while mostly being the same shape as their Tabulahan counterparts, they do not reach such high peaks and low troughs.

The possibly uniquely Tabulahan content question intonation: falling a perfect fourth on the last stressed syllable and rising to the former level for remaining syllables, is not used in Aralle. Instead a rise on the final stressed syllable followed by a fall signifies a content question.

9.3 Distribution

As with other South Sulawesi languages, the Aralle dialect of A-T displays a propensity for forming geminate consonant clusters. Where in Tabulahan only sonorants are found in geminate clusters, stops and fricatives forming hC clusters, Aralle allows free formation of geminates with this latter grouping also.

(127)

A.		T.		
/loppo/	[lɔ́ppo]	/lohpo/	[lɔ́hpo]	'vegetation'
/tappak/	[táppaʔ]	/tahpak/	[táhpaʔ]	'true'
/bittik/	[bɪ́ttiʔ]	/bihtik/	[bíhtiʔ]	'foot'
/hessæk/	[héssæʔ]	/hehsæk/	[héhsæʔ]	'mud'
/masussa/	[masússa]	/masuhsa/	[masúhsa]	'difficult'

Occasionally a geminate in Aralle will correspond to a nasal/stop cluster in Tabulahan.

(128)

A.		T.	
/happakaŋ/	[happákaŋ]	/hæmpækæŋ/	[hæmpækæŋ] 'rice picker

NOTES

[1]There is a fourth condition which causes stress to be on both the penultimate and the ultimate syllables. (See section 5.3 Rule 23).

[2]As this stress conditioned lengthening is entirely predictable and so slight, it has not been marked apart from (43).

[3]I am interpreting the hh cluster as h$\left[\begin{smallmatrix}C\\ \text{-son}\end{smallmatrix}\right]$ which fits the pattern for obstruents, rather than asgeminate h.

[4]Sirk terms these possessive 'enclitics', which behave like suffixes in regard to stress placement.

[5]There may be other members of this class not yet encountered.

[6]Several rules in this section have been numbered A or B (eg.13A) to indicate which rules in the previous section they are based on/most closely related to.

[7]Several days late March-early April 1990.

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