Topics in Kaytetye Phonology and Morpho-Syntax

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I hereby certify that the work embodied in the thesis is my own work, conducted under normal supervision. The thesis contains no material which has been accepted, or is being examined, for the award of any other degree or diploma in any university or other tertiary institution, and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968 and any approved embargo.

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I hereby certify that the work embodied in this thesis contains a published paper of which I am a joint author. I have included as part of the thesis a written declaration endorsed in writing by my supervisor, attesting to the contribution to the joint publication/scholarly work.

By signing below I confirm that Forrest Panther contributed the database analysis and the principal theoretical innovations to the paper entitled 'Associated Path in Kaytetye' (2020, Australian Journal of Linguistics 40.1: 74-105)

Signature:

Name: Mark Harvey

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Abstract

Kaytetye is an Arandic language with approximately 200 speakers spoken in Central Australia. The Arandic languages are notable for proposals that: (1) the basic syllable is VC; (2) complex verbal structures are words and associate motion to a predicate; (3) certain varieties have only two vowels /a/ vs /ə/. In this thesis, I evaluate previous analyses of these patterns, and propose new analyses using quantitative and qualitative methodology, as well as insights from typological data. The thesis focuses on five areas.

1. *The Status of Round Vowels*: Kaytetye has been analysed as having either a two-vowel (/ɐ/, /ə/) or a three-vowel system (/ɐ/ /ə/, /i/). I provide quantitative and qualitative evidence supporting the occurrence of a round vowel, producing a four-vowel system: /ɐ/ /ə/, /i/, /u/.

2. *Associated Path*: The current analysis of Associated Motion proposes that Associated Motion constructions are complex words, which are composed of a verb root and a motion morph: *arenke* 'see', *arey-alpenke* 'see after going back'. In this analysis I propose that Associated Motion constructions are auxiliary verb constructions, in which an auxiliary verb expresses a path configuration in relation to its complement VP (hence 'Associated Path'). The previous analysis raised serious challenges to understandings of the word and the semantic content a single word conveys. In the new analysis, I show that word structure in Kaytetye is comparatively simple.

3. *The Minimal Root*: Word minimality is standardly analysed as a constraint on word forms based on prosodic structure. I show evidence that Kaytetye has a second type of minimality effect, the 'minimal root', in which the forms of roots are constrained by lexical patterns.

4. *Reduplication*: I show that Kaytetye has two types of reduplication which are not analysable under a single approach to reduplication. 'Total reduplication' reduplicates a stem and forms a phrase, which results in a scalable interpretation of the base. 'Partial reduplication' only occurs in Associated Path constructions and has a path or distributive meaning depending on its position in the Associated Path construction.

5. *Syllable Structure*: The Arandic languages have been analysed with a basic VC syllable structure. I provide evidence that: (i) the VC analysis makes incorrect predictions in Kaytetye; (ii) the facts of syllabification favour a standard CV analysis; (iii) the data which appear in favour of VC syllabification are explained by the historical loss of initial consonants, and a VCV minimal root.

In these areas, I show that Kaytetye shows congruency with standard analyses of phonological and morpho-syntactic structures, and also challenges existing theories.

Morphological Glossing Conventions

+	Syntactic Boundary on which only Clitics Occur.
-	Morphological Boundary.
.	Connects Multiple Meanings of Morpheme.
=	Clitic Boundary
1	First Person
2	Second Person
3	Third Person
ACC	Accusative Case
ALL	Allative Case
AVER	Aversive Case
CAUS	Causative
COLL	Collective Number
COMP	Complementiser
DAT	Dative Case
DEF	Definite
DEM	Demonstrative
DIM	Diminutive
DIR	Directional
DS	Different Subject
EMPH	Emphatic
ERG	Ergative Case
EXCL	Exclamation
EXT	Extended
FOC	Focus
FUT	Future Tense
GEN	Genitive Case
HITH	Hither
IMP	Imperative Mood
INST	Instrumental Case
INTENS	Intensive
IPFV	Imperfective Aspect
LOC	Locative Case
NEG	Negative
NOM	Nominative Case
OBL	Oblique
PFV	Perfective Aspect
PL	Plural Number
PN	Personal/Place Name
POT	Potential Mood
PRIV	Privative Case
PROP	Proprietive Case
PRS	Present Tense
PST	Past Tense
PURP	Purposive Mood
RED	Reduplicant
REFL	Reflexive
SEQ	Sequential Case
SG	Singular
SIM	Simple/Unmarked Aspect
SS	Same Subject
SWITCH	Switch Reference
TOP	Topic
VOC	Vocative
conc	Concurrent (Abbreviation)
itr	Intransitive (Abbreviation)
tr	Transitive (Abbreviation)

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Chapter 1: Introduction

Kaytetye [ˈkɐidic] is an Arandic language spoken in Central Australia. Kaytetye had approximately 200 speakers in 2012 (Turpin & Ross 2012: 11), and the current population of speakers is likely lower than this number.

This thesis draws on previous fieldwork on Kaytetye, both published and unpublished. Koch's fieldwork began in the 1970s, Turpin's in the 1990s and Ken Hale's fieldwork was in 1959. The published literature has focused on language change (Koch 1997, 2001, 2003, 2004, 2007, 2013, 2014, 2018, 2019), Associated Motion (Koch 1984), semantics (Green & Turpin 2001; Koch 1982; Turpin 2002, 2013; Turpin & Ross 2012; Turpin & Si 2017), and song (Turpin 2005, 2007, 2008). Previous research has been carried out into the phonology and morpho-syntax of Kaytetye, and its scope has been comparatively limited (Harvey et al. 2015; Koch 1980, 1990; San 2016; Turpin et al. 2014). This is in contrast to Eastern & Central Arrernte, a language related to Kaytetye which has been the subject of multiple influential studies (Breen 2001; Breen & Pensalfini 1999; Henderson 2013). This thesis aims to address this gap and complement the existing Kaytetye literature.

The goal of this thesis is to provide new analyses of aspects of Kaytetye phonology and morpho-syntax through comparative evaluation of competing analyses, and to introduce new data for evaluating these analyses. In Chapter 2, I provide an overview of the language situation of Kaytetye and describe the databases and datasets that I use in this thesis. In Chapter 3, I provide an overview of Kaytetye phonology and morpho-syntax as necessary preliminaries to the analyses in this thesis. Following these, I address five areas of Kaytetye grammar:

- *Chapter 4:The Status of Rounding in Kaytetye*: Previous analyses of Kaytetye propose a two-vowel (Koch 1984) or three-vowel system (Koch 2006; Turpin & Ross 2012). I provide evidence that Kaytetye has a four-vowel system, which includes a round vowel: /ɐ, ə, i, u/.

- *Chapter 5:Associated Path*: Associated Path constructions have been termed Associated Motion constructions in previous literature on Kaytetye (Koch 1984) and in the typological literature (e.g. Guillaume 2016). These constructions in the Arandic languages were previously analysed as words, and as associating motion to a predicate (Henderson 2013; Koch 1984; Moore 2012). I show that Associated Path constructions in Kaytetye are phrasal and associate a path configuration to a verb.
- *Chapter 6:The Minimal Root*: Kaytetye shows minimality effects which target a VCV root form. Prosodic analyses of minimality, including a foot binarity analysis, do not account for this minimality target. I show that instead the VCV target is an optimal root form in Kaytetye, which balances standard phonological patterns in Kaytetye of vowel-initiality and polysyllabicity against phonological complexity.
- *Chapter 7:Reduplication*: The reduplication patterns in Kaytetye have not been studied in detail in previous literature. I show that Kaytetye has two types of reduplication which are not analysable under a single approach to reduplication. 'Total reduplication' reduplicates a stem and forms a phrase, which results in a scalable interpretation of the base. 'Partial reduplication' only occurs in Associated Path constructions and has a path or distributive meaning depending on its position in the Associated Path construction.
- *Chapter 8:Syllable Structure in Kaytetye*: Breen and Pensalfini (1999) propose a VC syllable analysis of Central Arrernte, a language related to Kaytetye. This analysis has been influential in research of language typology. I show that a VC analysis of Kaytetye is not supported by the evidence, while an onset maximising analysis

provides a well-motivated account for language data. I show that the appearance of VC syllabification is the result of language change, rather than syllable structure.

A general methodological principle that underlies the argumentation in this thesis is that if a phonological analysis with minimal departures from the surface form accounts for the data as well as an analysis with multiple departures, this analysis is preferable to the analysis with multiple departures. This application of Ockham's Razor to phonology is well-supported in the phonological literature and in formal models of phonology, including the concept of faithfulness constraints in Optimality Theory, which captures the generalisation that input forms correspond to output forms unless they are transformed in some way (McCarthy & Prince 1995). In chapters 3 & 4 I make use of this principle in argumentation for the phonemic status of a range of phonetic sequences.

Chapter 2: Language Situation and Datasets

2.1 Introduction

In this chapter I describe the language situation of Kaytetye. I do this in §2.2. Following this in §2.3, I provide information on the datasets used in this thesis for phonetic, phonological, and morpho-syntactic analysis.

2.2 Language Situation

In this section I provide a brief overview of the language situation of Kaytetye in three areas: (i) language affiliation; (ii) land – language associations; (iii) language status in terms of the number of speakers and the language's future.

2.2.1 Language Affiliation

Kaytetye is part of the Arandic language family and is therefore part of the Pama-Nyungan family. The relationship between the Arandic languages as proposed by Koch (2004: 130) and Hale (1962) is shown in Figure 1. The labelling in this figure makes use of Koch's definition of 'Aranda' referring to language groups, as opposed to 'Arrernte', referring to spoken varieties of Aranda. Therefore 'Aranda' is defined as the set of Arandic languages excluding Kaytetye.

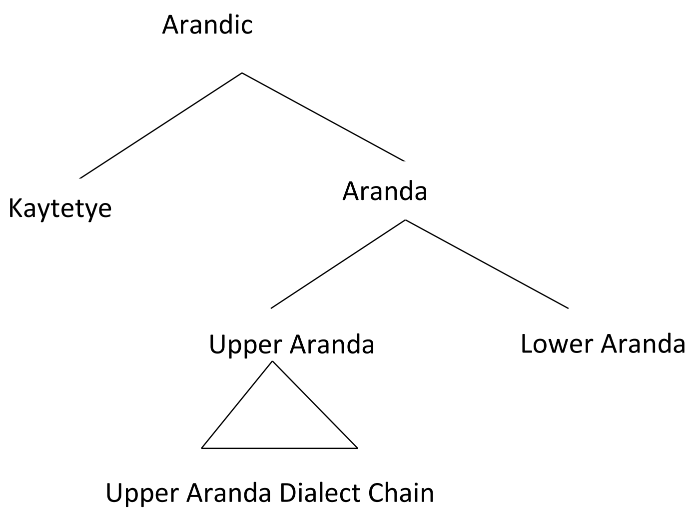

Figure 1: Varieties of the Arandic Language Family.

The place of Kaytetye in the Arandic language family shows that Kaytetye split from the rest of the Arandic languages early in pre-history and is therefore the most divergent of the Arandic languages. Researchers have noted that there is a comparatively low shared vocabulary between Kaytetye and varieties of Aranda, especially in the verbs (Breen 1990a: 156; Koch 2004: 129). This has led some scholars to doubt whether Kaytetye is related to the other Arandic languages genetically, or whether it forms a linguistic area with the Aranda languages with no genetic relationship (Dixon 2002: xxxix). Koch (2004) shows that there are innovations in terms of vocabulary, diachronic phonology, pronouns, inflection, and interrogatives which point to a proto-language (Proto-Arandic) from which both Kaytetye and the Aranda languages descend. I assume a genetic relationship between Kaytetye and the other Arandic languages in this thesis.

2.2.2 Geographical Associations of Kaytetye

The Arandic languages are spoken in a geographically contiguous area in Central Australia, centred roughly on Alice Springs. Kaytetye country, the region that the language is traditionally from, is a small region approximately 300km north of Alice Springs (Turpin 2000: 1).

In general terms, the southern associations of Kaytetye are to Stirling station, and the northern associations are to *Karlwe-karlwe* (‘Devil’s Marbles’). The eastern associations are near Ntarrengeny, and the western associations are around the Hanson river (Turpin 2000: 1; Turpin & Ross 2012: 11). Neighbouring languages of Kaytetye include other Arandic languages, i.e. Alyawarr to the east and Anmatyerr to the south, and other Pama-Nyungan langauges, i.e. Warlpiri to the west and Warumungu to the north.

2.2.3 Language Status

Kaytetye was estimated to have 250 speakers in 2000 (Turpin 2000: 1) and 200 speakers in 2012 (Turpin & Ross 2012: 11). The number of speakers at the time of this thesis is likely even lower. Turpin observes that today varieties of Aboriginal English to creole are the *lingua franca* at Tara and Alekarenge communities, although some older people (55+) can still understand and speak Kaytetye to varying degrees. In these and neighbouring communities, Kaytetye people can be heard speaking Anmatyerr, Alyawarr or Warlpiri (pers.com 2020). The current situation shows that Kaytetye is a highly endangered language.

2.3 Data and Datasets

In this section I present the datasets which form the basis of the analyses in this thesis. These datasets are presented under the following categories:

1. Data based on Elicitation
2. Data based on the *kPhon* Transcription Project
3. The *kRoot* Database
4. The Kaytetye Text Corpus

I discuss the datasets in terms of these categories, with a focus on the procedure which produces the dataset, and the resulting data.

2.3.1 Elicitation Data

This thesis involves two datasets based on elicitation data:

1. Elicitation of Associated Path forms with internal clitics in January 2018 by researchers Dr. Myfany Turpin & Dr. Michael Proctor
2. Elicitation of Partial Reduplication forms in April 2020 by researcher David Moore.

In this section I describe the elicitation procedures, as well as the resulting data for both datasets.

2.3.1.1 Associated Path Clitic Elicitation

In January 2018, Dr. Myfany Turpin & Dr. Michael Proctor elicited Kaytetye Associated Path constructions to determine whether these constructions permit medial clitics. The fieldwork was carried out with two female native speakers of Kaytetye.

The elicitation consisted of a set of 7 Kaytetye verbs. Each verb was placed in a framing sentence, and then sentences were generated in which the verb was placed into each of a list of 16 Associated Path constructions which are permitted with that verb root. The list of verbs and their framing sentences is shown in Table 1. The Associated Path forms are included in Table 2.

Table 1: Kaytetye Verbs Used in Associated Path Clitic Elicitation.

Verb Root	Verb Meaning	Framing Sentence	Translation
ahewine-	anger (someone)	*erlkwenge aleke ahewinenhe*	The old man angered the dog.
akape-	disappear	*aleke akapenhe*	The dog disappeared.
ake-	cry	*artweye akenhe*	The man cried.
alarre-	kill	*artweyele aherre alarrenhe*	The man killed the kangaroo.
amperrke-	shine	*ake amperrkenhe*	(His) head shone.
angke-	talk	*awerre angkenhe*	The boy talked.
ayne-	eat	*awerrele aynenhe*	The boy ate.
etel+are-	know	*relhele ampere nharte etel+arenhe*	The woman knew that place.

Table 2 lists whether either of the two native speakers found clitic placement to be acceptable between the Participle Suffix and Path Auxiliary in the set of AP constructions. The constructions were tested with four verbs: *ahewine-* 'make angry', *akape-* 'get lost', *ake-* 'cry', *etel+are-* 'recognise'. If either speaker found clitic placement to be acceptable with any of the four verbs, then it was marked with 'yes'. If neither speaker found clitic placement to be acceptable, then it was marked with 'no'.

Table 2: Associated Path Forms and Attested Clitics

AP Clitic Form	Definition	Clitic Placement
-lpe=lk+RED-	Predicate while going along	Yes
-nyeye=lk+alpe-	Return, predicate, then go	Yes
-nyeye=lk+ene-	Go, predicate quickly, then return	Yes
-ye=lk+alpe-	Go back and predicate	Yes
-ye=lk+ayte-	Predicate after someone else arrives	Yes
-ye=rn=lk+alpe-	Predicate while coming	Yes
-le=lk+ayte-	Predicate then go	No
-le=lk+alpe-	Predicate then go back	No
-le=lk+RED-*le=lk+arre-*	Predicate all the way along	No
-ny=lk+angkeletne-	Come, predicate quickly, and go	No
-nyey=lk+aytne-	Return, predicate, then go (lots)	No
-rre=lk+aperinte-	Predicate things while going along	No
-rre=lk+ape-	Predicate while going along	No
-ye=lk+RED-*ye=lk+ene-*	Predicate lots of things lots of times	No
-ye=lk+ene-	go and predicate	No
-ye=lk+enye-	Come and predicate	No

This dataset is relevant to the discussion of Associated Path in Chapter 5. This dataset is not directly referred to in this thesis, but its results inform the analysis of clitic placement in that chapter.

2.3.1.2 Partial Reduplication Elicitation

David Moore undertook fieldwork in April 2020 in Alice Springs with a female native Kaytetye speaker. This field work was in the form of elicitation of sentences in Kaytetye containing data on verbal reduplications. The elicitation was a series of recorded sessions in which the field worker said a sentence in Kaytetye with a simple verb form. The informant repeated the same sentence in with the verb in the form of an Associated Path construction. Examples of elicitation sentences are shown in (1) & (2), with the corresponding expected Associated Path forms.

(1) *Rapetye* *kwetye-nhe* → *Rapetye* *kwetye-lp+etye-nhe*
rubbish collect-PST.PFV rubbish collect-during+RED-PST.PFV
'Collected rubbish.' 'Collected rubbish along the way.'

(2) *Artnweng-amerne* *yweke-nhe* → *Artnweng-amerne* *yweke-lp+eke-nhe*
child-PL chase-PST.PFV child-PL chase-during+RED-PST.PFV
'Chased children.' 'Chased children along the way.'

The elicitation procedure included three stages: (i) modelling of forms; (ii) practice forms; (iii) the main elicitation set. Overall, there were 6 model forms, 6 practice forms, and 43 elicitation sentences. The main elicitation set is listed in Appendix 1.

Following the elicitation, the field worker sent the audio files to the author, who then annotated the phonetic forms of the reduplicants using Praat (Boersma 2001). The annotation procedure involved transcribing each produced verbal reduplication construction impressionistically in IPA. Each transcription was saved to a spreadsheet.

2.3.2 kPhon Transcription Project

In this section I describe the *kPhon* transcription project and the datasets which result from this project with relevance to this thesis: (i) the *Phonological Correspondence* dataset; (ii) the *Paired Transcriptions* dataset. In §2.3.2.1 I describe the raw transcription data and how it was produced through phonetic data annotation. In §2.3.2.2 I describe two datasets produced from the *kPhon* transcription data.

2.3.2.1 Raw kPhon Data

The *kPhon* transcription project involved the annotation of *Kaytetye-to-English Dictionary* (Turpin & Ross 2012) headwords read aloud by a middle-aged female native Kaytetye speaker. Each headword was read from the dictionary and was uttered twice. The transcription of these headwords was initially managed by Nay San under the supervision of Dr Michael Proctor in 2016. It was completed in 2018. A team of five annotators were involved in the project.

For each headword, the speaker produced two tokens. The transcription procedure involved annotators filling out a Praat Textgrid (Boersma 2001), with an IPA tier (which corresponded to the IPA of the entire token) and a vowel tier (for which each vowel received a transcription). For both levels of analysis, the transcribers provided an impressionistic transcription. Each transcriber was phonetically trained and had no knowledge of Kaytetye prior to starting. After the transcriptions were complete, the textgrids were validated by identifying and correcting common transcription errors, including: (i) cases where there was a vowel on the vowel tier but not on the ipa tier; (ii) cases where the boundaries marked for vowels are not within the ipa tier token; (iii) cases where the second token was not transcribed.

Each token had at least two independent annotations. An example Textgrid showing this procedure is shown in Figure 2. The result of the *kPhon* transcription project is a database of IPA transcriptions of tokens, and a database of vowel transcriptions. In all, there were 11,914 token transcriptions and 34,400 vowel transcriptions. Further details about the procedures of the *kPhon* transcription project are discussed in San (2016).

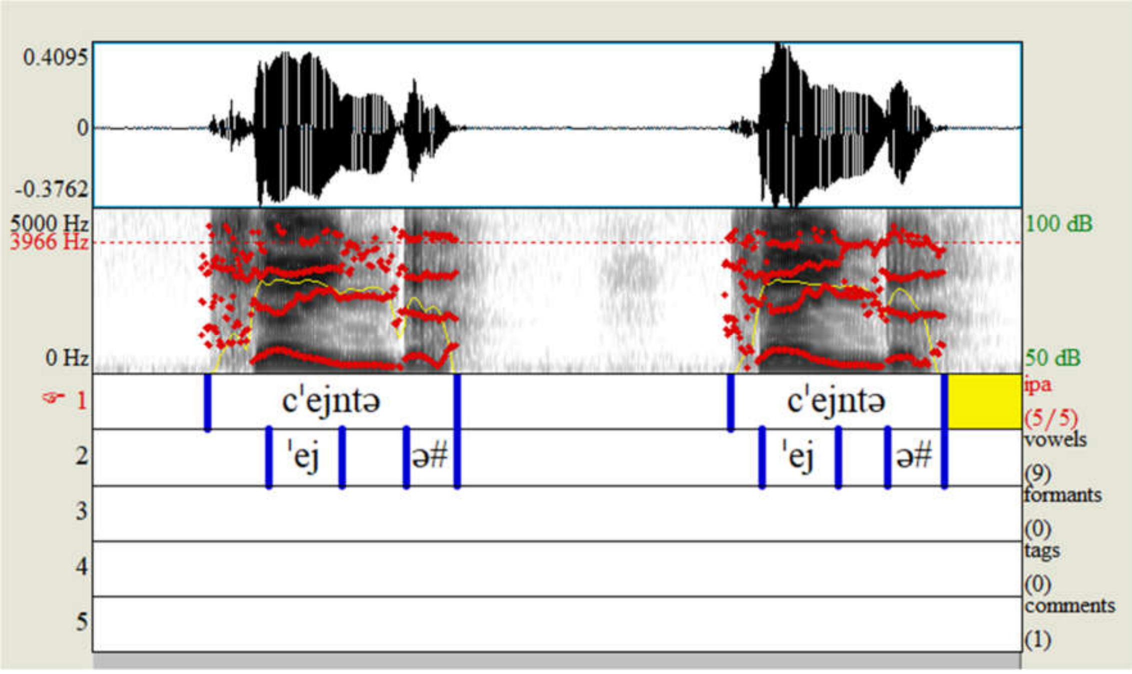

Figure 2: Example of Textgrid Produced by kPhon Transcription Procedure of the Root /cɐintə/ ‘bunch paspalidium’. Note the ‘ipa’ Tier of a Token-Level Transcription, and the ‘vowels’ Tier of Transcriptions of Vocalic Sequences.

2.3.2.2 The Phonological Correspondence and Paired Transcription

For the purpose of determining the phonetic realisation and phonotactics of phonological sequences, the raw *kPhon* data has limited applicability. This is because the token and vowel datasets are surface-level transcriptions with no corresponding information on the underlying phonological structure. This means that relevant factors such as phonetic variation in the same phonological environment and quantification of departures from predicted vowel qualities cannot be identified from these datasets alone. It also means that the raw data has limited applicability for testing the predictions of phonological analyses of Kaytetye.

I procedurally produced a set of predicted vowel or glide categories corresponding to vowel transcriptions, based on the predicted phonological form of the transcription which is itself derived from transformations of the orthography. Using a set of orthography-to-IPA regular expression replacement rules (Appendix 2), I generated phonological word forms for each token, and I identified the vowels for each of these tokens. I then matched these vowels or glide categories to the phonetic transcriptions provided by the transcribers using a Python script. The vowel/glide categories identified for this dataset have varying phonological analyses, as shown in chapters 3 & 4. For example, in, for the phonetic sequences which occur in free variation, [iː] & [ijə], I consider multiple phonemic analyses including /iː/, /ijə/, and /əjə/. I use a system of labels to describe sets of phonetic realizations which analysts agree should receive a single phonological analysis. In many cases, there are a number of proposals as to the formalization of this single phonological analysis. For example, in the case of the sequences [iː] & [ijə], the label *ijə* represents a set of phonetic realizations which I analyse phonemically as /ijə/ in §3.2.2.5. Table 3 shows the labels which are relevant to the analysis in this thesis.

The script matches these labels to the *kPhon* phonetic transcriptions. In practice, these labels are identical to substrings of the generated phonological forms, and therefore the goal of this procedure is to match up substrings in the generated phonological forms to vowel transcriptions. The script identified several conditions in which a label would successfully be matched to a transcription. These conditions rely on four concepts in the dataset:

1. *Phonological Context*: The IPA transcription of the prior and following consonants of a label or transcription.
2. *Generated Headword*: The generated IPA form of a dictionary headword, which corresponds to a transcription token.
3. *Vowel Count*: The number of vowels in the phonological form of a token, or the number of vowels associated with a transcribed token. For example, both tokens in Figure 2 have a vowel count of 2.

4. *Index*: The position of a label or vowel transcription in a token. For example, in Figure 2 the transcription [ˈej] in the first token has an index of 1, because it is the first vowel transcription.

Listed below are a set of rules which I applied to match labels to phonetic transcriptions. These rules are applied procedurally, starting with rule 1 and ending with rule 6. If none of the conditions of these rules were met, the label was treated as not corresponding to a transcription.

1. If: (i) a label has an identical phonotactic context to a transcription; (ii) there is only one vowel in the Generated Headword with that phonotactic context, then the label is matched to the transcription.
2. If: (i) the Generated Headword has the same number of vowels as the transcription; (ii) the label has the same index as the vowel transcription, then the label is matched to the transcription.
3. If: (i) a Generated Headword has both an initial and final vowel; (ii) the transcription has neither an initial or final vowel; (iii) the index of the vowel transcription is the index of the label – 1, the label is matched to the vowel transcription.
4. If: (i) the Generated Headword has a final vowel; (ii) the transcription does not have a final vowel; (iii) the transcription has a vowel count equal to the vowel count of the Generated Headword – 1; (iv) the label has the same index as the vowel transcription, the label is matched to the vowel transcription.
5. If: (i) the Generated Headword has an initial vowel; (ii) the transcription does not have an initial vowel; (iii) the index of the vowel transcription is the index of the label – 1, the label is matched to the vowel transcription.

6. If: (i) the phonological context of two adjacent vowel transcriptions matches the label; (ii) There is either no consonant between the two vowel transcriptions or there is a glide [w] or [j], then a label is matched to two adjacent vowel transcriptions.

In all, this dataset produced 40,385 labels, 9,795 (24%) of which did not correspond to a transcription. 6,247 (64%) of these are final vowels which are not realised in phonetic form. There were 3,548 remaining labels which could not be matched to a transcription. These were primarily the result of problems in the set of consonants in the transcription, for example when an annotator modified or added consonants to the transcription. This made the context of a vowel transcription impossible to recover. The result is 30,590 labels corresponding to phonetic transcriptions. The labels used in this thesis are shown in Table 3.

Table 3: The Labels for Sets of Phonetic Realizations used in this Thesis, and their Corresponding Phonological Forms under the Analysis in this Thesis.

Phonemic Representation	**Label**
/u/	*u*
/ə/	*ə*
/ɐ/	*ɐ*
/uwə/	*uwə*
/i/	*i*
/ɐi/	*ɐi*
/ijə/	*ijə*
/ɐjə/	*ɐjə*
/ɐwə/	*ɐwə*
/wə/	*wə*
/wɐ/	*wɐ*
/wi/	*wi*
/ɐː/	*ɐː*

The dataset matches these labels to phonetic transcriptions based on the generated IPA. Any vowel transcriptions which could not be matched with a vowel category through the generation of this dataset were discarded. The dataset has 30,226 tokens. In this thesis this dataset is called the *Phonological Correspondence* dataset. An example list of entries from the *Phonological Correspondence* dataset is provided in Table 4.

Table 4: Sample of Rows from the *Phonological Correspondence* Dataset. The Matched Vowels for Each Row are Boldened.

Label	Annotator	Generated Headword	Prior Consonant	Following Consonant	Vowel Transcription	Token Transcription	Duration
ɐ	ns	p**ɐ**lpɐlpə	p	l	ˈɐ	p**ɐ**lpɐlp^h	0.11
ɐ	ns	p**ɐ**lpɐlpə	p	l	ɐ	p**ɐ**lpɐlp^h	0.11
ə#	ns	pɐlpɐlpə	p	-	-	-	-
ɐ	kr	mw**ɐ**ɲəmə[1]	w	ɲ	ˈɔ	m**ɔ**tɲəmə̥	0.16
ə	kr	mwɐɲ**ə**mə	ɲ	m	ə	mɔtɲ**ə**mə̥	0.14
ə#	kr	mwɐɲəm**ə**	m		ə̥#	mɔtɲəm**ə̥**	0.07
ɐ	kr	mw**ɐ**ɲəmə	w	ɲ	ˈɔ	m**ɔ**tɲəmə̥	0.15
ə	kr	mwɐɲ**ə**mə	ɲ	m	ə	mɔtɲ**ə**mə̥	0.10
ə#	kr	mwɐɲəm**ə**	m		ə̥#	mɔtɲəm**ə̥**	0.13

From the *Phonological* Correspondence dataset, a dataset of paired annotator transcriptions was generated. The purpose of this *Paired Transcriptions* dataset is to identify two annotator's transcriptions of the same label. An example list of entries from this dataset is shown in Table 5.

[1] Note that for the token /mwɐɲəmə/, the vowels were able to be successfully matched with an altered consonantal context in the transcription as a result of the application of rule 2 of the script.

Table 5: Example Rows from the *Paired Transcriptions* Dataset

Label	Token	Prior Consonant	Following Consonant	Generated Headword	Token 1	Token 2	IPA 1	IPA 2
ɐ	1	p	l	pɐlpɐlpə	ˈɐ	ˈɐ	pɐɭpɐɭpə̥	pɐlpɐlp^{h}
ɐ	2	p	l	pɐlpɐlpə	ɐ	ɐ	pɐɭpɐɭpə̥	pɐlpɐlp^{h}
ə#	3	p	-	pɐlpɐlpə	ə̥#	-	pɐɭpɐɭpə̥[2]	-
ɐ	1	w	ɲ	mwɐɲəmə	ˈɔ	ˈo	mɔʈɲəmə̥	moɲɪm
ə	2	ɲ	m	mwɐɲəmə	ə	ɪ	mɔʈɲəmə̥	moɲɪm
ə#	3	m	-	mwɐɲəmə	ə̥#	-	mɔʈɲəmə̥	-
ɐ	1	w	ɲ	mwɐɲəmə	ˈɔ	ˈo	mɔʈɲəmə̥	moɲɪm
ə	2	ɲ	m	mwɐɲəmə	ə	ɪ	mɔʈɲəmə̥	moɲɪm

2.3.3 The kRoot database

For the purpose of identifying the phonological forms of Kaytetye morphological roots, I designed a database of word roots. In this section I provide an overview of the procedures in preparing this database, and its main features. A summary of the workflow used to create the *kRoot* database is set out in Appendix 3.[3]

2.3.3.1 Identification of Kaytetye Roots

The *kRoot* database is a collection of 2,767 syllabified phonological roots. *kRoot* uses as its base headwords from the *Kaytetye-to-English Dictionary* (Turpin & Ross 2012) written in

[2] This row shows one transcriber providing voiceless schwa [ə̥] while the other provided raised h [^{h}]. For this analysis raised-h is not treated as a vowel transcription while voiceless schwa is. In all, there are 42 instances of voiceless schwa transcriptions, and 180 instances of final [C^{h}] in the *Phonological Correspondence* dataset. A manual search of the *kPhon* transcriptions showed that the token provided in the table is the only instance in the dataset where final [^{h}] occurs where another annotator provided [ə̥].

[3] The code relevant to the production of this database is viewable at https://github.com/FPanther/kroot

Kaytetye orthography.

First, I retrieved the headwords in the *Kaytetye-to-English Dictionary*. From this set of word forms, complex words and phrases were filtered out by removing forms with a space (indicating a word boundary) or a hyphen (indicating a morpheme boundary). Headwords which did not have a defined part of speech were also removed. Following this, bound categories were removed from the dataset, including verb suffixes, nominal suffixes, clitics, and particles. Any overt morphology (for example case suffixation or verbal suffixes) were removed from headwords where these were identified.

I next identified potential roots from the remaining headwords. In order to be a root, the headword must meet one of two criteria:

1. The headword is morphologically simplex, i.e. it has no evidence of morphological complexity.
2. The headword has evidence of being analysable historically but is synchronically non-compositional This includes: (i) forms where the meaning is non-compositional, e.g. *akwerrepenhe* 'small baby' derives from the sequential case form of *akwerre* 'coolamon', i.e. 'from the coolamon' but the meaning of this word is lexicalised; (ii) forms where there is one identifiable morpheme but another component which is not synchronically meaningful e.g. *ahernarreparre* 'close to the ground' has the component *aherne* 'ground' but the component *arreparre* does not appear to correspond to any morpheme currently in Kaytetye.

Categories of headwords which do not conform to these criteria were removed: (i) proper names such as the names of places, people and stars/constellations; (ii) compositional compounds and phrases; (iii) variants of roots which were predictable by post-lexical procedures e.g. initial vowel deletion. 239 coverbs which were not listed as dictionary headwords were identified using the procedure described in Appendix 3.

Following these procedures, I identified 2,767 Kaytetye roots. This set was converted to IPA using a Python script which implemented the set of regular expression replacement rules in Appendix 2. These IPA forms were then syllabified using the replacement rules in Appendix 4.

This syllabified set of roots constitute the *kRoot* database. Shown in Table 6 is a randomly selected set of 10 roots from this database.

Table 6: Ten Randomly Selected Examples from the *kRoot* Database

Orthography	**Syllabified IPA**	**Part of Speech**	**Meaning**
kwe	ku	verb	Swallow
kelengkwere	kə.ləŋ.ku..ɻə	coverb	Be dizzy
ranentye	ɻɐ.nəɲ.cə	noun	Cooking fire
akatnywe	ɐ.kɐc.ɲu	verb	Vanish
apekathe	ɐ.pə.kɐ.t̪ə	noun	Part-Aboriginal (loanword ‘half-caste’)
antewaretye	ɐn.tu.wɐ..ɻə.cə	noun	Man (avoidance term)
lkwethelkwerrnge	lku.t̪əl.kur.ŋə	noun	A type of small plant
twele	tu.lə	coverb	Thud
ertnwanthe	əʈɳ.wɐn̪.t̪ə	noun	Thick mulga scrub
arlengarenye	ɐ.ɭə.ŋɐ..ɻə.ɲə	noun	Foreigner

2.3.4 Kaytetye Text Corpus

For the purpose of analysing the distribution of a range of constructions in Kaytetye, a text corpus was utilised. This text corpus corresponds to a set of published texts as well as transcriptions of audio recordings of Kaytetye conversations and elicitations. The text corpus is the result of work from several field workers and scholars, most prominently Myfany Turpin, Alison Ross, Harold Koch, and Ken Hale.

In Appendix 5 is a list of the text files which constitute the Kaytetye Text Corpus in this thesis, including (i) the name of the text file; (ii) the initials of Kaytetye informant for the text; (iii) the researcher(s) who recorded the audio (if applicable); (iv) the researcher(s) who transcribed and translated the audio.

Chapter 3: Overview of Kaytetye Phonology and Morpho-Syntax

3.1 Introduction

For the purposes of this thesis it is important to establish the basic contrasts that I propose for Kaytetye phonology, morphology and syntax. In this chapter, I provide a description of these oppositions, and where I differ from previous authors, I discuss the motivations of new analyses.

In §3.2, I describe the segmental inventory of Kaytetye, with focus on the vowel inventory. In §3.3, I describe Kaytetye parts of speech. In §3.4, I describe the phonotactics of Kaytetye word roots. In §3.5, I describe the stress and prosodic structure of Kaytetye words. Finally, in §3.6, I provide a brief overview of basic syntactic structures in Kaytetye.

3.2 The Segmental Inventory

There is variation in analyses of the segmental inventory of Kaytetye, especially with respect to the vowel inventory (Koch 1984; San 2016; Turpin & Ross 2012). In this section I describe the consonant inventory and the vowel inventory of Kaytetye. The analysis of the vowel inventory differs from previous theoretical analyses of Kaytetye, and therefore this discussion of the segmental inventory focuses on vowel oppositions.

3.2.1 Consonants

This thesis makes use of the analysis of the consonantal inventory of the Kaytetye in Harvey et al. (2015). This is shown in Table 7. Orthographic conventions used for each consonant are indicated in angle brackets where they differ from IPA. The consonant inventory shows six contrasts in place of articulation, and six contrasts in manner.

Table 7: Consonants in Kaytetye. Orthographic Representations of These Sequences are Shown in Angle Brackets Where They Differ from the IPA.

	Labial	Dental	Alveolar	Retroflex	Palatal	Velar
Stop	/p/	/t̪/ <th>	/t/	/ʈ/ <rt>	/c/ <ty>	/k/
Nasal	/m/	/n̪/ <nh>	/n/	/ɳ/ <rn>	/ɲ/ <ny>	/ŋ/ <ng>
Pre-Stopped Nasal	/pm/	/t̪n̪/ <tnh>	/tn/	/ʈɳ/ <rtn>	/cɲ/ <tny>	/kŋ/ <kng>
Lateral		/l̪/ <lh>	/l/	/ɭ/ <rl>	/ʎ/ <ly>	
Trill			/r/ <rr>			
Approximant	/w/			/ɻ/ <r>	/j/ <y>	(/ɰ/) <h>[4]

In addition to the six place oppositions in Table 7, previous analyses have posited a series of pre-palatal contour segments, which consists of two articulatory targets: a palatal glide, and an alveolar segment, e.g. /jt/ (Turpin & Ross 2012). Harvey (2011) provides evidence against the contour segment analysis of these sequences, and I do not assume the existence of pre-palatal segments in this thesis.

3.2.2 Vowels

In this thesis I provide evidence that the Kaytetye vowel inventory has the phonological oppositions shown in Table 8. This inventory proposes a four-vowel analysis, with a long low vowel and a diphthong. Included in Table 8 is the notation used to describe the sets of phonetic realizations of these phonemes in a theory-neutral manner, which I described in §2.3.2. In this chapter I assume the existence of a phoneme /u/, in contrast to previous authors in their analysis of the Arandic languages (Turpin & Ross 2012: 23-24; Wilkins 1989: 92-94). I justify this analysis in Chapter 4.

[4] The /ɰ/ phoneme only occurs in the speech of older speakers (Turpin & Ross 2012: 18).

Table 8: Vowels in Kaytetye, With the Label They Correspond to in This Thesis. Orthographic Representations of These Sequences are Shown in Angle Brackets.

Description	**IPA**	**Features**	**Label**	**Orthographic Representation**
Front Vowel	/i/	[-low, +front]	*i*	<i>[5]
Round Vowel	/u/	[+back, +round]	*u*	<we>
Schwa	/ə/	[-low, -front, -back]	*ə*	<e>
Short Low Vowel	/ɐ/	[+low]	*ɐ*	<a>
Long Low Vowel	/ɐː/	[+low]	*ɐː*	<aha, ahe>
Diphthong	/ɐi/	-	*ɐi*	<ay>

Other vocalic sequences occur in Kaytetye, which are realised phonetically as long vowels and diphthongs. I provide evidence in this section and in §3.4 that these vocalic sequences are most plausibly analysed as vowel-glide-vowel sequences, rather than as long vowels or diphthongs.

In §3.2.2.1 I present the basic phonetic oppositions in the *kPhon* transcription data, which I described in §2.3.2. In the sections following, I motivate the analysis of each category in Table 8, as well as the categories in Table 9, which are frequently realised as long vowels.

Table 9: Vowel-Glide-Vowel Sequences That are Analysed in This Section.

IPA	**Label**	**Orthography**
/ijə/	*ijə*	<eye>
/uwə/	*uwə*	<ewe>

3.2.2.1 *Phonetic Oppositions in Kaytetye Vowel Data*

In the *Phonological Correspondence* dataset there are four different types of transcriptions. These are summarised in Table 10. These are the raw transcriptions which are matched with a label, but for the purpose of this discussion, the labels are excluded.

[5] <ey> in older orthography.

Table 10: Categories of Transcription Data in the Phonological Correspondence Dataset.

#	Type	Phonological Category	Example	Evidence for Category	Count
1	One-vowel	Short vowel	p**ɐ**ɭpɐɭpə̥ ‘Smooth.’	one IPA vowel character in transcription	28,091
2	Two-vowel	Diphthong	ŋeŋk**ɐɪ** ‘Traditional healer.’	Two IPA vowel characters in transcription	1,102
3	One-vowel marked for length	Long vowel	**i**:tanpərə ‘High ground.’	One IPA vowel character with ‘:’	607
4	Two vowels with medial glide	Vowel-glide-vowel sequence	ɐ̰˞ɳ**owɛ**c ‘Conkerberry tree.’ (Vowel transcription is represented as [o.ɛ])	A period ‘.’ is present in the corresponding vowel transcriptions.	460

The data in Table 10 shows that while all four categories are attested in the dataset, short vowel transcriptions account for 92.8% of the total transcriptions, making all other patterns comparatively infrequent.

There are 65 unique short vowel transcriptions. All the less frequent transcriptions are variants of the more frequent transcriptions with diacritics or with transcribed on-glides or off-glides. The 12 short vowel transcriptions with a count greater than 200 are shown in Table 11.

Table 11: Unique Short Vowel Transcriptions in the *Phonological Correspondence* Dataset With a Count Greater than 200. Proportions are of the Set of All Short Vowel Transcriptions.

Vowel Transcription	Count	Proportion
ə	8,584	30.6%
ɐ	5,921	21.1%
a	3,698	13.2%
ɪ	2,236	8.0%
i	2,082	7.4%
ʊ	1,619	5.8%
ɘ	699	2.5%
u	683	2.4%
ɛ	653	2.3%
e	324	1.2%
o	255	0.9%
ɜ	249	0.9%

The short vowel data shows a very high frequency of four vowel categories: (i) high front vowels [i, ɪ] (15.4%); (ii) round vowels [ʊ, u] (8.2%); (iii) central vowels [ə, ɘ, ɜ] (34.0%); (iv) low vowels [a, ɐ] (34.3%). Less frequent in this data are the non-central mid-vowels [ɛ, e] & [o].

There are 72 unique diphthong transcriptions, 59 of which have a count lower than 20, showing a wide degree of variation in the transcription of diphthong sequences. The 13 diphthongs with a count greater than 20 are shown in Table 12.

Table 12: Unique Diphthong Transcriptions in the *Phonological Correspondence* Dataset With a Count Greater than 20. Proportions are of the Set of All Diphthong Transcriptions.

Diphthong Transcription	Count	Proportion
ɐɪ	193	17.5%
æɪ	108	9.8%
iə	104	9.4%
æi	68	6.2%
ɐi	57	5.2%
iɐ	55	5.0%
ɐe	51	4.6%
ʊɐ	45	4.1%
aɪ	33	3.0%
oi	31	2.8%
oɐ	30	2.7%
ʊə	29	2.6%
ʊɪ	26	2.4%

In this set of high frequency diphthongal transcriptions, there are three predominant categories: (i) a low vowel followed by a non-low, non-round vowel, e.g. [ɐi] (46.3%); (ii) a front vowel followed by a non-front vowel, e.g. [iə, iɐ] (14.4%); (iii) a round vowel followed by a non-round vowel e.g. [ʊə, ʊɐ, ʊɪ] (14.6%).

There are 11 unique long vowel transcriptions in the data, 7 of which have a count of 10 or lower. The long vowel transcriptions with a count greater than 10 are shown in Table 13.

Table 13: Unique Long Vowel Transcriptions in the Phonological Correspondence Dataset With a Count Greater than 10. Proportions are of the Set of All Long Vowel Transcriptions.

Vowel Transcription	Count	Proportion
iː	318	52.4%
ɐː	148	24.4%
oː	64	10.5%
aː	34	5.6%

This data shows that there are only three types of frequent long vowels in the phonetic data: (i) a long high front vowel [iː] (52.4%); (ii) a long low vowel [ɐː, aː] (30.0%); (iii) a long round vowel [oː] (10.5%).

Finally, there are 73 unique vowel-glide-vowel transcriptions, 62 of which have a count lower than 10. The 11 vowel-glide-vowel transcriptions with a count greater than 10 are shown in Table 14.

Table 14: Unique Vowel-Glide-Vowel Transcriptions in the *Phonological Correspondence* Dataset With a Count Greater than 10. Proportions are of the Set of All Vowel-Glide-Vowel Transcriptions.

Vowel Transcription	**Count**	**Proportion**
o.ɐ[6]	80	17.4%
o.a	48	10.4%
o.ə	34	7.4%
a.ə	23	5.0%
ɐ.ə	20	4.3%
ʊ.ə	19	4.1%
ə.ə	16	3.5%
ʊ.a	12	2.6%
i.ə	12	2.6%
u.ɐ	12	2.6%
u.ə	11	2.4%

There are five predominant patterns in this set of high frequency vowel-glide-vowel sequences: (i) a round vowel followed by a low vowel, e.g. [o.ɐ] (33.0%); (ii) a round vowel followed by a central vowel, e.g. [o.ə] (13.9%); (iii) a low vowel followed by a central vowel, e.g. [ɐ.ə] (9.3%); (iv) a central vowel followed by a central vowel, [ə.ə] (3.5%); (v) a front vowel followed by a central vowel, [i.ə] (2.6%).

These four categories, (i) short vowel; (ii) diphthong; (iii) long vowel; (iv) vowel-glide-vowel sequence, correspond to possible analyses of each of the categories described in

[6] The *Phonological Correspondence* dataset does not preserve the medial glide in these sequences, because the vowel tier transcriptions in the *kPhon* project does not include consonantal qualities. Therefore, a period '.' is placed between two vowel transcriptions to represent the medial glide.

this section. In Table 15 I summarise the possible analyses of each category I consider in this section. In this table I include a further category, ‘Complex Sequence’, to account for analyses which propose a vowel-consonant or consonant-vowel phonological form.

Table 15: Summary of Phonological Analyses of Each Category Discussed in this Section.

