CHAPTER 2
PHONOLOGY

The chapter is organised as follows: §2.1 and §2.2 present the consonant and vowel inventories and give general statements of allophonic variation. Section 2.3 describes the general phonotactic patterns of the language while §2.4 discusses the phonetics and two alternative phonological analyses of what is, given these patterns, a very unusual consonant cluster consisting of the retroflex rhotic glide and an apical stop. Section 2.5 summarises the recurrent morphophonemic processes involved in allomorphic alternations in the language and §2.6 describes the general word-stress pattern. Together, the description of phonotactic and morphophonemic patterns suggests an internal reconstruction of phonological changes affecting Martuthunira consonant clusters and §2.7 presents a brief description of diachronic trends in the languages of the area.

2.1 CONSONANTS

The Martuthunira consonant inventory conforms closely to a common Australian pattern (see Dixon 1980:132ff) with six points of articulation for stops and nasals, four laterals, two rhotics and two glides. Table 2.1 presents the consonant phonemes in a practical orthography.

TABLE 2.1: CONSONANT INVENTORY

	peripheral		lamino-	lamino-	apico-	apico-
	bilabial	velar	dental	palatal	alveolar	post-alveolar
stop	*p*	*k*	*th*	*j*	*t*	*rt*
nasal	*m*	*ng*	*nh*	*ny*	*n*	*rn*
lateral			*lh*	*ly*	*l*	*rl*
rhotic					*rr*	*r*
glide	*w*			*y*		

The following sets of (near) minimal pairs illustrate the laminal contrast in initial and intervocalic positions:

thami	mother's father	*jami*	medicine
thuli	tawny frogmouth	*juli*	intestine
nhartu	what	*nyartu*	emu feathers
patha-L	to blow	*pajapajangu*	type of bird
manhamanha	awkward	*manyarrka*	sugar
yilhi	chip	*yilyilyi*	tree type
kulhuwari	soft	*ngulyurr*	bridge of nose

Despite the contrasts illustrated by the above examples, some variation in laminals occurs in certain lexical items, for example:

nhimu	~	*nyimu*	spinifex mouse
nganathu	~	*nganaju*	1SG.ACC/GEN

The following examples establish the apical contrast for nasals and laterals:

nyina-Ø	to sit	*yirna*	this.ACC
nhuunu	spouse	*nyuurnu*	grizzle
juna	spirit	*jurna*	hitting stick
wilawila	shaken	*wirlayi*	tired

Examples below illustrate firstly the contrast between apical stops and then the contrast between the alveolar stop and the alveolar tap/trill.

matimati	place name	*martiju*	father's sister
mitawanti	place name	*mirtamirta*	white
putangara	goanna	*purtatharta*	head ornament
thaata	place name	*thaarta*	opening
witiwiti	hanging	*wirti*	pearl shell

matimati	place name	*marringkarri-Ø*	to wave
putangara	goanna	*purra*-L	to chop, hit
witiwiti	hanging	*wirrirri*	flame

As a general tendency, stops are voiceless and unaspirated in word-initial position and following a nasal, and voiced between vowels. However, there is a degree of free variation in voicing for all stops in all positions. Firstly, the peripheral stops /p/ and /k/ are most often voiceless, even between vowels. Similarly, the alveolar stop /t/, which is rare in intervocalic position, is always voiceless and involves a longer period of closure than is usual for other stops in this position.

By contrast, the apico-postalveolar stop /rt/ is realised as a (voiced) retroflex flap [ɽ] between vowels and both apical stops tend to be voiced following a nasal. The laminal stops are usually voiced in intervocalic position with the interdental /th/ showing the greatest tendency to lenition. This stop is variously realised as a voiced interdental stop [d̪], a dental fricative [ð], or as an interdental glide [y̪]. The variation appears to be partly determined by the particular lexical item. For example, in some words the interdental stop is never realised as a glide:

pithangara	[pɪdəŋɐɻɐ]	cork bark tree
muthu	[mɷd̪ɷ]	cold
mayitha	[mɐɪd̪ɐ]	small python

In other items there is free variation between voiced stop or fricative and the glide:

puuthuni	[pɷːy̪ɷnɪ]	~	[pɷːd̪ɷnɪ]	hook on spearthrower
withawitha	[wɪy̪əwɪy̪ə]	~	[wɪd̪əwɪd̪ə]	lost
pithirri	[pɪy̪eɾɪ]	~	[pɪd̪eɾɪ]	chill

And morphemes with the interdental stop in initial position always result in a word with a lenited form of the stop:

-tharra	-DU	[wɪrɐɣɐrɐ]	two boomerangs
-thurti	-CONJ	[pɪwɪɣuɽɪ]	mother-CONJ
-tha-	-VERB	[kɐɽɐɣɛɳiɲci]	chop-FUT

In some words the stop loses all laminal definition: in the following examples /th/ is realised as a syllabic break between identical vowels, as the retroflex rhotic continuant [ɻ̩], as a palatal glide [y], and as a labial/velar glide [w] respectively.

nhulatharra	[n̪ɷlɐ·ɐrɐ]	those two
warntitharninyji	[wɛɳʈiːɹɐɳiɲci]	throw-FUT
witiwititharninyji	[wɪtɪwɪtɪyɛɳiɲci]	hang up-FUT
thathurninyji	[t̪ɐwɷɳiɲci]	send-FUT

Table 2.2 summarises the most commonly occurring allophones of the stop phonemes in each position.

TABLE 2.2: STOP ALLOPHONES

	#__	N__	V__V			
p	p	p	p			
k	k	k	k			
t	–	d	t·			
rt	–	ɖ	ɽ			
j	c	c	j			
th	t̪	t̪	d̪	ð	ɣ̪	
					y	*witiwititharninyji*
					w	*thathurninyji*
					ɻ̩	*warntitharninyji*
					ø	*nhulatharra*

Laterals are articulated with slight pre-stopping where they close a syllable:

kurntal	[kɷɳɖɐᵗl]	daughter
pal.ya	[pɐᵗlyɐ]	skinny
mirtily	[mɪɽɪᶜʎ]	neonate kangaroo

Similarly, the alveolar rhotic /rr/ is realised as a tap [ɾ] between vowels and as a trill [r] in final position, where it is usually voiceless. Preceding a consonant both tap and trill articulations are heard. However, the single tap is not strictly a tap 'gesture'. Rather it is a single vibration made with the tongue in the trill position. The single vibration variant of the trill involves a definite articulatory 'posture', rather than 'gesture' (see Catford 1977:130), and appears to result in a longer period of occlusion than the intervocalic tap (although this has not been measured). The exaggeration of lateral prestopping and the single-vibration trill preceding a glide often results in the apparent insertion of an epenthetic vowel between the two consonants.

The retroflex continuant /r/ is relatively invariant in its articulation as [ɻ̩]. However, it is typically articulated with a degree of lip spread that may affect the quality of adjacent vowels (§2.2).

The glides /y/ and /w/ suffer some reduction in degree of occlusion in intervocalic position but this varies. Although phonetic vowel clusters or diphthongs occur most often, alternative pronunciations with intervening glides are also heard. Much depends on the degree of emphasis given to the particular word in a certain context.

ngawu	[ŋɒɷ]	~	[ŋɒwɷ]	Yes!
ngawurr	[ŋɒɷr]	~	[ŋɒwɷr]	foam
mayiili	[mɐeːlɪ]	~	[mɐyeːlɪ]	my father's father

Similarly, the palatal glide /y/ need not be articulated in initial position preceding the high front vowel /i/. Loss of initial /w/ preceding /u/ is very rare.

2.2 VOWELS

Table 2.3 presents the six vowel phonemes, three long and three short. Although the long vowels are not common (accounting for some four per cent of vowels in initial syllables) they must be recognised as a separate set of phonemes.