Label	**Short Vowel**	**Long Vowel**	**Diphthong**	**Vowel-Glide-Vowel**	**Complex Sequence**
ɐ	/ɐ/	-	-	-	-
ə	/ə/	-	-	-	-
i	/i/	-	-	-	/ə/ / _$C_{[palatal]}$
u	/u/	-	-	-	/ə/ / C^{w}_
ijə	/i/	/iː/	/iə/	/əjə/, /ijə/	-
uwə	-	/uː/	/uə/	/əwə/, /uwə/	-
ɐi	-	-	/ɐi/	/ɐjə/	/ɐj/
ɐː	-	/ɐː/	-	/ɐɰɐ/, /ɐɰə/	-

The following discussion analyses the categories in Table 15. *u* is excluded in the following discussion because this category is analysed in greater detail in Chapter 4.

Note that the analysis in this chapter assumes a correspondence of orthographic contrasts to phonological analyses. For example, the orthographic sequence <eye> corresponds to *ijə*, which in turn permits various analyses as shown in Table 15. While this chapter challenges the phonological analysis that the Kaytetye orthography represents, I assume in this thesis that it captures the basic contrasts that the Kaytetye phonology makes, such that it may be recast to produce a set of representative phonological forms of Kaytetye lexemes. This is because it is the product of decades of research by multiple linguists with extensive knowledge of the language, including input from native speakers, and therefore provides a secure basis on which to carry out a phonological analysis. The analysis in this section shows that the recasting from the orthography to the phonology produces forms that successfully capture a range of phonemic contrasts.

3.2.2.2 ɐ

The transcriptions of the low vowel *ɐ* in the *Phonological Correspondence* dataset with a count greater than 100 are shown in Table 16.

Table 16: Transcriptions of *ɐ* in the *Phonological Correspondence* Dataset with a Count Greater than 100.

Transcription	**Count**	**Proportion**
ɐ	5,240	54.4%
a	3,345	34.7%
ə	152	1.6%
ɐː	107	1.1%
Other	788	8.2%

The data shows that *ɐ* overwhelmingly corresponds to a low vowel: 95.3% of transcriptions contain the characters [a, ɐ]. Exceptions to this, such as the [ə] transcription, are marginal and irregular in the phonetic data. Therefore, the evidence is that this corresponds to the vowel /ɐ/.

3.2.2.3 ə

ə standardly corresponds to a central vowel. The transcriptions of *ə* which have a count greater than 200 are shown in Table 17.

Table 17: Transcriptions of *ə* in the *Phonological Correspondence* Dataset with a Count Greater than 200.

Transcription	**Count**	**Proportion**
ə	8,021	70.4%
ɘ	630	5.5%
ɛ	588	5.2%
ɪ	401	3.5%
ɐ	354	3.1%
ɜ	206	1.8%
Other	1197	10.5%

79.8% of transcriptions of *ə* include the vowels [ə, ɘ, ɜ], meaning that most transcriptions are accounted for as a central vowel. The remaining transcriptions are various vowel qualities such as high vowels [ɪ] and low vowels [ɐ], showing phonetic variation. The fact that the realisations of *ə* are accounted for by a central vowel and the remaining transcriptions show various qualities supports an analysis in which *ə* is /ə/.

3.2.2.4 i

In phonetic data, *i* and *ə* are contrastive. This contrast is established through the occurrence of near-minimal pairs. Examples (3) & (4) show the contrast between *i* and *ə* in the *kRoot* dataset, and the corresponding token transcriptions in *kPhon* dataset.

(3) /əl**ə**tələtə/ /ɐl**i**tə/
[eˈl**ə**telət] [ɐˈl**i**ːt]
‘Toddling.’ ‘Fork in a tree.’

(4) /ɐl̠**ə**ŋkuʎcə/ /ɐl̠**i**ŋkə/
[al̠'**ə**ŋkʊʎc] [ɐˈl̠**i**ŋkə]
‘Possessions.’ ‘Brown snake.’

In previous analyses of Kaytetye, high front vowels were treated as allophones of schwa (Turpin 2000: 28). Under that analysis, there is a phonological rule: /ə/ → [i~ɪ] / _$C_{[\text{palatal}]}$, in which many instances of [i] are accounted for by preceding a pre-palatal contour segment /jC/, which involves a glide target /j/ and a consonantal alveolar target (Harvey 2011) This analysis of *i* in the word *ilenke* ‘take’ are shown in (5).

(5) *ilenke*
/**ə**jlənkə/
‘Take.’

In contrast, more recent analyses have proposed the occurrence of a high front phoneme /i/ (Koch 2006; Turpin & Ross 2012). This analysis of the word *ilenke* ‘take’ is shown in (6).

(6) *ilenke*
/**i**lənkə/
‘Take.’

The distribution of the transcriptions of *ə* and *i* are shown in Table 18.

Table 18: The Realisation of *i* and *ə* in the *Phonological Correspondence* Dataset.

Label	**1st**	**2nd**	**3rd**	**Other**
ə	[ə] (8,021, 70.3%)	[ɘ] (630, 5.5%)	[ɛ] (588, 5.2%)	2,158, 18.9%
i	[i] (1,860, 41.2%)	[ɪ] (1,822, 40.4%)	[ə] (215, 4.8%)	614, 13.6%

I analyse the phonological status of *i* in terms of two observations about Kaytetye. The first observation is that there is a very high correspondence of *i* to a high front vowel. 628 (13.8%) transcriptions of *i* do not contain a high front vowel. Of these 628 instances, 303 (48.6%) are in initial position, and in initial position these 303 account for 15.4% of the initial *i*. In this set of 303 realisations, 151 (49.8%) are [e], 60 (19.8%) are [ə], and 35 (11.5%) are [ɘ]. This shows that fronted and central realisations are frequent in non-high realisations in initial position.

The remaining 325 of non-high front realisations are in medial position. This 325 corresponds to 12.8% of medial *i* transcriptions. This set shows a high degree of variability. 183 (57.6%) are central vowel realisations [ə, ɘ], 80 (24.6%) are rounded [ʊ, u, o, ɔ], 29 (8.9%) are fronted [e, ɛ], and 10 (3.2%) are low. This shows that there is wide variability in non-high front realisations in medial position.

The second observation is the status of pre-palatal segments in Kaytetye. Harvey (2011) showed that the analysis that [iC] and [jC] sequences in the Arandic languages involve pre-palatal contour segments is less plausible than the alternative that these involve diphthongs or consonant clusters. I show in §3.2.2.7 that the most parsimonious analysis of [ɐiC] sequences, which were also previously analysed with pre-palatal segments, involves a diphthong rather than a complex segment or consonant cluster.

I consider the two hypotheses of the phonological form of *i*:

1. The previous standard analysis that *i* corresponds to /ə/, through the rule /ə/ → [i] / _$C_{[palatal]}$.

2. The current analysis that *i* corresponds to a vowel /i/ with the features [-low, +front].

I evaluate these hypotheses as follows:

/ə/: This analysis proposes that occurrences of *i* correspond to a schwa followed by a palatal glide, either as a phoneme or as part of a pre-palatal contour segment /jC/. The data shows that [ə] transcriptions are infrequent, and are part of a larger set of marginal non-high front transcriptions of *i*. An analysis which proposes a departure from the standard surface form, i.e. [i], requires a corresponding theoretical gain in order for that analysis to be worthwhile. There does not appear to be any gain from proposing this analysis in the data considered here.

Furthermore, for this analysis to work, pre-palatal contour segments must occur to account for the occurrence of *i* prior to alveolar segments like that in (5). Given that other facts of Kaytetye phonology are explicable without appealing to pre-palatals, and the status of pre-palatals has been questioned in the literature (Harvey 2011), the fact that this analysis of *i* relies on the pre-palatal hypothesis means that it requires significant assumptions about Kaytetye phonology in order to work, for little theoretical benefit.

/i/: This analysis predicts that the standard realisation of *i* is as a front vowel. This prediction is borne out in the data: *i* corresponds to a front vowel, and instances where *i* is not a front vowel are infrequent and show a high degree of phonetic variation. It also does not require the acceptance of the occurrence of pre-palatal contour segments in Kaytetye, a category that has been questioned in the literature (Harvey 2011). This analysis is the most straight-forward analysis of *i*, and it does not make significant theoretical assumptions about Kaytetye phonology.

Therefore, the analysis of *i* as the phoneme /i/ provides a parsimonious account of the data, while the /ə/ analysis does not.

3.2.2.5 ijə

ijə in the *Phonological Correspondence* dataset most frequently corresponds to a high front long vowel, or a high front vowel target. The most frequent realisations of this sequence are shown in Table 19.

Table 19: Phonetic Transcriptions of *ijə*

Label	**1st**	**2nd**	**3rd**	**Other**
ijə	[iː] (227, 51.4%)	[i] (141, 31.9%)	[ɪ] (20, 4.5%)	54, 12.4%

In relation to this category I present four observations from Kaytetye phonetic and phonological data. The first observation is the high degree of correspondence between *ijə* and the transcriptions beginning with a high front vowel in the *Phonological Correspondence* dataset. Table 20 shows the number of transcriptions of *ijə* which begin with [i] or [ɪ] (excluding stress and other marking).

Table 20: Distribution of Transcriptions of *ijə* by Whether it Occurs with an Initial High Front Vowel.

Label	**Initial [i] or [ɪ]**	**Not Initial [i] or [ɪ]**
ijə	426 (96.4%)	16 (3.6%)

All 16 instances of *ijə* which are not high front vowel-initial begin with a rounded vowel, either [ʊ] or [u]. There are no instances of initial schwa in *ijə* transcriptions.

The second observation is the distribution of transcriptions of *ijə* which identify multiple vowel targets. Transcriptions with multiple vowel targets are identifiable by the occurrence multiple IPA vowel characters. The three most frequent two-vowel realisations of *ijə* are shown in Table 21. Of the set of 47 two-vowel transcriptions, 22 (46.8%) are vowel-glide-vowel sequences, while 25 (53.2%) are diphthongal.

Table 21: The Most Frequent Two-Vowel Transcriptions of *ijə*. Percentages are of the Total Set of *ijə* Transcriptions.

Label	**1st**	**2nd**	**3rd**
ijə	[i.ə] (12, 2.7%)	[iə] (5, 1.1%)	[ɪə] (4, 0.9%)

Table 22 shows the distribution of transcriptions by the number of phonetic vowel targets they identify.

Table 22: The Distribution of Transcriptions which Correspond to One and Two Vowel Targets by Position.

Position	**One**	**Two**
Medial	70 (75.3%)	23 (24.7%)
Final	330 (94.6%)	17 (4.9%)

The data shows a higher occurrence of two-vowel transcriptions in medial position compared to final position.

In order to determine whether the occurrence of two vowel targets in medial position is phonotactically conditioned, the places of articulation of consonants following two vowel target transcriptions were retrieved. The distribution of one-vowel target and two-vowel target transcriptions by place of articulation of the following consonant is shown in Table 23.

Table 23: Distribution of One-Vowel and Two-Vowel Transcriptions by Place of Articulation of the Following Consonant.

Place of Articulation	**One-Vowel Count**	**Two-Vowel Count**
Labial	2	2
Dental	0	0
Alveolar	22	21
Retroflex	6	6
Palatal	0	0
Velar	30	0
None (Token-Final)	334	19

The data shows that the occurrence of two-vowel transcriptions is prior to apicals, labials, and in final position, and are infrequent in token-final position compared to one-vowel transcriptions. Overall, the data does not support a complementary distribution of one-vowel and two-vowel transcriptions, because they both occur prior to alveolar, retroflex and labial segments.

The third observation relates to the distribution of *ijə* in word-medial but root-final position, e.g. in a noun root ending in *ijə* which takes a case suffix. The evidence from the audio corresponding to the *Kaytetye Text Corpus* is that the most frequent realisation of *ijə* in this context is as a long vowel, as in (7) & (8). No examples of a two-vowel target realisation have been identified, and the pattern of morpheme-final realisations of *ijə* generally pattern like those in token-final position.

(7) *Ankeye-le*
[anki:-li]
thief-ERG
'Thief (erg.).' (20130117TT_08 379.384)

(8) *Arlweye-le*
[aɭwe:-lə]
father-ERG
'Father (erg.).' (KH4560 59:18)

The final observation relates to the morphological patterning of roots ending in *ijə*. In Kaytetye, there are two ergative suffixes. In most noun roots, the ergative marker is *-le*, as in (9) & (10).

(9) *Aleke-le*
/ɐləkə-lə/
dog-ERG
'Dog (erg.).'

(10) *Rarre-le*
/ɻɐrə-lə/
wind-ERG
'Wind (erg.).'

In roots of a VCV shape, the ergative marker is *-nge*. as in (11) & (12).

(11) *Apmwe-nge*
/ɐpmu-ŋə/
snake-ERG
'Snake (erg.).'

(12) *Ente-nge*
/intə-ŋə/
stick-ERG
'Stick (erg.).'

Noun roots which end in *ijə* always receive the *-le* ergative suffix, as in (13) & (14).

(13) *Artweye-le*
[ɐʈwiː-lə]
man-ERG
'Man (erg.)'

(14) *Eltyemwerneye-le*
[ɪlcəmʊɳiː-lə]
policeman-ERG
'Policeman (erg.).'

Based on these four observations, I evaluate five hypotheses of the phonological form of *ijə*:

1. /iː/: *ijə* corresponds to its most frequent phonetic realisation, i.e. a long high front vowel.
2. /əjə/: *ijə* corresponds to the standard analysis of Kaytetye phonology, that it is a vowel-glide-vowel sequence in which both vowels are schwa.
3. /iə/: *ijə* corresponds to a diphthong, in which there is an initial high vowel target followed by a schwa.
4. /ijə/ & /i/: *ijə* corresponds to two targets. In medial position, it is a vowel-glide-vowel sequence /ijə/. In final position, it is the realisation of the phoneme /i/.
5. /ijə/: *ijə* corresponds to the vowel-glide-vowel sequence /ijə/ in all positions.

I evaluate these analyses according to the four observations in this section.

/iː/: This analysis provides a parsimonious account for the very high frequency of realisations of *ijə* as [iː] or [i]. This analysis predicts that the occurrence of two-vowel transcriptions is the result of a phonological rule of the form /iː/ → [ijə]. This process is only motivated by the data if its application is conditioned by phonotactics, for example it only occurs prior to a retroflex segment. The phonotactic data shows that the distribution is closer to free variation, in that there are contexts in which both [iː] and [ijə] freely occur. In this case, the alternative process, /ijə/ → [iː] is better motivated, because schwa is a vowel which is susceptible to allophony (Browman & Goldstein 1992b). Under this analysis, the ergative allomorphy pattern is analysable as selecting VCV roots, but not selecting VCV: roots. For example, /ɐpmu-ɲə/ 'Snake (erg.)', but /ɐʈwiː-lə/ 'Man (erg.)', in which the form with the final long vowel does not receive the allomorph. This analysis accounts for the ergative allomorphy data by proposing that trimoraic roots do not condition the allomorphy. Given that related allomorphy patterns in Australian languages select metrically binary forms (e.g. disyllables or bimoraic forms, see §6.2.1.1), this is a motivated analysis for the allomorphy data. However, given its less parsimonious account for the transcription data compared to other analyses considered in this section, I reject this analysis.

/əjə/: This analysis predicts the occurrence of initial schwas in *ijə* sequences. This is because the phonological form of this analysis is schwa-initial. The data shows that almost all transcriptions of *ijə* begin with a high front vowel and no transcriptions begin with schwa. This analysis proposes a surface departure with no clear theoretical benefit. Consequently, it is less parsimonious than the corresponding /ijə/ analysis, and so I reject this analysis

/ijə/ & /i/: This analysis provides a motivated account for the distribution of medial and final occurrences of *ijə*, as well as the patterns relating to root-final position. However, it does not provide a motivated explanation for the allomorphy pattern. This is because it predicts roots with final *ijə* end in /i/, and therefore a root such as *artweye* is /ɐʈwi/. The evidence is that the *-nge* allomorph targets VCV roots, and under this analysis *artweye* is a VCV root. Roots with final *ijə* always receive the *-le* ergative suffix, and therefore an analysis in which final *ijə* corresponds to a single vowel target does not provide a satisfactory account of the data.

/iə/: This analysis predicts a rule /iə/ → [ijə], which states that a diphthong may become disyllabic in the surface form. This rule is not parsimonious, because: (i) it is unmotivated by the behaviour of other diphthongs in Kaytetye. Out of 390 transcriptions of *ɐi*, 4 (1%) transcriptions are a vowel-glide-vowel sequence, and 267 (68.5%) are diphthongs. On the other hand, of 442 transcriptions of *ijə* there are 22 (5%) vowel-glide-vowel transcriptions, and 18 (4.1%) are diphthong transcriptions. The most straight-forward explanation of the contrast in the distribution of transcriptions between *ɐi* and *ijə* is that this is a contrast between a diphthong and a vowel-glide-vowel sequence; (ii) the data is adequately explained by the /ijə/ analysis, which also preserves the generalisation that vowel-glide-vowel transcriptions are more frequent than diphthong transcriptions. Therefore, this analysis is less parsimonious than competing analyses.

/ijə/: This analysis predicts that the occurrence of one-vowel transcriptions is the result of a phonological rule /ijə/ → [iː], in which the /jə/ sequence combines with /i/ to form a long vowel. In language typology, schwa is a vowel which is susceptible to allophony (Browman & Goldstein 1992b). Therefore, a rule which predicts that the /jə/ sequence in /ijə/ will frequently collapse in the phonetic data is motivated by the characteristics of schwa in language typology. This analysis accounts for diphthongal realisations through a similar procedure, in which a disyllabic sequence may be realised as a monosyllabic sequence. This analysis also adequately accounts for transcriptions of one-vowel targets in final position, because final position is frequently associated with a reduction in phonological content, as shown in §3.4.2. This analysis does not provide a motivated account for the pattern relating to root-final but word-medial occurrences of *ijə* as having one vowel target.

Out of the five alternatives, the /ijə/ & /i/ and /ijə/ analyses provide motivated explanations of the patterns relating to the transcription-initial high front vowel targets. These analyses have certain trade-offs, in that the /ijə/ & /i/ analysis does not account for the allomorphy data, and the /ijə/ analysis does not account for the root-final data. In this thesis I adopt the /ijə/ analysis rather than the /ijə/ & /i/ analysis because the ergative suffix data is unambiguous in relation to the treatment of final *ijə* as a vowel sequence rather than a single vowel /i/.

3.2.2.6 uwə

uwə frequently corresponds to a mid-back vowel in the *Phonological Correspondence* data. Table 24 shows the most frequent realisations of *uwə*. This shows that the three most frequent realisations of this category are as monophthongs.

Table 24: Most Frequent Transcriptions of *uwə*.

Label	**1st**	**2nd**	**3rd**	**Other**
uwə	o (66, 16.4%)	oː (54, 13.4%)	ɔ (26, 6.5%)	257 (63.8%)

Further data shows that two-vowel transcriptions of *uwə* account for 47.4% of transcriptions. Table 25 shows the most frequent two-vowel realisations of *uwə*, and Table 26 shows the number of one-vowel, two-vowel and three-vowel transcriptions of *uwə*. In the set of 206 two-vowel transcriptions, 143 (69.4%) are vowel-glide-vowel sequences, and 63 (30.6%) are diphthongs.

Table 25: Most Frequent Two-Vowel Transcriptions of *uwə*.

Label	**1st**	**2nd**	**3rd**
uwə	o.ə (26, 13.6%)	ʊə (23, 12.0%)	ʊ.ə (18, 9.4%)

Table 26: Count of One-Vowel, Two-Vowel, and Three-Vowel Transcriptions of *uwə*.

Label	**One-Vowel Count**	**Two-Vowel Count**	**Three-Vowel Count**
uwə	206 (51.1%)	191 (47.4%)	6 (1.5%)

In order to determine the phonological form of *uwə* I identify four observations of the transcription data. The first observation is the distribution of rounded segments in transcription-initial position in the *Phonological Correspondence* data. Table 27 shows the quantity of transcriptions of *uwə* which are round vowel-initial.

Table 27: Count of Round Vowel-Initial and Non-Round Vowel-Initial Transcriptions.

Label	**Round Vowel Initial**	**Not Round Vowel Initial**
uwə	329 (81.6%)	74 (18.4%)

This data shows that a significant minority of transcriptions do not begin with a round vowel. The 74 instances of an initial vowel transcription which is not round correspond to 33 unique transcription tokens. These tokens are shown in Appendix 6. These tokens were analysed to determine whether these transcriptions correspond to a sequence of *ə* + *wə* across a morpheme or word boundary. Of the 33 unique tokens, 24 (70.6%) are phrases in which the first word ends with *ə* and the following word begins with *wə*. This results in only 9 unique tokens with an initial non-round vowel. Therefore, non-round initial transcriptions are a marginal subset of the transcription data.

The second observation is the distribution of unrounded segments in final position in the *Phonological Correspondence* data. Table 28 shows the distribution of final round and final non-round transcriptions.

Table 28: The Count of Transcriptions with a Final Round Vowel and without a Final Round Vowel.

Label	**Round Vowel Final**	**Not Round Vowel Final**
uwə	225 (55.8%)	178 (44.2%)

The data shows that the data is split broadly evenly between round-final and non-round final transcriptions, although round vowels are more frequent. Table 29 shows the data in Table 28 broken down into one-vowel and two-vowel categories. It shows that when a two-vowel realisation occurs, forms without a final round vowel are significantly more frequent. This shows the occurrence of variation between a form with a round target, e.g. [o:], and a two-vowel target form with an initial round vowel and a final unrounded vowel, e.g. [owə].

Table 29: Distribution of *uwə* by Number of Vowel Transcriptions and Whether the Transcription has a Final Round Vowel.

Number of Vowel Transcriptions	**Final Round**	**Final Non-Round**
1	190 (92.2%)	16 (7.8%)
2	35 (18.3%)	156 (81.7%)

The third observation is the distribution of *uwə* in medial and final position in terms of the number of vowel targets in the transcription. Table 30 shows the number of vowel transcriptions in transcriptions of *uwə* categorised by whether it is medial or final.

Table 30: Number of Transcribed *uwə* Vowel Transcriptions by Position in Token.

Number of Vowel Transcriptions	**Medial**	**Final**
1	113 (38.2%)	93 (86.9%)
2	177 (59.8%)	14 (13.1%)

In medial position, *uwə* predominantly consists of two vowel transcriptions. However, most final *uwə* correspond to one vowel transcription, and comparatively vowel transcriptions are less frequent in final position.

The final observation relates to the place of articulation of segments following realisations of *uwə* by number of vowel targets. Table 31 summarises this data.

Table 31: Number of One Vowel and Two Vowel Transcriptions of *uwə* by Place of Articulation of the Following Consonant.

Place of Articulation	**One Vowel Transcription**	**Two Vowel Transcriptions**
Labial	0	0
Dental	23	28
Alveolar	60	141
Retroflex	0	3
Palatal	6	1
Velar	8	3
None (i.e. token boundary)	109	18

The results show that *uwə* sequences never occur prior to labials. The data does not show any evidence of restrictions of one-vowel and two-vowel transcriptions by place of articulation of the following consonant. The one restrictive category for one vowel transcriptions, the retroflex category, also has a very low count for two vowel transcriptions and the lack of one vowel transcriptions is likely the result of chance.

Based on these observations, I identify four analyses of *uwə*:

1. /uː/: A long round vowel.
2. /uə/: A diphthong with an initial round vowel target and a final schwa target.
3. /əwə/: The traditional analysis of these sequences, in which it is a vowel-glide-vowel sequence in which both vowels are schwa.
4. /uwə/: A vowel-glide-vowel sequence in which the initial vowel is a round vowel and the final vowel is a schwa.

I evaluate these four hypotheses of the phonological form of *uwə* as follows:

/uː/: This analysis predicts that realisations with multiple vowel targets are the result of departures from the phonological form through the rule /uː/ → [uwə]. There are two points in relation to this analysis:

1. The very high frequency of transcriptions with multiple vowel targets in medial position make this analysis less parsimonious than competing analyses, because monophthongal transcriptions are predicted to be significantly more frequent if such a process occurs.
2. Just as with the /iː/ analysis of *ijə* in §3.2.2.5, the opposite rule, i.e. /uwə/ → [oː] is better motivated, because schwa is a vowel which is susceptible to allophony (Browman & Goldstein 1992b).

/uə/: The diphthong analysis proposes a process /uə/ → [uwə], which states that a monosyllabic sequence becomes predominantly a disyllabic sequence in the surface form.

This rule is not parsimonious, because it is unmotivated by the behaviour of other diphthongs in Kaytetye. Out of 390 instances of *ɐi*, only 4 transcriptions are vowel-glide-vowel sequences. This is a very different distribution from the 143 realisations of *uwə* as a vowel-glide-vowel sequence.

/əwə/: This analysis predicts that the standard realisation of *uwə* will begin with an unrounded vowel. The data shows that this is not the case. Therefore, compared to the /uwə/ analysis, this analysis is not parsimonious, and consequently does not provide a satisfactory analysis considering more straight-forward analyses of the data.

/uwə/: This analysis accounts for the frequency of transcriptions which correspond to two vowel targets, and the facts relating to transcriptions being round vowel-initial and non-round vowel final. This analysis predicts an optional phonological rule /uwə/ → [oː]. Features (such as rounding) frequently spread in language typology (Halle 1995), and schwa is a vowel which frequently undergoes allomorphic change based on adjacent segments (Browman & Goldstein 1992b). These patterns motivate this rule.

Beyond these points, the *uwə* analysis also provides a well-motivated explanation for the frequent realisation as a mid-vowel, through the merging of the rounding and back features of *u* and the height feature of *ə*.

3.2.2.7 ɐi

There are 396 transcriptions of *ɐi* in the *Phonological Correspondence* dataset, which correspond to 28 unique transcriptions. 22 of these transcriptions have a count of 10 or lower. The six most frequent transcriptions are shown in Table 32. The predominant realisation of *ɐi* is as a diphthong: a low vowel followed by a high front vowel.

Table 32: Transcriptions of *ɐi* with a Count Greater than 10.

Transcription	Count	Proportion
ɐɪ	104	26.3%
ej	84	21.2%
æɪ	70	17.7%
æi	41	10.4%
e	15	3.8%
ɐi	12	3.0%
Other	70	17.7%

I describe the distribution of *ɐi* in terms of three observations. The first observation is the qualitative contrast between *ɐi* and *ɐjə* in the *kRoot* dataset. Near-minimal pairs occur in relation to these two categories, such as those shown in (15) & (16).

(15) *Ayelenenye*
/**ɐjə**lənəɲə/
'On the north side.'

(16) *Aylenengenye*
/**ɐi**lənəŋəɲə/
'People in the same skin group.'

The second observation relates to the proportion of short vowel, diphthongal and vowel-glide-vowel transcriptions of *ɐi*. These are summarised in Table 33.

Table 33: Distribution of Transcription Categories for *ɐi*.

Short/Vowel-Glide	Diphthong	Vowel-Glide-Vowel
123 (31.1%)	269 (67.9%)	4 (1.0%)

These data show that a diphthongal transcription is the most frequent type of transcription. Of the 123 short/vowel-glide transcriptions 91(74.0%) contain the glide [j]. The remaining transcriptions are single vowels of varying qualities, most frequent of which are [e] (15, 12.2%) and [ɪ] (6, 4.9%).

The third observation relates to the distribution of the place of articulation of consonants following *ɐi* in the *Phonological Correspondence* data. The count of places of articulation of these consonants is shown in Table 34.

Table 34: Distribution of Places of Articulation of Consonants Following ɐi .

Place of Articulation	Count
Labial	8
Dental	0
Alveolar	388
Retroflex	0
Palatal	0
Velar	0

The results show that *ɐi* occurs overwhelmingly prior to alveolar segments. However, it is attested prior to labial segments as well.

I identify three analyses of *ɐi*.

1. A vowel-glide-vowel sequence /ɐjə/.
2. A vowel-glide sequence /ɐj/.
3. A diphthong /ɐi/.

I evaluate these analyses according to the data points in this section.

/ɐjə/: The data shows a qualitative contrast between *ɐi* and the phonological sequence /ɐjə/. This contrast makes an analysis in which *ɐi* corresponds to /ɐjə/ untenable.

/ɐj/: This analysis accounts for the contrast between *ɐi* and /ɐjə/. However, it provides a less parsimonious account for the high frequency of diphthongal transcriptions of *ɐi* than a diphthongal analysis. Furthermore, this analysis predicts that *ɐi* followed by an alveolar segment involves a palatal + alveolar heterorganic cluster. There are two points in relation to this prediction:

1. There is no evidence for other palatal + alveolar clusters in Kaytetye.
2. Palatal + alveolar clusters are generally prohibited in Australian languages (Hamilton 1996).

For these reasons, this analysis provides a less straight-forward account than the /ɐi/ analysis.

/ɐi/: This analysis provides a parsimonious account for the general realisation of *ɐi* as a diphthong. It also provides a parsimonious account for the mid-vowel realisations of /ɐi/ through the process /ɐi/ → [e(j)], which is accounted for through the raising and fronting of the initial low vowel. The pattern of this diphthong occurring prior to alveolar segments is accounted for by these sequences generally arising historically from retroflex segments: */ɐ$C_{[retroflex]}$/ → /ɐi$C_{[alveolar]}$/ (Harvey 2011). In general, this analysis provides a more parsimonious account than the alternative analyses.

3.2.2.8 ɐ:

ɐ: generally corresponds to a long vowel. The most frequent transcriptions of this category are shown in Table 35.

Table 35: Most Frequent Transcriptions of *ɐ:*

Label	**First**	**Second**	**Third**	**Other**
ɐ:	ɐ (237, 51.3%)	a (144, 27.2%)	ɐ: (38, 8.2%)	43 (9.3%)

ɐ: generally corresponds to <aha> and <ahe> in the Kaytetye orthography, corresponding to a phonological analysis /ɐɰɐ/ and /ɐɰə/ respectively. No velar approximants or velar fricatives were transcribed in the *kPhon* headword data, and therefore the velar approximant /ɰ/ never occurs in the phonetic forms of the speaker AR in the *kPhon* project. Research has identified /ɰ/ as phoneme in older speakers of Kaytetye (Turpin & Ross 2012: 18), but there is no direct phonetic evidence of this phoneme in the data used for this thesis, which is largely from younger speakers. I do not assume the existence of /ɰ/ in the *kRoot* dataset or in this thesis.

I identify two observations in relation to these analyses. The first is vowel duration data in the *Phonological Correspondence* dataset. Figure 3 shows a density plot with the duration of initial *ɐ* and *ɐː* categories. Table 36 shows the count, mean, and standard deviation of the length of initial *ɐ* and *ɐː*.

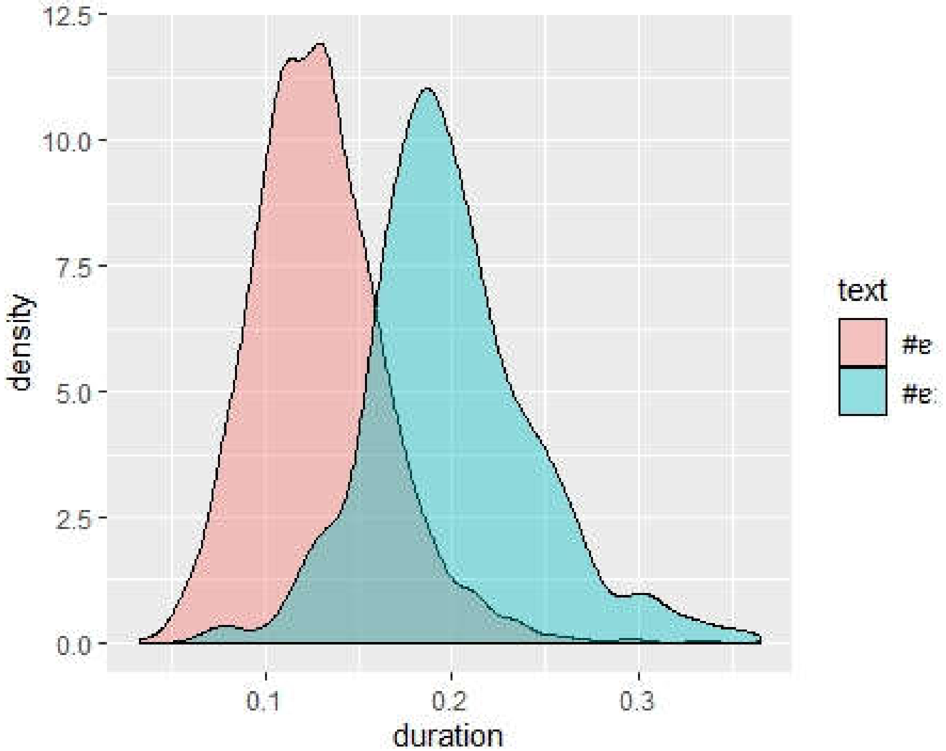

Figure 3: Density Plot of the Duration of *#ɐ* and *#ɐː* in the *Phonological Correspondence* Dataset.

Table 36: Key Figures in the Distribution of Duration of *#ɐ* and *#ɐː*

Label	**Count**	**Mean Duration (s)**	**Standard Deviation**	**95% Confidence Interval**
#ɐ	3,651	0.129	0.036	0.128 – 0.130
#ɐː	432	0.200	0.045	0.196 - 0.2024

The data shows that the duration of the *#ɐ* and *#ɐː* categories are unimodal. The mean duration of *#ɐ* is significantly lower than *#ɐː*, as shown by the non-overlapping 95% confidence intervals of the mean durations.

The second data point relates to stress placement. The proportions of transcriptions which identify *#ɐ* and *#ɐː* as stressed are shown in Table 37.

Table 37: Count of Stressed and Unstressed Transcriptions of #ɐ and #ɐ:.

Label	Stressed	Unstressed
#ɐ	34 (0.9%)	3617 (99.1%)
#ɐ:	345 (79.9%)	87(20.1%)

The results relating to stress placement show a predominant pattern in which #ɐ is standardly unstressed, and #ɐ: is standardly stressed.

I consider two analyses of ɐ:

1. The contrast between ɐ and ɐ: is neutralised, and therefore all correspond to the phoneme /ɐ/.
2. ɐ: corresponds to a long low vowel /ɐ:/.

I evaluate these analyses according to the two data points in this section.

/ɐ/: This analysis predicts that the distribution of #ɐ: is identical to #ɐ. In this respect it predicts two patterns: (i) the duration of #ɐ and #ɐ: are identical; (ii) Neither #ɐ nor #ɐ: show significant differences in the occurrence of stress. In terms of duration, the data shows a significant difference between #ɐ and #ɐ. In terms of stress, the data shows predominant stressing of #ɐ: while #ɐ is very rarely stressed. These results are inconsistent with this analysis.

/ɐ:/: This analysis predicts that the distribution of #ɐ: differs from #ɐ in ways which are motivated by vowel length. First, it predicts that the duration of #ɐ: is significantly longer than #ɐ. Furthermore, the weight-to-stress principle predicts that initial #ɐ: is stressed, while #ɐ is unstressed. The data shows that #ɐ: shows a significant difference in duration from #ɐ, with #ɐ: being significantly longer. The data also shows that #ɐ: is predominantly stressed in initial position.

These results show that there is a long low vowel in the current language of Kaytetye speakers, which derives from a previous vowel-glide-vowel sequence.

3.3 Parts of Speech in Kaytetye

In Kaytetye, there are five parts of speech.

1. Roots which inflect for tense/aspect/mood, i.e. verbs.
2. Referential roots which inflect for case, i.e. nominals.
3. Predicational roots which inflect for case, i.e. coverbs.
4. Roots which take no inflection, i.e. particles and clitics.
5. Predicational non-finite words derived from verbs, i.e. participles.

In this section I provide an overview of these classes by identifying the features which distinguish them from other classes. The data in the tables in this section are from data in the *Kaytetye-to-English Dictionary* (Turpin & Ross 2012).

3.3.1 Verbs

The class of verbs is characterised by the ability to be suffixed by any of the tense-aspect-mood (TAM) suffixes in Table 38.

Table 38: Tense, Aspect, and Mood Suffixes in Kaytetye.

Meaning	**Form**
Potential, Conditional	*-me*
Imperative	*-ne*
Same subject switch reference	*-ngele*
Different subject switch reference	*-ngewarle*
Past Tense Perfective Aspect	*-nhe/nye*
Present Tense Simple/Unmarked Aspect	*-nke*
Negative Imperative	*-ntyele*
Present Tense Imperfective Aspect	*-rrantye/rrane/yane*
Obligative	*-wene*
Purposive	*-wethe*
Future Tense	*-ye*
Past Tense Imperfective Aspect	*-yayne*

The present imperfective suffixes *-rrantye/rrane/yane* may precede a range of other suffixes, including *-nke* and *-ye*. The past imperfective suffix *-yayne* may also be followed by the suffix *-nke*.

Verbs may also take certain case markers following the TAM suffix position, which express discourse functions such as 'because', 'therefore', 'after', and so on.

(17) *Renhe arre alemewane* ***ayne-nye-penhe,*** *aleme=pe*
that COMP sweet_food **eat-PST.PFV-SEQ** stomach-TOP
atyenge ahene=lk+ine-nye
my good=then+CAUS-PST.PFV
'After eating that sweet food, it made my stomach better.'
(Turpin & Ross 2012:534)

I propose three sub-classes of verbs in Kaytetye.

1. *Lexical Verbs*: Verbs which express the primary semantics of the predicate and determine the argument structure of the clause in which they occur.

(18) *Aherre artweye-le* ***are-nke***
kangaroo man-ERG **see-PRS.SIM**
'The man sees a kangaroo.' (Turpin & Ross 2012:155)

(19) *Ayenge* ***ape-nke*** *arlelke*
1SG.NOM **go-PRS.SIM** hunting
'I go hunting.' (Turpin & Ross 2012:142)

2. *Light Verbs*: Verbs which occur with a coverb, and do not express the full semantics of a lexical verb. The primary role of light verbs is to determine the argument structure of the clause. The coverb expresses the primary semantics of the clause, but the light verb is semantically relevant to the coverb.

(20) *Atye* *etel+**are-rrantye*** *now*
1SG.ERG know+**see-PRS.IPFV** now
'I know [it] now.' (Turpin & Ross 2012:369)

(21) *Erlwanty+**are-yayne*** *errwanthe*
spectate+see-**PRS.IPFV** 2PL.NOM
'You were just watching.' (Turpin & Ross 2012:341)

(22) *Shiftem+**ayle-lp**+ayle-ye*
shift+**CAUS**-during+RED-FUT
'[it] will shift them.' (081014AmyN_06 30.942)

(23) *Arrangker+**ante-yan=**ape* *ayenge ...*
crave+**sit-PRS.IPFV**=EMPH 1SG.NOM
'I am really craving [food]…' (Turpin & Ross 2012:188)

3. *Auxiliary Verbs*: Auxiliary verbs express a Path configuration in Associated Path (AP) Constructions. Auxiliary verbs take non-finite verbs as their complements. The class of Path Auxiliary includes a reduplicant, as in (24).

(24) *Atye=pe* *kwere* *are-lp+**are-nhe***
1SG.ERG=TOP 3SG.ACC see-during+**RED-PST.PFV**
'I saw it along the way.' (Turpin & Ross 2012:225)

(25) *Erlwe* *nharte* *re* *ane-y+**alpe-nhe***
visible DEM 3SG.NOM see-after+**return-PST.PFV**
'That person is visible, he returned and sat down.' (Turpin & Ross 2012:340)

3.3.2 Nominals

Nominals are roots which inflect for case and head phrases which occur as arguments of verbs. There are several subtypes of the nominal class.

1. *Nouns*: Includes common nouns and proper nouns. Nouns take the standard case markers shown in Table 39. The absolutive case in Kaytetye is unmarked. All members of this class can function referentially (26)-(28) but many can also function predicationally, for example in existential and inchoative clauses (29).

Table 39: Standard Case Markers in Kaytetye.

Case	**Form**
Ablative	*-theye*
Allative	*-warle*
Aversive	*-ketye*
Comitative	*-larlenge / -ngarlenge*
Dative	*-we*
Denizen	*-arenye*
Ergatve/Locative/Instrumental	*-le / -nge*
Perlative	*-angkwarre*
Possessive/Genitive	*-arenge*
Privative	*-wanenye*
Proprietive	*-akake*
Purposive	*-wethewe*
Semblative	*-apenye*
Sequential	*-penhe*
Terminative	*-wartetye*

(26) ***Artnwenge*** *aytnarrerayte-nye*
child vanish-PST.PFV
'The child vanished.' (Turpin & Ross 2012:302)

(27) *Apelke* *re* ***artnwenge*** *atnkwathe-wethe*
then 3SG.NOM **child** make_sleep-PURP
'So that it can then put the child to sleep.' (Turpin & Ross 2012:311)

(28) *Elpertayle-rrantye* *angke* ***artnwenge-le***
interrupt-PRS.IPFV conversation **child-ERG**
'The child is interrupting the conversation.' (Turpin & Ross 2012:318)

(29) *Anatye* *ayerrere* ***makwerle****=peante-yane*
yam north **many**=TOP sit-PRS.IPFV
'North, yams are many.' (Turpin & Ross 2012:110)

2. *Pronouns*: Pronouns in Kaytetye are distinguished by their irregular case forms and their nominative/accusative alignment (or in the case of 1st and 2nd singular pronouns, three-way contrast in agent, patient, and intransitive subject). Table 40 lists the forms of the singular pronouns in Kaytetye.

Table 40: Singular Pronouns in Kaytetye.

Case	**1st Person**	**2nd Person**	**3rd Person**
Ergative	*atye*	*nte*	-
Subject/Nominative	*ayenge*	*nge*	*re*
Accusative/Oblique	*atyenge*	*ngkenge*	*kwere*
Possessive/Genitive	*atyeyenge*	*ngkeyenge*	*kwereyenge*
Reflexive	*atyewenhe*	*ntewenhe*	*rewenhe*

(30) ***Atye*** *are-nherre* *ilekaynewene …*
1SG.ERG see-PST.PFV red-tailed_black_cockatoo
'I saw a red-tailed black cockatoo…' (Turpin & Ross 2012:382)

(31) *Rlengke=lke=pe* ***ayenge*** *angke-nhe*
now=then=TOP **1SG.NOM** talk-PST.PFV
'I just spoke now.' (Turpin & Ross 2012:453)

(32) *Nte=lke* ***atyenge*** *nyartepe* *rlwarrine-nye*
2SG.ERG=then **1SG.ACC** then remind-PST.PFV
'Then you reminded me.' (Turpin & Ross 2012:566)

(33) *Arrereye* ***atyeyenge*** *atye* *rlwewe* *aperinte-rrantye*
older_sister **1SG.GEN** 1SG.ERG recognise take-PRS.IPFV
'I am introducing my older sister [to everyone].' (Turpin & Ross 2012:568)

(34) *Ayenge=pe* ***atyewenhe****=rtame* *rrkantarre-ran=awe*
1SG.NOM=TOP **1SG.REFL**=FOC laugh-PRS.IPFV=EXCL
'I'm laughing to myself.' (Turpin & Ross 2012:577)

3. *Demonstratives*: Demonstratives in Kaytetye are defined by their obligatory marking with the *=arte* definite clitic, and the fact that they do not take the *-nge* ergative/locative allomorph following the root.

Table 41: Forms of the Demonstrative *nharte* 'that' in Kaytetye.

Case	Form
Ergative	*nthelarte*
Absolutive	*nharte*
Locative	*nthelarte*
Dative	*nthewarte*
Sequential	*nthepenharte*
Aversive	*ntheketyarte*
Allative	*ntharlarte*

(35) *Artnwenge* ***nthelarte*** *thapakethapake* *ayne-yayne*
child **that.ERG** do_constantly eat-PST.IPFV
'That child would eat constantly.' (Turpin & Ross 2012:590)

(36) *Artnwenge* ***nharte*** *atye* *ethwe-lp+ethwe-nhe* *arntwe* *ile-wethe*
child **that** 1SG.ERG send-during+RED-PST.PFV water get-PURP
'I sent that child to get water.' (Turpin & Ross 2012:371)

3.3.3 Coverbs

Coverbs are a roots that are inherently predicational, but which do not take TAM suffixation. Coverbs co-occur with inflecting verbs, and the resulting meaning is a combination of the semantics of the coverb and the inflecting verb (37). Loan verbs from English occur as coverbs (38).

(37) *Atye* ***etel****+are-rrantye* *now*
1SG.ERG **know**+see-PRS.IPFV now
'I know [it] now.' (Turpin & Ross 2012:369)

(38) ***Shiftem****+ayle-lp+ayle-ye*
shift+CAUS-during+RED-FUT
'[He] will shift them.' (081014AN_06 30.942)

Kaytetye has many roots which convey prototypical adverbial concepts, such as *quickly*, and these roots are labelled 'adverbs' in the *Kaytetye-to-English Dictionary* (Turpin & Ross 2012). I argue here that there is no formal 'adverb' part-of-speech class in Kaytetye, i.e. a formally definable class of roots which can only function as modifiers. Rather, I propose that adverbial concepts are conveyed mostly by coverbs ('adverbial coverbs') and in some cases by particles ('adverbial particles'), e.g. *inteme* 'always'.

Adverbial coverb roots in Kaytetye differ from adverbs in other Australian and non-Australian languages. Listed below are three points of difference.

1. Cross-linguistically adverbs modify verbs, and do not express the primary semantics of a clause. In some cases, adverbial coverbs in Kaytetye may occur with no realised verb, and act as the predicate of the clause. In example (39), the coverb *alwene* 'return' is used with no inflected verb in its clause.