TABLE 2.3: VOWEL INVENTORY

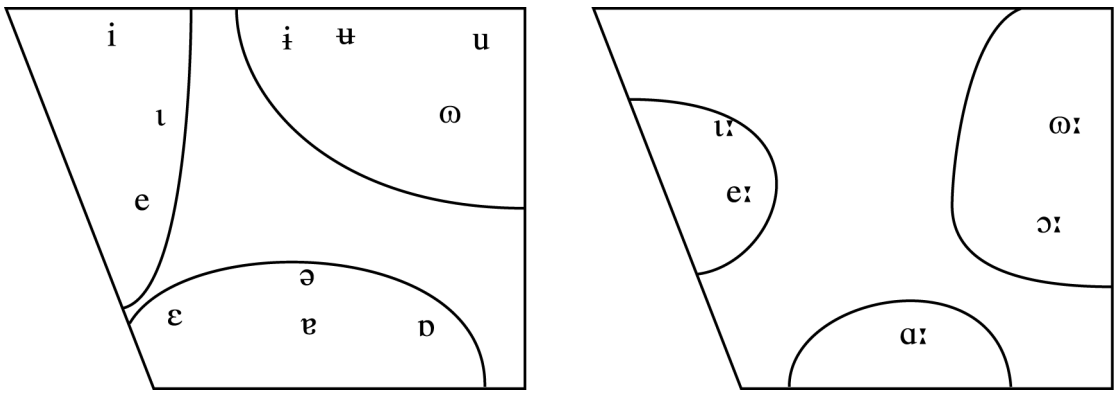
	front		back
high	*i, ii*		*u, uu*
low		*a, aa*	

The following examples demonstrate the length contrast for the three vowel qualities:

parnparn	twenty-eight parrot	*paarnpaarn*	silly
jamanu	foot	*jaamarnuru*	yawn.PRES
punilha	go.PAST	*puniina*	plant type
kulhuwari	soft	*kuulhu*	tadpole

There is a high degree of variability in the articulation of the vowels. Table 2.4 illustrates the phonetic locus of each of the vowel phonemes.

TABLE 2.4: VOWEL ALLOPHONES



The short high front vowel /i/ is usually articulated as the lax vowel [ɪ] though this varies with [i] near a palatal consonant. The alveolar consonants /rr/ and, to a lesser extent, /n/ and /l/ have a lowering effect on a preceding /i/, which is often realised as [e] in their proximity.

nyinalayi	[ɲenəleɪ]	sit.FUT
wirrirri	[weɾeɾɪ]	flame
yirra	[yeɾɐ]	tooth
martuthunira	[mɐʈωðωneˌɐ]	Martuthunira

The long high front vowel /ii/ is generally lower than its shorter counterpart. It is realised as [ɪː] in syllables which would regularly take stress (i.e. morpheme-initial syllables) with the allophone [eː] occurring elsewhere:

jiinngu	[cɪːnŋω]	*Grevillea pyramidalis*
kiirrkiirr	[kɪːɾkɪːɾ]	banded plover
mayiili	[mɐyeːlɪ]	my father's father
warriirti	[wɐɾeːʈɪ]	spears

The short back rounded vowel /u/ mainly varies between [u] and [ω] with the lax vowel most common in unstressed syllables. The vowel is generally fronted to [ü] following a lamino-dental consonant but the same fronting occurs in the immediate environment of all laminal consonants to a lesser degree. Preceding the retroflex approximant /r/ the fronted allophone is often the high mid unrounded vowel [ɨ].

nhula	[n̪ülɐ]	that near you
thurna	[t̪ünɻɐ]	glans penis
pal.yunyji	[pɐˈlyüɲcɪ]	rock python
yalhuru	[yal̪ɨˌɪω]	tongue

Once again, the long back rounded vowel is lower than its short counterpart. The lower allophone [ɔː] typically occurs following a lamino-dental consonant; elsewhere the vowel is consistently [ωː].

The low vowel /a/ has the widest range of allophones. Following a lamino-dental, and to a lesser extent lamino-palatal, consonant the vowel is well fronted and raised, approaching cardinal [ɛ]. Following a back rounded segment (usually /w/) and preceding a velar consonant the vowel is realised as a back rounded [ɒ]. In unstressed positions /a/ is slightly centralised and approaches schwa. Elsewhere, the vowel is an open mid [ɐ]. In final position preceding a lamino-palatal consonant, the mid allophone is typically characterised by a palatal off-glide. The long low vowel /aa/ shows almost no allophonic variation and is consistently realised as [ɐː].The different allophonic tendencies of vowels can be summarised as follows:

1. Long vowels are lower than their short counterparts and have a more restricted range of allophonic variation (longer segments have a higher degree of phonetic integrity).
2. Unstressed positions have a centralising effect on vowels.
3. A preceding lamino-dental consonant has the effect of fronting the low vowel /a/ and the back vowel /u/. Interestingly, the long back vowel /uu/ is lowered to [ɔː] in this position.
4. Alveolar consonants, in particular the rhotic /rr/, have a lowering effect on the high front vowel.

2.3 PHONOTACTICS

In §2.3.1 to §2.3.4 the general phonotactic patterns of the language are described. An examination of the frequency of occurrence of different phoneme combinations allows a more general statement of preferred phonotactic patterns than arises simply from a consideration of occurring forms. It is thus possible to class certain lexical items as phonotactically marked.

2.3.1 CONSTRAINTS ON POSITIONS OF OCCURRENCE

All Martuthunira words must begin with a consonant and may end in a consonant or vowel. Permissible initial consonants are restricted to the peripheral and laminal stops and nasals, and the peripheral and laminal glides /w/ and /y/. Final consonants are chosen from among the apical nasals and laterals, the lamino-palatal nasal and lateral, and the trill /rr/. All vowels may occur in word-final position. Table 2.5 illustrates the permitted initial and final consonants:

TABLE 2.5: PERMITTED INITIAL AND FINAL CONSONANTS

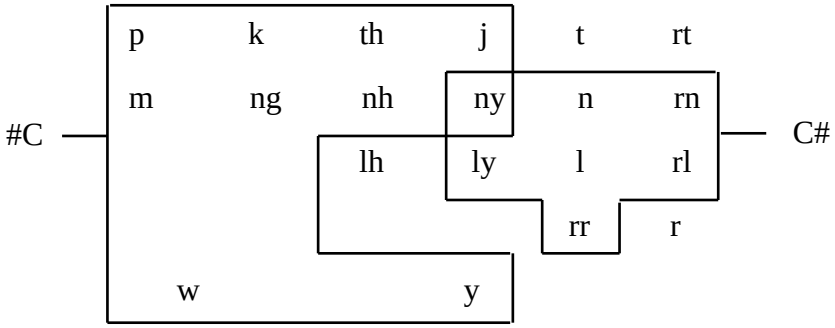


Table 2.6 lists the frequency of consonants in initial, final and intervocalic positions for a dictionary sample of 1,300 words:

TABLE 2.6: FREQUENCY OF CONSONANTS

	#C	C#	V_V		#C	C#	V_V
p	227	–	21	*lh*	–	–	51
k	217	–	30	*ly*	–	1	74
th	95	–	48	*l*	–	25	129
j	122	–	29	*rl*	–	1	74
t	–	–	7				
rt	–	–	209	*rr*	–	38	323
				r	–	–	226
m	194	–	85				
ng	162	–	53	*w*	179	–	185
nh	25	–	20	*y*	93	–	130
ny	52	19	32				
n	–	47	99				
rn	–	15	50				

A number of patterns emerge from the figures listed in Table 2.6. Firstly, those consonants that occur in word-initial position are less common in intervocalic position. The only exceptions are the two glides /w/ and /y/. The difference is most marked for the peripheral stops /p/ and /k/, and to a lesser extent the palatal stop /j/, and reflects historical changes affecting stops in intervocalic position (§2.7). Secondly, the alveolar consonants /n/, /l/ and /rr/ are the most common finally (although there is no evidence to suggest a neutralisation of the apical contrast in this position).