(39)	*Kngerrake=rtame*	*aynanthe*	***alwene***	*ampere*	*Arreparlere-warle*
	east=FOC	1PL.NOM	**return**	camp	PN-ALL
	'We [go] east and return to Arreparlere.' (Turpin & Ross 2012:94)				

2. Cross-linguistically adverbs are not restricted by the category of the predicate. For example, the adverb 'lazily' in English can occur with stative verbs ('She sat there lazily'), motion verbs ('She went lazily'), and action verbs ('She hit him lazily'). Adverbs in Kaytetye, however, are restricted by the semantics of the main predicate. For example, the adverbs *elpere* 'do quickly' and *alwene* 'return back' occur frequently with motion verbs and action verbs (40)-(41). These adverbs are not found with stative verbs (42)-(43) despite the fact that stative verbs such as *ane-* 'sit' are very commonly attested. This follows from the fact that *elpere* and *alwene* are coverbs and their meanings are inherently predicational and not modificational. The 'do' and 'return' predicates are incompatible with statives.[7]

[7] An alternative analysis is that what is occurring in Kaytetye relates to the semantic compatibility of adverbs and predicates, e.g. 'eat deliciously', 'sleep furiously', etc, rather than restrictions relating to lexical semantic class. Further research is required into this in Kaytetye, however I note that the

(40) … ***elpere*** *nte* *ile-ne*
do_quick 2SG.ERG take-IMP
'… you get it quickly!' (Turpin & Ross 2012:46)

(41) *Nhartepe* ***alwene****=pe* *nwanpe-nke*
then **return=**TOP jump-PRS.SIM
'Then it jumps back.' (Turpin & Ross 2012:520)

(42) ****elpere*** *ane-nke*
do_quick sit-PRS.SIM
'Sit quickly; for a short amount of time.'

(43) ****alwene*** *ane-nke*
return sit-PRS.SIM
'Sit back.'

3. Adverbs in Australian languages do not typically take case markers, although some languages allow referential case marking to a verbal argument (Dixon 2002). Adverbs in Kaytetye take a range of possible case markers, only some of which have a referential function (44). Other uses of case markers are not yet well understood but appear to express aspectual qualities (45)-(46).

(44) ***Akanpere-le*** *alarre-me=rtame* *atye=pe …*
go_straight_past-ERG hit-POT=FOC 1SG.ERG=TOP
'I can hit someone without stopping …' (Turpin & Ross 2012:46)

(45) *Apertame* *re* *ape-nke=rne* ***pwethe-le***
too 3SG.NOM go-PRS.SIM=HITH **be_imminent-LOC**
'And it comes right up close.' (081014AN_06 38.493)

(46) *Antywempe* ***arrengker-arle***[8] *ape-nke=pe*
fierce_snake **move_fast-ALL** go-PRS.SIM=TOP
'The fierce snake moves quickly.' (Turpin & Ross 2012:136)

3.3.4 Particles and Clitics

The particle class covers a range of forms, primarily defined by their inability to receive any

current data shows that the restrictions are on the aspectual class of the predicate (stative, motion, action) rather than the specific state or action it conveys.

[8] This is also analysable as the Alyawarr focus clitic *=arl*

kind of suffixation. Several particles are modificational, and others (especially interjections) can constitute an entire utterance. In the following sentences, the word in bold is a particle.

(47) ***Newe*** *ayenge=p=aperte* *ape-nherre*
no 1SG.NOM=TOP=just go-PST.PFV
'No I didn't go just by myself.' (Turpin & Ross 2012:110)

(48) ***Intem***=*apert=ame* *angke-rrane-ye*
always=only=INTENS talk-PRS.IPFV-FUT
'I will always be talking.' (Turpin & Ross 2012:400)

(49) ***Pwertaye*** *ntheketyarte!*
watch_out DEM.AVER
'Watch out for that!' (Turpin & Ross 2012:553)

(50) *Aye!*
hey
'Hey!'

Clitics are particles that are phonologically dependent on the preceding word, and do not receive independent stress (see further discussion of clitics in §5.4.2). Clitics standardly express discourse notions, e.g. *=lke* 'then' (51), but may express a range of concepts, such as definiteness (52).

(51) *Arntwe-nge=**lke*** *kwene* *ante-yane*
water-LOC=**then** down sit-PRS.IPFV
'Then it stays down in the water.' (Turpin & Ross 2012:453)

(52) *Artnwenge* *atyeyeng+**arte*** *errpatye*
child 1SG.GEN+**DEF** bad
'That child of mine is bad.' (Turpin & Ross 2012:212)

3.3.5 Participles

Participles are a predicational part of speech derived from verb roots. There are two types of participles:

1. Switch reference participles, of which there are two types: (i) participles in which the subject of the participle agrees with the subject of the matrix clause. These are marked by the suffix *-ngele*; (ii) participles in which the subject of the participle is

different from the subject of the matrix clause. These are marked by *-ngewarle*. Examples of these are shown in (53) & (54).

2. Associated Path participles, which occur as the complement of a Path Auxiliary. This class is described in greater detail in Chapter 5. The example in (55) shows this.

(53) *Atye* *aherre* ***are-ngele*** *aytne-nye*
1SG.ERG kangaroo **see-SWITCH.SS** spear-PST.PFV
'When I saw the kangaroo, I speared it.' (Turpin & Ross 2012:495)

(54) *Nte* *are-nhe* *atyenge* ***artnpe-ngewarle****?*
2SG.ERG see-PST.PFV 1SG.ACC **run-SWITCH.DS**
'Did you see me run?' (Turpin & Ross 2012:497)

(55) *Re* *arntwe* ***kwathe-lp****+athe-nhe*
3SG.NOM water **drink-during**+RED-PST.PFV
'He drank water on the way.' (Turpin & Ross 2012:454)

3.4 Root Phonotactics

In Kaytetye, the primary issue relating to root-level phonotactics is the distribution of segments in word-initial and word-final position. In this section I discuss these two phonological contexts. The data in this section is based on the *kRoot* and *Phonological Correspondence* datasets.

3.4.1 Root-Initial Position

The raw distribution of phonemes in root-initial position in the *kRoot* dataset is shown in Table 42.

Table 42: Quantitative Distribution of Phonemes in Root-Initial Position in the *kRoot* Dataset.

Phoneme	Count	Proportion
ɐ[9]	1,219	0.440
i	485	0.175
k	197	0.071
p	164	0.059
m	113	0.041
c	95	0.034
t	76	0.027
ŋ	64	0.023
w	53	0.019
t̪	48	0.017
l	43	0.016
ɻ	40	0.014
ɲ	39	0.014
n	37	0.013
j	19	0.007
l̪	18	0.006
ɭ	15	0.005
r	15	0.005
ʎ	13	0.005
n̪	11	0.004
ʈ	5	0.002
ɳ	3	0.001

This data shows a very high proportion of initial vowels. Two vowel qualities occur in initial position: /ɐ/ & /i/, corresponding to *ɐ* & *i*. Overall, these vowel qualities account for 1,714 (61.8%) of all root-initial segments.

In the *Phonological Correspondence* data, there is evidence of phonetic variation in the realisation (i.e. the non-occurrence) of predicted initial vowels. Table 43 shows the categories *ɐ* & *i* in initial position, and whether the vowel is phonetically realised. The data shows that non-realisation of the initial vowel occurs but is marginal.

[9]/ɐː/ is conflated with /ɐ/ in this section.

Table 43: Realisation of Initial Vowels in the *Phonological Correspondence* Dataset.

Label	**Realised**	**Not Realised**
ɐ	3,655 (92.8%)	283 (7.2%)
i	1,973 (90.8%)	200 (9.2%)

The data further shows uneven distribution relating to the place of articulation of consonants. Table 44 shows the count of initial segments by place of articulation.

Table 44: Distribution of Consonants in Root-Initial Position in the *kRoot* Dataset.

Place of Articulation	**Count**	**Proportion**
labial	330	11.9%
velar	261	9.4%
alveolar	211	7.6%
palatal	166	6.0%
dental	77	2.8%
retroflex	23	8.0%

The retroflex and dental categories are very infrequent in initial position. On the other hand, peripheral segments (labial and velar) are very frequent, accounting for 21.3% of initial segments.

3.4.2 Root-Final Position

This discussion is in two sections: (i) the phonological contrasts in final position; (ii) the status of phonetic diphthongs in final position. The status of final phonetic long vowels was discussed in §3.2.2, and therefore I do not consider these in this section.

3.4.2.1 Phonological Contrasts in Final Position

Analyses of Kaytetye agree that all morphemes, including all roots, are vowel-final (Koch 2006; Turpin & Ross 2012). Under the conventional analysis of Kaytetye phonology, all morphemes end with the phoneme /ə/.

In the expanded analysis of the vowel inventory of Kaytetye in this thesis, I propose that roots may be specified finally for two vowel phonemes: /ə/ & /u/. The counts of these vowels in final position in the *kRoot* dataset are shown in Table 45.

Table 45: Quantitative Distribution of Vowel Phonemes in Root-Final Position.

Vowel	Count	Proportion
/ə/	2,639	95.2%
/u/	133	4.8%

The data shows an overwhelming preference for roots ending in schwa, which accounts for 95.2% of the data. /u/ is comparatively infrequent. Examples (56) & (57) show minimal pairs between these two endings.

(56) *Antye*
/ɐɲcə/
'Native pear.'

(57) *Antywe*
/ɐɲcu/
'Grass humpy.'

Phonetic data shows that the same word may occur variably with and without a final vowel. The distribution of retained and deleted final vowels in the *Phonological Correspondence* dataset are shown in Table 46.

Table 46: Realisation of Final Vowels in the *Phonological Correspondence* Dataset.

Vowel	Realised	Unrealised
/ə/	3,369 (35.6%)	6,108 (64.4%)
/u/	179 (63.0%)	105 (37.0%)

The data shows that deletion of the final vowel is frequent with the vowel /ə/ and less frequent with /u/.

3.4.2.2 Final Vowel-Glide-Vowel Sequences

With respect to vowel-glide-vowel sequences, there are two predominant types in the phonetic data: (i) *ɐjə#*; (ii) *ɐwə#*. In this section I evaluate the phonological status of these sequences.

ɐjə# is a non-high vowel followed by a high front vowel, frequently realised as diphthongs [ai] or [ei]. The most frequent of the 116 transcriptions of *ɐjə#* in the *Phonological Correspondence* dataset are shown in Table 47.

Table 47: Most Frequent Transcriptions of *ɐjə#* in the Phonological Correspondence Dataset.

Label	**1st**	**2nd**	**3rd**	**Other**
ɐjə#	ɐɪ (29, 25.0%)	ej (24, 20.6%)	æɪ (14, 12.1%)	49 (42.2%)

68 (58.6%) of transcriptions begin with a low vowel, [ɐ, a, æ], and 37 (31.9%) begin with a mid-front vowel [e, ɛ]. 106 (91.4%) end in [j], [i] or [ɪ].

In the *Phonological Correspondence* data, there are instances of transcriptions in which this diphthong has a schwa following it. Examples of this are shown in (58) & (59).

(58) /ɐrkɐjə/
[ɐɾɻək'**ɐijə**]
'Faint, dull.'

(59) /tyayengetyaye/
[c'ɛiŋɪc**eɪə**]
'As a group.'

Of the 116 instances of final *ɐjə*, 8 (6.9%) realisations end in a central vowel. This makes it a marginal, but present, pattern in the data.

Audio data from the *Kaytetye Text Corpus* of final *ɐjə* preceding the locative suffix *-le* shows that realisations may be both disyllabic and a diphthong. (60) & (61) show examples of the realisations of the *ɐjə*-final root *elpaye* 'creek' with the locative suffix.

(60) *Elpaye-le*
[ɪlpejə-l]
creek-LOC
'At the creek.' (20091117_TT-01 398.816)

(61) *Elpaye-le*
[ɪlpeː-l]
creek-LOC
'At the creek.' (20091117_TT-01 398.816)

There are two analyses of this category in final position:

1. *ɐjə#* corresponds to /ɐi/ in final position.
2. *ɐjə#* corresponds to /ɐjə/ in final position.

The /ɐi/ analysis accounts for final schwa realisations under the process /ɐi/ → [ɐjə] in which a schwa may be optionally epenthesised to the end of the word. Epenthesis is a phonological process which occurs to repair ill-formed surface forms (Hall 2011). The optionality and rarity of this epenthesis does not support an analysis in which there is a phonological repair occurring. Consequently. there is no motivation for this kind of epenthesis to occur. This analysis also does not account for the vowel-glide-vowel realisations of this ending under affixation. On the other hand, the /ɐjə/ analysis accounts for the occurrence of schwa in final position and the vowel-glide-vowel realisations under affixation. Therefore, this analysis has advantages over the /ɐi/ analysis.

ɐwə# is a low vowel followed by a round vowel, standardly of the phonetic form [ɐo]. The most frequent of the 44 transcriptions of this diphthong are shown in Table 48.

Table 48: Most Frequent Transcriptions of *ɐwə#*.

Label	First	Second	Third	Other
ɐwə#	ɐo (8, 18.1%)	ɐɔ (4, 9.0%)	ɐu (4, 9.0%)	28 (63.6%)

28 (63.6%) of these transcriptions begin with a low vowel, and 12 (27.2%) begin with a round vowel. 34 (77.3%) transcriptions end with a round vowel. Schwa-final realisations account for 5 (11.4%) of the set of transcriptions.

I consider two analyses of final *ɐwə*:

1. *ɐwə#* corresponds to /ɐu/ in final position.
2. *ɐwə#* corresponds to /ɐwə/ in final position.

The /ɐu/ analysis proposes that in cases with final schwa, there is a procedure /ɐu#/ → [ɐwə#]. This is accounted for by epenthesis, in which a schwa is epenthesised in utterance-final position. The only motivation for such a rule is a phonological requirement that words end in a central vowel. The low frequency of instances of final schwa makes this rule stipulative. This rule is not motivated by the data, consequently this analysis is not motivated by the data.

The /ɐwə/ analysis proposes that non-schwa realisations are the result of elision of the final schwa. Elision of final schwa is a frequent pattern in Kaytetye, as shown in this section. Therefore, this analysis provides a parsimonious account compared to the alternative.

3.5 Stress and Prosody

The stress and prosodic structure of Kaytetye have not previously been the subject of comprehensive analysis. In this section I review previous descriptions of Kaytetye stress and describe generalisations of Kaytetye prosodic structure based on the evidence of phonetic data and descriptions of Kaytetye prosody by fieldworkers.

3.5.1 Stress

A root in Kaytetye has one prominence. The stress pattern in Kaytetye roots is conditioned to whether the word is consonant-initial (Turpin & Ross 2012: 26). If the word is consonant-initial, this prominence is always on the initial vowel (62).

(62) *Kayte*
[ˈ**kai**.tə]
'Grub.'

If the word is vowel-initial, the second vowel is stressed.

(63) *Aleke*
[aˈ**lə**.kə]
‘Dog.’

If there is an initial long vowel, i.e. /ɐː/, the initial vowel is stressed.

(64) *Aherre*
/ɐːrə/ → [ˈ**a**ː.rə]
‘Kangaroo.’

Polysyllabic suffixes show the same stress pattern. For example, fieldworkers agree that in the word in (65), there is a prominence in both the noun root and the proprietive suffix.

(65) *Alek-akake*
dog-PROP
[aˈ**lə**.kaˌ**ka**.kə]
‘Having a dog.’

3.5.2 Prosodic Domains

The levels of the prosodic hierarchy (Hayes 1989; Nespor & Vogel 2007) relevant to the phonological form of a word are shown in Figure 4.

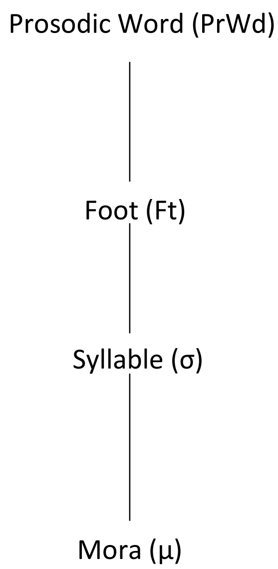

Figure 4: The Standard Levels of the Prosodic Hierarchy Relevant to Words.

The mora is phonologically active in Kaytetye, and is relevant in two related areas of Kaytetye phonology:

1. The phonemic contrast between the short vowel /ɐ/ and the long vowel /ɐː/, described in §3.2.2.
2. The initial stress of roots beginning with /ɐː/, shown in (64).

In Chapter 8, I discuss in further detail the category of the syllable. I show that the syllable is a phonologically active constituent in Kaytetye, and it corresponds to a standard onset maximising syllable structure. I show in §6.3.3.1 that there is no evidence for the foot, and Kaytetye stress can be adequately accounted for without appealing to prosodic feet.

The prosodic word in Kaytetye corresponds to a domain in which the first vowel followed by a consonant is stressed. All roots and polysyllabic nominal affixes correspond to a prosodic word. Example (66) illustrates the prosodic structure of the word in (65).

(66) *Alek-akake*
dog-PROP
[$_{\text{PrWd}}$(aˈlə.k)$_{\text{PrWd}}$$_{\text{PrWd}}$(aˌka.kə)$_{\text{PrWd}}$]
‘Having a dog.’

3.6 Kaytetye in Syntactic Typology

In this section I provide a broad overview of the key facts of Kaytetye syntax. These primarily relate to: (i) the characteristics of verbal arguments; (ii) the ordering of constituents in Kaytetye sentences. Other data relating to Kaytetye syntax which are relevant to the category of Associated Path, including valency and the distribution of adjuncts, are presented in Chapter 5.

3.6.1 Verbal Argument Coding

As discussed in §3.3.2, Kaytetye has an ergative alignment: the object of a transitive verb has identical morphology to the subject of an intransitive verb, as in (67)-(69). Pronouns show a nominative-accusative alignment, as in (70)-(72).

(67)	***Iterrtye-le***	*pweleke*	*ertwe-lh+ertwe-lh+ayle-nke*	
	person-ERG	cattle	descend-CAUS+descend-CAUS-cause-PRS.SIM	
	'The people made the cattle go down.' (Turpin & Ross 2012:450)			

(68)	***Iterrtye***	*impalthe-le*	*ante-yane*	
	person	side-LOC	sit-PRS.IPFV	
	'People are sitting on the side.' (Turpin & Ross 2012:396)			

(69)	*Marnte-le*	***iterrty**-inenge*	*ile-r+aperinte-rrantye*	
	bus-ERG	**person-**COLL	get-during+take-PRS.IPFV	
	'The bus picks many people up on the way.' (Turpin & Ross 2012:383)			

(70)	*Aherrke-le*	*ampe-nke*	***re***	
	sun-LOC	warm-PRS.SIM	**3SG.NOM**	
	'**It** warms up in the sun.' (Turpin & Ross 2012:555)			

(71)	***Re***	*atyenge*	*artnte*	*etnye-yayne*
	3SG.NOM	1SG.DAT	money	give-PST.IPFV
	'**He** used to give me money.' (Turpin & Ross 2012:644)			

(72)	*Ralharre*	*pwe-nke*	***kwere***	*ware-nge*	
	bush_banana_inside	cook-PRS.SIM	**3SG.ACC**	fire-LOC	
	'(You) cook **it**, the inside of the bush banana, in the fire.' (Turpin & Ross 2012:555)				

Kaytetye is also a pro-drop language, in which arguments which are clear from discourse context may be optionally dropped. For example, in example (72), the subject of the transitive verb is not expressed.

3.6.2 Constituent Order

Kaytetye is a non-configurational language and permits the free ordering of syntactic constituents. For example, a sentence such as *Tyweketywekele kwarte atherrantye* 'the chicken is laying an egg' allows all possible orderings of the constituents.

There is evidence for configurationality at the level of lexical phrases. I provide two examples of this kind of configurationality: (i) Modifiers of nouns in a Noun Phrase (NP) must always follow the noun, and never precede it (Turpin 2000: 42). For example, the phrase in example (73) is grammatical, but the phrase in example (74) is ungrammatical as an attributive construction; (ii) Coverbs must precede verbs, and may never occur following, and so the construction in (75) is grammatical, but (76) is ungrammatical.

(73) *Artnwenge* *kelye*
child small
'A small child.'

(74) **Kelye* *artnwenge*
small child
'A small child.'

(75) *Etel+are-nke*
recognise+see-PRS.SIM
'Recognise.'

(76) **Are-nke+etele*
see-PRS.SIM+recognise
'Recognise.'

Chapter 4: The Status of Rounding in Kaytetye

4.1 Introduction

In this chapter I evaluate two analyses of rounding in Kaytetye: The *Labialised Consonant* hypothesis in which rounding is a property of consonants, and the *Round Vowel* hypothesis in which there is a round vowel /u/ and /Cw/ consonant clusters. The first hypothesis is the standard analysis of Kaytetye, in which rounding is analysed as a secondary articulation feature in complex consonants (Breen 2001; Koch 2004). The second hypothesis proposes that there are two sources of rounding in the consonant and vowel phonology: (i) a labiovelar glide /w/; (ii) a round vowel /u/. This hypothesis is called the *Round Vowel* Hypothesis.

These hypotheses provide alternative analyses for two surface phonetic patterns in Kaytetye phonology: (i) the distribution of consonant-glide sequences; (ii) the distribution of round vowels. These are shown in Table 49.

Table 49: Phonological Analyses of the Labialised Consonant Hypothesis and Round Vowel Hypothesis.

Phonetic realization	[Cwɐ][10]	[Cwi]	[Cu]	[Cə]
Labialised Consonant Hypothesis	/Cʷɐ/	/Cʷi/	/Cʷə/	/Cə/
Round Vowel Hypothesis	/Cwɐ/	/Cwi/	/Cu/	/Cə/

The findings presented in this chapter is summarised as follows:

1. *u* is standardly realised as a round vowel.
2. *u* is standardly realised as [wə ~ wa] in final position.
3. The distribution of *CwV* negatively correlates to the sonority of *C*.
4. Reduplication consistently produces a round vowel in reduplicant-initial position when the second-to-last vowel in the verb root is rounded.

[10] In this chapter, C: Consonant; V: any vowel except for [ʊ] and [ə].

5. There is morpho-phonological alternation between a round vowel and schwa in root-final position.
6. In vowel hiatus situations at morpheme boundaries with *u* preceding another vowel, a labiovelar glide occurs.

In §4.2, I describe the distribution of the round vowel /u/ and the labiovelar glide /w/ in Kaytetye phonetic and phonotactic data. In §4.3, I describe morphophonological data in Kaytetye, including reduplication, root-final alternations, and vowel hiatus resolution patterns relating to the round vowel. In §4.4, I evaluate the *Labialised Consonant* and *Round Vowel* hypotheses against these data.

4.2 Phonetics and Phonotactics of Rounding

In this section I consider the distribution of the realisations of the round categories *w*, *u*, and *wə* in the *Phonological Correspondence*, *Paired Transcription*, and *kRoot* datasets. Table 3 in §2.3.2.2 provides a description of the labels used in this thesis and their corresponding phonological analysis. In Table 50 is a list of the labels relevant to this chapter, and their corresponding phonemic status under *Labialised Consonant* and *Round Vowel* analyses.

Table 50: Phonological Sequences under the Labialised Consonant and Round Vowel Hypotheses, and the Corresponding Labels used to Represent these Sequences in this Chapter. Asterisked Labels are Labels used in this Chapter but not in the *Phonological Correspondence* Dataset.

Label	Labialised Consonant	Round Vowel
u	/ə/ / C^w_	/u/
ə	/ə/	/ə/
ɐ	/ɐ/	/ɐ/
uwə	/əwə/	/uwə/
i	/i/	/i/
ijə	/ijə/	/ijə/
*wə**	/wə/	/wə/
*wɐ**	/wɐ/	/wɐ/
*wi**	/wi/	/wi/

The Kaytetye data shows that in terms of raw frequency values, rounded segments are infrequent in final position, frequent in medial position, and almost completely absent in initial position. Table 51 shows the count of transcribed round vowels and non-round vowels in these positions. Importantly, for the category of initial round vowels, there was never an instance in which two transcribers agreed on initial rounding for a given token. For this reason, initial *u* does not occur in Kaytetye

Table 51: Distribution of Rounded Vowels in the *kPhon* Raw Vowel Transcription Dataset

Quality	Initial	Medial	Final
Round	5 (0.07%)	3,764 (16.1%)	219 (4.9%)
Unrounded	6,594 (99.92%)	19,592 (83.9%)	4,225 (95.1%)

In this section I describe the distribution of *w* and *u* in terms of these three phonotactic positions. The data in Table 51 shows a high frequency of round vowels in medial position, and therefore I discuss this position first in §4.2.1. In §4.2.2 I identify the distribution of vowels preceded by labiovelar glides in initial position. In §4.2.3 I describe the distribution of *w* and *u* following consonants in the *kRoot* dataset. In §4.2.4 I describe patterns in the realisations of *u* in final position.

4.2.1 u in Medial Position

The realisations of *u* in medial position in the *Phonological Correspondence* dataset are shown in Table 52.

Table 52: Count of Transcriptions Corresponding to *u* in Medial Position with a Count Greater than 50. Rounded Transcriptions are in Bold.

Transcription	**Count**	**Proportion**
ʊ	1,353	0.59
u	576	0.25
o	140	0.06
ə	99	0.04
ɔ	62	0.02
Total	2,298	-

The data shows that most realisations of *u* in medial position are as a round vowel. 2,159 (94%) realisations of *u* contain a transcription of a round vowel. The *Paired Transcriptions* dataset shows that in 1,026 paired transcriptions of medial *u*, 1,007 (98.1%) have at least one annotator indicate a round vowel, and in 925 (90.2%) cases both annotators indicated a round vowel. This means that: (i) round vowels account for almost all realisations of *u* according to at least one annotator for each annotation pair; (ii) there are a minority of cases where transcribers disagreed on roundedness. I discuss this further below. These facts identify a rounded realisation as the standard realisation of *u*.

The most frequent non-rounded phonetic transcription of *u* is [ə]. In this case, there is significant disagreement in the quality of transcribed [ə] vowels in the *Paired Transcriptions* set. In the 82 tokens in the *Paired Transcriptions* set in which one annotator indicated *u* as [ə], there were 64 (78.0%) cases in which the other annotator identified a rounded vowel. This means that in the *Paired Transcriptions* set there are only 18 cases where one annotator indicated [ə] and another annotator indicated a corresponding unrounded vowel. This identifies occurrences of [ə] as a marginal realisation of /u/.

4.2.2 Rounding in Initial Position

It was shown in the introduction to this section that the phonetic data does not support the existence of round vowels in initial position. There is a contrast between three vowels preceded by an initial labiovelar glide. These correspond to three categories: *wɐ*, *wi*, *wə*. Examples (77)-(79) show the three-way contrast between these categories in the phonetic data.

(77) [wampəɻ]
‘Possum.’

(78) [wimpɐrə]
‘Tree grave.’

(79) [wənkə]
‘Throw.’

Corresponding to the phonetic data, the generated phonological forms in the *Phonological Correspondence* and *kRoot* datasets predict initial labiovelar glides corresponding to the three categories: *wɐ*; *wi*; *wə*.

The transcriptions relating to the vowel in initial *wɐ* are shown in Table 53.

Table 53: Transcriptions of *ɐ* in initial *wɐ* Sequences.

Transcription	**Count**	**Proportion**
ɐ	86	0.64
a	46	0.34
ɑ	2	0.02
Total	134	-

There is general agreement that all instances of the vowel in *wɐ* corresponds to a low vowel. No transcription of the vowel in *wɐ* is a round vowel.

The transcriptions of the vowel *i* in *wi* are shown in Table 54.

Table 54: Transcriptions of *i* in initial *wi* Sequences.

Transcription	**Count**	**Proportion**
i	18	0.58
ɪ	8	0.26
ɘ	2	0.07
ə	2	0.07
ʊ	1	0.03
Total	31	-

26 (83.9%) transcriptions are a high front vowel [i, ɪ] and 4 transcriptions correspond to a central vowel. Much like with *wɐ*, there is general agreement on the realisation of the vowel in *wi* is a high front vowel.

The transcriptions of the vowel quality in initial *wə* sequences with a count greater than 3 are shown in Table 55.

Table 55: Transcriptions of *ə* in initial *wə* Sequences with a Count Greater than 3. Rounded Transcriptions are in Bold.

Transcription	**Count**	**Proportion**
ə	18	0.31
ʊ	10	0.17
ɪ	8	0.14
ɜ	6	0.10
ɔ	4	0.07
u	4	0.07
Total	59	-

Compared to *wɐ* and *wi*, there is a much greater degree of variation in the transcriptions of the vowel in *wə*. Transcriptions generally show that unrounded vowel. Of the 59 transcriptions of this vowel, 39 (66.1%) are realised as an unrounded vowel. This is most frequently as a schwa (18, 31%).

In 20 transcriptions of *wə* (33.9%), a round vowel is indicated as the phonetic target. The spreading of phonological features, including rounding, is a well-established cross-linguistic pattern, which is well-motivated in both phonetic research and language typology (Halle et al. 2000; Jurgec 2011).

4.2.3 Phonotactics of CwV and Cu

In order to analyse the distribution of the labiovelar glide and *u*, *CwV* and *Cu* sequences were retrieved from the *kRoot* dataset. The IPA representation of *C* was retrieved. Pre-stopped nasals and nasals were conflated during this process because they have an identical primary articulatory target. Following this, each IPA consonant was categorised according to one of six categories, corresponding to six levels of the sonority hierarchy. Consonantal categories and the corresponding set of consonants are listed in Table 56. The sonority categories here are based on a sonority hierarchy proposed by Parker (2008).

Table 56: Kaytetye Consonantal Categories listed with Assigned Sonority Values and Segments.

Sonority	**Category**	**Segments included**
1	Obstruent	/p, t̪, t, ʈ, c, k/
2	Nasal	/m , n̪, n, ɳ, ɲ, ŋ/
3	Trill	/r/
4	Lateral	/l̪, l, ɭ, ʎ/
5	Rhotic Approximant	/ɻ/
6	Glide	/w, j/

The counts of each segment and each category before a round segment are provided in Table 57 and Table 58.

Table 57: Counts of Each Segment in *CwV* and *Cu* Sequences.

C	CwV	Cu	Total
k	73 (0.223)	254 (0.777)	327
p	34 (0.256)	99 (0.744)	133
ɭ	30 (0.476)	33 (0.524)	63
t	13 (0.165)	66 (0.835)	79
ʈ	12 (0.207)	46 (0.793)	58
ŋ	11 (0.256)	32 (0.744)	43
n	11 (0.22)	39 (0.78)	50
c	11 (0.172)	53 (0.828)	64
m	9 (0.237)	29 (0.763)	38
r	9 (0.184)	40 (0.816)	49
l	6 (0.113)	47 (0.887)	53
t̪	4 (0.143)	24 (0.857)	28
ɳ	3 (0.136)	19 (0.864)	22
ɻ	2 (0.059)	32 (0.941)	34
j	0 (0.0)	11 (1.0)	11
l̪	0 (0.0)	10 (1.0)	10
ɲ	0 (0.0)	10 (1.0)	10
ʎ	0 (0.0)	7 (1.0)	7
n̪	0 (0.0)	2 (1.0)	2

Table 58: Counts of Each Segmental Category in *CwV* and *Cu* Sequences.

Category	Sonority	CwV	Cu	Total
Stop	1	147 (0.213)	542 (0.787)	689
Nasal	2	34 (0.206)	131 (0.794)	165
Trill	3	9 (0.184)	40 (0.816)	49
Lateral	4	36 (0.271)	97 (0.729)	133
Rhotic.	5	2 (0.059)	32 (0.941)	34
Glides	6	0 (0.0)	11 (1.0)	11

In terms of frequency, stops are by far the most frequent type of segment. Of the stops, the peripheral segments /p/ and /k/ make up 66.7% of the total number of stops. Nasals show a comparatively low proportion of *CwV* counts, while laterals show a comparatively high proportion of *CwV* occurrences. However, /ɭ/ significantly skews the data for the lateral *CwV* category and other laterals show very low occurrence in this category. In the category of rhotic approximants, there are only 2 occurrences of *CwV*, and both are prior to palatal consonants. Vowels preceding palatal consonants have reduced phonological contrast, and therefore all instances of CwV in which C is a rhotic approximant is in a phonotactically marked environment. There are no CwV sequences in which C is a glide.

4.2.4 u in Final Position

The three most frequent transcriptions of *u* in the final position in the *Phonological Correspondence* dataset are presented in Table 59. All other transcription values have a count of 6 or lower. The transcriptions of final *u* show frequent occurrence of a preceding labiovelar glide. Annotators in the *kPhon* project did not transcribe glides preceding vowels in the vowel tier, and therefore these could not be retrieved procedurally. A hand-count of token-level transcriptions of tokens in the *kPhon* headword dataset shows that of the 179 realised final *u*, in 93 (52%) instances, a labiovelar glide [w] preceded the vowel.

Table 59: Unique Transcriptions of Final *u* which Have a Count of 30 or Greater

Transcription	**Count**	**Proportion**
ə	70	0.39
ɐ	35	0.20
a	30	0.17
Total	179	-

Most transcriptions of final *u* identify it as an unrounded vowel. Of the 179 transcriptions, 145 (81%) do not include a rounded vowel. Of the 34 transcriptions with a round vowel, 20 are digraphs, with a round vowel followed by an unrounded vowel. This pattern indicates that in final position, *u* is standardly realised as an unrounded vowel preceded by a labiovelar glide: [wə] or [wɐ].

The distribution of the series of low vowel [(w)a, (w)ɐ] vs. central vowel [(w)ə] transcriptions is accounted for by whether the final vowel is stressed. The counts of low vs. central transcriptions by stress are shown in Table 60.

Table 60: Categories of Vowel Transcriptions for Token-Final *u* By Stress with Column-Wise Percentages.

Vowel Type	Stressed	Unstressed
Low	78 (81.3%)	7 (8.4%)
Mid	10 (10.4%)	66 (79.5%)
Other (Rounded etc.)	8 (8.3%)	10 (12.0%)
Total	96	83

These results show that in final position, *u* is generally realised as a low vowel when stressed, and a central vowel otherwise. This distribution is very similar token-final *ə*, which is frequently lowered in stressed position, although it is not preceded by [w]. The distribution of token-final *ə* is shown in Table 61.

Table 61: Categories of Vowel Transcriptions for Token-Final *ə* By Stress with Column-Wise Percentages.

Vowel Type	Stressed	Unstressed
Low	131 (65.5%)	172 (5.4%)
Mid	69 (34.5%)	2,984 (94.2%)
Other	0	13 (0.4%)
Total	200	3,169

The results show that the distributional qualities of *u* and *ə* in token-final position are near-identical.

Under the *Round Vowel* hypothesis, final *u* is phonemicized as /u/ rather than /wə/. The motivation for this analysis is the behaviour of *u* under affixation, as shown in §4.3.2. When final *u* is followed by an affix, it is realised as a round vowel, standardly [ʊ] I show in §4.4.2 that a round vowel analysis is a more parsimonious analysis than alternative analyses.

4.3 Morpho-Phonological Patterns

In this section I consider morpho-phonological alternations between rounded and unrounded vowels. The data in this section is based on the *Partial Reduplication Elicitation* described in §2.3.1.2, as well as generalisations based on Kaytetye phonetic and phonological data.

4.3.1 Reduplication

Partial reduplication patterns copy a portion of a base to form a reduplicant. In this section I present data from the elicitation of reduplicated forms.

The partial reduplication pattern occurs in an Associated Path construction in which the root of the Path Auxiliary is a reduplicant. In this pattern, exemplified in (80) & (81), the reduplicant partially copies the verb root. The form of the reduplicant is that of a minimal root, i.e. VCV, which is copied from the end of the base verb root.

(80)	[ɐləpəcə-nkə] rise-PRS.SIM 'Rise.'	[ɐləpəcə-lp+**əcə**-nkə] taste-during+**RED**-PRS.SIM 'Taste along the way.'
(81)	[kwɐṯə-nkə] drink-PRS.SIM 'Drink.'	[kwɐṯə-lp+**ɐṯə**-nkə] drink-during+**RED**-PRS.SIM 'Drink along the way.'

In the *Partial Reduplication Elicitation* dataset there were two verb roots with *u* as the second-to-last vowel. These verb roots are listed in Table 62 with their phonological forms.

Table 62: Two Verb Roots with *u* as the vowel in the Second-to-Last Syllable which were used in Elicitation.

Labialised Consonant Hypothesis	Round Vowel Hypothesis	Kaytetye Orthography	Meaning
/ʎʷəkə-/	/ʎukə-/	*lyweke-*	Light (a fire), kindle
/jʷəkə-/	/jukə-/	*yweke-*	Chase away

The results of the elicitation show that for *lyweke-* and *yweke-*, the initial vowel of the reduplicant was consistently rounded for all instances it occurred. Examples from the elicitation data are shown in (82) & (83).

(82) *Alek-amern=aye,* *yweke-lp+**eke**-nhe*
dog-PL=EXCL chase-during+RED-PST.PFV
[alək-amɜɳ=ej.. jʊkʊ-lp+**ʊkə-n̪**]
'The dogs, (we) chased them along the way.'

(83) *Lyweke-lp+**eke**-nhe* *ware*
light-during+RED-PST.PFV fire
[ʎʊkʊ-lp+**ʊkə-n̪**ə waɻə]
'(I) lit the fire along the way.'

The final vowel in the verb roots in (82) & (83) also show rounding. In Kaytetye phonetic data, rounding frequently spreads rightwards by one syllable, but not consistently. An example of rightward spreading of rounding drawn from the IPA transcription dataset is shown in (84), and an example of spreading failing to occur is shown in (85). In the *kPhon* transcription data there are no observed examples of rightward spreading by two vowels. In the transcription data, the second following vowel is standardly unrounded, as in (86). However, Harold Koch (pers. comm. 2020) notes that rounding in the second following syllable can occur in the second following syllable in natural speech data, as in (87). The distribution of rounding spreading requires further investigation, but these current data show that it is inconsistently applied.

(84) *Arrwekele*
/ɐruk**ə**lə/
[arʊk**ʊ**lə]
'Ahead.'

(85) *Arwengerrpe*
/ɐɻuŋ**ə**rpə/
[ɐɻuŋ**ə**rp]
'Bush Turkey.'

(86) *Akwerrepenhe*
/ɐkurəpən̪ə/
[ɐkorɜp**ə**n̪ə]
'Baby.'

(87) *Kwertengerle*
/kuʈəŋəɭə/
[kʊʈʊŋ**ʊ**ɭə]
'Custodian.'

The spreading of rounding is inconsistent and is not frequently observed in the second following vowel from the vowel, and therefore it is insufficient to account for the consistent occurrence of rounding in the initial vowel of the reduplicant, as shown in (82) & (83). Instead, the parsimonious analysis of the rounding in the reduplicant is that it is the result of phonological specification.

An alternative approach to the rounding in the reduplicant is an analysis in which the reduplication over-copies the rounding from the base. In this analysis, the phonetic form [ʊ] even without the context of a preceding labialised consonant, because it is copying the rounding of the surface form: /j^{w}**ə**kəlp+**ə**kən̪/ →[j**ʊ**kʊlp+**ʊ**kə-n̪] 'Chased on the way'.

This analysis relies on the notion that the reduplication copies the VCV string at a point after the spreading of the labial feature. In relation to this, I point out that while the second vowel in the base is frequently rounded in the reduplication elicitation data, the second vowel in the reduplicant is frequently not, i.e. the base is standardly [jʊkʊ] while the reduplicant is standardly [ʊkə]. These are shown in examples (82) & (83). Given that this analysis aims to account for the rounding in the reduplicant through the copying of the [+labial] feature after it has spread, the fact that it does not copy the rounding in the second vowel is inconsistent with this analysis.

Yet another approach is a serial rule-based account, in which the reduplication procedure is applied after labial spreading. A summary of the procedures which apply in a serial rule-based account is shown in Figure 5.

Input	/jʷəkə-lp+RED-n̪ə/
Spread [+labial] Feature	/jʊkʊ-lp+RED-n̪ə/
Reduplicate VCV	/j**ʊkʊ**-lp+**ʊkʊ**-n̪ə/
Output	[jʊkʊlpʊkʊn̪ə]

Figure 5: Summary of a Serial Rule-Based Account of Kaytetye Partial Reduplication.

This analysis suffers from the same problem as the over-copying analysis, in that it proposes copying of the phonetic form of the base to produce the reduplicant. The data shows that the second vowel in the reduplicant is frequently unrounded, while the corresponding vowel in the base is always rounded. This means that the reduplicant does not copy the phonetic rounding in the base, consequently this analysis does not correctly predict the facts of rounding and reduplicant.

In verb roots in which there is a labiovelar glide preceding the vowel, the initial vowel in the reduplicant occurs without rounding.

(88) *Pantye* *ware-lp+**are**-nhe*
[pancə waɻə-lp+**aɻə**-n̪ə]
'Rolled up a blanket.'

(89) *Artyweye-le* *rapetye* *kwetye-lp+**etye**-nhe*
[aʈwiː-lə ɹapicə kwicɪ-lp+**icɪ-**n̪ə]
'The man collected the rubbish on the way.'

4.3.2 Nominal Root-Final Alternations

As discussed in §4.2.4 round vowels are phonetically restricted in final position. Nominal roots with *u* in root-final position are shown in Table 63 with predicted phonological forms under the *Labialised Consonant* and *Round Vowel* hypotheses.

Table 63: Phonological Forms of Noun Roots *apmwe* and *atnhelengkwe* under the Labialised Consonant and Round Vowel Analysis

Labialised Consonant	Round Vowel	Orthography	Meaning
/ɐpmʷə/	/ɐpmu/	*Apmwe*	Snake
/ɐt̪n̪ələŋkʷə/	/ɐt̪n̪ələŋku/	*Atnhelengkwe*	Emu

When *u* is in root-final position, the standard realisation is as the phonetic sequence [wə] in unstressed contexts and [wɐ] in stressed context. This is shown in (90) & (91).

(90) *Apmwe*
[apˈmwɐ]
'Snake.'

(91) *Atnhelengkwe*
[at̪ˈn̪ələŋkwə]
'Emu.'

In cases where the root is suffixed, *u* instead corresponds to [ʊ].

(92) *Apmwe-nge*
snake-ERG
[apˈm**ʊ**-ŋə]
'Snake (erg.).'

(93) *Atnhelengkwe-le*
emu-ERG
[at̪ˈn̪ələŋk**ʊ**lə]
'Emu (erg.).'

This pattern shows the alternation of *u* between [ʊ] and [wə] is a phonologically active alternation.

4.3.3 Vowel Hiatus at Morpheme Boundaries

Vowel hiatus in Kaytetye is resolved by the deletion of the initial vowel: /V_1V_2/ → [V_2]. This is seen in the behaviour of vowel-initial suffixes. An example of this is shown in (94).

(94) *Alek-akake*
dog-PROP
/ɐlək**ə**-**ɐ**kɐkə/ → [ɐlək**ɐ**kɐkə]. *[ɐlək**əɐ**kɐkə]

When a root ending in *u* undergoes this same vowel hiatus pattern, the [w] is retained and is followed by the initial vowel of the following morpheme. This is exemplified in (95).

(95) *Erlw-akake*
eye-PROP
/iɭu-ɐkɐkə/ → [ɚɭwɐkɐkə]
'Having eyes (i.e. with big eyes).'

In the *kRoot* dataset, there are 35 verb roots which are predicted to end with *u*. Two examples of verb roots which end in this category and their predicted phonological forms under the *Labialised Consonant* and *Round Vowel* hypotheses are shown in Table 64.

Table 64: Phonological Forms of Verb Roots *pwe*- and *akwe*- Under the *Labialised Consonant* and *Round Vowel* Hypotheses.

Orthography	**Labialised Consonant**	**Round Vowel**	**Meaning**
pwe-	/pʷə-/	/pu-/	Cook
akwe-	/ɐkʷə-/	/ɐku-/	Insert

In citation form with the present simple suffix *-nke*, *u* is realised as [ʊ].

(96) *Pwe-nke*
cook-PRS.SIM
[pʊ-nkə]
'Cook.'

(97) *Akwe-nke*
insert-PRS.SIM
[akʊ-nkə]
'Insert.'

The future tense marker in Kaytetye is *-ye*. This future tense marker is most frequently realised as a long high front vowel, as shown in examples (98) & (99). I showed in §3.2.2.5 that long high front vowels in this position correspond to /ijə/, and consequently I analyse the future tense suffix as /-ijə/. When the future tense suffix occurs following a root that ends with *u*, e.g. /pu-/ 'cook'; /aku-/ 'insert, *u* moves into the onset position and is realised as [w]. Examples (98) & (99) show this pattern.

(98) *Pwe-ye*
cook-FUT
[pw-iː]
'Will cook.'

(99) *Akwe-ye*
insert-FUT
[akw-iː]
'Will insert.'

4.4 Comparative evaluation of hypotheses on Kaytetye rounding

4.4.1 Labialised Consonant Hypothesis

The predictions of the *Labialised Consonant* Hypothesis are relevant to three areas of Kaytetye phonology and phonotactics: (i) the status of round vowels; (ii) the status of clusters with a labiovelar glide; (iii) morpho-phonological patterns relating to round vowels.

Round Vowels: The *Labialised Consonant* Hypothesis posits that there is no phoneme /u/ in Kaytetye. The occurrence of round vowels is accounted for by labialised consonants and the following schwa. The pattern predicted by the *Labialised Consonant* Hypothesis is that schwa following labialised consonants will show rounding, i.e. /C^{w}ə/ → [C^{w}ə]. However, in order to account for the attested pattern that rounding does not occur in final position, the formal description requires two phonological rules. These rules are shown in (100) & (101).

(100) /C^{w}ə/ → [Cʊ] / _C

(101) /C^{w}ə/ → [Cwə] / _#.

Labiovelar Glides: Under this analysis, there are no consonant clusters containing /w/. Instead, there are a series of phonemes which have a labial secondary articulation: /C^{w}/ rather than /Cw/. The secondary articulation analysis predicts that /C^{w}/ corresponds to a phoneme, rather than a consonant cluster. Consequently, any evidence of phonotactic restrictions relating to the [w] will favour a cluster analysis rather than a secondary articulation analysis,. This is because this would constitute evidence of the /w/ acting phonologically independently from the /C/. For example, for a consonant C, the sequences /C^{w}ɐ/ and /C^{w}ə/ (the latter undergoing the processes in rules (100) & (101)) will both occur. This is because /C^{w}/ is a complex consonant, not a cluster and there is no reason for its distribution to be restricted by the following vowel in principle.

Reduplication: This analysis predicts that round vowels will not occur consistently as the initial vowel in reduplication patterns. This is because rounding results from spreading from the preceding consonant. Therefore, the expected distribution in reduplication is that of the phonetic rightward spreading of rounding from preceding round vowels. Under this analysis, rounding will be inconsistently applied in the vowels of the reduplicant.

Alternations at Morpheme Boundaries: Alternations between [ʊ] and [wə] in root-final position are the result of the elsewhere application of the /Cʷə/ → [Cʊ] / _C rule in (100). Prior to /i/, labialised consonants /Cʷ/ occur as [Cw], i.e. /Cʷi/ → [Cwi]. In the form /pʷə-ijə/ cook-FUT 'will cook', the correct phonetic realisation is derived by this vowel hiatus resolution pattern: /pʷə-ijə/ → [pwijə ~ pwiː] 'will cook'.

4.4.2 The Round Vowel Hypothesis

In this section I present the predictions of the *Round Vowel* Hypothesis for Kaytetye phonology in the three areas identified in this chapter.

Round Vowels: The *Round Vowel* hypothesis proposes that there is a phoneme /u/ which corresponds to transcriptions of a round vowel. There is a general phonological procedure in which /u/ is unpacked to [wə]: /u/ → [wə] / _#, and /ˈu/ → [ˈwɐ] / _#. A similar neutralisation rule occurs in English, in which lax vowels never occur in final position, and in unstressed contexts are realised as schwa (Hammond 1999). I propose that in this phonological process, /u/ neutralises with schwa on the right edge, by shifting the rounding into the onset position.

Labiovelar Glides: This analysis proposes that there are no labialised consonants, but there are onset consonant clusters in which /w/ occurs as the final consonant: /CwV/ → [CwV]. Relevant to this pattern is *Sonority Dispersion Principle* and the *Sonority Sequencing Principle* (Clements 1990; Parker 2012). The *Sonority Dispersion Principle* requires the consonants in complex onsets to be maximally dispersed, such that C1 in an onset cluster has low sonority and C2 has high sonority. This results in restrictions on the occurrence of sonority plateaus in onsets. The *Sonority Sequencing Principle* states that the sonority of segments in a syllable is organised in such a way that the syllable edges will have low sonority and the nucleus will peak in sonority. This requires that C1 will have lower sonority than C2 in an onset cluster. These principles together predict that in /Cw/ onset clusters, C being of lower sonority is preferred over C being of high sonority.

Reduplication: This analysis predicts that the reduplicant will occur with an initial round vowel if a round vowel is predicted to occur in that position. This is because the round vowel is phonemically specified and is not dependent on the preceding consonant. This analysis also predicts that rounding will not be copied in instances where there is an initial /w/ or /Cw/ cluster, because /w/ is part of the onset.

Alternations at Morpheme Boundaries: Alternations between [ʊ] and [wə] in root-final position are the result of the neutralisation of contrast in the vowels /ə/ & /u/ in final position. This pattern is like English, in which short vowels are reduced to schwa in unstressed final position or are lengthened in stressed final position, in a static phonological pattern (Hammond 1999). When the root-final /u/ is at the end of an utterance, it is realised as [wə]: /u/ → [wə] / _#. However, when the root-final /u/ is in utterance-medial position, it is not conditioned by this rule, and therefore it is realised as a round vowel. The alternations relating to vowel hiatus at morpheme boundaries are the result of the resolution of the hiatus of two adjacent high vowels. The hiatus is resolved by the gliding /u/ to [w]: /Cui/ → [Cwi].

4.4.3 Evaluation

In this section I summarise the predictions of each analysis against the six pieces of evidence considered in this chapter. I consider whether the *Labialised Consonant* hypothesis and the

Round Vowel hypothesis provide explanations for the patterns which are motivated by language-internal patterns, language typology, or well-established phonetic and phonological patterns. I show that for all six pieces of evidence, the *Round Vowel* hypothesis provides a motivated account, while the *Labialised Consonant* hypothesis does not account for all the data.

High Occurrence of u as a Round Vowel: The *Labialised Consonant* hypothesis proposes that the occurrence of round vowels is the result of the spreading of rounding from the preceding labialised consonant to the following vowel. The *Round Vowel* hypothesis proposes that there is a phoneme /u/ which corresponds to *u*. the data shows that quantitative distribution of transcriptions of *u* is highly skewed with 90.9% of realisations being round vowels. There are two possible explanations for this highly skewed data:

1. It is the result of spreading of rounding from the preceding consonant.

2. It is the result of phonemic specification.

Both analyses account for the distribution of rounding. However, the most parsimonious analysis of the facts of rounding is that the phonetic round vowels correspond to phonemic round vowels, rather than underdoing rounding from spreading. This is because of the basic principle stated in the introduction to this thesis, that any proposal of an input-to-output transformation (i.e. /ə/ → [ʊ]) must be motivated by the data. One example of such a motivation would be if in the *kPhon* transcription data [ʊ] vowels showed an overwhelming occurrence of a preceding [Cw]. A hand count of the raw *kPhon* data shows only 20 instances of this vowel preceded by [Cw] out of 1,751 instances of a phonetic transcription [ʊ], and similarly low counts for other round vowels. Consequently, the rounding spreading analysis proposes a departure from the surface form with no significant explanatory gain.

Final Realisation of u as [wə~wa]: Under the *Labialised Consonant* hypothesis, there are two phonological rules: (i) /C^wə/ → [Cʊ] / _C; (ii) /C^wə/ → [Cwə] / _#. Under the *Round Vowel* hypothesis, this is is the result of a neutralisation of contrast between /u/ and /ə/ in final position, and the unpacking of the rounding feature to the onset position. The *Labialised Consonant* hypothesis proposes two phonological rules which are only motivated if they are framed in terms of edge effects. This analysis under the *Labialised Consonant* analysis is that at word edges, the underlying phonological form is retained while in other positions. I contrast two alternative edge effect patterns:

1. *Labialised Consonant Edge Effect Hypothesis*: The realization /C^wə/ → [Cwə] / _# is an edge effect.
2. *Round Vowel Edge Effect Hypothesis*: The realization /Cu/ → [Cwə] / _# is an edge effect.

The Labialised Consonant Edge Effect Hypothesis proposes a right edge effect that preserves the underlying form, rather than a neutralization or transformation. The Round Vowel Edge Effect Hypothesis proposes neutralization of the contrast between /ə/ and /u/ at the word edge, by unpacking the rounding to the onset position.

Right edge effects are well-recognised in the literature, and they standardly involve the reduction of phonological content, rather than the preservation of the underlying form (Beckman 1998; Bye & De Lacy 2000; Casali 1997). The *Round Vowel Edge Effect Hypothesis* proposes neutralisation at right edge, while the *Labialised Consonant Edge Effect Hypothesis* proposes that the right edge is the only position in which the underlying form is consistently preserved. Consequently, the *Round Vowel Edge Effect Hypothesis* is motivated by language typology, while the *Labialised Consonant Edge Effect Hypothesis* does not. For this reason, the *Round Vowel Edge Effect Hypothesis* provides a better explanation of the facts than the alternative.

Co-Occurrence Restrictions of Approximants and /w/: The Kaytetye data shows that in *CwV*, *C* cannot correspond to an approximant. This is a co-occurrence restriction relating to two adjacent segments of equal sonority. The *Labialised Consonant* hypothesis does not provide an explanation for this restriction. This is because this hypothesis predicts that a segment such as /j^{w}/ is not a cluster of /j/ + /w/, but is a complex segment, i.e. /j^{w}/ is a simplex onset. For this reason, there is no motivated explanation for why */j^{w}ɐ/ sequences fail to occur, while /j^{w}ə/ sequences are permitted. On the other hand, the *Round Vowel* hypothesis analyses these sequences as */jwɐ/ and /ju/. The former configuration entails a sonority plateau in the onset, which is disfavoured according to the *Sonority Sequencing Principle* (Clements 1990).

Reduplication of Round Vowels: Under the *Labialised Consonant* hypothesis, the reduplication of round vowels is not predicted because *Cu* is /C^{w}ə/, and the onset is not reduplicated. This predicts a reduplication pattern in the form shown in (102).

(102) *Yweke-lp+**e**ke-nhe*
/j^{w}əkə-lp+RED-n̪ə/
[jʊkʊ-lp+**ə**kə-n̪ə]
chase-during+RED-PST.PFV
'Chased on the way.'

The *Round Vowel* hypothesis predicts that the reduplicant will show a round vowel. The form of the reduplicant is shown in (103).

(103) *Yweke-lp+**e**ke-nhe*
/jukə-lp+RED-n̪ə/
[jʊkʊ-lp+**ʊ**kə-n̪ə]
chase-during+RED-PST.PFV
'Chased on the way.'

The data shows that the reduplicant consistently contains a round vowel in reduplicant-initial position when it is specified to occur. The data also shows that vowels preceded by /w/, e.g. in *wi, wɐ* in the base do not surface with rounding in the reduplicant. This categorical contrast between *u* and *wi, wɐ* is consistent with the *Round Vowel* hypothesis but not with the *Labialised Consonant* hypothesis.

Alternations Between /u/ and /ə/ in Root-Final Position: In nouns with a [wə] sequence in absolutive form, this sequence becomes [ʊ] when the ergative suffix is added: *atnhelengkwe* [at̪n̪ələŋk**wə**] 'emu', *atnhelengkwele* [at̪n̪ələŋk**ʊ**lə] 'emu (erg.)'. The *Labialised Consonant* hypothesis proposes that this alternation is the application of the rules: (i) /C^{w}ə/ → [Cʊ] / _C; (ii) /C^{w}ə/ → [Cwə] / _#. Both analyses account for the pattern.

Vowel Hiatus at Morpheme Boundaries: In verb roots that end in *u* and receive a vowel suffix such as the future tense /ijə/, the rounding shifts to the onset: [pwiː] 'Will cook'. The *Labialised Consonant* hypothesis accounts for this pattern through vowel hiatus resolution by deleting the first vowel: /p^{w}ə-ijə/ → [pwiː].[11] This vowel hiatus pattern is independently attested in word boundaries, in which the final short vowel of a word is deleted if the following word begins with a vowel. Example (104) shows this pattern.

(104)	*Aleke*	*akelye*
	/ɐlək**ə**	**ɐ**kəʎə/
	[ɐlək**ɐ**kəʎə]	
	dog	small
	'Small dog.'	

The *Round Vowel* hypothesis accounts for this pattern by analysing the round vowel as shifting to the onset to resolve the vowel hiatus: /pu-ijə/ → [pwiː]. This hypothesis proposes the gliding of the vowel and onset maximisation, both typologically common processes. The *Labialised Consonant* hypothesis proposes a procedure which is attested elsewhere in Kaytetye phonology, and the *Round Vowel* hypothesis proposes a typologically-motivated pattern. For this reason, both hypotheses propose a motivated account for this vowel hiatus

[11] An alternative analysis under a two-vowel system is that there is no vowel hiatus, and the schwa assimilates to the following glide: /pwə-jə/ → [pwiː]. I showed in §3.2.2 that there is a vowel /i/ and that surface long front vowels are more plausibly analysed as /ijə/ than /əjə/ and therefore this two-vowel analysis of this sequence is implausible.

pattern.

These results show that for all pieces of data, the *Round Vowel* hypothesis provides a motivated explanation for Kaytetye phonology. On the other hand, the *Labialised Consonant* hypothesis does not account for the reduplication pattern and the co-occurrence restrictions on *CwV* sequences. It also proposes significant departures from the surface forms without any significant explanatory gain. For these reasons, the *Round Vowel* hypothesis provides significant explanatory benefits that the *Labialised Consonant* hypothesis does not provide, and therefore it better accounts for the language data.

4.5 Conclusion

In this chapter I have presented evidence against the hypothesis that Kaytetye has a series of labialised phonemes. I presented an alternative analysis in which there are two patterns: (i) a round vowel phoneme /u/; (ii) a phonotactic position in the onset for a glide /w/. This analysis is consistent with the data and provides a plausible analysis of Kaytetye phonology.

Chapter 5: Associated Path

5.1 Introduction

Associated Path (AP) constructions are constructions in which a path is associated to a predicate.

(105) *Are-nke*
see-PRS.SIM
'See.'

(106) *Are-lp+are-nke*
see-during+RED-PRS.SIM
'See along (the way).'

(107) *Ayne-nke*
eat-PRS.SIM
'Eat.'

(108) *Ayne-y+alpe-nke*
eat-after+return-PRS.SIM
'Go back and eat.'

The verb *are-nke* 'see' in (105) may occur in the construction *are-lp+are-nke* (106), which associates the main action 'see' with a path: 'along the way'. Similarly, *ayne-nke* 'eat' (107) occurs in the construction *ayne-y+alpe-nke* (108) which associates a return path to the verb: 'return and eat'.

AP constructions were first identified by Koch (1984), and have since been identified in other languages in Australia and elsewhere (Guillaume 2016; Nordlinger 2010; Rose 2015; Simpson 2001). This chapter draws on the research of Harold Koch, Myfany Turpin, and Alison Ross, who have undertaken extensive work on Kaytetye (e.g. Koch 1984, forthcoming; Turpin & Ross 2012). In this chapter I analyse the structure of Associated Path constructions in Kaytetye. Previous analyses of Associated Path constructions propose that they are words which convey information about Associated Motion. I propose that they are phrasal constructions which convey information about Associated Path.

I provide a description of the previous research on Associated Path in Kaytetye in Section 5.2. Section 5.3 provides evidence for a compositional analysis of Associated Path constructions. Section 5.4 describes a range of semantic and syntactic characteristics of these constructions, which any analysis must account for. Section 5.5 evaluates the different analyses proposed for these constructions and shows that an auxiliary verbal analysis best accounts for the range of data. Section 5.6 examines the structure of 'Tripartite' AP constructions in light of the Auxiliary Verb analysis.

5.2 Associated Path in Kaytetye

Associated Path (AP) is more commonly known as Associated Motion in the literature (Guillaume 2016; Koch 1984). This is because Associated Path constructions usually involve motion. However, Associated Path does not always express motion. Example (109) describes the path of a creek using an AP construction, and example (110) uses an AP construction with a stative verb.

(109) *Artnatyerre=lke* ***arre-lp+arre-nhe,*** *tharrkere=lke*
gully=then **become-during+RED-PST.PFV** bank=then
kelye *re* ***arre-lp+arre-nhe***
small 3SG.NOM **become-during+RED-PST.PFV**
'Then it became a gully along there, then it became a small bank along there.'
(Turpin & Ross 2012:592)

(110) *Aynanthe* *awenyerr=ame* ***atnte-r+atnte-r+enye-rrane***
1PL.NOM one=EMPH **stand-concurrent+RED-concurrent+come-PRS.IPFV**
'We are standing around one-by-one.' (Turpin & Ross 2012:572)

Such constructions have been analysed as 'Fictive Motion', a notion originally proposed by Talmy (1996: 214-16) and adopted by Wilkins (2006: 51-52). The basic concept of 'Fictive Motion' is that these usages are metaphorical, using motion expressions to describe non-motion events. The 'Fictive Motion' analysis therefore requires an additional theoretical construct – metaphor. By contrast, the Path analysis does not require additional theoretical constructs in order to account for (109) and (110). A path is a delimitation on the potential spatial distribution of a predicate. This basic spatial delimitation frequently requires accompanying delimitations on the potential temporal distribution of the predicate. The potential spatial distribution of a predicate may be delimited without requiring that motion be involved, and this is the case with (109) and (110). I argue that interpretations of motion in AP constructions arise from the semantics of the constituents and from contextual pragmatics, and not from the construction itself.

Examples (109) and (110) also illustrate the two types of AP syntactic constructions in Kaytetye. The construction in (109) has two constituents which are both grammatical and prosodic words: (i) *arre-lp*, the Lexical Verb; (ii) *arre-nhe*, the Path Auxiliary. The root of the Path Auxiliary in this example is reduplicative auxiliary, which indicates an unmarked path (§5.3). I term this type the 'bipartite' construction. The construction in (110) has three word-level constituents: (i) *atnte-r*, the Lexical Verb; (ii) *atnte-r* , the Distributive Auxiliary; (iii) *enye-nke* the Path Auxiliary. I term this type the 'tripartite' construction. Most AP constructions in Kaytetye are bipartite constructions, and this chapter focuses on bipartite constructions. I discuss the structural analysis of tripartite constructions in §5.6, and illustrate them where semantically relevant elsewhere in the chapter.

Listed in Table 65 are 21 constructions identifiable as AP constructions.[12] The basic semantics of these listed constructions are identified in Koch (1984) and Turpin and Ross (2012). The definitions given in Turpin and Ross (2012) are shown in Table 65, and where the definitions used in this chapter differ from those of Turpin & Ross, they are noted.

[12] Turpin & Ross (2012) contains several constructions using the same structure as AP constructions, but which do not convey path, e.g. *-rr+antethene-* 'start to do', as well as some AP constructions that are poorly attested in existing data, e.g. *-y+alperine-* 'bring back and do', *-rnen+arre-* 'do coming', and *-y+*RED*-rr+enye-* 'do all the way along'. These are not included in this discussion, because there is very little data on these constructions.

Table 65: Associated Path Constructions in Kaytetye.

Verb form	Dictionary translation	Translation in this chapter
-l+ayte-	Predicate then go (transitive)	-
-l+alpe-	Predicate then go back	-
-l+arre-	Predicate going along (multiple actors)	
*-l+*RED*-l+arre-*	Predicate something lots of times going along	Predicate all along the way
*-lp+*RED-	Predicate once on the way	Predicate along the way
-ny+angkeletne-	Come and Predicate quickly[13]	-
-nyey+alpe-	Return and Predicate quickly	-
-nyey+aytne-	Go, Predicate, then return (lots)	-
-nyey+ene-	Go and Predicate quickly	-
*-rr+*RED*-rr+enye*	Predicate lots of times going along / Predicate across a large area	-
-rr+ayte-	Predicate then go (intransitive)	-
-rr+alpe-	Predicate then return (intransitive)	-
-rr+ape-	Predicate while going along (intransitive)	-
-rr+aperinte-	Predicate while going along (transitive)	-
-y+alpe-	Go back and Predicate	-
*-y+*RED*-y+ene-*	Predicate lots of things lots of times going along	-
-y+ayte-	Predicate after someone else arrives	-
-y+aytey+alpe-	Go back and then Predicate	-
-y+ene-	Go and Predicate	-
-y+enye-	Come and Predicate	-
-ye=rn+alpe-	Predicate while coming	-

Bipartite AP constructions have four obligatory constituents: The Lexical Verb Root (referred to as the LVR), the Participle Suffix, the Path Auxiliary Verb (or simply the Path Auxiliary), and the Tense-Aspect-Mood (TAM) suffix. The LVR is a main verb, which determines the argument structure of the clause. The Participle Suffix is attached to the LVR and expresses aspect or relative tense in relation to the path. The Path Auxiliary expresses a path configuration. The TAM suffixation used is the same suffixation as simple verb forms.

[13] Under the analysis in this chapter, it is the action or state that is quick, and not the path.

(111) *Are-y+alpe-nke*
see-after+return-PRS.SIM
LVR-Participle Suffix+Path Auxiliary-TAM suffix
'Return and see'

5.2.1 Associated Path and Purposive Constructions

AP constructions contrast with motion-purposive constructions. Japhug (Sino-Tibetan, Rgyalrongic) makes a similar contrast between AP and motion-purposive constructions (Jacques 2013). AP and motion-purposive constructions in Japhug contrast in their degree of event integration. For example, in a motion-purposive construction the action marked with the purposive can fail to occur while the motion occurs. In an AP construction, both events must occur or fail together (Jacques 2013: 203). Kaytetye has a similar contrast (112)-(113).

(112) *Akarletye* *aynanthe* ***ayne-y+ene-nke***
wild_orange 1PL.NOM **eat-after+go_to-PRS.SIM**
'We go and eat wild oranges' (AIATSIS22F_A 520.01)

(113) *Elkeparre-penhe=pe* *re* ***ape-ye**=lke,* *rlwene-we=lke*
hibernation-SEQ=TOP 3SG.NOM **go-FUT**=then food-DAT=the
re ***ayne-wethe**=lke*
3SG.NOM **eat-PURP**=then
'After hibernation he will go, for food, so that he can eat.' (Koch 85.11)

There is also a contrast in the clausal structure in AP and motion-purposive constructions. An AP construction heads a single clause, but in a motion-purposive construction there are two clauses. In example (113), both the motion and the purposive verbs project their own arguments.

5.2.2 Analyses of the structure of Associated Path constructions

In this chapter, I consider five morphosyntacic models which aim to account for the structure of AP constructions. An important theoretical distinction in these analyses is between light verbs and auxiliary verbs. A light verb is a verb which conveys argument structure, and does not take referential arguments (Butt 2010). On the other hand, an auxiliary verb does not convey argument structure (Anderson 2006). Both light verbs and auxiliary verbs do not form a complete predicate on their own, and require a complement. In §5.5 I evaluate these five models against the data in §5.4, and show that the Auxiliary Verb Analysis makes the best predictions of the data.

1. *Portmanteau Morpheme Analysis:* The Participle Suffix and Path Auxiliary are treated as a single morpheme. This morpheme is a portmanteau because it denotes more than one semantic notion (i.e. both path and relative tense/aspect). Dot notation is used to indicate the relationship between the Participle Suffix and Path Auxiliary: *are-y.alpe-nke* see-return_and_do-PRS.SIM ‘return and see’. This analysis was proposed for Central Arrernte AP constructions (Wilkins 1989).

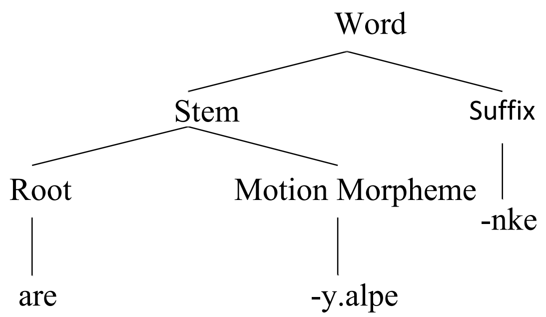

Figure 6: Constituent structure of the Portmanteau Morpheme Analysis of AP forms

2. *Compound Analysis*: The LVR and Path Auxiliary combine with the Participle Suffix and TAM suffix respectively to form word stems.[14] These stems then

[14] The term ‘stem’ is used here to refer to a root which has received a suffix, including the finite verb suffixation on the second stem. This use of ‘stem’ follows the use of this term by Henderson (2013:274) to describe a type of complex verb construction in Eastern and Central Arrernte: “A unit consisting of a suffix followed by a verb root which forms a stem compound with the stem in which the suffix part occurs: [[…+suffix]Stem [root+…]Stem]W. For example, the

compound into a single grammatical word. Henderson (2013: 274) proposes this analysis for AP constructions in Eastern and Central Arrernte. Wilkins (1991: 240) proposes a similar structure as the historical origin of current AP constructions. A compounding analysis was also used by Yallop to describe AP constructions in Alyawarr (1977: 62-66).

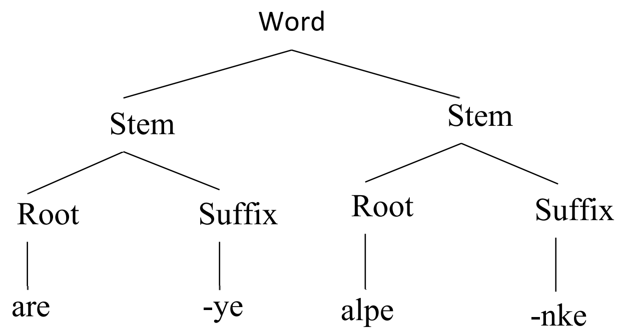

Figure 7: Constituent Structure of the Compound Analysis of AP forms

3. *Lexical Verb Analysis*: The Path Auxiliary is a lexical verb, acting in its full denotation as a lexical verb. The Participle Suffix derives a participle phrase as a complement of the VP. In this analysis, the Participle Suffix marks relative tense on the participle in relation to the time of the action of the Path Auxiliary.

Associated Motion form DO&RETURN involves a suffix +erl compounded with the verb root alp ‘return’. Note that the co-markers are joined with ‘=’ and given a single gloss.”

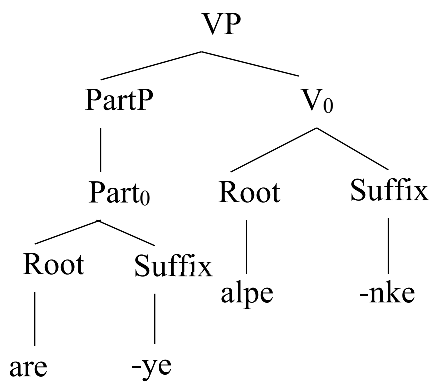

Figure 8: Constituent Structure of the Lexical Verb Analysis

4. *Light Verb Analysis*: The Path Auxiliary is a light verb, an inflecting verb which forms a monoclausal complex predicte with its complement. The light verb contributes to the argument structure of the overall construction. In this analysis, the Participle Suffix marks various aspectual and relative tense configurations on the LVR in relation to the light verb. This analysis is not considered in the existing literature.

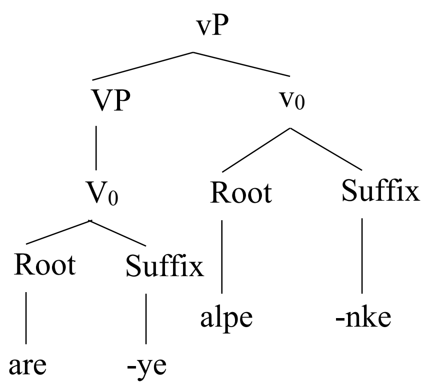

Figure 9: Constituent Structure of the Light Verb Analysis

5. *Auxiliary Verb Analysis*: The Path Auxiliary is an auxiliary verb, expressing a path configuration. The Participle Suffix inflects the LVR as the non-finite head of a VP. In this analysis, the Path Auxiliary, as an auxiliary verb, does not contribute to the

argument structure of the construction. This structure is proposed for an earlier stage of the language by Koch (2019), and the term ‘Auxiliary verb’ is used in Yallop’s compounding analysis of these constructions in Alyawarr (1977: 62).

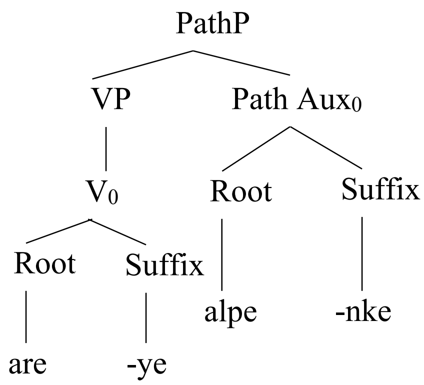

Figure 10: Constituent Structure of the Auxiliary Verb Analysis

5.3 Compositionality

In this section, I show that AP constructions have a high degree of morphological compositionality. Current analyses do not propose that AP constructions are morphologically compositional. Koch (1984) and Turpin and Ross (2012) analyse the overall meanings of each type of AP construction as idiosyncratic, and not emerging from any particular morphological components (also Koch 2012; Koch n.d.). Wilkins (1989: 272-74) proposes a portmanteau analysis for AP constructions in Mparntwe Arrernte but notes a regular correspondence between certain phonological strings within the forms, and the overall meaning. In Kaytetye, there is a regular correspondence between the occurrence of discrete morphological units and the overall meaning of AP constructions.

Bipartite AP constructions have two central grammatical constituents: (i) the Participle Suffix; (ii) the Path Auxiliary. The meanings I propose for the attested Participle Suffixes are given in Table 66 along with their glosses.

Table 66: Participle Suffixes in Kaytetye Associated Path Constructions.

Participle Suffix	**Meaning**	**Gloss**
-le	The LVR occurs before the path. Only attaches to transitive verbs.	before.tr
-rre$_1$	The LVR occurs before the path. Only attaches to intransitive verbs	before.intr
-rre$_2$	The LVR is concurrent with the path	concurrent
-ye	The LVR follows the path	after
-lpe	The LVR takes place within the path (i.e. after the path begins and before it ends)	during
-ny(ey)e	The LVR occurs rapidly and occurs concurrently with the path	quick

Path Auxiliaries derive historically from independent verbs (Koch 1984; forthcoming: 16). Several Path Auxiliaries occur synchronically as independent verbs, but others have no corresponding independent form. Synchronically, I analyse the appearance of the same phonological form as both a Path Auxiliary and a lexical verb as two distinct lexemes (see §5.4.3, §5.4.5). Table 67 sets out the inventory of Path Auxiliaries, together with any potential corresponding main verb forms.

Table 67: Path Auxiliary Verbs in Kaytetye Associated Path Constructions.

Path Auxiliary	Definition	Gloss	Independent Form	Definition	Notes
alpe-	Return Path	return	*alpe-*	Return, go back	
arre-	Path along to a location	along	*arre$_1$-* *arre$_2$-*	Become Put	It is unclear which verb *arre-* derives from.
ape(rine)-	Simple Path / Path along	go	*ape-* *aperine-*	Go Take	
ayte-	Path away from a location	go_out	*ayte-*	Head off, Rise up	
enye-	Path toward speaker	come_hither	-		Phonological identity to *enye-* 'give', but no evident semantic connection.[15]
aytne-	Path back and forth	to_and_fro	-		Phonological identity to *aytne-* 'stab', but no evident semantic connection.
angkeletne-	Path coming	come	-		Partial phonological identity to *eletnhe-* 'throw', but no evident semantic connection.
ene-	Path arrive at a location	go_to	-		Not attested as an independent form
RED-	Unmarked Path	RED	-		Reduplicant.

Path Auxiliaries express three semantic categories: Path: the spatiotemporal distribution of the predicate across the ground; Motion: the fact of movement or non-movement on the path;

[15] Kaytetye historically underwent initial dropping, in which words lost their initial consonants (Koch 2004:135-136). This means that word forms that once contrasted in their initial consonants are now homophonous. As such, it is likely that homophonous forms such as *enye* 'Path toward speaker' and *enye* 'give' have distinct historical origins which were once differentiated by their now-lost initial consonant.

Direction: the deictic characteristics of the path or motion. Table 68 lists the Path Auxiliaries and their specification for each of these categories. For example, *alpe-* expresses a fixed return path, always requires a motion interpretation, and has a directional component (that is, path toward return location).

Table 68: Semantic Specifications for Path Auxiliaries.

Path Auxiliary	**Path**	**Motion**	**Direction**
alpe	return/back	Yes	toward return location
arre	along to	-	-
ape(rine)	simple	Yes	-
ayte	out of location	Yes	away
angkeletne	toward a location	Yes	hither (place)
enye	toward a location	Yes	hither (speaker)
aytne	back-and-forth	Yes	thither and hither
ene	reach a location	Yes	thither
RED	unmarked	-	-

Bipartite constructions which have a straight-forward compositional analysis based on these definitions are listed in Table 69 with the verb roots *are-* ‘see’ and *angke-* ‘talk’.

Table 69: Fully Compositional Associated Path Forms in Kaytetye (Meanings from Table 65)

Verb Form	**Gloss**	**Meaning**	**Literal meaning**
are-l+alpe-	see-before.tr+return-	See before returning	See before path returning
are-l+ayte-	see-before.tr+go_out-	See before going	See before path out
are-lp+are-	see-during+RED-	See on the way	See during unspecified path
are-ny+angkeletne-	see-quick+come-	Come and see quickly	See quickly after path hither
are-nyey+alpe-	see-quick+return-	Return and see quickly	See quickly after path returning
are-nyey+aytne-	see-quick+to_and_fro-	Go back and forth seeing	See quickly to and fro
are-nyey+ene-	see-quick+go_to-	Go and see quickly	See quickly after path to location
angke-rr+alpe-	talk-before.itr =return-	Talk before returning	Talk before path returning
angke-rr+ape-	talk-concurrent+go-	Talk while going along	Talk concurrent with path along
angke-rr+ayte-	talk-before.itr+go_out-	Talk before going	Talk before path out
are-rr+alpe-	see-concurrent+return-	See while returning	See while path return
are-y+alpe-	see-after+return-	Go back and see	See after path return
are-y+ene-	see-after+go_to-	Go and see	See after path to location
are-y+enye-	see-after+come_hither	See after coming	See after coming
are-rr+aperinte-	see-concurrent+go (trans.)-	See while going along	See concurrent with path along

These fully compositional constructions contrast with 3 that are partially compositional, in that there is at least one morpheme (e.g. participle suffix or path auxiliary) which does not match with the interpretation of the construction. These are listed in Table 70.

Table 70: Partially Compositional AP forms in Kaytetye (Meanings from Table 65).

Verb Form	**Gloss**	**Meaning**	**Literal Meaning**	**Noncompositional Component**
*are-**ye**=rn+alpe-*	see-**after**=hither+return-	Come seeing	See **after** path return hither	Participle Suffix
*are-y+**ayte**-*	see-after+**go_out-**	See after someone arrives	See after **going out**	Path Auxiliary
are-l+arre-	see-before.tr+along	See while going along (multiple actors)	See before going along	Participle Suffix & Path Auxiliary

15 (83%) bipartite AP constructions are analysable as fully morphologically compositional constructions. Of the 3 that are partially-compositional, one has a Participle Suffix that does not correspond to the meaning of the construction, and one has a Path Auxiliary which does not correspond to the path configuration. The path component of *are-ye=rn+alpe-* 'come seeing' is correctly predicted by a combination of the clitic *=rne* 'hither' and the Path Auxiliary *alpe-*. The Participle Suffix *-ye* does not correspond to the semantics of the overall construction. There is only one example where both components do not correspond to the overall meaning: the form *are-l+arre-*. This AP construction is relatively rare and poorly attested (Turpin & Ross 2012: 448).

5.4 Aspects of the Morpho-syntax of AP Constructions

This section examines six criteria which will be used to evaluate the five morphosyntactic models presented in §5.5.

1. stress placement
2. clitic placement
3. form repetition
4. argument structure
5. transitivity harmony
6. argument placement

For each criterion, I provide a brief overview of the area of grammar it relates to. Following this, I describe its interaction with AP constructions.

5.4.1 Stress Placement

Stress placement is associated with morphological boundaries in nearly all Australian languages (Baker 2014: 134). Generally, stresses are placed at the left boundaries of certain phonologically and morphologically defined domains, principally lexical roots and polysyllabic morphemes. Kaytetye is a suffixing language and nearly all lexical roots are polysyllabic.[16] Consequently, the vast majority of monosyllabic morphemes in Kaytetye are suffixes.

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[16] There are some verb roots that are monosyllabic, e.g. *pwe-* ‘cook’, but these never occur independently, and always require suffixation (Turpin & Ross 2012). There are some unproductive prefixes occur which express possession in kin terms, e.g. *kwe-* ‘his’.These prefixes cohere metrically with the root they attach to. Thus kwe-mpwerne ‘3.Poss-brother_in_law’ is realised as [ˈkʊm.pʊ.ɳə], and not as [kʊm.ˈpʊ.ɳə].

There are two generally agreed observations about stress placement in Kaytetye. The first observation is that the first syllable with an onset in a lexical root receives stress (Turpin & Ross 2012: 26). [17]

(114) *Artetye*
[a.ˈ**ʈə.**cə]
'Mulga.'

(115) *Taltye*
[ˈ**tal**.cə]
'Raindrop.'

The second observation agreed on by fieldworkers and researchers is that in Kaytetye complex word forms involving two polysyllabic morphemes, both polysyllabic morphemes function as independent stress domains, as illustrated in (116). A similar phenomenon has been observed in Eastern and Central Arrernte (Henderson 2002: 112).

(116)	*Erntwemarre-wanenye*	*Erntwemarr-akake*
	[ɪɳ.ˈʈu.ma.rə.-ˈwa.ni.ɲə]	[ɪɳ.ˈʈu.ma.r-a.ˈka.kə]
	spinifex-PRIV	spinifex-PROP
	'Without spinifex.'	'Having spinifex.'

The pattern illustrated in (116) applies to all complex word forms in Kaytetye with polysyllabic morphemes. The first consonant-initial syllable in the second constituent of the overall complex word receives a stress. This pattern of stress placement cannot be explained if these complex words are treated as an unanalysable stress domain. Neither alignment to the left edge nor alignment to the right edge of the overall complex word, nor any combination of left and right alignment can model the difference between the two forms in (116). The difference between the two forms in (116) can be accounted for if both constituents are modelled as independent prosodic words, which are therefore independent stress domains.

[17] There is one exception to this rule, which is that roots with an initial /ɐː/ have stress on the first syllable. See §3.5.1

(117) *Erntwemarre-wanenye* *Erntwemarr-akake*
ω(ɪɳ.ˈʈu.ma.rə.)ω- ω(ˈwa.ni.ɲə)ω ω(ɪɳ.ˈʈu.ma.r)ω- ω(a.ˈka.kə)ω
spinifex-PRIV spinifex-PROP
'Without spinifex.' 'Having spinifex.'

As illustrated in (117), a single stress assignment rule can be applied in both simplex and complex word forms: Assign a stress to the first consonant-initial syllable in a prosodic word (Goedemans 1996; Topintzi & Nevins 2017; Turpin & Ross 2012: 26).

In AP constructions, the first syllable with an onset in both the LVR and the Path Auxiliary receive a stress.

(118) *Kwathe-lp+athe-nhe*
[ˈkwa.t̪ə-l.p+aˈt̪ə-n̪ə]
drink-during+RED-PST.PFV
'[He] saw on the way.'

(119) *Alarre-l+ayte-nke*
[aˈla.rə-l+aj.ˈtə-n.kə]
hit-before.tr+go_out-PRS.SIM
'Hits before going away.'

The default prosodic analysis is that AP constructions consist of two prosodic words, both part of a prosodic phrase.

(120) *Alarre-l+ayte-nke*
φ(ω(ɐ.ft(ˈ**lɐ.**rə)ft.l)ωω(ɐi.ft(ˈ**tən**.kə)ft)ω)φ

The prosodic boundary between these two words lies between the Participle Suffix and the Path Auxiliary.

5.4.2 Clitic Placement

Kaytetye has a range of clitics, which express a range of discourse functions. A set of common clitics are listed in Table 71.

Table 71: Selection of Discourse Clitics in Kaytetye.

Clitic	Meaning	Gloss
lke	Then; now; next; expresses change of state	then
pe	Topic; indicates the topic of the sentence	TOP
rtame	Focus; indicates the focus of the sentence	FOC
ame	Emphatic; emphasises the word it attaches to	EMPH
apeke	Maybe; indicates uncertainty	maybe
aperte	Only; indicates exclusivity of what it attaches to	only
apertame	Again; indicates repetition or additional action or thing	again
awe	Exclamatory; indicates that the speaker is giving a command	EXCL
aye	Vocative; follows nominals to show who is being addressed	VOC

Clitics in Kaytetye differ from suffixes in the following ways:

- Clitics express discourse functions, while suffixes express grammatical functions.
- Clitics are not restricted to following a single word class. Suffixes, on the other hand, are restricted to word classes. For example, verb endings cannot attach to nouns.
- Clitics attach to word-level units, while suffixes attach to roots or stems. In other words, clitics always follow suffixes, and never precede them (121). Forms such as (122) are unattested in Kaytetye. Note that even if the suffix is an entire prosodic word, e.g. *-akake* proprietive suffix, clitics are not observed preceding the suffix.
- Clitics may attach to words that do not inflect with suffixes, such as particle coverbs (123).

(121) ***Atherr-akake=lke*** *ane-yayne* *atyeyenge* *tyatye*
two-PROP=then sit-PST.IPFV my grandfather
'Then my grandfather had two of them.' (Turpin & Ross 2012:394)

(122) ****Atherr=lk=akake***
two-then=PROP
'Then having two.'

(123) *Bottom Bore-warle=lke* *aynanthe* *ape-nhe* ***inteme=lke***
Bottom Bore-ALL=then 1PL.NOM go-PST.PFV **for_a_while=then**
'Then I went to Bottom Bore for a while.'(DK19870411 462.022)

Clitics attach to syntactic constituents, i.e. grammatical words. The placement of clitics is not conditioned by prosodic factors, such as word size. For example, in quadrisyllabic words such as *peyakele* 'not', the clitic always follows the word root (124).

(124) ***Peyakele=lke*** *kwere.*
not=then 3SG.ACC
'Then it wasn't there.' (Turpin & Ross 2012:81)

Placement of the clitic within the word is ungrammatical.

(125) *$_{\text{ft}}$(pe=lke)$_{\text{ft}}$=$_{\text{ft}}$(ya.ke)$_{\text{ft}}$.le

(126) *$_{\text{ft}}$(pe.ya)$_{\text{ft}}$=lke=$_{\text{ft}}$(ke.le)$_{\text{ft}}$

Further, as illustrated in (121) and (122), clitics cannot be placed between prosodic words if the second prosodic word is a suffix and not therefore an independent grammatical word.

Koch (1984: 28) observes that clitics occur between the Participle Suffix and the Path Auxiliary of certain AP constructions.

(127) *Errke-ye=**lk**+alpe-nke* *re* *arte-nke-penhe=pe*
carve-after=**then**+return-PRS.SIM 3SG.NOM chop-PRS.SIM-SEQ=TOP
'He goes back and then carves it, after chopping it.'
(Koch 1984: 28, simplified)

Koch identifies only forms with the *-ye* 'subsequent action' Participle Suffix as occurring with clitics. However, further research has shown that clitics may be placed between a range of Participle Suffixes and Path Auxiliaries, including reduplicants. Examples (128)-(132) have AP constructions in which a clitic occurs between the Participle Suffix and the Path Auxiliary.

(128) … *tywengepe-nke* *arntarrtye-ye=**lk**+ayte-nhe* *atyenge*
trick-PRS.SIM hold-after=**then**+go_out-PST.PFV 1SG.ACC
'… they trick me, they grabbed me when I arrived.'
(20091117_TT-02 228.29)

(129) *Arwele* *alperre* *atye* *alarre-lp=**am**+arre-yayne*
branch leaf 1SG.ERG hit=during=**EMPH**+RED-PST.IPFV
'I hit the bushes really hard going along.' (Turpin & Ross 2012:100)

(130) *Artnpe-rr=**am**+ayte-nke*
run-concurrent=**EMPH**+go_out-PRS.SIM
'He keeps on running away.' (Turpin & Ross 2012:574)

(131) *Aytnathe-le=**lk**+ayte-nke*
run_out-before.tr=**then**+go_out-PRS.SIM
'Then run out of something and leave.' (Turpin & Ross 2012:303)

(132) ... *rlengke=lke* *ngelyawelawe-le* *rle-ye=**lk**+etnye-nherre,*
now=then light_rain-ERG fall_on-fut=**then**+come-PST.PFV
arntwe-nge
water-ERG
'… then now the light rain came falling, the water.'
(Turpin & Ross 2012:496)

As clitics attach to the right boundary of a syntactic word, the most parsimonious explanation for the clitic placement is that there is a syntactic word boundary between the Participle Suffix and the Path Auxiliary. Given that a syntactic boundary follows the participle suffix, this identifies the LVR and the participle suffix as a syntactic word. The occurrence of a syntactic boundary preceding the Path Auxiliary indicates that it is also a syntactic word.

5.4.3 Form Repetition

There are five Path Auxiliaries which correspond to an identifiable independent verb. These forms are shown in Table 72.

Table 72: The Meanings of Independent Verbs whose Forms also Occur as Path Auxiliaries.

Path Auxiliary	**Meaning**	**Lexical Verb**	**Meaning**
alpe-	Path back/returning	*alpe-*	Return/go back
ape-	Simple path (intransitive)	*ape-*	Go
aperinte-[18]	Simple path (transitive)	*aperine-*	Take
arre-	Path along to	*arre-*$_1$	Become, arrive
		arre-$_2$	Put
ayte-	Path away/out	*ayte*$_1$*-*	Grow, rise
		ayte$_2$*-*	Go, set off

There are several attested instances where the independent verb form occurs in an AP

[18] When the verb *aperine-* 'take' occurs with the present imperfective marker, it becomes *aperinte*: *aperinte-rrantye* '[he] is taking [it]' (Turpin & Ross 2012:143). Because the *-rr+aperinte-*

construction with the corresponding Path Auxiliary. In (133) & (134), the verb form *alpe-* 'return' and 'path back' is both the Lexical Verb and the Path Auxiliary. In (135), the same form *arre* 'put' and 'path along' is the Lexical Verb and Path Auxiliary. These forms differ from reduplications, because the semantics of the Path Auxiliary in these constructions do not correspond to the semantics of the reduplicative auxiliary.

(133) *Arlwenthe atherr=aperte* ***alpe****-ye=rn+****alpe****-rrane*
couple two=just **return**=after=HITH+**return**-PRS.IPFV
'Just those two are coming back.' (Turpin & Ross 2012:85)

(134) ... *atnakerre aynakerre aherrke-warle* ***alpe****-y+****alpe****-wene ...*
before 1PL.NOM sun-ALL **return**-after+**return**-OBLG
'…some time ago we had to go back toward the sun…'
(SP_TT070618_08 654.414)

(135) *Ware=rtame* ***arre****-l+arre-l+****arre****-yayne*
firewood=FOC **put**-before.tr+RED-before.tr+along-PST.IPFV
arrpe-yayne re=pe
light-PST.IPFV 3SG.NOM=TOP
'He would go all along putting down firewood and lighting it.'
(Turpin & Ross 2012:411)[19]

If the Path Auxiliary and a corresponding independent verb are distinct lexical entries, then these forms are predicted to occur. If they are the same lexical entry, then these forms are unexpected, because they would be unnecessarily repetitive. Note for example the grammaticality of English phrases such as "I do do that", "I have had that", "I am going to go" etc. In these cases, the same verb form occurs twice, but only one occurrence has the full lexical meaning of the verb.

construction almost always occurs with the present imperfective marker, the Path Auxiliary is cited in this form. However, in cases where the construction occurs with the past imperfective, it does not change: *kwathe-rr+aperine-yayne* 'drank while going along'.

[19] It is unclear whether the path verb *arre-* derives from the verb *arre-* 'become' or *arre-* 'put'. This form is included here because it includes the same phonological form in both positions. The fact that the construction is always transitive may indicate that the path verb derives historically from 'put', but there is no other evidence to suggest that this is the case.