Thirdly, the alveolar stop /t/ is very rare. It appears medially in just seven lexical items and does not occur in either initial or final position. By contrast, the retroflex stop /rt/ is among the most common intervocalic segments overshadowed only by the two rhotics /rr/ and /r/. The full set of words in which the intervocalic alveolar stop occurs is:

Matimati	name of unidentified rockhole
Mitawanti	name of a hill on the Robe River
Thaata	name of pool on Fortescue River
putangara	Gould's Sand Goanna
kuta	short
witiwiti	hanging down
tharratal	type of bird

Three of these words are names and in at least the two identified cases refer to places which are close to territorial boundaries with the Yinyjiparnti or Kurrama. The words conform to the phonotactic patterns of the neighbouring languages. The word *putangara*, although elicited as the word for goanna, never occurs in text (*mirntirimarta* being the preferred term). However, I have not yet found a cognate form in a related language. On the other hand, the words *kuta* and *witiwiti* may well be borrowed from Panyjima. This leaves *tharratal* as the only word for which some independent exceptional status cannot be given. It is thus possible to assume the non-occurrence of the alveolar stop in medial position as a general phonotactic rule of the language which admits of a very few exceptions. This discovery immediately calls into question the assumed phonemic status of the alveolar stop. With the exception of the few words mentioned here, the stop occurs only in the homorganic nasal-stop cluster /nt/.

2.3.2 CONSONANT CLUSTERS

Intramorphemic consonant clusters consist of no more than two consonants and fall into two classes: a set of heterorganic clusters of different kinds, and a full set of homorganic nasal-stop clusters (there are no homorganic lateral-stop clusters).

The set of consonants which may occur as the first member of a heterorganic cluster corresponds to the set of consonants permitted in word-final position. The second member of such a cluster is drawn from the set of peripheral consonants plus the palatal glide /y/; that is, a subset of the consonants permitted in initial position. However, not all possible combinations are attested. Table 2.7 lists the relative frequency of the various heterorganic clusters in a sample of 1,300 (apparently) monomorphemic items. The exceptional /r.t/ cluster is described in §2.4 below.

TABLE 2.7: INTRAMORPHEMIC CONSONANT CLUSTERS

C_1 \ C_2	*p*	*k*	*m*	*ng*	*w*	*y*
ny	–	4	–	–	–	–
n	16	42	4	4	–	–
rn	4	8	2	–	–	–
ly	1	1	–	–	6	–
l	1	1	–	–	16	42
rl	1	2	–	–	13	1
rr	2	5	–	–	21	28

Most clusters consist of either nasal plus stop, nasal plus nasal, or a non-nasal sonorant (lateral or rhotic) plus a glide. The few exceptions to this general tendency involve a non-nasal sonorant plus a stop:

lyp	*walypa*	type of tree (= Ngarluma)
lyk	*palykura*	flat (but also *pal.yura*)
lp	*wilpilpi*	emu chick
lk	*kurilkura*	seagull (= Ngarluma)
rlp	*marlpara*	surrounded
rlk	*kurlkura*	hair, fur (= Ngarluma)
	thurlku	boy (common in Mantharta languages)
rrp	*jirrpi*	patrimoiety totem
	warrpurri-Ø	to swim, bathe
rrk	*jarrkurti*	three
	jurrkirta	moon
	kurlurrkura	black-feathered emu
	manyarrka	sugar
	yurrkun	mangrove crab

The relative frequencies of clusters involving a lateral plus the palatal glide suggest a defective distribution. Although all three laterals occur together with the glide /w/ (with just one exception, *warlyarra* 'shiny, smooth'), only the alveolar lateral /l/ occurs in combination with /y/. This pattern is the result of a historical change merging laterals which precede the palatal glide (§2.7.2).

The following examples illustrate the six homorganic nasal-stop clusters:

ngampalyura	adult head louse
ngangka	mother
nganthari	tooth
nganyjali	proscribed object or food
kanta	leg
karnta	tear (from eye)
ngarnta	wound, injury

As in most Australian languages, these homorganic clusters complicate an otherwise simple statement of phonotactic constraints on consonant clusters and syllable structure conditions (see Dixon 1980:159ff). Although there is no good evidence at present for treating

these clusters as unit-phonemes (for example, Jagst (1973) treats them as a series of prenasalised stops in Ngardilpa), such an analysis would have some advantages. Firstly, it would enable a simpler statement of the phonotactics of consonant clusters. Secondly, treating the homorganic alveolar cluster /nt/ as a unit-phoneme would effectively deny the alveolar stop /t/ phoneme status.

2.3.3 INTERMORPHEMIC CLUSTERS

The possibilities for consonant clusters at morpheme boundaries are very open and can be characterised in the most general terms as involving one of the permissible word-final consonants followed by a permissible word-initial consonant. In reality, the set of actually occurring clusters is somewhat smaller. These are presented in Table 2.8 below:

TABLE 2.8: INTERMORPHEMIC CLUSTERS

C_2 / C_1	*p*	*k*	*th*	*j*	*m*	*ng*	*nh*	*ny*	*w*	*y*
ny	–	*	*	–	*	*	–	*	*	–
n	–	*	*	–	*	*	–	*	*	–
rn	–	*	*	–	*	*	–	*	*	–
ly	–	–	*	–	*	*	–	*	*	–
l	–	–	*	–	*	*	*	*	*	*
rl	–	–	*	–	*	*	–	*	*	–
rr	–	–	*	–	*	*	*	*	*	*

Note: * actually occurring
– predicted but not occurring in the data

The gaps in the predicted set can be explained as follows:

1. There are no bound morphemes with an initial bilabial /p/ or initial palatal stop /j/ in the data (§2.7.1).
2. Morphemes with an initial velar stop /k/ have allomorphs with initial /y/ following the non-nasal sonorants (§2.5.2).
3. The only morpheme with an initial /nh/ is the Proper Nominal marker, *-nha* (§3.1.2). There are few examples in the data of this morpheme occurring on a consonant-final word.
4. Similarly, the only morpheme with initial /y/ is the Vocative clitic, *-yi* (§7.11). There are few examples involving a consonant-final word.

A few morphemes that may be suffixed to consonant final stems violate the usual constraints on word initial consonants. Two different strategies are employed to avoid non-permissible clusters that would otherwise arise in this situation. Firstly, the syllable /pa/ (following a final nasal) or /wa/ (following a lateral or the alveolar rhotic) is inserted preceding the clitic *-rru*. In the examples presented in this description, this 'empty morph' *-pa* is set apart from the stem to which it is attached and is glossed as zero (-Ø):

pirtan-pa-rru	*minthal-wa-rru*	*kanparr-wa-rru*
quartz-Ø-NOW	alone-Ø-NOW	spider-Ø-NOW

The use of a syllable /pa/ to avoid certain phonotactic constraints is very common in languages of Western Australia, the best known example being the addition of the syllable to consonant final stems in a number of the Western Desert dialects (Dixon 1980:209). Within the Ngayarda group, Panyjima shares this feature (Dench 1991:133).

Secondly, an epenthetic vowel /u/ is inserted between a stem-final /l/ or /n/ and the clitics *-l*, *-lwa* and *-nu*. Similarly, the clitics *-lwa* or *-nu* following clitic *-l* are separated by /u/:

minthal-u-lwa	*pirtan-u-nu*	*mir.ta-l-u-lwa*
alone-Ø-ID	quartz-Ø-QUOT	not-THEN-Ø-ID

Despite the existence of a few bound morphemes with initial consonant clusters, there is little opportunity for these to come together with consonant-final stems. The only possible situation involves the clitic *-lpurtu* following a consonant-final nominal. There are no cases in the data collected and examples involving this clitic would be difficult to elicit. However, I would predict that such possibly complex clusters would be avoided by the insertion of the *-pa* syllable between stem and clitic.