5.4.4 Argument Structure

Kaytetye verbs may be intransitive, transitive, or ditransitive. Intransitive verbs take an absolutive argument, transitive verbs take ergative and absolutive arguments (some transitive verbs take a dative argument rather than absolutive), and ditransitive verbs take an ergative and absolutive argument, and an oblique argument (such as dative). Examples (136)-(138) show these contrasts, with the noun *artnwenge* 'child' in the three argument positions. Absolutive case is indicated by zero suffixation.

(136) ... *wele* *kngwere* ***artnweng***=*apeke* *artnpe-nhe*
well another **child**=maybe run-PST.PFV
'… well another one, perhaps a child, ran past.'
(Turpin & Ross 2012:602)

(137) *Elpertayle-rrantye* *angke* ***artnwenge-le***
interrupt-PRS.IPFV talk **child-ERG**
'The children are interrupting the conversation.'
(Turpin & Ross 2012:318)

(138) *Atye* *anthwengine-nke* *artnwe* ***artnwenge-we***
1SG.ERG give-PRS.SIM water **child-DAT**
'I give water to the child.' (Turpin & Ross 2012:132)

The transitivity of the LVR in AP constructions determines the argument structure of the overall construction. This is shown in (139)-(140).

(139) *Ane-y+alpe-yayne* *aynanthe*
sit-after+return-PST.IPFV 1PL.NOM
'We would stay after getting back.' (Turpin & Ross 2012:85)

(140) *Atye* *are-y+alpe-nhe* *erlkwe* *ngarrpe*
1SG.ERG see-after+return-PST.PFV old_man alone
'I returned and saw the old man by himself' (KH4562 13:42.385)

In these examples, the same Path Auxiliary *alpe-* is used. This occurs in both the intransitive construction (139) and the transitive construction (140). The intransitive verb *ane-* in (139) takes the single nominative argument *aynanthe* 'we', and there is no other verbal argument. In (140), the transitive verb *are-* takes two arguments: *atye* 'I (ergative)' and *erlkwe ngarrpe* 'the old man by himself', despite the fact that *alpe-* is independently an intransitive motion verb. This is because it is the LVR which determines the argument structure, and not the Path Auxiliary.

5.4.5 Transitivity Constraints

Transitivity constraints are the constraints within the AP construction which follow from the transitivity of the LVR. There are three different types of transitivity effects relevant here:

1. Transitivity Restrictions
2. Transitivity Harmony
3. TAM Suffix Allomorphy

Transitivity Restrictions: Some AP constructions are restricted to occurring only with transitive LVRs, and others with only intransitive LVRs. Other constructions do not select a transitivity value. These are shown in Table 73.

Table 73: Transitivity Value of Associated Path Constructions.

Verb Form	Definition	Transitivity Restriction
-l+alpe-	Predicate then go back	Transitive
-l+ayte-	Predicate then go	Transitive
*-l+*RED*-l+arre-*	Predicate all along the way	Transitive
-rr+aperinte-	Predicate while going along	Transitive
-rr+alpe-	Predicate then return	Intransitive
-rr+ape-	Predicate while going along	Intransitive
-rr+ayte-	Predicate then go	Intransitive
*-rr+*RED*-rr+enye*	Predicate lots of times going along / across a large area	Intransitive
*-lp+*RED*-*	Predicate along the way	No transitivity restriction
-ny+angkeletne-	Come and predicate quickly	No transitivity restriction
-nyey+alpe-	Return and predicate quickly	No transitivity restriction
-nyey+aytne-	go, predicate, then return (lots)	No transitivity restriction
-nyey+ene-	Go and predicate quickly	No transitivity restriction
-y+alpe-	Go back and predicate	No transitivity restriction
-y+ayte-	Predicate after someone else arrives	No transitivity restriction
-y+aytey+alpe-	Go back and then predicate	No transitivity restriction
-y+ene-	Go and predicate	No transitivity restriction
-y+enye-	Come and predicate	No transitivity restriction
*-y+*RED*-y+ene-*	Predicate lots of things lots of times going along	No transitivity restriction
-ye=rn+alpe-	Predicate while coming	No transitivity restriction

There is a general correspondence between the choice of Participle Suffix and the transitivity restriction of the overall construction: the *-le* Participle Suffix restricts the predicate to transitive verbs, and the *-rre* suffix generally restricts the predicate to intransitive verbs. The *-rr+aperinte-* form is an exception to this pattern.

Transitivity Harmony: Transitivity harmony refers to agreement between the LVR and the Path Auxiliary in terms of transitivity values. Two constructions, *-rr+ape-* and *-rr+aperinte-*, both meaning 'do while going along', differ only in their transitivity value. *-rr+ape-* only occurs with intransitive verbs; *-rr+aperinte-* with transitive verbs. The verb *aperinte-* 'take', derives from the verb *ape-* plus the causative verb *ine-* (Koch 1984: 25). This means that its literal meaning is not 'take', but 'make go'. This indicates that the *-rr+aperinte-* construction was originally a productive transitive counterpart to the construction *-rr+ape-*.

The 'do while going along' construction is the only construction which has transitivity harmony in the Path Auxiliary. In all other cases, it is the Participle Suffix, not the Path Auxiliary, which corresponds to the transitivity value of the construction. There are no transitive counterparts of *-rr+alpe-* and *-rr+ayte-*, such as **-rr+alperinte-* or **-rr+ayterinte-*, which differ only in the Path Auxiliary. Instead, their counterparts make use of the *-le* Participle Suffix.

TAM suffix allomorphy: Kaytetye present imperfective markers vary depending on the transitivity of the verb root: *-rrane/yane* for intransitive, and *-rrantye* for transitive (141)-(142).

(141) *Ape-**rrane***
go-**PRS.IPFV**
'Going.'

(142) *Aynte-**rrantye***
eat-**PRS.IPFV**
'Eating.'

The same AP construction will vary in the suffix type depending on the transitivity of the LVR. In (143), the intransitive root *atnywe-* 'enter' occurs in an AP construction with the intransitive imperfective suffix *-rrane*, while in (144) the transitive root *pwe-* 'cook' occurs in an AP construction with the transitive suffix *-rrantye*.

(143) *Kngwere* ***atnywe**-y+alpe-**rrane***
other **enter**-after+return-**PRS.IPFV**
'The other one goes back and enters.' (Turpin & Ross 2012:501)

(144) ... *kwer=arle* ***pwe**-y+alpe-**rrantye***
3SG.ACC=DEF **cook**-after+return-**PRS.IPFV**
'… [he] is going back and cooking it.' (Turpin & Ross 2012:549)

The suffixation in these examples corresponds to the transitivity of the LVR which the Path Auxiliary takes as its complement.

The fact that Path Auxiliaries, such as *alpe*, permit variation in TAM suffixation that the corresponding homophonous independent verb does not permit is evidence that the Path Auxiliary is not specified for a transitivity value while the corresponding independent verb is.

5.4.6 Configurationality and Constituent Placement

Kaytetye is a non-configurational language. That is, it has a generally free word order, in which syntactic constituents may be placed in multiple positions in the sentence. However, the AP construction is an exception to the generally non-configurational patterning of Kaytetye. The word-level constituents in AP constructions must appear in the order in (145).

(145) Lexical Verb + (Distributive Auxiliary +) Path Auxiliary

The only possible intervening constituents are certain discourse clitics (§5.4.2). As discussed below, nominal arguments and modifying adverbs may not appear medially in AP constructions. As such, the distribution of configurationality in Kaytetye is that a lower level syntactic structure, in this case the AP construction, is configurational whereas higher level syntactic structures, such as the VP, are non-configurational. This distribution of configurationality vs. non-configurationality, where lower-level syntactic structures are configurational and higher-level syntactic structures are non-configurational, is characteristic of many Australian languages (Nordlinger 2014: 230).

In Kaytetye, arguments of a verb may follow or precede it, including when the verb is in an AP construction. Examples (146) and (147) show that the subject and object of a verb may occur either before or after it.

(146)	*Tyaperatye*	***weye***	*ayne-lp+ayne-ne*	***aynanthe***
	straight.away	**meat**	eat-during+RED-IMP	**1PL.NOM**

‘We've got to eat some meat straight away.’ (Turpin & Ross 2012:607)

(147) ... ***Joe-le=pe*** *alarre-lp+arre-nherre* ***arnewetye****=tyamp=aperte*
PN-ERG=TOP hit-during+RED-PST.PFV **conkerberry**=too=only
'… Joe went hitting conkerberry trees, and so on.'
(Turpin & Ross 2012:606)

NPs which are arguments of AP constructions are not attested occurring between the Participle Suffix and the Path Auxiliary.

(148) **Ayne-lpe+wey+ayne-ne*
eat-during+meat+RED-IMP
'Eat the meat going along!'

(149) **Alarre-lp+arnewety+arre-nhe*
hit-during+conkerberry+RED-PST.PFV
'Hit the conkerberry tree going along'

Adverbs may precede or follow verbs, including AP constructions as examples (150) and (151) show.

(150) *Ertwe-y+alpe-nhe* *tent-warle* ***pwerrethepwerrethe***
descend-after+return-PST.PFV tent-ALL **be_crammed**
ane-y+alpe-nhe
sit-after+return-PST.PFV
'We went back to the tent and sat down crammed in together.'
(Turpin & Ross 2012:552)

(151) ... *aletye=lke* *re* *artnpe-rr+ayte-yayne*
wounded=then 3SG.NOM run-concurrent+go_out-PST.IPFV
aletyaletye
be_wounded
'… then the wounded animal, it would run off wounded.'
(Turpin & Ross 2012:76)

Adverbs are not attested between the Participle Suffix and the Path Auxiliary.

(152) **ane-y+elper+alpe-nhe*
sit-after+do_quickly+return-PST.PFV
'Returned quickly and sat down.'

(153) **artnpe-rr=aletyalety=ayte-yayne*
run-concurrent=be_wounded=go_out-PST.IPFV
'Would run off wounded.'

Adverbs in Kaytetye most typically occur immediately to the left of the verb they modify, especially when the adverb expresses a result of the action denoted by a verb.

(154) *Artweye* ***aytnane*** *ape-nhe* *weye-we*
man **fail** go-PST.PFV meat-DAT
'The man went for meat and failed.' (Turpin & Ross 2012:301)

(155) *Rlwene* *ateyeyenge atye* ***tyerte*** *akwe-wethe …*
food my 1SG.ERG **be_unseen** insert-PURP
'In order to hide (i.e. place so that it is unseen) my food…'
(Turpin & Ross 2012:617)

Adverbs generally precede constituents over which they have scope. Given this, the default interpretation of adverb placement medially in an AP construction would be that it only had scope over the Path Auxiliary and not over the LVR. This would result in a construction which does not have easily-interpretable semantics.

5.5 Analyses of the AP Construction

Having reviewed the phonological and morpho-syntactic properties of AP constructions, I now evaluate the five models summarised in §5.2.2 against the data discussed in §5.4. A summary of the predictions of each model is shown in Table 74.

Table 74: Predictions of Each Model of the AP Construction in Kaytetye.

Model	Stress	Clitic placement	Form Repetition	Argument Structure	Transitivity Constraints	Constituent Placement
Portmanteau	Not Predicted	Not Predicted	Predicted	Predicted	Predicted	Predicted
Compound	Predicted	Not Predicted	Not Predicted	Not Predicted	Not Predicted	Predicted
Lexical verb	Predicted	Predicted	Not Predicted	Not Predicted	Not Predicted	Not Predicted
Light Verb	Predicted	Predicted	Predicted	Not Predicted	Not Predicted	Not Predicted
Auxiliary	Predicted	Predicted	Predicted	Predicted	Predicted	Predicted

I first discuss the issue of constituent placement, which requires consideration of issues in syntactic and morphological theory which have not thus far been discussed. I address each of the five models in turn. I review the details of each model, and then I motivate the predictions given in Table 74 point-by-point. Finally, an evaluation is given for each model.

5.5.1 Constituent Placement and Syntactic Structure

This section considers theoretical explanations for the fact that nominal arguments and adverbs do not occur between the VP and the Path Auxiliary. I show that there is a well-motivated explanation for this fact under a Path Auxiliary analysis.

I showed in §5.4.6 that nominal arguments do not occur between the main verb and the Path Auxiliary. This follows from the fact that the Path Auxiliary does not take any nominal arguments. If the VP is right-headed, then all arguments of the verb are placed to the left (Carnie 2013: 101).

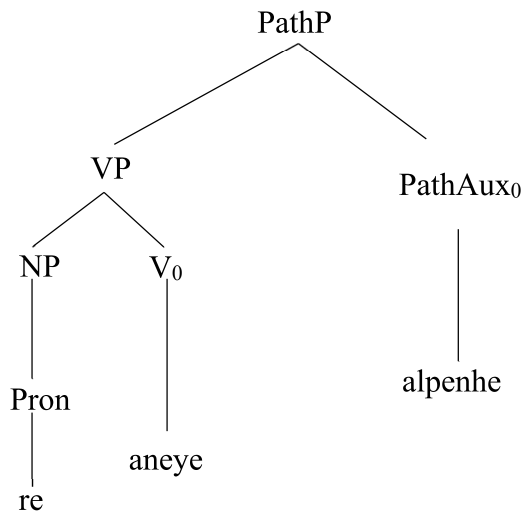

Figure 11: Structure of the sentence *re aney+alpenhe* ‘he returned and sat’

The resulting configuration does not provide a syntactic position for any argument NPs to be expressed between the Participle Suffix and the Path Auxiliary.

If an argument NP or ProP (Pronominal phrase) could occur between the Path Auxiliary and the main verb, it would take the main verb as its complement in a participle construction.

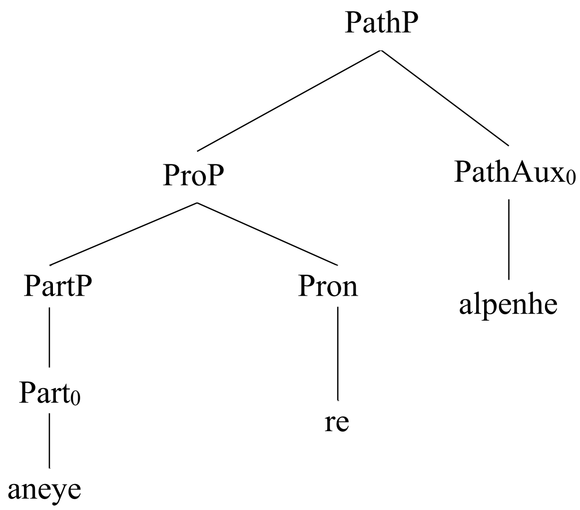

Figure 12: Structure of the ungrammatical sentence *aney+re+alpenhe* ‘he returned and sat’

There is no independent evidence that NPs may take a participle as a complement in Kaytetye.

For adverbial coverbs to occur between the Path Auxiliary and the Participle Suffix, the Coverbal Phrase (CoP) must be generated between the VP and the Path Auxiliary, or must move into this position, as in Figure 13 and Figure 14.

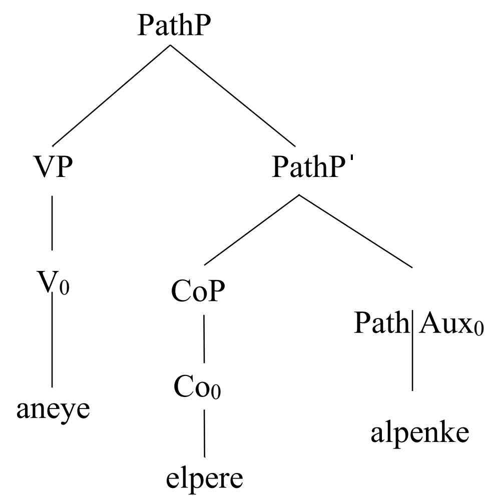

Figure 13: Structure of the ungrammatical sentence *aney+elper+alpenke* ‘go back quickly and sit’

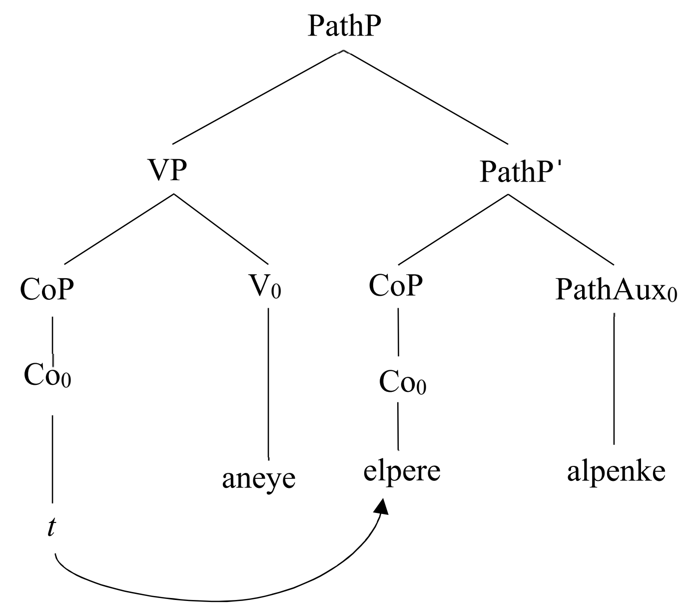

Figure 14: An ungrammatical sentence *ane-y+elper+alpenke* ‘go back quickly and sit’, with movement of *elpere* ‘do quickly’ to the medial position of the AP construction.

I do not predict the Path Phrase to take a coverb as its complement: this type of construction is unattested and there are no reasons that it should be predicted to do so.

If adverbial particles occurred within AP constructions, they would modify the Path Auxiliary, but not the LVR. Oppositions such as this would be predicted:

(156) *Intemaperte* *ane-y+alpe-nke*
always sit-after+return-PRS.SIM
'I always sit after returning.'

(157) *Ane-y+intemaperte+alpe-nke*
sit-after+always+return-PRS.SIM
'?I (not always) sit after always returning.'

The semantics of such constructions are very difficult to intepret, and the scope relations are much more easily expressed using multiple clauses.

Further, the Path Auxiliary expresses a grammatical notion of path, rather than the lexical notion of motion. That is, Path Auxiliary *ape-* 'path along/simple path' does not have the exact same semantic content as the lexical verb *ape-* 'go'. Cross-linguistically, grammatical words are not units that are selected for modification. This means that Path Auxiliaries are not legitimate targets for modification by adverbial particles.

5.5.2 Portmanteau Morpheme Analysis

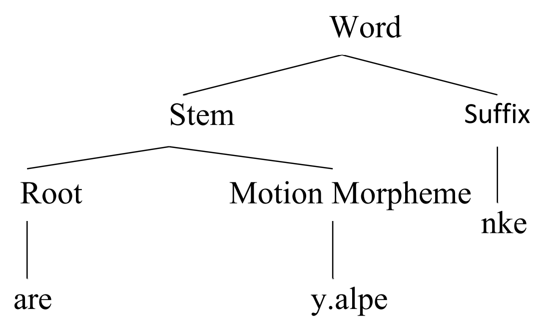

Figure 15: Morphological structure of the Morpheme Analysis of AP forms

The portmanteau morpheme analysis is that the Participle Suffix and Path Auxiliary are a single morpheme. In relation to the data given in Sections 5.3 & 5.4, this analysis compares in the following ways:

- *Stress*: This analysis predicts that the portmanteau morph is a single morphological unit, and as such forms its own stress domain. This predicts that the participle suffix will be observed with stress: *are-y+alpe-nke* [$_{\omega}$(aˈɻə)$_{\omega\omega}$(ˈyal.pən.ə)$_{\omega}$] This prediction is incorrect: It is the Path Auxiliary, not the Participle Suffix, which receives stress.

- *Clitic Placement*: This analysis predicts that clitics cannot be placed between the Participle Suffix and the Path Auxiliary, as it predicts no syntactic boundary in this position. This prediction is incorrect: clitics do occur in this position.
- *Form Repetition*: This analysis predicts that the same form will occur in both the lexical verb root and the Path Auxiliary position, with the Path Auxiliary expressing path semantics. This is because it predicts that in these situations the Path Auxiliary is simply a suffix and is not the same lexeme as the lexical verb. This prediction is correct: form repetition does occur.
- *Argument Structure*: This analysis predicts that because the Path Auxiliary is simply part of a suffix, it does not project argument structure. This prediction is correct: The Path Auxiliary does not have a role in determining the argument structure of the construction.
- *Transitivity Constraints*: This analysis predicts that the Path Auxiliary will not show transitivity harmony, because it is simply a morphological affix. This prediction is correct: Path Auxiliaries do not generally correspond to transitivity values (the one exception is the *-rr+ape(rine)-* constructions).
- *Constituent Placement*: This analysis predicts that there is no word boundary within the construction, and therefore predicts that no arguments occur between the Participle Suffix and the Path Auxiliary. For the same reason, adverbial coverbs and particles will not be placed in this position. This prediction is correct: arguments, adverbial coverbs and particles are not placed in this position.

Overall, this analysis fails to account satisfactorily for stress and clitic placement.

5.5.3 Compound Analysis

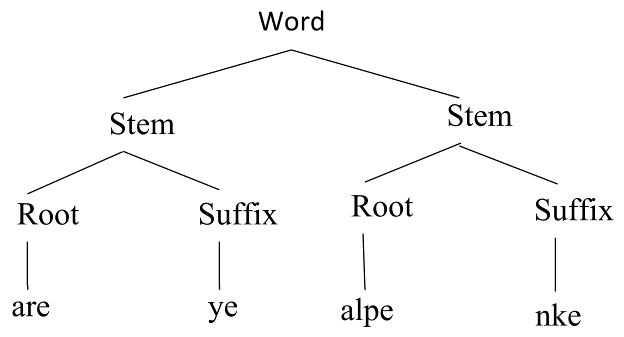

Figure 16: Morphological Structure of the Compound Analysis of AP forms

The Compound Analysis is that the AP construction is a single word, made up of two stems. The first stem is the lexical verb suffixed with the Participle Suffix. The second stem is the Path Auxiliary with the TAM suffix.

- *Stress:* This analysis predicts that there will be two prosodic words in the construction, because it is a compound made up of two stems. This prediction is correct: there are two prosodic words in AP constructions.
- *Clitic Placement:* This analysis predicts that clitics will not be placed between the Participle Suffix and the Path Auxiliary, as there is no syntactic boundary between the two stems. This prediction is incorrect: clitics do occur in this position.
- *Form Repetition:* This analysis predicts that the same form will not occur in both the lexical verb root and Path Auxiliary positions, as it predicts that in form repetitive constructions, it is the same lexical motion verb occurring in both stem positions. This prediction is incorrect: form repetitive constructions do occur.
- *Argument Structure:* Because in Australian languages complex word constructions are typically right-headed (Baker 2008: 116), this analysis predicts that the Path Auxiliary will determine the argument structure of the construction. It is also the right-head

stem which has the TAM suffixation, marking it as the head element. This prediction is incorrect: The Path Auxiliary does not determine the argument structure of the construction.

- *Transitivity Constraints:* This analysis predicts that the transitivity of the Path Auxiliary will correspond to the transitivity of the construction, because the Path Auxiliary is predicted to determine the argument structure of the construction. This prediction is incorrect: Path Auxiliaries do not normally correspond to transitivity values (the one exception is the *-rr+ape(rine)-* constructions).
- *Constituent Placement:* This analysis predicts that arguments will not occur between the Participle Suffix and the Path Auxiliary. This is because there is no syntactic boundary within the compound word. For the same reason, adverbial coverbs and particles cannot be placed in this position. This prediction is correct: arguments and adverbs cannot be placed in this position.

Overall, the compound analysis fails to satisfactorily account for clitic placement, form repetition, argument structure, and transitivity constraints.

5.5.4 Lexical Verb Analysis

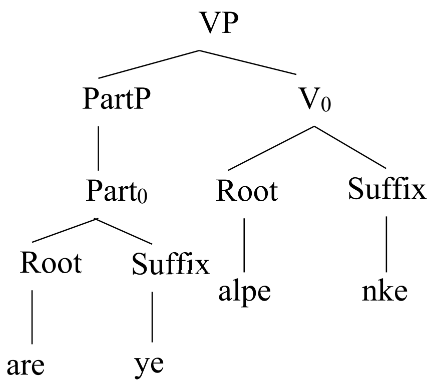

Figure 17: Syntactic Structure of the Lexical Verb Analysis

The Lexical Verb analysis is that the Path Auxiliary is a motion verb heading a VP, which takes the lexical verb as a participle. The Participle Suffix indicates a tense/aspect value in relation to the motion verb.

- *Stress:* This analysis predicts that the construction has two prosodic words, as it predicts that there are two distinct words in the construction. This prediction is correct: there are two prosodic words in the construction.
- *Clitic Placement:* This analysis predicts that clitics may be placed between the Participle Suffix and the Path Auxiliary. This is because it predicts that the lexical verb and the Path Auxiliary are separate words. This prediction is correct: clitics may be placed between the Participle Suffix and the Path Auxiliary.
- *Form Repetition:* Because this analysis predicts that the Path Auxiliary is a lexical motion verb, this analysis predicts that the same form will not occur in both the lexical verb root and Path Auxiliary positions. This prediction is incorrect: form repetition does occur.
- *Argument Structure:* This analysis predicts that the Path Auxiliary and the lexical verb will agree in transitivity, because the Path Auxiliary must share arguments with the lexical verb. This prediction is incorrect: The Path Auxiliary does not have a role in the argument structure of the construction.
- *Transitivity Constraints:* For the same reasons above, the Path Auxiliary is predicted to agree in transitivity with the lexical verb. This prediction is incorrect: Path Auxiliaries do not normally correspond to transitivity values (the one exception is the *-rr+ape(rine)-* constructions).

- *Constituent Placement:* This analysis predicts that arguments and adverbial coverbs and particles will occur between the lexical verb and the Path Auxiliary. This is because the Path Auxiliary is predicted to take arguments, and there are no restrictions predicted for the occurrence of adverbial coverbs and particles. This prediction is incorrect: arguments and adverbial coverbs and particles may not be placed in this position.

The Lexical Verb Analysis makes incorrect predictions about form repetition, argument structure, transitivity constraints, and constituent placement.

5.5.5 Light Verb Analysis

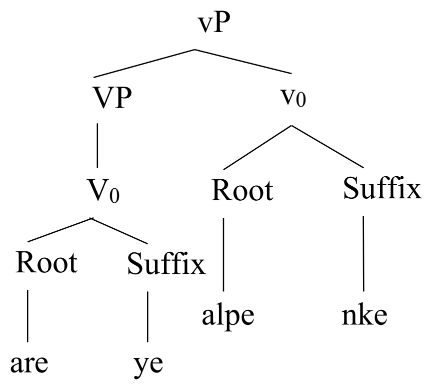

Figure 18: Syntactic Structure of the Light Verb Analysis

The Light Verb analysis is that the Path Auxiliary is a light verb, which expresses path and determines the argument structure of the construction.

- *Stress:* This analysis predicts that there are two prosodic words in the construction. This is because there are two grammatical words: the lexical verb, and the light verb. This prediction is correct: there are two prosodic words in the construction.

- *Clitic Placement:* This analysis predicts that clitics will occur between the Participle Suffix and the Path Auxiliary, because it predicts a syntactic boundary in this position. This prediction is correct: clitics do occur in this position.
- *Form Repetition:* This analysis predicts that the same form will occur in both the lexical verb root and Path Auxiliary positions, with the Path Auxiliary expressing path semantics. This is because the light verb is semantically bleached, and so it does not contain the same semantics as the corresponding lexical form. This prediction is correct: form repetitions do occur.
- *Argument Structure:* Because this analysis predicts that the Path Auxiliary is a light verb, which project arguments, it predicts that the Path Auxiliary will project argument structure. This prediction is incorrect: The Path Auxiliary does not project argument structure.
- *Transitivity Constraints:* For the reasons above, the Path Auxiliary is predicted to project argument structure. This prediction is incorrect: Path Auxiliaries do not normally correspond to transitivity values (the one exception is the *-rr+ape(rine)-* constructions).
- *Constituent Placement:* This analysis predicts that arguments and adverbial coverbs and particles will occur between the lexical verb and the Path Auxiliary. This is because the light verb takes arguments, and there is a syntactic position for adverbial coverbs and particles to occur in. This prediction is incorrect: arguments and adverbial coverbs and particles may not be placed between the lexical verb and the Path Auxiliary.

The Light Verb Analysis makes incorrect predictions in argument structure and constituent placement.

5.5.6 Auxiliary Verb Analysis

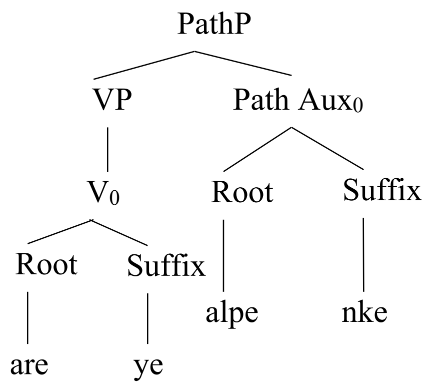

Figure 19: Syntactic Structure of the Auxiliary Verb Analysis

The Auxiliary Verb analysis predicts that the Path Auxiliary is an auxiliary verb, which does not project argument structure and expresses a path configuration. The lexical verb is a non-finite VP, and the Participle Suffix is a suffix expressing a relative tense or aspect specification.

- *Stress:* This analysis predicts that there are two prosodic words. This is because there are two grammatical words in this construction: the lexical verb and the Path Auxiliary. This prediction is correct; there are two prosodic words in this construction.
- *Clitic Placement:* This analysis predicts that clitics will occur between the Participle Suffix and the Path Auxiliary, because there is a syntactic boundary. This prediction is correct: clitics do occur in this position.
- *Form Repetition:* Because the Path Auxiliary is predicted to express path semantics rather than the same lexical item as a corresponding motion verb, this analysis predicts that the same form will occur in both the lexical verb root and Path Auxiliary positions. This prediction is correct: form repetitions do occur.

- *Argument Structure:* This analysis predicts that the Path Auxiliary does not contribute to the argument structure of the construction, as the Path Auxiliary is not predicted to project argument structure. This prediction is correct: The Path Auxiliary does not contribute to argument structure.
- *Transitivity Constraints:* This analysis predicts that transitivity harmony in the Path Auxiliary will not occur. This is because the Path Auxiliary is not predicted to project argument structure. This prediction is correct: Path Auxiliaries do not normally correspond to transitivity values (the one exception is the *-rr+ape(rine)-* constructions).
- *Constituent Placement:* This analysis predicts that arguments and adverbial coverbs and particles will not be placed between the lexical verb and the Path Auxiliary. This is because the VP is right headed, and the auxiliary verb does not take any arguments. This means that, despite there being a word boundary, there is no syntactic position at which an argument will occur. Furthermore, for the reasons outlined in §5.4.6 and §5.5.1, adverbial coverbs and particles are predicted to not occur between the Participle Suffix and the Path Auxiliary. This prediction is correct: arguments and adverbial coverbs and particles do not occur between the lexical verb and the Path Auxiliary.

The Auxiliary Verb analysis makes all the correct predictions for the data on AP constructions. Therefore, this analysis, out of those considered here, is the best-supported in the data.

5.6 Tripartite Constructions

This chapter has focussed on the structure of bipartite AP constructions. As stated in §5.2, there is another type of AP construction which consists of three words., i.e. tripartite constructions. Example (158) shows a tripartite AP construction, and example (159) shows the names for each component which I use in this thesis.

(158) *Are-l+are-l+arre-yayne*
see-before.tr+RED-before.tr+along-PST.IPFV
'Was seeing all the way along.'

(159) *Are-l+are-l+arre-yayne*
LVR-Participial Suffix +Distributive Auxiliary-Participial Suffix+Path Auxiliary-TAM suffix

Tripartite constructions have the LVR-participle suffix and Path Auxiliary-TAM suffix words of the bipartite construction. They also have an extra word, made up of a reduplicant and a participle suffix that agrees with the participle suffix of the LVR. This reduplicant expresses a distributed aspect, which indicates repetition or extension of the action or state denoted by the LVR.

The three tripartite constructions are listed in Table 75. Note that each form has a reduplicant as the root of the second word.[20]

Table 75: Tripartite Associated Path Constructions in Kaytetye.

Associated Path Construction	**Participle Suffix**	**Tripartite Morpheme**	**Meaning**
-l+RED-*l+arre*	-le	RED	LVR all the way along (transitive)
-rr+RED-*rr+enye-*	-rre$_1$	RED	LVR lots of times going along (intransitive)
-y+RED-*y+ene-*	-ye	RED	LVR lots of things going along (transitive)

(160) *Alyepe-le* *atye* ***elketnhe-l+etnhe-l+arre-rrantye***
do_slowly-ERG 1SG.ERG **clear-before.tr+RED-before.tr+along-PRS.IPFV**
'I slowly clear [it] all the way along' (Turpin & Ross 2012:98)

[20] The *y+ayte-y+alpe-* 'return and do' construction listed in Table 65 has the same structure as tripartite forms, but because it is very rare and likely a fossilised form, its structure is not considered here.

(161) *Alenye=lke* ***angke-rr+angke-rr+enye-rrane***
flowing_water=then **speak-conc+speak-conc+come_hither-PRS.IPFV**
karlarrangkerne
frog
'When there is flowing water, the frogs are always making noises going along' (Turpin & Ross 2012:117)

(162) *Wantewe* *nte* ***are-y+are-y+ente-yane****?*
why 2SG.ERG **see-after+RED-after+go_to-PRS.IPFV**
'Why do you keep going around looking?' (Turpin & Ross 2012:155)

I have provided evidence that an auxiliary analysis makes the best predictions of the data of bipartite AP constructions. One of the auxiliary roots in the bipartite construction is a reduplicant (Table 67). Given this, I propose that the most parsimonious analysis of the medial word in tripartite constructions is as a non-finite auxiliary verb, which complements the Path Auxiliary and takes the LVR as its complement.

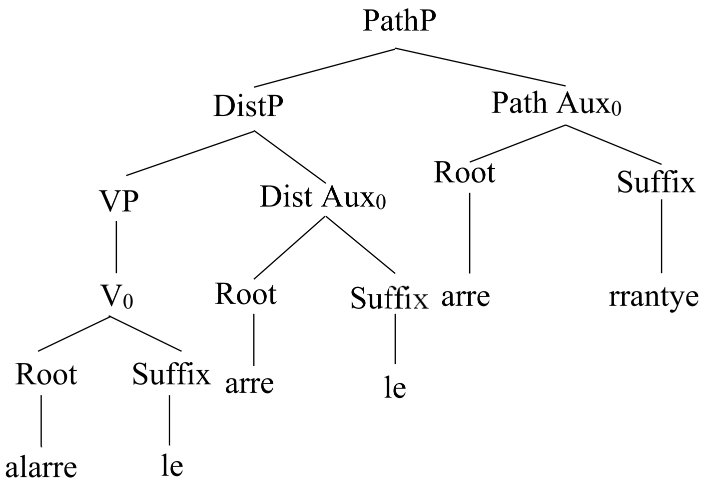

Figure 20: The constituent structure of Tripartite Associated Path Constructions in Kaytetye

This analysis accounts for the semantics of the tripartite constructions, and is consistent with the structure of bipartite constructions, by making use of auxiliary verbs to express grammatical notions of path and distributivity.

5.7 Conclusion

This chapter has shown that an analysis of AP constructions as Auxiliary Verb constructions has significant advantages over alternative analyses. AP constructions obligatorily have two constituents: a participial lexical verb and a path auxiliary. The Path Auxiliary expresses a path configuration, as well as other features such as motion and directionality, which relate both semantically and pragmatically to the concept of path. AP constructions may also have a third constituent, a Distributive Auxiliary, in addition to the Lexical Verb and Path Auxiliary. The Path Auxiliary takes a Distributive Phrase as its complement in tripartite constructions. The Distributive Auxiliary takes a VP as its complement, as does the Path Auxiliary in bipartite constructions. This VP is headed by the LVR suffixed with a Participle Suffix, which expresses aspectual and relative tense features.

Chapter 6: The Minimal Root

6.1 Introduction

Current analyses propose that there is a single common target for processes involving minimality effects: the minimal word (Blumenfeld 2011; Ketner 2006; McCarthy & Prince 1993; McCarthy & Prince 1990). I provide evidence that there is no single common target for minimality effects. Rather, there are at least two targets: the minimal word and the minimal root. The minimal word follows from prosodic constraints on output forms (McCarthy & Prince 1993). The minimal root follows from processing constraints on the forms of lexemes.

A phonological pattern involves a 'minimality effect' when the quantity of a constituent plays a conditioning role in that pattern. Current theories propose that the relevant quantity unit is the 'minimal word' which is defined in prosodic terms as a bimoraic constituent. This minimum constrains against the appearance of monomoraic forms and serves as a target when word forms are phonologically underspecified. The bimoraic minimum is standardly analysed as following from the requirement that words necessarily correspond to at least one foot, which in turn is necessarily bimoraic (Garrett 1999: 1; McCarthy & Prince 1993; McCarthy & Prince 1990).

This analysis faces two challenges in the literature: (i) languages with a non-trivial number of monomoraic word forms (Itô 1990); (ii) languages with evidence of a foot target, but where minimality effects do not target that foot form (Garrett 1999). I provide evidence that in Kaytetye, two minimality effects (suffix allomorphy and reduplication) do not have a prosodic constituent as their target and consequently a minimal word analysis is not supported. I analyse these minimality effects as targeting the minimal root. I show that the structure of the minimal root in Kaytetye follows from quantitatively predominant patterns in the Kaytetye lexicon. The relevant factors are: (i) the predominance of vowel-initial forms in the lexicon; (ii) the predominance of polysyllabic forms in the lexicon.

6.2 Minimality Effects

In this section I review minimality effects which have been identified in the literature. Following this, I describe the standard analysis of these effects, which relates to a prosodic target. I then discuss problems with this analysis which have been identified in the literature, and alternative proposals.

6.2.1 Minimality effects in Morphophonology

In this section I describe four areas which are targeted by minimality effects in morphophonology: (i) allomorphy; (ii) reduplication; (iii) augmentation; (iv) resistance to reduction. I show similar minimality effects operate in Kaytetye in §6.3.

6.2.1.1 Allomorphy

The allomorphy of affixes and grammatical units regularly targets the prosodic shape of the root. Allomorphy patterns may target a minimal form.

For example, Dyirbal (Pama-Nyungan, Queensland) has multiple suffixes which mark ergative case (Dixon 1972: 42). In vowel-final nouns, the standard case marker is *-gu*, shown in (163).

(163) yamani-**gu**
rainbow-ERG
'Rainbow (erg.).'

On disyllabic nouns, the ergative case marker is *-ŋgu*, shown in (164). Only disyllabic nouns receive this case marker.

(164) *yaɽa-**ŋgu***
man-ERG
'Man (erg.).'

In Dyirbal, like most Pama-Nyungan languages (Baker 2014: 148-49), words are minimally disyllabic (Dixon 1972). The *-ŋgu* ergative marker selects this form in a minimality effect.

6.2.1.2 Reduplication

There are two principal patterns of reduplication described in the literature: total reduplication, and partial reduplication (Kager 1999: 194-95). Total reduplication reduplicates an entire stem and produces a copy of the same size as the base. In partial reduplication, the form of the reduplicant is most commonly analysed in terms of a prosodic target, e.g. a syllable or a foot (McCarthy & Prince 1995; Saba Kirchner 2010). For example, in Hawaiian, reduplicants may take several possible forms, including a monosyllable or total reduplication. One possible target is bimoraic, which corresponds to the same form as a minimal word (Alderete & MacMillan 2015: 8), shown in (165)-(166).

(165) ***hio**-hiolo*
RED-tumble
'tumble repeatedly'

(166) ***keʔe**-keʔehi*
RED-stamp
'stamp repeatedly'

6.2.1.3 Augmentation

Augmentation refers to the addition of phonological content to a word to meet the requirements of a phonological constraint. Augmentation may occur as a minimality effect. For example, in Lardil (Tangkic, Northern Australia), minimality constraints prevent the appearance of monomoraic words (Wilkinson 1988). The Nominative case word form of the roots /ʈer/ 'thigh' and /kela/ 'beach' are illustrated in (167) and (168) (Round 2011: 331).

(167) /ʈer/ 'thigh' → Nominative: [ʈer**a**]

(168) /kela/ 'beach' → Nominative: [kela]

The first root receives an epenthetic vowel: [a]. The form *[ṯer] is ungrammatical because monosyllables cannot occur as words in Lardil. The epenthetic [a] is added as a repair strategy, to make the form disyllabic: [ṯera]. The same repair does not take place with the root /kela/ → [kela], because it is already disyllabic.

6.2.1.4 Resistance to Reduction

Languages commonly have processes which reduce the phonological content in words. For example, a language may delete vowels in certain positions. These procedures may fail to occur in words of a certain size, as a minimality effect. For example, in Yoruba, vowel hiatus may be resolved using two strategies: assimilation, or deletion. The final vowel of sub-minimal words is deleted, and the surviving consonant combines with the following word. In minimal words, the vowel is instead assimilated to the initial vowel of the following word, and is not deleted (Orie & Pulleyblank 2002: 102). These two strategies are shown in (169) & (170)

(169)	se	olu	→	solu	
	cook	mushrooms		'cook mushrooms'	
(170)	owo	epo	→	owe epo	*owepo
	money	oil		'money of oil'	

Orie & Pulleyblank analyse this pattern in relation to minimality effects. Subminimal forms such as *se* 'cook' are not well-formed prosodic words. Consequently, they combine to form a prosodic word with the following word to meet Yoruba minimality requirements. Minimal words, e.g. *owo* 'money', are well-formed prosodic words, and therefore cannot have their phonological content reduced. Therefore, they do not combine with the following word.

6.2.2 Prosodic Analysis of Minimality

The standard analysis of minimality effects posits that minimality effects follow from the fact that a word should involve a foot (Blumenfeld 2011; Downing 2005; Ketner 2006). Feet, in turn, are necessarily minimally bimoraic. (McCarthy & Prince 1993). Models of prosodic structure propose a hierarchy of prosodic units (Hayes 1989; Nespor & Vogel 2007). The levels of the hierarchy relevant for present purposes are shown in Figure 21.

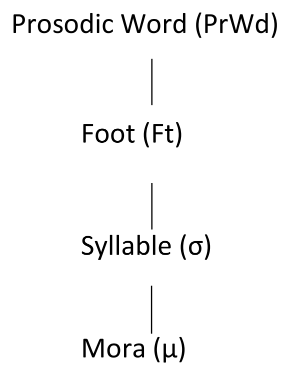

Figure 21: The Prosodic Hierarchy from the Mora to the Prosodic Word.

Earlier approaches of the hierarchy in Figure 21 made use of the *Strict Layer Hypothesis*, which means that prosodic constituents can immediately dominate only that prosodic constituent immediately below it, e.g. the Prosodic Word can only immediately dominate a foot (Peperkamp 1997; Selkirk 1984). Recent models of prosodic structure have not assumed the *Strict Layer Hypothesis* (Bennett & Elfner 2019: 156; Selkirk 2011). Furthermore, levels of the prosodic hierarchy may be absent in specific languages. For example, not all languages provide evidence for feet (Mansfield 2019; Özçelik 2019) or prosodic words (Hyman 2014).

The foot organises syllables into metrical constituents. Feet are binary, corresponding either to a bimoraic monosyllable, or a disyllable. If the foot is a monosyllable, that syllable is stressed. If the foot is a disyllable, one syllable is stressed and the other is unstressed. If stress is on the initial syllable, this forms a trochee, and if stress is on the final syllable it forms an iamb (Hayes 1985; Kager 2007). Not all languages permit monosyllabic feet, in which case all feet are disyllabic, and consequently all feet must correspond to a trochee or an iamb. The minimal word in each individual language therefore corresponds to the minimal requirements for foot structure in that language.

6.2.3 Issues in the Prosodic Analysis of Minimality

Itô (1990) and Garrett (1999) identify two challenges to the prosodic account of minimality:

1. There are languages in which CV word forms have a non-trivial occurrence in the lexicon, but which show bimoraic minimality effects.
2. There are languages with minimality effects, but the target of these minimality effects do not correspond to a foot in that language.

In relation to the first point, Itô (1990: 218) shows that Japanese has a significant number of monomoraic words. A search of *Kenkyuusha's New College Japanese-English Dictionary* (Collick et al. 2002) shows 62 monomoraic native Japanese words (Appendix 7). Despite this, Itô (1990: 218) identifies minimality effects in stem and word truncation, which target bimoraic forms or larger, as in (171) & (172).

(171) /birudiNgu/ 'building' → [biru] *[bi]

(172) /**ka**youbi **do**youbi/ 'Tuesdays and Saturdays' → [kaːdoː] *[kado].

These effects show that while Japanese displays minimality effects, a prosodic analysis of minimality does not account for the occurrence of monomoraic words.

In relation to the second point, Garrett (1999: 2-11) discusses a number of languages which show minimality which are not explained by feet. He identifies six categories:

1. There are languages which allow degenerate (i.e. monomoraic) feet but do not allow words in the form of a degenerate foot. For example, Cahuilla permits degenerate feet in trisyllabic word forms, e.g. *(ˈsu)(ˌkaʔ)ti*, 'the deer (obj.)' but degenerate feet cannot occur as independent words: **(ˈsu)* (Hayes 1995: 132-40; Seiler 1977: 28).

2. There are languages in which the minimal word is disyllabic, but this disyllabic form has an independent explanation. For example, Diyari never has stress on final syllables (Poser 1989: 128).This phonological rule prevents the occurrence of stressed monosyllables.
3. There are languages in which the minimal word is smaller than a foot. For example, Cahuilla allows CVC words, but CVC does not form a foot in the language (Seiler 1977).
4. There are languages with unbounded feet, but they have binary minimality effects. For example, Murik has an unbounded stress system, with only one stressed syllable in a prosodic word (Abbott 1982: 342). However, Murik does not permit monomoraic words (Abbott 1982: 344).
5. There are languages with a trochaic foot structure, but they permit CVV or CVC minimal words. For example, the standard stress pattern in Polish is that stress is penultimate (Comrie 1976). Under a binary foot analysis, the stressed syllable pairs with the final syllable in a trochaic foot (Kenstowicz 1995: 4-5). Despite this, Polish allows CVV and CVC words.
6. Languages in which vowel quality determines syllable weight but still have a CVV[21] or CVC minimal word. For example, in Javanese, non-schwa vowels attract stress (Robson 1992: 13). Gordon (2002: 21-22) analyses this pattern as a weight contrast and proposes this contrast to be between heavy (non-schwa) and light (schwa) vowels. Despite this pattern, Javanese does not have a CV minimal word, in which the V corresponds to a heavy vowel. Instead, the minimal word is CVX.