2.3.4 REDUPLICATION

Reduplication, not a particularly productive morphological device in Martuthunira, involves the complete reduplication of the lexeme root. As the following examples show, reduplication may affect disyllabic or trisyllabic roots, either vowel-final or consonant-final.

jampa-jampa	near to death
witha-witha	lost
manha-manha	shaky
yirti-yirti	striped
warnan-warnan	overcast
puriny-puriny	light breeze
winyarta-winyarta	exhausted
wurtura-wurtura	dirty/dusty
yarlwanhu-yarlwanhu	speckled brown and white

Trisyllabic reduplications are relatively uncommon and appear more to resemble words in apposition than true reduplications. Although there are no examples in the data of intervening material, the two parts of a trisyllabic reduplication bear an intonation pattern and degree of relative stress more in keeping with their being separate words.

Word-initial /p/ and /k/ are replaced by /w/ in medial position.

kurryu-wurryu	bumpy
kulha-wulha	heaped up
pinyja-winyja	shaken
punku-wunku	rolled up

This lenition is part of a general historical process affecting intervocalic peripheral stops (§2.7.1). However, the rule does not appear to be general for all reduplications. For two words in the data the lenition is optional:

pirntura-pirntura	ripples
parntalha-parntalha-npa-Ø	become blistered all over

These two cases happen to be the only examples in the data of reduplicated trisyllabic roots with an initial peripheral consonant. The optional status of the peripheral stop lenition thus supports the notion that trisyllabic reduplications have marginal status as singular words.

2.4 THE *r.t* CLUSTER

A small number of Martuthunira words reveal an interesting phonetic contrast between apical stops and a consonant cluster consisting of the retroflex rhotic glide followed by an apical stop. The phonetic cluster is represented orthographically as *r.t* in contrast to the retroflex stop *rt*. It occurs in just four words in the collected data and these are listed below together with near-minimal pairs involving the apical stops and /rr/.

kur.ta clever	*kurta* brother	*kuta* short	*kurrangu* black
mir.ta No	*mirtamirta* white	*Mitawanti* placename	*mirru* spearthrower
mir.tuwarra clever person			
thuur.ta sweet	*thurtu* sister		

The contrast is most clearly established by the minimal triple *kur.ta* 'clever', *kurta* 'elder brother' and *kuta* 'short'. As described in §2.1, the apical stops have quite different phonetic realisations: the retroflex stop is usually realised as a flap in intervocalic position while the alveolar stop, rare between vowels, is voiceless and involves a relatively long period of closure. Because of a lack of good controlled recordings it has not been possible to conduct a thorough instrumental analysis of the data. However, in the few spectrograms analysed, the contrasting length of /rt/ and /t/ and a corresponding (inversely proportional) difference in the length of the preceding vowel are clearly visible.

Plots of *kurta* revealed a period ranging from 3 to 4 centiseconds for the flap with a preceding vowel length of between 18 and 20 centiseconds. The plots of *kuta* revealed a period of voiceless closure, with burst release, varying from 12 to 18 centiseconds for the stop and a preceding vowel length of between 7.5 and 10 centiseconds. If the period of the consonant occlusion and the period of the preceding vowel are combined, the total length remains roughly constant for the two consonants. The average combined length of the closure plus the preceding vowel was 24.5 centiseconds for the alveolar stop in *kuta*, and was similarly 24.5 centiseconds for the retroflex flap in kurta.

The period of stop closure in *kur.ta* is similar to that of the alveolar stop in *kuta*, ranging between 14 and 21 centiseconds for the examples analysed. The consonant is voiceless and is released with some wide spectrum burst of energy. The preceding formant structure is clearly divisible between a pure vowel component and a structure showing strong retroflex colouring. Each accounts for approximately half the formant structure, which varies in length between 19 and 21 centiseconds. The average length of the closure plus the preceding formant structure is

36 centiseconds, significantly longer (by a half) than the combined average VC period for either *kuta* or *kurta* and clearly supporting the contention that *r.t* is a cluster.

The phonetic cluster might be analysed phonologically as a cluster involving either /r/ or /rl/ followed by the retroflex apical stop /rt/. Either combination would appear to fit the phonetic facts though there are good phonotactic reasons for preferring a phonological cluster /rl/+/rt/. Firstly, the phonotactics of Martuthunira permit laterals in syllable-final position but do not permit the retroflex rhotic to occur in this position. Secondly, the retroflex stop may occur following a consonant but only where that consonant is the homorganic nasal. The hypothesised homorganic lateral-stop cluster could be similarly categorised as a principled exception to the general constraints on intramorphemic clusters. The forms below illustrate the various contrasts under this analysis:

kuta	short
kurta	elder brother
kurlta	clever
kurnta	shame

Alternatively, the phonetic *r.t* cluster could be described as a single phoneme in contrast to the retroflex flap. By this analysis, what has to date been described as the retroflex stop in intervocalic position would now be described as a separate retroflex flap phoneme (orthographically /rd/), and the *r.t* cluster would fill its position as the intervocalic allophone of the retroflex stop /rt/. Under this analysis the apical stops share very similar phonotactic and phonetic properties: both are very rare in intervocalic position, occurring in just a handful of words, and both are realised in intervocalic position as relatively long, voiceless stops. On the other hand, the retroflex flap /rd/, like the apical tap /rr/, is extremely common in intervocalic position (in fact it only ever occurs in this position).

The phonetic realisation of the unit-phoneme /rt/ as a cluster might then be described as a breaking of the features of one segment into two separate segments: in this case the retroflexion of the stop is unpacked into a separate preceding glide. The following forms illustrate the phonemic contrasts inherent in the unit-phoneme analysis:

kuta	short
kurda	elder brother
kurta	clever
kurnta	shame

Unfortunately, only two of the four Martuthunira words involving the *r.t* cluster have clear cognates in other Ngayarda languages. The cognate forms are:

mir.ta	vs	*mirta*	Panyjima, Ngarluma, Yinyjiparnti
thuur.ta	vs	*thukurta*	Panyjima, Ngarluma

These cognates appear to support the unit-phoneme analysis of *r.t* as a retroflex stop and suggest a phonemic split in Martuthunira: while most instances of proto Ngayarda /*rt/ are reflected as flaps in intervocalic position, in some words /*rt/ is reflected as a retroflex stop. However, there are not enough examples to suggest a conditioning environment for the split and the lack of cognates outside of the Ngayarda group argues against borrowing as the basis for the split.

Of course, the Panyjima and Ngarluma cognates need not be taken as incontrovertible evidence against the cluster analysis. It may be that an original cluster has been simplified in

these languages and has reflexes independent of the retroflex stop only in Martuthunira. However, at this stage there is no evidence to suggest a reconstruction of homorganic lateral-stop clusters for proto Ngayarda. In addition, although a synchronic analysis of the cluster as /rlt/ simplifies the phonotactics, it also implies a certain regularity – that Martuthunira (and the Ngayarda languages generally) permit homorganic lateral-stop clusters – which obscures the exceptional status of the *r.t* cluster. On the other hand, the unit-phoneme analysis, while obviating the need for any fancy phonotactic footwork, implies a history involving (at this stage) unconditioned phonemic split.

On balance, *r.t* is treated here as a cluster consisting of the retroflex glide followed by the homorganic retroflex stop, represented orthographically as *r.t* (instead of the potentially confusing *rrt*, that is *r* + *rt*). This approach sacrifices two quite aesthetically pleasing synchronic analyses, but avoids assuming unsubstantiated historical change and remains faithful to the phonetic facts. The *r.t* cluster thus stands out as an exception to otherwise quite regular phonotactic patterns and begs further diachronic and synchronic investigation.

2.5 MORPHOPHONEMICS

Martuthunira has very few patterns of morphophonemic alternation and those that exist are easily stated. However, the language is not written here in terms of underlying forms; each allomorph of a morpheme is represented no matter how regular, or alternatively, how restricted the morphophonemic processes may be. The one exception to this involves the variation between apicals affecting the future inflection on verbs and the clitics *-l* and *-nu*. Because of the degree of apparent free variation here, each morpheme is represented by its most commonly occurring allomorph (§2.5.7).

This section is organised by recurring morphophonemic processes. Thus different allomorphs of one and the same morpheme may be described in different subsections according to the range of processes involved in the full complement of alternative forms. Full sets of allomorphs for each particular morpheme are given with the introduction of the set of functions of each morpheme in the following chapters.

2.5.1 SYLLABLE/MORA-COUNTING ALLOMORPHS

All lexical roots in Martuthunira are at least dimoric. Dimoric roots may be monosyllabic, in which case they involve a long vowel, or disyllabic involving two short syllables. A number of morphemes have different forms depending on the number of morae in the stem to which they are attached. In all cases, such 'mora-counting' alternations are sensitive to a basic contrast between dimoric stems and stems of more than two morae.

The clearest cases of mora counting alternation involve the locative (§4.5) and effector (§4.4) nominal suffixes, which differ only in that the effector forms have final /u/ where the locative forms have final /a/ (§4.1.3). These morphemes follow the common Australian pattern with forms *-ngku/a* and *-lu/a* on vowel-final stems. The *-ngku/a* allomorph occurs on nominal stems of two morae while the *-lu/a* alternant occurs on all stems of more than two morae (see Hale 1976b):

nguu-ngka	face-LOC	*kaara-la*	hip bone-LOC
nharnu-ngka	sand-LOC	*malarnu-la*	shade-LOC
muyi-ngku	dog-EFF	*muyira-lu*	dingo-EFF
tharnta-ngku	euro-EFF	*mirntirimarta-lu*	goanna-EFF

Similarly, the ’full-laden’ suffix, *-warlaya*, (§4.1.6, §4.16) has a shortened form *-warla* which appears on dimoric stems:

murti-warla	fast-FULL	*marrari-warlaya*	word-FULL
jinyji-warla	fat-FULL	*kunkuwarra-warlaya*	honey-FULL

The shortened form appears to be motivated by a desire to conform, as nearly as possible, to a disyllabic meter. Possibly the existence of other mora-counting alternations in the language has an analogical effect.

Finally, there are different forms of the collective suffix (§6.1.5, §6.3.2) on L-conjugation verbs depending on the length of the verb stem. On a stem of just two morae the suffix has the form *-yarri-Ø* while on longer stems the suffix is *-lwarri-Ø*:

karta-yarri-Ø	stab-COLL	*thuulwa-lwarri-Ø*	pull out-COLL
thani-yarri-Ø	hit-COLL	*kartatha-lwarri-Ø*	chop-COLL

2.5.2 LENITION OF PERIPHERAL STOPS

Allomorphs of a number of morphemes show evidence of a conditioned alternation affecting the velar stop /k/. Firstly, the stop is lenited to a laminal glide /y/ following a stem-final lateral or the alveolar rhotic /rr/. The clearest example is given by the various forms of the accusative suffix on consonant final nominal stems (§4.1.1, §4.3):

jinkarn-ku	*mukul-yu*
kurlany-ku	*kanparr-yu*

The identical pattern of lenition is revealed by the ’body-noise’ verbal derivational suffix *-karri-Ø/-yarri-Ø* (§6.3.6):

jinkurn-karri-Ø	*nhuurr-yarri-Ø*

By contrast, the ’belonging” suffix (§4.1.2, §4.13) shows lenition of /k/ to /w/ where /y/ is predicted:

jinkarn-kura	*mukul-wura*
kurlany-kura	*kanparr-wura*

Similar lenition of morpheme-initial /k/ to /w/ occurs following a vowel-final stem. Thus the genitive (§4.1.1, §4.12) has forms:

-ku	on stems with a final nasal
-yu	on stems with a final lateral or rhotic
-wu	on stems with a final vowel

For example:

muyi-wu	*jinkarn-ku*
pawulu-wu	*kanparr-yu*
tharnta-wu	*mukul-yu*

This same pattern is shared by the belonging suffix (a) and is also revealed by reduplications (b):

(a) *pawulu-wura*
kanyara-wura

(b) *kurryu-wurryu*
kulha-wulha

On vowel-final stems the lenition of the accusative suffix extends to loss of the consonant and harmonising of the suffix vowel with the final vowel of the stem (the divergence of the accusative and genitive morphemes is discussed in §4.1.1):

muyi-i	dog-ACC
pawulu-u	child-ACC
tharnta-a	euro-ACC

Morphophonemic lenition of the bilabial stop /p/ to the glide /w/ is shown by a number of reduplications:

parra-warra
punku-wunku
pulya-wulya

There are no bound morphemes with an initial bilabial stop and so it is not possible to discover patterns of morphophonemic alternation similar to those which exist for the velar stop.

2.5.3 VOWEL LENGTHENING

Vowel assimilations occur with four morphemes; the accusative and direct allative nominal suffixes, the *-:ngku-Ø* verbaliser, and the first person singular kin possessive suffix. The accusative suffix on vowel-final stems, consisting simply in a lengthening of the final vowel as the result of a complete lenition of **-ku*, has already been described in the preceding section.

Comparative evidence shows that the direct allative *-:rta* descends from **-karta* and so similarly involves, historically, the loss of /k/ and harmonising of the initial vowel with the final vowel of the stem. There are no examples in the data of this allative suffix occurring on consonant-final stems (§4.1.4, §4.7).

wuyu-urta	river-ALL
ngurra-arta	camp-ALL
puyi-irta	far-ALL

The most likely historical source of the verbal derivational suffix *-:ngku-Ø* involves a verb of form *kVngku-Ø* (§6.3.9) with a similar pattern of lenition and subsequent vowel harmony. Where the stem-final vowel is /a/, the resulting long vowel is reduced:

murti-ingku-Ø	run after
thartu-ungku-Ø	meet
jina-ngku-Ø	track

Finally, the first person singular kin-possessive suffix (§5.2) may be given an underlying form *-:ni* affecting a lengthening of the final vowel of a disyllabic stem. I have been unable to elicit an example involving a consonant-final stem.

mura-ani	my son
pawu-uni	my father
thami-ini	my mother's father

The suffix does not appear on trisyllabic kin terms but instead the vowel in the second syllable is lengthened:

kantharri	mother's mother	*kanthaarri*	my mother's mother
mayili	father's father	*mayiili*	my father's father
yumuni	father's brother	*yumuuni*	my father's brother

This process, like the addition of the *-:ni* suffix, results in a trisyllabic word with a lengthened second syllable. There seems little value in attempting to reconcile the two morphological processes in the synchronic grammar since the most likely historical process involved here is the analogical expansion of a paradigm.

2.5.4 VOWEL REPLACEMENT

The contemporaneous inflection *-rra* (§6.1.4, §10.1.4), and the related sequential relative suffix *-rrawaara*, effects a change in the form of a preceding Ø-conjugation verb-stem where that stem has a final /a/ vowel: the final /a/ is replaced with /i/.

nyina-rra	*nyinirra*
wangka-rra	*wangkirra*

The modern suffix form *-rra* descends from a form **-yarra*, and so the vowel replacement can be explained, in diachronic terms, as the lingering of the fronting effects of the palatal glide in the original Ø-conjugation allomorph. The common verb *nyina-Ø* 'sit, be' is similarly affected by the present relative inflection *-nyila*. This change is best described as an analogical extension from the *nyinirra* form affecting, to date, only this one verb stem.