The empirical evidence that Garrett provides raises significant issues with the hypothesis that

[21] In this chapter: C: Consonant; V: Vowel; X; Consonant or Vowel.

feet uniformly account for minimality effects.

6.2.4 Alternative Analyses of Minimality Effects

There are four alternatives to the foot analysis of minimality effects which aim to account for the types of effects seen in §6.2.3. The first is an approach put forward by Itô (1990) and Piggott (2010) in which phonology has different levels and minimality effects only apply at one level of phonology. The second is a coercion analysis, in which apparently sub-minimal forms are coerced into well-formed prosodic words (Blumenfeld 2011). The third is the 'Head-Dependent Asymmetry' analysis, in which morpho-syntactic heads must contain an amount of prosodic complexity (Downing 2005). The fourth is the Garrett (1999) approach, in which there are independent contraints on word forms. In this section I show that these alternatives either make near-identical predictions to the foot analysis (and therefore can be evaluated by the same criteria), or are unmotivated by the data on minimality and are therefore implausible.

6.2.4.1 Minimality and Phonological Levels

Itô (1990) analyses the Japanese minimality pattern as a contrast between derived forms (which have a minimality effect) and underived forms (which do not have a minimality effect). For example, a word such as /ki/ 'tree' is underived, and therefore corresponds straightforwardly to a surface form [ki].[22] On the other hand, the truncation process of the word /birudiNgu/ 'building' derives a truncated form. Therefore, the truncation must match the bimoraic minimum – *[bi], [biru].

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[22] Data shows phonetic lengthening in monomoraic Japanese words by 40-50% (Mori 2002). Braver & Kawahara (2014) show that this lengthening effect does not produce a vowel as long as standard long vowels in Japanese. This means that this effect is unlikely to be a minimality effect conditioned for a bimoraic minimum.

Piggott (2010: 23-29) gives a similar analysis for Mangap-Mbula (Austronesian, New Guinea) (Bugenhagen 1995). Mangap-Mbula permits sub-minimal monosyllabic words. Examples of these are shown in (173) & (174).

(173) *kar* 'Village.' (174) *so* 'You say.'

Mangap-Mbula shows evidence of binary prosodic structure in polysyllabic words, as shown in (175).

(175) *nakabasi → (ˌna.ka)(ˈba.si)*
'Axe.'

In complex words in which the first morpheme is a person agreement prefix, this prefix is invisible to stress assignment, as in (176).

(176) *ti-ˈ**men**.der* *ˈ***ti**-mender*
3PL-stand
'They stand.'

The exception to this is monosyllabic roots, in which the prefix is stressed, as shown in (177).

(177) *ˈ**ti**-la* **ti-ˈ**la***
3PL-do
'They do.'

Piggott proposes a Distributed Morphology analysis for these forms (Halle & Marantz 1994). Under this analysis, there is a contrast between languages which apply a minimality condition in the first cycle of the morphological derivation, and languages which apply it in the last cycle. Languages such as Mangap-Mbula apply the minimality condition late, and because roots are spelled out early in morpho-syntactic derivation, these forms are not required to meet a minimality condition. However, in morphologically complex forms such as (177), the minimality condition forces the prefix to be in the same prosodic word as the verb root in order to meet a minimality requirement. This procedure does not occur with larger verb roots, because these already meet the minimality requirement.

These analyses do not account for two features of minimal and sub-minimal words, as I show below:

1. Cross-linguistic variation in the frequency of sub-minimal forms.
2. Minimality effects unmotivated by prosodic structure.

Considering cross-linguistic variation in frequency, languages differ in the number of sub-minimal forms they permit. For example, Japanese has at least 62 sub-minimal roots, all of which occur as independent content words (Appendix 7) and have no prosodic restrictions on their form. On the other hand, Kaytetye has 24 sub-minimal roots. Only two sub-minimal roots in Kaytetye are nouns (/mpu/ 'urine', /cə/ 'rain'), and the remainder are verb roots, which always occur with suffixation, or function roots such as pronouns. Piggott's analysis predicts that cross-linguistically languages will be either like English and not permit sub-minimal words (Hammond 1999) or like Japanese and freely permit sub-minimal words. That is, these accounts propose a binary contrast between languages which permit sub-minimal forms, and those that do not. Consequently they do not account for the quantitatively gradient pattern observed in the data, that there are languages (such as Japanese) which permit a large number of sub-minimal forms, and languages (such as Kaytetye) which have a restricted number of sub-minimal forms.

Considering minimality constraints unrelated to prosodic structure, there are languages which allow forms smaller than a foot but still show further restrictions on size. For example, as described in §6.2.3, in Cahuilla (Uto-Aztecan) CVC words occur (e.g. *kút* 'fire', *kíš* 'house'), even though feet in Cahuilla must correspond to CVV, CVʔ, or a trochee (Garrett 1999; Seiler 1965, 1977). Despite the CVC minimum being unmotivated by prosodic structure, CV content words never occur in Cahuilla (Garrett 1999: 4). Neither a prosodic structure analysis nor Piggott's model provide a motivated account for this pattern, and an alternative mechanism is required.

6.2.4.2 *Prosodic Coercion*

Garrett (1999: 2-11) identified a range of minimal forms which do not correspond to feet in the language in which they occur. In multiple cases, these forms are still binary. For example, he identified that Polish has a syllabic trochaic foot structure, and therefore is not predicted to have monosyllabic feet. However, Polish permits CVV and CVC syllables as word minima. Cahuilla, discussed in the previous section, shows a similar pattern, in which there are binary word minima that do not correspond to feet.

Blumenfeld (2011) analyses these patterns in terms of 'coerced minimality'. That is, in languages like Polish, under default conditions, a monosyllable is not treated as heavy. In the instance of a minimal word form, however, CVC and CVV syllables are required to be bimoraic in order to meet the binarity requirements of a minimal word. That is, by default CVC and CVV are not heavy, but when a word is CVC or CVV, it is coerced into being heavy for the purposes of creating a well-formed prosodic word.

This analysis does not account for two patterns identified by Garrett, which are patterns 1 & 4 in the list in §6.2.3.

Pattern 1 is languages with degenerate feet which do not permit degenerate feet as minimal words. The prosodic coercion analysis proposes that minimality effects result from the assignment of prosodic structure, and there are circumstances where the form of a minimal word will differ from the standard form of a foot. In pattern 1 languages, there are feet (i.e. degenerate feet) which cannot occur as minimal words. The prosodic coercion analysis provides no mechanism to account for this pattern, and an alternative analysis is required to explain it.

Pattern 4 is languages which have no restrictions on the shapes of prosodic feet ('unbounded' feet) but still show binary minimality effects. Under a prosodic coercion analysis, minimality effects result from the requirements that prosodic words contain a binary foot. In an unbounded foot language, there is no condition in the grammar for feet to be binary, or for prosodic words to contain a binary foot. Therefore, this analysis does not account for languages of this type.[23]

Furthermore, I show in §6.3 that any analysis which proposes that minimality effects result from a foot binarity condition do not account for the Kaytetye minimality data. This means that this analysis does not account for a range of minimality patterns. Therefore, alternative analyses are required for other minimality patterns.

6.2.4.3 Head-Dependent Asymmetry

Downing (2005) proposed a Head-Dependent Asymmetry (Dresher & van der Hulst 1998) analysis to account for word minimality. Under this analysis, head morphemes (i.e. stems) are prominent, and therefore require complex prosodic structure to express their prominence. Morphological heads (which correspond to Prosodic Words) must branch prosodically, and therefore involve at least a disyllable or a bimoraic structure (Downing 2005: 95). Dresher and van der Hulst (1998: 319-20) define branching as a characteristic of phonological complexity, and this branching property is associated to heads, while dependents have simplex structure and have no branching condition.

This analysis accounts for all the data presented by Garrett. However, this analysis predicts that there will be languages in which the minimality condition is violated, and this condition is not violated, i.e. a binary contrast. I showed in §6.2.3 & §6.2.4.1 that there are

[23] A thesis examiner suggested that this could be analysed as an emergence of the unmarked effect, in which an unmarked binary foot emerges as a minimality effect. I have two responses: (i) In languages with unbounded feet there is no independent evidence of the occurrence of binary feet in the grammar. Consequently, it is unclear that this minimality condition can be attributed to a binary foot; (ii) It may be that languages with 'unbounded feet' have no prosodic feet at all, and stress is assigned at the level of the prosodic word (e.g. Özçelik 2019). Naturally if this is the case, the foot cannot account for binary minima in these languages.

languages with a significant number of monomoraic content words, and there are sub-patterns relating to their distribution. This analysis does not account for these sub-patterns.

Furthermore, I show in §6.3 that this analysis does not account for Kaytetye minimality effects, in which the minimality target cannot be sufficiently explained by the branching condition. Therefore, this analysis does not account for all the typological data.

6.2.4.4 Minimality-Specific Constraints

Garrett (1999) proposes two sets of constraints to account for minimality effects:

1. Prosodic constraints which have effects on prosodic word size. For example, NON-FINALITY requires stress to not fall on a final syllable, and UPBEAT requires stressed syllables to be preceded by an unstressed syllable.
2. Three independent phonological constraints on word size: BE-CV-LONG which requires words to correspond to at least a CV shape, BE-CVX-LONG, which requires words to be at least a CVV and CVC shape, and BE-CVCV-LONG, which requires words to be at least disyllabic.

While the prosodic constraints account for a subset of the data considered by Garrett, the BE-LONG constraints are not independently motivated. That is, they are stipulative and less plausible than a motivated analysis of minimality. Alternative constraints that have been proposed for minimality effects, such as WORDBINARITY (Ramasamy 2011), have this same basic problem, i.e. they are not independently motivated and stipulate an ad-hoc explanation for a language pattern.

In this chapter I propose an alternative mechanism to account for minimality effects which are not motivated by prosodic structure, which I identify as the minimal root.

6.3 Minimality in Kaytetye

In this section I examine two processes in Kaytetye: (i) ergative allomorphy, and (ii) reduplication. I show that both procedures involve minimality effects. Following this, I show that the target of these procedures is not analysable as the minimal word, because the target is not a foot.

6.3.1 Ergative Allomorphy

Kaytetye has a range of nominal case markers, including a single phonological form for the ergative, locative, and instrumental case. The default form is *-le*, as seen in (178). This marker attaches productively to loans, such as the place name 'Barrow Creek' in (179).

(178) *Artweye-le*
man-ERG
'Man (erg.).'

(179) Barrow Creek-*le*
PN-LOC
'At Barrow Creek.'

If the base is a nominal root that has a VCV shape, it takes a different ergative allomorph: -*nge*, seen in (180)-(182).

(180) *Apmwe-nge*
snake-ERG
'The snake (erg.).'

(181) *Ake-nge*
head-LOC
'On the head.'

(182) *Erlwe-nge*
eye-INST
'With eyes.'

This variant also occurs with CV nominal roots, such as *mpwe* 'urine' in (183).

(183)

Aleke	*nthelarte*	***mpwe-nge***	*rle-nherre*	*pelikante*	*nharte=pe*
Dog	that.ERG	**urine-INST**	wet-PST.PFV	billycan	that=TOP

'That dog urinated on that billycan.' (Turpin & Ross 2012:479)

Other nominal roots, including CVCV roots, receive the standard marker, and occurrence with the *-nge* suffix is ungrammatical.[24]

(184) *Kayte-le* **Kayte-nge*
grub-ERG
'The grub (erg.).'

(185) *Pantye-le* **Pantye-nge*
blanket-LOC
'In the blanket.'

(186) *Kelye-le* **Kelye-nge*
small-INST
'With the small one.'

(187) *Weye-le* **Weye-nge*
meat-ERG
'The game animal (erg.).'

6.3.2 Reduplication

In Kaytetye there is a partial reduplication pattern which appears only in Associated Path constructions (Koch 1984; Panther & Harvey 2020). This reduplication pattern selects a verb root as its base and the reduplicant occupies the root position in an auxiliary verb. This pattern reduplicates the rightmost VCV sequence of the base. Example (188) shows this pattern.

(188)	*Kwathe-nke* drink-PRS.SIM 'Drink.'	→	*Kwathe-lp+**athe**-nke* drink-during+**RED**-PRS.SIM 'Drink on the way.'

Partial reduplications always take a VCV form. Standard canonical prosodic shapes, such as CVCV in (189) do not occur.

(189)	*Kwathe-nke* drink-PRS.SIM 'Drink.'	→	**Kwathe-lp+**kwathe**-nke* drink-during+**RED**-PRS.SIM 'Drink on the way.'

[24] There are a small number of idiosyncratic cases of CVCV words occurring with the suffix *-nge*. This is almost always with the root *ware* 'fire', e.g. *ware-nge* fire-LOC 'at the fire'.

6.3.3 *Evaluation of the VCV as the Minimal Word*

The VCV form is selected for reduplication and ergative allomorphy. I consider in this section whether a minimal word analysis is a plausible analysis of the VCV form. I consider two facts of Kaytetye phonology:

1. There is no evidence for foot structure in Kaytetye.
2. The VCV target is not a prosodic target.

6.3.3.1 Metrical Feet in Kaytetye

Recent literature on prosodic structure has challenged the universality of feet (Mansfield 2019; Özçelik 2019). There is no independent evidence of feet in Kaytetye. There are three reasons for this.

1. The stress data in §3.5 shows that there is no evidence for secondary stress on monomorphemic roots. Consonant-initial roots with more than three syllables, like the root in (190), do not have secondary stress on the third syllable.
2. The onset-sensitive stress pattern of Kaytetye is inconsistent with an iambic analysis. If a root is consonant-initial, it receives stress on the first syllable, like the root in (190). An iambic analysis predicts that stress will fall on the second syllable of a root.
3. There is no evidence of trochaic foot structure. If a root is vowel-initial, it receives stress on the second syllable, as shown in (191). Under a standard trochaic analysis, stress on the initial syllable. The occurrence of stress on the second syllable does not support a standard trochaic analysis. Alternative approaches, such as alignment of a trochaic foot to the first syllable, e.g. Goedemans (1996), posit a trochaic foot with no

independent evidence. Consequently, trochaic analyses do not motivate the existence of feet in Kaytetye, especially considering analyses which do not include a foot.

(190) *Kalawerre*
[ˈ**kɐ**lɐwəɾə] *[ˈ**kɐ**lɐˌ**wə**ɾə]
'Spencer's Monitor.'

(191) *Aleke*
[ɐˈ**lə**kə]
'Dog.'

An alternative analysis consistent with an iambic analysis is that onsets are moraic, and therefore CV syllables are a well-formed foot (Topintzi & Nevins 2017). This analysis is only motivated by this stress pattern, and there is no other evidence for moraic onsets. Gordon (2005) analyses onset-sensitive stress as the result of the 'enhancing' effect that consonants have on the following vowels. Onsets provide a perceptual boost to the following vowel. Onsets are less sonorous than vowels and provide a 'quiet phase' online speech. This 'quiet phase' allows the auditory system to recover between exposures to comparatively intense vowels. This allows a vowel following a consonant to receive an auditory boost. This analysis is applicable to the Kaytetye stress pattern, which is identical. This analysis is motivated by the phonetic data, while the moraic onset analysis stipulates a theoretical construct to account for the data. Given a lack of motivation for the moraic onset analysis, I accept Gordon's onset-sensitive stress analysis in this thesis. This supports an analysis in which there are no feet and one stress is assigned for each prosodic word. This is shown in (192).

(192) *Kalawerre*
[$_{\text{PrWd}}$(ˈ**kɐ**lɐwəɾə)$_{\text{PrWd}}$]
'Spencer's Monitor.'

6.3.3.2 The VCV Target

The VCV target meets two criteria:

1. There are two vowels.

2. There is no initial consonant.

I showed in §6.3.1 & §6.3.2 that while VCV forms are targeted by minimality effects, CVCV forms are not. Both CVCV forms and VCV forms are disyllabic and bimoraic. Therefore, an analysis of Kaytetye minimality must account for the fact that there are disyllabic forms which are not targeted by Kaytetye minimality effects, and it is the absence of an initial consonant which conditions the effects.

6.3.3.3 Evaluation of the Minimal Word Analysis

In §6.2 I presented the standard analysis of word minimality and alternative approaches. All approaches to word minimality apart from the Garrett minimality-specific constraint approach predict that productive minimality effects target a binary prosodic form: a disyllable or a heavy monosyllable. The motivations for the shape of this form vary according to the analysis. In §6.2.4.4 I identified the minimality-specific constraint analysis as implausible because of its stipulative and unmotivated analysis of minimality. Therefore, the prediction of the minimal word analysis is that it corresponds to either a disyllable or a heavy monosyllable.

The data shows that the VCV target is a disyllable. However, the condition that the minimal word be vowel-initial does not easily fit into a bimoraic or disyllabic analysis. This is for two reasons.

1. The presence of an onset does not contribute to syllable weight in Kaytetye. While onset weight has been proposed to account for onset sensitive stress in Arrernte (Topintzi & Nevins 2017), this moraic onset analysis is less plausible than a prominence based account which does not propose onset weight (Gordon 2005). Therefore, CVCV and VCV are predicted to both be bimoraic and disyllabic, and

yet VCV shows minimality effects while CVCV does not. Furthermore, under a moraic onset analysis, a VCV form is not bimoraic, but trimoraic, because it is composed of two syllable nuclei and one onset. Therefore, the moraic onset analysis does not account for the VCV shape as a bimoraic target.

2. As discussed in §6.3.3.1, there is no evidence that Kaytetye has metrical feet, therefore there is no analysis in which VCV is a well-formed foot while CVCV is not.

Therefore, prosodic accounts of minimality are not sufficient to account for the VCV minimality effects in Kaytetye. In §6.4 I present an alternative approach to minimality and show that Kaytetye minimality effects target the minimal root, rather than the minimal word.

6.4 The Minimal Root

The 'minimal root' is the minimal productive phonological form which a lexical root may have. The constraints on the form of minimal roots are: (i) psycholinguistic and (ii) probabilistic. I analyse the minimal root as a constraint on the underlying forms of roots, and it may be framed as a type of morpheme structure constraint on roots (Booij 2011; Hammond 1997). In this section I describe these features of minimal root effects. Illustration of these points will be given using the VCV-root form I propose as the minimal root in Kaytetye. I provided justification for this shape in §6.3.

6.4.1 Psycholinguistic

Analogy and levelling are significant processes in both language change and psycholinguistics (Albright 2009; Blevins & Blevins 2009; De Smet & Fischer 2017; Lahiri 2011). This predicts that roots in a language will generally conform to a small set of regular patterns following from these processes. In Kaytetye, quantitatively prominent patterns include: (i) vowel-initial roots; (ii) polysyllabic roots.

6.4.2 Probabilistic

Minimal root effects arise from patterns of quantitative predominance in the lexicon. Consequently, minimal root constraints are better analysed in quantitative terms and not in terms of absolute rules. All quantitative patterns have exceptions, and I predict that there will be exceptions to the preferred minimal root structure, but these exceptions will be quantitatively minor. For example, the minimal root in Kaytetye is a VCV structure. Despite this, 24 sub-minimal roots occur.

6.4.3 Differences between the Minimal Word and the Minimal Root

Table 76 provides a summary of the contrasts between root minimality and word minimality.

Table 76: Contrast between the Minimal Word and the Minimal Root

Phenomenon	Minimal Word	Minimal Root
Domain	Phonological Output	Lexicon
Size Restriction	Enforced by Prosodic Structure	Enforced by Language Processing
Quantitative Phenomenon	Not a quantitative phenomenon. Therefore, exceptions are very rare and sporadic.	A quantitative phenomenon. Therefore, departures from predominant patterns are predicted.
Target	Prosodic Word	Morphological Root

The minimal word is the result of a phonological procedure, and so it occurs at the level of the phonological output. The minimal root is a constraint at the level of the lexicon, and for this reason it is not accounted for by phonological output. As shown in §6.2.2, the standard analysis of word minimality is that it follows from prosodic structure. On the other hand, minimal root effects cannot be accounted for by prosodic structure, because: (i) prosodic structure is assigned during phonological derivation, and so the forms of lexical roots cannot be constrained by prosody; (ii) roots are not prosodic units and consequently are not predicted to be constrained by prosody.

Minimal words result from phonological grammatical procedures. Sub-minimal forms are ungrammatical. Therefore, sub-minimal forms are predicted to be very rare or result from regular exceptions to the grammatical output (for example clitics are not mapped to prosodic structure, and so may be sub-minimal). On the other hand, as minimal roots are constrained by psycholinguistic factors, exceptions and sub-minimal forms are predicted to occur, because they are the result of perceptual and processing constraints, rather than grammatical rules. Finally, the target of minimal word effects is the prosodic word. By contrast, root minimality is only relevant to the morphological root.

6.5 Analysis of the Kaytetye Minimal Root

In §6.3.3.2, I described two characteristics of the Kaytetye Minimal Root: (i) it is vowel-initial; (ii) it is disyllabic. In this section, I motivate these two characteristics through lexico-statistical data in the *kPhon* dataset, to show that vowel-initial forms are predominant and monosyllabic forms show significant restrictions in their distribution.

6.5.1 Vowel-Initiality

I analysed the distribution of vowel-initial forms in the *kRoot* lexicon with an R script. Table 77 shows the distribution of noun and verb roots in Kaytetye. These are the two largest parts of speech. This data presents their distribution in terms of: (i) the total number of roots in these parts of speech; (ii) the number of vowel initial roots; (iii) the proportion of roots that are vowel-initial. It shows that a majority of forms in both parts of speech are vowel-initial.

Table 77: Proportion of Vowel-Initial Noun and Verb Roots in the kPhon Dataset, with Total Count and Number of Vowel-Initial Forms.

Part of Speech	Count	Vowel-Initial Count	Proportion
Nouns	2072	1218	58.8%
Verbs	302	223	73.8%

The only part of speech that does not have predominantly vowel-initial forms in the *kRoot* set is demonstratives, which only has 15 forms, 40% of which are vowel-initial. In total, 61.7% of the *kRoot* dataset is vowel-initial.

These data show that the Kayetye lexicon is predominantly vowel-initial. Characteristic of the Minimal Root is that its phonological form is constrained by prevailing patterns in the lexicon. The predominantly vowel-initial Kaytetye lexicon motivates the vowel-initial condition in the Minimal Root.

6.5.2 Disyllabicity

The notion of the minimal root necessarily entails that the root is phonologically simplex. All things being equal, this principle predicts a monosyllabic form, either a V or CV. V is an implausible configuration because as a vowel that is both root-initial and root-final, it may correspond to only two configurations: /ə/, /ɐː/. Consequently, this principle predicts that CV is the minimal root.

I showed in §6.3 that the minimal root is not a monosyllable, but a disyllable: VCV. This means that while CV is more phonologically simplex than VCV, it does not correspond to the minimal root. I identify two reasons for this:

1. The Vowel-Initial condition described in §6.5.1. CV is consonant-initial, and therefore it does not meet this condition.
2. The infrequency of CV roots in the Kaytetye lexicon.

In relation to this second point, Table 78 shows the distribution of a selection of root templates and the proportion of the *kRoot* dataset they comprise.

Table 78: Counts and Proportions of Roots in *kRoot* Data by Template

Root Template	Count	Proportion
CV	24	0.87%
VCV	214	7.73%
CVCV	345	12.47%
VCVCV	759	27.43%
CVCVCV	458	16.55%
VCVCVCV	507	18.32%
CVCVCVCV	182	6.58%
VCVCVCVCV	163	5.89%

CV is the smallest root shape in this data selection, and it comprises only 0.87% of the *kRoot* data. Furthermore, the greatest proportional change in this selection, as roots become larger, is between CV and VCV. VCV roots are 7.73% of the dataset. The number of VCV roots is approximately 9 times greater than the number of CV roots. In comparison, the number of VCVCV roots is 2.2 times greater than CVCV roots. In absolute and proportional terms, CV is under-represented in the data.

Table 79 shows the *kRoot* data grouped by number of syllables.

Table 79: Counts and Proportions of Roots in *kRoot* Data by Syllable Number

Syllable Number	Count	Proportion
1	26[25]	0.94%
2	559	20.2%
3	1217	44.0%
4	689	24.9%
5	210	7.59%
6	49	1.77%
7	14	0.51%
8	2	0.07%
9	1	0.04%

Note that roots with a high syllable count have a low proportion, with only two roots with 8 syllables and one root with 9 syllables. The count of 1 syllable roots corresponds to those roots with 6 or 7 syllables. That is, the count of 1 syllable roots patterns like those roots with a high syllable count, and not those with a low syllable count. Note that 2 syllable roots constitute over 20% of the lexicon and 3 syllable roots constitute 44%. That is, 1-syllable roots pattern like marginal roots, and not like those roots which form the bulk of the lexicon.

These facts of the distribution of CV and 1 syllable roots, i.e. their low count and their patterning like other marginal root forms, motivate their prohibition as a minimal root.

6.6 The VC Analysis

Breen and Pensalfini (1999) analysed Central Arrernte, a language related to Kaytetye, in terms of VC syllabification. Under this analysis, all morphemes in Kaytetye are composed phonologically of VC syllables, i.e. all consonants are syllabified into a syllable coda, and all vowels have a coda. This predicts that all roots are underlyingly vowel-initial and consonant-final. The occurrence of final vowels is the result of post-lexical epenthesis, and therefore is not part of the phonological forms of roots. Therefore, there are no VCV minimal roots, but

[25] Including CV and the two V roots.

VC monosyllables. Consequently, this VC analysis poses challenges to the analysis in this chapter.

I lay out in Chapter 8 detailed argumentation that the VC analysis is an implausible analysis of Kaytetye phonology. I summarise aspects of my argumentation in Chapter 8 here.

Under the VC analysis, ergative allomorphy targets a VC form, as shown in example (193), and partial reduplication copies the final VC syllable of a verb root, as in example (194).

(193)	*Ake-nge*	*Aleke-le*
	/ɐk-əŋ/ → [ɐkəŋə]	/ɐl.ək-əl/ → [ɐləkələ]
	head-ERG	dog-ERG
	'The head (erg.).'	'The dog (erg.).'

(194) *Kwathe-lp+**athe**-nhe*
/əkw.ɐt̪-əlp+**ɐt̪**-ən̪/ → [kwɐt̪əlp**ɐt̪**ən̪ə]
drink-during+**RED**-PST.PFV
'Drank on the way.'

Under a minimal word analysis, minimality effects target a monosyllable. I showed in §6.2.2 that the minimal word is standardly a bimoraic form. There is no independent evidence that a VC form is bimoraic in Kaytetye. For example, VC syllables do not attract stress under any analysis of Kaytetye syllabification. Therefore, the VC form is not a plausible minimal word.

In Chapters 3 & 4 I showed that Kaytetye roots may end in two vowels: /ə/ and /u/. This analysis means that there is a phonological contrast in root-final position. This phonemic contrast is not predicted by an epenthetic analysis, and therefore is not predicted by the VC analysis. Consequently, the VC analysis does not account for the phonological data.

6.7 Conclusion

In this chapter I have identified a category of minimality effect distinct from the minimal word. This 'minimal root' corresponds to a construct in the lexicon which matches the minimal productive root form. The minimal root is conditioned by psycholinguistic pressures, including canonical forms in the lexicon and informativeness of the phonological content of each root. This minimal root analysis is significant in its ability to account for a difficult and otherwise anomalous pattern in Kaytetye which alternative proposals do not provide a motivated account for. Further research in this area will analyse the psycholinguistic constraints on the form of the minimal root, especially in terms of the information content of root shapes and how this constrains the form of the minimal root.

Chapter 7: Reduplication in Kaytetye

7.1 Introduction

This chapter describes and analyses reduplication patterns in Kaytetye. In this chapter I show that there are two types of productive reduplication in Kaytetye.

I present data on four aspects of both types of reduplication.

1. Word Class of the Reduplicative Base
2. Semantics of the Reduplicant
3. Phonological Form of Reduplicant
4. Morpho-Syntactic Status of Reduplicant

In §7.2, I first discuss a type of unproductive reduplication in Kaytetye, which I call 'Lexical Reduplication'. In §7.3, I discuss Total Reduplication in Kaytetye, which involves the complete reduplication of a stem and in §7.4, I describe Partial Reduplication, another type of reduplication which partially copies its base. In §7.5, I show how a Minimal Reduplication (Saba Kirchner 2010) analysis accounts for Kaytetye reduplication patterns.

7.2 Lexical Reduplication

The term 'Lexical Reduplication' is used in this thesis to refer to reduplicated forms which meet either one of two criteria: (i) they do not have a non-reduplicated counterpart; (ii) there is a phonological match to a non-reduplicated counterpart but no straight-forward semantic relationship between the reduplicated and non-reduplicated forms. In this section, non-reduplicated forms which resemble a lexical reduplication have a question mark preceding the form.

All lexical reduplications are nominals or coverbs, and both partial and total reduplications are attested. All examples in this section are from the *Kaytetye-to-English Dictionary* (Turpin & Ross 2012).

I identify three primary domains of lexical reduplications. The first is animal names. Examples (195) & (196) show instances of this, with the reduplicant in bold. The origin of these is likely in onomatopoeia of the sound the animal makes.

(195) *eleterrekame**kame*** **eleterrekame*
'Australian Kestrel.'

(196) *kelelke**lelke*** **kelelke*
'Galah.'

The second domain is in coverbs. Certain coverbs only have reduplicated forms, but in other cases non-reduplicated counterparts also occur, normally with an unclear connection to the reduplicated form. Examples are shown in (197) & (198). Lexical reduplications in this category are likely related to historical non-reduplicated forms that no longer appear in the language.

(197) *ele**elete*** **elete*
'Toddle.'

(198) *atham**athame*** *?athame*
'Caring, generous' 'Dark.'

The third domain is plant names. Examples of these are shown in (199) & (200).

(199) *itet**itete*** **itete*
'Eremophila obovata.'

(200) *marlekalyey**alyeye*** **marlekalyeye*
'Caustic Orange.'

I analyse Lexical Reduplication as a non-productive type of reduplication, which in certain cases shows diachronic morphological complexity, but which corresponds to fixed, lexicalised forms synchronically. This is because: (i) Lexical Reduplication is inconsistently applied across the lexicon; (ii) Lexical Reduplication does not involve any synchronic reduplicative bases; (iii) the meanings of Lexical Reduplication do not consist of transparently reduplicative semantics. Therefore, I distinguish unproductive reduplication from productive reduplication in Kaytetye.

7.3 Total Reduplication

Total Reduplication is a pattern in which a stem is reduplicated to produce a scalable or countable interpretation of a base. The semantic interpretation typically relates to plurality, intensity, or repetition. Total Reduplication occurs with all parts of speech which may take nominal morphology including nouns, as in (201) & (202), and coverbs, as in (203)-(205).

(201)	*lterrpe*	→	*lterrpe+**lterrpe***
	thud		thud-**thud**
	'a thud'		'a rattle'
(202)	*ngwetyanpe*	→	*ngwetyanpe+**ngwetyanpe***
	morning		morning+**morning**
	'morning'		'every morning'
(203)	*amperl+are-nke*	→	*amperl+**amperl**+are-nke*
	track+see-PRS.SIM		track+**track**+see-PRS.SIM
	'See tracks'		'See lots of tracks'
(204)	*awap+ane-nke*	→	*awap+**awap**+ane-nke*
	block+sit-PRS.SIM		block+**block**+sit-PRS.SIM
	'blocked; closed'		'blocked up'
(205)	*ertwe-lh+ayle-nke*	→	*ertwe-lh+**ertwe-lh**+ayle-nke*
	descend-CAUS+cause-PRS.SIM		descend-CAUS+**descend-CAUS**+cause-PRS.SIM
	'make go down'		'make lots of things go down'

Total Reduplication is a productive reduplication pattern. Productivity refers to the ability to create new forms using a particular process (Matthews 2007). That is, the process must be generally applicable, so that new forms may be created using the same process. In the case of this reduplication pattern, productivity predicts two properties: (i) there are a wide range of coverbs and nominals which undergo Total Reduplication; (ii) loan words (as recentlyintroduced words) may undergo Total Reduplication.

With respect to the first property, it was shown in (201)-(205) that Total Reduplication occurs both the coverbs and noun categories. I show in §7.3.1 that Total Reduplication is attested with a high number of coverbs, nouns, and with multiple sub-types of these categories.

The second property, that loan words may undergo Total Reduplication, holds true. Examples (206)-(210) contain loanwords from English which show Total Reduplication.

(206) *Renhe-l=arte* *aynekanthe* *kalty+ine-yayne* *pipe-we*
that-ERG=DEF 1PL.ACC know+cause-PST.IPFV Bible-DAT
aynekanthe ***learnem+learnem****+ayle-nye*
1PL.ACC **learn+learn**+cause-PST.PFV
'That person would teach us the bible, she taught all of us'
(Turpin & Ross 2012:542)

(207) Not proper iron, ***rapetye+rapety****=ape*
not proper iron **rubbish+rubbish**=EMPH
'That isn't proper iron, it's **all** just **rubbish' (**AIATSIS13aB 486.603)

(208) *Nanikwert-ineng-akake* *atanthe* ***elkwemen+elkwemene***
goat-COLL-PROP 3PL.NOM **old_woman-old_woman**
alperine-yayne
take_back-PST.IPFV
'**The old women** with the goats would take them back'
(Turpin & Ross 2012:570)

(209) *Tyarlarte* *apmere* ***Kartetye+Kartety****-arle* *atnakakerre*
to_there camp **cottage+cottage**-ALL long_ago
atanthe *arrwekelenye-le* *ile-yayne* *rlwene* *ratyene*
3PL.NOM ancestors-ERG get-PST.IPFV food ration
'Long ago our ancestors would go and get food there, from **Barrow Creek Telegraph Station**'. (Turpin & Ross 2012:418)

(210) *Rrkant-arenge* ***lete+lete****.*
fun-GEN **lid+lid**
'**The toy car made of a lid** is for fun' (Turpin & Ross 2012:450)

These two predictions hold in Kaytetye Total Reduplication. Therefore, Total Reduplication is a productive reduplicative procedure.

In Total Reduplication, unlike in Partial Reduplication patterns, there is no phonological evidence to determine which portion of the construction is the base and which is the reduplicant. However, there are two pieces of evidence that the rightmost item is the reduplicant in the Total Reduplication construction:

1. In Partial Reduplication constructions, the base is to the left and the reduplicant is to the right, as shown in §7.4. Based on the pattern in Partial Reduplication, the most parsimonious analysis of Total Reduplication is that the reduplicant is to the right of the base.
2. Total Reduplication has derivational characteristics, and therefore is structurally identical to nominal constructions in which a noun occurs with a head which takes that noun as its complement.[26] The closest structure to this in Kaytetye is noun-demonstrative constructions. In noun-demonstrative constructions, the demonstrative must always follow the noun, as in (211) and never precede it.

(211)	*Thangkerne*	***nharte***	*apartange*	*re*	*alker-arl+arre-ngewanenye?*
	bird	**that**	why	3SG.NOM	sky-ALL+become-NEG

‘Why isn't that bird flying?’ (Turpin & Ross 2012:514)

7.3.1 Word Class and Total Reduplication

Total Reduplication is attested with nouns, adverbs, and coverbs. That is, Total Reduplication occurs with all root types which may occur with nominal morphology. Total reduplication is highly productive with coverbs, and this is seen in the productivity of causative constructions, like that in example (205). Therefore, in this section I focus on the categories of nouns and adverbs.

A search was carried out using the *Kaytetye Text Corpus*. All non-reduplicated lexemes in the *Kaytetye-to-English Dictionary* (Turpin & Ross 2012) tagged as either ‘nouns’

[26] Although this does not imply that the morpho-syntactic configurations of total reduplication and noun-demonstrative constructions are identical.

or ‘adverbs’ were selected, and reduplicated forms were generated for each form. These reduplicated forms were then searched in the corpus, to test whether reduplicated forms are attested for each noun. These forms were searched in their standard orthographic form, in which the reduplicants were separated with a hyphen. Forms which are not connected to the non-reduplicated form were removed manually. In all, 137 lexemes were found in reduplicated form. Each lexeme was assigned one of the following values: adverbial, animal, coverb, descriptive, directional, human, number expression, plant, temporal expression, or other noun. The count of each of these categories is in Table 80.

Table 80: Count of Word Types Attested with Total Reduplication

Category	**Count**
Adverbial	8
Animal	3
Coverb	2
Descriptive	44
Directional	3
Human	7
Number	2
Plant	13
Temporal	6
Other Noun	48

Total Reduplication is attested across a range of noun and adverb types. It is particularly frequent with descriptives and common nouns.

7.3.2 Semantics of Total Reduplication

For the purpose of determining the meanings of Total Reduplication, I surveyed the range of meanings which each lexeme attested with Total Reduplication had in Kaytetye texts. Through this survey, I identified four prominent meanings or uses: (i) repetition; (ii) intensity; (iii) collectivity; (iv) derivation of descriptive from non-scalar forms.

These four meanings/uses relate to the derivation of a scalable or countable interpretation of a stem. If the stem is already scalable or countable, the resulting interpretation denotes a high degree of the relevant concept, i.e. 'very X' or 'multiple instances of X'. If the stem is not scalable, reduplication may result in an attenuative interpretation. These patterns are shown in this section.

Repetition: There are examples of syntactic reduplication denoting repetition, or a state or action taking place over several instances. This sense is common for coverbs, as well as number nouns.

(212) ***Pererre+pererre**-le* *ape-rrane* *atyeyengaye*
back_and_forth+back_and_forth-INST go-PRS.IPFV EXCL
'wow I am going back and forth repeatedly' (Turpin & Ross 2012:536)

(213) *Ape* *aynanthe* ***awenyerr+awenyerr**-arenge-le* *angke-nke*
anyway 1PL.NOM **one+one**-GEN-ERG talk-PRS.SIM
'We will talk one-by-one anyway.' (KH4565 04:51-04:53)

Intensity: This usage occurs with nominals with inherently scalar semantics. The meaning relates to a greater degree of a quality, like the meaning of the English adverb 'very'.

(214) *Athe* *nharte=pe* ***arrilp+arrilpe***
grass that=TOP **sharp+sharp**
'That grass is **very sharp**' (Turpin & Ross 2012:331)

(215) *Awenyerr=arle* *ane-yayne* ***ater+atere***
one=EMPH be-PST.IPFV **scared+scared**
'One of them was **very scared**.' (Turpin & Ross 2012:234)

(216) *Athe* ***etnkwelth+etnkwelthe*** *kwenteltye* *kayte*
grass **long+long** kangaroo_grass grub
kwere-le *ante-yane*
3SG.OBL-LOC sit-PRS.IPFV
'Kangaroo grass is a **very long** grass that grubs live on.'
(Turpin & Ross 2012:435-436)

Collectivity: Total Reduplication may express collectivity with nouns (especially certain nouns denoting humans) and descriptive nominals. While Kaytetye has collective and plural suffixes, *-inenge* and *-amerne* respectively, there are no examples of constructions involving both total reduplication and these number suffixes. Reduplicated coverbs may also denote collectivity in the object of the clause.

(217) *Twerarte atanthe ilpilpake-nhe* ***aleyak+aleyake****=tyampe*
all 3PL.NOM take-PST.PFV **young_woman+young_woman**=too
'They all stole **the young women**.' (Turpin & Ross 2012:482)

(218) *Nanikwert-ineng-akake atanthe* ***elkwemen+elkwemene*** *alperine-yayne*
goat-COLL-PROP 3PL.NOM **old_woman+old_woman** bring-PST.IPFV
'They, **the old women** with goats, would bring [them] back.'
(Turpin & Ross 2012:570)

(219) *Mpelarte aynanthe arntarrtye-yayne tyate-nganyimpe=pe*
like_this 1PL.NOM have-PST.IPFV shirt-DIM=TOP
arleyale ***errpaty-errpatye***
useless **bad+bad**
'Like this we would have **a lot of** little **bad**, useless clothing'
(Turpin & Ross 2012:493)

(220) *Nhartepe weye* ***kelye+kelye****=pe ayne-nke=rtame*
then meat **small+small**=TOP eat-PRS.SIM=FOC
'Then he eats the **small bits of** meat' (Turpin & Ross 2012:422)

(221) *Iterrty-ineng=apeke* meeting-*w=apeke,*
Person-COLL=perhaps meeting-DAT=perhaps
wele ***karre+karr****+ine-nke*
well **together+together**+cause-PRS.SIM
'Perhaps there are some people for a meeting, well you gather them **all together**.' (Turpin & Ross 2012:417)

Related to this usage is the use of Total Reduplication to denote locations characterised by a noun. This collectivity usage is frequent with plant species, in which reduplication derives the semantics 'area characterised by multiple instances of X'.

(222) *Alwe-yayne=ee anpatyarre-nhe* ***artety+artetye****-l=aperte*
chase-PST.PFV=EXT escape-PST.PFV **mulga+mulga**-LOC=just
'He was chasing us a long time and we escaped in **the mulga scrub**.'
(Turpin & Ross 2012:220)

(223) ***Atnkerr+atnkerre*** *ntyere*
coolibah+coolibah swamp
'A swampy **area with coolibah trees**.' (Turpin & Ross 2012:518)

Derivation of Descriptive from Non-Scalar Forms: Total Reduplication may produce a descriptive term from a non-scalar noun or descriptive. When this occurs, the semantics are most frequently attenuative, in that they express a low degree of the descriptive sense, such as in (224) & (225), although non-attenuative items exist, as in (226).

(224) *Errpwerl+errpwerle*
black+black
'blackish; somewhat dark.' (Turpin & Ross 2012:356)

(225) *Elkwerr=aperte* ***terangke+terangke*** *arre-nherre=lke*
half_way=just **drunk+drunk** become-PST.PFV=then
'Then half-way I became **dizzy**.' (Turpin & Ross 2012:586)

(226) *Marl-arenge* ***ngkwerne+ngkwern****-arenge* *awekine-wethe* *kwere*
woman-GEN **bone+bone**-GEN healthy-PURP 3SG.ACC
'The [song] belonging to women will make **skinny** people healthy.'
(Turpin & Ross 2012:273)

7.3.3 Phonological Form of Total Reduplication

The evidence shows that Total Reduplication reduplicates a stem, i.e. the morphological root with any derivational affixation, which excludes any inflection for case. This is identifiable in two facts in Kaytetye reduplication patterns: (i) the placement of case suffixation; (ii) the form of total reduplicants.

In relation to the first point, in noun + modifier constructions in Kaytetye, there are two patterns: (i) both the noun and its modifier receive the same case marking; (ii) only the modifier receives case marking. Examples of these are shown in (227) & (228).

(227) ***Rarre-le*** ***alkenhe-le*** *arrtye-lp+arrtye-nke* *nterrenge* *elkerte*
wind-ERG **big-ERG** knock-during+RED-PRS.SIM seeds wattle
'The wind knocks the sickle-leaved wattle seeds.' (Turpin & Ross 2012:378)

(228) ***Angke*** ***kelye-le*** *mpware-nke*
voice **high-INST** do-PRS.SIM
'Do it in a **high-pitched** (lit. small) voice.' (Turpin & Ross 2012:422)

In Total Reduplication constructions, the first stem is never followed by a case suffix. The case suffix always follows the second stem, as in (229). This disagreement in the case marking of the base and the reduplicant shows that it is not a complete word that is reduplicated.

(229) *Alwe-yayne=ee* *anpatyarre-nhe* *artety+**artetye-l**=aperte*
chase-PST.PFV=EXT escape-PST.PFV mulga+**mulga-LOC**=just
'He was chasing us a long time and we escaped in the mulga scrub.'
(Turpin & Ross 2012:220)

In relation to the second point, derivational suffixation is always preserved in the reduplicant. For example, in the causative coverbal construction, the suffix *-lhe* is present in the reduplicant, as shown in (230).

(230) *Iterrtye-le* *pweleke* *ertwe-lh+**ertwe-lh**+ayle-nke*
person-ERG cow go_down-CAUS+**go_down-CAUS**+cause-PRS.SIM
'The person makes the cows go down.' (Turpin & Ross 2012:450)

The fact that only one constituent of the reduplicative construction shows case suffixation indicates that the target of reduplication is not the entire grammatical word. Furthermore, the fact that derivational morphology is reduplicated is evidence that the target is not the morphological root. Therefore, the target of the reduplication is the morphological stem.

7.3.4 Structure of Total Reduplication

I consider two hypotheses relating to the morphosyntactic structure of Total Reduplication:

1. Total Reduplication produces a Stem + Stem compound word, as in Figure 22.
2. Total Reduplication produces a phrasal construction in which a NP takes a RedP as a complement. The RedP only takes a reduplicant, as in Figure 23.

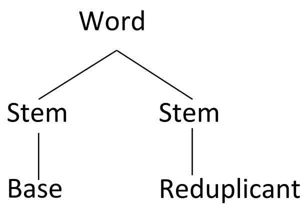

Figure 22: Structure of the Stem Compound Hypothesis of Total Reduplication.

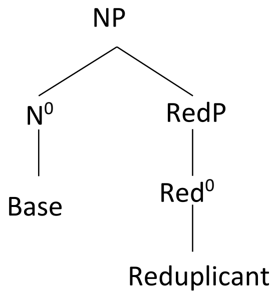

Figure 23: Structure of Phrasal Hypothesis of Total Reduplication.

I consider three facts of Total Reduplication to evaluate these hypotheses:

The Phrasal Hypothesis predicts a similar syntactic structure to that of noun – descriptor constructions. In Kaytetye a descriptor for a noun always follows the noun it modifies. Examples of these are shown in (231)-(232).

(231)	***Angke***	***kelye-le***	*mpware-nke*		
	voice	**small-INST**	do-PRS.SIM		

‘Do it with a **high-pitched** (lit. small) **voice**.’ (Turpin & Ross 2012:422)

(232)	***Ware alkenhe-l=****aparte*	*aynterrke*	*arre-nk=ape*	*atnwenthe=pe*	
	heat big-LOC=very	dry	become-PRS.SIM=EMPH	meat=TOP	

‘The meat became dry **in the great heat**.’ (Turpin & Ross 2012:139)

While Root-Root compounds are frequent in Kaytetye (e.g. *ak-arlpanke* head-plain ‘Bald’), there is no independent evidence for the occurrence of Stem + Stem compounds. The fact that there is an analogous construction to the Phrasal Hypothesis makes it more plausible than the Stem Compound Hypothesis.

In §7.3.3 I explained that the base cannot receive case suffixation in Total Reduplication constructions, while in noun-descriptor constructions case affixation in the noun is optional. This is plausibly due to the contrast between 'merged' and 'unmerged' readings of nouns and their modifiers, which were originally identified in Warlpiri, a neighbouring language of Kaytetye (Hale 1983; Nash 1986; Simpson 2005: 79). Under this analysis, there is a contrast between, for example, *aleke akelyele* 'A small dog' and *alekele akelyele* 'A dog that is small', the former being a merged reading and the latter being an unmerged reading. Under this view, Syntactic Reduplication only permits a merged construction, and therefore the base will not permit inflection with a case suffix. Further research is required to determine whether this is a feasible analysis for these constructions, and the extent to which case marking in nouns affects the syntactic structure of noun phrases.

7.4 Partial Reduplication

Partial Reduplication is a type of reduplication that occurs in the Kaytetye verbal system. Specifically, it refers to the occurrence of a reduplicant in Associated Path constructions, in which the reduplicant is the root of an auxiliary verb.

(233) *kwathe-lp+**athe**-nke*
drink-during+**RED**-PRS.SIM
'Drink on the way'

(234) *elketnhe-l+**ethne**-l+arre-rrantye*
clear-before+**RED**-before+go_along-PRS.IPFV
'clear all along'

This reduplication pattern has significant differences from the Total Reduplication pattern in §7.3, and it will be shown that it requires a different analysis.

7.4.1 Word Class and Partial Reduplication

The Partial Reduplication pattern only occurs in Associated Path constructions. For example, nominals and coverbs cannot act as the base for the reduplication process: only verb roots (including light verbs) can. For example, with the complex verb construction *lepelem+ayle-* 'do evenly' (from English 'level'), the light verb *ayle-* is reduplicated, and not the coverb *lepeleme*.

(235) *Nthewarte* *lepelem+ayle-lp+ayle-ne!*
for_that do_evenly+cause-during+RED-IMP
'Do it evenly for that one!' (Turpin & Ross 2012:449)

(236) **lepelem+ayle-lp+ele-ne*

No other productive types of reduplicant show the same pattern as the Partial Reduplication pattern.

7.4.2 Semantics

The Associated Path construction makes use of auxiliary verbs to associate path to a predicate. In some cases, the auxiliary verb is a reduplicant. These reduplicant auxiliaries appear in two different types of constructions:

1. The bipartite construction, in which the first word is a lexical verb, and the second word is a path auxiliary. The reduplicant occurs as the path auxiliary root. The reduplicant expresses a simple path configuration, with the most convenient English translation being 'on the way'. This is shown in example (237).

(237) *kwathe-lp+**athe**-nke*
drink-during+**RED**-PRS.SIM
'Drink on the way.'

2. The tripartite construction, in which the first word is a lexical verb, the second word is a distributive auxiliary, and the third word is a path auxiliary. The reduplicant occurs as the distributive auxiliary and expresses a scalar interpretation of the action

or state across the path. This is normally translated as ‘all the way’. An example of this type of construction is shown in (238).

(238) *arrtye-l+**arrtye**-l+arre-rrantye*
hold-before+**RED**-before+along-PRS.IPFV
‘Hold all the way along’

These two occurrences of the reduplicant have different semantics and are analysed as two distinct reduplicants: RED_{path} and RED_{dist}. In morphological gloss, the gloss RED is used, but in text these two types of reduplicant are distinguished.

7.4.3 Morpho-Syntactic Structure

The reduplicant RED_{path} occurs in a morpho-syntactic position associated with auxiliary verbs. Compare the following forms and see that the reduplicant occurs in the same ‘slot’ as auxiliaries such as *alpe-* ‘return’ and *ape-* ‘go’.

(239) *are-y+**alpe**-nke*
see-after+**return**-PRS.SIM
‘To see after returning.’

(240) *angke-rr+**ape**-rrane*
talk-concurrent+**go**-PRS.IPFV
‘Talking while going.’

(241) *are-lp+**are**-nke*
see-during+**RED**-PRS.SIM
‘See on the way.’

Path auxiliaries are syntactic and phonological words, and therefore are separate words from the main word of the construction (Panther & Harvey 2020; Panther et al. 2016).

The same analysis is consistent with RED_{dist}, which is inflected with a participle suffix, and so is plausibly analysed as the root of an auxiliary verb expressing distribution.

(242) *arrtye-l+**arrtye-l**+arre-rrantye*
hold-before+**RED-before**+along-PRS.IPFV
‘Hold all the way along’

The effect of this is that each reduplicant occurs as a verb root, and therefore projects its own auxiliary phrase. The phrase projected by RED$_{path}$ is a PathP, and the phrase projected by the RED$_{dist}$ is DistP. These are shown in Figure 24 & Figure 25.

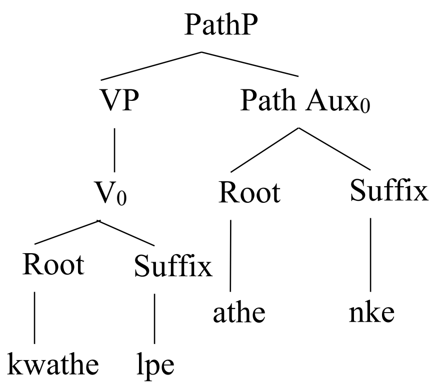

Figure 24: Morphological Reduplication of the Path Auxiliary.

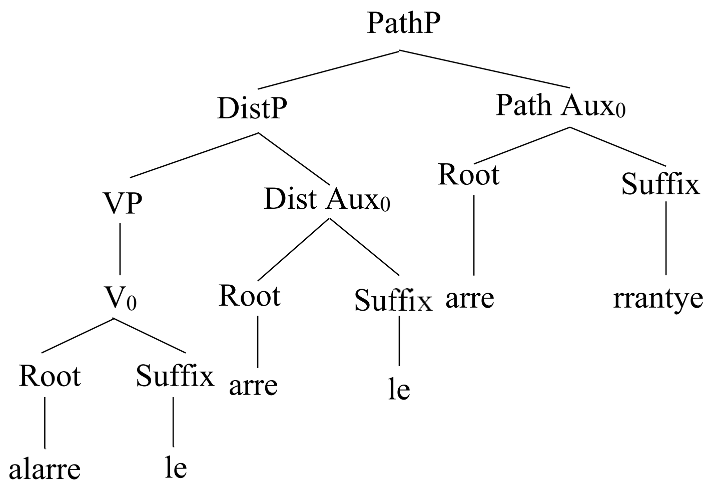

Figure 25: Morphological Reduplication of the Distributive Auxiliary

7.4.4 Phonological Form of the Verbal Reduplicant

The form of the reduplicant is shown in (243) and (244). The reduplicant is consistently disyllabic, and never begins with a consonant.

(243)	*Re*	*arntwe*	*kwathe-lp+**athe**-nhe*
	[ɹə	aɳʈwə	kwat̪ə-lp+**at̪ə**-n̪ə]
	3SG.NOM	water	drink-during+**RED**-PST.PFV
	‘He drank water on the way.’ (Turpin & Ross 2012:454)		

(244)	*Tyweretye*	*ltywerinte-l+**inte**-l+arre-rrantye*
	[cʊɻəcə	cʊɻintə-l+**intə**-l+arə-ɻancə]
	bean_tree_seed	make_hole-before+**RED**-before+along-PRS.IPFV
	‘You make holes in the bean tree seeds all the way along’ (Turpin & Ross 2012:459)	

In (243), the onset *kw* is not expressed in order to produce the reduplicant, *athe*. In the same way, the entire verb root *ltywerinte* ‘make a hole’ in (244) is truncated to its right edge: *inte*. The shape of the reduplicant is the Kaytetye minimal root, as I describe in 6.3.2. In nominals, this shape produces the ergative allomorphy pattern, in which the ergative marker is *-nge*, instead of the standard *-le*: *artweye-le* ‘man (erg.)’ but *apmwe-<u>nge</u>* ‘snake (erg.)’.

The reduplicant also undergoes verb root allomorphy. In Kaytetye, before the present imperfective suffix and the participle suffix *-le*, verb roots ending in the sequence <*ne*> receive an infixed <*t*>. This allomorphy only occurs in verb roots. Examples (245) & (246) show this infix.

(245)	*Lwempe*	*an**t**e-yane*	*mpele*
	country	live-PRS.IPFV	thus
	‘We live in country (*ane-* ‘sit; live).’ (Turpin & Ross 2012:460)		

(246)	*Lwethange*	*in**t**e-l+ayte-nye*
	part	put-before.tr+go_out-PST.PFV
	‘Put down part before going.’ (Turpin & Ross 2012: 464)	

The reduplicant receives this same infix if it matches this condition, as in (247) & (248). Note that in (247), the reduplicant occurs with the infix but the base does not.

(247)	*Ayenge=pe*	*ane-lp+an**t**e-yane*	*Hatches Creek-warl-atheke=lke*
	1SG.NOM=TOP	sit-during+RED-PRS.IPFV	PN-ALL-DIR=then
	‘Then I am sitting on my way to Hatches Creek.’ (Turpin & Ross 2012:111)		

(248) *Nhartepe* *wenheye* *arlkarl+inte-l+inte-l+arre-nke=rtame*
then that cold+cause-before+RED-before+along-PRS.SIM=FOC
kwere=pe, *akepe,* *artweye=pe.*
3SG.ACC=TOP poor man=TOP
'Then it cools him down all the way along, the poor man.'
(Turpin & Ross 2012:573)

This allomorphy procedure is not the result of a phonological procedure, because it occurs before at least two phonologically dissimilar affixes: *-le* and *-yane*. Instead, this is allomorphy associated with verb roots. Therefore, the reduplicant is a VCV form which occupies a verb root position.

7.5 Analysis of Kaytetye Reduplication

In this section I present a Minimal Reduplication analysis of Kaytetye reduplication patterns. First, I present the categories which Minimal Reduplication predicts. Following this, I present how these account for Kaytetye reduplication.

7.5.1 Minimal Reduplication

The Minimal Reduplication model is a model of reduplication proposed by Saba Kirchner (2010). Saba Kirchner identifies two types of reduplication, summarised in Table 81.

Table 81: Features of Phonological and Morphological Reduplication under Minimal Reduplication.

Reduplication Type	Origin	Area of Grammar
Morphological	Expression of a morpheme which is underspecified for segmentation	Phonology
Syntactic	Multiple spelling out of a syntactic node	Syntax

Morphological Reduplication is a situation in which a morpheme is underspecified for segmental content. A phonological procedure copies the segmental content of an adjacent morpheme. The reduplicant itself is fully specified for semantic and suprasegmental content.

Typical examples of morphological reduplication include Diyari (Karnic, South Australia), in which a derivational reduplication pattern copies the initial CV(C)CV disyllable of a root (Poser 1989: 132). Examples (249) & (250) show this procedure.

(249)	ŋapiri	→	ŋapi-ŋapiri
	father		RED-father
	'Father.'		

(250)	wakari	→	waka-wakari
	break		RED-break
	'Break.'		

Morphological reduplication may also have inflectional properties. For example in Ilocano (Philippine, Luzon), reduplication has a role in forming plural nouns (Hayes & Abad 1989: 357). The form of the reduplicant in this construction is the first permissible heavy syllable in the root. Examples (251) & (252) show cases of this.

(251)	kaldiŋ	→	kal-kaldiŋ
	goat		RED-goat
	'Goat.'		'Goats.'

(252)	jyanitor	→	jyan-jyanitor
	janitor		RED-janitor
	'Janitor.'		'Janitors.'

Under a Minimal Reduplication analysis, the reduplicant in Diyari corresponds to a disyllable: /σσ/. In the mapping of the phonological form to the surface form, segmental content is provided for the reduplicant through copying of the segments in the root adjacent to the reduplicant. The same is true for Ilocano: the reduplicant is a heavy syllable /$\sigma_{\mu\mu}$/, and the noun root provides the segmental content for the reduplicant to be realised.

Syntactic Reduplication accounts for reduplication patterns in which the reduplicant does not correspond to a phonological template (such as a disyllable or a heavy syllable) but corresponds to a morpho-syntactic unit. While Morphological Reduplication corresponds to a morpheme, Syntactic Reduplication corresponds to a word which complements the reduplicative base. Under a Minimal Reduplication analysis, all types of total reduplication are a form of Syntactic Reduplication.

Examples of Syntactic Reduplication include the formation of certain Indonesian plurals through the complete copying of a noun (Rafferty 2002). Examples (253) & (254) show this pattern.

(253)	bapak	→	bapak-bapak
	Gentleman		gentleman-gentleman
	‘Gentleman.	’	‘Gentlemen.’
(254)	saudara	→	saudara-saudara
	colleague		colleague-colleague
	‘Colleague.’		‘Colleagues.’

Minimal Reduplication analyses this pattern as the duplication of a syntactic node. Under this analysis, the reduplicant is a fusion of a morpheme (in the case of Indonesian a morpheme indicating plurality) and a copy of the syntactic node being copied. The syntactic structure of the reduplication pattern in (253) is shown in Figure 26.

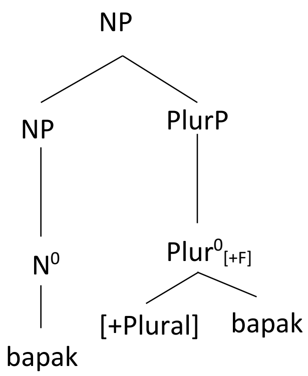

Figure 26: Syntactic Structure for Total Reduplication Pattern in Indonesian Under Minimal Reduplication Analysis.

7.5.2 Minimal Reduplication Analysis of Kaytetye

The evidence considered in this chapter shows that the form and function of total and partial reduplication in Kaytetye differ. Table 82 summarises the contrast between total and partial reduplication in Kaytetye.

Table 82: Comparison of Aspects of Total and Partial Reduplication.

Aspects of Reduplication	Total Reduplication	Partial Reduplication
Word Class of Base	Nouns, Coverbs, etc.	Verb Roots
Semantics	Scalable Interpretation of Stem	Path
Phonology	Total Copy of Stem	Minimal Root
Morpho-Syntactic Status of Reduplicant	Modifier of NP	Path Auxiliary which Takes VP as Complement

In every aspect considered in this chapter, Total Reduplication and Partial Reduplication differ from each other. Consequently, the parsimonious analysis of this fact is that there are two underlying contrasting patterns of reduplication.

The Minimal Reduplication analysis correctly predicts that the two types of reduplication in Kaytetye have different underlying structures. First, Total Reduplication corresponds to a form of Syntactic Reduplication. Under this analysis, the reduplicant in Total Reduplication is a syntactic word which heads a Reduplication Phrase (RedP) and complements the base. The syntax of this reduplication pattern is exemplified in Figure 27 for the phrase *elkwemen-elkwemene* ‘old women’.

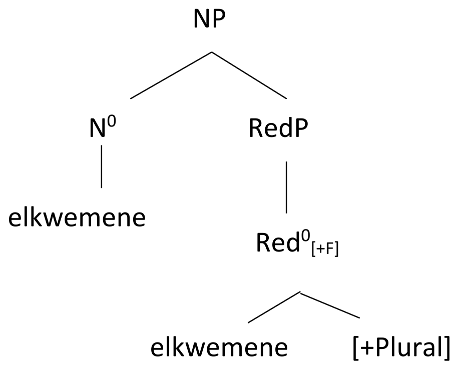

Figure 27: Syntactic Structure of the Reduplicative phrase *elkwemen-elkwemene* ‘old women’ in Kaytetye.

Partial Reduplication corresponds to Morphological Reduplication. The reduplicant corresponds to a template of the Minimal Root, which is semantically specified for a Path configuration. The verb root provides the segmental content for the reduplicant. The morpho-syntactic structure of this pattern is exemplified in Figure 28 for the phrase *kwathelp-athenhe* ‘Drank on the way.’

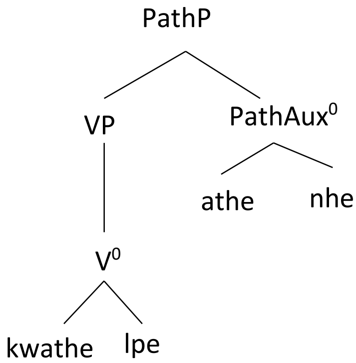

Figure 28: Morpho-Syntactic Structure of Partial Reduplication in Kaytetye.

Consequently, Minimal Reduplication accounts for the reduplication data in Kaytetye.

7.6 Conclusion

In this chapter I have presented two productive reduplication patterns in Kaytetye: Total Reduplication, and Partial Reduplication. I have shown that these types of reduplication contrast with each other in almost every aspect, including the classes which undergo these reduplications, the semantics of the reduplications, the forms of the reduplicant, and the morpho-syntactic status of the reduplicant. A *Minimal Reduplication* analysis correctly accounts for these two patterns in Kaytetye.

Chapter 8: Syllable Structure in Kaytetye

8.1 Introduction

In this chapter, I compare two analyses of Kaytetye syllable structure:

1. *VC Syllable Analysis*: The basic syllable structure of Kaytetye is of a VC shape, i.e. there are no syllable onsets.
2. *Onset Maximising Analysis*: Kaytetye syllable structure follows a standard onset maximising pattern and does not depart significantly from general typological patterns.

As necessary preliminaries I describe the concept of the syllable in typology in §8.2. In §8.3, I describe facts of Kaytetye phonology which any analysis of syllable structure in Kaytetye must account for. In §8.4, I describe the VC syllable analysis and its predictions, and in §8.5, I describe the *Onset Maximising* analysis. In §8.6, I comparatively evaluate these two theories of Kaytetye reduplication and show that the VC analysis makes significant mispredictions of Kaytetye phonology. In §8.7, I describe diachronic processes in Kaytetye which create the appearance of VC syllable structure.

8.2 Syllable Structure in Typology

The syllable is a constituent relevant to four areas: (i) prosodic structure; (ii) typological patterns; (iii) prosodic phonological patterns; (iv) articulatory phonology. In this section I describe the syllable in terms of these areas. Then I summarise the data in this section in §8.2.5 and show that CV syllables are phonologically primitive.

8.2.1 Syllable and the Prosodic Hierarchy

The classic model of the prosodic hierarchy proposes a universal set of prosodic constituents which are hierarchically ordered with each unit at Level n being properly included in a unit at Level n+1 (Hayes 1989; McCarthy & Prince 1993; Nespor & Vogel 2007; Selkirk 1980). The set of prosodic constituents of the prosodic hierarchy are shown in Figure 29.

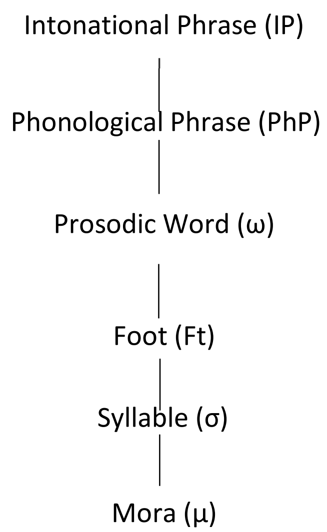

Figure 29: The Classic Model of the Prosodic Hierarchy

More recent analysis presents a more complex picture of the relationship between these levels, as well as the relationship between prosodic and syntactic constituents. Selkirk (2011) treats the prosodic constituents greater than the foot, i.e. the Prosodic Word, Phonological Phrase, and Intonational Phrase, as matching syntactic constituents. The Prosodic Word matches grammatical words, the Phonological Phrase matches phrases, and the Intonational Phrase matches clauses. Syntax permits recursion, and therefore these levels of prosodic structure are recursive. The lower levels of prosodic structure, i.e. the mora and the syllable, do not match morpho-syntactic units and therefore are not recursive. Furthermore, under this analysis, only those prosodic units which match syntactic structure are primitive (Selkirk 2011: 456). The implication of this analysis is that the syllable, along with the mora and foot, while widely attested, is not universal or primitive to phonological theory.

8.2.2 *Typology of Syllable Structure*

One role of the syllable in phonology is to organise the distribution of consonants and vowels (i.e. phonotactics). Structurally, syllables consist of an onset (an initial consonant or consonant cluster), a nucleus (normally a vowel, but in some cases a consonant), and a coda (a final consonant or consonant cluster). The onset and coda are together referred to as the syllable margins (Gordon 2016: 84-85).

Languages differ significantly with respect to the range of forms permitted, but certain patterns emerge in the typological literature. For example, in a survey of 486 world languages in the *World Atlas of Language Structures Online* (WALS), Maddieson (2013) identifies three categories of syllable structure typology:

1. *Simple syllable structure*: Languages permit no codas, and permit maximally one onset: (C)V
2. *Moderately complex syllable structure*: Languages either allow one coda consonant or permit two onset consonants. The second consonant in the onset must be a sonorant: (C)(C)V(C)
3. *Complex syllable structure*: Languages do not show the same restrictions on syllable structure as moderately complex syllable structure languages.

Maddieson lists 61 (12.6%) languages with simple syllable structure, 274 (56.4%) languages with moderately complex syllable structure, and 151 (31.1%) languages with complex syllable structure. Gordon (2016: 85) notes that onsetless syllables are more phonologically marked than syllables with onsets, and that clusters are more marked than singletons.

There are three principles or laws which constrain the form of syllables in the world's languages:

- *The Maximal Onset Principle* (Kahn 1976): This principle states that there is a preference for syllabification of segments into the onset, rather than the coda. For example, for a sequence VCV, the universal pattern is to syllabify this sequence as V.CV rather than VC.V (Gordon 2016: 85).

- *The Sonority Sequencing Principle* (SSP) (Clements 1990; Zec 1995): Sonority refers to the inherent amplitude that individual segments bear (Parker 2011). Segments are standardly analysed as occurring in a hierarchy, from less sonorant segments to more sonorant. The most frequently-cited hierarchy of segmental sonority has the following order: vowels > glides > liquids > nasals > obstruents (Clements 1990; Kenstowicz 1994; Parker 2011). Kager (1999: 267) summarises the requirements of the SSP in two statements:
    - onsets rise in sonority.
    - codas fall in sonority.

  The segments in the syllable sequence so that the nucleus is the sonority peak, and the edges of the syllable have the lowest sonority. This principle has implications for the phonology of syllabification in the world's languages. Maddieson (2013) provides the example of Darai (Indo-Aryan), which permits complex onsets, including stop + sonorant onsets. However, Darai does not permit sonorant + stop onsets.
- *Syllable Contact Law* (SCL) (Hooper 1976; Murray & Vennemann 1983; Seo 2011): SCL relates to the relative sonority of adjacent, heterosyllabic segments. Specifically, it states that across a syllable boundary, falling sonority consonant clusters are less marked than rising sonority clusters. For example, under SCL, a sequence [ɐ**n.t**ə] is less marked than a sequence [ɐ**t.n**ə].

8.2.3 Syllable in Prosodic Phonological Patterns

Whether the syllable is a phonologically active construct in a language can be tested by evaluating the role that the syllable plays in phonological patterns. Beyond the prosodic (§8.2.1) and typological (§8.2.2) aspects of the syllable, at least two other phonological patterns also refer to syllable structure:

1. Reduplication. For example in Hawaiian, a syllable is one of many possible reduplicative targets (Alderete & MacMillan 2015: 6), as in (255).

(255) **ha**-haki
'To break.'

2. Simplification and 'emergence of the unmarked' effects. In Nookta, reduplicants are specified for CV (Stonham 1990: 19), as in (256): This ensures a less marked syllable structure in the reduplicant. This reduplication pattern is analysable if the phonology refers to the internal structure of the syllable (i.e. the coda) when reduplicating the syllable.

(256) **či**-čims-ʻiːħ
'Hunting bear.'

8.2.4 Syllable in Articulatory Phonology

One of the focuses of research into articulatory gestures has been on the relationship between these gestures and syllable structure (Browman & Goldstein 1988, 1992a, 1992b; Goldstein & Fowler 2003; Ohala et al. 1986). This research shows that there are asymmetries in the articulation of syllable onsets and syllable codas.

An example of this type of asymmetry is in gestural timing. Relevant to this discussion is the notion of the 'C-Center' (i.e. 'Consonant Center') (Browman & Goldstein 1988, 2000; Byrd 1995; Nam & Saltzman 2003) The C-Center is a pattern of gestural coordination in the syllable onset, by which the mid-point of the onset is the beginning of the articulation of the syllable nucleus, no matter how many consonants occur in the onset. In other words, the gestural coordination of the consonants in the onset is in competition with the coordination of the entire onset with the nucleus, so that adding or removing onset consonants will change the articulation of the onset in a way that preserves the timing of the onset in relation to the nucleus (Nam & Saltzman 2003: 2253).

In contrast to onsets and syllable nuclei, there is no corresponding coordination in the timing of the nucleus and the coda (Browman & Goldstein 1988: 96). Instead, the segments in the coda are organised locally. The research on C-Centers has focussed on American English, although research into other languages largely confirms the findings that onsets temporally coordinate with the nucleus in a way that codas do not (Gao 2009; Goldstein et al. 2007; Kühnert et al. 2006).

Other evidence of the onset-coda asymmetries comes from the reduction of articulatory complexity in the coda position (Browman & Goldstein 1995; Recasens & Farnetani 1994; Scobbie et al. 2015; Sproat & Fujimura 1993) Browman and Goldstein (1995) identify to two examples of this: (i) the timing of the gestures associated with the phonemes /m/ and /l/; (ii) the reduction of consonantal gestures. In relation to the first example, the articulation of /m/ involves two gestures: the lowering of the velum, and lip closure. In onset position, velum lowering coincides with the end of lip closure, while in coda position, velum lowering coincides with the beginning of lip closure. The articulation of /l/ involves a tongue tip gesture and a tongue dorsum gesture. In onset position, these two gestures are synchronous, while in coda position the dorsal gesture significantly precedes the tongue tip gesture. Browman and Goldstein (1995: 25) observe that for both /m/ and /l/, it is the gesture which produces a wider constriction (i.e. the velum lowering and the dorsal gesture) which precedes the gesture that produces a narrower constriction (i.e. the lip closure and the tongue tip gesture) in the coda. These two gestures are synchronous in onset position.

In relation to the second example, Browman and Goldstein (1995: 26) observe that there is a general reduction in the positioning of articulators in final position. For example, the tongue tip height for onset /l/ is higher than that of coda /l/ (Browman & Goldstein 1995: 27). This reduction procedure also occurs with other articulators, including the lips and the tongue dorsum (Browman & Goldstein 1995: 29)

Both these examples show a reduction in the articulatory complexity of coda consonants. In the first example, gestures which are synchronous in onset position become asynchronous in the coda, reducing the complexity of the coordination of the gestures. In the second example, the articulators show a reduction in their positioning in coda position.

The universality of the articulatory asymmetry between onsets and codas has been challenged in relation to three Australian languages: (i) Central Arrernte (Arandic, Central Australia); (ii) Yanyuwa (Ngarnic, Gulf of Carpenteria); (iii) Yindjibarndi (Ngayardic, Pilbara). Tabain et al. (2004) show that in English speaker data, the distribution of F2 & F3 measurements on the consonant and locus equation measures patterns differently for VC and CV syllables, while for the three Australian languages there is parity in these measures for these syllable types. Tabain et al. interpret these results as showing that the coda position has phonetic prominence equal to the onset in Central Arrernte, while this is not true for English.

Tabain et al. propose that the reason for this pattern is the high number of places of articulation contrasts in the Australian languages. Under this analysis, the coda position must have parity with the onset in these measures to allow for phonetic cues for all six places of articulation. Therefore, under this analysis, this parity of measurements is not a challenge to onset-coda asymmetry, but a product of the phonemic inventory.

8.2.5 CV Syllable as a Phonological Primitive

In this section I have described aspects of the syllable in phonology: (i) the role of the syllable in prosodic structure; (ii) the syllable in language typology; (iii) the syllable in prosodic phonology; (iv) the syllable in articulatory phonology. The data in this section shows that CV syllable structure is a phonologically privileged configuration compared to VC syllable structure, and is phonologically primitive. This is in four areas:

1. The data in §8.2.2 shows that languages with simple syllable structure permit onsets, but they do not permit codas.
2. The Onset-Maximising principle described in §8.2.2 shows that syllabification into the onset is preferred to syllabification into the coda in language typology.
3. Emergence of the Unmarked effects described in §8.2.3 show that in phonological patterns codas are phonologically marked while onsets are not.
4. The evidence of articulatory gestures in §8.2.4 shows asymmetries between the onset and the coda.

Consequently, an analysis of a phonological system which makes use of VC syllable structure is typologically non-standard and requires motivation for such a structure. The evidence is that the default analysis of a phonological system is that it possesses an onset-maximising syllable structure.

8.3 Kaytetye Phonological Data

There are four aspects of Kaytetye phonology which any analysis of syllable structure must account for:

1. The distribution of schwa
2. Stress
3. Reduplication
4. The realisation of final vowels

In this section I provide an overview of these aspects.

8.3.1 The Distribution of Schwa

I present two aspects of the distribution of schwa /ə/ in Kaytetye: (i) phonetic evidence of its independence from other vowel phonemes; (ii) regressive palatal assimilation in relation to schwa.

Phonetics of Schwa

I showed in Chapter 3 that /ə/ has an independent articulatory target. Further evidence for the phonological status of schwa comes out of research by (San 2016). San carried out a k-means clustering analysis on the mean F1 and F2 values of vowel transcriptions to determine the optimal grouping of vowels in the *kPhon* vowel transcriptions data. The results of his analysis showed four groupings: (i) a low vowel /ɐ/; (ii) a round vowel /u/; (iii) a front vowel /i/; (iv) a central vowel /ə/. Multiple one-way ANOVAs confirmed these groupings, and Tukey's HSD showed a significant difference in F2 across all four groups (San 2016: 23). This shows that a central vowel /ə/ can be identified as having an independent articulatory target.

Regressive Palatal Assimilation

There is a contrast between /ɐ/ & /i/ prior to palatal segments, as shown in examples (257) & (258).

(257) /**ɐ**cə/
‘I.’

(258) /ɐɻ**i**cə/
‘Shoulder.’

There is no evidence that /ə/ occurs prior to palatal segments. In instances where /ə/ occurs prior to a palatal across a morpheme boundary, for example with the clitic =*tyampe*, it is realised as a high front vowel. This is shown in example (259).

(259) *Arwel**e**=tyamp=awe*
/ɐɻul**ə**=cɐmpə=ɐwə/ → [ɐɻʊl**i**=cɐmp=ɐo]
wood=and =EXCL
‘Wood and such things!’ (181014AmyN_05 13.936)

This shows that regressive palatalisation, though the application of the phonological rule /ə/ → [i] / _$C_{[palatal]}$, is a productive process in Kaytetye.

Phonetic data shows that palatal consonants occur in initial position without a preceding vowel. Examples from the *kPhon* dataset are shown in examples (260) & (261). This distribution is relevant to a prediction of the VC analysis which I discuss further in §8.6.1.

(260) [cɪʎəcɪʎə]
‘Tripe.’

(261) [ɲicəp]
‘Cubbyhouse.’

8.3.2 Stress

I described the stress pattern of Kaytetye in §3.5.1. The standard surface pattern of Kaytetye stress is that the first vowel preceded by a consonant is stressed. Examples (262) & (263) show this pattern.

(262) *Aleke*
[ɐˈ**lə**.kə]
‘Dog.’

(263) *Kayte*
[ˈ**kɐi**.tə]
'Grub.'

As discussed in §6.3.3.1, there is no evidence for feet in Kaytetye. This is because: (i) Kaytetye does not have secondary stress on monomorphemic roots; (ii) All facts of Kaytetye stress are accounted for without appealing to the existence of feet. Therefore, any analysis which proposes that Kaytetye has metrical feet proposes a construct for which there is no language-internal evidence.

8.3.3 Reduplication

I examined the partial reduplication pattern in §7.4. This pattern partially reduplicates the verbal base. Representative examples of this pattern are shown in examples (264) & (265).

(264)	*Kwathe-nke*	→	*Kwathe-lp+**athe**-nke*
	[kwɐt̪ə-nkə]		[kwɐt̪ə-lp+**ɐt̪ə**-nkə]
	drink-PRS.SIM		drink-during+**RED**-PRS.SIM
	'Drink.'		'Drink on the way.'
(265)	*Alarre-nke*	→	*Alarre-lp+**arre**-nke*
	[ɐlɐrə-nkə]		[ɐlɐrə-lp+**ɐrə**-nkə]
	hit-PRS.SIM		hit-during+**RED**-PRS.SIM
	'Hit.'		'Hit on the way.'

In instances where a verb root ends with a round vowel, this round vowel occurs in the reduplicant. Patterns such as those in example (266) occur.

(266) *Akwe-lp+akwe-nhe*
[ɐkʊ-lp+ɐkʊ-n̪ə]
open-during+RED-PST.PFV
'Opened on the way.'

Phonetic evidence in §4.3.1 shows that in reduplicants, initial round vowels occur when it corresponds to a round vowel in the verb root. In example (267), the initial [ʊ] vowel corresponds to the first vowel in the verb root, which is [ʊ].

(267) *Lyweke-lp+eke-nhe*
[ʎʊkə-lp+**ʊ**kə-n̪ə]
light-during+RED-PST.PFV
'Lit fires on the way.'

8.3.4 Final Vowels

In Kaytetye, vowels occur in final position in: (i) citation form; (ii) utterance-final position. Examples of these are shown in examples (268) & (269) from the *kPhon* transcriptions.

(268) [ɪpmer**ə**]
'Frost.'

(269) [ɪlp**eɪ**]
'Creek.'

Final vowels frequently do not occur in the surface form. Of the 9,761 final vowels in the *Phonological Correspondence* dataset, 6,213 (63.7%) are not realised. Examples (270) & (271) show transcriptions of the same headwords with and without the final vowel.

(270) [ɐkɐɭpɐnk**ə**] ~ [ɐkɐɭp̬ɐnk]
'Bald.'

(271) [æɪtnˈɛŋæɪtnɛŋ**ə**] ~ [ejtnəŋejtnəŋ]
'Hunters.'

If there is a final phonetic long vowel or diphthong, corresponding to an underlying vowel-glide-vowel sequence, then this final vowel is obligatory, as in (272) & (273).

(272) /ɐʈwijə/ → [aʈwiː] ~ ̇*[aʈw]
'Man.'

(273) /ilpɐjə/ → [ɪlpeɪ] ~ *[ɪlp]
'Creek.'

Final vowels receive stress when they are the first vowel preceded by a consonant in the root. This is the case for minimal roots, as examples (274) & (275) show.

(274) *Ake*
[ɐˈ**kɐ**]
'Head.'

(275) *Akwe*
[ɐˈ**kwɐ**]
'Arm.'

8.4 The VC Syllable Analysis

The VC analysis proposes that the phonological forms of all morphemes consist of sequences of VC syllables. Examples of roots and their predicted phonological forms under the VC syllable analysis are shown in Table 83.

Table 83: The VC Syllable Analysis of a Selection of Roots in Kaytetye

Orthography	**Phonetic Realisation**	***VC* Analysis**
Aleke	[ɐləkə]	/ɐl.ək/
Kayte	[kaitə]	/ək.ɐit/
Artweye	[ɐʈwiː]	/ɐʈw.ij/
Ilpe	[ilpɐ]	/ilp/

Breen (1990b) first proposed the VC syllable analysis for Central Arrernte, an Arandic language related to Kaytetye. In §8.4.1 I provide an overview of the argumentation Breen & Pensalfini provide for justifying a VC analysis in Central Arrernte. In §8.4.2 I describe the VC analysis of Kaytetye, and how it accounts for patterns in Kaytetye phonology. In this chapter I primarily address the applications of this analysis for Kaytetye, rather than addressing the VC analysis of Central Arrernte. See Kiparsky (2018) and Topintzi and Nevins (2017) for critiques of the areas described in §8.4.1 which do not occur in Kaytetye, and therefore are not evaluated in this chapter, especially the 'Rabbit Talk' language game and verbal allomorphy. Note also that their analyses of reduplication and the status of the final vowel differ from those in this thesis (Kiparsky 2018: 16-17; Topintzi & Nevins 2017: 4-5, 17-20).

8.4.1 VC Analysis of Central Arrernte

Breen and Pensalfini (1999) identify six areas in Central Arrernte as relevant to VC syllabification:

1. The Distribution of Schwa
2. Stress
3. Quantity-Sensitive Verbal Allomorphy
4. Rabbit Talk, a Language Game
5. Reduplication
6. The Occurrence of Final Vowels

For each area I describe how a VC syllable analysis accounts for the pattern.

8.4.1.1 The Distribution of Schwa

In the analysis of Breen and Pensalfini (1999: 2-3), most words in Central Arrernte begin in the vowels /a/ or /i/, in which /a/-initial words correspond to approximately half of the lexicon and /i/-initial words are 15%. Words may begin phonetically with [u], and this is analysed as being underlyingly /ə/ / _C^w. This is approximately 10% of the lexicon. The remaining 25% of the lexicon is orthographically consonant-initial, and there are no orthographic words beginning with schwa.

The VC analysis proposes that this 25% of the lexicon which is orthographically consonant-initial has an underlying initial schwa. This schwa is not realised in citation form, but surfaces in medial position. In example (276) is the phonetic form of the word *mpwarem* ‘is making’ with its predicted phonological form (Breen & Pensalfini 1999: 3). In example (277) from Breen and Pensalfini (1999: 2), the initial vowel in the pronoun /əŋkʷin̪/ is preserved in the phonetic form.

(276) /əmpʷ.ɐɻ.əm/ → [mpwɐɻəm]
‘Is making.’

(277) /amp əŋkʷiṉ/ → [amb#əŋkwiṉ][27]
child your
'Your child.'

Breen and Pensalfini (1999: 4) propose that the Central Arrernte schwa is a 'placeless' vowel, which is not specified for any features apart from being [-consonantal]. Under this proposal, the place of schwa is determined by the phonetic context of the vowel. In utterance-medial position, initial schwa is in an inter-consonantal position and therefore has a place specification. In citation form, in which case the initial schwa is utterance-initial, there is insufficient place information for the vowel, and therefore it is deleted.

8.4.1.2 Stress

The first vowel preceded by an onset in Central Arrernte receives stress (Henderson 2013: 215). This stress pattern is identical to Kaytetye and is shown in (278)-(279).

(278) [ɐmˈbə.ɻə] 'knee'

(279) [ˈt̪ə.mə] 'poke'

Under the VC analysis, this pattern results from the assignment of stress to the second syllable in the word (Breen & Pensalfini 1999: 3). As a metrical analysis, this means that words in Central Arrernte begin with an iamb. These are shown in examples (280) & (281).

(280) /$_{ft}$(ɐmbˈəɻ)$_{ft}$/ → [ɐmˈbəɻə] 'knee'

(281) /$_{ft}$(ət̪ˈəm)$_{ft}$/ → [ˈt̪əmə] 'poke'

8.4.1.3 Quantity-Sensitive Allomorphy

In Central Arrernte there is a verbal suffix which indicates plurality of subject. There are two forms that this suffix can take: *-ewarr* and *-erir* (Breen & Pensalfini 1999: 3-4).

[27] The IPA of the phonetic form is simplified in this example, and a predicted word boundary under the VC analysis is included.

(282) *mpwar-**ewar***
do-PL
'(many) do.'

(283) *angk-**erir***
talk-PL
'(many) talk.'

Breen and Pensalfini (1999: 4) analyse the *-erir* allomorph as selecting monosyllabic verb roots. The root *angk-* /ɐŋk-/, as a monosyllable, receives the *-erir* suffix. The root *mpwar-* /əmp^{w}.ɐɻ-/ is a disyllable and so it takes the standard suffix *-ewar*.

8.4.1.4 Reduplication

Attenuative/inceptive constructions in Central Arrernte are formed through reduplication with the addition of a suffix [-əlp] to the reduplicant (Breen & Pensalfini 1999: 7). The reduplication pattern reduplicates from the verb root. In (284), the verb root is totally reduplicated, while in (285) the verb root is partially reduplicated.

(284)	/ɐɻ-/ see 'See.'	→	[ɐɻ-əm] see-PRS 'See.'	→	[**ɐɻ**əlp-ɐɻ-əm] ATTN-see-PRS 'Start to look.'
(285)	/əmp^{w}.ɐɻ-/ do 'Do.'	→	[mpwɐɻ-əm] do-PRS 'Do.'	→	[**mpw**əlp-əmpwɐɻ-əm] ATTN-do-PRS 'Start to do.'

Under the VC analysis, this pattern is analysed as selecting the initial syllable of the verb. For the root /ɐɻ-/ this is total reduplication. For the verb /əmp^{w}.ɐɻ-/, the deletion of the initial vowel produces the reduplicant [mpw].

Breen and Pensalfini (1999: 12-19) point out that an onset-maximising analysis makes incorrect predictions in relation to reduplication. For example, the reduplication of the initial syllable under an onset-maximising analysis as in (286) & (287) does not produce the correct result.

(286) /ɐɻə-/ → [ɐ.ɻə-mə] → *[**ɐ**lp-ɐ.ɻə-mə]
see see-PRS ATTN-see-PRS
'See.' 'See.' 'Start to look.'

(287) /mp^{w}ɐɻə-/ → [mpwɐ.ɻə-mə] → *[**mpwɐ**lpə-mpwɐ.ɻə-mə]
do do-PRS ATTN-do-PRS
'Do.' 'Do.' 'Start to do.'

8.4.1.5 Rabbit Talk

Breen and Pensalfini (1999: 7-8) cite a language game called 'Rabbit Talk'. In this language game, phonological content from the beginning of the word is placed at the end of the word. With 'VC' words, an əj- affix is added to the word. The following examples exemplify this pattern.

(288) əmən̢ → ən̢əm 'Plant food.'

(289) ən̪t̪əm → əmən̪t̪ 'Giving.'

(290) ɐlpəcək → əcəkɐlp 'Go back.'

(291) iŋk → əjiŋk 'Foot.'

Breen and Pensalfini (1999) observe that the correct Rabbit Talk form is achieved by selecting the initial VC syllable then placing it at the end of the word. If the word is VC, then a syllable [əj] is placed before the word: **əm**.ən̢ → ən̢.**əm**, **ən̪t̪**.əm → əm.**ən̪t̪**, **ɐlp**.əc.ək → əc.ək.**ɐlp**, **iŋk** → əj.**iŋk**.

8.4.1.6 Final Vowels

In Central Arrernte if a word is in citation form or utterance-final position, it is frequently realised with a final schwa or low vowel. If a word is in utterance-medial position, it is also standardly followed by vowel. For example, in (292), the word /ɐmp/ 'child' is realised with a final low vowel. In (293), the same word is followed by a schwa.

(292) /ɐmp/ → [ɐmpɐ] 'Child.'

(293) /amp əŋkʷin̪/ → [ambəŋkwin̪][28]
child your
'Your child.'

The VC analysis does not predict final vowels because they entail a phonetic V or CV syllable. Breen & Pensalfini account for this through post-lexical phonology. Breen and Pensalfini (1999: 2) propose that these vowels do not correspond to a lexically specified vowel. Instead, they are epenthesised to the end of words in utterance-final position. Under this analysis, this is a variable post-lexical rule in which a word at the end of an utterance may end with a final schwa.

8.4.2 VC Analysis of Kaytetye

In this section I describe how the VC analysis accounts for the phonological data in §8.3. In Table 84 is a summary of the points in this section.

Table 84: Summary of the Account the VC Analysis Provides for Four Areas of Kaytetye Phonology

Kaytetye Phonology	**VC Analysis**
The Distribution of Schwa	Words that are consonant-initial in citation form have initial /ə/; all morphemes are vowel-initial.
Stress	Kaytetye stress is iambic.
Reduplication	Partial reduplication reduplicates a VC syllable.
Occurrence of Final Vowels	Final vowels are epenthetic.

8.4.2.1 The Distribution of Schwa

Under the VC analysis, there are no consonant-initial roots. Roots that are consonant-initial in citation form occur with an initial schwa. Examples of this are shown in (294) & (295).

(294) /ək.ɐit/ → [kɐitə]
'Grub.'

[28] The IPA of the phonetic form is simplified in this example.

(295) /əmpw/ → [mpwɐ]
'Urine.'

As in Breen & Pensalfini's analysis of Central Arrernte, schwa is analysed as being specified only for [-consonantal]. Under this analysis, schwa does not have sufficient context for place when it is not preceded by a consonant.

8.4.2.2 Stress

The analysis of Kaytetye stress that the VC analysis proposes is identical to that of Central Arrernte in §8.4.1.2. That is, Kaytetye stress is iambic.

(296) *Aleke*
/$_{ft}$(ɐlˈək)$_{ft}$/
'Dog'

(297) *Kaytetye*
/$_{ft}$(əkˈɐit)$_{ft}$ic/
'Kaytetye.'

8.4.2.3 Reduplication

The VC analysis accounts for Kaytetye partial reduplication by proposing that the reduplicant is the final monosyllable of the verb root. This is shown in (298).

(298) *Kwathe-lp+athe-nke*
/əkw.**ɐt̪**-əlp+RED-ənk/ → [kw**ɐt̪**-əlp+**at̪-**ənkə]
drink-during+RED-PRS.SIM

8.4.2.4 Occurrence of Final Vowels

Under the VC analysis, all words in citation form and at the end of utterances may occur with a final epenthetic schwa. This is shown in examples (299) & (300).

(299) *Aleke*
/ɐl.ək/ → [ɐlək**ə**]

(300) *Kayte*
/ək.ɐit/ → [kɐit**ə**]

8.5 The Onset Maximising Analysis

The *Onset Maximising* analysis proposes that Kaytetye has standard syllabification, in which consonants may be syllabified into the onset or the coda. An onset-maximising analysis for Arrernte syllable structure was proposed by Kiparsky (2018: 14-17) and Topintzi and Nevins (2017). A comparison between the VC analysis and the *Onset Maximising* analysis of the syllabification of a sample of roots is given in Table 85.