2.5.5 HAPLOLOGY

A number of morpheme combinations result in the dropping of one of two similar syllables. The first such pattern affects the second syllable of the passive derivational suffix -CM-*nguli-Ø* (§6.1.5, §6.3.1) when followed by certain final verb inflections. Here a syllable /li/ is dropped when the following syllable begins with a lateral or the alveolar rhotic /rr/:

**-nguli-layi*	→	*-ngu-layi*
-PASS-FUT		
**-nguli-lu*	→	*-ngu-lu*
-PASS-PURPss		
**-nguli-rra*	→	*-ngu-rra*
-PASS-CTEMP		

A similar pattern involves the dropping of the final /rri/ syllable of the collective (a) and 'body-noise' (b) derivational suffixes preceding the contemporaneous relative inflection *-rra*:

(a)	*-marri-rra*	→	*-marra*
	-yarri-rra	→	*-yarra*
	-lwarri-rra	→	*-lwarra*
(b)	*-karri-rra*	→	*-karra*
	-yarri-rra	→	*-yarra*
	-rarri-rra	→	*-rarra*

This reduction is optional. Unreduced versions are occasionally heard in text and are usually given in careful response to elicitation.

2.5.6 CONSONANT ASSIMILATION

The forms of the locative and effector nominal suffixes on stems with a final consonant can be described in terms of an assimilation of a non-nasal consonant to certain features of the stem-final consonant. The locative forms are:

-ta	following /n/
-rta	following /rn/
-tha	following /ny/
-a	following a lateral or /rr/

Following an apical nasal, the allomorph involves a homorganic stop. Following the only permissible final laminal nasal, the suffix involves the laminal stop /th/, resulting in a palatal-dental cluster. While this cluster is often articulated, in fast speech the common phonetic result is a double-articulated dental/palatal nasal-stop cluster. The appearance of the allomorph *-tha* (*-thu* for the effector suffix) rather than the expected homorganic **-ja* may preserve an original allophonic variation for the laminals. That is, /j/ only occurred preceding the vowel /i/ while /th/ occurred before vowels /a/ and /u/. This solution is suggested by Austin (1981c:302) for the same pattern of allomorphy in the Kanyara and Mantharta languages (and see also Dixon 1980:153).

2.5.7 APICAL ALTERNATION

The initial apical laterals and nasals of some bound morphemes show variation between alveolar and retroflex articulations. The morphemes affected are the two (conjugation dependent) forms of the future inflection; *-rninyji* and *-layi,* and the clitics *-l* and *-nu*:

-rninyji	/-ninyji/	~	/-rninyji/
-layi	/-layi/	~	/-rlayi/
-l	/-l/	~	/-rl/
-nu	/-nu/	~	/-rnu/

Although there are clear environments favouring one or other allomorph in each case, these are by no means restricting conditions. For example, a verb bearing the future inflection with an initial retroflex consonant, on one occasion, may occur in different circumstances with an initial alveolar. Because of this relatively free variation I have chosen not to represent the

alternate forms in transcriptions. Instead, the most common form of the morpheme is represented in each case.

Two factors affect the tendency for one or other apical to occur. Firstly, the retroflex realisation is preferred if the final syllable of the stem to which the morpheme is attached includes an apical lateral or nasal. This tendency is strongest where the preceding apical is alveolar and agrees in manner with the morpheme-initial consonant. Secondly, the alveolar articulation is preferred following the high front vowel /i/. Of course, these two conflicting conditions may co-occur in which case either articulation is possible. The preferred variants for each morpheme in each of the four possible environments are listed in Table 2.9. Where neither variant is clearly preferred the orthographic indication of the retroflex is enclosed in parentheses.

TABLE 2.9 : CONDITIONED APICAL ALTERNATIONS

	-rninyji	*-layi*	*-l*	*-nu*
$C_{[+apical]}V\_\_$	*-rninyji*	*-rlayi*	*-rl*	*-(r)nu*
$C_{[+apical]}i\_\_$	*-(r)ninyji*	*-layi*	*-l*	*-nu*
$C_{[-apical]}i\_\_$	*-(r)ninyji*	*-layi*	*-l*	*-nu*
elsewhere	*-rninyji*	*-layi*	*-l*	*-nu*

2.6 STRESS

Martuthunira stress typically conforms to a basic disyllabic metrical pattern with stress falling on the first syllable, but this pattern is confused by non-initial syllables involving long vowels. Historically, most of these dimoric syllables involved two syllables separated by a since lenited consonant. In the modern language the effects of the original disyllabic stress pattern are still felt.

As in many Australian languages, the stress patterns of words are determined in part by their morphological make-up. However, while it is a simple matter to devise regular stress rules dependent on morpheme boundaries, a number of clear exceptions show that regular rules of stress are better stated as operating on the output of word combination in which stress is already assigned to component morphemes. That is, certain morphemes are marked for stress in the lexicon.

It is necessary to recognise three levels of stress assignment. First, morphemes bear a lexical stress mark. Second, regular phonological stress rules modify the patterns arising from the combination of stress-marked morphemes in accordance with a general ban on sequences of two stressed syllables or sequences of three unstressed syllables. Third, the preferred word-stress patterns may be modified by the marking of emphatic stress at the phrase level.

Section 2.6.1 describes the basic stress patterns without reference to dimoric syllables, which are then discussed in §2.6.2. Section 2.6.3 makes a number of observations on the effects of phrasal stress on the preferred word stress patterns.

2.6.1 BASIC STRESS PATTERNS

At the lexical level, all morphemes of more than a single syllable in length have stress on their first syllable. In addition, the monosyllabic verbalisation suffixes *-ma*-L and *-tha*-L have lexical stress (stress is indicated by underlining).

panyu	good
kanyara	man, person
-mulyarra	-ALLative
-ma-L	-CAUSative
-tha-L	-Controlled Contact

Words which are recognisable as compounds (even though their component morphemes do not necessarily occur as free forms in modern Martuthunira) have a stress pattern in accord with their component morphemes. For example:

Mangkuru(+)thuni	Peter Creek
Wangkarta(+)muka	Mount Mistake

Similarly, a few monomorphemic verbs are stressed as though they involved the lexically stressed verbalisers. In a number of instances this pattern is probably a false segmentation based on the shape of the stem-final syllable rather than on the basis of any perceived morphological or semantic similarity with other verbal forms:

wuruma-L	to do for (someone)
kulaya-L	to try out, test
warrama-L	to make

The stress patterns arising from the combination of lexically stressed morphemes are modified by regular rules. The rules remove stress marking from the second of adjacent stressed syllables, and add stress to any syllable flanked by two unstressed syllables. By convention the rules operate from left to right.

Rule 1	CV	→	CV/CV __
Rule 2	CV	→	CV/CV__CV

The first rule accounts for aberrations of the basic disyllabic pattern introduced by the lexically stressed monosyllabic verbalisers. The second rule assigns a basic disyllabic stress pattern to strings of neutral monosyllabic morphemes or to sequences of three unstressed syllables arising from the operation of the first rule. The following examples illustrate the regular derivation of stress patterns on morphologically complex words:

(2.1)	*wantha-rninyji*	lexical stress
	wantharninyji	
(2.2)	*patha-rrnguli-nyila-a*	lexical stress
	patharrngulinyilaa	
(2.3)	*kanyara-ngara-la*	lexical stress
	kanyarangarala	
(2.4)	*kanyara-la-nguru*	lexical stress
	kanyaralanguru	Rule 2

(2.5)	*wangkarnu-marri-lha-rru*	lexical stress
	wangkarnumarrilharru	Rule 2
(2.6)	*panyu-rri-rra-rru*	lexical stress
	panyurrirrarru	Rule 2
(2.7)	*nhartu-ma-rninyji*	lexical stress
	nhartumarninyji	Rule 1
(2.8)	*wantharni-ma-rninyji-rru*	lexical stress
	wantharnimarninyjirru	Rule 1
	wantharnimarninyjirru	Rule 2
(2.9)	*mirru-ngka-ma-lalha-rru*	lexical stress
	mirrungkamalalharru	Rule 1
	mirrungkamalalharru	Rule 2
(2.10)	*kulaya-rninyji-rru*	lexical stress
	kulayarninyjirru	Rule 1
	kulayarninyjirru	Rule 2

2.6.2 THE EFFECTS OF LONG VOWELS ON STRESS PATTERNS

Just as certain morphophonemic alternations dependent on the length of stems are sensitive to morae rather than to syllables (§2.5.1), to some extent stress patterns are similarly conditioned. But although it is clearly the case that the stress rules treat some dimoric syllables as if they were disyllabic for the purposes of calculating stress meter, it is not possible to describe the stress system solely in terms of morae counts. The basic unit of phonological structure bearing stress is the syllable, not the mora.