Table 85: Comparison of VC and Onset Maximising Analyses for a Sample of Roots.

Orthography	**Phonetic Realisation**	**VC Analysis**	**Onset Maximising Analysis**
Aleke	[ɐləkə]	/ɐl.ək/	/ɐ.lə.kə/
Kayte	[kaitə]	/ək.ɐit/	/kɐi.tə/
Artweye	[ɐʈwiː]	/ɐʈw.ij/	/ɐ.ʈwi.jə/
Ilpe	[ilpɐ]	/ilp/	/il.pə/

The *Onset Maximising* analysis does not provide a unified account of the facts of Kaytetye phonology in §8.3. In this section I present analyses of Kaytetye phonology which are consistent with an onset-maximising analysis. A summary of these analyses is given in Table 86.

Table 86: The Predictions of the Onset Maximising Analysis for Four Areas of Kaytetye Phonology

Phonological Data	**Onset Maximising Analysis**
The Distribution of Schwa	(i) Schwa may or may not be specified for place; (ii) Morphemes that are consonant-initial in citation form are phonologically consonant-initial
Stress	Stress is onset-sensitive
Reduplication	The reduplicant is the minimal root
Final Vowels	Final vowels are lexically specified

8.5.1 The Distribution of Schwa

The *Onset Maximising* analysis does not make any specific predictions relating to schwa. The *Onset Maximising* analysis is consistent with an analysis in which schwa is placeless and an analysis in which it has place specifications. In §3.2.2.3 I showed that there is phonetic evidence that schwa is a mid-central vowel /ə/, and is not unspecified for place.

8.5.2 Stress

The *Onset Maximising* analysis accounts for stress through an onset-sensitive stress analysis. Under this analysis, the first vowel with an onset receives stress (Gordon 2005). This analysis does not stipulate the existence of feet. The stress assignment pattern under the *Onset Maximising* analysis is shown in (301) & (302).

(301) *Aleke*
/ɐləkə/ → [ɐˈ**lə.**kə]
'Dog.'

(302) *Kayte*
/kɐitə/ → [ˈ**kɐi**.tə]
'Grub.'

Gordon (2005) motivates this pattern through phonetic analysis. He identifies languages which show onset sensitivity to stress, including Central Arrernte, Pirahã (Mura, Amazon), and Banawá (Arawan, Amazon). Kiparsky (2018: 15-16) provides several other examples of languages in which onsetless syllables contrast with syllables with onsets prosodically, including Iowa-Ota (Siouan, Great Plains), Finnish (Uralic, Finland), and KiKerewe.(Bantu, Tanzania).

Gordon identifies that onsets provide a perceptual boost to the following vowel. Onsets are less sonorous than vowels and provide a 'quiet phase' online speech. This 'quiet phase' allows the auditory system to recover between exposures to comparatively intense vowels. This allows a vowel following a consonant to receive an auditory boost. In comparison, a vowel adjacent to another vowel will not receive a similar boost (Gordon 2005: 9). In onset-sensitive languages like Kaytetye, this perception of prominence leads to the association of this boost to stress.

8.5.3 Reduplication

In Chapter 6 I identified the category of the 'minimal root', a root form of the shape VCV. Under the *Onset Maximising* analysis, the form of the reduplicant corresponds to the minimal root, which copies the final VCV of the verb root for its segmental content.

(303) *Kwathe-lp+athe-nke*
/kw**ɐt̪ə**-lp+RED-nkə/ → [kw**ɐt̪ə**-lp+**at̪ə**-nkə]
drink-during+RED-PRS.SIM
'Drink on the way.'

8.5.4 Occurrence of Final Vowels

The *Onset Maximising* analysis predicts that all morphemes in Kaytetye end in a vowel. There is a phonemic contrast between two vowels in final position: /ə/ and /u/. The optional occurrence of these vowels in the phonetic data is the result of phonetic weakening of these vowels in utterance-final position (Myers & Hansen 2007). In utterance-final position, the pressure difference across the glottis is at its lowest, and the vocal folds widen (Löfqvist 1975; Myers & Padgett 2014; Ohala 1974; Smith 1979). The resultant poor signal quality motivates vowel reduction and deletion in utterance-final position.

8.6 Comparative Evaluation of the VC and Onset Maximising Analyses in Kaytetye

In this section I compare the predictions of the VC analysis and the *Onset Maximising* analysis. I compare these models in terms of the four areas of Kaytetye phonology described in §8.3. Table 87 summarises these areas, the predictions of the VC analysis, and an alternative proposal under the *Onset Maximising* analysis.

Table 87: Summary of Comparison of VC and Onset Maximising Analyses with respect to Four Areas of Kaytetye Phonology.

Phonological Topic	VC Analysis	Onset Maximising Analysis
The Distribution of schwa	Schwa has no place specification	Schwa may or may not be specified for place
Stress	Footing is iambic and initial schwa is deleted.	Stress is onset-sensitive
Reduplication	Partial reduplication reduplicates a VC syllable	Partial reduplication reduplicates a Minimal Root
The Final Vowel	The final vowel is the result of post-lexical epenthesis	The final vowel is lexically specified

8.6.1 The Distribution of Schwa

I summarise the data relating to schwa and the predictions of the VC and *Onset Maximising* analyses in Table 88.

Table 88: Summary of Data Relating to Schwa in Comparison to the Predictions of the VC and Onset Maximising Analyses.

Observation	VC Analysis	Onset Maximising Analysis
Schwa has independently targeted F1 & F2 Values.	Predicts schwa will show no evidence of an articulatory target.	No predictions relating to the place specifications of schwa.
Palatal consonants occur in initial position without a preceding vowel	Palatal consonants never occur in initial position and must always be preceded by a vowel.	Palatal consonants may occur in initial position.

Schwa has an Independent Articulatory Target: The VC analysis predicts that schwa shows no evidence of an articulatory target. The phonetic data shows that schwa has an independent articulatory target which contrasts with three other vowel qualities. This fact is not predicted by the VC analysis. This fact is consistent with the *Onset Maximising* analysis, which makes no predictions relating to the status of schwa.

Regressive Palatal Assimilation: In §8.3.1 I showed that schwa prior to a palatal consonant is raised to a high front vowel: /ə/ → [i] / _$C_{[palatal]}$. This shows that the position preceding a palatal consonant is sufficient to provide place information for the preceding schwa. The VC analysis predicts that roots that are consonant-initial in citation form begin with a schwa. Consequently, it predicts that there will be no forms which begin with a palatal, because an initial /#əC$_{[palatal]}$/ will always be realised as [#iC$_{[palatal]}$] The phonetic data shows that there are initial palatal consonants. Therefore, the VC analysis is inconsistent with this observation. The *Onset Maximising* analysis proposes a typologically standard syllable structure, in which onsets occur, and therefore palatal segments are predicted to occur in initial position. This is consistent with the data.

Consequently, the VC analysis makes mispredictions of the phonological data relating to schwa.

8.6.2 Stress

I summarise the phonological data relating to stress in §8.3.2 and the predictions of the VC and *Onset Maximising* analyses in Table 89.

Table 89: Summary of Data Relating to Stress, and the Predictions of the VC Analysis and the Onset Maximising Analysis.

Observation	**VC Analysis**	**Onset Maximising Analysis**
There are no feet in Kaytetye	Stress is accounted for by iambs, therefore Kaytetye has feet	Stress selects the first vowel preceded by a consonant, therefore Kaytetye does not require feet to account for stress
Stress occurs on the first syllable in consonant-initial forms	In consonant-initial forms, stress is predicted to occur on the second syllable	Stress is predicted to occur on the first syllable in consonant-initial forms

Lack of Feet: The VC analysis predicts that the stress pattern in Kaytetye is the result of iambs. There is no independent evidence for feet in Kaytetye, and proposing their existence adds extra theoretical machinery for what is an otherwise salient stress pattern: stress the first syllable with an onset. The *Onset Maximising* analysis does not assume the existence of feet and proposes this onset sensitive stress analysis which is motivated by the phonetics of post-consonantal vowels. Therefore, the *Onset Maximising* analysis provides a motivated account, while the VC analysis proposes a theoretical entity which is not required by the data.

Onset-Sensitive Stress: In standard phonological analysis, prosodic structure is assigned through phonological derivation, rather than occurring in the phonological form (Selkirk 2011: 436). For example in Optimality Theory, prosodic structure is assigned through input-output constraints, and does not occur in the phonological input (Kager 2007: 206). Under the VC analysis, there are iambic feet and schwa is elided in initial position. This elided vowel is not incorporated into prosodic structure in the phonetic output, because it is not part of the output. Therefore, this predicts stress shift in consonant-initial forms, and therefore stress will always fall on the second syllable. The predicted stress pattern is shown in examples (304) & (305).

(304) *Aleke*
/ɐl.ək/ → [$_{\text{ft}}$(ɐˈlə)$_{\text{ft}}$kə]
'Dog'

(305) *Kaytetye*
/ək.ɐit.ic/ → [$_{\text{ft}}$(kɐiˈ**ti**)$_{\text{ft}}$cə]
'Kaytetye.'

There are analyses which propose stress on underlying forms, for example in cyclic stress patterns (Halle & Kenstowicz 1991). However, these are needlessly baroque in light of the surface pattern of Kaytetye stress, which is that the first syllable with an onset is selected for stress. The fact that the iambic analysis is not readily apparent in the surface forms means that the alternative analysis, i.e. the onset sensitive stress analysis, is the more plausible alternative.

8.6.3 Reduplication

I summarise the phonological data relating to reduplication in §8.3.3 and the predictions of the VC and *Onset Maximising* analyses in Table 90.

Table 90: Summary of Data Relating to Reduplication, and the Predictions of the VC Analysis and the Onset Maximising Analysis.

Observation	**VC Analysis**	**Onset Maximising Analysis**
Root-final round vowels are reduplicated	The reduplicant is a VC monosyllable	The reduplicant is a VCV minimal root.

A morphological parse of the partial reduplication pattern under the VC analysis is shown in example (306). The vowel following the VC reduplicant belongs to the inflectional suffix and is highlighted in this example.

(306) *Kwathe-lp+athe-nhe*
/əkw.ɐt̪-əlp+ɐt̪-ən̪/
drink-during+RED-PST.PFV
'Drank on the way.'

The fact that the vowel is /ə/ specifies it as the initial vowel of the suffix *-nhe* under this analysis. Therefore, for all instances of the suffix *-nhe*, the VC analysis predicts that this vowel will always be /ə/, because it is phonologically specified by the suffix.

The data in §8.3.3 shows that round vowels are reduplicated in this position with the same *-nhe* suffix, and this corresponds to final round vowels in the verb root. Therefore, whether the root-final vowel is /ə/ or /u/ depends on the verb root, rather than the suffix. Under a VC analysis the vowel is specified in the suffix as /ə/, rather than in the root. The fact that this variation exists between a reduplicated /ə/ or /u/ is inconsistent with a VC reduplication analysis. A VC analysis could account for this pattern through the *Labialised Consonant* hypothesis, in which there is no round vowel /u/ but the round vowel instead corresponds to a schwa preceded by a labialised consonant. I showed in Chapter 4 that the *Labialised Consonant* hypothesis does not account for the rounding data in Kaytetye. The VCV minimal root analysis does not have these problems. Therefore, the data supports an *Onset Maximising* analysis rather than a VC analysis.

8.6.4 Occurrence of Final Vowels

I summarise the phonological data relating to the final vowel in §8.3.4 and the predictions of the VC and *Onset Maximising* analyses in Table 91.

Table 91: Summary of Data Relating to the Final Vowel, and the Predictions of the VC Analysis and the Onset Maximising Analysis in Relation to Each Point.

Observation	**VC Analysis**	**Onset Maximising Analysis**
There is a phonemic contrast between /ə/ and /u/ in final position	The final vowel is epenthetic, therefore there is no contrast in vowel quality	The final vowel is lexically specified, therefore there is a phonemic contrast in final position

The VC analysis predicts that utterance-final vowels are epenthetic. Therefore, it does not predict a phonemic contrast in final position. The phonological data supports a phonemic contrast between /ə/ and /u/ in final position. Therefore, the VC analysis makes a misprediction for the phonological data. The VC analysis could account for the occurrence of rounded and unrounded final vowels by appealing to the *Labialised Consonant* hypothesis, which proposes that there is no vowel /u/ but round vowels correspond to schwa with a preceding labialised consonant. I showed in Chapter 4 that the *Labialised Consonant* hypothesis is not supported by the data. Especially pertinent is the reduplication data, which is included in §8.3.3, in example (267) which shows that round vowels are duplicated in Kaytetye reduplication. /u/ is a phoneme in Kaytetye, and consequently there is phonological contract between /ə/ and /u/. This means that there is a contrast between /ə/ and /u/ in final position, a fact not predicted by the VC analysis. Utterance-final weakening accounts for the variation in the realisation of the final vowel under the Onset-Maximising Analysis

8.6.5 Summary

In each of the four areas considered in this section, the VC analysis either makes an incorrect prediction, or provides an unmotivated explanation. The *Onset Maximising* analysis provides a motivated account for these four areas. Therefore, the *Onset Maximising* analysis is a more plausible analysis of Kaytetye syllabification than the VC analysis.

8.7 Syllable and Word Structure

In the preceding section I showed that *Onset Maximising* syllabification provides a plausible analysis of the facts of Kaytetye phonotactics. I also showed that the VC analysis makes incorrect or insufficient predictions in §8.6. Because of this, standard syllabification correctly accounts for the data.

In this section I review the relationship between the syllable and the word in Kaytetye, especially in relation to the high number of vowel-initial roots in Kaytetye. I show that the fact that Kaytetye has a high number of vowel-initial morphemes is plausibly the result of diachronic patterns, rather than a result of syllabification.

8.7.1 Kaytetye Root-Initial Phonotactics

In the *kRoot* dataset, only 1,068 (38.5%) roots begin with a consonant. Out of the 1,704 vowel-initial forms, 1,180 begin with /ɐ/, 39 begin with /ɐː/, and 485 begin with /i/. This high frequency of vowel-initial forms also occurs in the other Arandic languages (Breen & Pensalfini 1999; Green 2010; Henderson 2013). This fact is highlighted by Breen and Pensalfini (1999: 3) in support of their VC analysis.

In the VC analysis, vowel-initial forms follow straight-forwardly from the syllable structure. Consonant-initial forms are accounted for by occurring with an initial /ə/ which is not realised in utterance-initial position. In the *Onset Maximising* analysis, the high frequency of vowel-initial forms results from historical language change, which is motivated by the reduction of phonological material with a low information content.

8.7.2 Arandic Historical Linguistics

Koch (1997, 2004) provides the most comprehensive historical analysis of the Arandic languages. Koch (1997: 276) analyses the Arandic language family with 8 sound changes from Proto-Pama-Nyungan, listed here for reference.[29]

a) The creation of the schwa /ə/ vowel.

b) The creation of prestopped nasals: *tn*, *pm*, etc.

c) The creation of prepalatal consonants: *yt*, *yn*, etc.

d) The creation of the velar approximant: /ɰ/.

e) The creation of rounded consonants: /p^w/, /t^w/, etc.

f) The loss of initial consonants.

g) The rightward shift of stress.

h) The addition of final vowels to consonant-final forms.

Koch (1997: 284-85) analyses Arandic with the historic loss of all initial consonants. Current consonant-initial forms in Kaytetye result from further elision of initial vowels following the loss of initial consonants. For example, Koch (1997: 285) proposes a possible development of the current 2SG.ERG pronoun *nte* /ntə/ from *nyunte, beginning with the elision then deletion of the initial nasal, producing *ente, and then the deletion of this initial vowel producing *nte*.

Dixon (2002: 593) lists six Pama-Nyungan language groups which have the complete loss of initial consonants: (i) most Northern Paman languages, (ii) Mbabaram, (iii) several South East Cape York languages, (iv) Nganjaywana, (v) several Upper Southwest Pama languages, (vi) the Arandic languages. This means that while the loss of initial consonants is not common, it occurs in a range of Pama-Nyungan languages independently.

[29] Koch's analysis of Kaytetye phonology differs from that in this thesis, especially in relation to the existence of: (i) the velar approximant /ɰ/; (ii) rounded consonants; (iii) prepalatalised segments.

8.7.3 Language Change and Initial Consonant Loss

I propose that the loss of initial consonants relates to the optimisation of phonological forms to reduce content which does not aid in the recognition of words. This is based on two proposals:

1. Initial consonants generally do not significantly aid in the identification of spoken words in Pama-Nyungan.
2. Language change reduces phonological structure with a low information content.

The first proposal is based on two facts about Pama-Nyungan phonotactics. The first fact is that there is generally a reduction of contrast in word-initial position. For example, the contrast between apical consonants is neutralised in word-initial position generally in Australian languages (Fletcher & Butcher 2014: 111-12). Dixon (2002: 553-56) defines 'canonical' Australian word-initial phonotactics as disfavouring apicals and liquids. The second fact is the general lack of word-initial consonant clusters. Both Fletcher and Butcher (2014) and Dixon (2002) identify a general restriction in the occurrence of consonant clusters in word-initial position generically across Australian languages.

These facts show the fact that word-initial position is associated with a low amount of phonological information in Pama-Nyungan languages. Pre-Arandic had these same features, including word-initial lenition which is proposed as a historical process in the Arandic languages (Koch 1997). The phonological reduction in initial position contrasts with medial consonants, which show a greater degree of contrasts and a more salient identifier of unique lexemes in speech (Dixon 2002; Fletcher & Butcher 2014). Butcher (2006) shows that in Australian languages medial consonants have a range of phonetic properties which enhance their acoustic and perceptual salience. Initial consonants do not show these properties.

The second proposal, that language change reduces phonological structure with low information content, is well-established in literature on language change. Experimental research has shown that the functional load of phonemes has a role in whether the phoneme is maintained diachronically or undergoes a merger with another phoneme (Wedel et al. 2013). As another example, unstressed vowels are regularly targeted by diachronic deletion or reduction patterns (Blust 2002; Delforge 2008). The right word edge, which has low information content for word recognition patterns, is also regularly targeted by diachronic phonological reduction (e.g. the loss of final consonants, which happened multiple times independently in the Austronesian Languages, Blevins 2004; Lynch et al. 2002; Wedel et al. 2019). Blevins (2001: 483-84) lists 8 Australian languages in which certain perceptually weak consonants were lost in initial position.

These facts motivate an account of vowel-initial word forms in Kaytetye through diachronic language change, rather than a fact emerging from syllable structure. This argument is supported by the fact that along with the Arandic language family, there were two other Australian language groups which also underwent general loss of word-initial consonants: (i) Northern Paman; (ii) Nhanta (Blevins 2001: 482). This shows it is a more general pattern in Australian languages. For these reasons, the VC analysis is unnecessary to account for the wide range of vowel-initial forms in Kaytetye.

8.8 Conclusion

In this chapter I compared the VC analysis and the *Onset Maximising* analysis of Kaytetye syllable structure. I justify the *Onset Maximising* analysis through negative and positive means: negative through showing the implausibility of a VC analysis, and positively through showing the plausibility of the *Onset Maximising* analysis with respect to Kaytetye language data.

Chapter 9: Conclusion

In this thesis I have identified four areas of interest in the analysis of Kaytetye phonology and morpho-syntax:

1. The vowel inventory.
2. The high number of vowel-initial forms.
3. The morpho-syntactic status of Associated Path constructions.
4. The unusual VCV target for minimality effects, including reduplicative forms.

Previous literature has proposed typologically non-standard analyses for these four areas in Kaytetye:

1. *Vowel Inventory*: a two-vowel system, in which there is a vertical contrast between /ɐ/ and /ə/ (Koch 1984; Turpin 2000). The appearance of a range of vowels is analysed as the effect of co-articulation with two types of complex consonants and /ə/: (i) pre-palatal consonants; (ii) labialised consonants.
2. *Vowel-Initial Forms*: Kaytetye has very similar phonology and morpho-syntax to the other Arandic languages, and it is necessary to consider analyses proposed based on data common to the Arandic languages. Prominent among these is the VC syllable analysis of Central Arrernte (Breen & Pensalfini 1999), which is proposed to account for the high number of vowel-initial forms in the Arandic languages, including Kaytetye.
3. *Associated Path Constructions*: Associated Path constructions are word-level constructions with fixed meanings, which are not morphologically analysable (Koch 1984).
4. *VCV Minimality*: Selection of VCV for minimality is arbitrary and not motivated by any synchronic patterns in Kaytetye (Koch 1990).

In contrast, for the first three areas I propose typologically standard patterns, and I show that non-standard accounts are unnecessary to explain the data. In this thesis I propose the following:

1. *Vowel Inventory*: A four-vowel system: /ɐ, ə, i u/, with no pre-palatal or labialised consonants, an analysis which is consistent with Kaytetye phonetic (San 2016) and phonological data.
2. *Vowel-Initial Forms*: Standard onset-maximising syllabification, and the high frequency of vowel-initial words is the result of the historical loss of initial consonants.
3. *Associated Path:* Associated Path is a phrasal construction with an auxiliary verb.

In relation to the VCV target, I show that the VCV target is not a minimal word under any analysis. I show that a new category, the 'minimal root' accounts for the VCV form. This target is motivated by language-internal patterns in the lexicon, rather than the assignment of prosodic structure, especially in relation to patterns of vowel-initiality and polysyllabicity. This proposal accounts for patterns of minimality which cannot be explained by standard minimal word analyses

I showed in this thesis that the analysis that Kaytetye has a round vowel /u/ has ramifications for understanding other aspects of Kaytetye phonology, particularly syllable structure. The evidence of the occurrence of initial round vowels in Kaytetye reduplication in §4.3.1 contrasts with the reduplication data of Wilkins (1989: 92-94) for Central Arrernte, which shows that rounding does not occur initially in the reduplicant. Further research is required to determine the extent to which the analyses in this thesis are applicable to other Arandic languages, and especially the extent to which the differences between Kaytetye and the Arandic languages are the result of differences in analysis, or differences in grammar.

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Appendix 1: Reduplication Elicitation Forms

#	Elicitation Sentence	IPA	Verb Definition	Noun Definition	Elicitation Translation	AP Target	AP Translation
1	*athe ertwathenhe*	[al̪t̪ə ət̪wat̪ən̪ə]	knock down, flatten	grass	flattened the grass	athe ertwathelp-___nhe	flattened grass along the way
2	*artetye ertwathenhe*	[at̪icə ət̪wat̪ən̪ə]	knock down, flatten	mulga	flattened the mulga	artetye ertwathelp-___nhe	flattened mulga along the way
3	*parreke ertwathenhe*	[parəkə ət̪wat̪ən̪ə]	knock down, flatten	fence	flatten the fence	parreke ertwathelp-___nhe	flattened fence along the way
4	*artnweng-armerne errwarenhe*	[aʈɳʊŋamənə ərwaɻən̪ə]	pick on, bully	children	bullied children	artnwenge errwarelp-___nhe	bullied children on the way
5	*atyerreye errwarenhe*	[acəri ərwaɻən̪ə]	pick on, bully	younger sibling	bullied a younger sibling	atyerreye errwarelp-___nhe	bullied younger sibling on the way
6	*kwerre errwarenhe*	[kʊrə ərwaɻən̪ə]	pick on, bully	young girl	bullied a young girl	kwerre errwarelp-___nhe	bullied a young girl on the way
7	*pantye warenhe*	[paɲcə waɻən̪ə]	roll or coil something up	blanket	rolled up a blanket	pantye warelp-___nhe	rolled up the blanket on the way/while travelling along
8	*waye warenhe*	[wejə waɻən̪ə]	roll or coil something up	wire	rolled up wire	waye warelp-___he	rolled up the wire on the way
9	*thwayeke warenhe*	[t̪wejəkə waɻən̪ə]	roll or coil something up	swag	rolled up the swag	thwayeke warelp-___nhe	roll up the swag on the way
10	*rapetye kwetyenhe*	[ɻapicə kʊcən̪ə]	collect or pick things up	rubbish	collected rubbish	rapetye kwetyelp-___nhe	collected rubbish on the way

11	*alekilparte kwetyenhe*	[aləkilpaʈə kʊcəṉə]	collect or pick things up from the ground	bush tomato	collected bush tomatoes	alekilparte kwetyelp-___nhe	collected bush tomatoes on the way
12	*katyerre kwetyenhe*	[kacərə kʊcəṉə]	collect or pick things up from the ground	desert raisin	collected desert raisins on the way	katyerre kwetyelp-___nhe	collected desert raisins on the way
13	*ware lywekenhe*	[waɻə ʎʊkəṉə]	light a fire	fire	lit a fire	ware lywekelp-___nhe	lit a fire on the way
14	*alek-amerne ywekenhe*	[aləkaməɳə jʊkəṉə]	chase away, hunt away, shoo something away, send someone off, flush out animals when hunting	dogs	chased off dogs	alek-amerne ywekelp-___nhe	chased off dogs on the way
15	*artnweng-amerne ywekenhe*	[aʈɳʊŋaməɳə jʊkəṉə]	chase away, hunt away, shoo something away, send someone off, flush out animals when hunting	children	chased off children	artnweng-amerne ywekelp-___nhe	chased off children on the way
16	*alethang-amerne ywekenhe*	[aləṯaŋaməɳə jʊkəṉə]	chase away, hunt away, shoo something away, send someone off, flush out animals when hunting	strangers	chased off a stranger	alethang-amerne ywekelp-___nhe	chased off strangers on the way
17	*Ice cream awentyenhe*	ice cream [awoɲcəṉə]	eat runny food, slurp, lick	ice cream	licked ice cream	ice cream awentyelp-___nhe	licked ice cream on the way

18	*Yerrampe awentyenhe*	[jəɹampə awoɲcən̪ə]	eat runny food, slurp, lick	honey ants	slurped up honey ants	yerrampe awentyelp-___nhe	slurped up honey ants on the way
19	*Ilperalke awentyenhe*	[ilpəɻalkə awoɲcən̪ə]	eat runny food, slurp, lick	sugarbag	slurped up sugarbag	ilperalke awentyelp-___nhe	slurped up sugarbag on the way
20	*errmetyine akewentyenhe*	[ərmicinə ako:ɳcən̪ə]	rise (dust or dirt)	dust cloud	dust rose	errmetyine akewentyelp-___nhe	dust rose on the way
21	*artnweng-amerne alewetnhenhe*	[aʈɳʊŋaməɳə alo:t̪n̪ən̪ə]	ask someone to do something; invite someone along	children	asked children	artnweng-amerne alewetnhelp-___nhe	asked children on the way
22	*arelh-amerne alewetnhenhe*	[aɹəl̪aməɳə alo:t̪n̪ən̪ə]	ask someone to do something; invite someone along	women	asked women	arelh-amerne alewetnhelp-___nhe	asked women on the way
23	*artwey-amerne alewetnhenhe*	[aʈwijaməɳə alo:t̪n̪ən̪ə]	ask someone to do something; invite someone along	men	asked men	artwey-amerne alewetnhelp-___nhe	asked men on the way
24	*artnweng-amerne nyerrewepenhe*	[aʈɳʊŋaməɳə ɲəro:pən̪ə]	tell someone off, swear at someone, reprimand	child	growled children	artnweng-amerne nyerrewelp-___nhe	growled children on the way
25	*arelh-amerne nyerrewepenhe*	[aɹəl̪aməɳə ɲəro:pən̪ə]	tell someone off, swear at someone, reprimand	woman	growled women	arelh-amerne nyerrewelp-___nhe	growled women on the way
26	*artwey-amenre nyerrewepenhe*	[aʈwijaməɳə ɲəro:pən̪ə]	tell someone off, swear at someone, reprimand	man	growled men	artwey-amerne nyerrewelp-___nhe	growled men on the way

27	*aleme artnweyenehe*	[aləmə aʈɳwi:nən̪ə]	be hurt, sore or in pain, stinging, aching	stomach	stomach hurt	aleme artnweyenelp-___nhe	stomach hurt on the way
28	*ake artnweyenehe*	[aka aʈɳwi:nən̪ə]	be hurt, sore or in pain, stinging, aching	head	head hurt	ake artnweyenelp-___nhe	head hurt on the way
29	*ilpe artnweyenehe*	[ilpa aʈɳwi:nən̪ə]	be hurt, sore or in pain, stinging, aching	ear	ear hurt	ilpe artnweyenelp-___nhe	ear hurt on the way
30	*artnwenge errweyenenhe*	[aʈɳʊŋə ərwi:nən̪ə]	anxious, nervous, jumpy	child	the child was nervous	child errweyenelp-___nhe	child was nervous on the way
31	*arelhe errweyenenhe*	[aɻəl̪ə ərwi:nən̪ə]	anxious, nervous, jumpy	woman	woman was nervous	arelhe errweyenelp-___nhe	woman was nervous on the way
32	*artweye errweyenenhe*	[aʈwii ərwi:nən̪ə]	anxious, nervous, jumpy	man	man was nervous	artweye errweyenelp-___nhe	man was nervous on the way
33	*artnwenge alarrenhe*	[aʈɳʊŋə alarən̪ə]	hit, bash, whack or beat someone or something	child	hit a child	artnwenge alarrelp-___nhe	hit a child on the way
34	*aleke alarrenhe*	[alәkә alarən̪ə]	hit, bash, whack or beat someone or something	dog	hit a dog	aleke alarrelp-___nhe	hit a dog on the way
35	*nantewe alarrenhe*	[nanto: alarən̪ə]	hit, bash, whack or beat someone or something	horse	hit a horse	nantewe alarrelp-___nhe	hit a horse on the way
36	*angketye amarrenhe*	[aŋkicə amarən̪ə]	swell up (of body part)	foot	foot swelled	angketye amarrelp-___nhe	foot swelled on the way
37	*eltye amarrenhe*	[əlca amarən̪ə]	swell up (of body part)	hand	hand swelled	eltye amarrelp-___nhe	hand swelled on the way

38	*aleke akngwakaylenhe*	[aləkə akŋwakejlən̪ə]	bump	dog	bumped a dog	aleke akngwakaylelp-___nhe	bumped a dog on the way
39	*artnwenge akngwakaylenhe*	[aʈɳʊŋə akŋwakejlən̪ə]	bump	child	bumped a child	artnwenge akngwakaylelp-___nhe	bumped a child on the way
40	*arwele akngwakaylenhe*	[aɻʊlə akŋwakejlən̪ə]	bump	tree, bush	bumped a bush	arwele akngwakaylelp-___nhe	bumped a bush on the way
41	*rlwene aynenhe*	[ɭʊnə ejnən̪ə]	eat, have a feed	bread	ate bread	rlwene aynelp-___nhe	ate bread on the way
42	*weye aynenhe*	[wi: ejnən̪ə]	eat, have a feed	meat	ate meat	weye aynelp-aynehe	ate meat on the way
43	*pwetyetake aynenhe*	[pʊcətakə ejnən̪ə]	eat, have a feed	bush tucker (from Eng.)	ate bush tucker	pwetyetake aynelp-aynenhe	ate bush tucker on the way

Appendix 2: Orthography to IPA Rules

Original	Result	Original	Result
^yt	ait	eway	uwɐi
-		eyewe	iju
ng	ŋ	eyi	əji
rr	r	eyawe	ijɐwə
tnth	tnt̪	eya	ijɐ
tnty	tnc	iwe	iwu
tnh	t̪n̪	ewe	uwə
nth	n̪t̪	ewa	uwɐ
tlh	t̪l̪	eye	ijə
lth	l̪t̪	aye	ɐjə
th	t̪	y	j
nh	n̪	[ea]$	ə
lh	l̪	[ea](\s)	ə\1
rtn	ʈɳ	e	ə
rnt	ɳʈ	ə([cɲʎ])	i\1
rtl	ʈɭ	a	ɐ
rlt	ɭʈ	\s+$	
rt	ʈ	wə	u
rn	ɳ	əɐ	ɐ
rl	ɭ	^u	wə
tny	cɲ	ɐu	ɐwə
nty	ɲc	ɐiɐ	ɐjɐ
tly	cʎ	([^ɐiəu])wu	\1u
lty	ʎc	iiw	iju
ty	c	uu	uwə
ny	ɲ	^ə	i
ly	ʎ	ii	ijə
r	ɻ	ɐɰ[ɐə]	ɐ:
h	ɰ	ɐj([^ɐiəu])	ɐi\1
ayi	aji	ɐ:j	ɐ:i
aywe	aju	ɐɰi	ɐ:ji
ewaye	uwɐjə		

Appendix 3: *kRoot* Database Creation Procedure

1. Retrieve all items in the *Kaytetye-to-English Dictionary* marked as headwords.
2. Filter out all headwords which are marked as morpho-syntactically complex with either a space (indicating a word boundary) or a hyphen (indicating a morpheme boundary). Headwords which did not have an identified part of speech were also excluded.
3. From this filtered set, code all remaining headwords with the following values:

    0: Proper name, e.g. place name, name of constellation or star, or personal names. These are excluded from analysis.

    1: Morphologically simplex form. These are forms which have no obvious morphological composition, especially the absence of a root which is elsewhere attested. Forms in this category are retained in the *kRoot* database.

    2: Historically complex form, which include: (i) Forms with one identifiable morpheme with one unidentifiable morpheme. For example, *ahernarreparre* ‘close to ground’ has the component *aherne* ‘ground’ but an otherwise unattested component *arreparre*. (ii) Forms which have identifiable morphology, but their meanings are not straight-forward interpretations of these morphemes, e.g. *ahentyepenhe*, meaning ‘lover’, derives from the root *ahentye* ‘throat’ with the sequential suffix *-penhe* ‘after; from’. Forms in this category must also not show evidence of an internal word boundary. These forms are treated as roots and retained in the database.

    3: Complex word forms or phrases, which were identified by transparent morphology, or there was other evidence of complex structure. These were excluded from the database.

4: A variant of a root or complex form. These were excluded from the database.

4. Analyse the set of complex word forms for coverbs and add these to the set of roots. A complex word form has a coverb if (i) there is a transparent verb root which co-occurs with the coverb, (ii) the coverb occurs in multiple constructions with a consistent meaning, (iii) the coverb and the verb root occur with a clitic, (iv) the coverb reduplicates, or (v) the coverb occurs with transparent case marking.
5. Convert the root set to IPA using the rules in Appendix 3 and syllabify them using the rules in Appendix 3.

Appendix 4: Syllabification Rules

Target	**Result**
VkŋV	V.kŋV
VcɲV	V.cɲV
VʈɳV	V.ʈɳV
VtnV	V.tnV
Vt̪n̪V	V.t̪n̪V
VpmV	V.pmV
VkŋCV	Vkŋ.CV
VcɲCV	Vcɲ.CV
VʈɳCV	Vʈɳ.CV
VtnCV	Vtn.CV
Vt̪n̪CV	Vt̪n̪.CV
VpmCV	Vpm.CV
VCCCV	VC.CCV
VCCV	VC.CV
VCwV	V.CwV
VCV	V.CV

Appendix 5: List of Texts in the Kaytetye Text Corpus

Text	Speaker	Recording	Transcription and Translation
081014AmyN_01.lbl	AN	Margaret Carew & Myfany Turpin	Margaret Carew & Myfany Turpin
081014AmyN_02.lbl	AN	Margaret Carew & Myfany Turpin	Margaret Carew & Myfany Turpin
081014AmyN_03.lbl	AN	Margaret Carew & Myfany Turpin	Margaret Carew & Myfany Turpin
081014AmyN_04.lbl	AN	Margaret Carew & Myfany Turpin	Margaret Carew & Myfany Turpin
081014AmyN_05.lbl	AN	Margaret Carew & Myfany Turpin	Margaret Carew & Myfany Turpin
081014AmyN_06.lbl	AN	Margaret Carew & Myfany Turpin	Margaret Carew & Myfany Turpin
081014AmyN_08.txt	AN	Margaret Carew & Myfany Turpin	Margaret Carew & Myfany Turpin
19900506_NK.txt	NK	Emily Hayes	Emily Hayes & Myfany Turpin
200005_TT.txt	TT	Myfany Turpin, Tom Kantour, and Claudia Row	Myfany Turpin, Tom Kantour, & Claudia Row
200210_IAD1101.txt	AN, JA	Myfany Turpin	Myfany Turpin
20090616_TThompson.lbl	TT	Myfany Turpin	Myfany Turpin
20091117_TT-01.lbl	TT	Myfany Turpin	Myfany Turpin & Alison Ross
20091117_TT-02.lbl	TT	Myfany Turpin	Myfany Turpin & Alison Ross
20110718_TThomp_03F.lbl	TT	Myfany Turpin	Myfany Turpin
20110718_TThomp05.lbl	TT	Myfany Turpin	Myfany Turpin & Alison Ross
20110718TThomp-1.lbl	TT	Myfany Turpin	Myfany Turpin & Carol Thompson
20110718TThomp04.lbl	TT	Myfany Turpin	Myfany Turpin & Carol Thompson
20111108_ANgamp_F.lbl	AN	Myfany Turpin	Myfany Turpin & Selma Thompson
20130114JA.lbl	JA	Myfany Turpin	Myfany Turpin
20130114SA.lbl	SA	Myfany Turpin	Myfany Turpin
20130117TT_01.lbl	TT	Myfany Turpin	Myfany Turpin
20130117TT_03.lbl	TT	Myfany Turpin	Myfany Turpin
20130117TT_04.lbl	TT	Myfany Turpin	Myfany Turpin

20130117TT_06.lbl	TT	Myfany Turpin	Myfany Turpin
20130117TT_07.lbl	TT	Myfany Turpin	Myfany Turpin
20130117TT_08.lbl	TT	Myfany Turpin	Myfany Turpin
20130117TT_09.lbl	TT	Myfany Turpin	Myfany Turpin
20130117TT_10.lbl	TT	Myfany Turpin	Myfany Turpin
20130923AmyN_1.lbl	AN	Myfany Turpin	Myfany Turpin
20130923AmyN_7.lbl	AN	Myfany Turpin	Myfany Turpin
20130923AmyN_8.lbl	AN	Myfany Turpin	Myfany Turpin
AIATSIS13aA.lbl	MN	Myfany Turpin	Joannie Ross, Alison Ross, & others
AIATSIS13aB.lbl	MN	Myfany Turpin	Joannie Ross, Alison Ross, & others
AIATSIS15b_A.lbl	PR	Myfany Turpin	Joannie Ross, Alison Ross, & others
AIATSIS17cA.lbl	PR	Myfany Turpin	Joannie Ross, Alison Ross, & others
AIATSIS18dA.lbl	RA	Myfany Turpin	Joannie Ross, Alison Ross, & others
AIATSIS18dB.lbl	RA	Myfany Turpin	Joannie Ross, Alison Ross, & others
AIATSIS22F_A.lbl	RA	Myfany Turpin	Joannie Ross, Alison Ross, & others
AIATSIS22F_B.lbl	RA	Myfany Turpin	Joannie Ross, Alison Ross, & others
CAAMA1010.lbl	AP	Emily Hayes	Myfany Turpin, Shirleen McLaughlin & Emily Hayes
DKemarre19870411.txt	DK	Emily Hayes	Myfany Turpin, Shirleen McLaughlin & Emily Hayes
Koch.txt	Various	Harold Koch	Harold Koch
IAD372A.lbl	TT	Myfany Turpin	Myfany Turpin
IAD372B_snakes.lbl	TT	Myfany Turpin	Myfany Turpin
IAD406.lbl	TT	Myfany Turpin	Carol Thompson, Peter Young, Leslie Thompson, Harold Koch & Myfany Turpin
IAD590.lbl	TT	Harold Koch and Myf Turpin	Harold Koch & Myf Turpin
kdict_examples.txt	Various	-	Myfany Turpin & Alison Ross
KH4556.txt	Various	Ken Hale	Ken Hale
KH4560.txt	Various	Ken Hale	Ken Hale
KH4561.txt	Various	Ken Hale	Ken Hale
KH4562.txt	Various	Ken Hale	Ken Hale

KH4563.txt	Various	Ken Hale	Ken Hale
KH4564.txt	Various	Ken Hale	Ken Hale
KH4565.txt	Various	Ken Hale	Ken Hale
KH4566.txt	Various	Ken Hale	Ken Hale
Kilpangkwerle_PY_TT.lbl	TT	Myfany Turpin	Myfany Turpin
MarlpwengeTT-01.txt	TT	Myfany Turpin	Myfany Turpin
MOKeefe19861027.txt	MN	Emily Hayes	Myfany Turpin & Emily Hayes
Signs0612TT_10.lbl	TT	Myfany Turpin	Myfany Turpin
Signs0612TT_11.txt	TT	Myfany Turpin	Myfany Turpin
signs0612TT_12.txt	TT	Myfany Turpin	Myfany Turpin
Signs0612TT_14.txt	TT	Myfany Turpin	Myfany Turpin
Signs0612TT_15.trs	TT	Myfany Turpin	Myfany Turpin
Signs0612TT_16.trs	TT	Myfany Turpin	Myfany Turpin
Signs0612TT_17.lbl	TT	Myfany Turpin	Myfany Turpin
SP_TT070618_01.lbl	TT & DT	Myfany Turpin	Myfany Turpin
SP_TT070618_02.lbl	TT & DT	Myfany Turpin	Myfany Turpin
SP_TT070618_03.lbl	TT & DT	Myfany Turpin	Myfany Turpin
SP_TT070618_04.lbl	TT & DT	Myfany Turpin	Myfany Turpin
SP_TT070618_07.lbl	TT & DT	Myfany Turpin	Myfany Turpin
SP_TT070618_08.lbl	TT & DT	Myfany Turpin	Myfany Turpin
TMick900506.txt	TM	Emily Hayes	Myfany Turpin & Emily Hayes
Twerrpe090405_01.lbl	TT	Myfany Turpin	Myfany Turpin
Twerrpe090405_02.lbl	TT	Myfany Turpin	Myfany Turpin

Appendix 6: Orthographic Forms of Tokens which Contain Initial Non-Round Vowels for *uwə* Transcriptions.

Headword	**First Word**	**Second Word**	***uwə* Across Word/Morpheme Boundary**
angkwerrewenke	*angkwerre*	*wenke*	Yes
artnankewenke	*artnanke*	*wenke*	Yes
ntyalpewenke	*ntyalpe*	*wenke*	Yes
tyerewenke	*tyere*	*wenke*	Yes
ltywerewenke	*ltywere*	*wenke*	Yes
ikngethelewenke	*ikngethele*	*wenke*	Yes
ilpaytelhewenke	*ilpaytelhe*	*wenke*	Yes
twepewenke	*twepe*	*wenke*	Yes
ngkweltyewenke	*ngkweltye*	*wenke*	Yes
ayterewenke	*aytere*	*wenke*	Yes
arltwerrnhewenke	*arltwerrnhe*	*wenke*	Yes
pwaltyewenke	*pwaltye*	*wenke*	Yes
ahewe ankeye angkenke	-	-	No
akeyewelewel-apenke	-	-	No
tyewe	-	-	No
akertewenke	*akerte*	*wenke*	Yes
ililerewenke	*ililere*	*wenke*	Yes
aywerre angkewene	-	-	No
elperlperewenke	*elperlpere*	*wenke*	Yes
ilperletyewenhe	-	-	No
arretyewe	-	-	No
ngkwernetyewenhe	-	-	No
ltetyewenke	*ltetye*	*wenke*	Yes
tyeletyelewenke	*tyele-tyele*	*wenke*	Yes
eltarewenke	*ltare*	*wenke*	Yes
ahapertewe erlwe	-	-	No
ahapertewe arrenke	-	-	No
amelyewenke	*amelye*	*wenke*	Yes
errkerrkewenke	*errk-errke*	*wenke*	Yes
ahapertewe akantye	-	-	No
werrpewerrpe	*werrpe*	*werrpe*	Yes
etntyerewenke	*etntyere*	*wenke*	Yes
nterrparewenke	*nterrpare*	*wenke*	Yes

Appendix 7: Monomoraic Native Japanese Words

These words and their translations were retrieved from *Kenkyuusha's New College Japanese-English Dictionary* (Collick et al. 2002) accessed through https://ejje.weblio.jp/ on 24/03/2020. Items in the dictionary which are identified as affixes (e.g. *o-* 雄 'male') are excluded. Only native Japanese lexemes are included in this list.

#	Romanisation	Kanji	Translation	#	Romanisation	Kanji	Translation
1	i	井	well	32	ne	値	price, cost
2	i	藺	bulrush	33	ne	寝	sleep
3	i	亥	the Pig (zodiac)	34	no	野	field
4	u	卯	the Hare (zodiac)	35	ha	歯	tooth
5	u	鵜	cormorant	36	ha	刃	(cutting) edge
6	e	柄	handle	37	ha	葉	leaf
7	e	餌	bait, (animal) feed	38	hi	一	one
8	e	絵	picture	39	hi	火	fire
9	o	尾	tail	40	hi	灯	a light
10	ka	蚊	mosquito	41	hi	杼	shuttle (of a loom)
11	ki	木	tree	42	hi	日	day
12	ki	生	raw, fresh (usually in phrases only)	43	fu	二	two
13	ke	毛	hair	44	he	屁	flatulence
14	ko	子	child	45	ho	帆	sail
15	su	州	sandbank	46	ho	穂	ear (of a plant)
16	su	酢	vinegar	47	ba	場	place
17	su	巣	nest	48	ma	真	genuine
18	su	簾	bamboo screen	49	ma	間	space

19	se	瀬	rapids, shallows	50	mi	実	fruit
20	se	背	height, back	51	mi	身	body
21	ta	田	rice field	52	mi	巳	the Serpent (zodiac)
22	chi	血	blood	53	mi	箕	winnow
23	te	手	hand	54	mi	三	three
24	to	戸	door	55	mu	六	six
25	de	出	appearance	56	me	芽	bud
26	na	菜	vegetable	57	me	目	eye
27	na	名	name	58	mo	喪	mourning
28	ni	荷	baggage	59	ya	八	eight
29	ne	根	root	60	ya	矢	arrow
30	ne	子	the Rat (zodiac)	61	ya	輻	spoke
31	ne	音	sound	62	wa	輪	circle, ring