The effects of long vowels on stress patterning are best described by reference to a number of examples. The simplest cases involve multisyllabic morphemes in which a long vowel appears in the first syllable. For example, the stress patterns of words based on the disyllabic (trimoric) nominal *nhuura* 'know', conform to the rules already stated:

(2.11)	*nhuura-npa-rra*	lexical stress
	nhuuranparra	Rule 2
(2.12)	*nhuura-ma-lalha-rru*	lexical stress
	nhuuramalalharru	Rule 1
	nhuuramalalharru	Rule 2

Where a monosyllabic (dimoric) morpheme is followed immediately by a stressed syllable the situation is more complicated. Consider the nominal compound *thaapuwa* 'rotten mouth'. As a compound this word is expected to have two lexical stress marks on the first and second syllables respectively – *thaapuwa*. However, when the word occurs in isolation, in nominative (unmarked) case, or is followed by a morpheme with an initial stressed syllable, the second syllable of the stem is unstressed:

(2.13)	*thaapuwa*	rotten mouth
	thaapuwangara	rotten-mouthed fellows-PL

This pattern might be expected given the regular rule erasing the second of a pair of stressed syllables. However, where *thaapuwa* is followed by a sequence of unstressed monosyllabic morphemes, stress is assigned to these as if stress were still present on the second syllable of the stem:

(2.14) *thaapuwa-rru* not: **thaapuwa-rru*
thaapuwa-la-rru **thaapuwa-la-rru*

Similar patterns occur where a long vowel (dimoric syllable) results from the addition of a vowel-initial (lexically stressed) morpheme to a vowel-final stem. For example, the allative suffix *-:rta* and the verbal derivational suffix *-:ngku-Ø* both yield a long second syllable when added to a disyllabic root.

(2.15) *ngurra-arta*
ngurraarta

(2.16) *ngurra-arta-npa-rra*
ngurraartanparra
**ngurraartanparra*

(2.17) *muyi-ingku-lha*
muyiingkulha
**muyiingkulha*

(2.18) *muyi-ingku-ngu-rra-rru*
muyiingkungurrarru
**muyiingkungurrarru*

These examples suggest that Rule 1 affects only adjacent short stressed syllables and that a late rule removes stress from the second of a pair of adjacent stressed syllables where either involves a long vowel.

Rule 1	CV	→	CV/CV __
Rule 2	CV	→	CV/CV__CV
Rule 3	CV(V)	→	CV(V)/CV(V) __

Rule 3 can be seen, from a diachronic viewpoint, as the reapplication of Rule 1 following a change in which intervening unstressed syllables have been lost. This has resulted in trisyllabic stems of four morae which affect the stress patterning of following morphemes as if they still consisted of four syllables, and yet bear a stress pattern consistent with their trisyllabic status.

The issue is further complicated by forms involving the addition of the*-:ngku-Ø* verbaliser to stems with a final /a/ vowel. In these cases the expected long vowel is reduced and yet the stress pattern remains consistent with what is historically a four-syllable verb stem with stress on the third syllable (2.19). To account for this pattern the rules of stress assignment, as stated, must apply before the vowel is reduced.

(2.19) *waya-ngku-ngu-rra* lexical stress
wayangkungurra Rule 2
not **wayangkungurra*

Not all examples of a lengthened second syllable arise through the addition of lexically stressed, vowel-initial morphemes to vowel-final stems. For example, the various inflected forms of the verb *waruulwa*-L 'keep on trying', show that the long second syllable acts as if it were stressed for the purpose of assigning stress to subsequent unstressed morphemes:

(2.20) *waruulwa-nngu-rra*
waruulwannngurra
**waruulwanngurra*

Similarly, a number of disyllabic morphemes have a long second syllable which, when followed by a sequence of unstressed morphemes, acts as if it were stressed. The following example illustrates this for the privative suffix *-wirraa*:

(2.21) *kapun-wirraa-npa-lha-rru*
kapunwirraanpalharru
not **kapunwirraanpalharru*

These cases can be accounted for by adding to Rule 2 so that any long vowel is stressed when it precedes an unstressed syllable:

Rule 2a	CV	→	CV/CV__CV
Rule 2b	CVV	→	CVV/__CV

Rule 2 then feeds Rule 3 which erases stress from long syllables immediately preceded by a stressed syllable. The full derivation of (2.21) is then (2.22).

(2.22)	*kapun-wirraa-npa-lha-rru*	lexical stress
	kapunwirraanpalharru	Rule 2b
	kapunwirraanpalharru	Rule 2a
	kapunwirraanpalharru	Rule 3

This can be compared with a derivation in which the long vowel in the privative suffix does not receive stress:

(2.23)	*nguyirri-wirraa-ma-rninyji*	lexical stress
	nguyirriwirraamarninyji	Rule 1

Words bear a primary stress assignment which falls on the first stressed syllable. Words that involve more than two stress marks often have a second more prominent stressed syllable. In most cases this secondary stress falls on the last stressed syllable in the word. However, if the word involves the *-ma*-L causative suffix and this suffix is not the last stressed syllable, then it attracts secondary stress. Examples of each of these patterns are given below:

(2.24) *wántha-rninyji*
wángkarnu-marri-lhà-rru
wáantharni-mà-rninyji-rru

2.6.3 PHRASE STRESS AND WORD STRESS

The preferred stress patterns of words are often affected by phrase stress and intonation patterns, syntactic emphasis on particular morphemes, and metrical rhymes. First, there is a tendency to stress final case-markers in certain contexts; usually where some contrast in syntactic function is being emphasised. The most common example of this occurs with the

long vowel allomorph of the accusative suffix on vowel-final nominal stems. This extra stress assignment clearly helps the listener to distinguish nominative forms (with a final short vowel) from accusative forms and so serves an important syntactic function. However, it is by no means an established rule that final accusative case-marking is always stressed.

Second, word stress assignments which result in word-final stress occurring on the antepenultimate syllable may be modified so that stress falls on the penultimate syllable. This shift most often occurs where a word has five syllables. A 3+2 metrical stress pattern is generally preferred over a 2+3 pattern.

(2.25)
patha-rralha-rru	→	*patharralharru*
kanarri-lha-rru	→	*kanarrilharru*
mani-ngka-npa-rra	→	*maningkanparra*
yakarrangu-la	→	*yakarrangula*

The preference for penultimate word-final stress occasionally results in stress assignment errors in fast speech. In the following examples, the speaker faltered momentarily and succeeded in breaking the penultimate vowel into an additional stressed syllable. In the first example, the long vowel allomorph of accusative case is broken into two short syllables. In the second example, the second syllable results from the repetition of the short vowel.

(2.26)
kurryarta-marta-a-rru	→	*kurryartamarta.arru*
yanga-rninyji-rru	→	*yangarninyji.irru*

Finally, the expected stress pattern for a word may be modified so that it 'rhymes' with the stress patterns of other words in a phrase. In (2.27) (from Appendix 1, Text 7:18-19), the preferred stress pattern for the word *kanyara-npa-rra-rru* is modified to conform to that of *panyu-npa-rra-rru*. The expected pattern of stress for *kanyara-npa-rra-rru* occurs in the following sentence of the same text (Text 7:20).

(2.27) *panyu-npa-rra-rru kanyara-npa-rra-rru*

↓

panyunparrarru kanyaranparrarru

Most instances of aberrant stress involve violations of Rule 2, the rule that assigns stress to sequences of unstressed syllables in accordance with a basic disyllabic pattern. However, the unexpected patterns nevertheless conform to the general constraints on possible sequences of stressed and unstressed syllables. Violations of lexical stress assignment are less common.

2.7 PHONOLOGICAL HISTORY

The phonological patterns described in the preceding sections make reference to a number of diachronic changes affecting Martuthunira consonants. In particular, the morphophonemic alternations described in §2.5 show evidence of conditioned lenition and loss of the peripheral stops in intervocalic position and in certain consonant clusters. The same changes are reflected in the general phonotactic patterns of the language: firstly /p/ and /k/ occur with relatively low frequency in intervocalic position (Table 2.6), and secondly the set of permissible intramorphemic consonant clusters (Table 2.7) reveals patterns of lenition similar to those occurring across morpheme boundaries.

Similar changes are described for other Ngayarda languages by O'Grady (1966) and for the Kanyara and Mantharta languages by Austin (1981c). Unfortunately, the only Martuthunira data available to O'Grady at the time of his study was a basic one-hundred item word list and it was not possible for him to do more than note that changes affecting this language were similar to changes affecting Yinyjiparnti and Kurrama, the most phonologically innovative languages in the group. With additional data it is possible to extend O'Grady's reconstruction to Martuthunira and thus attempt a reappraisal of the diachronic tendencies affecting other languages in the area. A detailed reconsideration of O'Grady's work is beyond the scope of this description but an initial reformulation is presented as an appendix to Dench (1987b).

2.7.1 LENITION OF STOPS

A number of Martuthunira words show evidence of the loss of /*k/ between like vowels:

**kakara*	>	*kaara*	hip bone
**yakan*	>	*yaan*	spouse
**nhukura*	>	*nhuura*	know
**nhukunu*	>	*nhuunu*	spouse of grandparent

However, there are also a number of words in which this lenition does not take place. Compare the following with the above examples:

makaran	type of plant
yakarrangu	sun, day
thukurtarra	person who talks out of place

Similarly, there is widespread evidence of the lenition of /*k/ to /w/ (between dissimilar vowels), /*p/ to /w/ and /*j/ to /y/ intervocalically. Although there is also phonetic lenition of /th/ to an interdental glide [ð̞] (§2.1), this does not result in a phonemic split in Martuthunira (effected in Yinyjiparnti by the fortition of /*lh/ to /th/).

**jikurra*	>	*jiwurra*	bony bream
**puka*	>	*puwa*	rotten
**warruka*	>	*warruwa*	devil
**makuntu*	>	*mawuntu*	punishment spear
**yapan*	>	*yawan*	hot cooking stone
**pipi*	>	*piwi*	breast
**jipa*	>	*jiwa*	shock, surprise
**thapi*	>	*thawi*	song type
**japurta*	>	*jawurta*	beard
**kaja*	>	*kaya*	elder brother
**pajapurtu*	>	*payawurtu*	savage
**yuja*	>	*yuya*	spinifex quail
**wajuwarra*	>	*wayuwarra*	type of marsupial rat

Once again, there are exceptions to this pattern:

pukarra	firewood
makurra	afternoon

ngapala	mud
kapun	person, body
jipurta	type of fruit
waja	baby
paju	REALly
yaji	mother's brother

That is, although there are sets of forms which suggest patterns of lenition equivalent to those which have affected Yinyjiparnti and Kurrama, there are also numerous forms which appear otherwise identical and in which the changes have not taken place. There are essentially two possible explanations for this state of affairs: either there is some conditioning environment yet to be discovered, or one or other set of forms is exceptional as a result of interference of some kind.

That the changes involve a more particular set of conditioning environments does not seem plausible given the great similarity between forms in both the leniting and non-leniting sets. Because the patterns of lenition do not coincide exactly with those of Yinyjiparnti and Kurrama it is probably best to assume that the lenited forms are 'Martuthunira proper'. The non-lenited forms are the more likely to have been borrowed.

2.7.2 CHANGES AFFECTING CLUSTERS

Proto-Ngayarda consonant clusters involving an initial lateral or /*rr/ followed by a stop have reflexes in Martuthunira showing lenition of the stop to a glide: /*k/ and /*j/ are lenited to /y/ and /*p/ becomes /w/. A subsequent change has affected the laterals so that the retroflex /*rl/ and palatal /*ly/ merge with the alveolar /l/ preceding /y/:

pulka	>	*pul.ya*	spinifex resin
parlkarra	>	*pal.yarra*	plain
ngalyka	>	*ngal.ya*	spike, firestick
warrku	>	*warryu*	joey kangaroo
pulpu	>	*pulwu*	stone axe
jirlpa	>	*jirlwa*	ashes
walypa-L	>	*walywa*-L	detach
kurrparu	>	*kurrwaru*	butcher bird
paljarri	>	*pal.yarri*	hill kangaroo
kurrjarta	>	*kurryarta*	spear

The lenition is equivalent to that occurring in Yinyjiparnti and Kurrama in clusters involving /*rr/ (O'Grady 1966). However, in Martuthunira the lenition extends to clusters involving laterals. By contrast, in Yinyjiparnti and Kurrama it is the laterals that show the effects of change in the comparable consonant clusters: they surface as stops in Kurrama and variously as rhotics or glides in Yinyjiparnti.

2.7.3 THE PROBLEM OF INTERVOCALIC *t*

The effective ban, in Martuthunira, on the alveolar stop /t/ in intervocalic position (§2.3.1) suggests that some historical changes might have effected a merger with the tap /rr/ in this

position. However, the non-occurrence of /t/ between vowels is actually very common among the languages of the area and any such change is clearly not restricted to Martuthunira. O'Grady's (1966) reconstruction includes a listing of 465 reconstructed items of which just three include a medial alveolar stop:

**katama*-L	to hit	reflexes only in Panyjima and Palyku
**jitamarra*	eye	reflexes only in Ngarla and Nyamal
**kutu*	dead	reflexes in Ngarla, Nyamal, Palyku and Panyjima

Of these languages, only Panyjima is undeniably a member of the core Ngayarda group, on present evidence (§1.2). While intervocalic /t/ is not uncommon in Panyjima it is rare in other Ngayarda languages. A few examples appear in Wordick's (1982) Yinyjiparnti dictionary but all of these are identical to Panyjima forms and may be borrowings. Hale's (n.d.) collection of Ngarluma vocabulary includes no example of intervocalic /t/.

The situation appears to be similar for the Kanyara and Mantharta languages. Austin's (1981c) reconstruction of proto Kanyara and proto Mantharta phonology includes a list of 475 reconstructed items in which there are no examples of intervocalic /*t/. There are also no examples of intervocalic /t/ in Austin's (1986b) lists of Thalanyji and Jiwarli vocabulary. Although phonological changes have produced intervocalic alveolars in Purduna and Tharrkari, Austin (1981c:312 footnote 12) notes that, for Tharrkari, "the contrast between *t* and *rr* is not well established synchronically and the two appear to fluctuate freely in a number of forms".

There appears to be a general tendency in languages of the area to merge the alveolar stop with the alveolar tap between vowels, corresponding to the common phonetic realisation of the retroflex stop as a flap in this position.